Kocaeli Hastane Yatırım ve Sağlık Hizmetleri A.Ş. (Kocaeli or SPV)

Kocaeli Integrated Health Campus Project (KİP)

DOCUMENT NUMBER:

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DOCUMENT TITLE:

AIR QUALITY MANAGEMENT PLAN – FINAL

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AIR QUALITY MANAGEMENT PLAN

PURPOSE SCOPE

This Management Plan has been developed in accordance with SPV policies, with the commitments undertaken by SPV in the ESA, with Turkish regulatory framework, with IFC Performance Standards, IFC EHS General and Sector specific Guidelines, EBRD Performance Requirements, OPIC Environmental and Social Policy Statement and EDC. The purpose of the plan is to define the actions to control the emissions to the atmosphere (in particular dust) generated by construction activities.

It includes guidelines and minimum requirements for EPC Contractor for defining its own plans/procedures appropriate to the nature and scale of the Project Construction phase.

APPLICATION

This Management Plan applies to the Project Construction phase only; the Operation phase aspects will be addressed in separate documents. It applies to construction work activities under the control of SPV, of EPC Contractor and to all KİP employees.

DEFINITIONS

Kocaeli or SPV:	Kocaeli Hastane Yatırım ve Sağlık Hizmetleri A.Ş.
Kocaeli Integrated Health Campus Project (or "KİP" or simply "Project"):	Kocaeli Integrated Health Campus Project, being executed by SPV or its affiliates
EPC Contractor (or simply EPC):	Gama – Türkerler Kocaeli Adi Ortaklığı & Gama Türkerler Dubai
Site Management:	All key managerial roles involved in the Construction Site management, mainly referring to the EPC Contractor's personnel
Environmental and Social Management System (ESMS)	The complete set of documents (including but not limited to: policies, manuals, plans, procedures, work instruction and records) developed to address, manage, monitor, audit and review the environmental, social, health and safety aspects of the KİP, aimed at mitigating potential ESHS risks and impacts and improving ESHS performance
Guidelines to EPC Contractor	Guidelines to EPC Contractor for the development of its own ESMS and associated EPC Contractor Procedures appropriate to the nature and scale of the Project are contained in SPV ESMS documentation. SPV ESMS documentation, identify also minimum requirements and specific responsibilities for EPC Contractor in line with the EPC contract
Construction Site:	The Construction Site includes all areas impacted in any manner by the construction activities.
Environmental and Social Management Plans (ESMPs)	Plans issued by SPV addressing significant Environmental and Social aspects (as identified in the ESA) by defining specific management methods, mitigation measures, monitoring activities, reporting, auditing and review.
EPC Contractor Procedure	A procedure to be prepared by EPC Contractor, to be used by EPC Contractor to describe how the mitigation and monitoring measures/actions outlined in SPV ESMPs are actually implemented.

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ACRONYMS

KİP	Kocaeli Integrated Health Campus Project
SPV	Kocaeli Hastane Yatırım ve Sağlık Hizmetleri A.Ş.
Golder	Golder Associates Turkey Ltd. Şti.
BAT	Best Available Technology
EBRD	European Bank for reconstruction and Development
EDC	Export Development Canada
EHS	Environmental, Health and Safety
EPC	Engineering Procurement and Construction
EPRP	Emergency Preparedness and Response Plan
ES	Environmental and Social
ESHS	Environmental, Social Health and Safety
ESA	Environmental and Social Assessment
ESMP(s)	Environmental and Social Management Plan(s)
ESMS	Environmental and Social Management System
ESAP	Environmental and Social Action Plan
EU	European Union
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
HS (or OHS)	(Occupational) Health and Safety
IFC	International Finance Corporation
ISO	International Organization for Standardization
KPI	Key Performance Indicators
OHSAS	Occupational Health and Safety Assessment Scheme
OPIC	Overseas Private Investment Corporation
PR	Performance Requirement (issued by EBRD)
PS	Performance Standard (issued by IFC)
QRA	Quantitative Risk Analysis
SEP	Stakeholder Engagement Plan
WHO	World Health Organization

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1.0 PURPOSE AND SCOPE OF THE PLAN

This Management Plan has been developed in accordance with SPV policies, with the commitments undertaken by SPV in the ESA, with Turkish regulatory framework, with EBRD Performance Requirements (in particular PR1 and PR3), with IFC Performance Standards (in particular PS1 and PS3) and IFC General and Sector Specific EHS Guidelines. Where no national regulation or international standard/guideline applies, it considers the adoption of Good International Industry Practices (GIIP).

The purpose of the Plan is to define the actions to be implemented to limit the emissions to the atmosphere during the Site construction and the measures to be carried out to verify the compliance with the air quality levels established by Turkish legislation and/or IFC and EBRD requirements.

The monitoring activities will focus on impacts on sensitive receptors (both human and environmental) identified in the ESA.

