DEWA Mohammed Bin Rashid Al Maktoum Solar Park – Phase V

900MW Solar PV IPP

Dubai, UAE

Environmental and Social Impact Assessment

Volume 4: Appendices

Prepared for:

June 2020

DOCUMENT INFORMATION

PROJECT NAME	DEWA Mohammed Bin Rashid Al Maktoum Solar Park – Phase V 900MW Solar PV IPP, Dubai, UAE
5CS PROJECT NUMBER	1305/001/079
DOCUMENT TITLE	Environmental and Social Impact Assessment – Volume 4: Appendices
CLIENT	ACWA Power
5CS PROJECT MANAGER	Max Burrow
5CS PROJECT DIRECTOR	Ken Wade

DOCUMENT CONTROL

VERSION	VERSION DATE	DESCRIPTION	AUTHOR	REVIEWER	APPROVER
1	04/06/2020	ESIA Volume 4 - Appendices	NM	MKB	KRW

1	Financial Capital
2	Social Capital
3	Natural Capital
4	Manufactured Capital
5	Human Capital

Regardless of location, mode of delivery or function, all organisations are dependent on *The 5 Capitals of Sustainable Development* to enable long term delivery of its products or services.

Sustainability is at the heart of everything that 5 Capitals achieves. Wherever we work, we strive to provide our clients with the means to maintain and enhance these stocks of capital assets.

DISCLAIMER

5 Capitals Environmental and Management Consulting
Principal office: PO Box 119899 Sheikh Zayed Road, Dubai, UAE
☏+971 4 343 5955 🖷+971 4 343 9366

APPENDIX A – ENVIRONMENTAL CLEARANCE

Environmental Clearance

Ref No EPBI-170220-00226 **Date** 02/03/2020

Project Information

Project Owner	: Dubai Electricity and Water Authority
Project Name	: Mohammed Bin Rashid Al Maktoum Solar Park
Location	: 971 - Saih Al dahel
Plot Number	: 971-7813
Scope	: Construction and operation of a 5,013 MW Photovoltaic (PV) and Concentrated Solar Power (CSP) Solar Park

Compliance Conditions

- This Environmental Clearance (EC) has been issued in accordance with the "Federal Law No. 24 of 1999 for the Protection and Development of the Environment", its Implementing Rules, Regulations and Amendments, and based on the final submitted Environmental Impact Assessment Report (EIAR, ref ED16.14_EIA Report, Revision 2 dated 07 November 2016) and revised Master Plan dated 09 October 2018.
- The Project implementation shall not lead to permanent damage or deterioration of the natural habitat and disruption of activities within the protected area (i.e. entry of visitors, entry of staff vehicles). Project site representatives should allow access to DM-Protected Area Officers to carry out random inspections at any time.
- All necessary measures shall be taken to ensure safe transit and/or passive relocation of mammals and to prevent wildlife incidents.
- Selection of flora and planting stock shall be in compliance with the list of species suitable and allowed by DM Horticulture and Irrigation Department and should not be classified as "Invasive Species" by the International Union for Conservation of Nature (IUCN).
- Failure to comply thereof or with any of the applicable requirements in the Environmental Laws and Regulations in the Emirate of Dubai and the compliance conditions in the Guidance on the EC requirements for Development and Infrastructure Projects in the Emirate of Dubai, shall result to the cancellation of this EC and legal action as per the Environmental Laws and Regulations in Emirate of Dubai.

The Dubai Municipality - Environment Department (DM-ED) reserves the right to amend the conditions of this document or impose additional conditions whenever deemed necessary to ensure protection of the Environment

Any violation of the above conditions will be subject to penalties.

Status Renewal **Valid Until** 01/03/2022

APPENDIX B – ESIA TERMS OF REFERENCE

DEWA Mohammed Bin Rashid Al Maktoum Solar Park – Phase V

900MW Solar PV IPP

Dubai, UAE

ESIA Terms of Reference

Prepared for:

January 2020

DOCUMENT INFORMATION

PROJECT NAME	DEWA Mohammed Bin Rashid Al Maktoum Solar Park – Phase V 900MW Solar PV IPP, Dubai, UAE
5CS PROJECT NUMBER	1305/001/079
DOCUMENT TITLE	ESIA Terms of Reference
CLIENT	ACWA Power
5CS PROJECT MANAGER	Max Burrow
5CS PROJECT DIRECTOR	Ken Wade

DOCUMENT CONTROL

VERSION	VERSION DATE	DESCRIPTION	AUTHOR	REVIEWER	APPROVER
1	15/01/2020	ESIA Terms of Reference	EFO	MKB	KRW

1	Financial Capital
2	Social Capital
3	Natural Capital
4	Manufactured Capital
5	Human Capital

Regardless of location, mode of delivery or function, all organisations are dependent on *The 5 Capitals of Sustainable Development* to enable long term delivery of its products or services.

Sustainability is at the heart of everything that 5 Capitals achieves. Wherever we work, we strive to provide our clients with the means to maintain and enhance these stocks of capital assets.

DISCLAIMER

5 Capitals Environmental and Management Consulting
Principal office: PO Box 119899 Sheikh Zayed Road, Dubai, UAE
☏+971 4 343 5955 🖷+971 4 343 9366

CONTENTS

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
BOO	Build Own Operate
DEWA	Dubai Electricity and Water Authority
EC	Environmental Clearance
EPs	Equator Principles
EPC	Engineering, Procurement and Construction
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
IFC	International Finance Corporation
IPP	Independent Power Project
OESMP	Operational Environmental Social Management Plan
O&M	Operation and Maintenance
PS	Performance Standards
RfP	Request for Proposal
SEP	Stakeholder Engagement Plan
ToR	Terms of Reference
5 Capitals	5 Capitals Environmental and Management Consulting

1 INTRODUCTION

To ensure a sustainable supply of clean energy in the Emirate of Dubai, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai launched the Dubai Programme for Renewable Energy in January 2012 and announced the Mohammed Bin Rashid Al Maktoum Solar Park, the largest single-site solar project in the world to enhance the sustainable development of Dubai.

The Solar Park aims to have a production capacity of 5,000MW upon completion by 2030, aligning with the Dubai Integrated Energy Strategy 2030, which seeks to secure a sustainable supply of energy by diversifying Dubai's energy mix, and increasing the use of clean and renewable energy sources to generate electricity.

The development of the Solar Park has been split into phases as follows:

- Phase I – a 13 MW solar Photovoltaic (PV) plant which was successfully commissioned in October 2013 by DEWA;
- Phase II - a 200 MW solar PV plant which was successfully commissioned in April 2017;
- Phase III - a 800 MW capacity solar PV plant scheduled to be commissioned by April 2020; and
- Phase IV - a 950 MW CSP - PV Hybrid Power Plant scheduled to be commissioned by 2023.

In order to meet the 5,000MW production capacity of the Solar Park by 2030, the fifth phase of the Mohammed Bin Rashid Al Maktoum Solar Park, a 900MW Solar PV project will be structured as an Independent Power Project to be developed on a BOO basis in three phases (300MW each phase). DEWA awarded the contract to construct the Phase V project to a consortium of Saudi Arabia's ACWA Power and Gulf Investment Company (GIC).

1.1 Scope of Work

ACWA Power has appointed 5 Capitals Environmental & Management Consultancy (5 Capitals) to prepare an Environmental & Social Impact Assessment (ESIA) Terms of Reference for the 900MW Solar PV Independent Power Project- Phase V in Dubai, UAE (herein referred to as 'the Project').

The ESIA ToR has been prepared to outline the anticipated environmental impacts associated with the Project and identify the respective scope of work required to prepare a robust ESIA.

An existing Environmental Clearance for the wider 3,843MW solar park was issued by Dubai Municipality Environmental Planning and Studies Section (DM-EPSS) and this covers the

development of PV and CSP projects within the stated landholding. The existing Environmental Clearance No. 034/2018 (see Appendix A) is based on an EIA prepared by DOME Consulting (2018), and includes stated conditions with respect to the implementation of all projects within the Park.

The proposed 900MW PV project falls within these boundaries and is under the scope of the existing solar park Environmental Clearance. As such, there is no requirement for a specific EIA to be prepared and submitted to DM-EPSS for separate project clearance. It is however required for the project to incorporate all applicable mitigation and management measures stated in the DOME EIA, as well as fulfilling any clearance criteria stated by Dubai Municipality in the Environmental Clearance.

It is understood that ACWA Power will seek project finance from financial institutions who may be signatories to the Equator Principles (a voluntary set of principles established to manage environmental and social investment risks), or have investment policies that are consistent with the IFC Performance Standards. As such, this ESIA ToR and subsequent ESIA will be submitted to the prospective project lenders and not to Dubai Municipality.

1.2 Objectives of the ESIA ToR

The main objectives of this ESIA ToR report in relation to the 'Project' are as follows:

- Identification of baseline environmental conditions based on review of available information to ensure baseline surveys are designed to enable the establishment of robust environmental conditions of the Project site and surroundings;
- Identification of potential key environmental impacts relating to the construction and operational phases of the project at an early stage to ensure assessment techniques for the subsequent ESIA to address these issues specifically; and
- Identification of the structure and content of the ESIA

This ToR has been informed by:

- Review of existing EIA report prepared for the 3,843 Solar Park (2018) and review of Environmental Clearance issued by Dubai Municipality to the Solar Park (March 2018);
- Analysis of the Project details and proposed works;
- Study of the relevant mapping and aerial photography and;
- Experience and review of ESIAs for similar projects and other local projects.

2 PROJECT DESCRIPTION

2.1 Project Overview

The scope of the Project comprises, amongst other things, the development, permitting, financing, design, engineering, procurement, construction, testing, commissioning, completion, insurance, ownership, operation and maintenance of the Plant by the Project Company

The Phase V Project will be implemented in three (3) phases as follows:

- Phase A - 300MW by 2nd April 2021;
- Phase B - 300 MW by 2nd April 2022, and
- Phase C - 300 MW by 2nd April 2023.

The Plant will be designed in such a way that the Maximum Power Output (active power) measured at the Electrical Delivery Point shall not exceed 900MW from the Plant at any time The Plant will use ground mounted PV technology with a minimum accumulated installed capacity of 900 MW connected to central inverter/transformer stations.

Power will be exported via two (2) 400/132 kV substations; namely, the existing MBR Solar Substation and the SHAMS Substation. The MBR Solar Substation is built and operational. The SHAMS Substation, a 400/132 kV substation, is currently under construction by DEWA and due to be completed in March 2021 (see figure 2-3 below). The interconnection between the Plant and the substations will be made through one 132kV underground cable for each 100 MW.

2.2 Project Location

The Project will be located at the Saih al Dahal area situated within the boundary of the Mohammed bin Rashid Al Maktoum Solar Park. The Solar Park is located about 53km south of the Dubai Creek, 21km south east of Al Maktoum International Airport (Dubai World Central: DWC) and approximately 23km away from the Dubai-Abu Dhabi border as shown in the figure below.

The site is owned by DEWA and DEWA will grant the Project Company a Musataha interest in the allocated site which is the equivalent under UAE law of a leasehold interest, but unlike a leasehold interest, a Musataha interest is registerable in the UAE. The right also allows the Project Company to build and own the Plant on the site independent of DEWA's ownership of the land and will grant easements and rights of way over designated areas outside of the site boundaries.

The Project will have a rectangular shape (approximately 2,752m E-W x 3,696m N-S) with a total area of approximately 10.17km^2. The site's altitude is between 100 and 120 meters above sea level (Figure 2-2).

Figure 2-1 Solar Park Location within the Emirate of Dubai Location

Figure 2-2 Project Location within Solar Park (Ref Red Boundary Line)

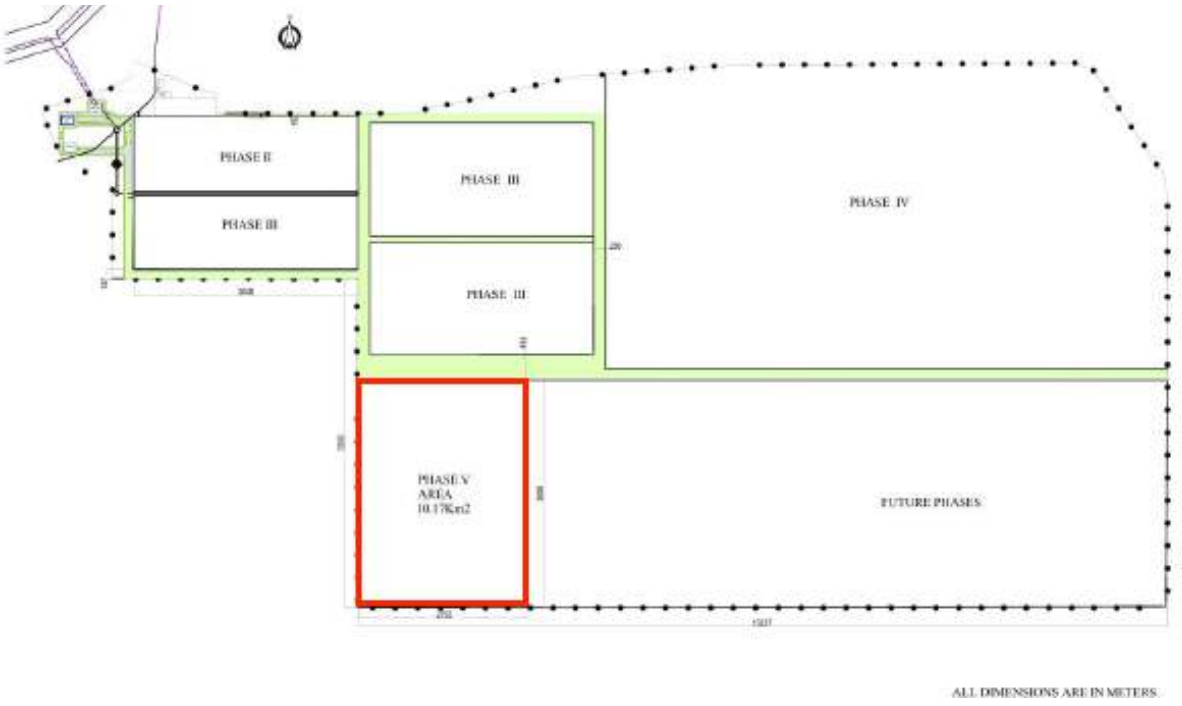
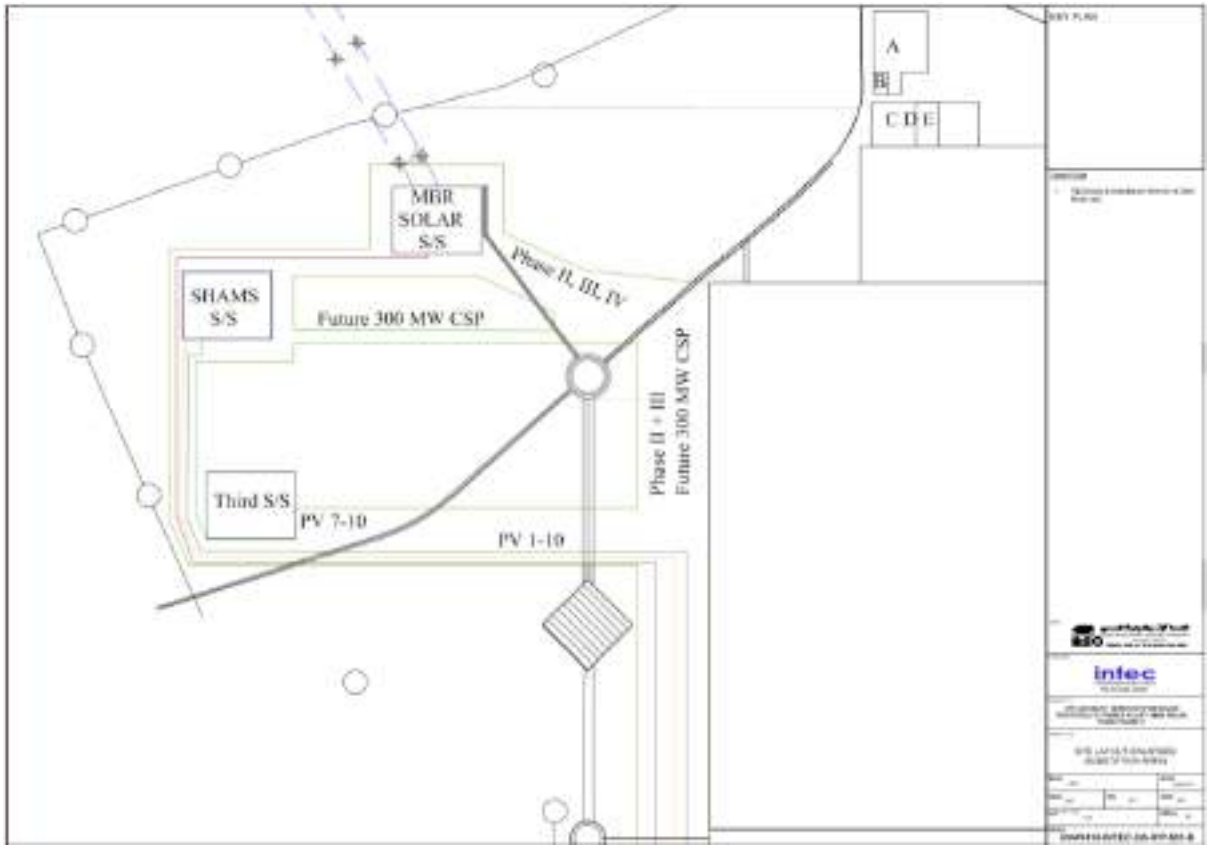


Figure 2-3 Location of Substations for Phase V



3 LEGAL FRAMEWORK

3.1 UAE Federal Regulatory Requirements

The federal law that establishes the framework for environmental protection in the UAE is Federal Law No. (24) of 1999 for the Protection and Development of the Environment. This law specifies the following key objectives:

- Protection and conservation of the quality and natural balance of the environment;
- Control of all forms of pollution and avoidance of any immediate or long-term harmful effects resulting from developments;
- Development of natural resources and conservation of biological diversity;
- Protection of the state of environment from the harmful effects of activities undertaken outside the region or state; and
- Compliance with international and regional conventions regarding environmental protection, control of pollution and conservation of natural resources.

