بلدية دبي
DUBAI MUNICIPALITY

Guidance on the Environmental Clearance (EC) Requirements

for Development and Infrastructure Projects in the Emirate of Dubai

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All information and documents referred to in this Guidance are applicable at the date of issuance. It is the full responsibility of the user to refer to latest amendments, if any.

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Definition of Terms and Abbreviations

For the exclusive use of this Guidance, the following terms, phrases, abbreviations, and definitions shall apply.

Term	Definition / Explanation
Affection Plan	An official site plot plan issued by the concerned planning authority, indicating the allocated plot number, the owner of the plot, the plot's land-use, survey coordinates delineating the boundary, the total land area, and the community where it is located. Other details included, if any, are the "no-build" or "frozen areas" affected by nearby areas of conservation or heritage value, current or planned public utility and infrastructure corridor (i.e. owned by Dubai Electric and Water Authority [DEWA] or Roads and Transport Authority [RTA]), military ground, among others. This document is also sometimes termed as "Site Plan".
Applicant	The Environmental Consultant or Company authorised by the Project Owner to secure, renew or amend the Environmental Clearance (EC) for a Project.
Aquifer	Geological formation with significant extents which can hold and transmit water to the groundwater wells.
Beneficial impact	Positive effect on the environment.
Biodiversity	The variability among living organisms from all sources including, among others, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
Climate Change	Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.
Coastal Environment Section (CES)	A Section within the Environment Department of Dubai Municipality (DM-ED), which oversees the sustainable development and the utilisation of Dubai coastal and marine environment through the formulation and implementation of Integrated Coastal Zone Management (ICZM) plans and procedures within the scope of responsibilities of Dubai Municipality. The Section is responsible for the monitoring of the Projects' compliance with the marine environment protection requirements and regulations imposed by the DM-ED in accordance with Federal Law No. 24 of 1999, and its Implementing Rules and Regulations. The section contributes significantly to the decision-making, understanding, analysis and study of coastal phenomena aimed at achieving a sustainable coastal development.
Compensation	An example of a trade-off whereby loss of natural values is remedied or offset by a corresponding compensatory action on the same site or elsewhere, determined through the process of Environmental Impact Assessment (EIA). Compensation involves implementing positive environmental measures to offset the residual adverse impacts which have been identified through the EIA process. Compensation measures have similar functions and produce outcomes which are of equal or greater environmental value to those which are expected to be lost.
Competent Authority	Dubai Municipality – Environment Department (DM-ED) is the Competent Authority in the Emirate of Dubai responsible for the implementation of the Federal Law No. 24 of 1999 for the Protection and Development of the Environment and its implementing rules and regulations.
Compliance Monitoring	Compliance Monitoring is conducted following the issuance of Environmental Clearance (EC) to ensure adherence with the conditions set in the EC and through the mitigation and monitoring requirements detailed in the Environmental Management Plan and the Environmental Monitoring Plan. It involves both Regulatory Monitoring and Self Monitoring.

Construction Environmental Control Plan (CECP)	Describes the construction works and prevention or mitigation measures in detail, and the environmental management and monitoring procedures to be implemented during the Project's construction phase. The CECP will ensure that appropriate environmental management practices are followed during the Project's construction phase. Based on the recommendations of the Environmental Impact Assessment, a CECP must be prepared and submitted with pertinent NOCs to the relevant Dubai Municipality Environment Department (DM-ED) Sections.
Control Measure	Actions and/or activities that are taken to prevent, eliminate or reduce the identified hazard or impact to the environment.
Comments Resolution Sheet (CRS)	A CRS is a form prepared by an appointed Environmental Consultant specifying the responses to each of the comments or concerns received from Dubai Municipality Environment Department (DM-ED) associated with the submitted Environmental Impact Assessment (EIA) document. Each comment or concern and the corresponding response shall be presented in a tabulated manner, clearly and accurately, providing all technical justification and references, to facilitate a speedy review process. This response shall also be incorporated and properly referenced in the revised EIA document.
Cumulative Environmental Effects / Cumulative Impact	The impact on the environment, which results from the incremental impact of an activity when added to other past, present, and reasonably foreseeable future activities. It can result from individually minor but collectively significant impact taking place over a period of time.
Cumulative Environmental Effects Assessment	Assessment of the effects of changes to the environment that are caused by an action in combination with other past, present, and future human actions.
Developer	A Company or Entity who develops land. The developer seeks a profit from development of the land, either by selling a development, such as residential complex, or an office building, or by holding the developed property to reap a return on the investment. In certain cases, Developer and Project Owner are one and the same (please refer to Project Owner definition).
Development	For the purpose of this Guidance, Development is any Project which involves conversion of a land for the construction of buildings and /or facilities for residential, commercial or industrial use, or for mixture of uses.
Direct Impact	Occurs through direct interaction of an activity with an environmental, social, or economic component.
Environment	The physical, cultural, social and economic attributes of the natural and built environs including land, water, atmosphere, climate, sound, odour, fauna, flora, and archaeological sites.
Environmental Aspect	An element, component, or resulting product of an activity or Project development that interacts with the environment.
Environmental Clearance (EC)	A Certificate with a set of environmental compliance conditions issued for the Project with known significant environmental impacts, and which satisfies the requirements of the Environmental Impact Assessment (EIA) process.
Environmental Consultant	Professional and experienced environmental practitioner registered with the Dubai Municipality Environment Department (DM-ED) to undertake Environmental Impact Assessment (EIA) studies and provide independent expert assessment and advisory services for their clients on matters pertaining to the management of environmental issues associated with the proposed Project. They assist in facilitating compliance of Project Owner to EIA process and environmental regulations, and in securing approval from the Competent Authority.
Environmental Control Section (ECS)	A Section within the Dubai Municipality Environment Department (DM-ED) responsible for the monitoring of the Project's compliance with the environmental requirements and regulations imposed by the DM-ED in accordance with Federal Law No. 24 of 1999, and its Implementing Rules and Regulations.
Environmental Impact / Effect	The resulting effect of an environmental aspect. Impact is used interchangeably and has the same meaning as "effect".

Environmental Impact Assessment (EIA)	A systematic planning process for identifying, predicting, analyzing and managing the potential environmental impacts (positive and negative) of a Project on the environment and the potential effects of the environment on the Project. The purpose of an EIA is to provide an independent assessment of a Project's potential environmental impacts to enable authorities and relevant stakeholders to understand and prevent or reduce the potential adverse impacts of the Project before making decisions on whether Environmental Clearance (EC) for the Project will be granted.
Environmental Impact Assessment Report (EIAR)	A document prepared by the Environmental Consultant that presents the detailed account of the quantitative EIA study process.
Environmental Impact Assessment Summary (EIAS)	An EIA document similar to an EIA Report in brief, which is a qualitative EIA study.
Environmental Management Consultant	An Environmental Management Consultant, if deemed required especially for large, multi-faceted Projects, is an Environmental Consultant and shall be appointed by the Project Owner to manage the implementation of the EIA recommendations and the EC's conditions. The Environmental Consultant for the EIA could also be the Environmental Management Consultant, but not necessarily so.
Environmental Management Plan (EMP)	An Action Plan or Management Strategy for the implementation of mitigation measures identified in an EIA.
Environmental Performance Report (EPR)	A document presenting the progress of the Project's implementation as well as the effectiveness of its environmental monitoring and management program.
Environmental Planning and Studies Section (EPSS)	A Section within the Environment Department of Dubai Municipality (DM-ED) responsible for environmental permitting of development, infrastructure, and industrial facility Projects; management and regulation of air pollution, noise, and odour; and undertaking environmental studies and development of environmental strategies in line with Federal and Local Policies.
Establishment	Any licensed commercial or business activity, which may include any building, factory, equipment, shop or office and any area or land and structures pertaining thereto.
Ex-situ	Off-site
Groundwater	Water occupying all voids within a geologic stratum.
Groundwater protected basins	Protected area demarcated by government for the protection and conservation of groundwater resources.
Hydrogeological environment	Refers to aspects of groundwater, soil, surface water and geological environments found in the Emirate of Dubai.
Indirect Impact	The effect on the environment, which is not a direct result of the Project, often produced away from or as a result of a complex pathway. Sometimes referred to as second or third level impacts, or secondary impacts.
Infiltration	The entry into soil or solid waste of water at the soil or solid waste surface.
Infrastructure	A facility or structure necessary for the efficient operation of a society. This includes, but not limited to, roads, bridges, railways, water and power supply, airports and seaports, drainage and sewerage networks.
In-situ	Onsite
International Environmental Agreement	Also referred to as a (international) protocol, covenant, convention amongst other terms, a type of treaty binding in international law with a primary stated purpose of controlling pollution and managing or preventing human impacts on natural resources.
Leachate	Any liquid that, in the course of passing through matter, extracts soluble or suspended materials which are harmful substances that may then enter the environment. This is most commonly used in the context of landfills or municipal solid waste disposal facilities.

Master Plan	A long-term planning document that provides a conceptual layout to guide future growth and development, presenting the overall land use of Development/Project through narrative and maps, and includes both present property uses as well as future land development plans. It is considered as a dynamic document that can be altered based on changing Project conditions over time and in line with the vision and policy directions of the government.
Mitigation Measures	Means to prevent, reduce or control the potential adverse environmental effects of a Project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means and optimizing the environmental benefits of a Project.
Natural Resources Conservation Section (NRCS)	A Section within the Dubai Municipality Environment Department (DM-ED) responsible for the monitoring, protection and sustainable management of natural resources including soil, groundwater, and biodiversity in accordance with applicable laws & regulations.
Negative impact	Commonly termed as adverse impact, which means detrimental effect on the environment.
No Objection Certificate (NOC)	A Certificate issued by the Competent Authority stating their no objection on the implementation of a Project or a specific activity that is a part or a component of a larger Project, which has already satisfied the requirements of the Environmental Impact Assessment (EIA) process.
Project	Any activity, process, premises or development regardless of scale or magnitude, which has an impact, whether significant or not, on the environment.
Project Owner	The owner of a Project to be developed.
Regulatory Compliance Monitoring	Conducted by DM-ED Officers and Engineers and involves, but not limited to, site inspection to check and verify the status of the Project and the mitigation measures as per the approved EIAR or EIAS, to record and assess the actual impacts of the Project, and to conduct desktop review of submitted documentation requirements as per the issued EC.
Residual Environmental Impact	Impacts remaining after the implementation of preventive and/or mitigating measures.
Screening	The process of deciding on whether an Environmental Impact Assessment (EIA) is required for a Project not categorised in this Guidance. The main conclusion will be a classification of the Project according to its likely environmental sensitivity. This will determine whether an EIA is needed, and if so, the type of EIA document.
Self Compliance Monitoring	Conducted by the Project Owner, Main Contractor or by Environmental Consultants, as applicable, and includes periodic site audits and inspections, as well as In-Situ or Ex-Situ sampling and testing.
Sensitive Receptor	Receptors are valued environmental features, such as groundwater, coastlines, air, biodiversity and human settlements (e.g. residential area, hospital, day care centre, etc.) that may be affected by one or more aspect of a proposed Project.
Separation Distance / Buffer Zone	Separation Distance is the linear distance between the source of emission and sensitive receptors. Buffer zone is the area of land (as determined by the separation distance) designed to protect sensitive receptors from a potential impact. The features of the buffer zone are a function of the impact they are designed to mitigate, and may include vegetation, land or sea scape features, and buildings or structures.
Significance	The extent to which something matters. Significance is the acceptability of the residual impacts of a Project on valued receptors. It may be determined by consideration of one or more of the following factors: 1. Magnitude, 2. Frequency, 3. Duration, 4. Geographic extent, 5. Seasonality, 6. Social/economic factors.
Stakeholder	Individuals, communities, government agencies, private organisations, non-governmental organisations or others who may directly or indirectly be affected by or may have interest on the Project or activity.
Sustainability / Sustainable Development	Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.
Trans-boundary	Crossing a political border either within a nation or international.

1 Introduction

A visionary leadership, unprecedented mega development Projects, high-quality infrastructure, an expatriate-friendly environment – these strategic foundations have set Dubai as a tourism hub and an iconic global metropolis within the region. The Dubai Government's decision to diversify from a trade-based and oil-reliant economy into a service- and tourism-oriented city has made real estate and other developments more valuable. Construction on a large scale has turned Dubai into one of the fastest-growing cities in the world, a city that boasts unmatchable towers, remarkable architecture and world-class developments.

To augment its success, Dubai is setting the fundamental groundwork for attracting new businesses and investors by establishing a suite of economic frameworks that remove barriers to development, encourage investment and promote ease in conducting business in the region. Embedded within these frameworks is the theme of environmental protection and sustainability.

As the Emirate aims to be a world leader and an example of environmental and sustainability excellence across the globe, it recognises the impacts on the environment brought about by this development. The protection, conservation and enhancement of the environment are considered three of the main objectives of the Federal and the Dubai Government that have been integrated into developmental policies and strategies. A system of federal laws and executive regulations focused on the protection and enhancement of the environment are enforced by competent authorities. These aim to protect the air, water, and soil environment from pollution and waste; develop water resources; protect marine environment; conserve biodiversity; natural resources, and fisheries; and render mitigation strategies and adaptation measures on climate change in order to promote sustainable development in the country.

In support of this initiative and pursuant to the Federal Law No. 24 of 1999 on the Protection and Development of the Environment (hereafter referred as the Law), the Dubai Municipality – Environment Department (DM-ED), the Competent Authority in Dubai as per the Law, has embarked on this strategic initiative to develop a Guidance on the Environmental Clearance Requirements for Development and Infrastructure Projects. This document (hereby referred to as the Guidance) is published under the authority of the DM-ED to provide information and guidance to Project Owners and Environmental Consultants on the DM-ED prescribed procedures and requirements to obtain an Environmental Clearance (EC) for all development, infrastructure, coastal and marine Projects in the Emirate of Dubai. An EC will be issued for Projects that will successfully complete the Environmental Impact Assessment (EIA) process leading to an approved EIA document. Specifically, an EC will be issued when the DM-ED is fully satisfied that the potential impacts of a Project have been properly analysed and addressed through the provision of appropriate mitigation measures.

This Guidance shall in effect supersede the Environmental Planning and Studies Section (EPSS) Technical Guideline No. 01 regarding the "Environmental Impact Assessment (EIA)", and the EPSS Technical Guideline No. 02 on the "EIA Requirements for Land Development and Infrastructure Projects", both issued in March 2019.

2 Purpose and Objectives

This Guidance is intended for the use of Project Owners and Environmental Consultants who are planning to submit an application to secure an EC from DM-ED. The Guidance describes the procedures and documentation required to properly carry out an environmental impact assessment of a proposed development, infrastructure, coastal and marine Project in the Emirate of Dubai. Strict adherence to the Guidance by Project Owners and Environmental Consultants is a necessary component of the EC application process. For an EC to be issued to a Project, the EIAR/EIAS shall satisfactorily identify and assess environmental impacts of the Project, recommend preventative and mitigation measures, and establish monitoring system to evaluate the effectiveness of measures.

This Guidance contains information that is proprietary to DM-ED, which shall not be used in any misleading context or purposes other than compliance with EC requirements in the Emirate of Dubai.

3 Dubai Strategic Vision

All of the environmental performance and sustainability indicators linked to the Dubai Strategic Vision shall be considered as part of the DM-ED EIA review. For convenience the main policy aspects in this regard are summarised below.

UAE VISION 2021

In 2014, the UAE launched a seven-year National Agenda to achieve the UAE Vision 2021. The National Agenda promotes an environment that integrates all segments of society while preserving the unique culture, heritage, and traditions of the UAE. The agenda was developed by over 300 officials from 90 federal and local government entities, and includes a set of national indicators, which support sustainable environment and infrastructure in addition to the sectors of education, healthcare, economy, police and security, housing, infrastructure and government services. It highlights the importance of infrastructure, which is a main pillar in attracting businesses and investors, and aims for the UAE to be among the best in the world in terms of quality of airports, seaports, road networks, and utility services.

Figure 1: UAE Vision 2021

DUBAI PLAN 2021

Dubai launched the Dubai Plan 2021 (DP 2021) to guide the Emirate's goal to be among the best cities in the world. Its main objective is to reinforce Dubai's position as a global center for trade and commerce, making it the top foreign direct investment destination worldwide. The development of DP 2021 took place in 2014, a process which engaged numerous stakeholders including the public and private sectors through a comprehensive media campaign.

Figure 2: Dubai Plan 2021

DP 2021 addresses various themes that complement the UAE Vision 2021: National Agenda. It describes the future of Dubai through holistic and harmonious perspectives, starting with the people and the society. It also presents the key characteristics of society needed to empower citizens in achieving their goals and the City's aspirations. The Plan covers both the natural and built environments, and looks at the living experience of the people, as well as the economic and social services provided.

DUBAI MUNICIPALITY STRATEGIC PLAN 2016 – 2021

In accordance with the UAE National Agenda and Dubai Plan 2021, DM launched its strategic plan to propel Dubai as a pivotal hub within the global economy. It sets ambitious targets for the Emirate's long-term growth, highlighting key sectors of focus. The Plan involves both government and relevant stakeholders to drive major investments, infrastructure, and social developments.

Figure 3: Dubai Municipality Strategic Plan (2016-2021)

The vision of Dubai Municipality Strategic Plan (2016-2021) contains the following strategic pillars:

- Creative and Pioneering Municipality;
- Constructive Partnerships and Effective Communication;
- City Growth;
- City Excellence; and
- City Environmental Sustainability.

The pillar 'City Environmental Sustainability' supports the objectives of the National Agenda and Dubai Plan 2021. In support to the Dubai Plan 2021 and DM Strategic Plan 2016-2021, DM has developed a number of strategies concerning various environmental sectors such as the Integrated Solid Waste Management Strategy 2030, Environmental Health Strategy for the Emirate of Dubai 2016-2021, and Dubai Air Quality Strategy 2017-2021.

4 EIA Principles and Factors

The full application of the following EIA principles and factors will increase the likelihood of the Project to achieve satisfactory environmental outcomes. These key principles and factors are based on international best practices for environmental impact assessment:

1. **Precautionary Principle:** This principle is used to invoke measures to prevent or reduce the threat of harm to the environment or human health in instances when scientific evidence about the threats posed by an activity or Project is not conclusive.

2. **Mitigation Hierarchy:** An approach that aims to reduce risks to the environment, economy and society following a specific order or hierarchy of steps: 1. Avoidance; 2. Minimization; 3. Rehabilitation; 4. Restoration and; 5. Offset.

3. **Maximum Resource Conservation:** Effective actions which lead to the optimal protection, preservation, management, or restoration of renewable and non-renewable natural resources such as wildlife, soil, energy and water.

4. **Polluter Pays:** The party responsible for producing pollution is responsible for paying for the damages done to the natural environment or community.

5. **Inclusiveness, Timeliness and Transparency:** The best decisions made are those in which the information and views of all interested and potentially affected parties are appropriately considered in a timely manner. Proper application of this three-(3)-pronged principle is the key as to whether an EC is issued or not.

6. **Disclosure and All Encompassing:** The Project Owner has the primordial duty and responsibility for disclosing all relevant information of the Project to produce a meaningful and acceptable EIA study. The EIA must be performed for the entire proposed Project and not parts thereof.

7. **Social Return on Investment (SROI):** Developed from traditional cost-benefit analysis and social accounting, it is a participative approach and an outcome-based measurement principle or tool used to understand and quantify the social, environmental and economic value of a proposed Project.

8. **Comprehensive:** The EIA process should fully consider all relevant information on the affected environment, of proposed alternatives and their impacts, and the measures necessary to monitor and investigate residual impacts.

9. **Credible:** The EIA process should be carried out with professionalism, rigor, fairness, objectivity, impartiality and balance, be evidence based, and subject to independent checks and verification.

10. **Early Integration:** The integration of the EIA process early into the Project development cycle is a vital aspect of Project planning and design. The EIA process, which is primarily concerned with assessing the overall impacts of any proposed Project, development, or activity, is also used to ensure the earliest possible inclusion of environmental protection, mitigation, and enhancement measures into the Project design elements.

11 **Zero Discharge:** The goal of this principle is minimal pollution from an activity or Project, including zero effluent discharge to the aquatic environment, recycling and reuse of all solid and liquid process wastes, and reducing air emissions to the lowest possible quantity and toxicity.

12 **No net loss:** When every effort is made to avoid, minimise and restore, human activities can still have negative impacts on biodiversity. To avoid a net loss of biodiversity and ecosystem services, damages resulting from human activities must be balanced by equivalent gains.

13 **Local, traditional and indigenous knowledge:** "Indigenous knowledge" is the term used to describe the knowledge systems developed by a community as opposed to the scientific knowledge that is generally referred to as "modern knowledge". Local, traditional and indigenous knowledge is the basis for local-level decision-making in many rural communities. This knowledge should be used in the impact assessment to provide a complete and reliable overview of issues specific to a community. Views exchanged with stakeholders and experts are valuable elements of the EIA.

5 Objectives and Scope of an EIA

Adherence to, and the earliest application of, the EIA requirements and procedures contained herein is intended to:

- Protect the Emirate of Dubai from significant adverse environmental impacts caused by the implementation of a Development or Infrastructure Project at the earliest possible stage of the Project cycle;
- Ensure that Projects are environmentally assessed at the earliest stage of the Project cycle in a prudent and rational manner, with mindful consideration of the detrimental consequences to natural, human and built environment, and climate change;
- Ensure that an environmental impact assessment is completed in a timely manner;
- Promote cooperation and coordinated action amongst government entities with respect to environmental impact assessments;
- Encourage government entities and Project Owners within the Emirate of Dubai to take actions that promote sustainable development in order to achieve and maintain a healthy environment and healthy economy; and
- Encourage the evaluation of the cumulative effects of Projects within the Emirate of Dubai and the consideration of the results of this evaluation in environmental assessments.

The scope of an Environmental Impact Assessment (EIA) comprises:

- Description of the proposed Project and associated works together with the environmental requirements for carrying out the Project;
- Identification and description of the components of the environment that are likely to be affected by the proposed Project and to cause adverse impacts to the proposed Project;
- Identification and quantification of pollution sources and determination of the significance of impacts on sensitive receptors including cultural heritage sites;
- Identification and quantification of any potential losses or damage to flora, fauna and natural habitats;
- Identification of the negative impacts and recommendations on appropriate mitigation measures during all phases of the Project (e.g. construction, operation, as applicable);
- Identification, prediction and evaluation of the residual (i.e. after practicable mitigation) environmental impacts and the cumulative impacts expected to arise during the construction and operation phases, as applicable, of the proposed Project in relation to the sensitive receptors;
- Investigation of the likelihood and extent of potentially undesirable “side effects” of proposed mitigation measures;
- Identification of constraints associated with the mitigation measures recommended in the EIA study;
- Identification and assessment of residual impacts after mitigation; and
- Plan and details of the environmental monitoring and audit requirements, as necessary, to ensure the implementation and the effectiveness of the adopted environmental protection and pollution control measures.

6 EIA Legal and Regulatory Framework

The UAE has a comprehensive legal and regulatory framework to ensure a sustainable environment within the Country consisting of federal laws, ministerial decrees, and executive by-laws.

The EIA system in the UAE is a legal requirement under Federal Law No. 24 of 1999. EIAs are implemented within the Emirate of Dubai under the jurisdiction of the DM-ED. Relevant provisions of the following main laws and regulations shall be used as reference, as applicable, during the preparation of the EIA Study.

Table 1: Federal Laws & Regulations

Federal Laws & Regulations	Description
Federal Law No. (26) of 1981	Concerning the Commercial Maritime Law
Federal Law No. (9) of 1983	Regulating the Hunting of Birds and Animals
Federal Law No. (19) of 1993	Designation of Maritime Areas of the UAE
Federal Law No. (24) of 1999	Protection and Development of the Environment
Executive order of Federal Law No. (24) of 1999	Regulation for Handling Hazardous Materials, Hazardous Wastes and Medical Wastes
Federal Law No. (23) of 1999	Exploitation, Protection, and Development of Living Aquatic Resources
Federal Law No. (11) of 2002	Regulating and Controlling International Trade in Endangered Species of Wild Fauna and Flora
Federal Decree No. (13) of 2003	Agreement for Protection of Wildlife and its Natural Habitat in the GCC Countries
Cabinet Decree No. (12) of 2006	Regulation Concerning Protection of Air from Pollution
Federal Decree No. (11) of 2007	UAE Joining the Convention of Wetlands of International Importance (RAMSAR)
Federal Law No. (22) of 2016	Concerning Possession of Dangerous Animals
Federal Law No. (11) of 2017	Concerning the Heritage/Antiquities

Table 2: Ministerial Decrees

Ministerial Decrees	Description
Ministerial Decision No. (33) of 2012	Regulating the Handling of HCFCs
Ministerial Decision No. (152) of 2013	Concerning the Regulation of the Passage and Export of Hazardous Waste Shipments Across the Borders of the UAE
Ministerial Decision No. (783) of 2015	Concerning the Banned and Restricted Industrial Chemicals in the UAE

Table 3: Local Laws, Orders, & Decrees

Local Laws/ Decrees/Orders	Description
Local Order No. (61) of 1991	Environment Protection Regulations in the Emirate of Dubai, its Rules of Implementation
Decree No. (22) of 2001	Concerning the Conservation of the Coastal Zone in the Emirate of Dubai
Local Law No. (11) of 2003	Establishment of Protected Areas in Dubai
Local Order No. (15) of 2008	Protection of Groundwater in the Emirate of Dubai
Decree No. (22) of 2014	Establishment of (6) Protected Areas in Dubai

Moreover, as part of the UAE's commitment to protect the environment and to address the global environmental challenges and issues, the UAE has signed and ratified many international and regional environmental conventions and agreements as listed in the following tables.

Table 4: International Conventions & Agreements

Year	International Convention/Agreement
1954	Convention for the Prevention of Pollution of the Sea by Oil and its amendments
1969	International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Causalities
1972	London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
1972	Convention on the Protection of the World Cultural & Natural Heritage
1973	Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES
1973	International Convention for the Prevention of Pollution from Ships (1973) as amended by Protocol MARPOL (1978)
1976	Convention on Limitations of Liability for Maritime Claims
1979	Charter of the United Nations Industrial Development
1982	United Nations Convention on the Law of the Sea (UNCLOS)
1985	Vienna Convention for the Protection of the Ozone Layer
1987	Montreal Protocol on Ozone Depleting Substances of 1987 and Montreal Amendments (London 1990, Copenhagen 1982, Montreal 1987, Beijing 1999)
1989	Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal
1991	International Convention for the Protection of New Varieties of Plants (UPOV)
1992	Convention on Biological Diversity
1992	United Nations Framework Convention on Climate Change
1994	United Nations Convention to Combat Desertification
1997	Kyoto Protocol to the UN Convention on Climate Change
1998	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
2001	Stockholm Convention on Persistent Organic Pollutants (POPS)
2007	Convention on Wetlands of International Importance (Ramsar)
2013	Minamata Convention on Mercury
2016	Paris Protocol to the UN Framework Convention on Climate Change
2016	Convention on the Conservation of Migratory Species (CMS) of Wild Animals

Table 5: Regional Conventions & Agreements

Year	Regional Convention/Agreement
1978	Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution, and its Protocol Concerning Regional Cooperation in Combating Pollution by Harmful Substances in Cases of Emergency
1990	Protocol for the Protection of the Marine Environment Against Pollution from Land-Based Sources
1991	Convention on Conservation of Wildlife and its Natural Habitats in the GCC Countries

7 Categorisation of Projects

This Chapter provides a list of Projects that are subject to an EIA, as required by the Federal Law No. 24 of 1999, prior to the commencement of any construction activity, any changes or modification in its process or component, or any planned expansion of an existing Project. The Projects that are covered by this Guidance are categorised based on location, size and sensitivity, the nature and magnitude of the potential environmental impacts, and consequently the type of EIA study required.

This Guidance identifies two types of EIA studies as follows:

- **EIAR:** quantitative EIA leading to the preparation of an EIA Report (EIAR); and
- **EIAS:** qualitative EIA leading to the preparation of an EIA Summary (EIAS).

The types of Projects and the corresponding type of EIA document required are presented in the following Section 7.1.

7.1 List of Projects Required to be Subjected to an EIA (Mandatory List)

Project Classification as per Federal Law No. 24 of 1999	Project Type	Threshold / Criteria	Required EIA Document
Non-renewable Resource Projects			
Petrol projects (similar but not limited to benzene, diesel, oils or fats) and natural gas projects, which include exploration (discovery and extraction), storage, transportation (i.e. pipeline), selling and collecting (i.e. distribution)	Fossil fuel, natural gas, and mineral ore exploration and development including offshore structures or pipelines	All	EIAR
	Onshore pipelines for the transport of oil, natural gas or petrochemical products	In new oilfield or pipeline corridor	EIAR
		In existing oilfield or pipeline corridor	EIAS
	Bulk storage facilities for petroleum, natural gas or petrochemical products	Tank farm or tank terminal	EIAS
	Fuel filling stations	All	EIAS
Power Generation and Desalination Projects			
Power plant projects (regardless of power source) including power transmission lines, substations, installations and related equipment used	Power generation plants (fossil fuel)	All	EIAR
	Renewable energy plants (i.e. hydro, geothermal, solar power plants, Waste to Energy)	All	EIAR
	Open substations	All	EIAS
	High voltage overhead power transmission lines	All	EIAS
Water desalination projects (regardless of the technology) including pipelines, assembly, storage, distribution, disinfection, treatment, installations and related equipment used, discharges (i.e. brine)	Desalination plant and potable water processing facility	All	EIAR
	Reverse osmosis (RO) plant	Using Treated Sewage Effluent (TSE) or desalinated water	EIAS
	Sea water reverse osmosis (SWRO) plant	All	EIAR
Groundwater resource usage projects including exploration, extraction, transfer, storage, injection, installation and related equipment	Groundwater extraction, purification and recharge	All	EIAR
	Dams, water reservoir	All	EIAR

Project Classification as per Federal Law No. 24 of 1999	Project Type	Threshold / Criteria	Required EIA Document
Land, Air and Sea Transport Projects			
Fast lane projects including bridges and roadways	New highways, road network, or bridges	All	EIAR
	Railway and mass transport network	All	EIAR
Tunnel projects	Tunnels, tunnelling and related works	All	EIAR
	Sewer, irrigation, or drainage network	All	EIAR
Marina and seaport projects and waterway and dredging Projects that require dredging of marine, anchors and seaport pathways	Development of a new harbour(s) or terminal(s) or marina or modification of an existing harbour or marina in coastal zone *(including rock works, capital dredging or excavation, quay walls, reclamation)*	All	EIAR
	Development of artificial canals connected to the Creek or sea or existing waterways *(including excavation or dredging, retaining walls)*	All	EIAR
	Maintenance dredging *(including approach channels, turning basins)*	All	EIAS
	Development of promenade or new marina or modification of existing marina in Creek or waterways *(including floating pontoons with mooring systems, piles supporting platforms, quay walls, revetment)*	With any reclamation or encroachment into the Creek or waterways	EIAR
		Without any reclamation or encroachment into the Creek or waterways	EIAS
	Modification of existing marina in the coastal zone *(including replacement or repairs to existing floating pontoons and mooring system)*	• Up to 10 no. of berths or slips • Without any rock works, dredging or reclamation	EIAS
Bridge over the water	Bridges above marine water *(including Piers located in Creek or waterways or sea)*	All	EIAR
Airport and airfield construction projects regardless of size	Airport and airfields	All	EIAR
Projects Related to Waste			
Waste disposal projects (regardless of method used: buried, incinerated or otherwise) whether solid, semi-solid, liquid or gaseous, hazardous or non-hazardous, municipal, industrial or medical including sites, industries, equipment and related transport	Landfills and waste disposal site	All	EIAR
	Waste incineration plant	All	EIAR
	Waste transfer station	All	EIAR
Waste treatment projects (regardless of method used: recycled, reused or otherwise) whether solid, semi-solid, liquid or gaseous, hazardous or non-hazardous, municipal, industrial or medical including sites, industries, equipment and related transport	Hazardous waste treatment facility	All	EIAR
	Waste sorting & recovery	All	EIAR
	Waste composting plant	All	EIAR

Project Classification as per Federal Law No. 24 of 1999	Project Type	Threshold / Criteria	Required EIA Document
Projects Related to Housing and Industry			
New horizontal housing or new population city projects	Residential, commercial or mixed-use community development	Without permanent discharge to Creek or sea	EIAS
		- Adjacent or within 100-m from a beach - With permanent discharge to Creek or sea	EIAR
Construction of industrial zone projects	Industrial estates, park, city or complex	Without water intake or permanent outfall to Creek or sea	EIAS
		- Adjacent or within 100-m from a mean sea level shoreline - With water intake or permanent outfall to Creek or sea	EIAR
New vertical housing projects	Building(s) *(regardless of height)*	With a marina component	EIAR
Special Projects			
Projects located near, next to, or within protected areas, or ecologically sensitive areas, or environmentally sensitive areas	Any Project	All	EIAR
Projects for the establishment of any kind of activity, installation and work on the islands and coastline of the UAE	Effluent-discharging outfalls *(thermal discharge, brine, hypersaline water, treated sewage effluent, storm water or groundwater, etc.)*	Storm water or groundwater with discharge rates greater than 2.0-m^3/sec	EIAR
		For all other effluents threshold is NOT applied	
		Storm water or groundwater with discharge rates less than 2.0-m^3/sec	EIAS
	Coastal stabilisation *(including revetment, groynes, breakwaters, seawalls, artificial reefs, beach reclamation, dredging, etc.)*	All	EIAR
	Maintenance of existing beaches *(cleaning, re-profiling, trimming, beach nourishment)*	All works extending below the intertidal zone	EIAS

Project Classification as per Federal Law No. 24 of 1999	Project Type	Threshold / Criteria	Required EIA Document
Coastal and offshore reclamation projects	Development of an artificial island(s) or peninsulas *(land reclamation, beaches, rock works, and quay walls)*	All	EIAR
	Sub-marine pipelines	All	EIAR
	Sub-marine cables	All	EIAS
	Offshore capital dredging and/or disposal *(sand dredging from borrow areas, disposal of dredged material)*	All	EIAR
	Temporary or permanent causeway(s) *(including rock works, reclamation)*	All	EIAR
	Temporary or permanent causeway(s) supported on piles	All	EIAS
Projects that are expected to affect the heritage, historical, recreational, scientific, cultural and service nature of the surrounded areas of the project	Golf course	New and without water discharges to the sea or Creek	EIAS
		New and with water discharges to the sea or Creek	EIAR
Hospitals and health facilities, including medical incinerators and laboratories	Hospitals, veterinary, specialised medi-clinics, health facilities with incinerator and/or laboratories	All	EIAR

Note:
With reference to the Online EC Application (https://environment.dm.gov.ae), this Table shall serve as a guide to enable the EC Applicant to identify the correct Project Type and the required EIA document for the Project.