The monitoring activities described are mainly focused on sensitive human receptors (i.e. human settlements within a close distance from Project activities in proximity of the areas surrounding the Project site).

No environmental sensitive receptors (with respect to the impact caused by dust and other emissions) have been identified in proximity of the areas surrounding the Project site.

Should any new (i.e. not present before) or additional (i.e. not identified before) sensitive receptor be identified in the course of the Project, this Plan, and in particular the monitoring section, will be revised including additional mitigation and monitoring measures, as necessary.

This Management Plan applies to normal operating conditions during the Site construction activities and does not specifically address any emergency situation; this is addressed in the EPC Contractor Emergency Preparedness and Response Procedure (EPR).

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2.0 BACKGROUND POLICIES AND STANDARDS

This section includes all those policies, standards and requirements of reference for this Plan that are applicable for, but not limited to, the Project during Construction phase.

It also includes tables with ambient air quality performance parameters derived from Turkish legislation, EU Standards and/or IFC requirements. The most stringent parameters (highlighted with bold characters in the table) will be chosen as project standard to define the target/acceptance criteria of key performance indicators for the monitoring activities.

2.1 National standards and regulations

TITLE	Turkish Reg. Gaz. Date
Communique on Certificate of Competency (annex EK-4 Monitoring and Control form – Construction phase)	27436, 18/12/ 2009
Regulation on Assessment and Management of Air Quality (Turkish HKDYY)	26898, 06/06/2008
Regulation on Decreasing the Ozone Depleting Materials	27052, 12/11/2008
Regulation on Control of Exhaust Gas Emission and Quality of Fuel and Diesel	28837, 30/11/2013
Regulation on the Control of Air Pollution Caused by Industrial Plants (Turkish SKHKKY)	27277, 03/07/2009
Regulation on Odor Causing Emissions	28712, 19/07/2013
Regulation on Reduction of Sulphur Content of Some Fuel	27368, 06/10/2009/
Regulation on Monitoring of Greenhouse Gas Emissions	29003, 17/05/2014

2.2 International standards

Source	Document Title
The Equator Principles Association	The Equator Principles, June 2013
IFC - International Finance Corp.	IFC Performance Standards (PS) and Guidance Notes GN)
IFC - International Finance Corp.	IFC PS1 and GN1: Assessment and Management of Environmental and Social Risks and Impacts
IFC - International Finance Corp.	IFC PS3 and GN3: Resource Efficiency and Pollution Prevention
IFC - International Finance Corp.	IFC General EHS Guidelines: Environmental
IFC - International Finance Corp.	IFC General EHS Guidelines: Construction and Decommissioning
EBRD	EBRD-Performance Requirement 1
EBRD	EBRD-Performance Requirement 3
EU Commission	http://ec.europa.eu/environment/air/quality/standards.htm

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2.3 Source documents

This section presents source documents, i.e. documents where SPV commitments are sourced from and that are the trigger for the development and implementation of the ESMPs and in general of the ESMS documentation. They are in turn based on Turkish regulatory framework, EBRD Performance Requirements and IFC Performance Standard and Guidelines.

Document ID	Document Title
ESA Reports	Environmental Social Assessment (January, 2016)

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2.4 Ambient air quality performance parameters

This section provides air quality parameters from different applicable regulations for both human and environmental receptors. SPV and EPC Contractor are committed to meet the most stringent requirement. The most stringent requirement is highlighted with bold/underlined character.

Ambient air quality standards for human receptors

Parameter	Average Period	Ambient Air Quality Limits of Turkish Regulation on Air Quality assessment and Management (Off. Gaz. 26898, 06/06/2008)		Regulation on the Control of Air Pollution Caused by Industrial Plants (Off. Gaz. 27277, 03/07/09)	WHO Ambient Air Quality Guidelines	Directive 2008/50/EC of the EU Parliament and of the Council of 21/05/08 on Ambient Air Quality and Cleaner air for Europe
		Annex IA: Transition Period Limit (2016) Note (1)	Annex I: Future Target Values (Date by which limit value is to be met)	Annex II: Evaluation of Air Pollution Contribution of Plants and Air Quality Measurement	General Guidelines (for human health) Note (2)	(Date by which limit value is to be met)
SO_2	10 minute [µg/m³]	-	-		500 (guideline value)	-
	One hour [µg/m³]	900	**350** (2019) (not to be exceeded more than 24 times a calendar year)	440	-	**350** (not to be exceeded more than 24 times a calendar year)
	One day [µg/m³]	200 (STL)	**125** (2019) (not to be exceeded more than 3 times a calendar year)	**200**	**125** (Interim target - No. 1) 50 (Interim target - No. 2) 20 (guideline)	**125** (not to be exceeded more than 3 times a calendar year)
	Winter average (1 Oct. to 31 Mar.) [µg/m³]	120	-	20	-	-
	Target limit for yearly average [µg/m³]	60	-	60	-	-