Federal Law No. 24 of 1999 contains several environmental principles and standards as part of its Executive Order, which was issued by the Cabinet of Ministers in two Decrees:

- Ministerial Decree No. 37 of 2001 including the following regulations:
  - Regulation concerning Environmental Impact Assessment of Projects and;
  - Regulation concerning Handling of Hazardous Substances, Hazardous Wastes and Medical Wastes.
- Ministerial Decree No. 12 of 2006 on Regulation concerning the Protection of Air from Pollution; and
- Cabinet Resolution. No. (37) of 2001 on the Regulation for Hazardous Materials, Hazardous Waste and Medical Waste

Other Federal Laws also applicable to this Project are:

- Federal Law No. 11 of 2006 amending some provisions of Federal Law No. 24 of 1999;
- Federal Law No. 8 of 1980 concerning Regulation of Working Relations, as amended by Law No 12 of 1986. This is known as 'Labour Law' and is a comprehensive law that regulates all aspects of labour relations between employers and employees from employee entitlements to industrial safety, preventive measures, health and social care for workers and its Ministerial Orders or Decrees:
  - Ministerial Order No. 32 of 1982 Specifying Preventive Methods and Measures for Protecting Workers against Work Hazards;
  - Ministerial Decision No. 37/2 of 1982 on the Medical Care which the Employer is Obliged to Provide to his Workers;

- Cabinet Resolution No. 13 of 2009 Approving the General Standards Manual of the Labour Collective Accommodation and Attached Services;
- Ministerial Decree No. 764 of 2015 on Ministry approved Standard Employment Contracts;
- Ministerial Decree No. 765 of 2015 on Terminating Employment; and
- Ministerial Decree No. 766 of 2015 on Rules and Conditions for granting Work Permits.

- Federal Law No. 11 of 2002 for 'Regulation and Control the International Trade in Species of Wild Fauna & Flora';
- Federal Law No. 16 of 2007 concerning Animal Protection; and
- Federal Law No. 12 of 2018 on the Integrated of Waste Management.

3.2 Local Standards and Regulatory Requirements

In the Emirate of Dubai, the entity responsible for developing environmental regulations in response to UAE Federal Law No. (24) of 1999 is the Dubai Municipality Environmental Planning and Studies Section (DM-EPSS). The local law that establishes the framework for environmental protection within the Emirate is the Local Order 61/1991 which addresses environmental issues relating to the disposal of wastewater, air pollution, noise pollution and protected areas for wildlife.

In addition to the Local Order 61 of 1991 on the Environment Protection Regulations in the Emirate of Dubai, the following environmental regulations, standards and guidelines are relevant to this Project and have been considered in the preparation of this ESIA ToR report:

- Administrative Order No. 211 of 1991 on the Issue of the Executive Regulations for the Local Order No. 61 of 1991 on the Environment Protection Regulations in the Emirate of Dubai;
- Local Order No. 2 of 1998 on the Management of Protected areas in Dubai;
- Local Order No. 11 of 2003 concerning Public Health and Community Safety in the Emirate of Dubai and Local Order No. 2 of 2004 amending Local Order No. 11 of 2003;
- Federal Law No. 12 of 2018 on the Integrated of Waste Management
- Local Order No. 15 of 2008 on the Protection of Groundwater in the Emirate of Dubai;
- Local Decree No. 22 of 2014 regarding the Establishment of Wildlife Sanctuaries in the Emirate of Dubai; and
- Administrative Resolution No 38-2012 Amending Administrative Resolution No. (30) of 2007 Issuing the Implementing Regulations of Local Order No. (11) of 2003 Concerning Public Health and Community Safety in the Emirate of Dubai;
- Administrative Resolution No. 30 of 2007;

- Local Order No. 11 of 2003 Concerning Public Health and Safety of the Society in the Emirate of Dubai;
- Local Order No. 8 of 2002 Regarding Sewage, Irrigation, & Water Drainage in the Emirate Of Dubai;
- Local Order No. 10 of 2003 Concerning Technical Conditions To be Fulfilled by Electrical Equipment in the Emirate of Dubai; and
- All applicable Codes of Practice, Information Bulletins and Circulars issued by Dubai Municipality - EPSS.

In addition, Dubai Municipality has developed a series of Technical Guidelines and Environmental Standards concerning the protection of the environment and the conservation on the natural resources in the Emirate of Dubai. The Technical Guidelines present the accredited technical requirements that must be observed and adhered to by the Project. The most significant Technical Guidelines published by the DM-EPSS are listed below:

- Guidance on the Environmental Clearance (EC) Requirements for Development and Infrastructure Projects in the Emirate of Dubai (2019); and
- Technical Guideline on Translocation, Handling, and Restoration of Wildlife (2018).

3.3 International Treaties and Convention

Table 3-1 Regional Protocols and Conventions

NAME OF REGIONAL PROTOCOL/ CONVENTION	SIGNED/ RATIFIED
Convention on Conservation of Wildlife and its Natural Habitats in the GCC Countries, 2001	2003

Table 3-2 International Protocols and Conventions

NAME OF INTERNATIONAL PROTOCOL/CONVENTION	SIGNED/ RATIFIED
Memorandum of Understanding concerning the Conservation of Migratory Birds of Prey in Africa and Eurasia	2008
Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), 1997 - Non-Annex I Country	2005
Stockholm Convention on Persistent Organic Pollutants (POPs), 2001	2002
United Nations Convention to Combat Desertification (UNCCD), 1994	1999
United Nations Convention on Biological Diversity, 1992	1999
United Nations Framework Convention on Climate Change (UNFCCC), 1992	1995
Paris Agreement to the UN Framework Convention on Climate Change	2016
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989 and amendments in 1995	1992

NAME OF INTERNATIONAL PROTOCOL/CONVENTION	SIGNED/ RATIFIED
Montreal Protocol on Ozone Depleting Substances, 1987 and Montreal Amendments (London 1990, Copenhagen 1992, Vienna 1995, Montreal 1997, Beijing 1999)	1989
Vienna Convention for the Protection of the Ozone Layer, 1985	1989
Geneva Convention on Long-Range Transboundary Air Pollution, 1979	-
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1973	1999
Convention Concerning the Protection of World Cultural and Natural Heritage, 1972	-

3.4 Lenders Requirement

It is understood that ACWA Power will seek project finance financial institutions who may be signatories to the Equator Principles (a voluntary set of principles established to manage environmental and social investment risks), or have investment policies that are consistent with the IFC Performance Standards. As such there are a number of separate requirements for the Environmental and Social Impact Assessment (ESIA) of the project as set out below.

A core difference between DM-EPSS and lender requirements is the extent of Social Assessment required by the lenders. Hence the impact assessment for International Lenders is termed as Environmental and Social Impact Assessment (ESIA). The Equator Principles require compliance with International Finance Corporation (IFC) Performance Standards. When DM-EPSS regulations differ from the levels and measures presented by IFC Performance Standards and IFC EHS Guidelines, the Project will aim to achieve whichever is more stringent.

3.4.1 The Equator Principles

The Equator Principles (EP) are a risk assessment framework used by financial institutions to determine, assess and manage the environmental and social risk in projects financing. The Equator Principles were updated in 2006 (EPII) to include projects with a capital cost of US$10 million or more across all industry sectors and these are the prevailing applicable conditions for this project. The Equator Principles Association Steering Committee reviewed the Equator Principles in 2011 and approved the latest version, EP III on April 26th 2013. These became effective from June 2013.

The EPs establish the minimum standards to be adopted by the EP Financial Institution (EPFI) as those from IFC Performance Standards/World Bank EHS Guidelines and/or the relevant host country laws, regulations and permits that pertain to environmental and social issues.

The Equator Principles consist of the following principles:

- Principle 1 - Review and Categorisation
- Principle 2 - Environmental and Social Assessment
- Principle 3 - Applicable Environmental and Social Standards
- Principle 4 - Environmental and Social Management System and Equator Principles Principle Action Plan
- Principle 5 - Stakeholder Engagement
- Principle 6 - Grievance Mechanism
- Principle 7 - Independent Review
- Principle 8 - Covenants
- Principle 9 - Independent Monitoring and Reporting
- Principle 10- EPFI Reporting

3.4.2 IFC Performance Standards

The IFC Performance Standards are designed to help avoid, mitigate, and manage risks and impacts throughout the life of a project as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. The 2006 version of the IFC Performance Standards was reviewed and made applicable to all new projects from 1st January 2012. The updated IFC PSs reflect IFC's stronger commitment to climate change, business and human rights, corporate governance and gender equality as well as strengthening the due diligence process for IFIs. Such updates include comparable labour terms for migrant and non-migrant workers, clarification of levels of stakeholder engagement, monitoring of supply chains and an enhanced focus on energy efficiency.

IFC is a shareholder in ACWA Power, and therefore all ACWA Power projects must comply with the IFC Performance Standards and IFC EHS Guidelines. The following lists the IFC Performance Standards (2012):

- Performance Standard 1: assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labor and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples

- Performance Standard 8: Cultural Heritage

3.4.3 World Bank and IFC General EHS Guidelines

The World Bank Group and IFC Environmental, Health and Safety Guidelines (EHS Guidelines) are technical reference documents with general and industry-specific examples of GIIP, as defined in IFC's PS 3: Resource Efficiency and Pollution Prevention. IFC uses the EHS Guidelines as a technical source of information during project appraisal activities.

The World Bank Group International Finance Corporation (IFC), Environmental, Health and Safety (EHS) General Guidelines of April 2007 superseded the World Bank Handbook issue of 1998. The updated EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS 3: Resource Efficiency & Pollution Prevention, as well as certain aspects of Occupational and Community Health and Safety. The General EHS Guidelines contain information on crosscutting environmental, health, and safety issues potentially applicable to all industry sectors. No industry specific guidelines have been developed for solar power projects.

The General EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology.

3.5 Environmental Standards and Guidelines

The applicable environmental standards for the Project as per the national regulations and lender guidelines are outlined below.

Table 3-3 Applicable Standards & Guidelines

Environmental Parameter	UAE & Dubai Standards	Lender Guidelines
Ambient Air Quality	Ministerial Decree No. 12 of 2006 concerning Protection of Air from Pollution - Annex (2) establishes Federal Maximum Allowable Emission Limits of Air Pollutants emitted from Hydrocarbon Fuel Combustion Sources. Annex 7 establishes the maximum allowable limits of dust in working areas and Annex 8 establishes the Ambient Air Quality Standards.	IFC EHS General Guidelines: Table 1.1.1: WHO Ambient Air Quality Guidelines
Noise	Ministerial Decree No. (12) of 2006 concerning Protection of Air from Pollution - Annex (6) establishes Maximum allowable limits for noise levels in different areas and Local Order No. 61 of 1991 on the Environment Protection Regulations of the Emirate of Dubai establishes the Maximum hours of exposure to noise levels for workers in Chapter VI 'Noise Control', Article 43.	IFC EHS General Guidelines: Table 1.7.1: WHO Noise Level Guidelines

Environmental Parameter	UAE & Dubai Standards	Lender Guidelines
Soil Quality	No specific standards available. For benchmarking purposes only (not compliance) it is proposed to reference the Dutch Soil Quality Standards.	
Groundwater	There are no established groundwater standards in the UAE . As such, the use of the Dutch standards is common practice for the analysis of groundwater, and these are viewed as good international practice.	

All the above-mentioned standards require project compliance. Where there is contradiction in limits between UAE and/or Dubai standards and lender guidelines, the most stringent will apply.

In accordance with lender requirements, where specific national standards do not exist, a good practice standard should be applied.

4 ESIA METHODOLOGY

Given that the Phase V Project is already covered under the existing 3843MW Solar Park clearance provided by DM-EPSS for all PV and CSP projects, there is no requirement for a specific EIA or DM-EPSS Environmental Clearance for the proposed Project. As such, the ESIA that would be prepared for this Project will not be submitted to Dubai Municipality and no Environmental Clearance/Approval/Permit will be obtained. The ESIA methodology outlined herein is only for project finance required by international financial institutions.

In order to satisfy lenders requirements and align with the PPA requirements, the ESIA will be undertaken through the implementation of the following stages.

- Stage 1: Baseline Studies and Research
- Stage 2: Project Stakeholder Analysis and Consultations
- Stage 3: Impact Assessment
- Stage 4: Identification of Mitigation and Management Measures
- Stage 5: ESIA Reporting
- Stage 6: Preparation of Environmental & Social Management Framework

4.1.1 Stage 1: Baseline Studies and Research

The baseline studies and research will provide a benchmark of the existing environmental and social conditions around & within the Project site by which the potential impacts of the proposed project can be assessed for the construction and operational phases. Baseline surveys will comprise collection of primary or secondary data (or a combination), which may include physical surveys on-site, use of maps, satellite imagery, references from relevant studies and other available data sources.

The collection of data will cover the range of physical, ecological, public health, socioeconomic, occupational health, cultural heritage aspects etc. that are likely to be affected (directly or indirectly) by the construction and operational phases of the Project.

The proposed baseline surveys required for the Phase V Project is presented in Section 5 of this report.

4.1.2 Stage 2: Project Stakeholder Analysis and Consultations

Consultation with stakeholders is an essential part of the environmental & social assessment process. The main objective of the consultation is to establish a dialogue with those stakeholders who may be affected by aspects of the Project or may have an interest in the outcome of the ESIA process. However, specific requirements for stakeholder engagement

have not been established in the UAE, and are not recognised as a necessity in the ESIA process.

In regard to the lender requirements, all of the IFC Performance Standards include requirements for an amount of stakeholder engagement (either in the ESIA, or as part of the future ESMS) and therefore the project will require a level of engagement. In particular, IFC Performance Standard 1 on "Social and Environmental Assessment and Management Systems" describes the stakeholder engagement requirements in more depth. It states the following:

"Stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts. Stakeholder engagement is an on-going process that may involve, in varying degrees, the following elements:

- Stakeholder analysis and planning;
- Disclosure and dissemination of information;
- Consultation and participation;
- Grievance mechanism; and
- On-going reporting to Affected Communities.

The nature, frequency, and level of effort of stakeholder engagement may vary considerably and will be commensurate with the project's risks and adverse impacts, and the project's phase of development."

As common and good practice, stakeholder engagement is considered a key aspect of all projects and should be undertaken at the ESIA stage in order to notify, gain views and enable a better understanding of the dynamics of the local environment.

With respect to the Phase V project, due to the lack of any required land acquisition, rights of way and the development of the project away from sensitive receptors, only a few stakeholders have been outlined for consultation and these are presented in Section 5.2 of this report alongside reporting requirements.

4.1.3 Stage 3: Impact Assessment Significance Criteria

In order to obtain a credible assessment of environmental impacts, the assignment of 'effect significance' to each identified impact needs to be a robust, consistent and transparent process. The methodology to assess 'effect significance' during the preparation of the ESIA is

outlined below and follows an International Best Practice guideline[1] based on the assumption that the significance of an impact on resources or receptors is considered to result from an interaction between three factors:

- The nature and magnitude of the impact (i.e. a change in the environment, social and/or health baseline conditions);
- The number of resources or receptors affected (i.e. humans and the environment);
- The environmental value or sensitivity of those resources or receptors to the change.

A three-step approach will be used to determine the significance of environmental effects, as follows:

- **Step 1** – Evaluation of value/sensitivity of resource or receptor;
- **Step 2** – Assessing the magnitude of the impact on the resource or receptor; a
- **Step 3** – Determining the significance of impacts

Identification and Evaluation of Sensitive Receptors

Sensitive receptors are defined as:

- Elements of the ***environment*** that are of value to the functioning of natural systems (i.e. areas or elements of ecological, landscape or heritage value, species, habitats and ecosystems, soil, air and water bodies or land-use patterns);
- ***Social*** receptors, such as stakeholders (i.e. users of dwellings, places of recreation, places of employment, community facilities or household relocation) and human systems (e.g. employment market, population disease susceptibility and disease communicability, exposure to toxicity of chemicals).

During the preparation of the ESIA, the environmental value (or sensitivity) of the environmental & social value (or sensitivity) of the resource or receptor will be defined by using the criteria in the table below.

[1] See for example Scottish Natural Heritage (2009) A handbook on environmental impact assessment or Highways Agency (2008) Assessment and Management of Environmental Effects design manual for roads and bridges HA 205/08 Volume 11, Section 2, Part 5.