7.2 Exempted Miscellaneous Types of Projects (Exclusion List)

All Projects not categorised in Section 7.1 are exempted to secure EC. These include, but not limited to, the following:

Project Classification	Project Type	Description/Remarks
Land, Air and Sea Transport Projects	Improvement of existing road *(widening, removal or addition of lanes, interchange, pedestrian crossing, etc.)*	-
	Access road to a development	-
	Helipad	-
Power-Related Projects	Enclosed Substation	-
	Loop-In–Loop-Out (LILO) OHL	-
Projects Related to Waste	Grey water treatment facility	-
	Sewage Treatment Plant (STP)	-
Projects Related to Housing and Industry	Low-rise buildings including labour accommodation	-
Special Projects	Private zoos and similar facilities	-
	Leisure, public parks, entertainment complex and theme parks	-
	Mall and shopping centres	-
	District Cooling Plants (DCPs)	If there is reverse osmosis (RO) plant / facility, refer to Section 7.1 for the required EIA study covering only the RO components.
Coastal/Marine Projects	Modification of existing marina in the coastal zone *(replacement or repairs to existing floating pontoons and mooring systems)*	Without any rock works, dredging / reclamation
	Maintenance of existing beaches *(cleaning, re-profiling, trimming, beach nourishment)*	On dry areas and within the intertidal zone
	Development of promenade, new marina or modifications of existing marina in Creek or waterways *(floating pontoons with mooring systems, piles supporting platforms)*	Without edge protection structures (e.g. revetment, quay walls) No dredging or temporary reclamation
	Emergency coastal stabilisation *(using revetments, geo-containers, etc.)*	-
	Floating leisure and entertainment structures *(water parks and restaurants)*	-

Screening is intended only for Projects that do not fall under any of the classifications in Sections 7.1 and 7.2. If a Project Owner or its appointed Environmental Consultant still has a doubt whether the proposed Project requires an EIA or not, a screening shall be conducted whereby DM-ED will provide clarification. The outcome of the screening process will be a categorisation of the Project according to its likely environmental sensitivity. A decision will be made whether an EIA is needed, and the level of assessment required.

8 Environmental Clearance Requirements

Project Owners or their authorised representative who intend to secure an EC from the DM-ED for the proposed Project shall comply with the requirements and follow the process provided in this Chapter.

8.1 EC Application Process

The EC application process implemented by the DM-ED in the Emirate of Dubai is reflected in Figure 4 and discussed in the following sections.

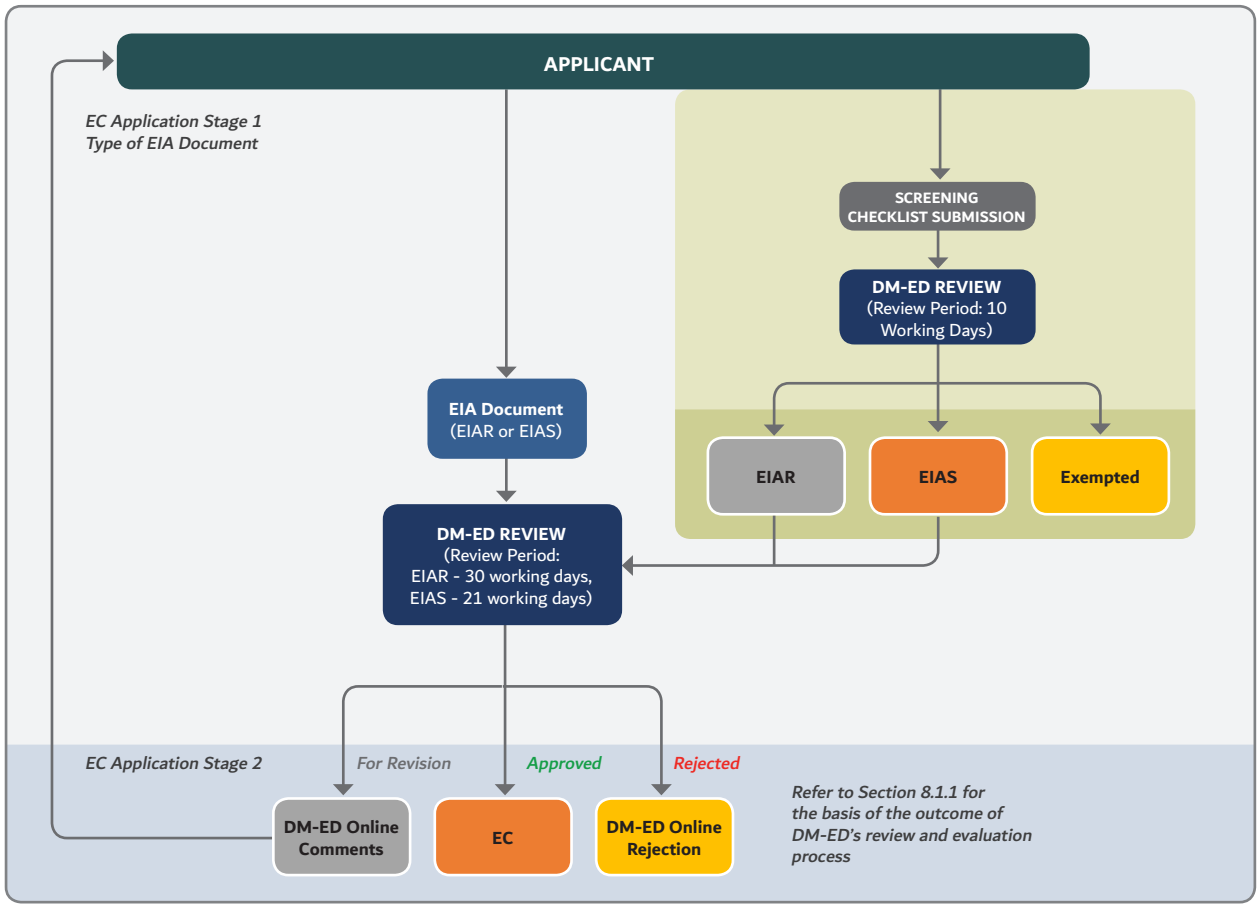


Figure 4: EC Application Process

Note: "Exempted" = "EIA Not Required"

8.1.1 Projects Subjected to an EIA

As per Article 4 of Federal Law No. 24 of 1999, "*Without contravention to the provisions of the above article, the Federal Environmental Agency, in coordination with the Competent Authorities and Concerned Parties shall undertake the evaluation of environmental impact of the Project and establishment to be licensed. No Project or establishment shall start the activity before obtaining the license aforementioned in the previous article including environmental impact assessment.*" The license referred to is the EC, which is the approval issued by the DM-ED to Projects that satisfy the EIA requirements.

For a Project that falls under any of the classifications in Section 7.1, the first stage of EC application process involves the preparation and submission of all the required documents and information on the proposed Project, as specified in the following sections, to be carried out by the Environmental Consultant authorised by the Project Owner. This includes the execution of the required EIA Study and the DM-ED review process.

With reference to Article 6 of Federal Law No. 24 of 1999, "*The Agency shall, in coordination with the Competent Authorities, decide on the applications submitted, within a period not exceeding one month from the date of submission of the application.*" The DM-ED review and evaluation process for an EIAR is not more than thirty (30) working days, and for EIAS not more than twenty-one (21) working days.

The second and final stage is the decision by the DM-ED on the EC application. It is based on the outcome of the review and evaluation process of the submitted EIAR or EIAS. The final decision will be one of the following:

1. **Approval**, which leads to the issuance of EC (refer to Section 10.1); or
2. **Revision**: Should the submitted EIA document requires revision, DM-ED will provide the review comments, request for clarification or require additional information through the Online EC Application System. It shall be expected that within one (1) month period, the revised EIA document incorporating all the comments, with a referenced Comments Resolution Sheet (CRS) shall be submitted. A CRS is a form prepared by an appointed Environmental Consultant or the Applicant, as applicable, specifying the response to each of the comments or concerns received from DM-ED associated with the submitted EIA document. Each comment or concern and the corresponding response shall be presented in a tabulated manner, clearly and accurately, providing all technical justification and references, to facilitate a speedy review process. The responses shall also be incorporated into the revised EIA document. On some occasions and as deemed necessary by DM-ED, a technical clarification meeting with the appointed Environmental Consultant or the Project Management Team, and the Project Owner (refer to Roles and Responsibilities) may be required, to resolve any outstanding issues or conflicting responses. Should the revised EIA document is not received within one (1) year from the date of issuance of the comments, the "EIA Study" shall no longer be considered valid, and a new study shall be required; or
3. **Rejection**: Rejection of the submitted EIAR or EIAS (refer to Section 10.2).

8.1.2 Screening Process

Most of the Projects in Dubai are included in either the Mandatory (Section 7.1) or Exclusion (Section 7.2) Project Categorisation Lists. In case a Project does not belong to any category or the Applicant is unsure, the Project shall be subjected to a screening process on a case-by-case basis. For this purpose, the Applicant shall complete a Screening Checklist (refer to Annex 1) and submit the hard copy of the said Screening Checklist to EPSS along with the supporting documentation deemed necessary by the Applicant.

The purpose of the Screening Checklist is to provide information on the Project and the reasonably foreseeable impacts on the environment for the DM-ED to reach a decision if an EIA study is deemed required for the Project. The decision, which will be communicated to the Applicant through the same Screening Checklist, may be one of the following:

- EIAR or EIAS is required;
- EIA study is not required; or
- Additional information is required to come up with a decision on the type of EIA study.

The Screening Checklist with DM-ED's decision will be returned to the Applicant within ten (10) working days from the date of receipt of the checklist.

8.2 EIA Documents for EC Application

There are two types of environmental assessment document required in obtaining an EC for a Project - Environmental Impact Assessment Report (EIAR) and Environmental Impact Assessment Summary (EIAS). The following sections describe the differences between these documents.

8.2.1 EIA Report (EIAR)

An Environmental Impact Assessment Report (EIAR) is required for the Projects listed in Section 7.1 of this Guidance, in which unmitigated impacts are expected to be "significant, sensitive, and diverse". The objective of an EIAR is to present to the DM-ED all detailed information on the need for the proposed Project, its nature, size, and location; environmental conditions (through baseline surveys) of the proposed Project site; potentially significant environmental impacts including predictions through numerical model simulations; proposed measures to avoid, mitigate, or compensate for the predicted impacts; and monitoring plans. All these information must be complete, accurate and clear in order to facilitate the decision-making process for issuing an EC.

The EIAR also serves as a statement of commitment by the Project Owner to comply with the environmental protection laws and regulations of the UAE, Dubai, and international conventions, as well as a binding agreement with the DM-ED on the implementation of measures to protect the natural and built environment.

Guidance on preparing an EIAR is provided in Annex 2, which is divided into two (2) parts:

PART I provides guidance on the structure and contents of an EIAR;

PART II provides the checklist, which needs to be prepared by the Environmental Consultant as part of the submission of the EIAR.

Annex 4 provides the guidance on the scope of the required environmental baseline surveys and modelling requirements.

8.2.2 EIA Summary (EIAS)

An Environmental Impact Assessment Summary (EIAS) is a report on a "qualitative" EIA that is required for the Projects listed in Section 7.1 of this Guidance, which are expected to have impacts that are "less significant, less sensitive, and less diverse" and where mitigation measures can be easily incorporated into the Project design and operations. An EIAS follows the same assessment process as the EIAR, but unlike an EIAR, the description of the environmental resources and conditions in the Project study area can be based on existing or secondary data. The study is carried out and presented in a high level and qualitative approach, and not as detailed as the EIAR.

Guidance on preparing an EIAS is provided in Annex 3, which is also divided into two (2) parts:

PART I provides guidance on the structure and contents of an EIAS;

PART II provides the checklist, which needs to be prepared by the Applicant as part of the submission of the EIAS.

Guidance on the scope of the environmental baseline survey and modelling, if deemed required, is provided in Annex 4.

8.3 Submission Requirements

The following information and documents shall be completed and submitted by the Applicant through the online service webpage *(**https://environment.dm.gov.ae**, Service Request Name: Request for Environmental Clearance for Development and Infrastructure Projects)*:

- Basic details of the Project and the Project Owner;
- Copy of the approved Affection Plan/s issued by the concerned planning authority;
- Copy of the latest Master Plan/Design;
- Letter of appointment from the Project Owner to the Applicant to secure the EC on their behalf;
- Details of the Applicant (e.g. contact information and focal person of the Applicant);
- Copy of the valid Dubai license (i.e. commercial, etc.) of Project Owner and appointed Environmental Consultants' CVs, portfolio of Project experience, etc., as attachment to the EIA document;
- EIA Document (i.e. EIAR or EIAS either in word document or readable PDF with working table of contents links);
- Properly referenced Comments Resolution Sheet (CRS), if applicable; and
- Other supporting documents deemed necessary by the Applicant.

9 Roles and Responsibilities

The EIA process in the Emirate of Dubai entails the key stakeholders to carry out their roles and responsibilities as defined below. It is vital that all key stakeholders have a clear understanding of their specific responsibilities in the EIA process to facilitate efficient and effective Project planning and implementation.

9.1 Competent Authority

As mandated by Federal Law No. 24 of 1999 for the Protection and Development of the Environment, the Dubai Municipality Environment Department (DM-ED) is the Competent Authority responsible for establishing and implementing the EIA guidelines and procedures, for taking decisions on the EC applications, and for monitoring environmental compliance (i.e. Regulatory Compliance Monitoring, refer to Section 11.1) of all Projects and activities within the Emirate of Dubai. The main roles of DM-ED in the context of the EIA process and post EC compliance monitoring include the following:

- Receive the EIA documents and EC-related application submitted by the appointed Environmental Consultant or Applicant, and evaluate for completeness;
- Technical review of EIA documents, organise EIA clarification meetings with the Project Owner and the appointed Environmental Consultant or Applicant, when necessary, and make the decision on the application;
- Prepare and issue the EC for the Project, if granted, or reject the application online; and
- Enforce environmental compliance after the issuance of the EC (i.e. Regulatory Compliance Monitoring).

9.2 Project Owner

The Project Owner (individual, private company or government), has direct responsibility for the Project and shall provide necessary, complete and clear information on the Project at all stages of the EIA study process. The Project Owner appoints experts to undertake EIA studies on their behalf and respond to technical questions or clarifications on their submissions until the final approval of the EC application.

The Project Owner is specifically responsible to ensure the following actions are taken:

1. The Master Plan/design is frozen prior to the commissioning of an EIA study.
2. Appoint a DM-registered Environmental Consultant to carry out the EIA study for the entire components of the Project or Master Plan as opposed to separate studies on each Project component.
3. Provide the appointed Environmental Consultant with transparent and complete information on the proposed Project, and comprehensive Project schedule for the preparation of the EIAR or EIAS.
4. Understand the timing required for undertaking numerical modelling studies and other studies associated with EIA study.
5. Work with the appointed Environmental Management Consultant (if deemed required) to ensure that the recommendations of the EIAR or EIAS and their Environmental Management and Monitoring Plan (EMMP) and EC conditions are complied with, during the Project implementation.
6. All required environmental monitoring are performed in accordance with the Executive Order of the Federal Law No. 24 of 1999 on EIA study requirements.
7. Secure a copy of the EC, in a timely manner, once notification on the EC approval is received.
8. Ensure that any DM-ED requested installation of permanent monitoring stations (to remain after Project construction, as applicable) is completed.

9. Keep and maintain records of monitoring results for five (5) years after the EC issuance date, and grant DM-ED Officers and Engineers access to these records, when required.
10. Grant DM-ED Officers and Engineers access to the site and records, and provide assistance during periodic or unscheduled inspections.
11. Ensure compliance, at all times, of the Project activities to the EC conditions.
12. Timely renewal of the EC, as necessary.
13. Proactively inform the DM-ED in case of any changes (i.e. new, addition, amendment) in the activities or Project components.
14. Adequately communicate and share the requirements of the issued EC and Environmental Monitoring Plan as per the approved EIA document to the appointed Contractors.
15. Conduct, or appoint the Main Contractor or an Environmental Consultant to perform, periodic comprehensive environmental audits of the Project (i.e. Self Compliance Monitoring, refer to Section 11.2) during the construction phase to ascertain that compliance has been achieved as per the recommendations of the EIAR or EIAS and the conditions of the EC; and / or submit the Environmental Performance Report (EPR) in accordance with the requirements of the EC. The EPR should be comprehensive and accurate as per the minimum requirements stated in Section 11.3 of this Guidance.

9.3 Environmental Consultants

Environmental Consultants are entities of professionals and experts registered with DM-ED to undertake EIA studies for Projects, and to manage the implementation of environmental protection requirements, as applicable. They assist the Project Owner to obtain the EC by carrying out the EIA study, including the preparation of EIAR or EIAS, recommendation of mitigation measures, and developing environmental management and monitoring plans. As DM-ED registered Environmental Consultants, they are obliged to adhere to the Code of Conduct governing the registration of Environmental Consultants in the Emirate of Dubai. The guidance on the registration of environmental consultants in the emirate of Dubai is provided in Annex 6.

The Environmental Consultants, who are commissioned to undertake EIA studies for the purpose of obtaining an EC for a Project, have the following roles and responsibilities:

1. Prepare the EIA study in accordance with the requirements of DM-ED stated in this Guidance, the internationally recognised best practices, and the requirements of pertinent International Conventions on Environmental Protection.
2. Ensure that the information provided in the EIAR or EIAS is accurate and consistent with the Project design to the best of their knowledge.
3. Undertake an EIA study for the entire components of the Project or Master Plan and not separate studies on each Project component to ensure the integrity of the EIA study itself and ultimately the protection of the natural and built environment from the entire proposed Project.
4. Use most up-to-date available data.
5. Ensure that all members of the EIA team and sub-contractors have acceptable technical capability and that sampling and analytical equipment are certified.
6. Submit EIA documents, and its revisions, in a timely manner.
7. Ensure that the laboratories involved in the baseline environmental surveys are accredited by the Emirates International Accreditation Centre (EIAC), formerly Dubai Accreditation Center (DAC), for the specific tests.
8. Acknowledge their ethical role when carrying out an EIA study as per Federal Law No. 24 of 1999, and accordingly provide sound technical advice and solutions to the Project Owner throughout the course of the environmental study.

9. Conduct the required Self Compliance Monitoring and submission of EPR (refer to Sections 11.2 and 11.3, respectively) if appointed by the Project Owner.

9.4 Main Contractor

The Project Owner usually appoints an engineering consultant or contractor to design and build the Project. The appointed engineering consultant or contractor, or simply the Main Contractor, is responsible for complying with the EC conditions and for the implementation of the Environmental Management and Monitoring Plan (EMMP), both applicable for the construction phase. The Main Contractor is obliged to transfer responsibility to, and take responsibility for any sub-contractor that they employ during the construction of the Project.

The roles and responsibilities of the Main Contractor are the following:

1. Ensure that the Project is implemented as per the EIAR or EIAS information, recommendations and EMMP.
2. Ensure compliance with all of the applicable conditions of the issued EC related to construction, and address non-compliances, if any.
3. Prepare and submit obligatory Methods Statements for each construction phase to the Environmental Consultant during the EIA, if available.
4. Brief all sub-contractors on the requirements of the EIA and EC Conditions, including mitigation measures, provide sub-contractors with copies indicating their individual responsibilities, and ensure compliance through internal inspections and audits.
5. Accompany the authorised DM-ED Officers and Engineers during Regulatory Compliance Monitoring.
6. Inform the DM-ED, through all known means of communication, any environmental incidents at the Project site that results to environmental impacts regardless of the degree or severity. The Main Contractor shall be held accountable in case of occurrence of environmental violation and non-compliance. In this case, the DM-ED has the right to issue penalty in addition to compensation for the environmental damage associated with the violation or non-compliance.
7. Receive Notice of Violation (NOV) on behalf of the Project Owner in case an environmental violation is observed on site.
8. Take actions to rectify the environmental incidents, violations or non-compliance in coordination with the Environmental Consultant, if any, and as applicable.
9. Conduct the required Self Compliance Monitoring and submission of EPR (refer to Sections 11.2 and 11.3, respectively) if appointed by the Project Owner.

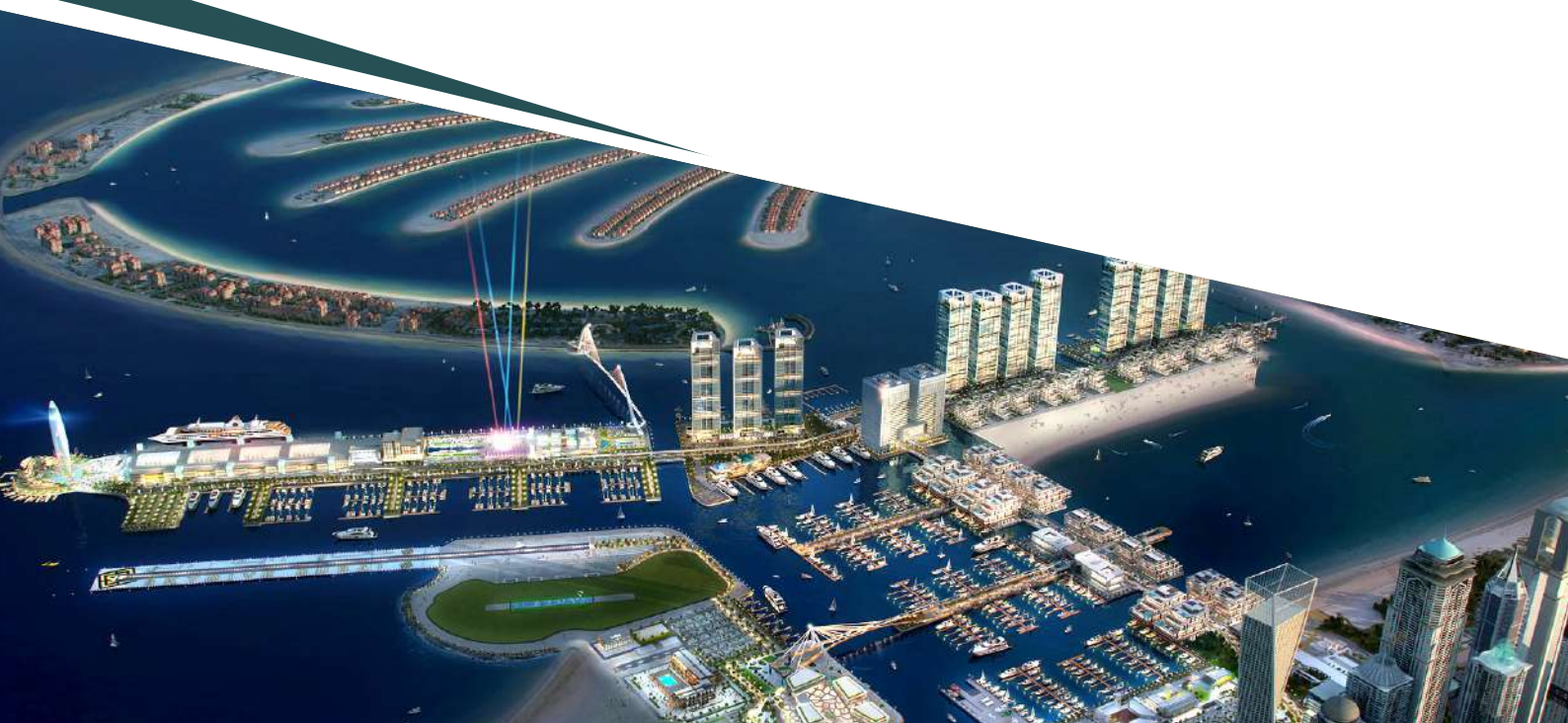
9.5 Environmental Management Consultant

An Environmental Management Consultant may be appointed, if deemed necessary, for a large, multi-faceted Project. Environmental Consultants can play the role as Environmental Management Consultant to manage the implementation of the EIA study recommendations and EC conditions during the construction phase of a Project.

The appointed Environmental Management Consultant shall be fully cognizant of the environmental regulations pertaining to the entire Project and shall be responsible to:

1. Act as a principal point of contact between DM-ED and the Main Contractor or Project Owner on environmental issues at the Project site.
2. Accompany the authorised DM-ED Officers and Engineers during Regulatory Compliance Monitoring.
3. Review method statements for environmental aspects and advise on improvements prior to starting the work.

4. Ensure that the recommendations of the EIAR or EIAS, EMMP, and the EC conditions are implemented by the Project Owner and Main Contractor.
5. Conduct periodic comprehensive environmental audits of the Project (i.e. Self Compliance Monitoring, refer to Section 11.2) during the construction phase to ascertain that compliance has been achieved as per the recommendations of the EIAR or EIAS and the conditions of the EC. The frequency of environmental monitoring is governed by the nature of the Project and monitoring may be required on a monthly or quarterly basis. DM-ED has the right to determine the frequency and duration of monitoring, as deemed necessary.
6. Inspect the construction works for compliance with the agreed method statement, pollution prevention measures and permit conditions, and providing advice to the Main Contractor (still as part of Self Compliance Monitoring).
7. Bear equal responsibility with the Main Contractor for the implementation of the EIA study recommendations and conditions of the EC, and for the consequences in the event of non-compliance.
8. Submit the Environmental Performance Report (EPR) in accordance with the requirements of the EC. The EPR should be comprehensive and accurate as per the minimum requirements stated in Section 11.3 of this Guidance.
9. Inform the Main Contractor to address the non-compliance issue(s), in case of environmental violations and non-compliance during the construction of the Project with respect to the EIA study, the issued EC, and the relevant environmental laws and regulations, or any practice that cause a negative environmental impact, and follow up with them until the issues are rectified.
10. Inform the DM-ED immediately, through all known means of communication, in the following cases:
    a. Non-Compliance with the agreed method statements, recommendations of the EIA study and EMMP, and the EC conditions;
    b. No actions taken to rectify identified environmental issues;
    c. Violations causing significant environmental impacts;
    d. Occurrence of environmental damage due to an incident or emergency situation (i.e. indicating the date of occurrence, action taken, current status, etc.).
11. Attend site progress meetings as necessary, and where required, meetings with the concerned stakeholders for any environmental concerns.
12. Receive Notice of Violation (NOV) on behalf of the Project Owner or Main Contractor in case an environmental violation is observed on site.



10 Decision-Making on Granting EC

After the successful completion of the EIA Process including the DM-ED review and evaluation, the final stage is the decision from the DM-ED. The final decision on the Project's EC application may be in the form of an EC or a Rejection through the Online EC Application System. The EC is only issued once the DM-ED is fully satisfied that the proposed Project is assessed not to cause adverse impact to the environment. As a minimum, therefore, all of the requirements for carrying out the EIA study must be met, Project implementation establishes conformance with environmental laws, best environmental management practices satisfactorily demonstrated, and all pertinent documents as per this Guidance have been properly submitted.

10.1 Issuing the Environmental Clearance (EC)

The Environmental Clearance (EC) is the "license", as per Federal Law No. 24 of 1999, being issued by the DM-ED to Projects that satisfy the EIA requirements. The EC specifies the following information:

- Name of the Project Owner;
- Name of the Environmental Consultant, if the Project Owner is government or public entity;
- Name of the Project or Project Type;
- Location of the Project including the specific plot number and community as per the Affection Plan;
- Coverage or scope of the EC;
- Date of Issue and Validity (usually 2 years, subject to renewal; DM-ED reserves the right to limit the validity on a Project-specific basis); and
- Compliance Conditions.

The Compliance Conditions stipulate the set of environmental requirements that must be complied with by the Project Owner, the Main Contractor, or the Environmental Consultant, as applicable, during the implementation of the Project. The Compliance Conditions specify the following:

- General Conditions stating the mandatory compliance with the Federal Law and applicable Environmental Laws & Regulations of the Emirate of Dubai;
- Specific environmental compliance obligations for the Project Owner and its appointed Main Contractor, or Environmental Consultant, as applicable;
- Required specific environment protection measures and other means that ensure compliance with all applicable regulations on environment protection as per the approved EIAR or EIAS;
- Document submission (if required); and
- Monitoring and reporting requirements.

The Project Owner shall note that if no action is taken within three (3) months after receipt of EC approval notification, the EC shall be rescinded. The Project will then be required to undergo the EIA study process again.

10.2 Rejecting the EC Application

The online EC application may be rejected, in accordance with the Federal Law No. 24 of 1999, for the following reasons:

- If the revised EIA document or response to DM-ED comments is not received within six (6) months from the date of issuance of the comments; or
- If the third submission of the EIA document still does not substantially satisfy the requirements as stipulated in this Guidance, or the DM-ED technical comments have not been satisfactorily addressed.

11 Post EC Compliance Monitoring and Reporting

Post-EC Compliance Monitoring involves both Regulatory Monitoring (i.e. primarily Project site inspection performed by DM-ED) and Self Monitoring (i.e. performed by the Main Contractor, Environmental Consultant or Environmental Management Consultant, as applicable). Regulatory Compliance Monitoring is conducted to ensure adherence by the Project Owner, and its appointed Main Contractor, Environmental Consultant, or Environmental Management Consultant, as applicable, to the conditions stipulated in the EC and the implementation of the mitigation and monitoring requirements detailed in the EMMP of the EIAR or EIAS. Records of Self Monitoring are submitted to DM-ED as Environmental Performance Reports (EPRs). Data from permanent monitoring station, if required, may form part of the EPR.

Compliance Monitoring is carried out to:

1. Ensure that the EC conditions and the required mitigation measures are being implemented; and
2. Evaluate whether mitigation measures are working effectively.

11.1. Regulatory Compliance Monitoring

Regulatory Compliance Monitoring by DM-ED involves, but not limited to, site inspection to check and verify the status of the Project and the mitigation measures as per the approved EIAR or EIAS, and to record and assess the actual impacts of the Project, and to conduct desktop review of submitted documentation requirements as per the issued EC. To monitor the Project's environmental compliance, DM-ED Officers and Engineers are assigned to a Project once the EC is issued.

The assigned DM-ED Officers and Engineers evaluate Project's compliance with the EC Conditions, gather Project information if environmental damage occurs or public complaints are raised, and issue Notices of Violation (NOV) should non-compliances are observed and not corrected or if there are activities or Project components that are not covered by the EC. Issuance of NOVs shall be as per the mandate of the concerned DM-ED Section.

11.2 Self Compliance Monitoring

Self Compliance Monitoring is usually performed by the Main Contractor or by an appointed Environmental Management Consultant, as applicable. Self Compliance Monitoring includes periodic site audits and inspections, as well as in-situ or ex-situ sampling and testing. Ex-situ samples shall be analysed by an Emirates International Accreditation Centre (EIAC)-accredited laboratory, or by the Dubai Central Laboratory (DCL). Through all stages of the Project, the Main Contractor or the Environmental Management Consultant, as applicable, shall establish and implement a system to create, maintain and manage comprehensive, accurate and reliable records covering all the environmental aspects of the works that are being undertaken on the Project site, including but not limited to, any environmental emissions, wastes, sampling and analysis, and incidents. This system and the records within it must comply with regulatory requirements as well as the applicable international best practices. The Main Contractor or the Environmental Management Consultant, as applicable, shall ensure that appropriate records are retained for five (5) years after the EC issuance date. Depending on Project specific requirements, these records or summary reports shall be provided periodically to the ECS by the Main Contractor or by the Environmental Management Consultant, as applicable, through the submission of the EPR.

For coastal or marine Projects, and for Projects with the potential to adversely impact Sanctuaries and Protected Areas, a Construction Environmental Control Plan (CECP), based on the EIAR or EIAS recommendations, must be prepared and submitted with pertinent NOCs to the relevant DM-ED Sections. Self Compliance Monitoring shall be clearly identified and specified in the CECP.

11.3 Environmental Performance Report

An Environmental Performance Report (EPR) must be submitted regularly, in accordance with the EC condition, to the ECS by the Project Owner, Main Contractor, Environmental Consultant, or the Environmental Management Consultant, as applicable, over the duration of the Project implementation. The EPR provides the progress of the Project's implementation as well as the effectiveness of its environmental monitoring and management program. Frequency of EPR submission shall be decided by DM-ED based on the EIAR or EIAS conclusions and recommendations.