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Parameter	Average Period	Ambient Air Quality Limits of Turkish Regulation on Air Quality assessment and Management (Off. Gaz. 26898, 06/06/2008)		Regulation on the Control of Air Pollution Caused by Industrial Plants (Off. Gaz. 27277, 03/07/09)	WHO Ambient Air Quality Guidelines	Directive 2008/50/EC of the EU Parliament and of the Council of 21/05/08 on Ambient Air Quality and Cleaner air for Europe
		Annex IA: Transition Period Limit (2016) Note (1)	Annex I: Future Target Values (Date by which limit value is to be met)	Annex II: Evaluation of Air Pollution Contribution of Plants and Air Quality Measurement	General Guidelines (for human health) Note (2)	(Date by which limit value is to be met)
	Target limit for winter average [µg/m³]	120	-		-	-
	Calendar year [µg/m³]	150 (LTL)	-		-	-
NO_2	One hour [µg/m³]	-	**200** (2024) (not to be exceeded more than 18 times a calendar year)	280	200 (guideline)	**200** (not to be exceeded more than 18 times a calendar year)
	Calendar year [µg/m³]	52	**40** (2024)	52	40 (guideline)	**40**
	One day [µg/m³]	**300** (STL) (95% in a year)	-		-	-
PM_{10}	One day [µg/m³]	80	**50** (2019) (not to be exceeded more than 35 times a calendar year)	80	150 (Interim target - No.1) 100 (Interim target - No. 2) 75 (Interim target - No.3) 50 (guideline)	**50** (not to be exceeded more than 35 times a calendar year)
	Calendar year [µg/m³]	52	**40** (2019)	52	70 (Interim target - No. 1) 50 (Interim target - No. 2) 30 (Interim target - No. 3) 20 (guideline)	**40**

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Parameter	Average Period	Ambient Air Quality Limits of Turkish Regulation on Air Quality assessment and Management (Off. Gaz. 26898, 06/06/2008)		Regulation on the Control of Air Pollution Caused by Industrial Plants (Off. Gaz. 27277, 03/07/09)	WHO Ambient Air Quality Guidelines	Directive 2008/50/EC of the EU Parliament and of the Council of 21/05/08 on Ambient Air Quality and Cleaner air for Europe
		Annex IA: Transition Period Limit (2016) Note (1)	Annex I: Future Target Values (Date by which limit value is to be met)	Annex II: Evaluation of Air Pollution Contribution of Plants and Air Quality Measurement	General Guidelines (for human health) Note (2)	(Date by which limit value is to be met)
	Winter average (1 Oct. to 31 Mar.) [µg/m³]	90	-		-	-

Note (1):

- LTL – Long-Term Limit: It is the arithmetic average of all the measurements results which shouldn't be exceed;
- Long Term Value: arithmetic average of all measurement results;
- STL – Short Term Limit: the value not to be exceeded by 95% of maximum daily average measurement results or statistically all the measurement results;
- Short Term Value: While maximum daily average values or statistical results of the numerical values of all measurements are arranged according to the size of the measurement results, it shouldn't be exceed 95% of measurements values.

Note (2) - Interim targets are proposed by WHO guidelines as incremental steps in a progressive reduction of air pollution and are intended for use in areas where pollution is high. These targets aim to promote a shift from high air pollutant concentrations, which have acute and serious health consequences, to lower air pollutant concentrations. If these targets were to be achieved, one could expect significant reductions in risks for acute and chronic health effects from air pollution. Progress towards the guideline values should, however, be the ultimate objective of air quality management and health risk reduction in all areas. For more information refer to "*WHO Air quality guidelines*".

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Ambient air quality standards for environmental receptors

Parameter	Average Period	Ambient Air Quality Limits of Turkish Regulation on Air Quality assessment and Management (Annex I)	WHO Ambient Air Quality Guidelines Guidelines for Europe (for ecosystem)	Directive 2008/50/EC of the EU Parliament and of the Council of 21/05/08 on Ambient Air Quality and Cleaner air for Europe
SO_2	Calendar year and winter (1 October to 31 March) [µg/m³]	**20** (for wildlife and ecosystem)	20 (for forests and natural vegetation) 30 (for agricultural crops)	**20** (for vegetation)
NO_2	Calendar year [µg/m³]	-	30	-
NO_x	Calendar year [µg/m³]	**30** (for vegetation)	-	**30** (for vegetation)

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3.0 ROLES AND RESPONSIBILITIES

Principal roles and responsibilities for the implementation of this plan are outlined below.

3.1 EPC Contractor & Subcontractors

EPC Contractor has to ensure sufficient and qualified resources are allocated on an ongoing basis to achieve effective implementation of this Management Plan.