Table 4-1 Environmental Value of Receptor or Resource

VALUE (SENSITIVITY)	DESCRIPTION OF VALUE
Very High	• High importance and rarity on an international scale and limited or no potential for substitution. • The receptor has already reached its carrying capacity, so any further impact is likely to lead to an excessive damage to the system that it supports. • Locations or communities that are highly vulnerable to the environmental impact under consideration or critical for society (e.g. indigenous peoples, hospitals, schools).
High	• High importance and rarity on a national scale, and limited potential for substitution. • The receptor is close to reaching its carrying capacity, so a further impact may lead to a significant damage to the system that it supports. • Locations or communities that are particularly vulnerable to the environmental impact under consideration (e.g. residential areas, vulnerable/marginalized groups).
Medium	• High or medium importance and rarity on a regional scale, limited potential for substitution. • The receptor is already significantly impacted, but it is not close to reaching its carrying capacity. Further impacts will get increase the stress of the underlying system, but evidence does not suggest that it is about to reach a critical point. • Locations or groups that are relatively vulnerable to the environmental impact under consideration (e.g. commercial areas).
Low	• Low or medium importance and rarity on a local scale. • The receptor is not significantly impacted and shows a large spare carrying capacity. Impacts are not likely to generate any noticeable stress in the underlying system. • Locations or groups that show a low vulnerability to the environmental impact under consideration (e.g. industrial areas).
Very Low	• Very low importance and rarity on a local scale. • The receptor is not impacted and shows a very large spare carrying capacity. Impacts are very unlikely to generate any noticeable stress in the underlying system. • Locations or groups that show a very low vulnerability to the environmental impact under consideration (e.g. industrial areas).

The existence of receptors that are legally protected (e.g. designated areas, protected habitats or species) will be taken into consideration for the assessment of the sensitivity of the receptors.

Identification and Evaluation of Potential Impacts

In line with 5 Capital's assessment methodology, the following types of impacts will be considered:

- Direct Impacts - Potential impacts that may result from the construction and operation of the Project acting directly on an environmental or social receptor (e.g. land take for construction of the camps);
- Indirect Impacts – Potential impacts which are not a direct result of a Project activity, often produced later in time or further removed in distance, but are normally a result of a complex pathway (e.g. dust deposition on vegetation which causes reduction in photosynthetic rates);
- Beneficial Impacts – Impacts that have a positive, desirable or favourable effect on the sensitive resources or receptors (e.g. landscape providing artificial habitat for a variety of species, creating jobs during the construction and/or occupation phases of a project);
- Adverse Impacts – Impacts that are detrimental and have a negative influence on sensitive resources or receptors;
- Event Related Impacts - Potential unplanned or accidental impacts stemming from an unintentional event such as fire, explosion, oil spill, etc. taking into consideration likelihood of occurrence;
- Cumulative Impacts - The additive potential impacts that may result from the incremental potential impacts of the planned Project plus the potential impacts of reasonably anticipated future projects or future phases of a same development.

The magnitude of the impact refers to the extent of change that is anticipated to occur for the receptor(s) under consideration and is considered as a function of:

- Extent/scale;
- Duration;
- Frequency and;
- Likelihood of occurrence.

In other words, the criterion that will be used for assessing the magnitude of impacts includes: the geographical scale of the impact, the permanence of impact and the reversibility of the impacted condition. A brief description of the magnitude of the impacts is provided in the table below.

Table 4-2 Criteria for Magnitude of Impacts

MAGNITUDE OF IMPACT	DESCRIPTION OF MAGNITUDE
Major	*Adverse:* Loss of resource and/or quality and integrity; severe damage to key characteristics, features or elements. A major impact is usually large scale, permanent and irreversible. *Beneficial:* Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	*Adverse:* Significant impact on the resource, but not adversely affecting the integrity; Partial loss of/damage to key characteristics, features or elements. Moderate impacts usually extend above the site boundary, and are usually permanent, irreversible or cumulative. *Beneficial:* Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	*Adverse:* Some measurable change in attributes quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Minor impacts usually are only noticeable within the site and are temporary and reversible. *Beneficial:* Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	*Adverse:* Very minor loss or detrimental alteration to one or more characteristics, features or elements. *Beneficial:* Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Determination of Significance of Impacts

Significance of impacts is determined by taking into consideration the sensitivity of an identified receptor or resource and the magnitude of the project impact. That is, the greater the environmental sensitivity of an identified receptor or resource, and the greater the magnitude of impact, the more significant the impact (project impact).

In addition to this, where a project has a major detrimental impact on a highly valued environmental resource/receptor, the consequences of that impact on the said resource would be significant adverse effect. In other words, it is the result of the impact acting on the receptor that produces an environmental effect.

Effects can be either beneficial or adverse. The table below shows the criterion that will be used for determining the significance of Project's environmental impacts based on the above explanation. Definitions of each significance categories are provided in table 4-4.

Table 4-3 Criteria for Determining Significance of Impacts

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		No change	Negligible	Minor	Moderate	Major
SENSITIVITY OF RECEPTOR	Very High	Neutral	Minor	Moderate to Major	Major	Major
	High	Neutral	Minor	Minor to moderate	Moderate to Major	Major
	Medium	Neutral	Negligible to minor	Minor	Moderate	Moderate to Major
	Low	Neutral	Negligible to minor	Negligible to minor	Minor	Minor to moderate
	Very Low	Neutral	Negligible	Negligible to minor	Minor	Minor

In some cases, above the significance is shown as being one of two alternatives. In these cases, a single description will be decided upon with reasoned judgement for that level of significance chosen.

Table 4-4 Definition of Impact Significance

SIGNIFICANCE CATEGORY	CRITERIA
Very Large	Only adverse effects are assigned this level of importance as they represent key factors in the decision-making process. Effects are associated with sites and features of national or regional importance. Effects exceed statutory limits. Mitigation measures are unlikely to remove such effects.
Large	Important considerations at a local scale but, if adverse, are potential concerns to the project and may become key factors in the decision-making process. Mitigation measures and detailed design work are unlikely to remove all of the effects upon the affected communities or interests.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource. They represent issues where effects will be experienced but mitigation measures and detailed design work may ameliorate or enhance some of the consequences upon affected communities or interests. Some residual effects will still arise.
Slight	Local issue unlikely to be of importance in the decision-making process. Effects do not exceed statutory limits. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
Neutral	No effect or effect that is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. No mitigation is required.

Where potential significant impacts ('Major' or 'Moderate to Major') are identified, mitigation & management measures will be proposed to mitigate (adverse) or enhance (positive)

impacts. Mitigation measures will be developed commencing with avoiding risks/impacts, followed by minimizing them, and finally compensating/offsetting residual impacts if applicable. Where potential impacts that do not require further actions are identified, this will be clearly stated in the ESIA.

Section 5.3 of this report provides the environmental & social aspects that will be addressed in the ESIA as a result of the Projects (Phase V) development .

4.1.4 Stage 4: Identification of Mitigation & Management Measures

The Project includes a variety of measures to ensure that environmental standards and guidelines can be achieved by the project. The projects impact assessment process as outlined above will therefore take into consideration those measures included to the projects design. In addition to specific measures included to the projects design, the ESIA will outline further mitigation and/or management measures for the construction and the operational phase, upon which the project can further minimise or avoid negative impacts, and ameliorate positive impacts.

Most impacts will be fully mitigated through commitment to develop project environmental and social plans (such as Emergency Preparedness and Response Plans, Waste & Wastewater Management Plan, Chance Find Procedure, Working Conditions and Terms of Employment Procedure, Occupational Health & Safety Plan, etc.).

4.1.5 Stage 5: ESIA Reporting

The ESIA report will be presented in the following format developed by 5 Capitals:

- **Volume 1:** Non-Technical Summary
- **Volume 2:** Main Text, Tables, Figure and Plates
- **Volume 3:** Environmental and Social Management Framework
- **Volume 4:** Appendices

Volume 1 will provide a Non-Technical Summary of the ESIA, including the main outcomes, and conclusions.

Volume 2 will comprise of the main text of the ESIA and full impact assessment, with mitigation, management and monitoring measures identified.

Volume 3 (ref. to Stage 6 below) will provide a framework for the development of the project's Environmental & Social Management System (ESMS) for construction and operations, and how the outcomes of the ESIA should be implemented and managed in practice. This includes the development of the overarching environmental management plans, such as the Construction

Environmental & Social Management Plan (CESMP), Operational Environmental & Social Management Plan (OESMP) and complimentary plans and procedures. The framework presented in Volume 3 will be consistent with ESMS requirements stated in IFC PS1.

Volume 4 will comprise of Appendices.

4.1.6 Stage 6: Preparation of Environmental and Social Management Framework

As part of the ESIA (ESIA Vol. 3) for the Phase V Project, a framework Environmental and Social Management Plan (ESMP) will be prepared for the effective management of potential environmental and social issues that may arise throughout the construction and operational phases of the Project. The framework ESMP will be informed by the outcome of the ESIA as mitigation & management measures as identified through the ESIA process for construction and operations will be outlined. Also, applicable monitoring & reporting requirements will be provided in the ESMP.

The ESMP will be developed to ensure that all Environmental and Social Impacts associated with both the construction and operational phases of the project are appropriately controlled by the effective implementation of proposed management measures. This will be undertaken for each phase of the Project through the development of a project specific construction phase ESMS and operational phase ESMS.

The ESMP will be intended to be a live document subject to regular review and update as the project evolves.

As a minimum, the ESMP will include the following:

- Project's Environmental and Social objectives and commitments
- Applicable activities and timescales for construction/operation;
- A schedule of actions to be implemented including the specific impact mitigation measures identified in the ESIA
- Organizational structure and roles & responsibilities for effective implementation of mitigation measures.
- List of complimentary E&S plans and procedures to be developed by the Project's EPC and/ O&M contractors
- Monitoring and reporting requirements including measures for inspection, audit, review and preventative action.

Note: Prior to the commencement of construction works at the Project site, Dubai Municipality will require that a project specific Construction Environmental Management Plan (CEMP) is

submitted for approval (According to Condition No.5 of the Environmental Clearance issued to the Solar Park). This CEMP will need to be developed by the respective Engineering, Procurement and Construction (EPC) Contractor and would cover all potential environmental and social impacts associated with the project's construction phase (including potential impacts from subcontractors). Following receipt of a construction phase permit/clearance/approval, the EPC Contractor will be responsible for the successful implementation of the CEMP across the Project site.

5 TERMS OF REFERENCE

5.1 Receptors

The following receptors have been initially identified based on local knowledge of the Project site and its surrounding environment, review of satellite imagery and available previous studies. These local receptors have been identified within the solar park and a 5km radius of the Project site, which is considered to be the expected range of the Project's area of influence.

Table 5-1 Local Receptors

RECEPTOR	RECEPTOR TYPE	DISTANCE FROM THE PHASE V PROJECT SITE
Phase I - 13MW PV Project	**Industrial**	Approximately 5.2km to the northern boundary of the Project site
Phase II - 200MW PV project		Approximately 3.3km to the northern boundary of the Project site
Phase III - 800MW PV Project - Field A		Approximately 1.9km to the northern boundary of the Project site
Phase III - 800MW PV Project - Field B		Approximately 2.4km to the northern boundary of the Project site
Phase III - 800MW PV Project - Field C		Approximately 440m to the northern boundary of the Project site
Phase IV - 950MW PV & CSP Project- Parabolic Trough 1		Approximately 1.3km from the south boundary to the northern boundary of the Project site
Solar Innovation Centre	**Educational**	Approximately 5.4km to the northern boundary of the Project site
Research and Development Centre	**Commercial**	Approximately 6km to the northern boundary of the Project site

5.2 Preliminary Potential Impacts

Although the development of the Solar PV Project is associated with the generation of renewable energy and is an important step towards achieving sustainable development within the Emirate of Dubai and the Country, the construction and operation of the Project will potentially result in impact (both positive & negative) upon environmental and social parameters. Most of the potential negative impacts are however expected to be minimal due to the location of the Project and the presence of only industrial receptors within its vicinity.

The tables below outline the preliminary environmental & social impacts expected to be associated with the construction and operational phases of the Project.

Table 5-2 Preliminary Potential Environmental & Social Impacts – Construction Phase

ENVIRONMENTAL & SOCIAL PARAMETER	POTENTIAL IMPACTS
Air Quality	• Dust generation during site preparation and earthworks; • Gaseous emissions from vehicles, machinery & equipment. • Inadequate containment/storage of fuels, paints, solvents and other volatile substances. • Odour due to the inadequate management of sanitary facilities.
Noise & Vibration	• Noise from machinery & vehicle use for excavation, grading, piling, compacting activities, etc.; • Noise from vehicle movement within the site and along solar park road; • Vibration generation during breaking, piling and use of vibratory rollers.
Terrestrial Ecology	• Loss of habitat and flora species due to site preparatory works and clearance; • Impacts to fauna species from noise, vehicles, habitat loss; • Habitat fragmentation in the wider area;
Soil & Groundwater Quality	• Cross contamination of soils; • Accidental leaks & spillages of hazardous materials or chemicals; • Inadequate waste & wastewater management
Waste and Wastewater	• Inappropriate management of construction solid hazardous & non-hazardous wastes; • Inappropriate management of wastewater and liquid wastes.
Landscape Character and Visual Impacts	• Change in landscape character through land use and topographical changes as a result of site clearance, fencing, vehicle movements, etc. • Impacts to the visual amenity of the envelope of local receptors. ***NB:*** *Change in landscape character as a result of the Project's development will not be significantly noticeable as the construction of new structures & installation of PV Panels will embed with the present landscape character (industrial) of the Solar Park.*
Archaeology & Cultural Heritage	• Accidental damage or destruction to potential unknown archaeological resources buried within the Project site.
Socio-Economics	• Dissemination of construction skills from expatriate workers into the local labour force; • Creation of employment opportunities; • Increased traffic along the Solar Park road during construction.
Community Health & Safety	• Risk to public safety from increased road vehicles (particularly HGVs), use of high-powered equipment, accidental pollution releases, issues with site security etc.; • Potential for community exposure to diseases as a result of worker influx into local area.
Labour and Working Condition	• Risk to the health & safety of Project workforce during movement of heavy machinery, excavation, handling of chemical, etc. • Quality of accommodation for workers.

Table 5-3 Preliminary Potential Environmental & Social Impacts – Operational Phase

ENVIRONMENTAL & SOCIAL PARAMETER	POTENTIAL IMPACTS
Air Quality	• Gaseous emissions from vehicles, machinery & equipment during operations (Assuming emergency diesel generators & diesel fire pumping systems will be used during operations).
Terrestrial Ecology	• Habitat fragmentation; • Potential bird mortality. Due to lake effect
Soil Quality	• Accidental leaks & spillages of hazardous materials or chemicals.
Waste and Wastewater	• Inadequate management of solid hazardous & non-hazardous wastes; • Inadequate management of Wastewater and liquid waste generation and disposal.
Landscape & Visual Amenity	• Change in landscape character due to installation of thousands of PV arrays; • Aesthetic impacts and glare during operation.
Socio-economics	• Sustainable supply of renewable energy in the Emirate of Dubai • Employment opportunities and dissemination of skills to UAE Nationals related to the operation of the facility

Note: Gaseous emissions during the operational phase is expected to be minor due to the use of few vehicles during Project's operational phase.

On the basis of the above identified preliminary potential impacts for construction and operational phases, the following baseline studies and preliminary impact assessment are proposed in Section 5.3 & 5.5 respectively.

5.3 Proposed Baseline Studies

The table below outlines the proposed baseline surveys required for the Project. The scope of the required studies outlined below is based upon the existing level of information available and based on the potential impacts identified above.

Table 5-4 Proposed Baseline Surveys

Environmental & Social Parameter	Proposed Baseline Studies
Air Quality	• Conduct ambient air quality monitoring within or around the Project site and at receptor location to determine concentrations of carbon monoxide (CO). nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3) and Particulate Matter ($PM_{2.5}$ and PM_{10}). • The monitoring campaign will run for a 72-hour period to ensure the provision of conditions that can be compared with hourly and 24-hourly standards, as well as indicating diurnal fluctuations in ambient air quality. • Establish a meteorological station adjacent to the air quality monitoring station for the period of the monitoring to measure wind speed, direction, humidity and temperature in order to characterize and describe the typical climate conditions within the Project area.
Noise and Vibration	• Conduct day & night time noise survey at representative locations within the Project area and at receptor locations to confirm baseline conditions prior to commencement of Phase V construction works. • Given the location of the Project, ambient noise levels will be monitored for 15-minutes at each monitoring location during both day and night time.
Soil & Groundwater Quality	• Although the site has been identified as a greenfield site by DEWA (refer to the Minimum Functional Specifications of the RfP), soil sampling and analysis for common pollutants (including heavy metals and petroleum-based hydrocarbons) should be conducted within the Project site. • Sampling locations will be determined by olfactory evidence on-site at the time of sampling. • Due to the known depth of groundwater (>30m) and lack of foreseen long-term risks to groundwater quality or abundance, sampling of groundwater is not proposed.
Terrestrial Ecology/ Biodiversity	• Establish a habitat classification map • Given the potential ecological value within the vicinity of the project area, dawn and dusk ecological surveys will be undertaken at accessible, representative locations of each habitat within the project area. • Flora and fauna species to be identified during the ecological surveys and animal tracks & existential traces of fauna to be documented. • There are no bird flyways within the project locality based on knowledge of the area, however, the ecological baseline (transects surveys) will include consideration of avifauna by conducting dawn and dusk bird surveys
Archaeology and Cultural Heritage	• Although there are no archaeological artefacts or features of cultural heritage within the Project area, (based on knowledge of the area) site

Environmental & Social Parameter	Proposed Baseline Studies
	visual inspection will need to be undertaken to confirm the site does not host artefacts or cultural heritage element.
Waste & Wastewater	• Licensed facilities for waste and wastewater management will be identified, so that applicable management requirements can be identified in the ESIA.
Landscape and Visual	• The ESIA will apply a measure of value/sensitivity to the landscape and visual receptors identified.
Socio-Economics	• A detailed desktop review of available literature on the area will be carried out to identify and delineate human communities that may be affected one way or another by the construction and subsequent operation of the proposed power plant. Detailed statistics and demographic data will be obtained from relevant government information sources, where available.
Labour & Working Conditions	• The baseline will largely relate to the identification of the required labour force, existing areas of accommodation etc. so that effective assessment and mitigation can be undertaken in the ESIA.
Community Health, Safety & Security	• The ESIA will ensure that local receptors and communities are fully identified, so that potential impacts can be delineated and applicable mitigation measures pit in place.