An EPR shall contain the following:

- Identification of the environmental standards, performance measures, and statutory requirements that apply to the Project implementation;
- Assessment of the environmental performance of the implementation of the Project in relation to its compliance with the standards, performance measures, and statutory requirements stipulated in the EC;
- Identification of any non-compliance (with supporting documentation in the form of photographic evidence or monitoring data) with the conditions of the EC during the reporting period;
- If any non-compliance is identified, description of the actions and measures that were or are being performed to ensure compliance, responsible parties for each of these actions and measures, timeframe to implement the actions, and measurement or monitoring of the effectiveness of the corrective measures;
- Copy of complaints for the reporting period and a description of actions taken or being taken to address registered complaints;
- Results of all environmental monitoring required by the EC and other permits, including interpretations and trends or exceptions in these results;
- Drawings showing works progress, location of monitoring points, and location of mitigation measures (e.g. silt curtains).

12 EC Renewal

The EC issued to the Project Owner specifies the date of its validity, and the conditions also state the requirements for the EC renewal. The Project Owner shall renew the EC, whenever required, at least thirty (30) days prior to its expiry date, unless otherwise specified in the original EC. The EC renewal is subject to the compliance of the Project Owner and its appointed Main Contractor, or Environmental Consultant, as applicable, with the conditions stipulated therein, and the resolution of any violations or penalties resulting from non-compliance. The EC renewal process implemented by the DM-ED is reflected in Figure 5 and the submission requirements are discussed in the following section.

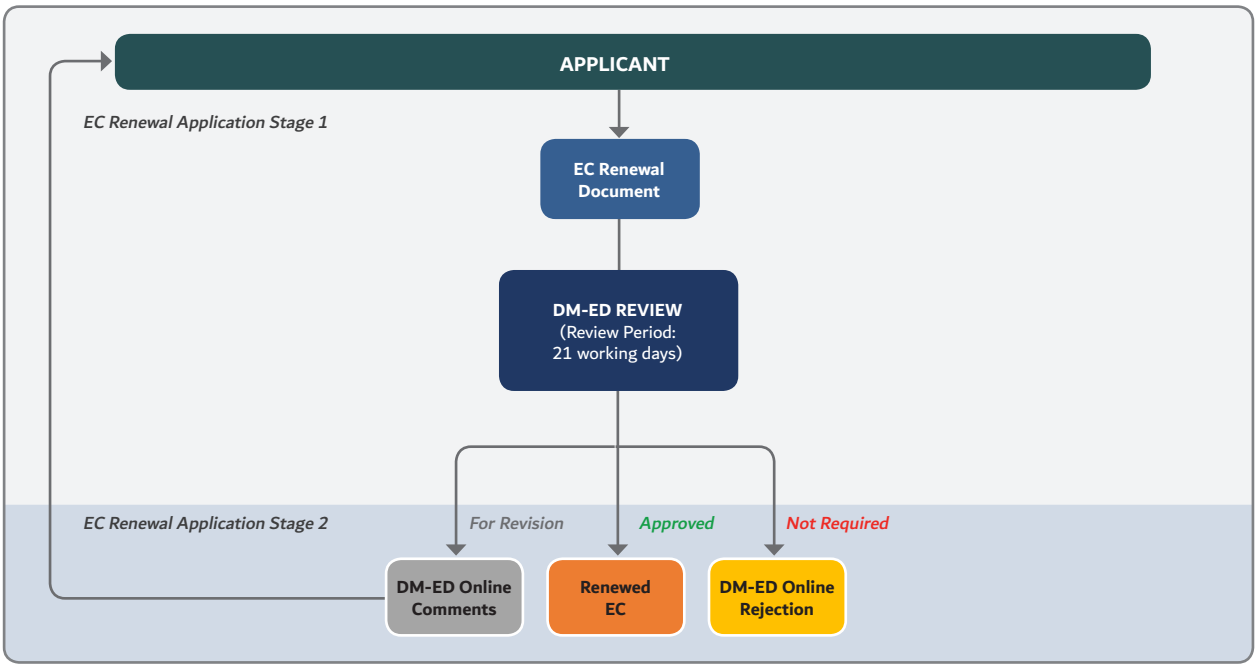


Figure 5: EC Renewal Process

Submission Requirements

For the purpose of renewing the issued EC, the following information and documents shall be completed and submitted by the Applicant through the online service webpage (***https://environment.dm.gov.ae***, *Service Request Name: Request for Environmental Clearance for Development and Infrastructure Projects)*:

- Reference number of the previous EC;
- Letter of appointment from the Project Owner to the Applicant to renew the EC on their behalf;
- Details of the Applicant (e.g. contact information and focal person of the Applicant), if different from previous EC application;
- Other supporting documents as deemed necessary by the Applicant.

Non-renewal of the EC will be considered a violation and may result in the imposition of penalties as may be determined by the ECS.

13 EC Amendment

The EC is issued to the specific Project Owner and Project scope declared during the conduct of the EIA study and EC application stage. Whenever there is change in the Project Owner or inclusions of new Project components, modification on the Project or any components not covered by the issued EC, the Project Owner or its authorised representative shall secure prior approval from the EPSS and consequently request for the amendment of the existing EC. The request for EC amendment shall be applied at least thirty (30) days prior to the implementation of the proposed change. The EC amendment process implemented by the DM-ED is reflected in Figure 6 and the submission requirements are discussed in the following section.

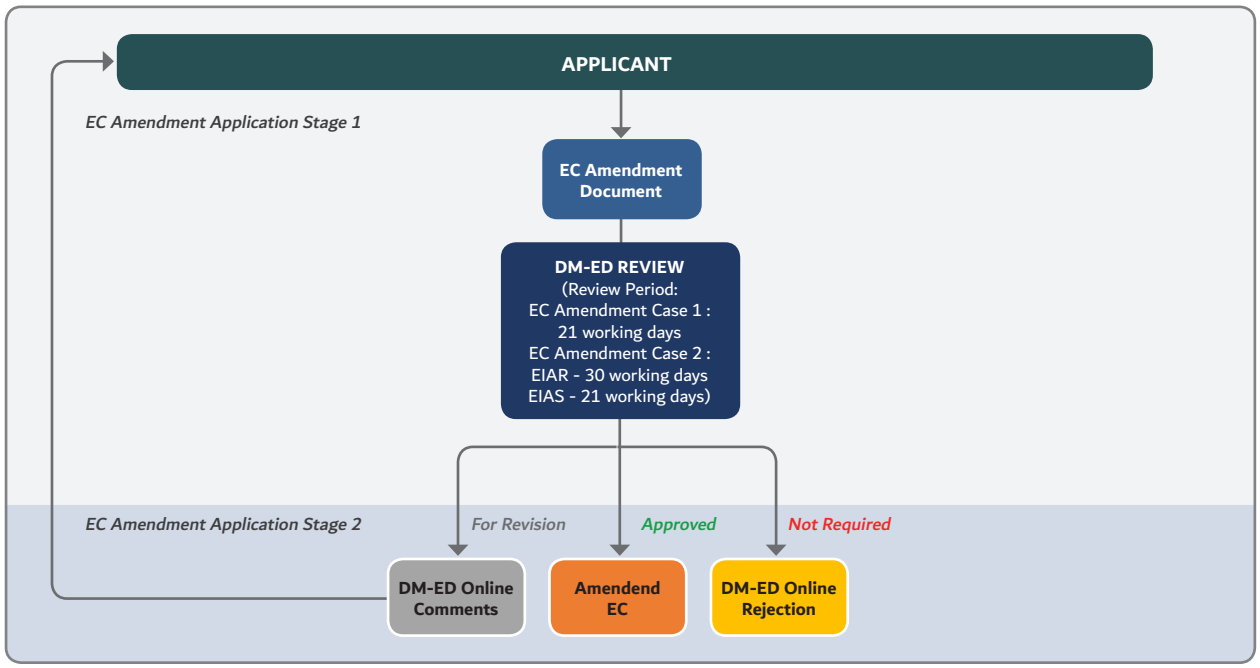


Figure 6: EC Amendment Process

There are two (2) reasons that can trigger EC amendment request:

Case 1. Change in Project ownership or Project name

In this amendment request, the appointment of an Environmental Consultant is not mandatory. The amendment request may be applied by any company authorised by the Project Owner, which may be an Environmental Consultant, or Contractor as applicable.

Case 2. Change in Project location, change in Master Plan, new or altered Project component

In this amendment request, only a DM-ED-registered Environmental Consultant may submit the application.

Submission Requirements

For the purpose of amending the issued EC, the following information and documents shall be completed and submitted by the Applicant through the online service webpage (***https://environment.dm.gov.ae***, *Service Request Name: Request for Environmental Clearance for Development and Infrastructure Projects)*:

EC Amendment Due to Change in Project Ownership or Project Name:

- Reference number of the previous EC;
- Letter from the Project Owner specifying the purpose of the request for EC Amendment;
- Letter of appointment from the Project Owner to the Applicant to request for EC amendment on their behalf;
- Details of the Applicant (e.g. contact information and focal person of the Applicant), if different from previous EC application;
- Copy of the valid Dubai license (i.e. commercial, etc.) of new Project Owner;
- Other supporting documents, as deemed necessary by the Applicant.

EC Amendment Due to Change in Project Location, Change in Master Plan, New or Altered Project Component:

- Reference number of the previous EC;
- Letter from the Project Owner specifying the purpose of the request for EC Amendment;
- Letter of appointment from the Project Owner to the Applicant to request for EC amendment on their behalf;
- Details of the Applicant (e.g. contact information and focal person of the Applicant), if different from previous EC application;
- EIA Document (i.e. EIAR or EIAS either in word document or readable PDF with working table of contents links);
- Copy of the approved Affection Plan/s issued by the concerned planning authority, for change in Project location;
- Copy of the latest Master Plan/Design;
- Properly referenced Comment Resolution Sheet (CRS), if applicable;
- Other supporting documents, as deemed necessary by the Applicant.

Annex 1

Project Screening
Checklist

Project Screening Checklist

(For Projects Not Listed in Sections 7.1 and 7.2)

Project Information	
Project Name	
Location	
Project Owner	
Name of Environmental Consultant (if any)	
Name of Sub-contracted Environmental Consultant (if any)	
Brief Project Description and Surrounding Land Uses	

Screening Criteria	**Yes / No / [-] if not known**
1. Is the Project location: a. within or next to an inland waterbody?	
b. within or next to the Creek?	
c. on the coast?	
d. offshore?	
2. If the Project is within, next to or near an inland water body, is the waterbody connected to the sea or to the Creek?	
3. Is the Project location near any designated protected area or conservation area as per the Department of Urban Studies and Planning or Federal or Local Laws?	
4. Is the Project within, next to or near any of the following areas which can be affected by the Project: a. areas already receiving discharges of similar nature?	
b. an area used by protected, important or sensitive species of plants (e.g. Ghaf tree) or animals (e.g. Arabian Tahr, turtles)?	
c. an area with important natural resources (aquifers, shallow water table, fish reefs) or features (wadi)?	
d. an area with archaeological or cultural heritage assets?	
e. areas subjected to subsidence, flooding, or erosion?	
f. area(s) with development plans (if so, identify by name and describe nature of development)?	
g. areas of high landscape / seascape value and tourism importance?	
5. Is the Project location an undeveloped area and will there be loss of vegetation (e.g. trees, plants) or displacement of animals?	
6. Is the Project location previously developed and will there be any demolition of existing facilities?	
7. Is the Project located in or near densely populated or built-up area?	
8. Is the Project location near any area occupied by sensitive land uses such as hospitals, schools, recreation, tourism, or community facilities?	
9. Is the Project located near or adjacent to another Emirate?	
10. Will construction or operation of the Project involve physical changes in the area (such as topography, land use, change in waterbodies, etc.)?	
11. Will the construction or operation of the Project involve the use of natural resources such as groundwater or marine water?	
12. Will the construction or operation of the Project cause significant noise and vibration or generation of air emissions which may lead to complaints from the public?	
13. Will the Project release light, heat energy, chemicals, TSE or groundwater?	

Project Owner Authorised Representative
Name
Designation
Signature
Date

Screening Decision (For EPSS Use Only)			
❑ EIA Report	❑ EIA Summary	❑ EIA Not Required	❑ Additional Information Required

Name	Remarks
Signature	
Date	

Annex 2

Contents/Outline of an Environmental Impact Assessment Report (EIAR)

Contents/Outline of an Environmental Impact Assessment Report (EIAR)

INTRODUCTION

The EIAR serves as a statement of commitment by the Project Owner on his obligations to comply with its recommendations and with Federal Legislation requirements on environmental protection. The EIAR is also a binding environmental protection agreement between a Project Owner and Dubai Municipality-Environment Department (DM-ED), which is the Competent Authority for the implementation of Federal Legislation, Local Legislation and Regulations and International Conventions in the Emirate of Dubai.

Purpose and Structure

The purpose of Annex 2 "EIAR Outline and Contents" is to provide guidance on the structure and contents of the report on a quantitative Environmental Impact Assessment study, i.e. the Environmental Impact Assessment Report (EIAR), for Development and Infrastructure Projects. This guidance is provided as PART 1 of this Annex. PART 2 entails the checklist, which needs to be completed by the Environmental Consultant in preparation for the submission of the EIAR to EPSS.

Annex 4 provides guidance on the scope of the necessary environmental baseline surveys and numerical modelling requirements (e.g. scope of numerical model simulations for Projects, which are subject to quantitative impact assessment).

The structure of this guidance reflects, in most parts, the structure of an EIAR. Guidance on the contents of each EIAR chapter and its sections is also provided in Part 1.

PART 1 – GUIDANCE ON THE CONTENTS OF EIA REPORT

Guidance on the contents of EIAR is provided below:

EIAR COVER PAGE AND CONTENTS LIST

The EIAR text shall be preceded by:

(i) Cover/Title Page

(ii) QA sheet with date of issue, revision number, name of author, reviewer and approver

(iii) Table of Contents with links to each heading and sub-heading

(iv) List of Abbreviations

(v) List of Tables

(vi) List of Figures

(vii) List of Engineering Plans / Maps

(viii) List of Annexes

EXECUTIVE SUMMARY

The Executive Summary (ES) shall summarise in a non-technical language, the significant findings, conclusions and recommendations of the EIA study and described in detail in the EIAR. The ES shall include:

- A brief description of the proposed Project, any alternatives considered and the justification for the need for the preferred option.

- The conclusion of the scoping out exercise that identified the environmental resources that were Scoped In and further studied in the EIAR or Scoped Out .
- Concise details of the environmental baseline survey and characterisation of the Scoped In, and hence studied, environmental resources.
- Summary of the Project characteristics constituting the sources of significant changes in the existing environment leading to significant impacts.
- Description of significant impacts and measures to prevent, mitigate or compensate for them (in that order).
- List of the environmental resources, which will need monitoring to verify the effectiveness of the selected measures.
- Recommendation for resolving any (where applicable) environmental conflicts of interest.
- A brief account of the identified compensation measures (where applicable).

1. CHAPTER ON INTRODUCTION

The Introduction shall comprise:

- General Project Description
- Statement of Need for the Project
- Project Alternatives and Preferred Option
- Information on External Project Funding (where applicable)

General Project Description

This Section shall provide a general description of the proposed Project, including information on the nature, size and location of the Project, its processes, products, services as appropriate, and the land/water uses of the surrounding areas. This information shall be supported by:

- Project Affection Plan and up-to-date Master Plan/Design;
- Clear, to scale and informative maps and figures showing the Project location and its immediate surroundings.

Statement of Need for Project

This Section shall give a clear statement on why the Project is needed, its compatibility with the Federal and Emirate development strategies, programmes and plans. It shall present the long term social and economic benefits to the Emirate and society on the whole, which call for an overriding public interest when significant adverse negative impacts with little potential for prevention and/or mitigation are predicted.

Project Alternatives and Preferred Option

This Section shall clearly state the Project alternatives (e.g. nature, location, size) or individual elements of the Project (i.e. design, processes), which were considered in order to identify the preferred alternative option, and link this with the justification for its Statement of Need. The likely significant impacts and feasible prevention / mitigation / compensation measures for each identified Project alternative shall be presented, as shall the reasoning for eliminating each option.

The “Do-Nothing” Option

The “Do-Nothing” option (i.e. no proposed development at the proposed location or elsewhere) and its long term social, economic and environmental consequences shall also be briefly discussed.

2. CHAPTER ON LEGAL FRAMEWORK AND STANDARDS

This Chapter shall list the expected parameters in emissions and discharges from the planned activities/ operations of the proposed Project, and accordingly shall clearly identify all Environmental Legislation and Regulations, in the UAE Federal and Dubai Emirate Levels, which the proposed Project is subject to and must comply with for the purposes of demonstrating environmental protection.

This Chapter shall also list all the Regional and International Conventions (obligations) for environmental protection, which the UAE has or is in the process of ratifying. Where the latter is the case, the timetable of ratification shall be identified in relation to the Project status and schedule.

3. CHAPTER ON THE EIA PROJECT TEAM

This Chapter shall provide information on:

- The DM-ED-registered environmental consultancy firm undertaking the quantitative EIA study;
- The EIA Project Team Leader and team members, by name; their respective field of expertise, and the corresponding module or area of study assigned to each ("key deliverable");
- The name(s) of DM-ED-registered sub-consultant(s), the scope of their works in the EIA study (e.g. numerical model simulations, environmental baseline surveys), proven experience, and DM-accreditation details;
- The name of the EIAC-accredited laboratories that are commissioned for collection and analyses of environmental samples during the baseline surveys with accreditation details.

4. CHAPTER ON THE DETAILED DESCRIPTION OF THE PROJECT AND PROJECT SITE

This Chapter shall clearly present all the available information on the proposed Project and its location, with as much detail as possible, provided on GIS maps (where relevant), on the following elements of the proposed Project:

- The proposed Project's location, delineation of Project boundaries, and planning status shall be explained; copy of Affection Plan and Master Plan/Design to be included.
- Description of the nature of the proposed Project (e.g. residential, commercial, mixed, industrial, etc.).
- The size (spatial coverage) of the proposed Project, in relation to the surrounding developments/land uses shall be given.
- Description of the nature of the existing land use(s) and expected changes at the location of the proposed Project, including the characterisation of a site being a brownfield site (previously developed) or a greenfield site (no previous development).
- The proposed Project's immediate surroundings and its proximity to sensitive land uses or areas of environmental importance and protection status within the Emirate of Dubai shall be identified; this information shall be supported by high quality, clear and informative maps (to scale), figures and photos.
- For proposed Projects that are adjacent or very close to the borders of the Emirate of Dubai, information on land use(s) across the borders shall be provided.
- The phases of Project development and construction, supported by a Project works schedule shall be explained; the footprint of the construction works shall be clearly provided.
- A detailed description of major construction works, such as deep excavations, temporary dewatering, dredging, reclamation, land excavation and anticipated volumes of earth material associated with such works shall be given; available or most probable Method Statements shall be included in this Chapter.

- The proposed Project layout showing:
    - The major utilities and infrastructure (e.g. permanent artificial water bodies, roads, bridges within the footprint of the proposed Project);
    - The locations of air emissions sources and effluent discharge outfalls;
    - The water intake and outfall points, if applicable.
- Description of the services, technologies, products, waste stream associated with the construction and operational phases of the proposed Project, including site clearance prior to construction (where relevant).
- (Where applicable) A comprehensive description of the Project operational processes, process flowchart, types and quantities of raw materials, production capacity, energy and water requirements, material balance, and water balance shall be provided.
- The information pertaining to waste streams (air, water, hazardous waste, solid waste, soil), shall be provided
- The anticipated major sources of air, soil and water contamination or disturbance to wildlife (e.g. noise and light) and built environment (i.e. existing buildings, infrastructure) shall be identified and described in detail.
- Description of the existing legitimate uses by natives, residents and tourists at the proposed Project area and its surrounding areas.
- The manpower requirements (i.e. estimated number of labour force, labour camp on the Project site, where relevant).
- Total capital cost.
- (Where applicable) If the proposed Project is externally funded, the name of the funding organisation(s) (e.g. World Bank/IFC), and any environmental protection requirements of the funding organisation, in addition to these guidelines, which the EIA study needs to comply with shall be explained.

5. CHAPTER ON THE EIA STUDY PROCESS

Scoping In and Out of Environmental Resources

This Section shall provide a description of the Scoping In and Out exercise. The purpose of this exercise is to identify which environmental resources are not within the Project site, in its immediate surroundings nor, for very obvious reasons, are likely to be impacted upon as a result of the proposed Project. Any environmental resources that falls in this category shall be Scoped Out of the quantitative environmental impact study. This exercise shall also include trans-boundary environmental resources.

The conclusion on Scoping Out an environmental resource needs to be fully justified. Any environmental resource that is not listed as Scoped Out is, therefore, identified as a Scoped In resource and it shall be studied in the quantitative EIA.

Where there is no obvious reason to justify Scoping Out an environmental resource, this resource shall be subject to the quantitative EIA study.

The environmental resources to be subject to the Scoped In and Out exercise for the purposes of a quantitative EIA study are as follows:

Geology, Hydro-geology, Geomorphology
Oceanography, Hydrodynamic Regime, Coastal Processes
Climatic Conditions, Climate Change and Air Quality

Noise and Vibration
Land Uses, Soil and Groundwater
Water Uses, Water and Sediment Quality
Aquatic Ecology and Nature Conservation
Terrestrial Ecology and Nature Conservation
Archaeology and Cultural Heritage
Amenities, Tourism and Recreation
Utilities and Infrastructure
Waste Generation and Management
Sustainability
Other Environmental Resources/Assets/Issues

Environmental Resources Data Collection and Gap Analysis

This Section shall give a brief description of the type of sources, which were sought after in order to obtain data on the Scoped In environmental resources; such sources can include:

- Review of existing data and pertinent publications
- New and complementary environmental baseline survey
- Observations, sightings, and photographs
- Consultation findings
- Anecdotal evidence

Review of Existing Data

The review of the available environmental data and the identification of gaps in data is primarily a desk-top study. This Section of the EIAR shall clearly identify the available data that was included in the description of the Scoped In environmental resources and the impacts prediction exercises (i.e. numerical model simulations). Available environmental data can be referred to by title of publication, name(s) of author(s), date, and source of publication.

The validity of and confidence level on existing data for the purposes of the quantitative impacts prediction shall need to be clearly stated in this Chapter. Data that is older than 5 years shall not be deemed valid for the quantitative EIA study.

Where maps, drawings and photographs from available data are to be used in the EIA study, these shall be included and shall be of good quality and easy to read.

Gap Analysis

Gaps in available data, which prevent a comprehensive description of the Scoped In environmental resources thus jeopardising the integrity and confidence level of the quantitative EIA study and its conclusions, shall be identified and described in this Section.

New and Complementary Environmental Baseline Surveys

Where no data or partial data exists on Scoped In environmental resources, new or Complementary Environmental Baseline Surveys to fill in significant gaps in available data shall be fully identified in this Section of the EIAR. The findings of the complementary surveys will complement available data for the purposes of providing a comprehensive description of the Scoped In environmental resources.

The approach to and methodologies for the baseline surveys shall be briefly described in the Chapter on the EIA Study Process; the survey data and its interpretation shall be presented in the Chapter on the Existing

Environment, Impacts, Mitigation, Residual Impacts as part of the comprehensive description of each Scoped In environmental resource.

The detailed description of the scope and results of the all baseline surveys shall be included in the EIA study as Technical Appendices.

The name(s) of the field survey team(s) and the EIAC-accredited laboratory shall be provided.

Field surveys and laboratory analytical specifications shall be explained clearly and in detail in the Chapter on the EIA Study Process; the specifications for both field surveys and laboratory analyses shall be complete in order to achieve the dual role of:

- Facilitating a comparison with the requirements of the Local Order No. 61 of 1991 on the Environment Protection Regulations in the Emirate of Dubai, its Rules of Implementation.
- Enabling a comprehensive and detailed quantitative impacts prediction and evaluation.

The information on the baseline surveys shall include:

- Location of the survey area, spatial coverage, number of sampling stations; this information shall be supported by:
    - Clear, easy to read and to scale maps;
    - Justification on good representation of environmental resource and fulfilment of identified data gaps.
- Character of survey (e.g. one off or seasonal); the implications for the environmental resource characterisation; and survey methodology.
- Number of samples per sampling station (justification for selected number and locations).
- Suite of in situ and ex situ parameters measured (see Table 5.1).
- Laboratory analytical methodologies and Detection Limits for each parameter (see Table 5.1).
- Data validation methods and Quality Assurance/Quality Control methods.

The timing of marine and terrestrial surveys reflects the biological productivity and activity, which vary significantly throughout the year; for this reason, the timing of each survey shall be justified, and the results shall be accompanied by a discussion on their representation of the true biological activity and potential of the surveyed habitat.

For land and seascape characteristics, visual presentations of the proposed Project's features shall be from realistic perspective, angle and level in order to realistically inform the impact assessment study.

No new laboratory analytical results, including partial data (i.e. only selected parameters) shall be accepted from a non EIAC-accredited laboratory; analytical results from laboratory methodologies with detection limit (DL) higher than the regulatory standard for the parameters tested shall be rejected. In such events, the integrity of the information on Scoped In environmental resources and subsequent quantitative impact predictions and assessments shall be in doubt and the EIA study shall be rejected. More than one (1) EIAC-accredited laboratory can be involved in order to secure valid analytical results.

The information on the laboratory analyses shall be tabulated in the Chapter on the EIA Study Process as per Table 5.1 below:

Table 5.1 Example of Laboratory Analytical Specifications presentation for comparing Detection Limits with Regulatory Standard for environmental quality parameters

Parameter	Regulatory Standard (LO 61/91) & Appendix 1 and Appendix 2 of Annex 4 Part 2	Laboratory Methodology	Laboratory Detection Limit (DL)

Marine core samples as opposed to grab samples shall be collected for environmental characterisation of sediment where contamination is expected. The length of the core shall be dictated by the depth of excavation/ dredging. Geotechnical samples shall not be accepted as environmental characterisation samples.

Comparison with Standards

The choice of standards against which analytical results are to be compared shall be known prior to finalising the sampling specifications, so as to ensure that the suite of analyses is complete.

EIA Methodology

This Section shall clearly present the approach that was followed in order to:

- Quantitatively predict the impacts on each of the Scoped In environmental resources from the proposed Project;
- Where applicable, quantitatively predict the cumulative impacts on each of the Scoped In environmental resources from the proposed Project in combination with other planned, (and soon to be implemented) Projects adjacent to the proposed Project site;
- Identify the magnitude and assess the significance of impacts, cumulative impacts included;
- Identify environmental risks and hazards; and
- Identify pertinent measures to prevent, mitigate against and compensate for (in that order) all significant impacts and risks.

Where relevant, the indirect/secondary impacts (i.e. triggered by a direct/primary impact) shall also be studied in the quantitative EIA.

This Section shall also clearly identify and explain the limitations of the EIA study for which assumptions have to be made. The limitations may include, but not limited to, the level of information on the proposed Project available at the time of the study, constraints in conducting the baseline surveys, and limitations on the impacts prediction and assessment process.

6. CHAPTER ON THE EXISTING ENVIRONMENT, IMPACTS, MITIGATION, RESIDUAL IMPACTS

Description of the Scoped In Environmental Resources

This Section shall entail the comprehensive descriptions of all Scoped In environmental resources and built environmental aspects; the descriptions shall be based on the data that is obtained through available data review, the baseline survey results, the consultation findings, and EIA team's site visit observations; all shall be included in the References & Bibliography list, and shall be clearly referenced accordingly in the text, where relevant.

For each Scoped In environmental resource, a brief statement on the (new) field baseline surveys and/or the gap analysis and subsequent complementary baseline surveys shall be made. Reference to the relevant Sections of the Chapter on the EIA Study Process and data source shall be made in the text in this Section.

The description of each environmental resource in this Section needs to be succinctly presenting and interpreting the detailed technical information, which is appended as Technical Appendix to the EIAR; the level of information and detail in this Section shall be such so as to comprehensively and completely describe the following characteristics of the environmental resource, and relate them to the impacts prediction:

- The main characteristics (biotic, abiotic, built environment).
- The land and water uses (roads, waterways, water intakes, industrial discharges urban and rural areas).
- The environmental quality status (surface and groundwater, sediment, air, soil, biodiversity).
- The prevailing regime/situation (local climate, hydrodynamic, flushing).
- The protection/conservation status (protected National sites/habitats/species; Internationally recognised protection status).

- The human environment (Culture, Heritage, Amenities, Recreation, Tourism).
- Utilities (existing cables pipelines, sewage & drainage networks).
- Waste management (existing management at Project site).
- Any other environmental information including Sustainability plans, programmes pertinent to the site and character of the proposed Project.

The information on all Scoped In environmental resources shall be presented, as much as possible, on maps that are easy to read, accurately scaled and oriented; GIS maps are preferred. Maps and drawings shall be provided on A3 size.

Prediction and Assessment of Environmental Impacts

The potential impacts during the construction and operational phases of the proposed Project on each one of the Scoped In environmental resources shall be quantitatively assessed as much as possible. The impacts shall be linked to the Method Statements and Project activities/works and their sequence as described in the Chapter on the Detailed Descriptions of the Proposed Project and Site.

The quantitative prediction of impacts on certain environmental resources, primarily surface and ground water quality, air quality, noise levels, and sediment transport and shoreline changes requires the use of numerical model simulations. This Section shall describe in brief the model simulations, which were undertaken to predict impacts from the proposed Project. The detailed description of the scope and results of all model simulations shall be included in the EIA study as Technical Appendices.

The impacts prediction and assessment information to be provided in this Section shall entail the following:

- A clear description of the nature of the most probable impacts, and the cause-pathway-effect relationship between the Project's planned activities and the potentially impacted environmental resources for all Project phases; the impacts within and outside the construction and operational footprints of the proposed Project, including cumulative trans-boundary impacts (if applicable) shall be clearly identified.
- The methodology followed to accurately predict and evaluate impacts (refer to Annex 4 Part 2 for the guidance on the quantitative prediction of marine/coastal impacts).
- Where a quantitative impact assessment for an environmental resource is not possible, this shall be stated; the reason for not carrying out the quantitative assessment shall be given, and the implications for achieving the objective to effectively protect the environmental resource in question shall be discussed. The risks to environmental protection from the qualitative impacts assessment shall be identified and reflected in the Project's monitoring plans for all Project phases.
- Where numerical model simulations to predict impacts were undertaken, the purpose of modelling shall be stated, the type of model for the concerned coastal processes, whether it is a 2D or 3D model, and its selection shall be explained and justified in terms of its applicability and appropriateness for the environmental impact assessment; model configuration and key input parameters and data source (i.e. available data or baseline survey) shall be described in detail. The modelling scenarios shall be rationalised for the intended purpose. All relevant model output shall be adequately interpreted. Clear conclusions and recommendations, and limitations of the modelling studies shall be clearly presented. Clear reference to the appended full model simulation technical report shall be made (by report revision number and section of the technical report, date).
- Spatial presentation of the area where impacts (both direct and indirect) in relation to the proposed Project's construction and operational footprints.
- The nature of the impact in terms of direct or indirect (i.e. secondary), reversibility, long or short term, local or regional or trans-boundary (if applicable).
- The significance of the identified impact; impacts shall be identified as negligible, minor, moderate, major adverse or beneficial.

Quantitative Prediction of Impacts

For guidance on the type of proposed Projects that require numerical model simulations, refer to Table 1 of Annex 4 Part 1 and Table 4-1 of Annex 4 Part 2 of this Guidance. All numerical simulation model exercises shall be carried out by DM-ED registered Environmental Consultants.

Cumulative Impacts

Environmental resources have a capacity to accommodate changes; single changes can be more easily accommodated than multiple. For this reason, the quantitative EIA study shall also include the prediction and assessment of cumulative impacts from the proposed Project, Projects that are in the construction stage as well as planned Projects. The area of impacts to be considered shall include the areas of both direct and indirect cumulative impacts.

The information on the most probable cumulative impacts shall be supported by a clear description of the factors leading to the cumulative nature of impacts.

Prevention, Mitigation and Compensation Measures

The measures to prevent, mitigate against or compensate for, preferably in that order, the identified significant impacts including the cumulative impacts shall be clearly described in this Section.

This Section shall also include information on how the identified prevention measures shall be in place at the start of the works/operations and before any of the predicted impacts are realised.

For the predicted significant impacts during the proposed Project's operational phase, all relevant and feasible technology, techniques, equipment, processes and procedures that will prevent and/or mitigate them shall be outlined.

It is possible that at the time of the EIA study, there is limited information on the construction methods available. Where this is the case, reference to previous experience or information on measures, proven to be effective, from similar Projects shall be made. Where such information can be available, it is expected to be fully utilised.

Where impacts cannot be prevented or mitigated but feasible compensation measure(s) can be implemented, these shall be discussed in this Section. Where compensation is not feasible either, a full explanation shall be provided and the significance for the impacted environmental resource shall be fully discussed.

The implementation of all identified measures, implementation schedule, responsible entity for the implementation, corrective measures, supervision, monitoring effectiveness, auditing and reporting shall be clearly identified and stated in this Section.