EPC Contractor have to ensure the effective implementation of this plan by issuing its own Management Procedure addressing, detailing and customizing specific actions, measures and monitoring activities under EPC Contractor's responsibility. The EPC Contractor Procedure has to include a description of allocated resources, responsibilities and communication procedures to relevant personnel.

EPC Contractor has to provide relevant monitoring data and monitoring reports to SPV as indicated in section 7 "Reporting" of this plan.

If any Subcontractor is involved, it is responsible for duly implementing requirements included in EPC Contractor Procedures under the EPC Contractor supervision.

3.2 SPV

SPV Management has to ensure sufficient and qualified resources are allocated on an ongoing basis to achieve effective implementation of actions, measures and monitoring activities under SPV's responsibility. SPV Management is responsible for:

- Management Plan final approval
- taking appropriate actions to address major Non-Conformities based on audit reports, performance monitoring reports and on SPV HSE Manager proposed approach and actions.

SPV HSE Manager is responsible for:

- ensuring that this Management Plan is up to date and appropriate to the nature and scale of the KİP and ensuring that this Management Plan is implemented effectively by EPC Contractor;
- ensuring that action/measures and monitoring activities directly under SPV responsibilities are carried out timely and adequately according to this Management Plan requirements
- proposing to SPV Management, if necessary, amendments and/or updates to this Management Plan and issuing plan revisions
- programming inspections and audit activities to ensure the correct implementation of this Management Plan and of EPC Contractor Procedure

- addressing Non-Conformities through the definition of Preventive/Corrective actions
- bringing major Non-Conformities immediately to the attention of SPV Management
- collecting, organizing and reviewing monitoring data and performance monitoring reports from EPC Contractor and providing summary results of such reports to SPV Management, to stakeholders and to the Lenders.

4.0 MANAGEMENT METHODS AND MITIGATION MEASURES

4.1 Introduction

This section firstly presents the construction activities which could generate a potential impact on air quality. The air emission sources are identified from the source documents (the EIA in particular) related to the construction phase.

The air emissions considered in the Plan are the following:

- The fugitive dust generated during construction activities, and
- The release of engine emissions from the construction equipment and vehicles.

The emission of dust may arise from activities such as:

- Site preparation
- Excavation
- Material storage
- Material transportation.

The exhaust emissions may arise from activities such as:

- Use of construction equipment and machinery, and
- Material transportation (vehicles such as trucks etc.).

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4.2 Specific management methods and mitigation measures

This section presents the management methods and mitigation measures that the Plan aims to implement to mitigate the fugitive dust and exhaust pollutants emissions which are related to the construction activities and the use of construction equipment, machinery and vehicles.

The methods and measures/actions are included in the tables below, related respectively to the dust and the exhaust pollutants. For each method and measure/action identified, the following tables show:

- The identification code (ID.)
- the reference (or source) documents (i.e. ESA, Turkish standard, permits, IFC Performance Standards and EHS Guidelines, EBRD Performance Requirements, OPIC Environmental and Social Policy Statement or other GIIP)
- frequency/timing of the measure/action, as applicable
- Key Performance Indicator (KPI), if applicable, and related quantitative target or qualitative acceptance criteria;
- the related responsibility for implementing the measure/action.

For the measures actions where no KPI can be identified the cells reports “n.a.” (not applicable). In this case an on/off acceptance criteria will apply; in other words the acceptance criteria set is a qualitative one, such as “the measure/action has been implemented effectively”.

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ID.	Source doc.	Mitigation Action/Measure Description	Frequency / Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-01	ESA - 9.1.6 IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning EBRD – PR1 and PR3 OPIC Turkish Reg. Gaz. No. 27277	Construction sites, particularly the excavation areas, have to be moisturized in hot-dry seasons or in windy conditions.	Twice a day	Suspension of dust from excavation areas No. of complaints	No visible suspension of dust from excavation areas No complaints or grievances from communities	EPC Contractor
AIR-02	ESA – 9.1.6 IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning EBRD – PR1 and PR3 OPIC Turkish Reg. Gaz. No. 27277	Open storage piles have to be moisturized in hot-dry seasons or in windy conditions (if necessary the material may also be compacted). In very adverse windy conditions, the material should be moisturized also to prevent dust emission from the unloading/loading areas. Wind control measures (construction of shields, walls or planting trees) should be taken into account to prevent dust emissions in open storage piles.	Twice a day	Suspension of dust from open storage piles No. of complaints	No visible suspension of dust from open storage piles No complaints or grievances from communities	EPC Contractor
AIR-03	ESA - 9.1.6 IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning EBRD – PR1 and PR3 OPIC Turkish Reg. Gaz. No. 27277	Main unpaved routes and parking areas used in the construction site have to be stabilized and coated in order to keep dust emission at minimum levels. The routes used have to be moisturized especially in hot-dry seasons or in windy conditions. Vehicles carrying earth will be covered with canvas to prevent dust emissions. Other alternative measures with same effectiveness (such as moisturizing the top of the earth heap carried by the vehicle with water sprinklers) can be taken.	Ongoing	Suspension of dust from route, parking areas and earthmoving trucks. No. of complaints	No visible suspension of dust from route, parking areas and earthmoving trucks. No complaints or grievances from communities	EPC Contractor