5.4 Proposed Stakeholder Engagement

Proposed stakeholders to be consulted in regard to this ESIA are listed in the table below. All consultation will be subject to prior agreement by ACWA Power, and therefore may change from the intentions outlined below.

Table 5-5 Proposed Stakeholders for Consultation

Stakeholders	Intention for Consultation
Phase I -13MW PV	To inform about the Project and to obtain data/information in regard to the baseline conditions of the environment within the Solar Park for use as representative baseline data for the ESIA.
Phase II – 200MW	
Phase III – 800MW	
Phase IV-950 MW CSP - PV Hybrid	
Other Projects within the Solar Park (SIC & RDC)	

Prior to commencing consultation, a clear action plan on how the identified stakeholders will be consulted will be developed. The result of the stakeholder identification, analysis, and consultation activities would be reflected within the ESIA and in a stand-alone Stakeholder Engagement Plan (SEP) which will summarize related activities conducted to date, issues raised, and will lay out how ongoing engagement will occur in the future.

The SEP shall include:

- Identification and analysis of key stakeholder groups, their relevance to the project, and their interests/concerns;
- Information disclosure, stakeholder consultation and incorporation of stakeholders' concerns into project design where appropriate;
- List of issues raised, by whom, and responses provided, as well as the dates and times of meetings held, methods of information dissemination etc.;
- Grievance Mechanism to receive and facilitate resolution of the stakeholder's concerns and grievances about the project's environmental and social performance;
- Monitoring and Reporting requirements; and
- Management structure and roles & responsibilities for effective implementation of the SEP.

5.5 Proposed Impact Assessment

During preparation of the ESIA, an impact assessment will be undertaken following characterization of the environmental and social baseline, and identification of all project aspects. The following methods have been proposed to enable assessment of potentially significant impacts of the Project.

The scope of the assessment will cover the construction and operational phase of proposed Project and will be undertaken in accordance with relevant Federal, local, and lenders requirements. Assessment of significance will be undertaken with reference to the methodology stated in Chapter 4.

Table 5-6 Proposed Impact Assessment Methodology

Environmental & Social Parameter	Proposed Preliminary Impact Assessment Methodology
Air Quality	In accordance with a best practice methodology (such as the UK's Institute of Air Quality Management (IAQM) for construction dust) an assessment of the potential impacts of construction dust will be made. Potential impacts will be combined with baseline concentrations to determine the significance of impacts.
Noise & Vibration	Assessment of impact significance will be made by considering the existing baseline condition in combination with the potential additional construction phase noise impacts from construction sources. The determination of impact magnitude will be made based upon a prediction of construction noise using BS5228-1:2009 *'Code of Practice for Noise and Vibration Control on Construction and Open Sites'*. A basic model for the calculation of noise propagation will be used to predict the expected additional impact of the works at the receptors. The potential impacts will be based upon the degree of change in decibels at the receptor location and compliance to regulatory noise standards.

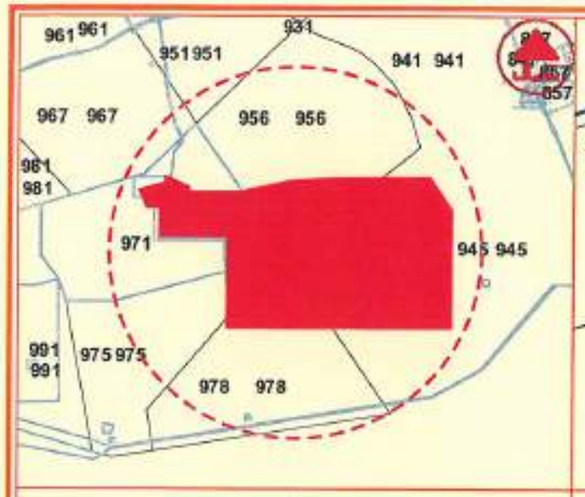
Environmental & Social Parameter	Proposed Preliminary Impact Assessment Methodology
Terrestrial Ecology/Biodiversity	The outcomes of the baseline survey outlined in Section 5.3 above should be compared with the expected site clearance during construction to determine potential impacts upon ecology.
Soil	The assessment of impact significance will be determined on the baseline condition of the soil in combination with the expected likelihood and magnitude of impacts of cross-contamination to soils.
Archaeology and Cultural Heritage	The ESIA will include brief examination of the available literature on archaeological and historical sites in the UAE.
Waste & Wastewater Management	The ESIA will aim to quantify the type and volumes of waste and wastewater streams to be generated by the project's construction and operational phases. Based on this, good practice measures for management waste will be outlined, as well as anything specific that is required for special handling of certain waste/wastewater streams. The availability of local facilities for waste and wastewater management and treatment will be fully considered in the assessment.
Landscape and Visual	The ESIA will apply a measure of value/sensitivity to the landscape and visual receptors identified herein and determine the likely associated magnitude of impacts in order to quantify significance of effects and also identify opportunities for mitigation to reduce the magnitude of any identified impacts.
Socio-Economics	Impact of significance on employment, economics, social development and infrastructure will be based on the impact the project will have on the baseline socio-economic investigation conducted.
Labour & Working Conditions	The ESIA will highlight IFC Performance Standard requirements attributable to the project associated with worker conditions (including worker accommodation) and occupational health and safety and identify proposed mitigation measures and associated plans that will need to be prepared and implemented to ensure that potential for these impacts are appropriately managed.
Community Health, Safety & Security	The ESIA will highlight the principle community, health, safety and security issues associated with the project and identify proposed mitigation measures and associated plans that will need to be prepared and implemented to ensure that potential for these impacts are appropriately managed. The ESIA will also cover the projects security provision and relevant aspects relating to IFC Performance Standards such as influx of workers and spread of disease.

5.6 Mitigation, Residual Impacts and Management

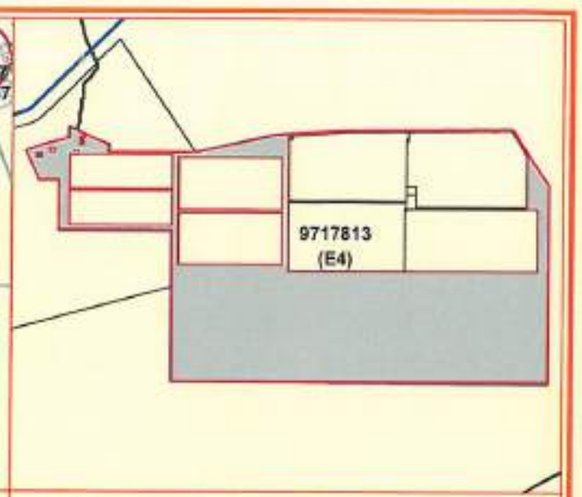
Following the assessment of impact significance, the ESIA will identify appropriate mitigation and on-going management measures applicable for the impacts. Based on the expected effectiveness of the mitigation measures, residual impact significant will further be assessed in the ESIA.

Please refer to Chapter 4 herein which outlines the methodology for this and the development of an Environmental & Social Management Framework as part of the ESIA.

APPENDIX C – AFFECTION PLAN



العرف العام



تصنيف استعمالات الأرض

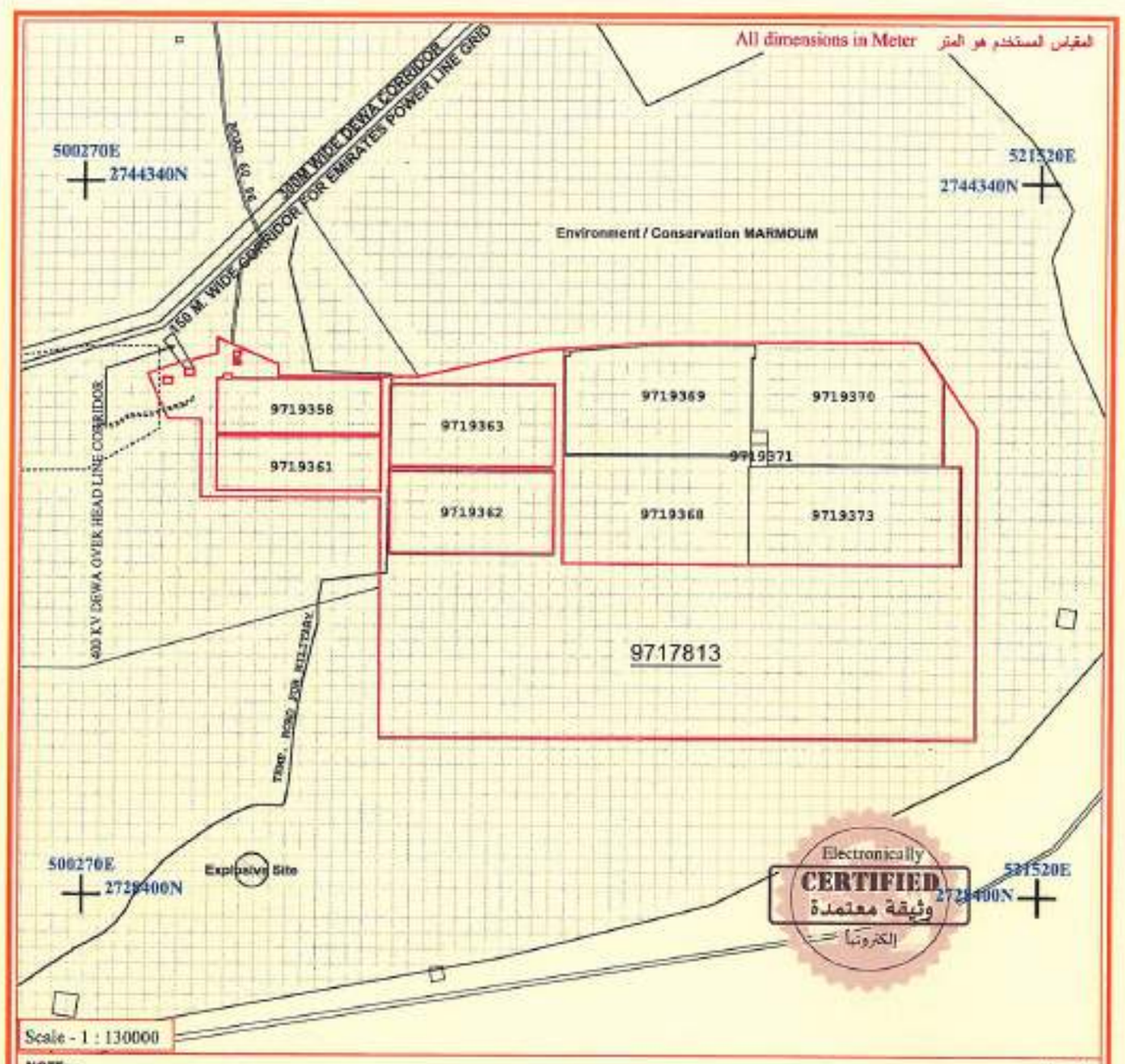
المعلومات التخطيطية لقطعة الأرض رقم 9717813 كما يلي :

الاستعمال :	E4	مجمع الشيخ محمد بن راشد آل مكتوم للطاقة الشمسية
الارتفاع :	E4	—
المواقف :	E4	حسب النظام المعمول به في بلدية دبي لكل استعمال
الارتداد :	E4	ربع الارتفاع من الجوار ومن منتصف السكيك وبحد أقصى7.5 متر و بحد أدنى 3 متر
ملاحظات :	E4	يراعى تقديم تصميم أولي وتفاصيل إستعمالات الأراضي ومخططات المشروع ككل و مراحل التنفيذ بالإضافة الى دراسة التأثيرات المرورية و البيئية و موافقة كافة جهات الخدمات و هيئة دبي للطيران المدني لإعتمادها قبل المباشرة بالتنفيذ.

المنسوب المرجعي = (30) سم من منسوب أي طريق قائم مجاور
.يتحمل المالك تكاليف نقل خطوط الخدمات إن وجدت

هذه المعلومات التخطيطية سارية المفعول مالم تتعارض مع التشريعات التخطيطية المعتمدة، و للتأكد من صلاحيتها قبل البيع والشراء يرجى الدخول إلى موقع البلدية الالكتروني IDUBAI واستخدام تطبيق مكتشف الأراضي أو من خلال تطبيق (www.dm.gov.ae)
The information is applicable as long as it does not conflict with other approved planing regulations, and should always be reviewed for validity upon selling or purchasing. Please visit (www.dm.gov.ae) plot locater Application and IDUBAI app.

Prepared By : AANUMAN



NOTE:-
PLOT IS INSIDE CONSERVATION AREA
PLAN AS PER PLANNING
FOR DIMENSION DETAILS CONTACT SURVEY DEPARTMENT
THE OWNER WILL BE RESPONSIBLE FOR THE CHECKING OR RELOCATION OF SERVICES FOUND WITHIN THE PLOT

ملاحظة:-
الأرض تقع ضمن منطقة محمية طبيعية
المحافظة بعد إعادة التخطيط
لتحديد الأبعاد يرجى مراجعة إدارة المساحة
على المالك تحمل نقل الخدمات إن وجدت

OWNER OF TITLE :
هيئة كهرباء ومياه دبي - مجمع الطاقة الشمسية
DEWA - SITE FOR SOLAR PARK

اسم المالك :

REF : DM S 971-7813 SAIH AL DAHAL DATED 04-04-2018

المرجع:

TOTAL AREA	sq. m.	61896047.95	متر مربع	المساحة الكلية
	sq. ft.	666243514	قدم مربع	
AFFECTED AREA	sq. m.	NIL	متر مربع	المساحة المتأثرة
	sq. ft.	NIL	قدم مربع	
SIKKA SETBACK AREA	sq. m.	NIL	متر مربع	مساحة ارتداد السكة
	sq. ft.	NIL	قدم مربع	
COMPENSATION AREA(MORE THAN 20%)	sq. m.	NIL	متر مربع	مساحة التعويض (أكثر من20%)
	sq. ft.	NIL	قدم مربع	
BALANCE AREA	sq. m.	61896047.95	متر مربع	المساحة الصافية
	sq. ft.	666243514	قدم مربع	

OWNER TITLE : Granted — حيازة الملكية: منحة
DATE: 02/08/2018 — تاريخ الاصدار
FIRST PLAN DATE : — تاريخ أول خريطة

مدير عام بلدية دبي
DIRECTOR GENERAL OF DUBAI MUNICIPALITY

www.makani.ae

خريطة التخطيط
AFFECTION PLAN

PARCEL ID. رقم القطعة: 9717813

COMMUNITY المنطقة: سيح الدحل
SAIH AL DAHAL

بلدية دبي
DUBAI MUNICIPALITY

CONFIDENTIAL

APPENDIX D – AIR CALIBRATION CERTIFICATES

CAB12

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model HIM-6000 is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

Model	Serial Number	Calibration Date	Next Calibration Due
HIM-6000	917136	January 7, 2020	January 2021

Calibration Span Accessory if purchased	Sensor A K=	Sensor B K=	Model :

Dan Okuniewicz	Mark Sullivan
Technician	**Supervisor**

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

PARTICULATES NOT OTHERWISE REGULATED, RESPIRABLE 0600

DEFINITION: aerosol collected by sampler with 4-µm median cut point

CAS: None RTECS: None

METHOD: 0600, Issue 3	EVALUATION: FULL	Issue 1: 15 February 1984 Issue 3: 15 January 1998

OSHA: 5 mg/m³
NIOSH: no REL
ACGIH: 3 mg/m³

PROPERTIES: contains no asbestos and quartz less than 1%; penetrates non-ciliated portions of respiratory system

SYNONYMS: nuisance dusts, particulates not otherwise classified

SAMPLING

SAMPLER:	CYCLONE + FILTER (10-mm nylon cyclone, Higgins-Dewell (HD) cyclone, or Aluminum cyclone + tared 5-µm PVC membrane)
FLOW RATE:	nylon cyclone: 1.7 L/min HD cyclone: 2.2 L/min Al cyclone: 2.5 L/min
VOL-MIN:	20 L @ 5 mg/m³
-MAX:	400 L
SHIPMENT:	routine
SAMPLE STABILITY:	stable
BLANKS:	2 to 10 field blanks per set

ACCURACY

RANGE STUDIED:	0.5 to 10 mg/m³ (lab and field)
BIAS:	dependent on dust size distribution [1]
OVERALL PRECISION ($\hat{S}_{rT}$):	dependent on size distribution [1,2]
ACCURACY:	dependent on size distribution [1]

MEASUREMENT

TECHNIQUE:	GRAVIMETRIC (FILTER WEIGHT)
ANALYTE:	mass of respirable dust fraction
BALANCE:	0.001 mg sensitivity. Use same balance before and after sample collection
CALIBRATION:	National Institute of Standards and Technology Class S-1.1 or ASTM Class 1 weights
RANGE:	0.1 to 2 mg per sample
ESTIMATED LOD:	0.03 mg per sample
PRECISION:	<10 µg with 0.001 mg sensitivity balance <70 µg with 0.01 mg sensitivity balance [3]

APPLICABILITY: The working range is 0.5 to 10 mg/m³ for a 200-L air sample. The method measures the mass concentration of any non-volatile respirable dust. In addition to inert dusts [4], the method has been recommended for respirable coal dust. The method is biased in light of the recently adopted international definition of respirable dust, e.g., +7% bias for non-diesel coal mine dust [5].