For marine/coastal Projects and Projects located near the protected area or expected to have significant impacts on the environment, the description of and discussion on all feasible measures is expected to be informative and constructive so that it forms the basis for the development of the Construction Environmental Control Plans (CECP) linked to specific NOCs or Management Plan for the operational phase of the Project as may be required.

Environmental Enhancement

Any environmental enhancement opportunities that the proposed Project presents shall also be presented and discussed. The latter shall also be re-iterated in the conclusions and recommendations section of the EIA study.

Residual and Unavoidable Impacts

It is possible that, following implementation of prevention and/or mitigation measures, certain impacts still remain, most likely at a lesser magnitude and spatial extent. These residual impacts are usually accepted as part of the unavoidable changes to environmental resources due to a proposed Project.

It is also possible that certain impacts cannot be prevented at all.

For these reasons, both the residual (post-mitigation) and unavoidable impacts shall be identified and discussed for

all Project phases; where relevant, the discussion shall make references to the legal requirements/limits (numerical standards), as identified in the Chapter on Legal Framework and Standards. The residual and unavoidable impacts shall be characterised in the same way as the pre-mitigation impacts (i.e. minor, moderate or major).

Structure of Chapter 6

Table 6.1 below provides a preferred sequence of the Sections and sub-sections of Chapter 6 of the EIAR.

Table 6.1 EIAR Chapter 6 Sections breakdown

Section number	Section Heading – Scoped In Environmental Resource
6.1	Geology, Geomorphology
6.1.1	Existing Conditions
6.1.1.1	Available Data and Gap Analysis
6.1.1.2	Baseline Surveys
6.1.2	Impacts Assessment
6.1.3	Prevention, Mitigation, Compensation
6.1.4	Residual Impacts
Note: *The succeeding Sections shall also contain the above Sub-sections.*	
6.2	Oceanography, Hydrodynamic Regime, Coastal Processes
6.3	Climate and Air Quality
6.4	Noise and Vibration
6.5	Land Uses, Soil and Groundwater
6.6	Water and Sediment Quality
6.7	Aquatic Ecology and Nature Conservation
6.8	Terrestrial Ecology and Nature Conservation
6.9	Socio-Economic
6.10	Archaeology and Cultural Heritage
6.11	Amenities, Tourism and Recreation
6.12	Utilities and Infrastructure
6.13	Waste Generation and Management
6.14	Project Sustainability
6.15	Other Environmental Resources/Assets/Issues

7. CHAPTER ON THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS

This Chapter shall present a framework of an Environmental Management and Monitoring Plan (EMMP) for all proposed Project phases.

The Framework EMMP shall serve as a road map for the individual contractors to develop CECPs (for the construction phase of marine/coastal Projects), and for the Project Owner to implement environmental monitoring requirements during the operational phase of their Projects.

The Framework EMMP shall include information on:

- The environmental resources expected to be impacted as per the EIA study;
- The mitigation measures, and corrective actions to be taken when measures fail to reach the protection objective;

- The monitoring plans, required to monitor:
    - The effectiveness of the prevention and/or mitigation measures;
    - The residual impacts and impacts on the environmental resources that are unavoidable or cannot be mitigated;
- Waste collection and disposal management plan;
- Inspection and auditing programmes;
- Roles and responsibilities for the effective implementation and management of the measures and monitoring plans;
- A mechanism for reporting, monitoring and auditing results;
- Environmental induction and training program for construction and operation workers and management; and
- External communications with regulators and interested parties/stakeholders.

Monitoring programmes for each Project phase shall be developed with as much detailed information as possible. The monitoring plans shall include, but not limited to, the following:

- The monitoring objectives to determine the effectiveness of the identified preventive/mitigation measures;
- In situ and ex situ environmental parameters to be monitored and the trigger levels to initiate investigations and remedial actions;
- Sampling design, methodology and equipment for measurement, data management & analysis, equipment calibration;
- An outline figure of the sampling locations reflecting anticipated impacts and sensitive receptors/targets; monitoring locations shown on clear maps/drawings;
- The duration and frequency of monitoring, with justification where possible (e.g. seasonal monitoring); the frequency shall reflect environmental sensitivities;
- The type and frequency of the reporting mechanism of the monitoring results (i.e. real time or periodic report submission or both); and
- The organisational structure of the Environmental Management Team, that is the responsible entity to undertake the monitoring plan and supervise/audit the monitoring team.

8. CHAPTER ON THE EIA CONCLUSIONS AND RECOMMENDATIONS

The EIA study conclusions can be presented in this Chapter as Project Environmental Matrices for both the Project Construction and Operational Phases; references to the relevant Sections and Sub-sections (by number) of the Chapters on the EIA Study Process and the Existing Environment, Impacts, Mitigation, Residual Impacts, shall feature in each Matrix, as appropriately.

Each Matrix shall comprise the following:

- Planned works/activities/operations of the proposed Project;
- All Scoped In environmental resources within and around the proposed Project's site that were studied in the EIA;
- Predicted impacts;
- Identified measures;
- Residual impacts;

- Recommended monitoring activity, identifying monitoring frequency and referencing drawings of monitoring locations; and
- Environmental enhancement opportunities.

Both Project Construction and Operational Environmental Matrices could be prepared early on in the EIA study to serve as a road map to the identification exercise of cause-path-impact, and as the impacts identification and assessment study develops, they can be populated accordingly to include the identified measures, residual impacts and monitoring plans.

An example of a Construction Environmental Matrix is given in Table 8.1 below.

Table 8.1 Example of a Construction Environmental Impacts Matrix

Planned Activity & Works*	Environmental Resource	Impacts	Risk of Impact happening (Low, Medium, High)	Prevention	Mitigation	Residual Impacts	Compensation	Monitoring
Reclamation	Water quality	Increase in background TSS levels		- Bund reclamation area - Weirs, settling basins - Silt curtains	- Revise reclamation method and speed - Install double silt curtain outside reclamation discharge point	Lesser increase of TSS near reclamation	n/a	- Real time - Ex situ (frequency to be noted here)
		Dredging plume migrating towards sensitive targets						
	Marine Habitat	Blanketing of seagrass beds		n/a	n/a	n/a	Compensation plan	frequency of periodic surveys to be noted here
		Smothering of corals		Relocation				frequency of periodic surveys to be noted here
	Air quality	Exhaust emissions from dredger and auxiliary land vehicle fleet		- Green fuel (dredger) - Switched off engines				
**Pre-Construction Site preparation works (where applicable) to be included and identified in the Matrix								

Similarly, an Environmental Matrix for the Operational Phase of the proposed Project must be prepared.

9. CHAPTER ON THE STATEMENT OF COMMITMENT

This Chapter of the EIAR shall include the statement of commitment to the implementation of the EIA requirements; this statement can either be prepared by the Project Owner or by the appointed Environmental Consultant.

The statement of commitment shall particularly highlight the EIA recommendations for:

- The preferred identified prevention/mitigation or compensation measures;
- Corrective actions in the event that measures prove ineffective; and
- Monitoring plans for all phases of the Project.

ANNEXES

The detailed description of the scope and results of all baseline surveys and numerical model simulations shall be included in the EIAR as Technical Appendices.

BIBLIOGRAPHY & REFERENCES

All of the data sources (available data, research papers and conference publications, periodical articles, working group reports, guidelines, other published EIA studies, Environmental Legislation and Regulations, Decrees, International Conventions and Agreements) shall be listed in the Bibliography and References List of the EIAR.

PART 2 - CHECKLIST FOR THE ENVIRONMENTAL CONSULTANT IN PREPARATION FOR THE SUBMISSION OF AN EIAR

Table 1 below entails a checklist that the Environmental Consultant needs to fill out, in preparation of an EIAR for the purposes of applying for an Environmental Clearance. This Checklist shall be dated, signed and stamped by the Environmental Consultant, and shall be submitted together with the EIAR.

Table 1: EIAR Contents Checklist

EIAR Title	
Revision No	
Date of Submission	
Cover Page and Contents List	
☐	Project title, name of Project Owner and Consultant, date, revision number
☐	QA sheet with date of issue, revision number, name of author, reviewer and approver
☐	Table of Contents with links to each heading and sub-heading
☐	List of Abbreviations
☐	List of Tables
☐	List of Figures
☐	List of Engineering Plans / Maps
☐	List of Annexes
Executive Summary	
☐	A brief description of the proposed Project written in a non-technical language
☐	Statement of need of proposed Project
☐	Alternatives considered
☐	Scoped in and out Environmental Resources
☐	Summary of gap analysis and environmental baseline survey
☐	Summary of the project characteristics constituting the sources of significant changes in the existing environment leading to significant impacts
☐	Description of significant impacts and measures to prevent, mitigate or compensate for
☐	List of the environmental resources that will need monitoring to verify the effectiveness of the selected measures
☐	Recommendation for resolving any (where applicable) environmental conflicts of interest
☐	A brief account of the identified compensation measures (where applicable)
Chapter 1 – Introduction	
☐	General description of Project; Affection Plan; Master Plan; clear, to scale and informative figures showing project location and surrounding areas
☐	Statement of need; Advantages and disadvantages to the natural and built environment, and local economy; Social benefits
	Consideration, information on:
☐	• Alternatives to the proposed Project (i.e. type, location)

☐	• Alternatives to individual elements (i.e. process/technology/techniques) of the Project
☐	• Major environmental aspects and significant environmental impacts for each alternative
☐	• "Do Nothing" option
Chapter 2 – Legal Framework and Standards	
☐	Applicable Federal and Emirate Level Laws, Regulations, Decrees on Environmental Protection
☐	Federal and Emirate Level Standards and Threshold Limits that apply to the nature of the proposed Project and anticipated impacts
☐	Applicable International Treaties and Conventions
Chapter 3 – The EIA Project Team	
☐	The DM-registered environmental consultancy firm, who will undertake the quantitative EIA
☐	The EIA Project team leader and team members, by name; their respective field of expertise, and the corresponding module or area of study assigned to each ("key deliverable")
☐	The name(s) of DM-ED registered sub-consultant(s) and their respective study scope for the EIA; proven experience, and DM-accreditation details
☐	The name(s) of the EIAC-accredited laboratories involved in the baseline surveys
Chapter 4 – Detailed Project Description (Construction and Operational Phases)	
☐	Project Master Plan and Affection Plan
☐	Nature, size and location of the project; the nature of the existing land use(s) and expected changes at the location of the proposed Project
☐	Pre-construction site clearance needs for mobilisation
☐	Description of expected Project footprint of construction and operational phases
☐	Description of immediate surroundings and its proximity to sensitive land uses or areas of environmental importance and protection status within the Emirate of Dubai, and across the borders (as applicable)
☐	Detailed description of major construction works
☐	(If applicable) Operational phase processes/activities, environmental aspects (details), waste stream and disposal options, pollutants/disturbances from planned and unplanned activities
☐	Maps, drawings, figures, photographic plates supporting all Project description and activities
☐	Maps, drawings, figures are up to date and clear to read with informative legend
☐	Project status, outline construction schedule
☐	Total capital cost
☐	(If applicable) If the project is externally funded, the name of the funding organisation(s) (e.g. World Bank/IFC) and their environmental protection requirements
Chapter 5 – Description of the Project's EIA Study Process	
☐	Scoping in and out of environmental resources
☐	Justification on scoped-out environmental resources
☐	Available data review
☐	Gaps analysis
	New and/or Complementary Baseline survey:
☐	• Identification and detailed specification of all additional data collection studies (field surveys etc.) for all scoped in environmental resources
☐	• Detailed, to scale and clear to read maps and drawings of additional surveys
☐	• Name(s) of the DM-registered field survey team(s) and the EIAC-accredited laboratory(s) for all analysed parameters
☐	• Field survey and analytical specifications facilitate comparison with the requirements of the Local Order No. 61 of 1991

☐	• Field survey and analytical specifications enable comparison with selected quality standards
☐	• Field survey and analytical specifications enable a comprehensive and detailed quantitative impacts prediction and evaluation
☐	• Field sampling locations are depicted on clear, easy to read and to scale maps
☐	• Character of survey (e.g. one off or seasonal) and implications for the environmental resource characterisation explained
☐	• Laboratory analytical methodologies and detection limits for all parameters
☐	• Data validation methods and Quality Assurance/Quality Control methods
	EIA Methodology
☐	• Explanation of the methodologies for assessing the significance of impacts
☐	• Identification of numerical studies
☐	• Limitations of the EIA Study
Chapter 6 – Environmental Baseline Information, Impacts, Mitigation and Residual Impacts	
☐	Description of existing scoped In environmental resources (air, soil, water, shoreline, waterways), land and water uses within proposed Project location and surrounding areas
☐	Environmental sensitivities (wildlife, residential areas, protected/designated areas, water intakes) at proposed Project location and surrounding areas
☐	Detailed, to scale and easy to read maps and drawing showing the spatial distribution of environmental resources and Environmental sensitivities within and adjacent to the proposed Project
☐	Identification and detailed specification of all studies that were undertaken to predict impacts (direct and indirect) and their magnitude (spatially and temporary) during all phases of the project
☐	Description of specific impact prediction studies (i.e. numerical model study specifications)
☐	Justification on confidence level for qualitative impact assessment, where applicable
☐	Identification and assessment of impacts as per the EIA methodology
☐	Acknowledgment and description of the potential cumulative impacts on each environmental resource
☐	Spatial presentation of the area where impacts (both direct and indirect) shall be felt
☐	Description of feasible mitigation measures to prevent/mitigate against/compensate measures
☐	Measures relate to described construction methods and operational phase characteristics
☐	Where applicable, environmental enhancement was identified
☐	Acknowledgment of potential for and description of most probable residual impacts
Chapter 7 – Environmental Management and Monitoring Plan	
	Outline EMMP:
☐	• Scope and objectives of the project-wide environmental monitoring programmes
☐	• Roles and responsibilities for effective implementation and management
☐	• Mechanism for reporting monitoring and auditing results
☐	• External communications with regulators and interested parties
	Identification of environmental standards for the monitoring programme to include monitoring of:
☐	• Cumulative impacts
☐	• Residual impacts
Chapter 8 – Conclusions and Recommendations	
	Succinct and to the point information on:
☐	• Proposed Project characteristics
☐	• Environmental resources and associated significant impacts

☐	• Identified measures to prevent, mitigate, compensate for impacts
	• Recommendations for monitoring:
☐	○ The effectiveness of measures
☐	○ Impacts, including cumulative and residual
☐	○ Environmental enhancement opportunities
☐	EIA matrix with scoped in environmental resources, project activities/works, impacts, mitigation, monitoring
Chapter 9 – Statement of Commitment	
	Statement of Commitment on the EIAR recommendations on:
☐	• The preferred identified prevention/mitigation or compensation measures
☐	• Corrective actions in the event that measures prove ineffective
☐	• Monitoring plans for all phases of the Project
Annexes	
☐	References/Bibliography
☐	Relevant engineering drawings
☐	Appointed Environmental Consultants' CVs, portfolio of Project experience, etc
☐	Project Owner's Dubai License (for private companies)
☐	Detailed reports with methodologies and results of studies undertaken for the baseline surveys and impacts prediction (e.g. numerical simulation studies) and accreditation details of the laboratory.
Quality of Submission	
	Inclusive of all above requested information for the Competent Authority to reach a clear understanding of the Project's:
☐	• Location and boundaries
☐	• Characteristics
☐	• Significant impacts
☐	• Recommended measures and monitoring programmes
☐	• Roles and responsibilities, and commitments
☐	Compliant with the EIAR Guidance in contents and structure
☐	Clarity of written language and submission of a complete document, text and annexes
☐	Correct cross-referencing between main EIAR text and its annexes
☐	Clarity of graphics, text and tables

DATE	**NAME OF ENVIRONMENTAL CONSULTANCY**
	STAMP AND SIGNATURE

Annex 3

Contents/Outline of an Environmental Impact Assessment Summary (EIAS)

Contents/Outline of an Environmental Impact Assessment Summary (EIAS)

INTRODUCTION

The EIAS serves as a statement of commitment by the Project Owner on his obligations to comply with its recommendations and with Federal Legislation requirements on environmental protection. The EIAS is also a binding environmental protection agreement between a Project Owner and Dubai Municipality-Environment Department (DM-ED), which is the Competent Authority for the implementation of Federal Legislation in the Emirate of Dubai.

Purpose and Structure

The purpose of Annex 3 "EIA Summary Outline and Contents" is to provide guidance on the structure and contents of an Environmental Impact Assessment Summary (EIAS) for development, infrastructure, coastal and marine Projects requiring a qualitative EIA study. Part 1 provides the guidance document for EIAS, whereas Part 2 provides the checklist, for submission to EPSS, which needs to be completed by the Environmental Consultant in preparation of the EIAS for Development and Infrastructure Projects.

The structure of this guidance reflects, in most parts, the structure of an EIAS. Guidance on the contents of each chapter and its sections are also provided in Part 1.

PART 1 – GUIDANCE ON THE CONTENTS OF EIAS

Guidance on the contents of EIAS is provided below:

EIAS COVER PAGE AND CONTENTS LIST

The report text shall be preceded by:

(i) Cover/Title Page

(ii) QA sheet with date of issue, revision number, name of author, reviewer and approver

(iii) Table of Contents with links to each heading and sub-heading

(iv) List of Abbreviations

(v) List of Tables

(vi) List of Figures

(vii) List of Engineering Plans / Maps

(viii) List of Annexes

1. CHAPTER ON INTRODUCTION

The Introduction shall comprise:

- General Project Description;
- Statement of Need for the Project;
- Project Alternatives and Preferred Option; and
- Information on External Project Funding (where applicable).

General Project Description

This Section shall provide a general description of the proposed Project, including information on the nature, size and location of the Project, its processes, products, services as appropriate, and the land/water uses of the surrounding areas. This information shall be supported by:

- Project Affection Plan and approved Final Master Plan; and
- Clear, to scale and informative maps and figures showing the Project location and its immediate surroundings.

Statement of Need for Project

This Section shall give a clear statement on why the Project is needed, its compatibility with the Federal and Emirate development strategies, programmes and plans. It shall present the long term social and economic benefits to the Emirate and society on the whole, which call for an overriding public interest when significant adverse negative impacts with little potential for prevention and/or mitigation are predicted.

Project Alternatives and Preferred Option

This Section shall clearly state the Project alternatives (e.g. nature, location, size) or individual elements of the Project (i.e. design, processes), which were considered in order to identify the preferred alternative option, and link this with the justification for its Statement of Need. The likely significant impacts and feasible prevention / mitigation / compensation measures for each identified Project alternative shall be presented, as shall the reasoning for eliminating each option.

The "Do-Nothing" Option

The "Do-Nothing" option (i.e. no proposed development at the proposed location or elsewhere) and its long term social, economic and environmental consequences shall also be briefly discussed.

2. CHAPTER ON THE EIA PROJECT TEAM

This Chapter shall provide information on:

- The DM-ED-registered environmental consultancy firm undertaking the EIA study;
- The EIA Project Team Leader and team members, by name; their respective field of expertise, and the corresponding module or area of study assigned to each ("key deliverable");
- The name(s) of DM-ED-registered sub-consultant(s), the scope of their works in the EIA study (e.g. environmental baseline surveys), proven experience, and DM-accreditation details;
- When required, the name of the EIAC-accredited laboratories that will be commissioned for the analyses of environmental samples during the baseline surveys with the accreditation details.

3. CHAPTER ON THE DETAILED DESCRIPTION OF THE PROJECT AND PROJECT SITE

This Chapter shall clearly present all the available information on the proposed Project and its location, with as much detail as possible, provided on GIS maps (where relevant), on the following elements of the proposed Project:

- The proposed Project's location, delineation of Project boundaries, and planning status shall be explained; copy of Affection Plan and Master Plan to be included;
- Description of the nature of the proposed Project (e.g. residential, commercial, mixed, industrial);
- The size (spatial coverage) of the proposed Project, in relation to the surrounding developments/land uses shall be given;

- Description of the nature of the existing land use(s) and expected changes at the location of the proposed Project;
- The proposed Project's immediate surroundings and its proximity to sensitive land uses or areas of environmental importance and protection status within the Emirate of Dubai shall be identified; this information shall be supported by high quality, clear and informative maps (to scale), figures and photos;
- For proposed Projects that are adjacent or very close to the borders of the Emirate of Dubai, information on land use(s) across the borders shall be provided;
- The phases of Project development and construction, supported by a Project works schedule shall be explained; the footprint of the construction works shall be clearly provided;
- A detailed description of major construction works, such as deep excavations, temporary dewatering, land excavation and anticipated volumes of earth material associated with such works shall be given; available or most probable Method Statements shall be included in this Chapter;
- The proposed Project layout showing:
    - The major utilities and infrastructure (e.g. permanent artificial water bodies, roads, bridges within the footprint of the proposed Project);
    - The locations of air emissions sources and effluent discharge outfalls.
- Description of the services, technologies, products, waste stream associated with the construction and operational phases of the proposed Project, including site clearance prior to construction (where relevant);
- (Where applicable) A comprehensive description of the Project operational processes, process flowchart, types and quantities of raw materials, production capacity, energy and water requirements, material balance, and water balance shall be provided;
- The information pertaining to waste streams (air, water, hazardous waste, solid waste, soil), shall need to be provided;
- The anticipated major sources of air, soil and water contamination or disturbance to wildlife (e.g. noise and light) and built environment (i.e. existing buildings, infrastructure) shall be identified and described in detail;
- Description of the existing legitimate uses by natives, residents and tourists at the proposed Project area and its surrounding areas;
- Total capital cost; and
- (Where applicable) If the proposed Project is externally funded, the name of the funding organisation(s) (e.g. World Bank/IFC), and any environmental protection requirements of the funding organisation, in addition to these guidelines, which the EIA study needs to comply with shall be explained.

4. CHAPTER ON THE EIA STUDY PROCESS

Scoping In and Out of Environmental Resources

This Chapter shall provide a description of the Scoping In and Out of exercise. The purpose of this exercise is to identify which environmental resources are not within the Project site, in its immediate surroundings nor, for very obvious reasons, are likely to be impacted upon as a result of the proposed Project. Any environmental resources that falls in this category shall be Scoped Out of the environmental impact study. This exercise shall also include trans-boundary environmental resources.

The conclusion on Scoping Out an environmental resource needs to be fully justified. Any environmental resource that is not listed as Scoped Out is therefore identified as a Scoped In resource and it shall be studied in the EIAS.

Where there is no obvious reason to justify Scoping Out an environmental resource, this resource shall be subject to the EIAS.

The environmental resources to be subject to the Scoped In and Out exercise for the purposes of the EIAS are as follows:

Geology, Hydro-geology, Geomorphology
Oceanography, Hydrodynamic Regime, Coastal Processes
Climatic Conditions, Climate Change and Air Quality
Noise and Vibration
Land Uses, Soil and Groundwater
Water Uses, Water and Sediment Quality
Aquatic Ecology and Nature Conservation
Terrestrial Ecology and Nature Conservation
Archaeology and Cultural Heritage
Amenities, Tourism and Recreation
Utilities and Infrastructure
Waste Generation and Management
Sustainability
Other Environmental Resources/Assets/Issues

Environmental Resources Data Collection

This shall give a brief description of the type of sources, which were sought to obtain data on the Scoped In environmental resources; such sources can include:

- Review of Existing data and pertinent publications
- Observations, sightings, and photographs
- Consultation findings
- Anecdotal evidence

Review of Existing Data

The review of the available environmental data (e.g. secondary baseline data) is primarily a desk-top study. This Section of the EIAS shall clearly identify the available data that was included in the description of the Scoped In environmental resources and the impacts prediction exercises. Available environmental data can be referred to by title of publication, name(s) of author(s), date, and source of publication.

The validity of and confidence level on existing data for the purposes of the qualitative impacts prediction shall need to be clearly stated in this Section. Data that is older than 5 years shall not be deemed valid for the EIA study.

Where maps, drawings and photographs from available data are to be used in the EIA study, these shall be included and shall be of good quality and easy to read.

EIA Methodology

This Section shall clearly present the approach that was followed in order to:

- Predict (qualitatively) the impacts on each of the Scoped In environmental resources from the proposed Project;
- Where applicable, highlight the potential for cumulative impacts on each of the Scoped In environmental resources from the proposed Project in combination with other planned, (and soon to be implemented) Projects adjacent to the proposed Project site;
- Identify the magnitude and assess the significance of impacts, cumulative impacts included
- Identify environmental risks and hazards; and
- Identify pertinent measures to prevent, mitigate against and compensate for (in that order) all significant impacts and risks.

Where relevant, the indirect/secondary impacts (i.e. triggered by a direct/primary impact) shall also be studied in the EIA.

This Section shall also clearly identify and explain the limitations of the EIA study for which assumptions have to be made. The limitations may include, but not limited to, the level of information on the proposed Project available at the time of the study, constraints in obtaining available baseline data, and limitations on the impacts prediction and assessment process.

5. CHAPTER ON THE EXISTING ENVIRONMENT, IMPACTS, MITIGATION, RESIDUAL IMPACTS

Description of the Scoped In Environmental Resources

This Section shall entail the descriptions of all Scoped In environmental resources and built environmental aspects; the descriptions shall be based on the data that is obtained through available data review, the consultation findings, and EIA team's site visit observations; all shall be included in the References & Bibliography list, and shall be clearly referenced accordingly in the text, where relevant.

The description of each environmental resource in this Section needs to be as complete as possible using such information from existing data sources so as to comprehensively and completely describe the following characteristics of the environmental resource, and relate them to the impacts prediction:

- The main characteristics (biotic, abiotic, built environment);
- The land and water uses (roads, waterways, industrial discharges urban and rural areas);
- The environmental quality status (surface and groundwater, sediment, air, soil, biodiversity);
- The prevailing regime/situation (local climate, hydrodynamic, flushing);
- The protection/conservation status (protected national sites/habitats/species; internationally recognised protection status);
- The human environment (culture, heritage, amenities, recreation, tourism);
- Utilities (existing cables pipelines, sewage & drainage networks);
- Waste management (existing management at Project site); and
- Any other environmental information including Sustainability plans, programmes pertinent to the site and character of the proposed Project.

The information on all Scoped In environmental resources shall be presented, as much as possible, on maps that are easy to read, accurately scaled and oriented; GIS maps are preferred. Maps and drawings shall be presented in A3 size.

Prediction and Assessment of Environmental Impacts

The potential impacts during the construction and operational phases of the proposed Project on each one of the Scoped In environmental resources shall be reflecting the Method Statements and Project activities/works and their sequence as described in the Chapter on the Detailed Descriptions of the Proposed Project and Site.

The impacts prediction and assessment information to be provided in this Section shall entail the following:

- A clear description of the nature of the most probable impacts, and the cause-pathway-effect relationship between the Project's planned activities and the potentially impacted environmental resources for all Project phases; the impacts within and outside the construction and operational footprints of the proposed Project, including cumulative and trans-boundary impacts (if applicable) shall be clearly identified;
- The methodology followed to accurately predict and evaluate impacts;
- Spatial presentation of the area where impacts (both direct and indirect) in relation to the proposed Project's construction and operational footprints;
- The nature of the impact in terms of direct or indirect (i.e. secondary), reversibility, long or short term, local or regional or trans-boundary (if applicable); and
- The significance of the identified impact; impacts shall be identified as negligible, minor, moderate, major adverse or beneficial.

Cumulative Impacts

Environmental resources have a capacity to accommodate changes; single changes can be more easily accommodated than multiple. For this reason, the EIAS shall also discuss the potential for and nature of cumulative impacts from the proposed Project and planned Projects. The area of impacts to be considered shall include the areas of both direct and indirect cumulative impacts.

The information on the most probable cumulative impacts shall be supported by a clear description of the factors leading to the cumulative nature of impacts.

Prevention, Mitigation and Compensation Measures

The measures to prevent, mitigate against or compensate for, preferably in that order, the identified significant impacts including the cumulative impacts shall be clearly described in this Section.

This Section shall also include information on how the identified prevention measures shall be in place at the start of the works/operations and before any of the predicted impacts are realised.

For the predicted significant impacts during the proposed Project's operational phase, all relevant and feasible technology, techniques, equipment, processes and procedures, which will prevent and/or mitigate them shall be outlined.

It is possible that at the time of the EIA study there is limited information on the construction methods available. Where this is the case, reference to previous experience or information on measures, proven to be effective, from similar Projects shall be made. Where such information can be available, it is expected to be fully utilised.

Where impacts cannot be prevented or mitigated but feasible compensation measure(s) can be implemented, these shall be discussed in this Section. Where compensation is not feasible either, a full explanation shall be provided and the significance for the impacted environmental resource shall be fully discussed.

The implementation of all identified measures, the implementation schedule, the responsible entity for the implementation, corrective measures, supervision, monitoring effectiveness, auditing and reporting shall be clearly identified and stated in this Section.

The description of and discussion on all feasible measures is expected to be informative and constructive so that it forms the basis for the development of the Construction Environmental Control Plan (CECP) as may be required by the concerned DM-ED Section.

Environmental Enhancement

Any environmental enhancement opportunities that the proposed Project presents, shall also be presented and discussed. The latter shall also be re-iterated in the conclusions and recommendations section of the EIAS.

Residual and Unavoidable Impacts

It is possible that, following implementation of prevention and/or mitigation measures, certain impacts still remain, most likely at a lesser magnitude and spatial extent. These residual impacts are usually accepted as part of the unavoidable changes to environmental resources due to a proposed Project.

It is also possible that certain impacts cannot be prevented at all.

For these reasons, both the residual (post-mitigation) and unavoidable impacts shall be identified and discussed for all Project phases; where relevant, the discussion shall make references to the legal requirements/limits (numerical standards), as identified in the Chapter on Legal Framework. The residual and unavoidable impacts shall be characterised in the same way as the pre-mitigation impacts (i.e. minor, moderate or major).

6. CHAPTER ON THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS

This Chapter shall present a framework of an Environmental Management and Monitoring Plan (EMMP) for all proposed Project phases.

The Framework EMMP shall include information on:

- The environmental resources expected to be impacted as per the EIA study;
- The mitigation measures, and corrective actions to be taken when measures fail to reach the protection objective;
- The monitoring plans, required to monitor:
  - The effectiveness of the prevention and/or mitigation measures;
  - The residual impacts and impacts on the environmental resources that are unavoidable or cannot be mitigated;
- Waste collection and disposal management plan;
- Inspection and auditing programmes;
- Roles and responsibilities for the effective implementation and management of the measures and monitoring plans;
- A mechanism for reporting, monitoring and auditing results;
- Environmental induction and training program for construction and operation workers and management;
- External communications with regulators and interested parties/stakeholders.

Monitoring programmes for each Project phase shall be developed with as much detailed information as possible, and included in this Chapter; the monitoring plans shall include, but not limited to, the following:

- The monitoring objectives to determine the effectiveness of the identified preventive/mitigation measures;
- In situ and ex situ environmental parameters to be monitored and the trigger levels to initiate investigations and remedial actions;
- Sampling design, methodology and equipment for measurement, data management & analysis, equipment calibration;

- An outline figure of the sampling locations reflecting anticipated impacts and sensitive receptors/ targets; monitoring locations shown on clear maps/drawings;
- The duration and frequency of monitoring, with justification where possible (e.g. seasonal monitoring);
- The type and frequency of the reporting mechanism on the monitoring results (i.e. real time or periodic report submission or both); and
- The organisational structure of the Environmental Management Team, that is the responsible entity to undertake the monitoring plan and supervise/audit the monitoring team.

7. CHAPTER ON THE EIA CONCLUSIONS AND RECOMMENDATIONS

The EIA study conclusions can be presented in this Chapter as Project Environmental Matrices for both the Project Construction and Operational Phases; references to the relevant Sections and Sub-sections (by number) of the Chapters on the EIA Study Process and the Existing Environment, Impacts, Mitigation, Residual Impacts, shall feature in each matrix, as appropriately.

Each Matrix shall comprise the following:

- Planned works/activities/operations of the proposed Project;
- All Scoped In environmental resources within and around the proposed Project's site that were studied in the EIA;
- Predicted impacts;
- Identified measures;
- Residual impacts;
- Recommended monitoring activity, identifying monitoring frequency and referencing drawings of monitoring locations; and
- Environmental enhancement opportunities.

Both Project Construction and Operational Environmental Matrices could be prepared early on in the EIA study to serve as a road map to the identification exercise of cause-path-impact, and as the impacts identification and assessment study develops they can be populated accordingly to include the identified measures, residual impacts and monitoring plans.

An example of either matrix is given in Table 7.1 below.

Table 7.1 Example of a Construction Environmental Matrix

Planned Activity & Works*	Environmental Resource	Impacts	Risk of Impact happening (Low, Medium, High)	Prevention	Mitigation	Residual Impacts	Compensation	Monitoring
**Pre-Construction Site preparation works (where applicable) to be included and identified in the Matrix								

8. CHAPTER ON THE STATEMENT OF COMMITMENT

This Chapter of the EIAS shall include the statement of commitment to the implementation of the EIA requirements; this statement can be prepared by either the Project Owner or by the appointed Environmental Consultant.

The statement of commitment shall particularly highlight the EIA recommendations for:

- The preferred identified prevention/mitigation or compensation measures;
- Corrective actions in the event that measures prove ineffective; and
- Monitoring plans for all phases of the Project.

ANNEXES

The detailed description of the scope and results of all baseline surveys, if required, shall be included in the EIAS as Technical Appendices.

BIBLIOGRAPHY & REFERENCES

All of the data sources (available data, research papers and conference publications, periodical articles, working group reports, guidelines, other published EIA studies, Environmental Legislation and Regulations, Decrees, International Conventions and Agreements) shall be listed in the Bibliography and References List of the EIAS.