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ID.	Source doc.	Mitigation Action/Measure Description	Frequency / Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-04	ESA – 9.1.6 IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning OPIC EBRD – PR1 and PR3 Turkish Reg. Gaz. No. 27277	Truck transporting fugitive material such as soil, sand, etc. has to be covered to prevent dispersion during transportation. On each journey the sheeting material has to be maintained in good order.	Ongoing	Release of materials and particulate matter from truck transporting fugitive material No. of complaints	No visible release of materials and particulate matter from truck transporting fugitive material No complaints or grievances from communities	EPC Contractor
AIR-05	ESA – 9.1.6 IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning OPIC EBRD – PR1 and PR3 Turkish Reg. Gaz. No. 27277	Minimizing dust from open area source by using control measures such as installing enclosures/covers/shields. This mitigation has to be applied in case of storage of fine material (≤2 mm in size) and when large quantities of concrete have to be mixed. Photographic record of each storage of fine material has to be taken to prove the mitigation measure application.	Ongoing	Enclosure and/or cover of storage of fine material	Photographic records prove the mitigation measure application	EPC Contractor
AIR-06	GIIP Turkish Reg. Gaz. No. 27277	The dumping areas will be re-vegetated as soon as possible.	Ongoing	Re-vegetated dumping area (m2)	100% of the planed re-vegetated dumping area	EPC Contractor
AIR-07	GIIP	Where feasible, the open area sources (e.g. areas subjected to topsoil stripping) will be reinstatement as soon as possible.	Ongoing	Re-vegetated open source area	100% of the planned re-vegetated open source area	EPC Contractor

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ID.	Source doc.	Mitigation Action/Measure Description	Frequency / Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-08	ESA GIIP	An appropriate wheel-washing facility (washing unit) has to be maintained at all gates of the construction site used on a normal basis (i.e. not at gates used only for emergency access). Furthermore, the wheels of the trucks have to be cleaned before the trucks leave the dumping area sites. The above measures are needed to minimize and reduce the risk of dust emissions and deposition of material on the public roads In case of any drop of material on public roads the roads will be cleaned by EPC Contractor.	Ongoing	Deposition of dust on the public roads at the exits of the constructio n site No. of complaints	No visible deposition of dust on the public roads at the exits of the construction site No complaints or grievances from communities	EPC Contractor
AIR-09	IFC EHS GL: Environmental IFC EHS GL: Constr. and Decommissioning OPIC EBRD PR1 and PR3 GIIP	Fugitive material stockpiles have to be stored away from sensitive receptors, where possible. If the stored material is located next to any a sensitive receptor, the stockpiles have to be fenced by covers or by erecting screening/windbreaks to prevent wind whipping (the fences should have similar height and size to the stockpile to act as wind barriers). Photographic record of each soil stockpile has to be taken to prove the mitigation measure application.	Ongoing	Fugitive material stockpile localizatio n	Photographic records prove the mitigation measure application	EPC Contractor
AIR-10	GIIP	Maximum height of fugitive material stockpiles has to be less than 5 meters.	Ongoing	Fugitive material stockpile height	Fugitive material stockpile height < 5 m	EPC Contractor
AIR-11	GIIP	Speed limit on unpaved routes has to be set to 30 km/h to minimize dust generation.	Ongoing	Suspension of dust from unpaved route No. of complaints	No visible suspension of dust from unpaved route No complaints or grievances from communities	EPC Contractor

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ID.	Source doc.	Mitigation Action/Measure Description	Frequency / Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-12	GIIP	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques (such as water sprays).	Ongoing	Use of dust suppression techniques for cutting, grinding or sawing equipment	Cutting, grinding or sawing equipment has to be carried out in conjunction with suitable dust suppression techniques	EPC Contractor
AIR-13	GIIP EBRD PR2 IFC PS2	In accommodation camps, areas/activities that can generate fugitive dust have to be located far from human receptor (like accommodation and recreational areas etc.). If dust impacting human receptors is generated by the presence of unpaved areas, these have to be sealed/paved.	Ongoing	Fugitive material source localization	Condition met	EPC Contractor
AIR-14	ESA – 9.1.6 IFC EHS GL: Environmental EBRD PR1 and PR3 OPIC Turkish Reg. Gaz. No. 28837	Exhaust gas emission arising from the engine land vehicles in traffic will comply with the Turkish Regulation on Control of Exhaust Gas Emissions. Vehicles will be subjected to appropriate routine maintenance programs as required by national Regulation on Control of Exhaust Gas Emission. The use of vehicles that do not comply with the emission limits will not be permitted until such vehicles will be serviced and re-tested.	Yearly	Outcome of the Control of Exhaust Gas Emissions	100% positive outcomes	EPC Contractor
AIR-15	IFC EHS GL: Environmental EBRD PR1 and PR3 OPIC GIIP Turkish Reg. Gaz. No. 28837	Equipment and vehicle will be maintained in good repair in order to guarantee good operation conditions and limit the exhaust emissions. The efficiency has to be regularly checked.	Ongoing	Equipment and vehicles check	100% of equipment and vehicle checked	EPC Contractor
AIR-16	IFC EHS GL: Environmental EBRD PR1 and PR3 OPIC GIIP	Use of low-sulfur fuel.	Ongoing	Sulfur fuel concentration	Sulfur fuel concentration < 50 ppm	EPC Contractor