INTERFERENCES: Larger than respirable particles (over 10µm) have been found in some cases by microscopic analysis of cyclone filters. Over-sized particles in samples are known to be caused by inverting the cyclone assembly. Heavy dust loadings, fibers, and water-saturated dusts also interfere with the cyclone's size-selective properties. The use of conductive samplers is recommended to minimize particle charge effects.

OTHER METHODS: This method is based on and replaces Sampling Data Sheet #29.02 [6].

CAB-12

ENVIRONMENTAL DEVICES CORPORATION

Calibration Report

Date: January 2020

Customer Name:
System ID: Serial Number 917136

Notes:

BASIC CHECK	
Power Voltage	PASS
CPU Diagnostic Test	PASS
Air Flow Rate	PASS
Digital Communication	PASS
Sensor Output Voltages	PASS
Signal Channel Voltages	PASS
Memory Card Voltages	PASS

SENSOR	Low Span	Observed Low Test Result	High Span	Observed High Test Result	Calibration Accuracy
PM A *(10µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10ug/m3
PM B *(2.5µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10 ug/m3
CO	0 ppm	0 ppm	2.5 ppm	2.5 ppm	+/- 0.01 ppm
NO_2	0 ppb	0 ppb	374 ppb	374 ppb	+/- 5 ppb
SO_2	0 ppb	0 ppb	352 ppb	352 ppb	+/- 5 ppb
VOC	0 ppb	0 ppb	500 ppb	500 ppb	+/- 5ppb
O3	0 ppb	0 ppb	58 ppb	58 ppb	+/- .1 ppb
NH3	0 ppm	0 ppm	50 ppm	50 ppm	+/- 1ppm
H2S	0 ppb	0 ppb	652 ppb	652 ppb	+/-5ppb
CH_2O	0ppb	0ppb	4ppm	4ppm	+/-5ppm

Calibration Technician DO
Dan Okuniewicz

Supervisor MS
Mark Sullivan

ENVIRONMENTAL DEVICES CORPORATION

Calibration Report

Date: August 2019

Customer Name:

System ID: Serial Number 9[illegible]31

Notes:

BASIC CHECKS	
Power Voltage	PASS
CPU Diagnostic Test	PASS
Air Flow Rate	PASS
Digital Communication	PASS
Sensor Output Voltages	PASS
Signal Channel Voltages	PASS
Memory Card Voltages	PASS

SENSOR	Low Span	Observed Low Test Result	High Span	Observed High Test Result	Calibration Accuracy
PM A *(10µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10ug/m3
PM B *(2.5µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10 ug/m3
CH4	0 ppm	0 ppm	25000 ppm	25000 ppm	+/- 25 ppm
CO	0 ppm	0 ppm	2.5 ppm	2.5 ppm	+/- 0.01 ppm
CO_2	300ppm	300 ppm	1000 ppm	1000 ppm	+/- 50 ppm
H2S	0 ppb	0 ppb	652 ppb	652 ppb	+/-5ppb
NH3	0 ppm	0 ppm	50 ppm	50 ppm	+/- 1ppm
NO_2	0 ppb	0 ppb	374 ppb	374 ppb	+/- 5 ppb
SO_2	0 ppb	0 ppb	352 ppb	352 ppb	+/- 5 ppb
TSP	0 ug/m3	0 ug/m3	7500 ug/m3	7500 ug/m3	+/- 10 ug/m3
VOC	0 ppb	0 ppb	500 ppb	500 ppb	+/- 5ppb
O3	0 ppb	0 ppb	58 ppb	58 ppb	+/- .1 ppb
Temperature	0°C	0°C	50°C	50°C	+/- 2°C
Relative Humidity	13%	13%	75%	75%	+/- 3%
Wind Speed	0 mph	0 mph	16 kph	16 kph	+/- 1 kph
Wind Direction	90°	90°	270°	270°	+/- 3 degrees

Calibration Technician [signature]
Dan Okuniewicz

Supervisor [signature]
Mark Sullivan

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model HIM-6000 is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

Model	Serial Number	Calibration Date	Next Calibration Due
HIM-6000	919231	August 2019	August 2020

Calibration Span Accessory if purchased	Sensor A	Sensor B	Model :
	K= 18,300	K= 18,000	CS-105

Dan Okuniewicz	Mark Sullivan
Technician	**Supervisor**

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

PARTICULATES NOT OTHERWISE REGULATED, RESPIRABLE 0600

DEFINITION: aerosol collected by sampler with 4-µm median cut point

CAS: None RTECS: None

METHOD: 0600, Issue 3 **EVALUATION: FULL** **Issue 1: 15 February 1984**
Issue 3: 15 January 1998

OSHA: 5 mg/m³
NIOSH: no REL
ACGIH: 3 mg/m³

PROPERTIES: contains no asbestos and quartz less than 1%; penetrates non-ciliated portions of respiratory system

SYNONYMS: nuisance dusts; particulates not otherwise classified

SAMPLING

SAMPLER: CYCLONE + FILTER (10-mm nylon cyclone, Higgins-Dewell [HD] cyclone, or Aluminum cyclone + tared 5-µm PVC membrane)

FLOW RATE: nylon cyclone: 1.7 L/min
HD cyclone: 2.2 L/min
Al cyclone: 2.5 L/min

VOL-MIN: 20 L @ 5 mg/m³
-MAX: 400 L

SHIPMENT: routine

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 0.5 to 10 mg/m³ (lab and field)

BIAS: dependent on dust size distribution [1]

OVERALL PRECISION ($\hat{S}_{r_T}$): dependent on size distribution [1,2]

ACCURACY: dependent on size distribution [1]

MEASUREMENT

TECHNIQUE: GRAVIMETRIC (FILTER WEIGHT)

ANALYTE: mass of respirable dust fraction

BALANCE: 0.001 mg sensitivity; use same balance before and after sample collection

CALIBRATION: National Institute of Standards and Technology Class S-1.1 or ASTM Class 1 weights

RANGE: 0.1 to 2 mg per sample

ESTIMATED LOD: 0.03 mg per sample

PRECISION: <10 µg with 0.001 mg sensitivity balance; <70 µg with 0.01 mg sensitivity balance [3]

APPLICABILITY: The working range is 0.5 to 10 mg/m³ for a 200-L air sample. The method measures the mass concentration of any non-volatile respirable dust. In addition to inert dusts [4], the method has been recommended for respirable coal dust. The method is biased in light of the recently adopted international definition of respirable dust, e.g., - +7% bias for non-diesel, coal mine dust [5].

INTERFERENCES: Larger than respirable particles (over 10 µm) have been found in some cases by microscopic analysis of cyclone filters. Over-sized particles in samples are known to be caused by inverting the cyclone assembly. Heavy dust loadings, fibers, and water-saturated dusts also interfere with the cyclone's size-selective properties. The use of conductive samplers is recommended to minimize particle charge effects.

OTHER METHODS: This method is based on and replaces Sampling Data Sheet #29.02 [6].

CAB4

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model HIM-6000 is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 –1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

Model	Serial Number	Calibration Date	Next Calibration Due
HIM-6000	913021	October 1, 2019	October 2020

Calibration Span Accessory if purchased	Sensor A K=	Sensor B K=	Model :

Dan Okuniewicz	Mark Sullivan
Technician	**Supervisor**

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

PARTICULATES NOT OTHERWISE REGULATED, RESPIRABLE 0600

DEFINITION: aerosol collected by sampler with 4-µm median cut point CAS: None RTECS: None

METHOD: 0600, Issue 3	EVALUATION: FULL	Issue 1: 15 February 1984 Issue 3: 15 January 1998

OSHA: 5 mg/m³
NIOSH: no REL
ACGIH: 3 mg/m³

PROPERTIES: contains no asbestos and quartz less than 1%, penetrates non-ciliated portions of respiratory system.

SYNONYMS: nuisance dusts, particulates not otherwise classified

SAMPLING

SAMPLER	CYCLONE + FILTER (10-mm nylon cyclone, Higgins-Dewell [HD] cyclone, or Aluminum cyclone + tared 5-µm PVC membrane)
FLOW RATE:	nylon cyclone: 1.7 L/min HD cyclone: 2.2 L/min Al cyclone: 2.5 L/min
VOL-MIN:	20 L @ 5 mg/m³
-MAX	400 L
SHIPMENT:	routine
SAMPLE STABILITY	stable
BLANKS:	2 to 10 field blanks per set

ACCURACY

RANGE STUDIED	0.5 to 10 mg/m³ (lab and field)
BIAS:	dependent on dust size distribution [1]
OVERALL PRECISION (S_r):	dependent on size distribution [1,2]
ACCURACY:	dependent on size distribution [1]

MEASUREMENT

TECHNIQUE:	GRAVIMETRIC (FILTER WEIGHT)
ANALYTE	mass of respirable dust fraction
BALANCE:	0.001 mg sensitivity; use same balance before and after sample collection
CALIBRATION:	National Institute of Standards and Technology Class S-1.1 or ASTM Class 1 weights
RANGE:	0.1 to 2 mg per sample
ESTIMATED LOD:	0.03 mg per sample
PRECISION:	<10 µg with 0.001 mg sensitivity balance, <70 µg with 0.01 mg sensitivity balance [3]

APPLICABILITY: The working range is 0.5 to 10 mg/m³ for a 200-L air sample. The method measures the mass concentration of any non-volatile respirable dust. In addition to inert dusts [4], the method has been recommended for respirable coal dust. The method is based in light of the recently adopted international definition of respirable dust, e.g., +7% bias for non-diesel, coal mine dust [5].

INTERFERENCES: Larger than respirable particles (over 10 µm) have been found in some cases by microscopic analysis of cyclone filters. Over-sized particles in samples are known to be caused by overloading the cyclone assembly. Heavy dust loadings, fibers, and water-saturated dusts also interfere with the cyclone's size-selective properties. The use of conductive samplers is recommended to minimize particle charge effects.

OTHER METHODS: This method is based on and replaces Sampling Data Sheet #29.02 [6].

ENVIRONMENTAL DEVICES CORPORATION

Calibration Report

Date: October 2019

Customer Name:

System ID: Serial Number 91302J

Notes:

BASIC CHECKS	
Power Voltage	PASS
CPU Diagnostic Test	PASS
Air Flow Rate	PASS
Digital Communication	PASS
Sensor Output Voltages	PASS
Signal Channel Voltages	PASS
Memory Card Voltages	PASS

SENSOR	Low Span	Observed Low Test Result	High Span	Observed High Test Result	Calibration Accuracy
PM A *(10µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10ug/m3
PM B *(2.5µm)*	0 µg/m³	0 µg/m³	5000 µg/m³	5000 µg/m³	+/- 10 ug/m3
CH4	0 ppm	0 ppm	25000 ppm	25000 ppm	+/- 25 ppm
CO	0 ppm	0 ppm	2.5 ppm	2.5 ppm	+/- 0.01 ppm
H2S	0 ppb	0 ppb	652 ppb	652 ppb	+/-5ppb
NO_2	0 ppb	0 ppb	374 ppb	374 ppb	+/- 5 ppb
NH3	0 ppm	0 ppm	50 ppm	50 ppm	+/- 1ppm
SO_2	0 ppb	0 ppb	352 ppb	352 ppb	+/- 5 ppb
VOC	0 ppb	0 ppb	500 ppb	500 ppb	+/- 5ppb
O3	0 ppb	0 ppb	58 ppb	58 ppb	+/- .1 ppb
Temperature	0°C	0°C	50°C	50°C	+/- 2°C
Relative Humidity	13%	13%	75%	75%	+/- 3%

Wind Speed and Direction Not Returned

Calibration Technician

Dan Okoniewicz

Supervisor

Mark Sullivan

APPENDIX E –NOISE CALIBRATION CERTIFICATES

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research Plc
Instrument Type	CR:811C
Description	Sound Level Meter
Serial Number	D20575FD

Calibration Procedure

The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2013, IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001, IEC 61260:1995, IEC 60942:2003, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable.
Sound Level Meters: All Calibration procedures were carried out by substituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	GRAS 40AP	Serial Number	173198	Calibration Ref.	0170
Calibrator Type	B&K 4231	Serial Number	2594796	Calibration Ref.	A1811

Calibrated by T. A. Goodwill

Calibration Date 01 April 2019

Calibration Certificate Number 269591

This Calibration Certificate is valid for 12 months from the date above.

Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH
Telephone: +44 (0) 1723 891655 Fax: +44 (0) 1723 891742
Email: sales@cirrusresearch.co.uk

Certificate of Calibration

Certificate Number: **127637**

Date of Issue: **01 April 2019**

Instrument

Manufacturer: **Cirrus Research plc** Serial Number: **50571**

Model Number: **CR:515**

Calibration Procedure

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC 60942:2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer s data.

Date of Calibration: **01 April 2019**

Calibration Results

Measurement	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
1	94.01	1000.0	0.52
2	94.02	1000.0	0.53
3	94.02	1000.0	0.53

Average	**94.02**	**1000.0**	**0.53**
Uncertainty	± 0.11	± 0.14	± 0.10

The reported uncertainties of measurement are expanded by a coverage factor of k=2, providing a 95% confidence level.

Cirrus Research plc, Acoustic House, Bridlington Road
Hunmanby, North Yorkshire, YO14 0PH, United Kingdom
Telephone: 0845 230 2434 **Int:** +44 1723 891655
Email: sales@cirrusresearch.co.uk
Web: www.cirrusresearch.co.uk
UK Registration No. 987160

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **01/04/19** CERTIFICATE NUMBER **127638**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Test engineer:
D.Swalwell
Electronically signed:

Microphone

Microphone capsule

Manufacturer: Cirrus Research plc

Model: MK:224

Serial Number: 20044089

Calibration procedure

Date of calibration: 25 March 2019

Open circuit: 54.5 mV/Pa

Sensitivity at 1 kHz: -25.3 dB rel 1 V/Pa

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6.2005 with the free-field response derived via standard correction data traceable to a National Measurement Institute.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

Environmental conditions

Pressure: 102.20 kPa

Temperature: 21.0 °C

Humidity: 26.0 %

APPENDIX F – BASELINE DATA: AIR QUALITY RESULTS

RPSA 03504-09-01

LABORATORY REPORT FOR AMBIENT AIR QUALITY MONITORING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-09-01
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-09-01
	Nature of Business	Consultancy			
	Reference	AAQM 01- Ambient Air Quality Monitoring			

Project Detail				
	Name	1305/001/079 Dewa PV Phase V	ID	Not Given
	Address	Mohammed Bin Rashid Solar Park, Al Qudra, Dubai, United Arab Emirates		
	Consultant	No Specific Consultant		
	Contractor	No Specific Contractor		

Monitoring Detail						
	Location (GPS)	AAQM 01, 24.7247614 N 55.4154246 E			On-Site Observation	
	Point	AAQM 01, Open Area			Area Activity	Open Area
	Start Date	26/04/2020	Time	10:00 Hrs	Area Condition	Normal
	End Date	29/04/2020	Time	10:00 Hrs	Exposure Time	72 Hrs

Meteorological Average Results

Parameter	RESULT	Unit	Lab Detection Limit	Test Method
Ambient Temperature	**34.1**	°C	0.1	Internal Procedure IP-04 / Haz Scanner
Relative Humidity	**28.6**	%	0.1	
Wind Speed	**4.7**	kph	0.1	
Wind Direction	**210**	°	1	

Monitoring Average Results

Parameter	RESULT	Unit	Lab Detection Limit	# UAE Federal Law Limits	Test Method
Carbon Monoxide (as CO)	**0.16**	mg/m^3	0.02	10 (8 Hrs)	Internal Procedure IP-04 / Haz Scanner
Nitrogen Dioxide (as NO_2)	**< 38**	$\mu g/m^3$	38	150 (24 Hrs)	
Sulphur Dioxide (as SO_2)	**< 52**	$\mu g/m^3$	52	150 (24 Hrs)	
Ozone (as O_3)	**23**	$\mu g/m^3$	20	120 (8 Hrs)	
Particulate Matter 2.5 (PM2.5)	**29**	$\mu g/m^3$	10	-	Internal Procedure IP-04 / Haz Scanner
Particulate Matter 10 (PM10)	**56**	$\mu g/m^3$	10	150 (24 Hrs)	

Notes				
	Test Variation	None	Monitored By	SL/BN
	Remarks	This test is accredited by Emirates International Accreditation Centre (EIAC)	Equipment Ref. No.	CAQ12
	Reference	# Annex (8), Ambient Air Quality Standards (Air Pollutants Limits in the Ambient Air) , UAE Cabinet Decree (12) of 2006		

Results relates only to the items tested.