PART 2 - CHECKLIST FOR THE ENVIRONMENTAL CONSULTANT IN PREPARATION OF AN EIAS

The Table 1 below provides a checklist which needs to be accomplished by the Environmental Consultant in preparation of an EIAS for the purposes of applying for an Environmental Clearance. This Checklist shall be dated, signed and stamped by the Environmental Consultant, and shall be submitted together with the EIAS.

Table 1: EIAS Contents Checklist

EIAS Title	
Revision Number	
Date of Submission	
Cover Page and Contents List	
☐	Project title, name of Project Owner and Consultant, date, revision number
☐	QA sheet with date of issue, revision number, name of author, reviewer and approver
☐	Table of Contents with links to each heading and sub-heading
☐	List of Abbreviations
☐	List of Tables
☐	List of Figures
☐	List of Engineering Plans / Maps
☐	List of Annexes
Chapter 1 – Introduction	
☐	General description of Project; Affection Plan; Master Plan; clear, to scale and informative figures showing Project location and surrounding areas
☐	Statement of need; Advantages and disadvantages to the natural and built environment, and local economy; Social benefits
	Consideration, information on:
☐	• Alternatives to the proposed project (i.e. type, location)
☐	• Alternatives to individual elements (i.e. process/technology/techniques) of the Project
☐	• Major environmental aspects and significant environmental impacts for each alternative
☐	• "Do Nothing" option
Chapter 2 – The EIA project team	
☐	The DM-registered environmental consultancy firm, who will undertake the qualitative EIA study

☐	The EIA Project Team Leader and team members, by name; their respective field of expertise, and the corresponding module or area of study assigned to each (“key deliverable”)
☐	The name(s) of DM-ED registered sub-consultant(s) and their respective study scope for the EIA; proven experience, and DM-accreditation details
☐	The name(s) of the EIAC-accredited laboratories involved in the baseline surveys (if required)
Chapter 3 – Detailed Project Description (Construction and Operational Phases)	
☐	Project Master Plan and Affection Plan
☐	Nature, size and location of the Project; the nature of the existing land use(s) and expected changes at the location of the proposed Project
☐	Pre-construction site clearance needs for mobilisation
☐	Description of expected Project footprint of construction and operational phases
☐	Description of immediate surroundings and its proximity to sensitive land uses or areas of environmental importance and protection status within the Emirate of Dubai, and across the borders (as applicable)
☐	Detailed description of major construction works
☐	(When applicable) Operational phase processes/activities, environmental aspects (details), waste stream and disposal options, pollutants/disturbances from planned and unplanned activities
☐	Maps, drawings, figures, photographic plates supporting all Project description and activities
☐	Maps, drawings, figures are up to date and clear to read with informative legend
☐	Project status, outline construction schedule
☐	Total capital cost
Chapter 4 – Description of the Project’s EIA Study Process	
☐	Scoping in and out of environmental resources
☐	Justification for scoping out
☐	Available data review
	EIA methodology:
☐	• Explanation of the methodologies for assessing the significance of impacts
☐	• Limitations of the EIA Study
Chapter 5 – Environmental Baseline Information, Impacts, Mitigation and Residual Impacts	
☐	Description of existing scoped in environmental resources (air, soil, water, shoreline, waterways), land and water uses within proposed Project location and surrounding areas
☐	Environmental sensitivities (wildlife, residential areas, protected/designated areas) at proposed Project location and surrounding areas
☐	Detailed, to scale and easy to read maps and drawing showing the spatial distribution of environmental resources and environmental sensitivities within and adjacent to the proposed Project
☐	Justification on confidence level for qualitative impact assessment
☐	A description of the likely effects / impacts of the proposed Project
☐	Description of feasible mitigation measures to prevent/mitigate against/compensate measures
☐	Acknowledgment of potential for and description of most probable residual impacts
Chapter 6 – Environmental Management and Monitoring Plan	
	Outline EMMP:
☐	• Scope and objectives of the project-wide environmental monitoring programmes

☐	• Roles and responsibilities for effective implementation and management
☐	• Mechanism for reporting monitoring and auditing results
☐	• External communications with regulators and interested parties
	Identification of environmental standards for the monitoring programme to include monitoring of:
☐	• Cumulative impacts
☐	• Residual impacts
Chapter 7 – Conclusions and Recommendations	
	Concise information on:
☐	• Proposed Project characteristics
☐	• Environmental resources and associated significant impacts
☐	• Identified measures to prevent, mitigate, compensate for impacts
	• Recommendations for monitoring:
☐	○ The effectiveness of measures
☐	○ Impacts, including cumulative and residual
☐	○ Environmental enhancement opportunities
☐	EIA matrix with scoped in environmental resources, project activities/works, impacts, mitigation, monitoring
Chapter 8 – Statement of Commitment	
	Statement of commitment on the EIAS recommendations on:
☐	• The preferred identified prevention/mitigation or compensation measures
☐	• Corrective actions in the event that measures prove ineffective
☐	• Monitoring plans for all phases of the Project
Annexes	
☐	References/Bibliography
☐	Relevant engineering drawings
☐	Appointed Environmental Consultants' CVs, portfolio of Project experience, etc
☐	Project Owner's Dubai License (for private companies)
Quality of Submission	
	Inclusive of all above requested information for the Competent Authority to reach a clear understanding of the Project's:
☐	• Significant impacts
☐	• Recommended measures and monitoring programmes
☐	• Roles and responsibilities and commitments
☐	Compliant with the EIAS Guidance in contents and structure
☐	Clarity of written language and submission of a complete document
☐	Clarity of graphics, text and tables

DATE	**NAME OF ENVIRONMENTAL CONSULTANCY**
	STAMP AND SIGNATURE

Annex 4

Guidance on Environmental Baseline Surveys and Numerical Modelling

Annex 4

Part 1

Guidance on the Requirements for Air, Noise, Odour Baseline Monitoring & Modelling and Separation Distance

Guidance on the Requirements for Air, Noise, Odour Baseline Monitoring & Modelling, and Separation Distance

Air Quality and Odour Monitoring

1. Air monitoring techniques and analyses shall be carried out following international best practices or standard methods established by recognised international bodies.
2. Only laboratories accredited by the EIAC for the particular task and parameters shall be engaged for air and odour sampling, monitoring and analyses.
3. Detection limits of instruments, analysers or internationally accepted methods shall be below corresponding statutory or adopted allowable limits of pollutants in ambient air and odour to allow suitable assessment (Refer to Table 3).
4. Existing weather and air quality information in the proximity of the site must be screened and reviewed to obtain representative data using appropriate and acceptable instruments.
5. Monitoring shall be chosen based on the following criteria:
   a. Upwind, downwind and crosswind of emission sources;
   b. Premises fenceline or close to the sensitive receptors boundary which are likely to be impacted; and
   c. The duration of monitoring shall be based on statutory averaging time (hourly, daily, 8-hours) of concerned parameters.
6. A minimum of three (3) monitoring locations from the upwind, downwind and crosswind of the prevailing wind direction is required. Depending on the Project (i.e. type of emission, magnitude of emission, Project footprint, sensitivity of the area, etc.), however, additional number of locations may be required to cover variable wind directions and sensitive receptors.
7. The minimum required parameters to be monitored and period of record for each Project type are presented in Table 1 and Table 2. Additional parameters and longer monitoring period may be required depending on the scope of the proposed Project, the type and magnitude of emissions, the sensitivity of the nearby receptors, and any atmospheric dispersion modelling requirement.
8. All relevant data including temperature, wind speed, wind directions, site conditions and activities, nearby emissions sources shall be recorded throughout the baseline monitoring period and shall be appended in the EIAR/EIAS.
9. Monitoring should be done under typical or normal weather conditions (i.e. not during dust storm events). Any data (i.e. PM and TSP) measured at wind speeds of more than 5 m/s shall be invalidated.
10. Criteria pollutants must be reported at the same averaging time of the relevant limits.
11. A Quality Assurance/Quality Control (QA/QC) program must be in place that covers equipment maintenance; calibration; sample handling, storage and transport; and data verification.

Noise Monitoring

1. Noise monitoring shall be carried out following international best practices or standard methods established by recognised international bodies.
2. Noise measurement must be undertaken with the following considerations:
   a. Noise measurement must be undertaken employing a Class 1 sound level meter. The sound level meter must be calibrated at least 2 years by a calibration laboratory and field performance shall be checked with a portable sound level calibrator before and after each measurement.
   b. The measurement should be taken outdoor or inside affected property. The sound level meter should

be at least 1.2 - 1.5 meters above the ground, floor or building and should be no less than 3.5 meters from any reflective surface such as walls or buildings. When it is not possible to locate at 3.5 meters, the preferred position shall be more than 1-meter from any reflective wall.

c. Where measurement is made inside any habitable room of the noise affected residential premises and a window or door is the major transmission path for the noise, measurements shall be taken with the window or door fully opened and fully closed to obtain an estimate of noise level difference.

3. Monitoring locations shall be chosen based on the following criteria:
   a. Location of existing or future noise sources;
   b. Background noise which is not much influenced by emission sources; and
   c. Topography between noise sources and noise sensitive receivers.
4. Unless otherwise specified in Table 1 and Table 2, a minimum of four (4) monitoring locations and 15-minute monitoring period in each location are required during daytime and nighttime, weekdays and weekend. The minimum 15-minute averaging time is applicable only for constant noise levels. In case of erratic, impulse and other types of noise, the monitoring time shall be prolonged for a minimum of 12 hours during daytime and nighttime. Additional monitoring locations and longer monitoring interval may be required depending on the nature and characteristic of noise emissions (e.g. type, time of occurrence, the sensitivity of the surrounding receptors, and any noise modelling requirement).
5. Noise monitoring should be carried out on a day with calm to gentle breeze represented by wind speeds not more than 5 m/s. In case of highwinds, the microphone shall be protected with windscreen.
6. All relevant data including wind speed, site activities, and noise sources shall be recorded throughout the baseline monitoring period and shall be appended in the EIAR/EIAS.

7. Noise levels shall be reported as A-weighting and equivalent continuous sound level (Leq) to assess compliance with the Federal allowable limits including Lmax, Lmin, L5, L95, L90 for source noise and background assessment.
8. A Quality Assurance/Quality Control (QA/QC) program must be in place that covers equipment maintenance, calibration, and data verification.

Table 1: Minimum Baseline Air and Noise Monitoring, and Modelling Requirements for EIAR

Project Classification	Project Type	Air	Odour	Noise	Modelling Requirements
Non-renewable resource projects	Fossil fuel, natural gas, and mineral ore exploration and development including offshore structures or pipelines	×	×	×	×
	Onshore pipelines for the transport of oil, natural gas or petrochemical products *(in new oilfield or pipeline corridor)*	×	×	×	×
Power Generation and Desalination Projects	Power generation plants *(fossil fuel)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (7-day continuous)	×	If NSR is present within 300m from plot boundary: Continuous noise for a period of at least 7 days	Air dispersion modelling[A]
	Renewable Energy *(i.e. hydro, geothermal power plants, WTE)*	For waste-to-energy: NO_x, SO_2, CO, O_3, PM_{10}, TSP, Metals (Cd, Hg, As, Cr, Cu, Pb, Mn, Ni), Acid Gases (HCl, HF), VOC, Dioxins/ Furans (7-day continuous)	For waste-to-energy: Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), NH_3 (24-hr continuous)	If NSR is present within 300m from plot boundary: Continuous noise for a period of at least 7 days	Air dispersion modelling[A] (waste-to-energy)
	Desalination plant and potable water processing facility	If with fossil fuel combustion source: NO_x, SO_2, CO, O_3, PM_{10}, TSP (7-day continuous)	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Sea Water Reverse Osmosis (SWRO) plant	×	×	×	×
	Dams, water reservoir	PM_{10}, TSP (7-day continuous)	×	At least 15-min monitoring period over day and night	×
	Groundwater extraction and purification and recharge	×	×	×	×
Land, Air and Sea Transport Projects	New highways, road network or bridges	PM_{10}, TSP (7-day continuous)	×	Continuous noise for a period of at least 7 days	Noise modelling[C]
	Railway and mass transport network	PM_{10}, TSP (7-day continuous)	×	Continuous noise for a period of at least 7 days	Noise modelling[C]
	Tunnels, tunnelling and related works, sewer, irrigation, and drainage network and sea outfall	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Development of a new harbour(s) or terminal(s) or marina or modification of an existing harbour or marina in coastal zone *(rock works, capital dredging or excavation, quay walls, reclamation)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Development of promenade or new marina or modification of existing marina in Creek or waterways with any reclamation or encroachment into the Creek or waterways *(including floating pontoons with mooring systems, piles supporting platforms, quay walls, revetment)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Development of artificial canals connected to the Creek or sea or existing waterways *(excavation or dredging, retaining walls)*	PM_{10}, TSP (7-day continuous)	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Temporary or permanent causeway(s) *(rock works, reclamation)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Bridge(s) over marine water *(including piers located in Creek or Waterways or Sea)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Airport and airfields	NO_x, SO_2, CO, O_3, PM_{10}, TSP (7-day continuous)	×	Continuous noise for a period of at least 7 days	Noise modelling[B]

Project Classification	Project Type	Air	Odour	Noise	Modelling Requirements
Projects Related to Waste	Landfills and waste disposal site	×	Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), volatile organic compounds, ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Odour modelling[C]
	Waste transfer station	×	For organic/odourous wastes: Volatile organic compounds, Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Odour modelling[C]
	Hazardous waste treatment facility	For hazardous and medical waste incineration: NOx, SO_2, CO, O_3, PM10, TSP, Metals (Cd, Tl, Hg, Sb, As, Cr, Co, Cu, Pb, Mn, Ni, Sn, V), Acid Gases (HCl, HF), VOC, Dioxins/Furans (7-day continuous)	Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Air dispersion modelling[A] (incineration), Odour modelling[C]
	Waste incineration plant	NO_x, SO_2, CO, O_3, PM_{10}, TSP, Metals (Cd, Tl, Hg, Sb, As, Cr, Co, Cu, Pb, Mn, Ni, Sn, V), Acid Gases (HCl, HF), VOC, Dioxins/Furans (7-day continuous)	Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Air dispersion modelling[A], Odour modelling[C]
	Waste sorting & recovery facility	×	For organic/odourous wastes: Volatile organic compounds, Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Odour modelling[C]
	Waste composting plant	×	Volatile organic compounds, Reduced sulphur compounds (H_2S, methyl mercaptans, DMS, DMDS), ammonia (24-hr continuous)	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	Odour dispersion modelling[C]
Projects Related to Housing and Industry	Building(s) with marina component *(regarless of height)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Residential, commercial or mixed-use community development *(adjacent or within 100m from the beach or with permanent discharge to Creek or sea)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	×	×
	Industrial estates / complex *(adjacent or within 100m from the main sea level shoreline or with water intake or with permanent outfall to Creek or sea)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	At least 15-min monitoring period over day and night	×
Special Projects	Effluent discharging outfalls *(thermal discharge, brine, hypersaline water, treated sewage effluent, and for storm water or groundwater with discharge rates greater than 2.0 m^3/sec)*	×	×	×	×
	Coastal stabilisation *(including revetment, groynes, breakwaters, seawalls, reefs, beach reclamation, dredging, etc.)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Development of an artificial island(s) or peninsulas *(land reclamation, beaches, rock works, and quay walls)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Sub-marine pipelines	×	×	×	×
	Golf courses *(new and with water discharges to the sea or Creek)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	At least 15-min monitoring period over day and night	×
	Offshore capital dredging and/ or disposal *(sand dredging from borrow areas, disposal of dredged material)*	×	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×
	Hospitals, veterinary, specialised mediclinics, health facilities with incinerator and/or laboratories	With fossil fuel combustion source: NO_x, SO_2, CO, O_3 With incinerator: NO_x, SO_2, CO, O_3, PM_{10}, TSP, Metals (Cd, Tl, Hg, Sb, As, Cr, Co, Cu, Pb, Mn, Ni, Sn, V), Acid Gases (HCl, HF), VOC, Dioxins/ Furans (24-hr continuous)	×	×	×

Notes:
NSR – Noise Sensitive Receivers
[A] – Air or odour dispersion modelling should be undertaken employing BREEZE AERMOD or BREEZE CALPUFF model.
[B] – Noise modelling should be undertaken employing SoundPLAN model.
[C] – Modelling will be required depending on the sensitivity of the Project location in relation to affected receptors.
The EPSS reserves the right to include / exclude any of the above requirements on case-by-case basis.

Table 2: Minimum Baseline Air and Noise Monitoring, and Modelling Requirements for EIAS

Project Classification	Project Type	Air	Odour	Noise	Emf	Modelling Requirements
Non-renewable resource projects	Onshore pipelines for the transport of oil, natural gas or petrochemical products *(in existing oilfield or pipeline corridor)*	×	×	×	×	×
	Bulk storage facilities for petroleum, natural gas or petrochemical products	VOCs (floating roof tanks) 24 hrs	×	If NSR is present within 300m from plot boundary: At least 15-min monitoring period over day and night	×	×
	Fuel filling stations	×	×	×	×	×
Power Generation and Desalination Projects	Open Substation	×	×	×	✓	×
	High Voltage Overhead Power Transmission Lines	×	×	×	✓	×
Projects Related to Housing and Industry	Residential, commercial or mixed-use community development *(without permanent discharge to Creek or sea)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	×	×	×
	Industrial estates / complex *(without water intake or with permanent outfall to Creek or sea)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	At least 15-min monitoring period over day and night	×	×
Land, Air and Sea Transport Projects	Development of promenade or new marina or modification of existing marina in Creek or waterways without any reclamation or encroachment into the Creek or waterways *(including floating pontoons with mooring systems, piles supporting platforms, quay walls, revetment)*	×	×	×	×	×
	Modification of existing marina in the coastal zone with up to 10 no. of berths or slips or without any rockworks, dredging or reclamation *(including replacement or repair to existing floating pontoons and mooring system)*	×	×	×	×	×
Special Projects	Maintenance of existing beaches *(including cleaning, re-profiling, trimming, beach nourishment)*	×	×	×	×	×
	Effluent discharging outfalls *(storm water or groundwater with discharge rates less than 2.0 m^3/sec)*	×	×	×	×	×
	Sub-marine cables	×	×	×	×	×
	Reverse Osmosis Plant	×	×	×	×	×
	Golf courses *(new and without water discharges to the sea or Creek)*	NO_x, SO_2, CO, O_3, PM_{10}, TSP (24-hr continuous)	×	At least 15-min monitoring period over day and night	×	×

Notes:

NSR – Noise Sensitive Receivers

The EPSS reserves the right to include / exclude any of the above requirements on case-by-case basis.

Table 3: Reference Standards

Parameter	Reference Standards
SO_2, CO, NO_2, O_3, TSP, PM_{10}, Pb	Ambient Air Quality Standards, UAE Cabinet Decree No. (12) of 2006 Concerning the Protection of Air from Pollution
H_2S	WHO Air Quality Guideline (7 µg/m^3, 30-min averaging time)
NH_3	US NIH (30 µg/m^3, 30-min averaging time)
All other air parameters	Ontario's Ambient Air Quality Criteria
Noise	Allowable Limits for Noise Level in Different Areas, UAE Cabinet Decree No. (12) of 2006 Concerning the Protection of Air from Pollution
EMF	International Commission on Non-Ionizing Radiation Protection (ICNIRP)

Recommended Separation Distance

Any Project that is likely to be affected by activities that create or are potential to create significant adverse impacts (e.g. EMF, odour) must be sited on appropriate location according to the applicable land use zoning regulations and with adequate buffer or separation distance. The sensitivity of the receptors at the Project from either existing or planned activity, should be taken into consideration when providing suitable buffer or separation distance. The types, sensitivity, and description of sensitive receptors are provided in Table 4.

Table 4 – Description and Features of Sensitive Receptors Area

Sensitivity and (Type of Area)	Description and Features of the Receptors Area
High (Type 1 Area)	• Protected areas for conservation of national or international importance • Water supply reserves • Hospitals and school premises • High density residential block (according to land use classification), town center
Moderate (Type 2 Area)	• Vital utilities such as electricity and energy sources, natural wealth reserves, and state-protected economic zones • Light density residential blocks (according to land use classification), public parks • Natural body of water • Place of cultural heritage
Light (Type 3 Area)	• Commercial buildings, offices, and other public areas • Food products manufacturing premises • Agricultural crops farmland
Marginal (Type 4 Area)	• Industrial • Animal farmland but without dairy or meat food products processing

The provision of adequate buffer or separation distance will not only minimise the impact on sensitive receptors within a proposed Project, but most importantly, pre-empts any future conflicts that may arise due to harmful effects of electromagnetic field (EMF), noise, malodour, and other emissions and/or harmful discharges to the environment. Any Project that will be located near facilities that generate odour or EMF emissions is recommended to provide a buffer or separation distance in accordance with the local and international best practices. The assessment on the provision of buffer zone or separation distance should be integrated with the air impact assessment in the EIA study.

Annex 4

Part 2

Guidance on Coastal and Marine Numerical Model Simulations for Quantitative EIA Studies

Guidance on Coastal and Marine Numerical Model Simulations for Quantitative EIA Studies

These guidelines set the requirements for scoping and undertaking coastal model simulation studies in support of quantitative EIA studies, and presenting the results in an EIAR. Their purpose, therefore, is to serve as a reference for the Consultant to the expectations of DM-ED on the data requirements, contents, calibration and deliverables of coastal model simulations.

If it becomes necessary to deviate from or omit part(s) of the requirements, a detailed explanation and justification on the integrity of the results and their significance for the quantitative impact prediction for the EIA study shall be provided in the modelling study report and in the relevant section within the EIAR.

The approach to the coastal modelling study shall at the very least follow the guidance specified in Sections 1.1 – 1.6 that follow.

1.1 Coastal Modelling Study Objectives

The objectives of applying coastal modelling in an EIA study shall be stated clearly including the scope of modelling and the intended use of the modelling output. It shall include a brief description of the site, the coastal system, the Project and the potential effects of the Project on the coastal system.

1.2 Selection of the Model(s)

The suitability of the model(s) chosen for the intended purpose shall be justified by the Consultant with technical description of the model(s).

The model configuration(s) shall be presented, including model domain, resolution and dimensionality. In case stratification is anticipated in the Project area, either naturally existing or caused by the Project, 3D model(s) shall be used; otherwise alternatives shall be justified.

Table 4-1 presents a matrix of type of model(s) required for coastal/marine Projects. Table 4-2 summarises general considerations for coastal model simulations to be followed. Notwithstanding these two tables, it shall be noted that DM will review and approve numerical modelling studies on a case-by-case basis with consideration on the nature and size of the proposed Project and its proximity to sensitive receptors of the natural and built environment.

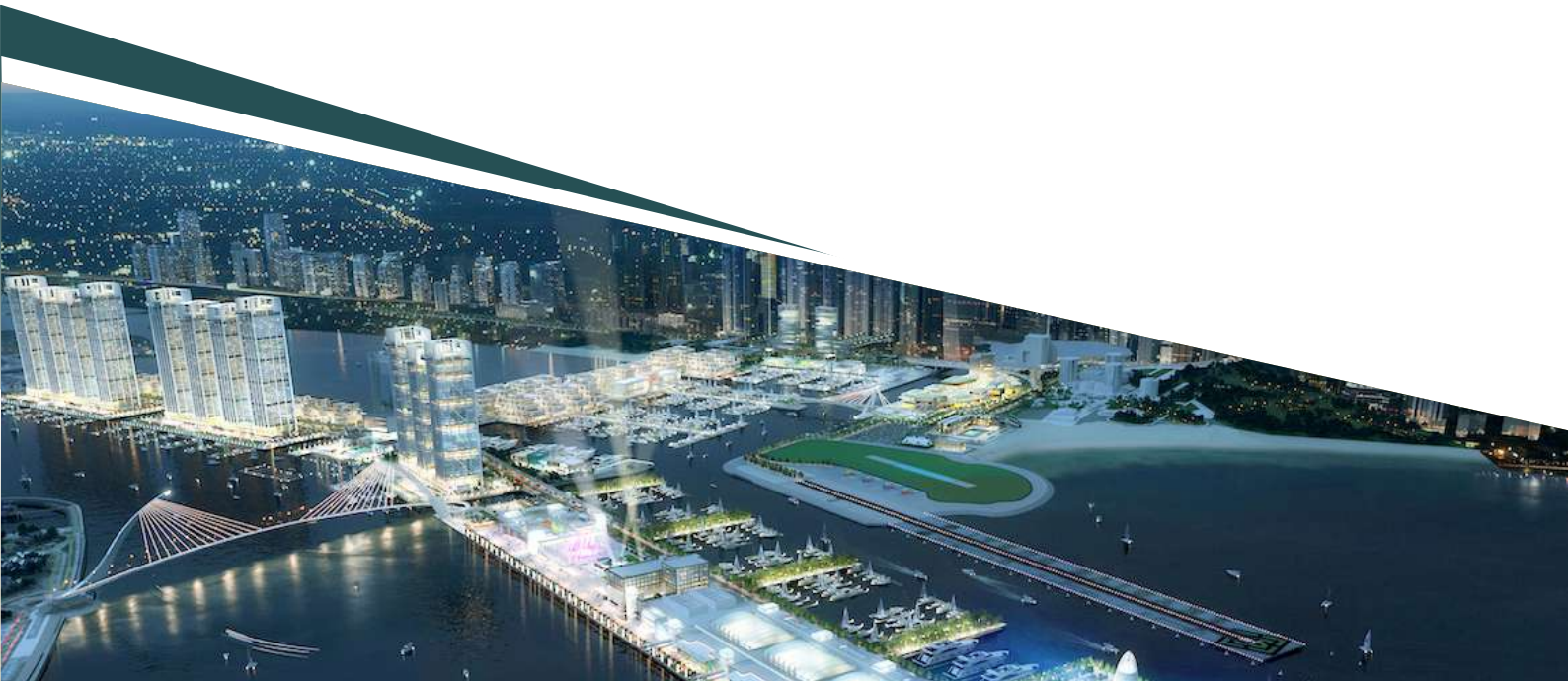


Table 4-1: EIA - Modelling Study Requirements for Coastal/Marine Projects

Description of Projects	Scope of Works of Project	Hydrodynamics	Flushing / Tracer Dispersion	Initial Dilution Analysis
Development of an artificial island(s) or peninsulas	Land reclamation, beaches, rock works, and quay walls	✓	✓	×
Development of a new harbour(s) / terminal(s) / marina or modification of an existing harbour / marina in coastal zone	Rock works, dredging / excavation, quay walls & floating pontoons, reclamation	✓	✓	×
Development of artificial canals connected to the Creek/sea/ existing waterways	Excavation / dredging, retaining walls	✓	✓	×
Coastal stabilisation	Revetment, groynes, detached breakwaters, beach nourishment, dredging etc.	✓ (in case of any nearby existing harbours, outfalls, canal / creek entrance, sensitive marine habitat, etc.)	✓ (in case of any nearby existing harbours, outfalls, canal / creek entrance, etc.)	×
Effluent discharging outfalls	Open channel outfall: Thermal discharge, brine, hypersaline water, etc.	✓	✓ (if discharged in semi-enclosed waterbodies)	✓
	Pipe outfalls: Thermal discharge, brine, hypersaline water, etc.	✓	✓ (if discharged in semi-enclosed waterbodies)	✓
	Treated sewage effluent	✓	✓	✓
	Storm water / groundwater (rate of discharge > 2.0 cu.m / s)	✓	✓ (if discharged in semi-enclosed waterbodies)	✓
Development of promenade, new marina or modifications of existing marina in Creek / waterways	Floating pontoons with mooring systems, piles supporting platforms, quay walls, revetment			
Temporary / permanent causeway(s)	Rock works, reclamation	✓	✓	×
Bridge(s) over marine water	Bridges/piers	✓	×	×
Offshore dredging and/or disposal	Sand dredging from borrow areas, disposal of dredged material	✓	×	×

NOTE: The CES reserves the right to include / exclude any of the above studies on case-by-case basis.

Plume Dispersion	Water Quality	Wave Transformation	Wave Disturbance	Shoreline Evolution	Sediment Transport / Morphology	Oil Spill
✓	×	✓	✓	✓	×	×
✓	×	✓	✓	✓	✓ (for approach channel and turning basin)	✓ (for terminal with re-fuel facility)
×	✓ (depending on proximity to sensitive receptors, e.g. Desalination intakes, Ras Al Khor Sanctuary & TSE outfall)	✓ (if connected to the sea)	×	✓ (if connected to the sea)	×	×
✓ (in case of dredging and/or nourishment)	×	✓	×	✓	×	×
✓	✓ (for water quality parameters may be impacted)	✓	×	✓	×	×
✓	✓ (for water quality parameters may be impacted)	×	×	×	×	×
×	✓	×	×	×	×	×
✓	✓ (if located close to sensitive receptors like intakes, fish farms, etc.)	×	×	×	×	×
Numerical modelling studies are not required if no reclamation / encroachments into the waterways.						
✓	×	✓	×	✓	×	×
×	×	×	×	×	×	×
✓	×	×	×	×	✓	×

Table 4-2: Model Information Required in the Coastal Modelling Study Report

Type of Model	Processes to be Modelled	Model Configurations
Hydrodynamics	The hydrodynamic model is applied for simulating surface elevation and currents, as well as temperature and salinity. It provides the flow and dispersion data for other models such as plume dispersion, sediment transport, oil spill and water quality. It often serves as a core in the coastal modelling for EIA. The driving forces of the coastal hydrodynamics that should be included in the modelling are: □ **Tides**: As a minimum, hydrodynamic modelling should be conducted for a spring-neap tidal cycle; □ **Meteorological Forces**: Wind and atmospheric pressure should be included in the model, if it is deemed important, such as for plume dispersion studies where the discharge pollutant(s) could be drifted to receptors (such as intakes) faster than in calm weather. The Study Report should state whether typical or extreme conditions will be studied, how the seasonal variation will be investigated; □ **Density**: In the vicinities of existing and future outfalls, that discharge effluent with a density significantly different from the ambient seawater, baroclinic effect should be included. For the Projects that could potentially impact the water quality in the Dubai Creek, discharges from sewage treatment plants and storm water outfalls and precipitation, that influence the salinity, should be included. The Study Report should state whether and how the temperature and salinity will be modelled and clearly explain which data (available or new) to support the modelling study; □ **Waves**: The Study Report shall justify if the wave effect on hydrodynamics should be considered, such as radiation stress on near-shore currents.	□ **Dimensionality**: The model dimensionality should be determined with the knowledge of dynamic processes in the model area. For Projects where water density variation is significant, such as in the Creek and in the vicinities of outfalls, 3D model should be applied unless the Consultant justifies it is appropriate not to; □ **Model Domain**: The model domain should be large enough so that the open boundaries of the model will have negligible effects on the model results. As a rule of thumb, the open boundaries shall be at least one tidal excursion away from the Project site and areas of interest so that the water in the area of interest will not leave the model domain in a single tidal cycle. Consideration should also be given to data availability for specifying the open boundary input and for calibrating and validating the model; □ **Model Resolution**: The model resolution should be high enough to resolve shoreline and development shapes, bathymetric features such as rapid change in bed level, dredged channel(s), and anticipated dimension and gradient of the intended modelling processes such as eddies and plume dimension. For water channels, at least 3 elements/grids should be planned across the channel. This rule of thumb also applies to dredged channel(s). The principle is that the cross sections and its temporal variation should be reproduced by the model. For 3D model, the number of layers should be sufficient to resolve the stratification. As a minimum, 5 layers should be defined;
Flushing / Tracer Dispersion	Flushing modelling should be conducted, if an (semi-) enclosed area(s) will be formed by the development or the development may have potential impact on an existing (semi-) enclosed area(s), to simulate water exchange between the internal basin(s) and its surrounding water body (i.e. flushing) for assessing the potential for adverse negative impacts on the water retention time within a semi enclosed area and obtain an indication of potential for water quality deterioration. Classically flushing study is conducted by simulating conservative tracer initially distributed in the (semi-) enclosed basin. Other methods may also be applied with adequate technical justification. The flushing criteria/guidelines adopted for the assessment should be stated in the Study Report with references.	□ **Area(s) to Be Assessed**: The area to be modelled should be defined with clear rationality. In principle, the water outside that area to be assessed should be relatively more open and is less susceptible to water quality changes. □ **Model Resolution**: The model resolution should be fine enough that it will not influence the results, especially in the area where direct water exchange occurs, such as within one tidal excursion of the boundary of the inner and outer basin. The tracer plume should be resolved with sufficient spatial resolution. □ **Model Warm-up:** The hydrodynamic model should be warmed up before the flushing simulation starts. □ **Starting Time:** The flushing simulation starting time should be chosen to be representative and/or conservative for the assessment. Sensitivity tests should be conducted for assurance of appropriate simulation starting time. □ **Simulating Time:** The flushing simulation should be performed to a time that 90% of the initially distributed tracer is flushed out of the basin.
Initial Dilution Analysis / Near-field Modelling	For outfalls and offshore disposal, initial dilution analysis / near-field modelling should be conducted for compliance assessment with regulatory and/or best practice guidelines, and for characterising the mixing in the near-field where the initial jet characteristics of momentum flux, buoyancy flux, and outfall geometry influence the jet trajectory and mixing.	□ **Outfall Configurations / Placement Methodology**: The design basis of the chosen outfall scheme/disposal methodology should be described; □ **Effluent Characters:** The flow / disposal rates and water quality properties of the effluent for modelling should be representative for the range of discharge with reference to Regulatory Standard (Local Order No. 61 of 1991) & Appendix 1 and Appendix 2 of Annex 4 Part 2; □ **Ambient Conditions**: receiving water conditions should be representative, including the range of water levels, ambient currents, depth, density and stratification, and their seasonal variation.
Plume Dispersion / Far-field Modelling	Plume dispersion / far-field modelling is required where there are sensitive receptors in the vicinity of the Project site, and it should be conducted for delineating the zones of influence of discharges (outfalls, dredging and placement/disposal, etc.). Consideration should be given to non-conservative parameters, including: □ **Bacteria Decay**: the parameters should be representative to the site condition; □ **Heat Exchange**: with air for thermal discharges if it is deemed significant to the assessment; □ **Settling**: settling should be included for suspended sediment and substances adhered to suspended sediment.	□ **Advection-Dispersion Model:** The model resolution within the zone of influence should be sufficient to resolve the plumes; □ **Particle Model:** The number of particles should be sufficient for statistical accuracy. □ **Parameters**: The parameters should be site specific, such as the bacteria decay rate and sediment settling velocity. □ **Sourcing**: the source strength adopted in the modelling should be rationalised based on the operational conditions.