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ID.	Source doc.	Mitigation Action/Measure Description	Frequency / Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-17	GIIP	Construction plant/equipment/machinery exhausts have to be directed vertically upwards where possible and directed away from the ground.	Ongoing	Vertical direction of construction plant/equipment/machinery exhausts	Construction plant/equipment/ machinery exhausts	EPC Contractor
AIR-18	GIIP	Vehicles and equipment have not to be left running for long periods when not directly in use. The engines of vehicles and equipment have to be switched off in case of pauses longer than five minutes. Equipment or vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.	Ongoing	Shutoff of vehicles and equipment engine when it is not in use for five minutes	Vehicles and equipment engine has to be shutoff when it is not in use for five minutes	EPC Contractor
AIR-19	GIIP	Avoid the use of gasoline or diesel powered equipment where electricity or battery powered equipment is practicable.	Ongoing	Use of electricity or battery powered equipment where practicable	Only use of electricity or battery powered equipment where practicable	EPC Contractor
AIR-20	GIIP EBRD PR2 IFC PS2 OPIC	Lighting of fire and burning of materials in the Construction site (as well as in the Dumping areas) is prohibited. Smoking limitations and allowed smoking areas have to be regulated also taking into account Turkish regulations.	Ongoing	Presence of fires	No presence of fires No people smoking in unauthorized areas	EPC Contractor

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5.0 MONITORING

5.1 Emission sources

This section includes the monitoring activities carried out to verify if the applied mitigation measures are such that air emissions during the construction activities are in compliance with the air quality requirements.

The air emissions taken into account are the following:

- Fugitive dust (PM_{10})
- Traffic pollutants (NO_2, SO_2)

The mainly sources of air emissions are the following areas:

- The construction site
- The roads mainly traveled by trucks during the transportation of the construction materials and excavated debris
- The dumping areas where inert material from the construction site is transported

5.2 Sensitive receptors

In this section the sensitive receptors (including human and environmental sensitive receptors) located near to the emission sources are identified, based on the ESA.

A. Human Sensitive receptors

The human sensitive receptors considered in this Plan are the residential areas (i.e. settlements and/or their neighborhoods) and in particular schools, hospitals, recreational areas. Information about human receptors is taken from source documents (ESA) and/or from internet sources.

The list of human sensitive receptors, located in the surroundings of Project activities (including dumping and material and waste transportation) taken into account is presented below:

- The down side of the Project area, located at north-west direction from the construction site and nearby the (upper) Trans European Motorway (TEM)-O4 section
- Residential buildings of the Yeşilova quarter, located at the north side of construction site and nearby the O-4 highway.
- TOKİ buildings of the Tavşantepe Quarter, located at the eastern side of O-4 highway.

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- Hacı Bektaş Veli Middle School of the Tavşantepe Quarter, located at the southern side of the construction site.

B. Environmental Sensitive receptors

Based on ESA dust and other emissions from Project activities are not considered a significant issue for flora and fauna.

5.3 Monitoring points

The monitoring points have been selected taking into account the sensitive receptors identified and their distance and location with respect to the emission sources. Considering the air emission typology (dust and traffic pollutants) a maximum distance of 100 m has been considered.

Each monitoring point is identified with a specific identification code. The codes comprise the term “AIR-POI” and a progressive number related to each monitoring station identified (i.e. AIR-POI-01 to AIR-POI-04).

The location (including the coordinates) of the following monitoring points is representative of the following human sensitive receptors and shown in below figure:

- AIR-POI-01 (below figure): The down side of the Project area, located at north-west direction from the construction site and nearby the (upper) Trans European Motorway (TEM)-O4 section
- AIR-POI-02 (below figure): Residential buildings of the Yeşilova quarter, located at the north side of construction site and nearby the O-4 highway
- AIR-POI-03 (below figure): TOKİ buildings of the Tavşantepe Quarter, located at the eastern side of O-4 highway
- AIR-POI-04 (below figure): Hacı Bektaş Veli Middle School of the Tavşantepe Quarter, located at the southern side of the construction site

