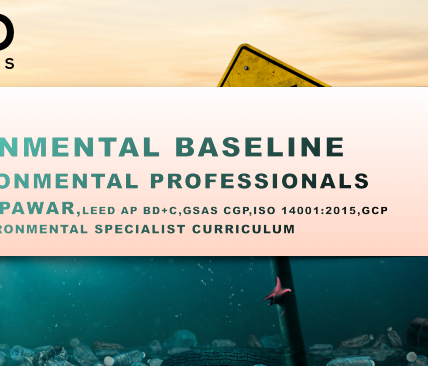




STRATEGIC ENVIRONMENTAL ASSESSMENT - SEA

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP
ENVIRONMENTAL SPECIALIST COURSE





ENVIRONMENTAL BASELINE FOR ENVIRONMENTAL PROFESSIONALS

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WHAT SHOULD YOU LEARN

Project Site and Study Area
Air Quality, Noise Levels and Vibrations

Geology and Seismicity, Soil Quality, Surface Water and Groundwater Quality

Marine Water and Sediment Quality, Marine Ecology, Terrestrial Ecology, Socio-Economics, Cultural Heritage and Archaeology.....

PROJECT DESCRIPTION

The Project Site and SEA Study Area, terms used in this SEA, are defined as follows:

- ✓ **Project Site:** Geographical boundaries of the temporary and permanent works of the Project development
- ✓ **SEA Study Area:** Geographical boundaries for SEA baseline data collection purposes, which may vary due to the nature and extent of the study
- ✓ Existing environmental conditions were assessed through a combination of primary surveys conducted in the SEA Study Area and secondary information obtained from desk-top based research
- ✓ The primary and secondary findings with respect to the identified environmental aspects, according to the Abu Dhabi guidelines, are described in the following sections: Air Quality, Noise Levels and Vibrations, Geology and Seismicity, Soil Quality, Surface Water & Groundwater Quality

AIR QUALITY

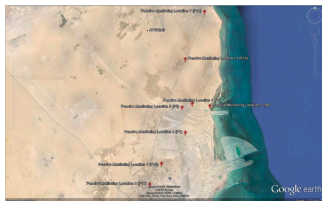
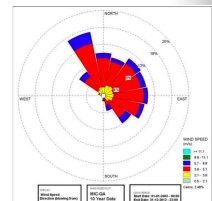


Figure 4-4 Passive Monitoring Locations



NOISE LEVELS AND VIBRATIONS +



Type of Zone	Maximum Noise Limits at Property Line, dB(A), 10-min average	
	Daytime (04:00 – 22:00)	Night-time (22:00 – 04:00)
Residential & Institutional	55	45
Commercial	65	55
Industrial	75	75

The noise levels expected in undeveloped areas, characterized by desert and sabkha with little industry, are typically 20 – 30 dB. However, noise levels in the QEZ3 area are currently affected by construction activities for the NPP and the project and by traffic on the Mesaieed – Al Wakrah Expressway (Route 11). Qatar has not established noise limits for construction activities and vibration levels for construction and operation activities.

GEOLOGY AND SEISMICITY



The Qatar peninsula is geologically part of the Arabian Gulf Basin. The basin, with a width of more than 1,200 km, extends eastward from the Arabian Shield to the Zagros fault system of Iran. The relevant formations are entirely of Tertiary to Quaternary age, as shown in Figure.

The near-surface of the Doha and Mesaieed areas consist mainly of shallow Holocene and Pleistocene (Quaternary) deposits formed primarily of marine and Aeolian deposits of sand and silt. The major tertiary formations that underlie these recent deposits can be divided into:

- ☑ Simsima limestone (Upper Damman);
- ☑ Midra shale (Lower Damman); and
- ☑ Rus formation.

GEOLOGY AND SEISMICITY



The greater part of Qatar consists of a relatively uniform limestone horizon, the Simsima Limestone, of Middle Eocene age (approximately 40 million years old) that is part of the Upper Damman Formation. From an engineering point-of-view the limestone can be described as moderately weak to moderately strong crystalline limestone with joints and fractures of variable spacing. In some areas, the upper layers of the Simsima Limestone tends to be highly weathered to the extent that the limestone forms gravel and cobbles within a silt, sand or marl matrix.