Type of Model	Processes to be Modelled	Model Configurations
Water Quality	WQ modelling should be conducted for assessing the compliance with Local Order No. 61 of 1991 & Appendix 1 and Appendix 2 of Annex 4 Part 2. The model should also be able to assess, where required, potential adverse negative impact on water intakes for uses that may affect human health and/or the ecosystem at large. The WQ model should include: □ **Physical, Chemical and Ecological parameters and their interactive processes**: the model should be able to simulate major processes that influence the concerned water quality, such as introducing nutrients or altering the site condition or configuration encouraging those processes potentially leading to algal blooms. The concentrations of the model input parameters should be representative for the site specific conditions/ambient concentrations; □ **External Factors**: the model should include external factors such as solar radiation, expected parameter concentrations of an effluent discharge loadings. Seasonal differences should also need to be reflected	In Dubai coastal waters, particular concerns are: □ **Deficiency of Dissolved Oxygen**: especially in Dubai Creek; □ **Algal Bloom**: in Dubai coastal water and Dubai Creek; □ **Elevated Nutrient Concentrations:** Dubai Creek; □ **Toxic Substances**: to the desalination plant intakes. The model should be representative of the existing water quality condition, discharges and intakes, typical and seasonal variation of discharges and ambient conditions. The model should be calibrated and validated for the existing/historical conditions, and allow for seasonality differences in certain water quality parameters.
Wave Climate / Wave Transformation	For EIA, the main purpose of wave modelling is to assess the changes in wave conditions due to the Project, which may have consequences in shoreline stability, beach sand quality and siltation in the vicinities of the Project site. The wave model should be able to simulate the growth, decay and transformation of wind-generated waves and swell in offshore and coastal areas.	□ **Model Domain and Spatial Resolution**: The model domain should be planned with consideration of availability of wave data. The model should be configured to represent bathymetry, shoreline and structures; □ **Spectral Method**: Choice of full spectral or directionally decoupled should be justified. Directional and frequency resolutions should be determined with knowledge of the site condition; □ **Stationary or Instationary**: choose according to the importance of growth, decay and transformation of wind-generated waves □ **Forces**: Main forces that influence the waves in the area of interest, such as offshore waves, winds and water levels, should be identified and considered in the modelling. □ **Climate Change:** In case needed, the impact of climate change, in terms of sea level rise and/or storm intensification, should be assessed.
Boussinesq Wave Modelling / Wave Disturbance	Where wave diffraction is important, Boussinesq type of model should be applied	□ **Model Domain and Grid Orientation**: should be planned with consideration of incoming waves to be modelled; □ **Model Resolution**: should be specified with consideration of wave characteristics to be modeled and wave transformation processes included in the simulation; □ **Model Setup**: The model setup planner should be presented for MIKE BW application. Rationality and summary of model setup should be presented for other software. □ **Structures**: The hydrodynamic characteristics of coastal structures and the parameters representing them should be documented. □ **Model Warm-up and Simulation Time**: The model should be warm-up to minimise/eliminate the influence of initial condition on results that to be used for analysis. The time period of useful simulation should be sufficiently long that stable statistical results could be obtained.
Longshore and cross-shore sediment transport modelling	For a Project that interrupts littoral transport and/or has potential impact on shoreline stability, littoral transport and/or shoreline evolution modelling should be conducted to assess: □ Littoral drift, sediment budget, and changes due to the Project; □ Equilibrium shoreline orientation and changes due to the Project; □ Shoreline evolution: prediction of shoreline accretion/erosion. Assessment of risk to structures, navigation and water exchange, and tidal inland water bodies protected by narrow beach or spit; □ Beach profile morphology in response to storm events and the risk of shoreline protection structures.	□ **Shore Profiles**: The shore profiles should be representative for the site or intended design. The number of the profiles should be sufficient to represent the variation of shore profiles and sediment characteristics in the Project area. The cross-shore profile should be perpendicular to the shore and or the depth contours. The profiles should have an extension so that the wave-driven longshore currents and sediment transport are insignificant in the first grid point; □ **Wave Climate Statistics and Storm Waves**: The wave climate input should be site specific and include seasonal variation. The number of wave climate locations should be sufficient to represent the spatial variation of the wave conditions within the Project site. For storm process studies, rationality of storm event selection (including storm duration) should be justified. □ **Water Levels**: Water level variation should be considered in the modelling in case of necessary. The importance of Sea Level Rise should be evaluated; □ **Currents**: The importance of tidal currents and regional circulation should be evaluated for justifying if they should be included in the sediment transport modelling; □ **Sediment Characteristics**: Site specific or design specified sediment parameters should be used in the model.

Type of Model	Processes to be Modelled	Model Configurations
Sediment Transport / Morpholology	For dredging and disposal Projects that alter the bathymetry, and for Projects that may change hydrodynamic regime in sensitive areas, and for assessing the stability of material placed on sea bed, sediment transport / morphological modelling should be conducted to assess the siltation/erosion and/or morphological changes. The Study Report should justify the following: □ Cohesive or non-cohesive sediment; □ Currents and/or waves driven processes; □ Feedback of morphological/bathymetric changes to sediment transport; □ 1D cross-sectional or 2D simulations.	□ **Model Resolution**: The resolution of sediment transport model and the hydrodynamic and/or wave models, should be sufficiently fine to represent the dynamic and morphological gradients; □ **Sediment Characteristics**: Site-specific sediment properties should be used in the model. The availability and/or erodibility of sediment on the sea bed should be considered in the model; □ **Bed Slope Effects**: The calculation of sediment transport should include the slope effect where it is significant. □ **Wave Effects**: The importance of waves to the sediment transport processes should be evaluated for determining if it should be included in the modelling or not. □ **Storm Events**: The study should assess if the sediment transport processes are dominated by storm events or by the climate conditions. □ **Parameters**: key model parameters should be presented with backup references.
Oil Spill	Oil spill risk assessment should be conducted for Projects with oil/ refuel terminal(s) and/or risk of oil spill. The oil spill model should consider oil slick moves due to the inherent spreading of the oil, currents, winds and waves and its fates, including natural dispersion, emulsification and weathering.	□ **Probability**: The study should analyse the probability of spill, possible rate/duration/volume of release(s); □ **Deterministic or Stochastic**: The study should rationalise the modelling methodology. In principal, a stochastic modelling is required for EIA. □ **Oil properties**: Oil properties adopted for the modelling should be documented and backed up with information/references. □ **Modelling Scenarios**: The modelling scenarios should reflect the types of incidents and site conditions and its seasonal variations. □ **Outputs**: The impact to both aquatic environment and to the shoreline should be assessed.

1.3 Data Needs and Acquisition

Data required for the modelling studies must be clearly defined in the modelling study report that will be appended to the EIAR as a Technical Annex. In general, the data input to the coastal model studies shall include, but not be limited to, the following:

- Data for model setup: bathymetry/topography, shoreline, development and construction plans, sediment characteristics.
- Data driving the models: boundary inputs, meteorological forces (wind, atmospheric pressure, air temperature, radiation), discharges, and initial conditions.
- Data for model calibration and validation: Water level, current speed and direction, water temperature and salinity, dye dispersion , measured water quality parameters, measured waves, shoreline and morphological data, etc.

The sources, temporal and spatial coverage of the available data shall be documented. The appropriateness of available data for the modelling study and potential influence to the modelling study quality shall be assessed and this shall be clearly reported in the main modelling study report that will be appended to the EIAR as well as in the relevant section within EIAR.

Data gap(s) shall be filled in before carrying out the model simulation study. Not complying with this requirement may affect the EIA conclusions and jeopardise the EC issuance.

1.4 Model Calibration and Validation

The approach to undertaking the model calibration and validation including the standards/criteria to be followed and data to be used shall be clearly documented in the report of the modelling study.

Calibration and validation processes are essential for the model development. Both procedures make use of measured field data to compare with the model results. This is required to demonstrate confidence in the model performance so that robust and reliable conclusions can be drawn from the results.

Calibration is to be conducted during the development of the model, with the ultimate goal of producing a model, which provides a realistic representation of the coastal processes within the study area. Model configuration, parameters and forcing data could be adjusted in reasonable ranges. The adjustment and rationale shall be clearly explained and justified and reported in the main modelling study report. Sensitivity analysis shall be performed to investigate the effect on the key output parameters resulting from variation of input data and model parameters.

Once the model calibration is successful, model validation shall be carried out, using the model setup and parameters to produce the best model 'fit' during calibration, against an independent data.

The calibration and validation results could be assessed in two ways:

1. Visual comparison of the model output against measured data: the shape, regression trend, range and limits of model output and measured data by inspecting time series plots and/or scatter diagram.
2. Statistical compliance analysis between the measured data and the model results, to determine the percentage that the model fits the measured data within defined limits, e.g. 90% of the model predictions are within 0.1 units or 10% of the observed value and or other statistical measures (e.g. bias, root mean square error, correlation, etc.).

As a best practice, both methods should be used. A single method may not provide a full assessment of model performance.

The hydrodynamic model usually serves as the core of the coastal modelling studies and for this reason it shall be calibrated and validated against both water levels and currents, as well as temperature and salinity in case of a baroclinic model. For 3D hydrodynamic model, calibration and validation against measured currents shall be carried out across the water column, i.e., at surface, mid-depth and near-seabed. For tidal model(s), the non-tidal components shall be removed from the measurement for comparison with the simulated tides.

For hydrodynamic model calibration and validation, DM recommends the guidelines set out in the Foundation for Water Research (FWR) document 'A Framework for Marine and Estuarine Model Specification in the UK' (FWR, 1993) that recommends quantitative model performance criteria as summarised Table 4-3.

Table 4-3: Guidelines of Hydrodynamic Model Performance Criteria

Parameter	Tolerance Applied			
	Coastal		Estuarine/Creek	
	Absolute	Relative	Absolute	Relative
Water Level	+/- 0.1m	10% of Spring tidal ranges 15% of Neap tidal ranges	+/- 0.1m at mouth +/- 0.3m at head	15% of Spring tidal ranges 20% of Neap tidal ranges
Current Speed	+/- 0.1m/s	+/- 10-20% of observed speed	+/- 0.2m/s	+/- 10-20% of observed speed
Current Direction	+/- 20 degrees	N/A	+/- 20 degrees	N/A
High Water Phase	+/- 15mins	N/A	+/- 15mins at mouth +/- 25mins at head	N/A
Temperature	+/- 0.5 deg. C	N/A	+/- 0.5 deg. C	N/A
Salinity	+/- 1 psu	N/A	+/- 1 psu at mouth +/- 5 psu or more in the region of most rapid change	N/A

These criteria might be too testing for all regions of the modelled area; a less stringent expectation might be that these conditions should be satisfied for 90% of location/time combination evaluated.

The Consultant may use other methods to evaluate the model performance with clear explanations. The alternative selected methods must be clearly explained and justified.

The advection-dispersion modelling, such as flushing and plume modelling, shall be calibrated/validated with dye dispersion data if available and/or measurements (such as salinity, temperature and/or water quality parameters) of the present/historical conditions. Special care should be given to rationalise the dispersion coefficients and control of artificial numerical dispersion related to numerical schemes and model resolutions.

The water quality modelling shall be calibrated/validated with monitoring data. The seasonal variation shall be evaluated.

The wave transformation model shall be calibrated/validated with the past (hindcasting/storm periods) as well as present condition of measured wave data.

The longshore and cross-shore sediment transport modelling shall be calibrated/validated with historical shoreline evolution data that could be derived from the historical surveys/observations and/or satellite images.

Sediment transport/morphological modelling shall be calibrated/validated with historical survey data.

1.5 Model Application

The modelling study report shall clearly explain the considered modelling scenarios, which need to be determined for the intended purpose, e.g. “typical” or “worst case” conditions, and the range of conditions to be modelled. As a minimum, baseline and further conditions shall be modelled. Where relevant and in accordance with the need to consider appropriate alternative designs during a quantitative EIA study, DM reserves the right to ask for alternative options for a proposed development to also be modelled and evaluated.

Appraisal shall be conducted to determine if climate change should be considered in the modelling; this shall be clearly explained in the simulation model report that will be appended to the EIAR.

1.6 Modelling Results and Deliverables

The modelling study shall be carried out to achieve the EIA objectives. The contents of the coastal modelling study report shall comply with these guidelines, including, but not limited, to the following elements, which shall be described in a comprehensive manner:

- Description of the coastal modelling scope of work
- Objective of the coastal modelling study(ies)
- Rationale for selection of the model(s) (including but not limited to a discussion of the advantages and limitations of the adopted model(s) and a comparison with other considered but not selected models)
- Description of the available data for supporting the modelling study
- Model setup and configuration
- Calibration and validation processes and demonstration that the developed model(s) fit the intended purpose
- Modelling Scenarios and their rationality
- All relevant model output for the production runs with adequate interpretation and assessment of the impacts
- Clear conclusions and recommendations, and limitations of the modelling studies
- All input and output files for the models shall be provided in digital format as an appendix to the report to ensure that the modelling excise is auditable by DM-ED
- Presentations in other format, such as animations, shall be submitted to assist DM-ED’s review. DM-ED reserves the right to ask for the model setup and output in digital format.

Appendix 1 - Marine Water Quality Objectives

S. No.	Parameter		Units	Permissible Limits		
				Sea Water	Creeks & Waterways	Ports
Physical & Chemical Parameters						
1	Ammonium	NH_4 N	mg/l	0.1	0.07	0.35
2	Biological Oxygen Demand	BOD_5	mg/l	20	10	20
3	Residual Chlorine	R.C.	mg/l	0.01	0.01	0.01
4	Cyanide	CN	mg/l	0.01	0.05	0.01
5	Dissolved Oxygen 2-m below the surface	DO	mg/l	Greater than 5 or 90% saturation degree	Greater than 5 or 90% saturation degree	Greater than 4 or 90% saturation degree
6	Dissolved Oxygen at the bottom	DO	mg/l	Greater than 4	Greater than 4	Greater than 3
7	Nitrate Nitrogen	NO_3 N	mg/l	0.5	0.5	0.75
8	Nitrite	NO_2	mg/l	0.3	0.3	0.5
9	Oil and Grease		mg/l	0.01	0.01	1
10	pH		-	1 unit change from ambient	1 unit change from ambient	1 unit change from ambient
11	Phenols		mg/l	0.01	0.01	0.03
12	Phosphate Phosphorous	PO_4 P	mg/l	0.05	0.05	0.1
13	Poly Aromatic Hydrocarbons	PAHs	mg/l	0.001	0.001	0.01
14	Surface Plankton		mg/l	0.02	0.02	0.025
15	Temperature		Degrees Celsius	2 degrees Celsius change from ambient	2 degrees Celsius change from ambient	2 degrees Celsius change from ambient
16	Total Nitrogen		mg/l	2	2	2.5
17	Total Suspended Solids	TSS	mg/l	Average 10 and maximum 25	Average 10 and maximum 25	Average 15 and maximum 30
18	Tributyltin	TBT	µg/l	0.001	0.001	0.01
19	Surfactants		µg/l	20	20	20
Metals						
20	Aluminum	Al	mg/l	0.15	0.15	0.2
21	Arsenic	As	mg/l	0.01	0.01	0.01
22	Cadmium	Cd	mg/l	0.003	0.003	0.003
23	Chromium 6	Cr	mg/l	0.01	0.01	0.01
24	Copper	Cu	mg/l	0.005	0.005	0.005
25	Iron Total	Fe	mg/l	0.15	0.15	0.2
26	Mercury	Hg	µg/l	0.05	0.05	0.5
27	Zinc	Zn	mg/l	0.02	0.02	0.05
Biological Pollutants						
28	Fecal Coliform		CFU/ 100 ml	100 /100 ml	100 /100 ml	200 /100 ml
29	E. coli		CFU/ 100 ml	100 /100 ml	100 /100 ml	200 /100 ml

Appendix 2 - Effluent Discharge Limits to Marine Environment at the Point of Discharge (Before Mixing with Receiving Waters)

S. No.	Parameter		Units	Permissible Limits
Physical & Chemical Parameters				
1	Ammonium	NH_4 N	mg/l	2
2	Biological Oxygen Demand	BOD_5	mg/l	25
3	Chemical Oxygen Demand	COD	mg/l	100
4	Residual Chlorine	Cl^-	mg/l	1
5	Cyanide	CN^-	mg/l	0.05
6	Floating Particles		mg/l	Non Present
7	Fluorides	F^-	mg/l	20
8	Oil &Grease		mg/l	5
9	Nitrate Nitrogen	NO_3 N	mg/l	15
10	Petroleum Hydrocarbons		mg/l	less than 5
11	pH		-	6-9
12	Phenol		mg/l	0.1
13	Phosphate Phosphorous	PO_4 P	mg/l	0.1
14	Sulfide	S^{-2}	mg/l	0.1
15	Total Suspended Solids	TSS	mg/l	15
16	Total Nitrogen	TN	mg/l	10
17	Total Organic Carbon	TOC	mg/l	40
18	Total Phosphorous	TP	mg/l	2
19	Turbidity		NTU	75
20	Total Dissolved Solids	TDS	mg/l	1500
Metals				
21	Aluminum	Al	mg/l	20
22	Antimony	Sb	mg/l	0.1
23	Arsenic	As	mg/l	0.05
24	Barium	Ba	mg/l	2
25	Beryllium	Be	mg/l	0.05
26	Cadmium	Cd	mg/l	0.05
27	Chromium 6	Cr^{+6}	mg/l	0.1
28	Cobalt	Co	mg/l	0.2
29	Copper	Cu	mg/l	0.5
30	Iron	Fe	mg/l	2
31	Lead	Pb	mg/l	0.1
32	Manganese	Mn	mg/l	0.2
33	Mercury	Hg	mg/l	0.001
34	Nickel	Ni	mg/l	0.1
35	Selenium	Se	mg/l	0.02
36	Silver	Ag	mg/l	0.005
37	Zinc	Zn	mg/l	0.1
38	Pesticide (Herbicides Insecticides Biocides)		µg/l	Non Present
39	PCBs (Chlorinated Organic Compounds)			
40	Poly Aromatic Hydrocarbons	PAHs		
41	Solvents			
42	Tributyltin and its derivatives	TBT		
43	Surfactants			
Biological Pollutants				
44	Fecal Coliform		Cells /100 ml	1000
45	Coliform Count		MPN/100 ml	1000
46	Fecal Streptcocci		MPN/100 ml	100
47	Entero Viruses		PFU/10 L	Non Present
48	Salmonella		MPN/1 L	Non Present
49	Tapeworm Eggs		CFU/100 ml	Non Present

Annex 4

Part 3

Guidance on Hydrogeological Study and Requirements for Landfills

Guidance on Hydrogeological Study and Requirements for Landfills

This Annex 4, Part 3 provides the detailed requirements for conducting hydrogeological study as part of the EIA for Projects with potential effect on soil and groundwater environment, and the requirements specifically for landfill Projects.

1. Requirements for Groundwater and Soil Environment

This Section describes the principal considerations which should be addressed during the preparation of the hydrogeological study as part of an EIAR, whenever required, within the context of the local hydrogeological environment. The study should be based on real time data collected from the area of interest sufficiently covering the Project boundary and preferably, outside Project boundary. The baseline hydrogeological study should include the following:

a. General site description
b. Soil investigation
c. Geotechnical and geophysical investigation
d. Depth to water level and flow
e. Dewatering related issues
f. Conceptual site modelling
g. Possibility of groundwater pollution
h. Groundwater trend (rise) current, during construction & post Project
i. Proximity with groundwater protected basin
j. Sea water intrusion
k. Handling hazardous materials

In addition to the above, a detailed hydrogeological study should include:

l. Groundwater flow modelling (if applicable)
m. Use of modelling results in impact assessment, mitigation plan, and environmental enhancement (solutions).

1.1 General Site Description

Land confirmation with exact extent of the area in Dubai Local Transverse Mercator (DLTM) coordinates should be provided. Maps should be reviewed for the geological and hydrogeological conditions that exist for regional, as well as site specific Project boundary. The recommended minimum distance from two (2) to five (5) kilometers (km) should be reviewed in the context of the hydrogeological environment, as well as the scale of Project and beyond the Project boundaries to reflect the sensitivity of the subsurface. Maps to a scale of 1:50,000 are adequate to present the regional geological and hydrogeological information.

A site visit and walk over survey should be made. Available literature survey should be reviewed for semi regional and site specific location. Location of important sites including protected areas, National Heritage or historical areas or other sites which can be of national interest, dumped material or any other unusual features should be reported.

Topographic base mapping and aerial photography, historical change within and around the Project site should be reported. Drainage pattern should be established using topographic elevations in relation to rainfall-runoff scenario and other relevant conditions. An appropriate resolution map and scale should be presented to describe the same.

1.2 Geology and Soil

Available regional geological and soil maps should be considered in the study which should be duly correlated with the actual field investigations or surveys. This Section should contain a description of the outcrops and bedrock materials including thickness and geological structures like wadi channels, palaeo channel, cavities, joints, faults, folds, etc. An overview of the regional stratigraphy, including thicknesses of the formations, and unit name, is expected. This description should also include an assessment of soils and infiltration properties inferred from grain size analyses from on-site test pits or boreholes, where completed. The report should also contain a minimum of two cross-sections (along perpendicular lines) to support discussions on geology, stratigraphy and flow patterns. Ideally, the cross-sections will be oriented along the groundwater flow path and across the groundwater flow path. In some cases, the cross-sections will be constructed based on the available data (regional sections along roads, etc.). Borehole logs should be shown on the cross sections with an interpretation of geologic units encountered. For shallow construction, test pit data may be correlated, where possible.

Figures to be prepared include;

- Surficial and bedrock geology;
- Soils; and
- Cross sections with plan.

To establish representative soil conditions, sampling should be carried out sufficiently representing changes within the area of interest. Project should quantify the amount of soil present at the site, its quality and possible use. A walk over soil assessment is needed to define soil sampling sites. Once the locations are defined, samples should be collected following US EPA standard (USEPA 2014). The sampling results should be analysed to establish soil quality and its usability. In case soil is required within the Project site, the report should mention the required quantity and quality for the intended use. Possible soil remediation measures can be suggested for approvals which lead to soil quality improvement for the Project specific use. Details of required soil tests (i.e. parameters) are provided in Appendix 3 of this Annex. Characterisation of soil and sub-soils shall be carried out in accordance with a recognised standard or nomenclature system (e.g. BS5930:1990) for sub-soils or Environmental Protection Agency (EPA) Code of Practice for Environmental Risk Assessment for Unregulated Waste Disposal sites, where relevant.

1.3 Geotechnical & Geophysical Investigations

On-site investigations comprised of excavation of test pits or boreholes are advanced to determine surficial geologic and hydrogeologic conditions. While no minimum number of test pits is stipulated, the Environmental Consultant is expected to construct as many test pits as required by the geo-technical regulations and to use professional judgment to determine the number and location of test pits required to adequately assess the soils and overburden materials present on the site.

Boreholes may be constructed in place of test pits and may be finished as monitoring wells. Like test pits, boreholes should be installed at strategic locations across the site so that potential impacts to sensitive groundwater dependent features can be adequately assessed.

Description of test pits or boreholes should be correlated with available relevant maps, logs should be used to prepare hydrogeological cross section running across the Project area, and related information should be provided as appendix.

Wherever required, an appropriate geophysical technique should be employed to investigate subsurface conditions for geological features, sub-surface materials and groundwater conditions.

1.4 Monitoring Wells

Groundwater monitoring wells (piezometers) should be constructed to a depth of maximum influence (of Project) or excavation or dewatering depth (whichever is greater) of the Project. In case, overlying an important aquifer, full aquifer depth should be tapped. Test pits or boreholes should be advanced to a depth to correspond with the engineering plans associated with planned Project. Test pit or borehole locations should be provided

on a figure and all data should be provided in an appendix. Each test pit or borehole record should show the date of excavation and data collection. Ground elevation (in meters above sea level or m asl) must be provided for each pit. Piezometers should also be maintained and preserved for the monitoring purposes during Project implementation.

The water level data should be utilised to address key issues like dewatering temporal and spatial change in water level, quality and quantitative status (i.e. recharge rate).

The location of monitoring wells should also consider up-stream and downstream approach of proposed Project area.

Well drilling permit should be obtained from the Natural Resources Conservation Section (NRCS) to drill and install groundwater well.

All the wells should be properly protected from any surface run-off. The well head protection should be installed as per the DM standard layout (refer to Appendix 4 of this Annex). The well head protection consists of concrete foundation, and the top metal cover box. The metal cover box can be sealed by four (4) screws at the corners, which can be removed easily at the time of well repairing. The flow-meter should be installed as per the design outlay.

Groundwater wells which are no longer in use or have left half way during drilling exercise should be abandoned to prevent any kind of contamination from these wells. The proper abandoning of such wells is crucial as they may act as a pathway for the groundwater contamination (refer to Appendix 5 of this Annex).

1.5 Water Quality

A description of groundwater quality and surface water, wherever applicable, should be provided to establish a baseline for the assessment of potential future impacts. The list of groundwater quality parameters is provided in Appendix 2 of this Annex.

1.6 Water Balance

This Section should present the details of various types of water use within the Project including pre- and post- Project. A precise groundwater balance should be presented using applicable standard techniques of groundwater budgeting. Impact of Project activities (e.g. dewatering, pumping, infiltrations, etc.) and future water use (e.g. recreational, parks, ponds, irrigated land, open land, etc.) on hydrogeological environment should be discussed.

1.7 Conceptual Groundwater Model

Conceptual Site Model (CSM) helps determine the types of hydrogeological environment present at the Project location. The CSM should provide all in and out components in terms of source, pathway, receptor and linkages. The description of the CSM (with appropriate schematic 3D-diagram) should include layered geological and hydrogeological information presented in the maps and cross sections, and its responses (susceptibility) to identified features and potential activities associated with proposed Project (i.e. during or post development).

1.8 Groundwater Protected Basins

Construction Projects or other anthropogenic activities like farming, recreational, or any other intrusive activity in close proximity with groundwater protected area would automatically qualify for a detailed hydrogeological and groundwater modelling study. The demarcation for groundwater resources protected areas in the Emirate of Dubai is presented in Appendix 1 of this Annex. The hydrogeological and groundwater modelling study (discussed in Section 1.9 of this Annex) should analyse possible impacts of the aforementioned activities on groundwater resources.

1.9 Groundwater Flow and Solute Transport Modelling Study

Modelling studies are required to see the overall complex environment behavior with applied threats or stresses. This specific requirement will be based upon Project components like geographical extents, intrusive character,

distance from groundwater protected basin, impact on groundwater environment, etc. The groundwater flow modelling should consist of the following:

- Selection of model extents and grids;
- Integration of all inputs;
- Boundary conditions;
- Conceptualisation of 3D hydrogeological environment;
- Aquifer parameters;
- Groundwater balance components;
- Selection of appropriate chemical parameters for solute transport modelling;
- Aquifer parameters and stress conditions;
- Calibrations (steady and transient states);
- Validation; and
- Relevant stress based futuristic scenarios.

The outcomes of the modelling study should be used in the impact assessment and identification of mitigation and environmental enhancement measures.

The standard content or structure of hydrogeological study for an EIAR, if required, is provided in Appendix 6 of this Annex.

2. Requirements for Landfill Sites

This section provides detailed guidance on the required construction design plan for Landfill Projects. This plan should be submitted to the DM-ED for necessary review and approval.

2.1 Site selection

Ideally, areas with least susceptibility to groundwater contamination should be selected for landfill site. The criteria for the identification of potential suitable sites include, but not limited to, the following:

i. City masterplan & developmental Projects;
ii. Hydrogeological and geological conditions;
iii. Geotechnical aspects;
iv. Meteorological aspects;
v. Land use and availability of land;
vi. Prevailing wind pattern; and
vii. Distance to roads, sewage systems, electricity.

After identification of sites, which generally fulfill the requirements, an investigation of each potential site should be carried out consisting of the following:

i. Investigation of hydrogeological and geological conditions
ii. Vulnerability model
iii. Environmental impact assessment study
iv. Environment management & monitoring Plan

As a general rule, the following should be considered:

(a) Landfill site should not fall within (or 1 km towards downstream) any groundwater protected area.

(b) Upstream of groundwater protected basin (Item a) should be strictly avoided.

(c) Maintain a safe depth to water level (>25-30 m) below ground level.

2.2 Landfill Development Plan

The site layout plan should show clearly the location of the area to be selected for landfill. Regional and site-specific, high-resolution Digital Elevation Model (DEM) should be prepared showing the proposed landfill. The site drawing should include all the landfill components with proper size and elevation with mean sea level reference.

Contour intervals vary depending on ground elevation. For small features, 0.25-m contour interval can be used while sites with high topographical relief may have contours at intervals of 0.5-m or 1.0-m.

2.3 Site Infrastructure

The following principal infrastructure elements should be discussed in detail:

- Access and traffic control;
- Site accommodation and compounds;
- Weighbridges;
- Wheel cleaners;
- Site services;
- Civic waste facilities;
- Security; and
- Leakage detection and alarm system.

2.4 Leachate Management and Treatment

Leachate management system should consider the following objectives:

- Reduce the potential for seepage out of the landfill through the sides or the base either by exploiting weaknesses in the liner or by flow through its matrix;
- Prevent liquid levels rising to such an extent that they can spill over and cause uncontrolled pollution to ditches, drains, watercourses, etc.;
- Influence the processes leading to the formation of landfill gas, chemical and biological stabilization of the landfill;
- Minimise the interaction between the leachate and the liner; and
- Ensure the stability of the waste in case of above ground landfill.

2.5 Groundwater and Surface Water Management

It is essential that a landfill design includes provisions for the management and protection of both groundwater and surface water. Information gathered from the investigations will assist in detailing the level of groundwater or surface water management required.

Groundwater management may be required to minimise or prevent:

- Interference with the groundwater regime during the construction period;
- Damage to the liner (by uplift);
- Transport of contaminants from the landfill; and
- Leachate generation by preventing groundwater infiltration.

2.7 Required Lining System

The lining system protects the surrounding environment including soil, groundwater and surface water by containing leachate generated within the landfill, controlling ingress of groundwater, and assisting in the control of the migration of landfill gas. The selected liner system must achieve consistent performance and be compatible with the expected leachate for the design life of the facility.

2.8 Recommended Capping System

The main objectives in designing a capping system are to:

- Minimise infiltration of water into the waste;
- Promote surface drainage and maximise run off;
- Control gas migration; and
- Provide a physical separation between waste, and plant and animal life.

The capping system normally includes a number of components which are selected to meet the above objectives.