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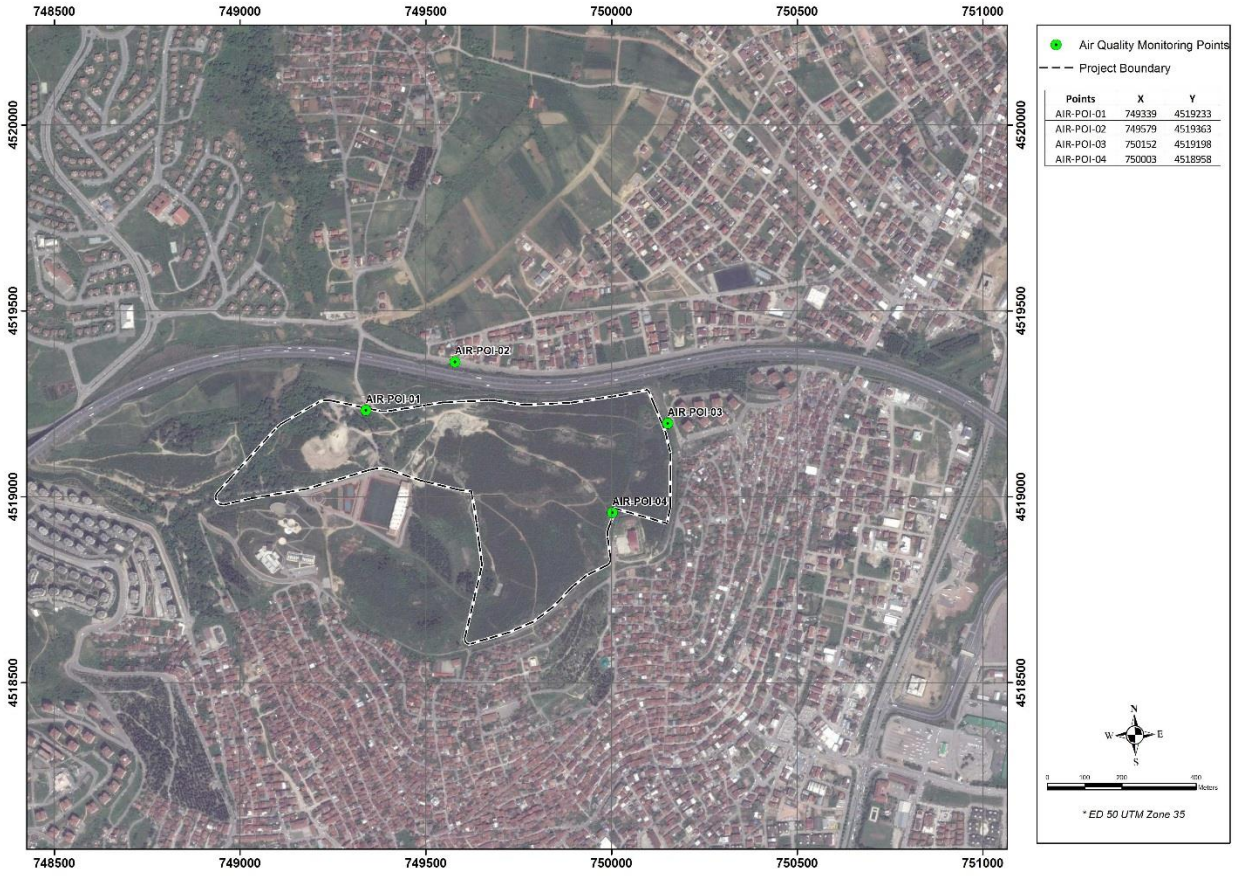

Air Quality Monitoring Points

5.4 Monitoring program

Monitoring program will apply national/international methods for sample collection and analysis. The sampling will be performed by qualified personnel and the analysis will be conducted by permitted/certified entities.

The duration of the measurement will take into account the national and international regulations/standards.

In the following sections the sampling and analytical methods are described for each air emission typology.

The table at the end of this section details the monitoring (measurement) activities identified for air emission monitoring in the Construction phase. For each monitoring activity identified, the table shows:

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- The identification code (ID.)
- the reference (or source) documents (i.e. ESA, Turkish standard, permits, IFC Performance Standards and EHS Guidelines, EBRD Performance Requirements, OPIC Environmental and Social Policy Statement or other GIIP)
- A description of the monitoring activity including parameters to be monitored and monitoring locations.
- frequency/timing of the measurement,
- Key Performance Indicator (KPI), and related quantitative target, if the target consist of a regulatory limit this will be indicated;
- the related responsibility for implementing the monitoring activity.

A. PM_{10}

Particulate matter sampling is conducted according to the gravimetrical method in compliance with EPA 40 CFR Part 50 National Ambient Air Quality Standards for Particulate Matter as recommended by World Bank and Ministry of Environment and Urbanization.