Form No. TDF-01, Issue: 02 / 26.04.2016 , Rev.: 0.)-

Murtaza Husein
Manager (Technical & Operations)
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail		Lab ID Detail	
Name	5 Capitals Environmental & Management Consulting	Date	05/05/2020
Address	Sheikh Zayed Rd. Near Dubai Mall Station P O Box 119899 Dubai, United Arab Emirates	Report Number	RPSA 03504-09-02
		Sample Number	SPSA 03504-09-02
Nature of Business	Consultancy		
Reference	AAQM 01- Ambient Air Quality Monitoring		

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26th Apr 2020 11:00	< 0.02	< 38	< 52	20	< 10	< 10	44.0	11.0	0.0	52
12:00	< 0.02	< 38	< 52	28	19	35	42.2	11.0	2.7	198
13:00	< 0.02	< 38	< 52	26	13	31	43.1	11.0	9.6	234
14:00	< 0.02	< 38	< 52	32	< 10	17	43.9	11.0	7.9	202
15:00	< 0.02	< 38	< 52	34	< 10	< 10	44.9	11.0	6.0	185
16:00	< 0.02	< 38	< 52	35	< 10	10	44.9	11.0	5.9	180
17:00	< 0.02	< 38	< 52	36	14	24	43.3	11.0	5.0	174
18:00	< 0.02	< 38	< 52	37	58	71	39.5	11.0	10.2	172
19:00	< 0.02	< 38	< 52	42	36	59	36.3	17.0	6.9	189
20:00	< 0.02	< 38	< 52	36	41	63	33.4	15.0	4.1	263
21:00	0.03	< 38	< 52	24	37	63	31.1	20.5	2.7	309
22:00	0.06	< 38	< 52	21	31	72	29.0	22.5	2.2	326
23:00	0.09	< 38	< 52	< 20	30	62	29.2	20.8	4.1	328
27th Apr 2020 00:00	0.12	< 38	< 52	< 20	33	70	29.0	21.3	2.2	325
1:00	0.22	< 38	< 52	< 20	33	53	29.3	31.5	11.6	142
2:00	0.33	< 38	< 52	< 20	23	64	27.9	36.8	5.9	231
3:00	0.26	< 38	< 52	< 20	28	55	27.2	40.0	3.3	239
4:00	0.36	< 38	< 52	< 20	58	88	25.7	41.3	2.2	317
5:00	0.25	44	< 52	< 20	75	91	24.6	36.5	4.7	332
6:00	0.12	< 38	< 52	< 20	37	86	24.8	32.8	4.5	329
7:00	0.14	< 38	< 52	< 20	27	92	27.1	29.0	3.0	253
8:00	0.10	< 38	< 52	23	21	26	31.1	21.8	4.4	58
9:00	0.05	< 38	< 52	25	< 10	12	39.1	12.3	6.3	21
10:00	< 0.02	< 38	< 52	26	< 10	< 10	45.4	11.0	11.4	41
11:00	< 0.02	< 38	< 52	24	< 10	< 10	48.7	11.0	12.3	52
12:00	< 0.02	< 38	< 52	25	< 10	13	51.2	11.0	13.5	90
13:00	< 0.02	< 38	< 52	24	< 10	< 10	52.8	11.0	13.3	120
14:00	< 0.02	< 38	< 52	29	68	104	50.3	11.0	13.2	207
15:00	< 0.02	< 38	< 52	38	23	61	43.9	16.0	6.4	235
16:00	< 0.02	< 38	< 52	46	39	69	41.7	19.0	0.0	239
17:00	< 0.02	< 38	< 52	37	26	35	41.3	16.0	8.2	250
18:00	< 0.02	< 38	< 52	31	15	27	39.5	16.0	9.1	254
19:00	< 0.02	< 38	< 52	31	46	69	36.0	20.0	7.7	246
20:00	0.06	< 38	< 52	28	39	64	33.5	21.3	2.6	280
21:00	0.15	48	< 52	28	41	72	32.7	22.8	3.1	230
22:00	0.21	< 38	< 52	23	37	79	31.4	26.8	2.9	227
23:00	0.20	38	< 52	< 20	85	126	29.0	30.3	1.7	301
28th Apr 2020 00:00	0.23	< 38	< 52	< 20	83	123	28.5	30.3	1.0	333
1:00	0.25	< 38	< 52	< 20	45	105	28.6	31.3	3.8	243
2:00	0.35	< 38	< 52	< 20	< 10	53	26.8	59.3	3.0	161
3:00	0.47	< 38	< 52	< 20	14	68	25.5	72.0	1.0	172

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

eiaCI
051-LB-TEST

RPSA 03504-09-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-09-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-09-02
	Nature of Business	Consultancy			
	Reference	AAQM 01- Ambient Air Quality Monitoring			

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
4:00	0.34	< 38	< 52	< 20	60	90	24.6	76.8	0.6	134
5:00	0.40	< 38	< 52	< 20	48	80	24.5	77.5	1.4	115
6:00	0.38	< 38	< 52	< 20	44	72	24.1	80.5	2.6	143
7:00	0.39	< 38	< 52	22	17	66	26.2	73.3	3.8	94
8:00	0.43	< 38	< 52	23	18	56	28.4	64.5	2.8	65
9:00	0.46	< 38	< 52	23	14	27	30.6	59.3	5.7	107
10:00	0.46	< 38	< 52	23	12	16	34.0	46.5	6.4	172
11:00	0.48	< 38	< 52	23	< 10	11	38.0	29.5	3.9	109
12:00	0.26	< 38	< 52	29	< 10	13	39.2	21.3	6.3	105
13:00	0.22	< 38	< 52	27	37	95	38.2	23.0	11.4	188
14:00	0.15	< 38	< 52	26	30	70	40.5	18.5	6.4	208
15:00	0.07	< 38	< 52	27	43	80	41.2	13.5	5.7	197
16:00	0.08	< 38	< 52	33	11	20	40.0	11.0	0.0	193
17:00	< 0.02	< 38	< 52	31	59	99	37.0	15.0	3.1	203
18:00	0.03	< 38	< 52	31	30	58	34.8	18.0	8.5	222
19:00	0.10	< 38	< 52	30	41	65	33.3	21.5	5.9	250
20:00	0.14	< 38	< 52	27	25	46	32.8	22.0	3.0	323
21:00	0.16	< 38	< 52	26	25	39	32.8	22.5	3.6	168
22:00	0.15	< 38	< 52	24	10	23	31.2	29.8	3.6	147
23:00	0.17	< 38	< 52	20	40	55	30.3	32.0	2.2	144
29th Apr 2020 00:00	0.24	< 38	< 52	< 20	27	49	30.5	31.5	5.0	129
1:00	0.31	< 38	< 52	21	22	33	29.5	36.0	4.0	161
2:00	0.29	< 38	< 52	< 20	21	58	28.1	39.8	1.4	237
3:00	0.31	< 38	< 52	< 20	63	150	27.6	39.5	2.1	327
4:00	0.20	< 38	< 52	< 20	53	184	26.3	41.0	1.3	252
5:00	0.21	< 38	< 52	< 20	30	58	25.7	41.3	0.8	324
6:00	0.21	< 38	< 52	< 20	10	32	26.6	39.5	1.9	337
7:00	0.20	< 38	< 52	< 20	< 10	15	26.8	38.8	0.5	332
8:00	0.22	< 38	< 52	< 20	13	22	32.4	26.8	3.1	331
9:00	0.14	< 38	< 52	23	24	48	34.9	22.0	1.2	334
10:00	0.12	< 38	< 52	25	28	56	31.3	23.0	0.8	342

كور لابوراتوري | CORE LABORATORY

P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-09-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail		Lab ID Detail	
Name	5 Capitals Environmental & Management Consulting	Date	05/05/2020
Address	Sheikh Zayed Rd. Near Dubai Mall Station P O Box 119899 Dubai, United Arab Emirates	Report Number	RPSA 03504-09-02
		Sample Number	SPSA 03504-09-02
Nature of Business	Consultancy		
Reference	AAQM 01- Ambient Air Quality Monitoring		

8 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26/04/2020 11:00-16:00	< 0.02	< 38	< 52	29	< 10	17	43.8	11.0	5.3	175
17:00-00:00	0.04	< 38	< 52	27	35	60	33.9	17.4	4.6	261
27/04/2020 01:00-08:00	0.22	< 38	< 52	< 20	38	69	27.2	33.7	4.9	238
09:00-16:00	< 0.02	< 38	< 52	29	17	36	46.6	12.8	9.6	126
17:00-00:00	0.11	< 38	< 52	26	46	74	34.0	22.9	4.5	265
28/04/2020 01:00-08:00	0.38	< 38	< 52	< 20	31	74	26.1	66.9	2.4	141
09:00-16:00	0.27	< 38	< 52	26	19	41	37.7	27.8	5.7	160
17:00-00:00	0.12	< 38	< 52	26	32	54	32.8	24.0	4.3	198
29/04/2020 01:00-10:00	0.22	< 38	< 52	< 20	27	65	28.9	34.8	1.7	298

24 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26-27/04/2020										Day 1
10:00-10:00 Hrs	0.09	< 38	< 52	23	26	48	34.8	20.7	5.3	212
27-28/04/2020										Day 2
10:00-10:00 Hrs	0.20	< 38	< 52	24	32	62	34.7	37.6	5.2	186
28-29/04/2020										Day 3
10:00-10:00 Hrs	0.19	< 38	< 52	22	27	57	32.9	27.4	3.6	232

Results relates only to the items tested.

This report shall not be reproduced except in full, without the written approval of the [illegible] Laboratory.

DISCLAIMER: Scope of Accreditation http://www.dac.dm.ae/NR/rdonlyres/6641CFF6-0B0D-4F4E-[illegible]/0/CoreLaboratory18073.pdf

Form No. TDF-31, Issue: 02 / 26.03.2016, Rev.: 0 / -

Murteza Husain
Manager (Technical & Operations)
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-10-01

LABORATORY REPORT FOR AMBIENT AIR QUALITY MONITORING

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

Client Detail	Name	5 Capitals Environmental & Management Consulting	Lab ID Detail	Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-10-01
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-10-01
	Nature of Business	Consultancy			
	Reference	AAQM 02- Ambient Air Quality Monitoring			

Project Detail	Name	1305/001/079 Dewa PV Phase V	ID	Not Given
	Address	Mohammed Bin Rashid Solar Park, Al Qudra, Dubai, United Arab Emirates		
	Consultant	No Specific Consultant		
	Contractor	No Specific Contractor		

Monitoring Detail	Location (GPS)	AAQM 02, 24.7034965 N 55.4226636 E			On-Site Observation	
	Point	AAQM 02, Open Area			Area Activity	Open Area
	Start Date	26/04/2020	Time	11:00 Hrs	Area Condition	Normal
	End Date	29/04/2020	Time	11:00 Hrs	Exposure Time	72 Hours

Meteorological Average Results

Parameter	RESULT	Unit	Lab Detection Limit	Test Method
Ambient Temperature	34.2	°C	0.1	Internal Procedure IP-04 / Haz Scanner
Relative Humidity	25.6	%	0.1	
Wind Speed	7.4	kph	0.1	
Wind Direction	156	°	1	

Monitoring Average Results

Parameter	RESULT	Unit	Lab Detection Limit	# UAE Federal Law Limits	Test Method
Carbon Monoxide (as CO)	0.18	mg/m^3	0.02	10 (8 Hrs)	Internal Procedure IP-04 / Haz Scanner
Nitrogen Dioxide (as NO_2)	< 38	$\mu g/m^3$	38	150 (24 Hrs)	
Sulphur Dioxide (as SO_2)	< 52	$\mu g/m^3$	52	150 (24 Hrs)	
Ozone (as O_3)	< 20	$\mu g/m^3$	20	120 (8 Hrs)	
Particulate Matter 2.5 (PM2.5)	< 10	$\mu g/m^3$	10	-	Internal Procedure IP-04 / Haz Scanner
Particulate Matter 10 (PM10)	42	$\mu g/m^3$	10	150 (24 Hrs)	

Notes	Test Variation	None	Monitored By	SL/BN
	Remarks	This test is accredited by Emirates International Accreditation Centre (EIAC)	Equipment Ref. No.	CAQ4
	Reference	# Annex (8), Ambient Air Quality Standards (Air Pollutants Limits in the Ambient Air) , UAE Cabinet Decree (12) of 2006		

كور لابوراتوري P.O.Box: 232686 CORE DUBAI-U.A.E. CORE LABORATORY

Results relates only to the items tested.

Form No. TOF-31, Issue: 02 / 26.03.2018 , Rev.: 0 /-

FOR: Murtaza Husaini
Manager (Technical & Operations)
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

eiac

011-LB-TEST

RPSA 03504-10-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-10-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-10-02
	Nature of Business	Consultancy			
	Reference	AAQM 02- Ambient Air Quality Monitoring			

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26th Apr 2020 12:00	< 0.02	< 38	< 52	< 20	< 10	26	41.9	11.0	0.0	18
13:00	< 0.02	< 38	< 52	26	< 10	12	42.2	11.0	10.2	36
14:00	< 0.02	< 38	< 52	30	< 10	< 10	42.8	11.0	12.0	25
15:00	< 0.02	< 38	< 52	30	< 10	< 10	43.5	11.0	8.8	33
16:00	< 0.02	< 38	< 52	28	< 10	< 10	43.5	11.0	8.4	22
17:00	< 0.02	< 38	< 52	27	20	70	42.8	11.0	6.4	184
18:00	< 0.02	< 38	< 52	28	29	80	39.2	11.0	15.7	7
19:00	< 0.02	< 38	< 52	26	19	59	36.2	17.0	12.6	13
20:00	0.09	< 38	< 52	< 20	< 10	52	33.3	12.0	3.9	79
21:00	0.28	< 38	< 52	< 20	10	49	31.2	20.3	6.3	143
22:00	0.33	< 38	< 52	< 20	< 10	45	29.6	21.0	7.6	152
23:00	0.27	< 38	< 52	< 20	< 10	39	28.8	21.0	9.6	148
27th Apr 2020 00:00	0.23	< 38	< 52	< 20	< 10	26	28.8	20.8	5.1	140
1:00	0.33	< 38	< 52	< 20	13	46	30.1	30.3	15.5	255
2:00	0.40	< 38	< 52	< 20	< 10	35	28.5	34.0	5.9	67
3:00	0.47	< 38	< 52	< 20	11	53	28.6	32.3	4.1	141
4:00	0.42	< 38	< 52	< 20	25	79	27.3	32.0	6.6	155
5:00	0.32	< 38	< 52	< 20	14	50	27.8	24.3	12.8	158
6:00	0.24	< 38	< 52	< 20	13	44	28.1	24.0	13.3	158
7:00	0.25	< 38	< 52	< 20	11	37	28.3	23.5	4.4	180
8:00	0.20	< 38	< 52	25	< 10	33	32.1	16.0	5.4	229
9:00	0.21	< 38	< 52	22	< 10	< 10	36.6	11.8	5.9	203
10:00	0.23	< 38	< 52	27	< 10	< 10	39.9	11.0	11.1	228
11:00	0.16	< 38	< 52	23	< 10	< 10	41.5	11.0	13.2	243
12:00	0.10	< 38	< 52	38	< 10	< 10	46.4	11.0	15.7	288
13:00	< 0.02	< 38	< 52	31	< 10	< 10	52.2	11.0	18.1	317
14:00	0.04	< 38	< 52	37	< 10	66	51.2	11.0	21.5	107
15:00	< 0.02	< 38	< 52	< 20	< 10	56	45.8	15.0	20.4	42
16:00	< 0.02	< 38	< 52	22	46	159	41.2	18.5	0.0	49
17:00	0.03	< 38	< 52	23	18	65	40.9	15.8	5.0	60
18:00	0.14	< 38	< 52	23	< 10	11	38.9	18.5	10.8	66
19:00	0.08	< 38	< 52	< 20	16	39	35.3	20.0	10.5	53
20:00	0.21	< 38	< 52	20	< 10	42	32.2	23.3	2.5	99
21:00	0.25	< 38	< 52	< 20	< 10	35	30.1	27.0	0.7	58
22:00	0.32	< 38	< 52	< 20	< 10	53	29.3	28.8	1.9	22
23:00	0.30	< 38	< 52	< 20	13	103	29.0	30.0	3.6	132
28th Apr 2020 00:00	0.28	< 38	< 52	< 20	< 10	40	28.4	28.5	7.3	177
1:00	0.21	< 38	< 52	< 20	14	83	27.1	34.0	1.8	187
2:00	0.38	< 38	< 52	< 20	< 10	14	26.1	51.8	3.6	325
3:00	0.48	< 38	< 52	< 20	12	22	24.9	68.3	1.7	344
4:00	0.50	< 38	< 52	< 20	29	31	24.5	73.3	4.3	307