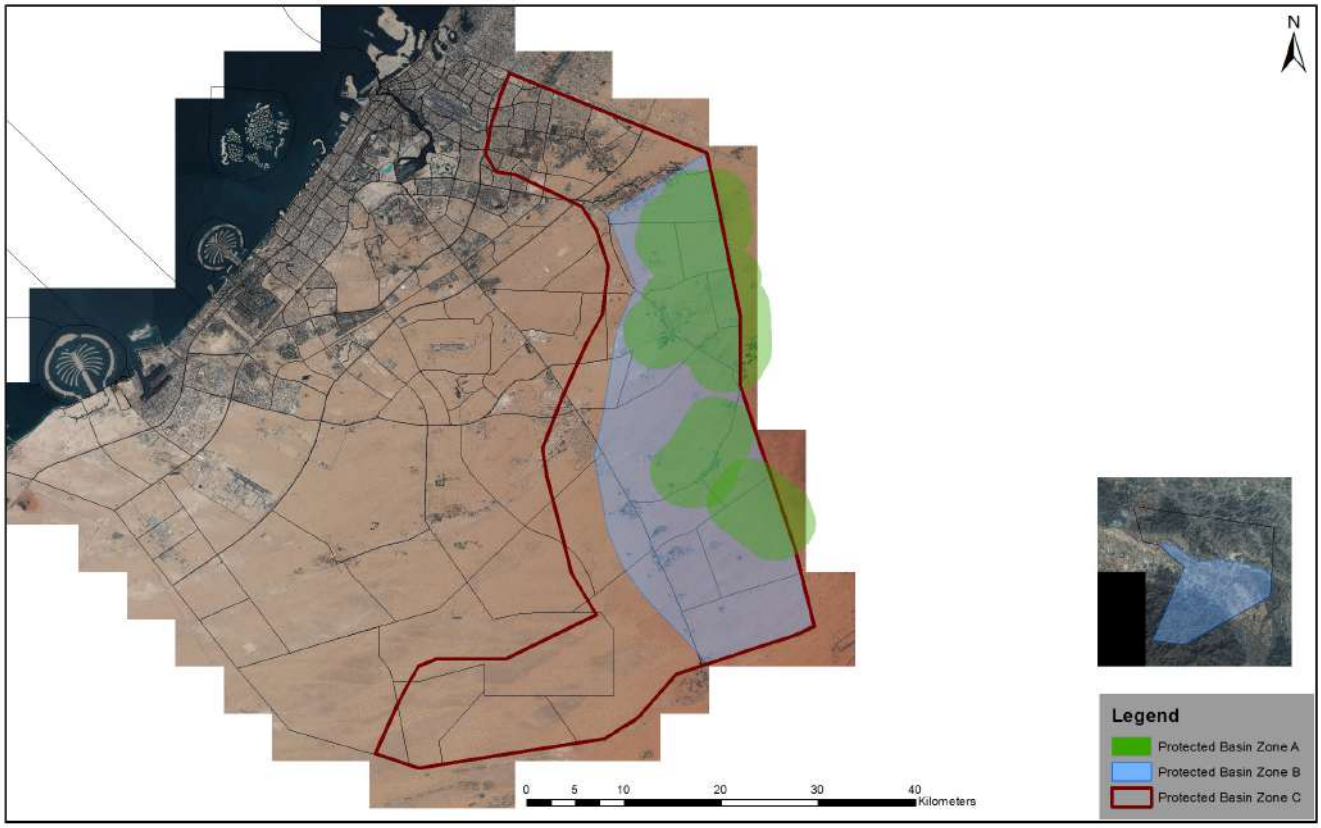
2.9 Environmental Monitoring Systems

The waste dump sites should have permanent groundwater monitoring plan which can sufficiently monitor its impact, both temporally and spatially. Groundwater monitoring wells should be installed for periodic quality check. A record of quality and water level at regular interval should be maintained and made available to the DM-ED, when required.

The waste dump site should have a permanent groundwater dewatering system which can operate to keep groundwater below safe level (if groundwater rise poses a threat on system).

The environmental monitoring system should include alarm system for any air and water contamination incidents and emergency evacuation plan.

Appendix 1 - Map Showing Extents of Groundwater Protected Basin



NOTE:

(1) **The Inner Protection Zone (Zone A)** lies more distant from the wellhead and provides protection against contamination. The risk of bacterial contamination from land use is greatly reduced in this Zone but significant pollution risks still persist from petroleum products, chlorinated solvents and persistent chemicals or activities. This constitute a wellfield or part of sub-basin i.e. relatively smaller in size in comparison to the entire well head basin. It is very significant in terms of public health and since it is relatively small in size, implementation and enforcement are more readily achieved. Its extent is usually defined by groundwater travel time, whereby a 50 days radius is most commonly applied.

(2) **The intermediate Protection Zone (Zone B)** (or total source capture area) encompasses the entire contribution zone of the groundwater catchment area. It provides protection against persistent contaminants. In situations of intensive groundwater exploitation it is also significant in terms of resource conservation for potable water supply. TDS contour line of 2000 mg/l (encompasses zone A fully) is considered as Zone B boundary.

(3) **The Outer Protected Zone (Zone C)** designated by outer boundary drawn on appropriate criteria to provide additional protection level to groundwater resources. The zone C boundary is drawn on 5000 mg/l TDS contour and 5 kilometer buffer zone of 2000 mg/l TDS contour along the groundwater flow direction.

Appendix 2 - Baseline Groundwater Quality Parameters

S. No.	Parameter	Unit of measurement
Coordinates of sampling location(s)		
Date/time of sampling		
Sampled after well purging by (Bailer/Pump)		
Total Project area		
Depth to water level (m)		
Physical parameters		
1	pH	
2	Temp	Degree Celsius
3	Color	
4	Turbidity	NTU
5	E Conductivity	microS/cm
6	TDS	mg/L
7	Total Hardness	mg/L as $CaCO_3$
8	Residual chlorine	mg/L as Cl_2
Inorganic parameters		
9	Sodium	mg/L
10	Potassium	mg/L
11	Calcium	mg/L
12	Magnesium	mg/L
13	Sulphate	mg/L
14	Nitrate	mg/L
15	Phosphate	mg/L
16	Total Nitrogen	mg/L
17	Chloride	mg/L
18	Aluminium	µg/L
19	Arsenic	µg/L
20	Cadmium	µg/L
21	Chromium	µg/L
22	Cobalt	µg/L
23	Copper	µg/L
24	Iron	µg/L
25	Lead	µg/L
26	Molybdenum	µg/L
27	Boron	µg/L
28	Barium	µg/L
29	Beryllium	µg/L
30	Manganese	µg/L
31	Zinc	µg/L
32	Mercury	µg/L

S. No.	Parameter	Unit of measurement
Miscellaneous parameters		
33	Oil & Grease-Free oil	mg/L
34	Pesticides-Non Chlorinated	mg/L
35	Phenols	mg/L
36	Benzene	mg/L
37	Hydrogen sulphide	mg/L
38	Total Cyanide	mg/L
39	Dissolved Oxygen	mg/L
40	Biochemical Oxygen Demand	mg/L
41	1, 2 dichloroethane	mg/L
42	Dichloromethane	mg/L
Microbial parameters		
43	E. Coli	CFU/100 ml
44	Total Coliform	CFU/100 ml
45	Total Bacterial Count	CFU/100 ml @37 degree Celcius

i. WHO drinking water standard to be followed for Lower detection limit (LDL)

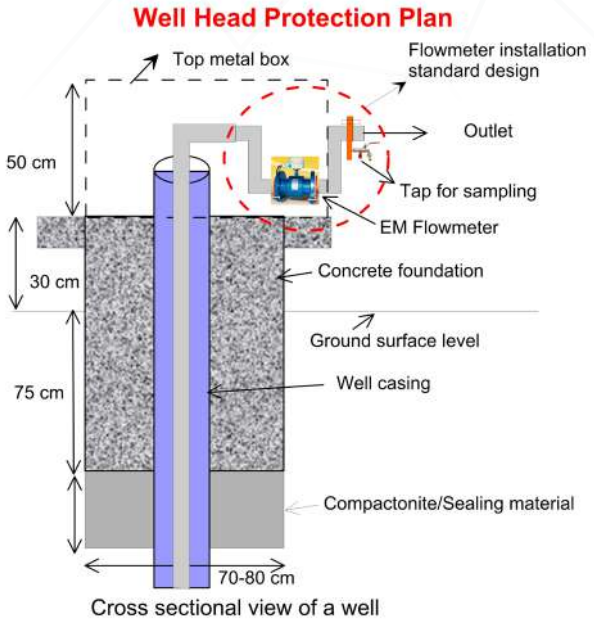
ii. Dutch Intervention Value (DIV, 2000) parameters* & limits to be followed for area other than protected area

iii. WHO drinking standard limits to be followed for protected area

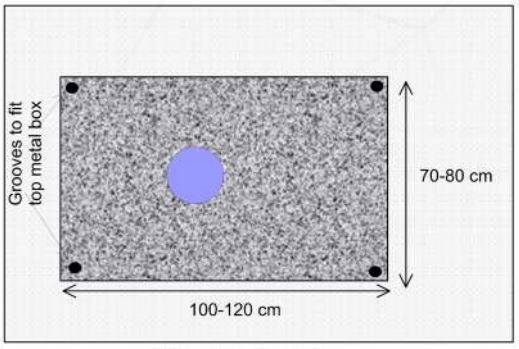
Appendix 3 - Baseline Soil Quality Parameters

S. No.	Parameter	Unit of Measurement
Sampling date		
Soil sample coordinates		
Depth to water level (m)		
Representative sample depth (cm)		
Physical parameters		
1	pH	
2	E Conductivity	microS/cm
3	SAR	Ratio
4	ESP	Ratio
5	Gypsum%	%
6	Estimated Organic Matter	% OM
7	Heavy metals Cy, Zn, Mn, Fe, Cu, Si, Al, Co, Se, Cd, Pb, As, Cr, Ni, Hg	Mg/kg
8	Soil texture	(USDA classification)
Quantitative assessment		
1	Cut and fill volume	Cubic meter
2	Agricultural soil	Cubic meter
3	Non-agricultural soil	Cubic meter

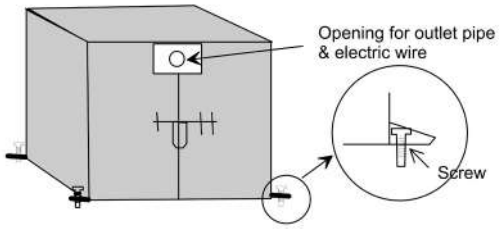
Appendix 4 - Temporary Well Head Protection Plan



Cross sectional view of a well



Top view of a well



Top Metal Box mounted over concret base

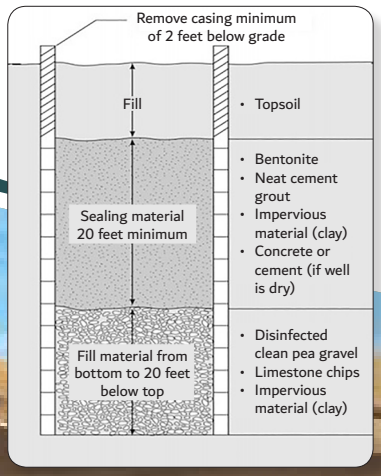
Appendix 5 - Well Abandonment

Well Abandonment Report

Make a report detailing the method statement described below, including the field activity pictures.

1. Take photos for the existing well before closing.
2. Remove all accessories cable, pump & whole screen (or till 3-10 feet) from the existing wells.
3. Fill the groundwater well by natural sand, Bentonite, soil, and gravel. These material should be uncontaminated (take photos for the material / sand).
4. The impervious layer depth slot should be filled with impervious sealing material.
5. Fill the top layer 3 to 5 meters of the well by Bentonite mixed with water, the impervious seal/layer, to avoid the groundwater from any type of contamination.

Schematic Diagram to Show Depth Wise Sealing Material



Appendix 6 - Standard Content of Hydrogeological Study for an EIAR

Introduction	Regional geology & hydrogeology
	Hydrology (rainfall-runoff, surface water bodies, pour point etc.)
	Area of interest/influence
	Baseline groundwater & soil conditions
Sampling	Method statements
	Sampling locations (Location map)
	Baseline groundwater & soil quality
	Groundwater levels
	Geotechnical studies (lithology, permeability, water level, SPT etc)
	Permeability of unsaturated/saturated zone
	Environmental soil testing & quantitative assessment)
	Details of water use types in different Project phase
Impact assessment (of construction & post Project activities) on groundwater & soil	Groundwater & soil contamination
	Groundwater level rise/decline; change in flow pattern
	Impacts assessment of different water usage
	Short & long term impact
	Groundwater budget integrating all influential components
	Impact/Risk Assessments
Groundwater Numerical Modelling (if required)	Model conceptualisation
	Calibration & validation
	Relevant predictive scenarios
Conclusions	Project specific activities & threats to groundwater & soil
	Stress on groundwater quality & quantity during or post Project activities
	Develop & prioritise categories of threats
Recommendations	Key requirements for groundwater & soil protection
	Sampling frequency & periodic monitoring report (PMR)
	Environmental management and control plans

Annex 4

Part 4

Guidance on Biodiversity Baseline Assessments

Guidance on Biodiversity Baseline Assessments

Biological Environment

Baseline studies of biodiversity resources provide a reference point against which any future changes associated with a Project can be assessed and offer information for subsequent monitoring of biodiversity performance. A comprehensive baseline study should identify (both in the immediate and wider area around a Project site) habitats that will be affected, the range and status of the main species groups that live in the area, the potential presence and status of protected areas or other important areas for biodiversity, and any potential impacts to ecosystem services that might have local, regional or global impacts. A list of good practices on conducting ecology survey is provided in Appendix 2 of this Annex.

The following should be provided in the description of the biological environment:

- Assessment of flora and fauna present within the impact zone of the Project delineating season and duration:
    - Conservation status of each species should be highlighted as categorised by national and international authorities
    - Diversity indices should represent the condition of the species, habitats and communities.
- Assessment of, but not limited to, potential damage to terrestrial and aquatic flora and fauna due to discharge of effluents and gaseous emission, air pollution, land use and landscape changes from the Project during construction and operational phases.
- Assessment of, but not limited to, damage to aquatic (freshwater and marine) flora and fauna (including commercial fishing) due to physical disturbances, alterations and effect of any activity during the construction and operational phases.
- Description of potential biological stresses within the impact zone of the proposed Project.
- Description of measures in relation to its impact on the biological diversity in the Project area or its adjacent areas in accordance to the mitigation hierarchy.

Employment of Assessment Methods

Results in the employment of methods should be quantifiable and should not be presented only as qualitative.

For aquatic environment, the following taxa and ecosytems should be assessed, including but not limited to:

- Mammalia
- Reptilia
- Fishes
- Phytoplankton
- Zooplankton
- Invertebrates (including macro-benthos, meo-benthos)
- Seaweeds (macroalgae)
- Benthos and associated communities (shoreline, intertidal, etc.)
- Coral reefs
- Seagrass and associated species
- Mangroves

The following standard technique/s should be employed, otherwise, accepted published protocols should be described appropriately and justified:

- Bibby, C. J., Burgess, N. D., Hill, D. A. and Mustoe, S. H. (2000) Bird Census Techniques. Second edition. London: Academic Press.
- English S, Wilkinson CR and Baker VJ. (1994) Survey Manual for Tropical Marine Resources. Australian Institute of Marine Science. 368 p.
- Glasson, J., Therivel, R. and Chadwick, A. (1999). Introduction to Environmental Impact Assessment. UCL press Ltd. London & Philadelphia; USA.
- Mueller-Dombois, D. and Ellenberg, H. 1974. Aims and Methods of Vegetation Ecology. Wiley, New York. 547 pp.
- Rau, J.G. and Wooten, D. C. (1980). Environmental Impact Analysis Handbook. New York, McGraw Hill.
- Standard Survey Methods for Key Habitats and Key Species in the Red Sea and Gulf of Aden. PERSGA Technical Series No. 10. PERSGA, Jeddah.
- Standard Techniques should be followed for assessment of shoreline assessment and intertidal benthic fauna (English et al. 1994).
- UNEP. (1988). Environmental Impact Assessment- Basic Procedures for Developing Countries. The World Bank.

For terrestrial environment, the following taxa should be assessed, including but not limited to:

- Flora
- Mammalia
- Aves
- Reptilia
- Amphibia

Standard technique/s described in the following should be employed, otherwise, accepted published protocols should be described appropriately and justified.

Flora

Detailed accounts of vegetation units noted in the field should be described in accordance with the relevant literature for Dubai / UAE (e.g. Deil & Müller-Hohenstein, 1996; Brown & Sakkir, 2004; Brown & Böer, 2005; Feulner, 2011; Deil & Müller-Hohenstein, 1996).

The following methods for vegetation survey and abundance assessment should be used:

- Line intercept method to estimate percentage cover (Kent & Coker 1994).
- Point quarter plot (Bonham 1989; Dix 1961; Risser & Zedler 1968).
- Bonham, C.D. 1989. Measurements for terrestrial vegetation. John Wiley Sons, New York. pp. 159-164.
- Brown, G. & Sakkir, S. (2004). The vascular plants of Abu Dhabi Emirate. Internal Research Report, Environmental Research and Wildlife Development Agency (now Environment Agency), Abu Dhabi.
- Brown, G. & Böer, B. (2005). Terrestrial Plants. In: Hellyer, P. & Aspinall S. (eds.), The Emirates–A Natural History. Trident Press, London. pp. 141–155.
- Deil, U. & Müller-Hohenstein, K. (1996): An outline of the vegetation of Dubai (UAE) – Verhandlungen der Gesellschaft für Ökologie 25: 77-95.

- Dix, R.L. 1961. An application of the point-centered quarter method to the sampling of grassland vegetation. Journal of Range Management 14:63-69.
- Feulner, G.R. (2011). The flora of the Ru'us al-Jibal – The mountains of the Musandam Peninsula: An annotated checklist and selected observations. Tribulus 19: 4–153.
- Kent M., Coker P. 1994. Vegetation description and analysis. A practical approach. Belhaven Press, London, 363.
- Mueller-Dombois, D. and Ellenberg, H. (1974). Aims and Methods of Vegetation Ecology. Wiley, New York. 547 pp.
- Risser, P.G., and P.H. Zedler. (1968.) An evaluation of the grassland quarter method. Ecology 49:1006-1009

- **DAFOR**: This method is used for assessing abundances of plants over large areas. It is a density or cover measure. This involves simply assigning each species as dominant, abundant, frequent, occasional or rare ('DAFOR'). These classes have no strict definition and the Environmental Consultant must decide based on their professional judgement and interpretation, including the scoring system based on relative cover or density of species.
- **Quadrats**: Quadrats are for measuring abundances of sessile species in any vegetation, including aquatic macrophytes. Quadrats can be used to measure density, frequency, cover or biomass. They are used to define sample areas within the study area and are usually four strips of wood, metal or rigid plastic, which are fixed together to form a square. It can be useful to use bolts so that the quadrat can be dismantled for storage or transport. For aquatic macrophytes, a wood or plastic frame will float and can be used to sample floating or emergent vegetation on the water surface.
- **Point Quadrats:** Point quadrats are used for estimating cover of grasses, herbs, mosses, etc. in short vegetation. A point quadrat is a thin rod with a sharpened tip, and should usually be made of metal for rigidity and strength. Good materials are thick gauge wire, welding rod, knitting needles and even bicycle spokes. The point quadrat is lowered vertically through the vegetation and various recording methods can be used to get various types of data.
- **Transects:** Transects can be used for a variety of survey purposes in any vegetation. Standard techniques should be followed as per Mueller-Dombios, D. and Ellenberg, H. (1974) Aims and Methods of Vegetation Ecology, Wiley, New York.

Reptiles

Most common survey method employed to estimate the abundance of reptiles involve capturing individuals.

Summary of Methods Suitable for Various Groups

Method	Snakes	Lizards	Turtles
Hand capturing	*	*	*
Noosing		+	
Trapping	?	+	+
Marking individuals	*	*	*

* Method usually applicable, + method often applicable, ? method sometimes applicable.

Birds

Birds are among the easiest of animals to census. They are often brightly coloured, highly vocal at certain times of the year and relatively easy to see. They are also very popular, with the result that high-quality field guides are available in most parts of the world and there are many professionals and amateurs with a high level of identification skills. Because of this popularity, they are undoubtedly the most frequently surveyed of all taxonomic groups. Bibby et al. (2000) gives an excellent and detailed review of techniques.

Summary of Methods Suitable for Various Groups

Method	Water-birds	Seabirds	Wading birds	Raptors	Near-passerines	Passerines
Line transects	+	*	+	+	+	*
Point transects	?		?	?	+	*
Counting colonial nests	+	*		?	+	?
Counting roosts and flocks	*		*		?	?
Counting migrants				+		?
Indirect counts	+		?			
Tape playback		+		+	?	?
Vocal individuality	?	?	?	?	?	?

* Method usually applicable, + method often applicable, ? method sometimes applicable.

Mammals

Census methods for mammals depend critically on the size of the species and its natural history. If species are diurnal, common and highly visible, the census problem is relatively simple. If species are nocturnal, rare and difficult to detect, the census problems are most difficult. As in all ecological census work, the Environmental Consultant shall decide the purpose of the study and the level of precision required. The following methods should be used:

- Line transects
- Feeding signs
- Pellet count
- Camera traps
- Sherman traps

Marine Mammals

Approaches to evaluating marine mammals from a biodiversity perspective are significantly different to most other marine organisms because of the geographic scale of distributions, and the conservation status of many of the species which are found in the region. Standard techniques that should be used to assess the marine fauna include:

- PERSGA (2010), Evans & Hammond (2004). Standard Survey Methods for Key Habitats and Key Species in the Red Sea and Gulf of Aden. PERSGA Technical Series No. 10 (2010). PERSGA, Jeddah.
- Evans, P.G.H. & Hammond, P.S. 2004. Monitoring cetaceans in European waters. Mammal Review, 34, 131-156.

Shoreline Assessment and Intertidal Benthic

Standard techniques that should be followed for assessment of shoreline and intertidal benthic fauna include:

- PERSGA (2010), Evans & Hammond (2004). Standard Survey Methods for Key Habitats and Key Species in the Red Sea and Gulf of Aden. PERSGA Technical Series No. 10 (2010). PERSGA, Jeddah.
- English S, Wilkinson CR and Baker VJ. (1994) Survey Manual for Tropical Marine Resources. Australian Institute of Marine Science. 368 p.

Habitat Description

Habitat of the Project area should be classified with reference to the following:

- Brown, G. & Böer, B. (2004) Interpretation Manual of the Major Terrestrial Natural and Semi-Natural Habitat Types of Abu Dhabi Emirate. - ERWDA Internal Research Report. 62 pp.
- Al Dhaheri, S., Javed, S., Alzahlawi, N., Binkulaib, R., Cowie, W., Grandcourt, E. and Kabshawi, M. (2017). Abu Dhabi Emirate Habitat Classification and Protection Guideline. Environment Agency Abu-Dhabi.

The following components should be included in the EIAR for Projects that will have impacts on the sensitive areas described in the following paragraph:

- Vulnerability Assessment
- Flight Path Assessment
- Bird-Friendly Building Design Plan
- Translocation and Conservation Plan

Sensitive Areas:

- Areas with important regulating services in terms of maintaining biodiversity such as Protected areas: defined as "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (IUCN,2008). The Protected Area Network in the Emirate of Dubai is presented in Appendix 1 of this Annex.
- Areas containing threatened ecosystems outside of formally protected areas, where certain classes of activities would always require an impact assessment at an appropriate level of detail.
- Areas identified as being important for the maintenance of key ecological or evolutionary processes, where certain classes of activities would always require an impact assessment at an appropriate level of detail.
- Areas known to be habitat for threatened species, which would always require an impact assessment at an appropriate level of detail.
- Areas with important regulating services for maintaining natural processes with regard to soil, water, or air, where impact assessment at an appropriate level of detail is always required. Examples can be wetlands, highly erodable or mobile soils protected by vegetation (e.g. steep slopes, dunefields), forested areas, coastal or offshore buffer areas, etc.
- Areas with important provisioning services, where impact assessment at an appropriate level of detail is always required. Examples can be extractive reserves, lands and waters traditionally occupied or used by local communities, fish breeding grounds, etc.
- Areas with important cultural services, where impact assessment at an appropriate level of detail is always required. Examples can be scenic landscapes, heritage sites, sacred sites, etc.
- Areas with other relevant ecosystem services (such as flood storage areas, groundwater recharge areas, catchment areas, areas with valued landscape quality, etc.); the need for impact assessment and/or the level of assessment is to be determined (depending on the screening system in place).
- Species with conservation status higher that "least Concern" or "Data Deficient" categorised under IUCN or Local threat categories.

Wildlife Translocation

The translocation of wildlife should be carried out as per the guidelines given below:

- Translocation, Handling, and Restoration of Wildlife in the Emirate of Dubai, NRCS, Dubai Municipality.
- IUCN/SSC (2013). Guidelines for Reintroductions and Other Conservation Translocations. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission, viiii + 57 pp.

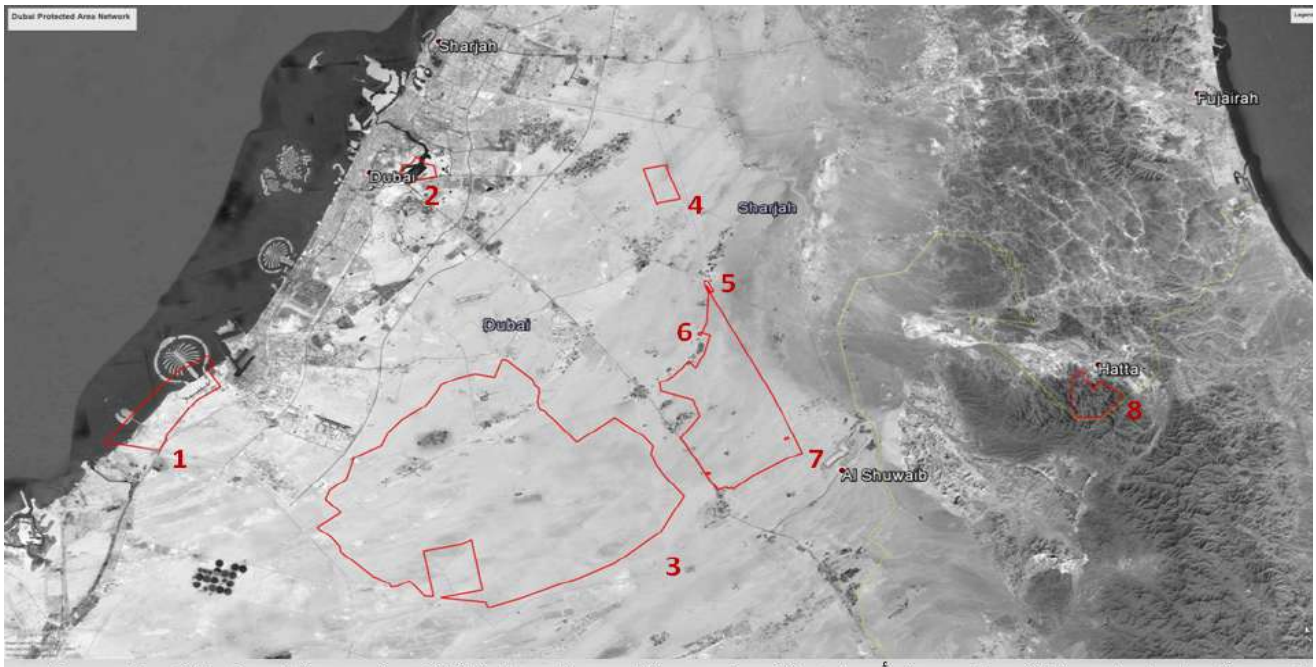
Fill Data

Data gathered during EIA should be submitted in the format below along with the submission of the EIA report.

Date and Time	Habitat (According to Brown G. and Boer B. (2004) and Al Dhaheri et al. (2017)	GPS Coordinate	Species	Number	Activity	Methods

- Brown G. and Boer B. (2004). Interpretation Manual for the Major Terrestrial Natural and Semi – natural Habitat Types of Abu Dhabi Emirate. Environmental Research and Wildlife Development Agency, Abu Dhabi.
- Al Dhaheri, S., Javed, S., Alzahlawi, N., Binkulaib, R., Cowie, W., Grandcourt, E. and Kabshawi, M. (2017). Abu Dhabi Emirate Habitat Classification and Protection Guideline. Environment Agency Abu-Dhabi.

Appendix 1- Protected Area Network in the Emirate of Dubai



1. محمية جبل على البحرية77كم2 2. محمية رأس الخور6كم2 3. محمية المرموم الصحراوية 950كم2 4. محمية الوحوش 15كم2 5. محمية جبل نزوى 1كم2 6. محمية غاف نزوى0.1كم2 7. محمية المها الصحراوية226كم2 8. محمية حتا الجبلية 27كم2.

1. Jabal Ali Marine Sanctuary 77km² **2.** Ras Alkhor Reserve km² **3.** Al Marmoom Desert Conservation Reserve 950km² **4.** Al Whoosh Reserve15km² **5.** Jabal Nizwa Reserve 1km² **6.** Ghaf Nizwa Reserve 0.1km² **7.** Al Maha Desert Conservation Reserve226km² **8.** Hatta Mountain Protected Area 27km²

Appendix 2- Good Practice on Conducting Ecology Survey

Good Practice on Conducting Ecology Survey

- Assess the scale of the whole area surrounding the potential development site for which the impact is to be assessed i.e. the study area for each impact type should be an ecologically meaningful unit. For example, if a road is to pass through a heathland, the ecological survey should consider the entire heathland rather than just the road route, and impacts on hydrology should be considered in the context of the appropriate watershed rather than a fixed corridor.
- Decide on the main season or whether through the year surveys are required, considering the importance of the site in migration, breeding and winter periods.
- Assess the level of normal variation to be expected. Does the population of some species fluctuate wildly? Are key species elusive? Decide the number and spread of visits e.g. generally 5-10 visits are required to adequately detect birds from a range of habitats, with five being the minimum.
- Decide whether to conduct a full survey or a sample survey. If the area is especially large a sample survey may be better unless the area is composed of a mosaic of different habitats, in which case, a stratified design would be more appropriate.
- Decide on the specific method – whole wildlife community or is the location of key species more important. If a compromise is promoted usually neither the common species nor the rarer ones will be adequately covered.
- Assess the skills of the observer/recorder and use trained staff. It is important that professionals who understand the process of interpretation are employed. Specialist amateurs may need to be approached to cover some difficult groups.
- Decide early on the methods to be used to capture data (maps, recording forms, etc) and how it will be computerised.
- Determine the best methods of presenting the data e.g. mean monthly maxima, graphically presented, in map form, as territory clusters, as mean and maximum counts per season, as bird-days, and/or as an index. This will often be species specific.
- Decide whether and how to incorporate existing data from a diversity of sources. Provide an assessment of its strengths/limitations for EIA purposes, recognizing that much of the data will have been collected for different objectives and so is unlikely to be available in a standard format.

Annex 5

Environmental Compliance Conditions

Environmental Compliance Conditions

General Environmental Compliance Conditions

1. Prior approval shall be secured from the Environmental Planning and Studies Section (EPSS) for any modification / change in the Project or inclusion of new Projects components, or establishment of any additional facilities, such as temporary concrete batching plants, not covered by the Environmental Impact Assessment (EIA). The request of amendment of EC from the EPSS should be made by the Project Owner at least thirty (30) days prior to the change.
2. The Environmental Clearance (EC) shall be renewed at least thirty (30) days prior to its expiry date. The renewal of the EC is subject to the compliance of the Project Owner and/or its appointed contractors and operator to the compliance conditions stipulated herein/or additional Project-specific requirements indicated in the issued EC, and payment of outstanding fees and penalties as a result of violations in the future, if any.
3. The EC does not exempt the Project Owner and/or its appointed contractors and operator from securing other government approvals or preclude other agencies/departments from enforcing their rules and regulations.
4. All applicable DM permit requirements shall be obtained and complied with. These include, but not limited to, permits from the DM Waste Management Department for the disposal of all wastes (e.g. solid, liquid, including sludge and hazardous waste), and permit from the EPSS for Storage of Dangerous Goods, if any.
5. All air and noise emissions to the environment shall comply with the applicable Environmental Laws and Regulations in the UAE and Emirate of Dubai.
6. Discharge of any wastewater / effluent generated from the Project implementation shall, at all times, comply with the applicable discharge limits/standards enforced by the concerned DM Departments.
7. All chemicals that shall be used for the buildings' maintenance, cooling system, firefighting equipment, among others, shall have zero ozone depletion potential (ODP) or low global warming potential (GWP).
8. All required sampling and analyses shall be conducted by the Dubai Central Laboratory (DCL) and/or any laboratory accredited by the Emirates International Accreditation Centre (EIAC), formerly Dubai Accreditation Centre (DAC).
9. A copy of the EC shall be kept at the Project site at all times. The Project Owner and/or its appointed contractors and operator shall allow access, and provide assistance to the authorised DM-ED officers and engineers in carrying out inspections, incident investigations, taking of pictures, and in obtaining relevant information such as onsite sources of emissions and effluent discharges at anytime, except if it is unsafe to do so.
10. The construction and/ or operation activities shall not cause any environmental pollution or any complaints from the public and its adjacent communities. In case of environmental pollution and/or complaints, the Project Owner and/or its appointed contractors and operator shall implement appropriate corrective actions, settle environmental disputes, and bear all responsibilities on any environmental damages and cost for any remediation thereof.
11. Any environment-related incidents and complaints shall be reported immediately to the Environmental Control Section (ECS) within twenty-four (24) hours. The incident report shall describe the likely cause, the time of occurrence, and the conditions under which an incident occurred, the extent of impact, and the remedial actions undertaken. In such events, a registered Environmental Consultant shall be appointed to determine and supervise the necessary corrective actions to be undertaken, and conduct the necessary monitoring activities to ensure compliance to the prescribed standards.
12. A **semi-annual** Environmental Performance Report (EPR), including environmental protection measures implementation and monitoring, and a brief description with photo documentation of the construction progress (as applicable) shall be submitted to the ECS within seven (7) days after each reporting period.

Specific Conditions for Projects with Odour Emitting Sources

The following compliance conditions shall be applicable for, but not limited to, Projects with sources of odourous gases such as Municipal Solid Waste Recovery or Recycling Facility, Landfill or Composting Facility, etc., in addition to the General Environmental Compliance Conditions (except for condition nos. 7 & 12):

13. Adequate controls and mitigation measures shall be implemented for all air emissions associated with the Project activities. All emissions to the air environment shall comply with the limits provided in the Cabinet Decree No. (12) of 2006. The ambient concentration of the below odourous gases shall not exceed the following limits at plot boundaries and nearby sensitive receptor(s).