The flow rate is 16.7 l/min. Short term values were calculated by the formula below:

- KVD = Xav + 1.64 * ((2*□(Xav-X)2) / ((2*z)-1)) 1/2
- X is one measurement value,
- Xav is the measurement average value,
- z is the number of measurement.

B. Traffic pollutants

SO_2 and NO_2 tubes are installed around the construction site at the locations AIR-POI-01, AIR-POI-02, AIR-POI-03 and AIR-POI-01. The tubes stay on Site one month period and then are sent to the Gradko Laboratories for analysis after the end of exposure period. The tubes are analyzed at the laboratory by UV Spectrophotometry and Ion Chromatography for NO_2 and SO_2, respectively.

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ID.	Source doc.	Monitoring Action/Measure description	Frequency/Timing	KPI	Target/ Acceptance criteria	Responsibilities
AIR-21	ESA – App. N GIIP	Revision of this monitoring plan following an assessment of presence of other receptors in single houses/buildings (that has not been considered)	Once before starting monitoring activities.	N.A.	Single houses/building human receptors all identified	EPC Contractor
AIR-22	ESA - App. N	Fugitive dust monitoring at AIR-POI-01, AIR-POI-02, AIR-POI-03 and AIR-POI-04: • PM_{10} • SO_2&NO_2	Monthly	One day concentration of PM_{10} [µg/m³] Monthly average concentration of SO_2 and NO_2 [µg/m³]	<50 µg/m³ <40 µg/m³	EPC Contractor

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6.0 AUDIT AND REVIEW

The correct implementation of this Management Plan is verified through internal inspections and audits to be carried out according to the requirements included in internal audit section of “ESMS Manual”.

The schedule, the frequency, the scope and objectives of the audit as well as the responsible internal inspectors will be indicated in the Audit Program that will be developed and updated by SPV HSE Department.

Internal auditing will address:

- The correct implementation of this Management Plan;
- The correct development and implementation of EPC Contractor Procedure;
- The correct and timely implementation of an auditing and review system by the EPC Contractor;
- Each of the point indicated in the tables in Section 4 (mitigation actions/measures) of this Plan.

Internal inspections frequency has to be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Evidences and results of the inspection and audit activities are included in the audit reports and in the “Non-Conformity and Preventive/Corrective actions” records.

SPV Management reviews results of inspections and audits and the progress of the Preventive/Corrective actions and takes additional appropriate actions if necessary according to the indications included in “Management Review” of the ESMS Manual.

7.0 REPORTING

7.1 Audit reports (by SPV)

Evidences of the implementation of the mitigation actions/measures (detailed in Section 4 of this plan) and related results are collected through inspection and auditing activities as detailed in section 6 “Audit and Review” of this plan; these evidences are described in the audit reports.

7.2 EPC Contractor Monitoring Reporting

Evidences and results of the each monitoring (measurement) activity (detailed in section 5 of this plan) have to be included in specific air quality monitoring reports to be provided by EPC Contractor; these reports have to include the following minimum information/data:

- Description of the measurement equipment used;
- Description of the correlation between the monitoring measures and the related construction activities;
- The KPI results and their compliance with the target/acceptance criteria;
- Reporting any anomalies that could have affected partially or totally the KPI results;

The monitoring reports will be provided by EPC Contractor to SPV within 15 days from the monitoring activity.

Evidences and results of the mitigation measures/actions (detailed in section 4 of this Plan) have to be included in specific air emission mitigation measures report to be provided by EPC Contractor; these reports have to include the following minimum information/data:

- The list of the mitigation measures implemented, including the ID code (see section 4), a description, and their aim;
- The air emission source as construction activity (e.g. excavation, transportation, etc.) related to the mitigation measure
- The period of the measure application (start date and end date)
- The achievement (or not) of the target/acceptance criteria for key the performance indicator.

The mitigation measures report will be provided by EPC Contractor to SPV on annual six monthly basis within June and December.

7.3 Air quality reporting (SPV)

A. Collection of air quality monitoring data

The air quality monitoring results provided by EPC Contractor have to be documented and reported by SPV on an ongoing basis. The documentation includes the following items for each monitoring measure:

- The identifying code of the monitoring measure and location applied
- The description of the monitoring measure applied
- The air emission source related to the monitoring measure
- The period of the monitoring measure (start date and end date)
- The KPI results
- The achievement (or not) of the target/acceptance criteria for KPI.

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B. Six monthly reporting on air quality

A six monthly report on air quality will be done by SPV, based on the reports provided by EPC Contractor and on the audit reports, summarizing:

- Synthetic description of the mitigation measures applied by EPC Contractor;
- monitoring activities and their results compared to target criteria;
- conclusions and recommendations (if any).

The report will provide the basis to verify the effectiveness of this Management Plan by the external public and stakeholders which should be informed on the results of monitoring and on the project environmental performance related to the dust and other emissions prevention. This report constitutes the basis for the monitoring report to be available for the Lenders.