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-10-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station P O Box 119899 Dubai, United Arab Emirates		Report Number	RPSA 03504-10-02
				Sample Number	SPSA 03504-10-02
	Nature of Business	Consultancy			
	Reference	AAQM 02- Ambient Air Quality Monitoring			

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
5:00	0.40	< 38	< 52	< 20	20	36	24.5	72.8	4.0	302
6:00	0.44	< 38	< 52	< 20	19	44	23.9	75.0	5.2	321
7:00	0.33	< 38	< 52	< 20	14	41	26.0	69.0	3.8	270
8:00	0.48	< 38	< 52	< 20	16	53	30.6	55.8	2.4	244
9:00	0.41	< 38	< 52	< 20	< 10	< 10	33.0	45.8	6.2	299
10:00	0.50	< 38	< 52	< 20	< 10	< 10	37.0	36.8	10.4	271
11:00	0.32	< 38	< 52	23	< 10	< 10	40.1	24.5	4.8	144
12:00	< 0.02	< 38	< 52	30	< 10	< 10	41.2	19.8	8.2	297
13:00	< 0.02	< 38	< 52	32	13	108	40.3	20.5	18.5	21
14:00	< 0.02	< 38	< 52	30	< 10	53	41.3	16.3	10.5	24
15:00	< 0.02	< 38	< 52	27	< 10	45	41.8	12.8	9.3	178
16:00	< 0.02	< 38	< 52	30	10	252	40.2	11.0	0.0	21
17:00	< 0.02	< 38	< 52	26	35	155	37.1	15.3	3.0	34
18:00	< 0.02	< 38	< 52	22	24	86	34.5	18.0	16.3	37
19:00	< 0.02	< 38	< 52	25	11	49	32.9	20.3	8.4	67
20:00	0.04	< 38	< 52	< 20	< 10	42	32.2	22.5	5.7	144
21:00	0.07	< 38	< 52	< 20	< 10	30	32.2	22.3	4.8	163
22:00	0.09	< 38	< 52	< 20	< 10	16	30.8	24.0	3.5	248
23:00	0.13	< 38	< 52	< 20	< 10	40	29.7	29.8	2.2	314
29th Apr 2020 00:00	0.23	< 38	< 52	< 20	< 10	15	30.2	30.5	8.2	228
1:00	0.29	< 38	< 52	< 20	< 10	27	28.6	34.3	5.6	174
2:00	0.30	< 38	< 52	< 20	< 10	32	27.5	37.8	2.6	184
3:00	0.29	< 38	< 52	< 20	< 10	37	26.9	40.0	5.8	164
4:00	0.21	< 38	< 52	< 20	< 10	38	27.1	35.8	5.7	171
5:00	0.24	< 38	< 52	< 20	< 10	18	27.5	33.3	4.2	197
6:00	0.22	< 38	< 52	< 20	< 10	17	28.4	29.8	5.3	188
7:00	0.21	< 38	< 52	23	< 10	14	28.6	30.0	3.8	190
8:00	0.21	< 38	< 52	26	< 10	< 10	35.2	20.5	5.7	179
9:00	< 0.02	< 38	< 52	20	< 10	< 10	37.5	16.3	10.0	170
10:00	< 0.02	< 38	< 52	22	14	22	34.6	12.0	9.6	172
11:00	< 0.02	< 38	< 52	< 20	< 10	14	35.7	28.3	8.0	185

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-10-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-10-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-10-02
	Nature of Business	Consultancy			
	Reference	AAQM 02- Ambient Air Quality Monitoring			

8 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26/04/2020 12:00-16:00	< 0.02	< 38	< 52	22	< 10	< 10	42.8	11.0	6.6	78
17:00-00:00	0.15	< 38	< 52	< 20	13	52	33.7	16.8	8.4	108
27/04/2020 01:00-08:00	0.33	< 38	< 52	< 20	13	47	28.8	27.0	8.5	168
09:00-16:00	0.09	< 38	< 52	27	< 10	37	44.3	12.5	13.2	185
17:00-00:00	0.20	< 38	< 52	< 20	10	48	33.0	24.0	5.3	83
28/04/2020 01:00-08:00	0.40	< 38	< 52	< 20	16	40	25.9	62.5	3.3	287
09:00-16:00	0.15	< 38	< 52	23	< 10	60	39.4	23.4	8.5	157
17:00-00:00	0.07	< 38	< 52	< 20	12	54	32.4	22.8	6.5	154
29/04/2020 01:00-11:00	0.18	< 38	< 52	< 20	< 10	21	30.7	28.9	6.0	179

24 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26-27/04/2020										Day 1
11:00-11:00 Hrs	0.18	< 38	< 52	< 20	< 10	36	34.7	18.3	8.5	126
27-28/04/2020										Day 2
11:00-11:00 Hrs	0.26	< 38	< 52	< 20	11	42	34.4	34.4	6.9	187
28-29/04/2020										Day 3
11:00-11:00 Hrs	0.11	< 38	< 52	< 20	< 10	47	33.4	24.2	6.9	156

Results relates only to the items tested.

This report shall not be reproduced except in full, without the written approval of [illegible].

DISCLAIMER: Scope of Accreditation http://www.dac.dm.ae/NR/rdonlyres/6641CFF6-[illegible]/0/02SSA2/0/CoreLaboratoryLB075.pdf

Form No. TOF-31, Issue: 01 / 26.03.2016, Rev.: 0.)

FOR: Murtaza Husani
Manager (Technical & Operations)
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-11-01

LABORATORY REPORT FOR AMBIENT AIR QUALITY MONITORING

Client Detail	Name	5 Capitals Environmental & Management Consulting	Lab ID Detail	Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-11-01
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-11-01
	Nature of Business	Consultancy			
	Reference	AAQM 03 - Ambient Air Quality Monitoring			

Project Detail	Name	1305/001/079 Dewa PV Phase V	ID	Not Given
	Address	Mohammed Bin Rashid Solar Park, Al Qudra, Dubai, United Arab Emirates		
	Consultant	No Specific Consultant		
	Contractor	No Specific Contractor		

Monitoring Detail	Location (GPS)	AAQM 03, 24.6929517 N 55.4134760 E			On-Site Observation	
	Point	AAQM 03, Open Area			Area Activity	Open Area
	Start Date	26/04/2020	Time	12:00 Hrs	Area Condition	Normal
	End Date	29/04/2020	Time	12:00 Hrs	Exposure Time	72 Hours

Meteorological Average Results

Parameter	RESULT	Unit	Lab Detection Limit	Test Method
Ambient Temperature	34.3	°C	0.1	Internal Procedure IP-04 / Haz Scanner
Relative Humidity	26.4	%	0.1	
Wind Speed	7.8	kph	0.1	
Wind Direction	194	°	1	

Monitoring Average Results

Parameter	RESULT	Unit	Lab Detection Limit	# UAE Federal Law Limits	Test Method
Carbon Monoxide (as CO)	0.67	mg/m³	0.02	10 (8 Hrs)	Internal Procedure IP-04 / Haz Scanner
Nitrogen Dioxide (as NO_2)	< 38	µg/m³	38	150 (24 Hrs)	
Sulphur Dioxide (as SO_2)	< 52	µg/m³	52	150 (24 Hrs)	
Ozone (as O_3)	40	µg/m³	20	120 (8 Hrs)	
Particulate Matter 2.5 (PM2.5)	< 10	µg/m³	10	-	Internal Procedure IP-04 / Haz Scanner
Particulate Matter 10 (PM10)	32	µg/m³	10	150 (24 Hrs)	

Notes	Test Variation	None	Monitored By	SL/BN
	Remarks	This test is accredited by Emirates International Accreditation Centre (EIAC)	Equipment Ref. No.	CAQ16
	Reference	# Annex (8), Ambient Air Quality Standards (Air Pollutants Limits in the Ambient Air) , UAE Cabinet Decree (12) of 2006		

Results relates only to the items tested.

This report shall not be reproduced except in full, without the written approval of [illegible]

Form No. TDF-31, Issue: 02 / 26.03.2015 , Rev.: 0 /-

كور لابوراتوري | CORE LABORATORY

P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

كور لابوراتوري P.O.Box: 232686 CORE DUBAI-U.A.E. CORE LABORATORY

For: Murtaza Husaini
Manager (Technical & Operations)
For CORE Laboratory

055-LB-TEST

RPSA 03504-11-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

TESTING | INVESTIGATION | ASSURING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-11-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-11-02
	Nature of Business	Consultancy			
	Reference	AAQM 03- Ambient Air Quality Monitoring			

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26th Apr 2020 13:00	0.48	< 38	< 52	45	< 10	20	45.2	11.0	2.0	248
14:00	1.22	< 38	< 52	38	< 10	< 10	45.6	11.0	13.2	229
15:00	1.04	< 38	< 52	46	< 10	< 10	46.8	11.0	10.3	228
16:00	1.40	< 38	< 52	70	< 10	< 10	46.3	11.0	8.3	189
17:00	0.70	< 38	< 52	63	< 10	24	44.4	11.0	7.8	215
18:00	1.05	< 38	< 52	23	< 10	27	40.3	11.0	16.9	206
19:00	0.58	< 38	< 52	63	< 10	31	36.7	17.0	13.0	216
20:00	0.17	< 38	< 52	55	< 10	39	34.2	17.0	8.5	288
21:00	0.54	< 38	< 52	53	< 10	38	31.8	18.0	8.9	346
22:00	0.54	< 38	< 52	59	< 10	38	29.9	21.0	5.7	268
23:00	0.53	< 38	< 52	57	< 10	36	29.3	21.0	7.7	357
27th Apr 2020 00:00	0.44	< 38	< 52	51	< 10	27	29.6	20.8	7.7	277
1:00	0.33	< 38	< 52	24	< 10	100	30.7	28.3	18.0	187
2:00	0.46	< 38	< 52	23	< 10	26	29.1	32.3	9.4	265
3:00	0.60	< 38	< 52	48	< 10	38	29.1	33.0	6.1	142
4:00	0.58	< 38	< 52	52	< 10	70	27.6	33.3	5.8	170
5:00	0.63	< 38	< 52	60	< 10	62	27.3	28.0	5.3	2
6:00	0.47	< 38	< 52	40	< 10	40	27.6	23.5	4.1	2
7:00	0.44	< 38	< 52	50	< 10	29	28.8	21.5	5.9	216
8:00	0.51	< 38	< 52	45	< 10	18	33.0	15.3	8.7	64
9:00	0.79	< 38	< 52	52	< 10	13	38.7	12.3	10.6	57
10:00	1.99	< 38	< 52	< 20	< 10	< 10	41.2	11.0	15.3	69
11:00	2.74	< 38	< 52	20	< 10	10	43.3	11.0	16.3	76
12:00	2.08	< 38	< 52	28	< 10	< 10	44.1	11.0	18.7	120
13:00	2.78	< 38	< 52	20	< 10	< 10	45.0	11.0	19.0	155
14:00	1.51	< 38	< 52	21	< 10	54	43.5	12.8	20.7	223
15:00	0.12	< 38	< 52	< 20	< 10	42	43.6	12.0	19.7	244
16:00	< 0.02	< 38	< 52	24	< 10	23	42.9	13.5	0.0	251
17:00	0.04	52	< 52	21	< 10	18	41.7	16.0	0.0	275
18:00	0.60	70	< 52	20	< 10	30	39.8	18.3	12.2	275
19:00	0.31	80	< 52	22	< 10	53	36.2	20.0	11.8	264
20:00	0.41	62	< 52	26	< 10	41	33.5	21.0	7.1	289
21:00	0.41	47	< 52	47	< 10	45	31.7	25.5	4.3	243
22:00	0.45	45	< 52	56	< 10	43	30.7	27.3	5.6	226
23:00	0.48	42	< 52	52	< 10	106	29.5	29.5	5.0	232
28th Apr 2020 00:00	0.47	< 38	< 52	49	10	72	28.3	30.3	4.5	174
1:00	0.36	< 38	< 52	35	< 10	30	27.9	32.0	3.6	258
2:00	0.46	< 38	< 52	44	< 10	49	26.6	44.3	3.1	152
3:00	0.51	< 38	< 52	35	< 10	36	25.4	69.5	2.1	165
4:00	0.55	< 38	< 52	28	< 10	30	24.6	78.5	2.8	132

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-11-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

TESTING | INVESTIGATION | ASSURING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-11-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-11-02
	Nature of Business	Consultancy			
	Reference	AAQM 03- Ambient Air Quality Monitoring			

Hourly Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
5:00	0.48	< 38	< 52	31	< 10	33	24.7	76.0	4.3	118
6:00	0.52	< 38	< 52	34	< 10	36	24.3	78.5	4.3	148
7:00	0.44	< 38	< 52	27	< 10	34	26.4	71.8	5.2	90
8:00	0.69	< 38	< 52	30	< 10	40	31.1	58.3	3.5	57
9:00	1.10	< 38	< 52	74	< 10	35	34.4	47.3	7.5	127
10:00	0.88	< 38	< 52	74	< 10	21	37.2	38.8	10.9	190
11:00	1.22	< 38	< 52	54	< 10	23	41.0	25.5	4.8	227
12:00	1.50	< 38	< 52	76	< 10	< 10	41.8	17.5	9.2	123
13:00	0.69	< 38	< 52	67	< 10	50	40.4	21.0	19.3	204
14:00	0.85	< 38	< 52	58	< 10	48	41.1	17.5	11.6	209
15:00	0.71	< 38	< 52	46	10	53	42.0	13.0	10.5	201
16:00	0.55	< 38	< 52	56	10	47	40.4	11.0	0.0	204
17:00	0.21	< 38	< 52	36	< 10	41	37.9	11.0	0.0	216
18:00	0.29	< 38	< 52	45	< 10	35	35.4	15.5	16.4	223
19:00	0.45	< 38	< 52	47	< 10	30	33.5	21.0	9.9	251
20:00	0.58	< 38	< 52	43	< 10	34	32.8	21.5	7.2	324
21:00	0.53	< 38	< 52	39	< 10	32	32.1	25.0	4.5	251
22:00	0.52	< 38	< 52	37	< 10	25	31.6	25.5	3.8	164
23:00	0.39	< 38	< 52	29	< 10	27	30.2	29.8	3.4	132
29th Apr 2020 00:00	0.59	< 38	< 52	24	< 10	25	31.1	31.3	8.9	142
1:00	0.57	< 38	< 52	31	< 10	19	29.3	35.5	6.9	178
2:00	0.52	< 38	< 52	25	< 10	33	28.1	38.3	3.8	189
3:00	0.50	< 38	< 52	24	< 10	39	26.9	41.5	6.5	337
4:00	0.41	< 38	< 52	21	< 10	38	26.4	40.3	3.8	345
5:00	0.46	< 38	< 52	22	< 10	24	26.8	37.0	3.0	94
6:00	0.47	< 38	< 52	23	< 10	15	27.6	32.0	3.5	179
7:00	0.47	< 38	< 52	24	< 10	11	28.2	31.0	1.3	92
8:00	0.52	< 38	< 52	28	< 10	13	35.7	22.8	4.0	266
9:00	0.88	< 38	< 52	51	< 10	< 10	40.7	15.5	7.5	177
10:00	0.24	< 38	< 52	38	< 10	18	35.4	15.0	7.1	169
11:00	0.17	< 38	< 52	28	14	28	33.5	11.0	6.7	171
12:00	0.40	< 38	< 52	30	10	15	32.0	25.0	6.0	150

كور لابوراتوري | CORE LABORATORY

P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

RPSA 03504-11-02

HOURLY, 8 HOURS & 24 HOURS AVERAGE DATA FOR AMBIENT AIR QUALITY MONITORING

TESTING | INVESTIGATION | ASSURING

Client Detail			Lab ID Detail		
	Name	5 Capitals Environmental & Management Consulting		Date	05/05/2020
	Address	Sheikh Zayed Rd. Near Dubai Mall Station		Report Number	RPSA 03504-11-02
		P O Box 119899 Dubai, United Arab Emirates		Sample Number	SPSA 03504-11-02
	Nature of Business	Consultancy			
	Reference	AAQM 03- Ambient Air Quality Monitoring			

8 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26/04/2020 13:00-16:00	1.03	< 38	< 52	50	< 10	14	46.0	11.0	8.4	223
17:00-00:00	0.57	< 38	< 52	53	< 10	25	34.5	17.1	9.5	272
27/04/2020 01:00-08:00	0.50	< 38	< 52	43	< 10	42	29.1	26.9	7.9	131
09:00-16:00	1.50	< 38	< 52	25	< 10	26	42.8	11.8	15.0	149
17:00-00:00	0.40	54	< 52	37	< 10	36	33.9	23.5	6.3	247
28/04/2020 01:00-08:00	0.50	< 38	< 52	33	< 10	89	26.4	63.6	3.6	140
09:00-16:00	0.94	< 38	< 52	63	< 10	57	39.8	23.9	9.2	186
17:00-00:00	0.44	< 38	< 52	37	< 10	37	33.1	22.6	6.8	213
29/04/2020 01:00-12:00	0.47	< 38	< 52	29	< 10	52	30.9	28.7	5.0	196

24 Hrs Average Results	CO	NO_2	SO_2	O_3	PM 2.5	PM 10	Temp.	R.Humidity	Wspeed	Wdirection
	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	°C	%	kph	°
Detection Limit	0.02	38	52	20	10	10	0.1	0.1	0.1	1
26-27/04/2020										Day 1
12:00-12:00 Hrs	0.85	< 38	< 52	45	< 10	29	35.8	18.4	9.8	185
27-28/04/2020										Day 2
12:00-12:00 Hrs	0.68	< 38	< 52	38	< 10	38	33.8	36.4	7.1	193
28-29/04/2020										Day 3
12:00-12:00 Hrs	0.50	< 38	< 52	36	< 10	29	33.3	24.5	6.5	203

Results relates only to the items tested.