Ambient Air (Odour)		
Parameter	**Standard Limit**	**Source of Standard Limit**
H_2S *	7 µg/m³ (30-min averaging)	WHO
NH_3 *	30 µg/m³ (30-min averaging)	NIH, US
Dimethyl disulphide	56 µg/m³ (10-min averaging)	Ontario's Ambient Air Quality Criteria
Dimethyl sulphide	30 µg/m³ (10-min averaging)	
Methyl mercaptan	13 µg/m³ (10-min averaging)	

*Continuous measurement for 24 hrs at plot boundary and nearby sensitive receptor(s)

14. Whenever a foul odour complaint arises, the Project Owner/Operator shall conduct an air quality monitoring of the parameters listed in condition no. 13 at the odour control unit exhaust, plot boundaries, and at nearby sensitive receptors, for at least 1-hour to 24-hours (continuous) extendable to seven (7) days. The monitoring instrument should have an averaging time of at least 10 minutes, including records of wind direction and valid calibration certificate.

15. A **quarterly** Environmental Performance Report (EPR) including environmental protection measures implementation and monitoring and a brief description with photo documentation of the construction progress (as applicable). The EPR should include quarterly air quality monitoring report for the parameters listed in condition no. 13 with the meteorological data and monitoring location map. The quarterly EPR shall be submitted to the ECS within seven (7) days after each reporting period.

Specific Conditions for Fuel Filling Stations

In addition to the General Environmental Compliance Conditions (except for condition no. 7), the following conditions shall be applicable:

16. The fuel storage tanks and fuel dispensing equipment shall be provided with adequate vapour recovery systems (VRS Stages 1 & 2) and shall be operated and maintained in accordance with manufacturer's recommendations.

17. All chemicals that will be used for the buildings' maintenance and firefighting equipment, including the refrigerant for the VRS shall have zero ozone depletion potential (ODP) or low global warming potential (GWP).

18. All measures to prevent and/or control the spillage / leaks of petroleum products and chemicals from all relevant activities during the operation shall be implemented based on the Environmental Management Plan (EMP) framework in the approved EIAS.

Specific Conditions for Coastal Projects

In addition to the General Environmental Compliance Conditions (except for condition no. 12), the following conditions shall be applicable:

19. A construction No Objection Certificates (NOC) shall be obtained from the Coastal Environment Section (CES) prior to commencement of any marine construction works. In addition to the NOC, a Construction Environmental Control Plan (CECP) shall be approved by CES.

20. Any liquid fuel, oil and chemical shall be stored within impermeable secondary containment (bunded area). For a single-walled fuel tank, the secondary containment shall be at least 110% of the tank. For multiple

drums and containers, the secondary containment must be 110% of the largest drum or 25% of the combined full capacity of all drums and containers. Spill kits must be located close to the designated storage area, and must be appropriate for the quantity and type of chemicals, oil and fuel stored on site.

21. Lightweight non-hazardous construction waste (paper, plastic, polystyrene) shall only be stored in bins and containers with lids, and they shall be emptied regularly to prevent overfilling and spilling. Similarly, they will be transported in closed waste trucks.
22. Hazardous waste shall temporarily be stored on site within a bunded area with impermeable surface, no connection to the drainage network or a surface water body. In the event of a spill, contaminated sand/soil shall be excavated immediately, and temporarily stored on site at the designated hazardous waste area. All hazardous waste shall be collected and disposed of at a licensed landfill for hazardous waste, by a licensed DM-approved waste contractor. Chain of custody records of collection and disposal of the contaminated soil as hazardous waste shall be retained on site.
23. A **quarterly** Environmental Performance Report (EPR) including but not limited to, environmental protection measures implementation and monitoring, monthly laboratory analysis results, monitoring locations, and a brief description with photo documentation of the construction progress shall be submitted to the ECS within seven (7) days after each reporting period.

Specific Conditions for Projects Near, Beside or Within the Protected or Conservation Areas

In addition to the General Environmental Compliance Conditions (except for condition no. 12), the following conditions shall be applicable:

24. A No Objection Certificate (NOC) shall be obtained from the Natural Resources Conservation Section (NRCS) prior to commencement of any activities within the Protected or Conservation Area.
25. A Translocation Plan for the species that will be impacted by the Project shall be submitted to the NRCS within thirty (30) days from the date of issuance of the EC.
26. Implement necessary measures to protect any fauna or flora with conservation status categorised higher than "Least Concern" encountered during the Project implementation as per requirements of NRCS Technical Guideline on the Translocation, Handling, and Restoration of Wildlife in the Emirate of Dubai.
27. Any ecological-related incident shall be reported to the NRCS within twenty-four (24) hours. The incident report shall describe the likely cause, the time of occurrence, and the conditions under which an incident occurred, the extent of impact, and the remedial actions undertaken. In such events, a registered Environmental Consultant shall be appointed to determine and supervise the necessary corrective actions to be undertaken, and conduct the necessary monitoring activities to ensure compliance to the prescribed standards.
28. A **quarterly** Environmental Performance Report (EPR), including but not limited to, environmental protection measures implementation and monitoring, monthly laboratory analysis results, monitoring locations, and a brief description with photo documentation of the construction progress shall be submitted to the ECS within seven (7) days after each reporting period.

Specific Conditions for Projects with Permanent Lagoon, Lake, or Man-made Surface Water Features:

In addition to the General Environmental Compliance Conditions, the following conditions shall be applicable:

29. The establishment or operation of closed permanent lagoon, lake, or man-made surface water features (hereafter collectively referred to as "lagoon") shall be carried out only after obtaining the necessary Environmental Clearance (EC) from DM-ED.
30. Periodic maintenance shall be carried out to ensure that the water quality is maintained within the allowable limits specified in the Environmental Standards as per the following table:

Environmental Standards for Water Quality of Closed Lagoons

No.	Parameter		Measurement Unit	Maximum Allowable Limits
Physical/ Chemical Parameters				
1	Ammonium in the form of Nitrogen	NH_4-N	mg/L	1
2	Biochemical Oxygen Demand (5-days)	BOD_5	mg/L	10
3	Chemical Oxygen Demand	COD	mg/L	50
4	Dissolved oxygen from the surface and up to 2 meters (m) from the bottom	DO	mg/L	>5 or 90% saturation
5	Dissolved oxygen at the bottom	DO	mg/L	>4
6	Fluorine	F	mg/L	20
7	Nitrate in the form of Nitrogen	NO_3 N	mg/L	15
8	Oils & Grease		mg/L	>1
9	pH		-	6 – 9
10	Phenols		mg/L	0.001
11	Phosphate in the form of Phosphorus	PO_4 P	mg/L	0.1
12	Sulphide in the form of Sulphur	S^{-2}	mg/L	0.1
13	Cyanide	CN	mg/L	0.05
14	Surface Plankton		mg/L	0.02
15	Total Suspended Solids	TSS	mg/L	Maximum 20
16	Turbidity		NTU	75
Metals				
17	Aluminum	Al	mg/L	5
18	Arsenic	As	mg/L	0.05
19	Cadmium	Cd	mg/L	0.05
20	Chromium (Chromium 6)	Cr	mg/L	0.05
21	Cobalt	Co	mg/L	0.2
22	Copper	Cu	mg/L	0.5
23	Total Iron	Fe	mg/L	2
24	Lead	Pb	mg/L	0.1
25	Manganese	Mn	mg/L	0.2
26	Mercury	Hg	mg/L	0.001
27	Molybdenum	Mo	mg/L	0.01
28	Nickel	Ni	mg/L	0.1
29	Selenium	Se	mg/L	0.02
30	Silver	Ag	mg/L	0.005
31	Zinc	Zn	mg/L	0.1

31. No gases that impart foul odour shall be emitted beyond the applicable allowable limits as per the laws, regulations, and legislations in the Emirate of Dubai.
32. An increase in algal growth that may cover the water surface shall be prevented and controlled.
33. The growth of plants and grasses, which can distort the aesthetic view of the lagoon and can cause generation of unpleasant odour, shall be prevented and controlled.
34. Necessary approval shall also be secured from Public Health and Safety Department for the lagoon.
35. Relevant conditions and standards related to animal health shall be taken into consideration in cases when there are identified organisms or species of concern in the area where the lagoon is located.
36. The water from the lagoon shall not be discharged or replaced without the applicable permit issued by the DM Waste Management Department (DM-WMD).
37. The sludge and sediment in the lagoon shall not be disposed without the applicable permit issued by the DM Waste Management Department (DM-WMD).
38. Environmental status report regarding the lagoon shall be submitted to the Environmental Control Section (ECS) on a periodic basis, as specified in the conditions of the EC.
39. The Project Owner / Operator of the lagoon shall take samples and carry out analysis through any laboratory accredited by the Emirates International Accreditation Centre (EIAC), formerly Dubai Accreditation Center (DAC), for the specific environmental tests, to measure the levels of the concentrations of the odorous elements in order to verify the compliance with all the environmental requirements and standards. The Project Owner / Operator shall bear all the cost related to the monitoring and analysis of environmental samples. The monitoring report shall be submitted to the ECS on a periodic basis, as specified in the conditions of the EC.

Annex 6

Guidance on the Registration of Environmental Consultants in the Emirate of Dubai

Guidance on the Registration of Environmental Consultants in the Emirate of Dubai

I. Introduction

The Dubai Municipality Environment Department (DM-ED) recognises the role of Environmental Consultants in promoting sustainable development in the Emirate of Dubai through the facilitation of Projects' compliance with the applicable Federal and Local environmental laws and regulations. DM-ED requires Environmental Consultants to be registered to ensure that they are licensed to perform environmental consultancy activity, suitably qualified and competent to carry out the required environmental studies, and are proficient in the environmental requirements of DM-ED.

This Annex 6 provides guidance and describes the coverage, requirements, procedures and conditions on the registration of Environmental Consultants with DM-ED to enable them to carry out environmental studies for Projects in Dubai. This Annex also emphasises the Environmental Consultants' accountability in all the environmental reports submitted to DM-ED and responsibility in promoting professionalism with their Clients, fellow Environmental Consultants, and DM-ED.

II. Coverage of Registration

The following Table 1 provides the list of the code-based environmental services (hereafter referred as Environmental Codes) on which the Environmental Consultants shall be registered to. The minimum qualification requirements for specialist per Environmental Code are also provided below.

Table 1 - Description of Environmental Services and Minimum Qualification Requirements

DM-ED	Environmental Code	Description	Minimum Qualification
EPSS	EAS	Environmental Impact Assessment Summary (EIAS) without any Specialised Study	• With a Bachelor's degree or an equivalent in any relevant field • At least five (5) years experience in environmental impact assessment studies • Should have a valid UAE employment visa, Emirates ID, and should be locally based
	A	Air Environment (Air Quality, Odour, Noise, Waste and Related Odour Control, Climate Change)	• With a Bachelor's degree in Engineering, Sciences, or relevant discipline • At least five (5) years experience of relevant professional experience
	B	Air Environment Modelling	
	B1	Air and Odour Dispersion Modelling	• With a Bachelor's Degree in Engineering, Sciences, or relevant discipline • At least ten (10) years of relevant professional experience
	B2	Noise Modelling	• With a Bachelor's Degree in Engineering, Sciences, or relevant discipline • At least ten (10) years of relevant professional experience

DM-ED	Environmental Code	Description	Minimum Qualification
NRCS	C	Soil and Groundwater	– With Master's or Ph.D. degree in Environmental Science, Soil Science, or Hydrology and Groundwater – At least ten (10) years of relevant professional experience for specialist with Master's degree and seven (7) years for specialist with Ph.D. degree – Should have at least three (3) years experience working in the United Arab Emirates in the relevant field
	D	Hydro-geology	– With Bachelor's, Master's or PhD degree in Geology/Hydrogeology/Hydrology/Water Resources – At least seven (7) years of relevant professional experience for specialist with Bachelor's degree, five (5) years for specialist with Master's degree, and three (3) years for specialist with Ph.D. degree – Should have at least one (1) year experience working in the United Arab Emirates in the relevant field
	E	Ecology and Biodiversity	– With Master's or PhD degree in Environmental Science, Wildlife, or biological related sciences (e.g. Zoology or Botany) – At least five (5) years of relevant professional experience for specialist with Master's degree and three (3) years for specialist with Ph.D. degree – Should have at least one (1) year experience working in the United Arab Emirates in the relevant field
	F	Wildlife Translocation	– With Bachelor's degree in Veterinary Science and at least seven (7) years of relevant professional experience; or – With Master's or Ph.D. degree in Environmental Science, Wildlife, or biological related sciences (e.g. Zoology or Botany) and at least five (5) years of relevant professional experience for specialist with Master's degree and three (3) years for specialist with Ph.D. degree – Should have at least three (3) years experience working in the United Arab Emirates in the relevant field
	G	Marine Species Translocation	– With Master's or Ph.D. degree in Marine Science, Environmental Science, or biological related sciences (e.g. Zoology or Botany) – At least five (5) years of relevant professional experience for specialist with Master's degree and three (3) years for specialist with Ph.D. degree – Should have at least three (3) years experience working in the United Arab Emirates in the relevant field
CES	H	Marine Water & Sediment Quality	– With Bachelor's degree in Environmental Sciences / Environmental Management / Geography / Biology or relevant discipline and at least ten (10) years of professional experience – With Master's or Ph.D. degree in relevant discipline and at least seven (7) years of professional experience
	I	Marine / Coastal Modelling Studies	
	I1	Hydrodynamics, Flushing, Plume, or Tracer Dispersion, Dilution Analysis	– With Master's degree in Science / Engineering and at least ten (10) years of hands-on experience – With Ph.D. degree in relevant disciplines and at least seven (7) years of professional experience
	I2	Marine Water Quality	– With Master's degree in Science / Engineering and at least ten (10) years of hands-on experience – With Ph.D. degree in relevant disciplines and at least seven (7) years of professional experience
	I3	Wave Propagation & Transformation, Wave Tranquility	– With Master's degree in Coastal / Ocean Engineering or equivalent and at least ten (10) years of professional experience – With Ph.D. degree in relevant disciplines and at least seven (7) years of professional experience
	I4	Sediment Transport, Shoreline Evolution, Morphological Evolution	– With Master's degree in Coastal / Ocean Engineering and at least ten (10) years of professional experience – With Ph.D. degree in relevant disciplines and at least seven (7) years of professional experience
	I5	Oil Spill Modelling	– With Master's degree in Science / Engineering and at least ten (10) years of hands-on experience – With Ph.D. degree in relevant disciplines and at least seven (7) years of professional experience

III. Conditions for Registration

Conditions of Registration
for Environmental Consultants in the Emirate of Dubai

In conjunction to the "Code of Conduct for Environmental Consultants" (provided in Appendix 7), the following are the Conditions of the Registration, which shall be complied by the registered Environmental Consultant or any Environmental Consultancy Company with the intention to register with DM-ED.

A. General Conditions for All Environmental Consultants

1. An environmental consultancy company who intends to register to any of the Environmental Codes shall comply with the minimum qualification requirements provided in Table 1, the minimum requirements for submission provided in Appendix 1, and the procedure for registration provided in Appendix 2. The company shall have at least one (1) locally-based specialist who shall qualify and pass the written examination for any of the Environmental Codes.
2. An environmental consultancy company who intends to carry out an environmental impact assessment study (i.e. EIA Summary) which does not require any specialised study shall be registered with at least Environmental Code EAS.
3. Any application that does not comply with the DM-ED's minimum registration qualifications and requirements shall be rejected.

B. Specific Conditions for Registered Environmental Consultant

1. A registered Environmental Consultant shall not undertake any Environmental Code which the company does not have a registered specialist. DM-ED will not accept or review any environmental report or any section of an Environmental Impact Assessment (EIA) document prepared by Environmental Consultant who is not registered with DM-ED.
2. The names with corresponding signatures of the Environmental Consultant's registered specialists and the assigned principal technical reviewer, including the registered specialists based outside the UAE (if any), shall be declared and included in the environmental report. The signatures affixed in the report signify the accountability of the concerned specialists and technical reviewer on all information contained therein. The specialists involved in the report preparation, including the specialists based outside the UAE (if any), shall attend in person all technical meetings that may be required by the DM-ED. DM-ED reserves the right to reject any environmental report or EIA document without the names and signatures of the registered specialists involved in the preparation of the environmental report or EIA document.
3. A registered Environmental Consultant shall only appoint a sub-contractor or laboratory (i.e. for soil, groundwater, marine sediment sample collection, water quality, air quality and noise monitoring, etc.) duly accredited by the Emirates International Accreditation Centre (EIAC), formerly Dubai Accreditation Centre (DAC), to perform the specific monitoring or testing activity. DM-ED will reject any environmental monitoring report prepared by sub-contractor or laboratory without EIAC accreditation.
4. A registered Environmental Consultant who intends to update/change the company details shall comply with the minimum requirements for submission provided in Appendix 5-I and the procedure for registration provided in Appendix 6.
5. A registered Environmental Consultant who intends to register for a new Environmental Code or add a new specialist shall comply with the minimum qualification requirements provided in Table 1, the minimum requirements for submission provided in Appendix 5-II and the procedure for registration provided in Appendix 2. In case the new specialist is already registered, and is transferring from another company, it shall specifically indicate in the tabulated list of specialist the previous company of the new specialist, the Environmental Code(s) he or she was registered with the previous company, and the codes to be registered with the new company.
6. The renewal of registration shall be applied at least thirty (30) days before its expiry with the submission of updated documents (please refer to Appendix 3). The renewal of registration is subject to re-evaluation

of the Environmental Consultant's and specialist/s' qualifications, compliance with the conditions of registration, and performance for each registered Environmental Code.

7. In an event that a registered Environmental Code cannot be undertaken as a result of the departure of the registered specialist from the company, the EPSS shall be immediately updated and the company's registration shall be revalidated.
8. The Environmental Consultant's entire registration shall be automatically cancelled if:
    - o the Dubai license of the environmental consultancy company and / or the employment visa of the only locally-based registered specialist expires beforehand;
    - o the quality of the reports submitted to DM-ED are repeatedly and consistently not in compliance with the DM-ED requirements (i.e. maximum of three instances leading to an issuance of a warning letter by EPSS).
9. The Environmental Consultant's registration for a specific Environmental Code shall be automatically cancelled if:
    - o the registered specialist/s leaves the company without an alternate or replacement who is also registered under the company for the same Environmental Code;
    - o employment visa of the registered specialist/s, based locally or outside the UAE, expires beforehand without an alternate who is also registered under the company for the same Environmental Code.
10. The Environmental Consultant's entire registration or the registration for a specific Environmental Code shall be automatically cancelled if the evaluation of registration renewal documents shows that the Environmental Consultant did not provide any environmental service in the Emirate of Dubai within the last three (3) years.

IV. Applications for Registration

New applications for registration and request for the amendment (i.e. addition of Environmental Code or Specialist) or renewal of an existing registration shall be submitted manually to the EPSS. The Registration of Environmental Consultant Application Form (can be obtained from the EPSS) shall be submitted in one (1) hard copy with the soft copies of the minimum requirements for submission compiled in one (1) compact disk (CD) or flash drive.

The minimum requirements and procedures for registrations are provided in the Appendices as follows:

- Appendix 1: Minimum Requirements for the New Registration of Environmental Consultants;
- Appendix 2: Procedure for the New Registration of Environmental Consultants or Registration of New Environmental Code / Specialist for Registered Environmental Consultants;
- Appendix 3: Minimum Requirements for the Renewal of Environmental Consultant's Registration;
- Appendix 4: Procedure for the Renewal of Environmental Consultant's Registration;
- Appendix 5: Minimum Requirements for the Registration Amendment;
- Appendix 6: Procedure for the Request for Change in Company Details.

Appendix 1

Minimum Requirements for the New Registration of Environmental Consultants in the Emirate of Dubai

I. Basic Requirements

- Licensed in Dubai to undertake the activity "Environmental Consultants and Studies", or similar activity (i.e. for Dubai Freezone companies).
- Employs a specialist for the Environmental Code(s) to be applied for registration with qualifications compliant with Table 1 of this Annex. The specialist may handle maximum of two (2) Environmental Codes other than Code "EAS" provided that he or she has the relevant qualification and experience.
- Owns or leases the necessary software and/or equipment required to undertake the services under the environmental codes to be applied for registration.

II. Required Documents

A. Properly filled Registration of Environmental Consultant Application Form

B. Company Documents

- Copy of valid Dubai Professional License with the required activity.
- Organisational structure of the licensed company, to include the names and position of its key personnel.
- Office mailing address and contact details.
- A portfolio of the environmental consultancy projects in the UAE carried out in the last five (5) years by the company and approved by DM-ED or other relevant Authority.
- For companies registering with specialists based outside UAE:
    - o A letter from the Dubai-licensed company certifying that the specialist/s is/are employed in their international branch office;
    - o Copy of Company's Memorandum of Association and Certificate of Incorporation or Certificate of Registration of the international branch;
    - o International company profile;
    - o International corporate organisational structure.

C. Tabulated list of Specialist/s per Environmental Code

D. Documents of the Specialists

- Copy of passport, employment visa and Emirates ID (the employment visa of the specialists shall be under the Dubai-licensed company).
- Curriculum Vitae, copy of UAE attested diplomas, transcript of school records, and relevant training certificates.
- For specialists based outside the UAE (if any):
    - o Proof of employment (i.e. certificate of employment issued by the international branch office);
    - o Copy of passport;
    - o Copy of employment visa (if applicable, for Foreign Nationals);
    - o Curriculum Vitae;
    - o Copy of diplomas, transcript of school records, and relevant training certificates.

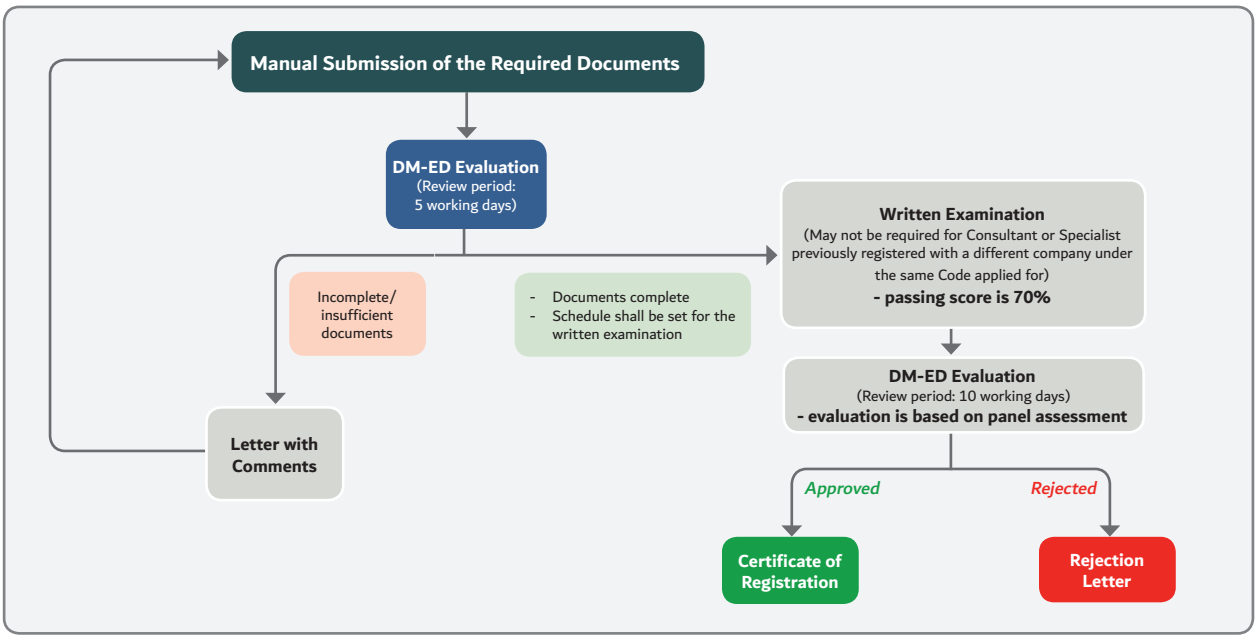
E. Software / Equipment Documents

- Copy of software license;
- Proof of ownership (e.g. receipts of purchase) or copy of contract/lease agreement with the equipment/software owner/proprietor/lessor;
- Copy of valid calibration certificates of the equipment.

Appendix 2

Procedure for the New Registration of Environmental Consultants or

Registration of New or Additional Environmental Code / Specialist for Registered Environmental Consultants in the Emirate of Dubai



Appendix 3

Minimum Requirements for the Renewal of Environmental Consultant's Registration

A. Properly filled Registration of Environmental Consultant Application Form

B. Company Documents

- Copy of updated/latest Dubai license with the required activity.
- Updated organisational structure of the licensed company, to include the names and position of its key personnel.
- Updated office mailing address, and contact details (if applicable).
- Updated portfolio of the environmental consultancy projects in the UAE carried out in the last three (3) years by the company and approved by DM-ED or other relevant Authority. The portfolio should include Projects in Dubai.
- For companies renewing registration with specialists based outside the UAE:
    - o A letter from the Dubai licensed company certifying that the specialist/s is/are employed in their international branch office;
    - o Copy of Company's Memorandum of Association and Certificate of Incorporation or Certificate of Registration of the international branch;
    - o Updated international company profile;
    - o Updated international corporate organisational structure.

C. Tabulated list of Specialist/s per Environmental Code

D. Documents of the Specialists

- Copy of latest valid passport, employment visa and Emirates ID (the employment visa of the specialists shall be under the Dubai licensed company).

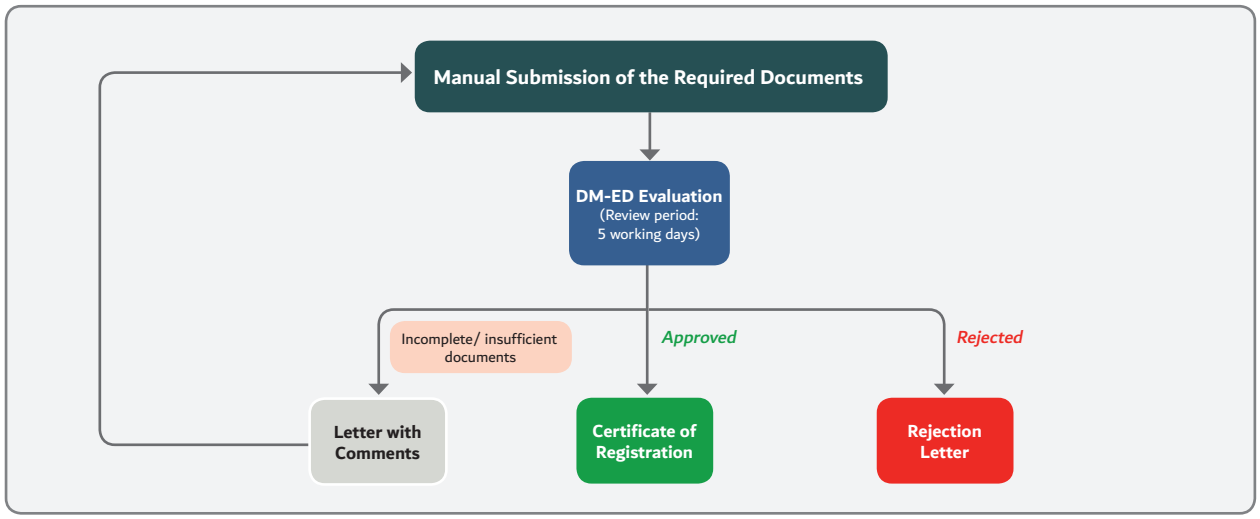
- Updated curriculum Vitae, copy of updated relevant training certificates (i.e. required to be UAE attested if issued outside the country).
- For specialists based outside the UAE (if any):
    - Proof of employment (i.e. updated certificate of employment issued by the international branch office);
    - Copy of latest valid passport;
    - Copy of updated employment visa (if applicable, for Foreign Nationals);
    - Updated Curriculum Vitae;
    - Copy of updated relevant training certificates.

E. Software / Equipment Documents

- Copy of latest/updated software license;
- Proof of ownership (e.g. receipts of purchase) or copy of latest/updated contract/lease agreement with the equipment/ software owner/proprietor/lessor;
- Copy of valid calibration certificates of the equipment.

Appendix 4

Procedure for the Renewal of Environmental Consultant's Registration



Appendix 5

Minimum Requirements for the Registration Amendment

A. Properly filled Registration of Environmental Consultant Application Form

I. Change in Company Details

B. Company Documents

- Copy of valid Dubai Professional License with the required activity.
- Organisational structure of the licensed company, to include the names and position of its key personnel.
- Office mailing address and contact details.
- For companies registering with specialists based outside UAE:

- Copy of Company's Memorandum of Association and Certificate of Incorporation or Certificate of Registration of the international branch;
- International company profile;
- International corporate organisational structure.

Note: After EPSS' evaluation, the company details will be updated in the database of Registered Environmental Consultants in the Emirate of Dubai.

II. New or Additional Environmental Code / Specialist

B. Tabulated list of Specialist/s per Environmental Code

C. Documents of the Specialists

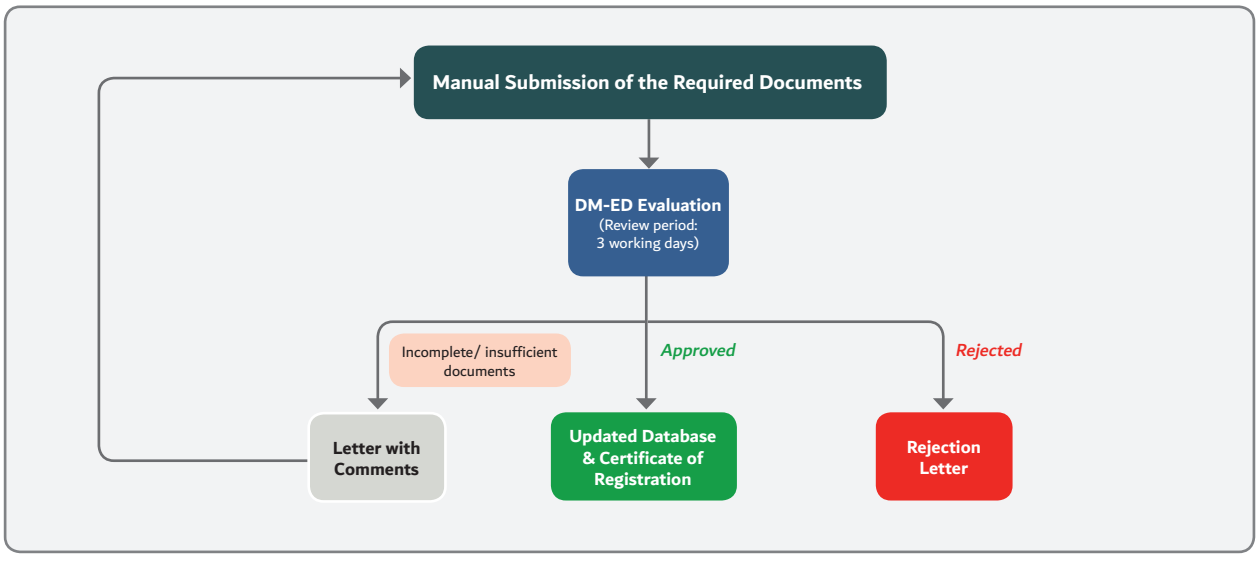
- Copy of passport, employment visa and Emirates ID (the employment visa of the specialists shall be under the Dubai licensed company).
- Curriculum Vitae, copy of UAE attested diplomas, transcript of school records, and relevant training certificates.
- For specialists based outside UAE (if any):
  - Proof of employment (i.e. certificate of employment issued by the international branch office);
  - Copy of passport;
  - Copy of employment visa (if applicable, for Foreign Nationals);
  - Curriculum Vitae;
  - Copy of diplomas, transcript of school records, and relevant training certificates.

D. Software / Equipment Documents

- Copy of software license;
- Proof of ownership (e.g. receipts of purchase) or copy of contract/lease agreement with the equipment/software owner/ proprietor/lessor;
- Copy of valid calibration certificates of the equipment.

Appendix 6

Procedure for the Request for Change in Company Details



Appendix 7

Code of Conduct for Environmental Consultants

All Registered Environmental Consultants are obliged to maintain and advance the reputation of the consultancy profession by rigorously observing this Code of Conduct. Failure to do so shall result in the reevaluation of Environmental Consultant's registration with the Dubai Municipality Environment Department (DM-ED).

Upon registration, the Environmental Consultant agrees and shall adhere to the set of responsibilities, but not limited to the following:

1. To act professionally and in unbiased manner, and not undertake any study that the Environmental Consultant is not registered and competent to perform;
2. To provide the agreed environmental services to the Project Owner or its appointed representative and comply with the environmental requirements of Dubai Municipality-Environment Department (DM-ED) with the highest level of professionalism;
3. To be truthful, accurate, and fair to the assigned work, without any fear or favor, while striving to increase the competence and prestige of the environmental impact assessment profession;
4. To judiciously use information required by DM-ED or acquired from the Project Owner or its appointed representative in the development and preparation of the Environmental Impact Assessment (EIA) document and any relevant environmental reports, and maintains confidentiality of information as required;
5. Not to intentionally communicate false or misleading information that may compromise the integrity of any EIA study;
6. Not to accept any favour from the Project Owner or its appointed representative and avoid any conflict of interest that may affect the environmental services to be carried out;
7. Not to act in a manner detrimental to the reputation of any of the stakeholders, Project Owner or its appointed representative, and DM-ED; and
8. To cooperate fully in any clarification procedure (e.g. official letter, request for meeting, etc.) as may be required by DM-ED.

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