The Midra Shale is part of the Lower Damman Formation of Middle Eocene age. The shales consist of laminated to massive siltstone. The Rus formation underlying the Midra Shale formation consists of chalky dolomitic limestone.

SOIL QUALITY



✓ The Project site is generally flat-lying coastal plain consisting of sand with patchy vegetation. Soil conditions across the site were assessed by reviewing data available through a desktop-based study, site observations, geotechnical investigations and laboratory analysis of soil samples.

SURFACE WATER AND GROUNDWATER QUALITY

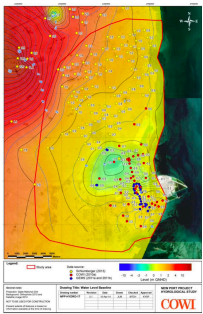


Figure 4-21: Groundwater Level Contour Map

✓ Hydrogeological conditions at the site were assessed through a combination of reviewing data available through a desktop-based study, site observations, hydrological investigations, pump testing, in-situ monitoring and laboratory analysis of groundwater samples.

✓ Sabkhas (salt flats), as shown in Figure 4-23, cover part of the project site. Sabkhas are characterized by highly saline soil and groundwater levels close to the soil surface.

MARINE WATER AND SEDIMENT QUALITY

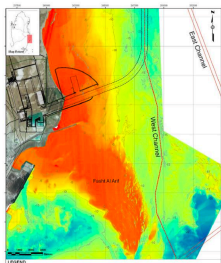


Figure 4-20: Bathymetry from LIDAR Survey of Qatar Coastal Waters, 2002
Source: EIA for NPP CCWE, 2013

Table 4-16 Summary of physicochemical parameters of seawater results

Parameter	Units	Maximum	Minimum	Average	*Qatari Standards
Max. Depth	m	12.75	0.25	3.37	—
Temperature	°C	31.00	28.90	30.11	—
pH		8.15	7.98	8.07	6.8-8.3
Conductivity	µS/cm	71,989.40	64,204.10	66,487.42	—
TDS	mg/L	42,999.40	41,851.70	42,356.27	33-45*103
DO	mg/L	6.06	4.59	5.61	<4.0

*Executive Regulations of Law of Environmental Protection No. 30 of 2002

✓ Marine water and sediment conditions around the Project site were assessed through a combination of a review of available data in a desktop-based study, detailed underwater surveys, and sediment and seawater sampling followed by laboratory analyses.

MARINE ECOLOGY

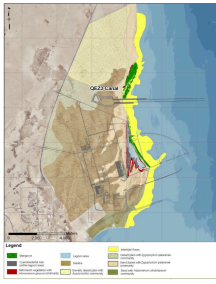


Figure 4-22 Coral Formations along Fasht al 'Arif

✓ The marine ecological condition in the surroundings of the Project site was assessed through a combination of reviewing available data through a desktop-based study, detailed underwater surveys, and sampling sediment and seawater followed by laboratory analyses.

Figure 4-20 Marine and Terrestrial Ecological Communities around QED3
Source: QEA for QED3 Canal, 2013

TERRESTRIAL ECOLOGY

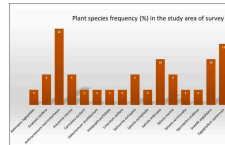


Figure 4-24 Flora Species Distribution

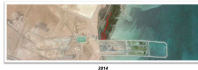


Figure 4-27 Mangrove Habitat near QED3 in 2011 (aerial) and 2014 (aerial)

✓ Terrestrial ecological conditions at the site were assessed through a combination of reviewing data available through a desktop-based study and visiting the site. The site survey was complimented with digital photography and accurate site location using GPS.

✓ Several areas within the Project project site are currently being used by the NPP and the Project Canal project and hence significantly anthropized.

CULTURAL HERITAGE AND ARCHAEOLOGY



Figure 4-21 Sites of Cultural Heritage Interest (Mowagiri, 2005)



Figure 4-25 Site of Al-Hadi, 2010

✓ The cultural heritage and archaeology in and around Project were assessed through a combination of reviewing data available through a desktop-based study and from site survey reports completed by the Qatar Museum Authority (QMA).