DISCLAIMER: Scope of Accreditation http://www.dac.dm.ae/NR/rdonlyres/6641CFF6-0[illegible]ED9780D255A2/0/CoreLaboratoryL8073.pdf

Form No. TOF-31, Issue: 02 / 30.03.2016, Rev.: 0 / -

Pr. Murtaza Hasan
Manager (Technical & Operations)
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6, Dubai Investment Park (DIP), Dubai. UAE.
t +971 4 8852626 f +971 4 8852627 e mail@corelab.org www.corelab.org

APPENDIX G – AMBIENT NOISE RESULTS

Cirrus Research plc

Measurement Summary Report

Name	N-1				
Time	27-Apr-20 08:43:44	**Person**	**Place**	**Project**	
Duration	00:15:00				
Instrument	D20575FD, CR:811C				

Calibration

Before	27-Apr-20 8:42	Offset	0.90 dB	**After**	28-Apr-20 17:31	Offset	0.60 dB

Basic Values	
LAeq	50.2 dB
LCPeak	91.7 dB
LEX8	35.2 dB
LAFMax	72.2 dB

Projected Exposure	
30 Minutes	38.2 dB
1 Hour	41.2 dB
2 Hours	44.2 dB
4 Hours	47.2 dB
6 Hours	49.0 dB
8 Hours	50.2 dB
10 Hours	51.2 dB
12 Hours	52.0 dB

ReportId

Cirrus Research plc

Measurement Summary Report

Name	N-2				
Time	27-Apr-20 09:32:08	**Person**	**Place**	**Project**	
Duration	00:14:59				
Instrument	D20575FD, CR:811C				

Calibration

Before	27-Apr-20 8:42	Offset	0.90 dB	**After**	28-Apr-20 17:31	Offset	0.60 dB

Basic Values	
LAeq	47.8 dB
LCPeak	100.2 dB
LEX8	32.7 dB
LAFMax	60.2 dB

Projected Exposure	
30 Minutes	35.8 dB
1 Hour	38.8 dB
2 Hours	41.8 dB
4 Hours	44.8 dB
6 Hours	46.6 dB
8 Hours	47.8 dB
10 Hours	48.8 dB
12 Hours	49.6 dB

ReportId

Cirrus Research plc

Measurement Summary Report

Name	N-3				
Time	27-Apr-20 10:06:05	**Person**	**Place**	**Project**	
Duration	00:15:01				
Instrument	D20575FD, CR:811C				

Calibration

Before	27-Apr-20 8:42	Offset	0.90 dB	**After**	28-Apr-20 17:31	Offset	0.60 dB

Basic Values	
LAeq	50.2 dB
LCPeak	105.6 dB
LEX8	35.2 dB
LAFMax	62.4 dB

Projected Exposure	
30 Minutes	38.2 dB
1 Hour	41.2 dB
2 Hours	44.2 dB
4 Hours	47.2 dB
6 Hours	49.0 dB
8 Hours	50.2 dB
10 Hours	51.2 dB
12 Hours	52.0 dB

ReportId

Cirrus Research plc

Measurement Summary Report

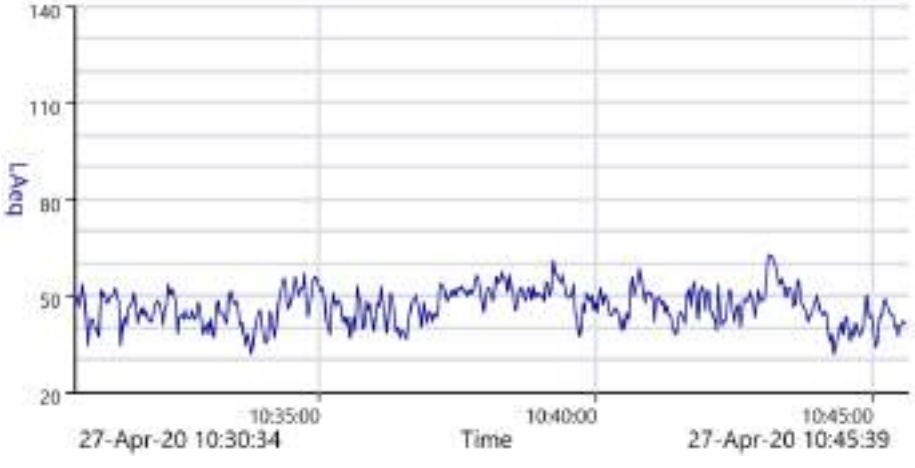
Name	N-4				
Time	27-Apr-20 10:30:34	**Person**	**Place**	**Project**	
Duration	00:15:01				
Instrument	D20575FD, CR:811C				

Calibration

Before	27-Apr-20 8:42	Offset	0.90 dB	**After**	28-Apr-20 17:31	Offset	0.60 dB

Basic Values	
LAeq	50.0 dB
LCPeak	98.8 dB
LEX8	35.0 dB
LAFMax	66.6 dB

Projected Exposure	
30 Minutes	38.0 dB
1 Hour	41.0 dB
2 Hours	44.0 dB
4 Hours	47.0 dB
6 Hours	48.8 dB
8 Hours	50.0 dB
10 Hours	51.0 dB
12 Hours	51.8 dB



ReportId

Cirrus Research plc

Measurement Summary Report

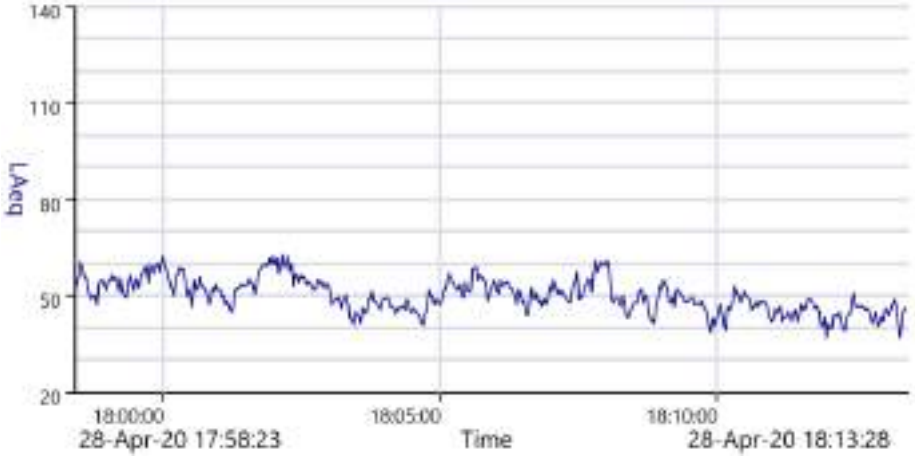
Name	N-5				
Time	28-Apr-20 17:58:23	**Person**	**Place**	**Project**	
Duration	00:15:00				
Instrument	D20575FD, CR:811C				

Calibration

Before	28-Apr-20 17:31	Offset	0.60 dB	**After**	02-May-20 17:39	Offset	0.40 dB

Basic Values	
LAeq	53.1 dB
LCPeak	102.1 dB
LEX8	38.1 dB
LAFMax	68.6 dB

Projected Exposure	
30 Minutes	41.1 dB
1 Hour	44.1 dB
2 Hours	47.1 dB
4 Hours	50.1 dB
6 Hours	51.9 dB
8 Hours	53.1 dB
10 Hours	54.1 dB
12 Hours	54.9 dB



ReportId

Cirrus Research plc

Measurement Summary Report

Name	N-6				
Time	28-Apr-20 18:28:03	**Person**	**Place**	**Project**	
Duration	00:14:59				
Instrument	D20575FD, CR:811C				

Calibration

Before	28-Apr-20 17:31	Offset	0.60 dB	**After**	02-May-20 17:39	Offset	0.40 dB

Basic Values	
LAeq	35.6 dB
LCPeak	89.1 dB
LEX8	20.5 dB
LAFMax	58.6 dB

Projected Exposure	
30 Minutes	23.6 dB
1 Hour	26.6 dB
2 Hours	29.6 dB
4 Hours	32.6 dB
6 Hours	34.4 dB
8 Hours	35.6 dB
10 Hours	36.6 dB
12 Hours	37.4 dB

ReportId

Cirrus Research plc

Measurement Summary Report

Name	N-7				
Time	28-Apr-20 18:52:55	**Person**	**Place**	**Project**	
Duration	00:14:59				
Instrument	D20575FD, CR:811C				

Calibration

Before	28-Apr-20 17:31	Offset	0.60 dB	**After**	02-May-20 17:39	Offset	0.40 dB

Basic Values	
LAeq	25.1 dB
LCPeak	84.0 dB
LEX8	10.0 dB
LAFMax	47.7 dB

Projected Exposure	
30 Minutes	13.1 dB
1 Hour	16.1 dB
2 Hours	19.1 dB
4 Hours	22.1 dB
6 Hours	23.9 dB
8 Hours	25.1 dB
10 Hours	26.1 dB
12 Hours	26.9 dB

ReportId

APPENDIX H – SOIL LABORATORY ANALYSIS

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

DAC
LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/01
Sample No : SP/SA-03504/01
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S1)
Sampling Point : Surface, 55.41819274 N, 24.72509181 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Fine Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 09:40 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis	**Tested by :** AI / DC		**Date of Analysis :** 26/04/2020 - 03/05/2020	
Parameters	**RESULT**	**Unit**	**MDL**	**Test Method**
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**34.7**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**22.8**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**3.1**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**3.9**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**188.8**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**27.0**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**9.9**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**46**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**24.9**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**476.70**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**59**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Results relates only to the items tested.
This report shall not be reproduced except in full, without the written approval of the CORE laboratory.
DISCLAIMER: For complete scope of accreditation kindly visit EIAC website http://www.eiac.gov.ae/en/accrediatedcabs/Pages/default.aspx

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/02
Sample No : SP/SA-03504/02
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S2)
Sampling Point : Surface, 55.41864813 N, 24.71806601 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Coarse Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 10:15 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis	Tested by : AI / DC		Date of Analysis : 26/04/2020 - 03/05/2020	
Parameters	**RESULT**	**Unit**	**MDL**	**Test Method**
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**46.6**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**33.6**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**4.3**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**6.2**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**228.1**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**36.0**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**14.1**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**28**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**< 1.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**431.88**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**45**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

DAC
LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/03
Sample No : SP/SA-03504/03
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S3)
Sampling Point : Surface, 55.42264 N, 24.703704 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Fine Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 10:22 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis	**Tested by :** AI / DC		**Date of Analysis :** 26/04/2020 - 03/05/2020	
Parameters	**RESULT**	**Unit**	**MDL**	**Test Method**
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**75.6**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**16.9**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**2.2**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**1.2**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**145.0**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**21.8**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**5.9**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**10**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**31.8**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**549.70**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**8**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/04
Sample No : SP/SA-03504/04
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S4)
Sampling Point : Surface, 55.41341222 N, 24.69261088 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Fine Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 10:45 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis | **Tested by :** AI / DC | **Date of Analysis :** 26/04/2020 - 03/05/2020

Parameters	RESULT	Unit	MDL	Test Method
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**93.2**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**19.9**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**2.7**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**3.4**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**158.0**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**27.9**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**7.9**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**111**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**162.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**554.34**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**24**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

DAC
LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/05
Sample No : SP/SA-03504/05
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S5)
Sampling Point : Surface, 55.40574921 N, 24.696162 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Coarse Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 11:10 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis | **Tested by :** AI / DC | **Date of Analysis :** 26/04/2020 - 03/05/2020

Parameters	RESULT	Unit	MDL	Test Method
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**144.3**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**36.7**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**4.1**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**6.2**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**204.2**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**40.2**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**12.4**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**78**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**< 1.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**351.50**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**279**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Results relates only to the items tested.
This report shall not be reproduced except in full, without the written approval of the CORE laboratory.
DISCLAIMER: For complete scope of accreditation kindly visit EIAC website http://www.eiac.gov.ae/en/accrediatedcabs/Pages/default.aspx

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/06
Sample No : SP/SA-03504/06
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S6)
Sampling Point : Surface, 55.41578645 N, 24.69189358 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Fine Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 10:45 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis | **Tested by :** AI / DC | **Date of Analysis :** 26/04/2020 - 03/05/2020

Parameters	RESULT	Unit	MDL	Test Method
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**47.7**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**19.5**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**3.0**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**6.4**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**188.7**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**26.3**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**8.1**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**16**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**< 1.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**533.75**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**51**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

DAC
LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/07
Sample No : SP/SA-03504/07
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S7)
Sampling Point : Surface, 55.406936 N, 24.696253 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Coarse Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 11:10 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis | **Tested by :** AI / DC | **Date of Analysis :** 26/04/2020 - 03/05/2020

Parameters	RESULT	Unit	MDL	Test Method
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**153.8**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**32.0**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**4.2**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**6.4**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**190.5**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**41.0**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**11.9**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**54**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**< 1.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**365.87**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**2590**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory

كور لابوراتوري | CORE LABORATORY
P. O. Box 232686, Warehouse No. 6,
Dubai Investment Park (DIP-1), Dubai, UAE.
t +971 4 8852626 f +971 4 8852627
e mail@corelab.org www.corelab.org

DAC
LB-073-TEST

CORE LABORATORY
TESTING | INVESTIGATION | ASSURING

LABORATORY TEST REPORT FOR SOIL

Client Name : 5 CAPITALS ENVIRONMENTAL AND MANAGEMENT CONSULTING
Nature of Business : Environment Consultant
Client Address : P O Box 119899, Sheikha Sana Bldg, Shk Zayed Road, Dubai, United Arab Emirates

Date : 09/05/2020
Report No : RP/SA-03504/08
Sample No : SP/SA-03504/08
Sampling Report No : Not Applicable

Sample Detail

Sample Type : Solid (Soil)
Source of Sample : Soil (S8)
Sampling Point : Surface, 55.411949 N, 24.700924 E
Sampling Location : 1305/001/079 DEWA PV PHASE V

On-Site Details

pH / Temperature : Not Applicable
Appearance : Brown Fine Solid
Preservation : Yes

Sampling Detail

Apparatus : Bottles and Hand Auger
Quantity / Size : Plastic (1*1 Kg)
Sampling Date / Time : 26/04/2020 / 11:15 Hrs
Receiving Date : 26/04/2020 **Time :** 13:00 Hrs

Method : Grab
Collected by : Client Rep.
Delivered by : SL/BN (Core Lab Rep.)
Received by : DC (Core Lab Rep.)

Results of Chemical Analysis	**Tested by :** AI / DC		**Date of Analysis :** 26/04/2020 - 03/05/2020	
Parameters	**RESULT**	**Unit**	**MDL**	**Test Method**
Arsenic as As *	**< 5.0**	mg/kg	5.0	APHA AWWA 3120 B
Barium as Ba *	**52.7**	mg/kg	1.0	APHA AWWA 3120 B
Cadmium as Cd *	**< 2.0**	mg/kg	2.0	APHA AWWA 3120 B
Chromium as Cr *	**15.5**	mg/kg	1.0	APHA AWWA 3120 B
Cobalt as Co *	**2.1**	mg/kg	2.0	APHA AWWA 3120 B
Copper as Cu *	**3.8**	mg/kg	1.0	APHA AWWA 3120 B
Lead as Pb *	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Manganese as Mn *	**145.5**	mg/kg	2.0	APHA AWWA 3120 B
Mercury as Hg	**< 1.0**	mg/kg	1.0	APHA AWWA 3120 B
Nickel as Ni *	**22.8**	mg/kg	2.0	APHA AWWA 3120 B
Zinc as Zn *	**6.7**	mg/kg	2.0	APHA AWWA 3120 B
TOTAL PETROLEUM HYDROCARBON				
Gasoline Range (C5 - C10)	**< 2.0**	mg/Kg	2.0	USEPA 8015
Diesel Range (C11 - C28)	**< 20.0**	mg/Kg	20.0	USEPA 8015
Motor Oil Range (C29 - C40)	**< 50.0**	mg/Kg	50.0	USEPA 8015
NUTRIENTS				
Chloride as Cl	**12**	mg/Kg	1	British Standard 1377 Part 3
Nitrate as NO3	**< 1.5**	mg/Kg	1.5	Cadmium Reduction Method £
Phosphate Phosphorus as PO4	**580.81**	mg/Kg	0.10	USEPA PhosVer 3 Method £
Sulfate as SO4	**16**	mg/Kg	1	British Standard 1377 Part 3

Test Method Variation: None
Remarks: 1) * This Test is Accredited by Emirates International Accreditation Centre (EIAC).
2) £ Water / KCl / NaHCO3 Extract.
Reference: APHA AWWA WEF 23rd Ed. 2017 Standard Method for the Examination of Water and Waste Water.

Liwelyn Villapando
Laboratory Manager
For CORE Laboratory