



TERMS OF REFERENCE
FOR THE PREPARATION OF AN
ENVIRONMENTAL IMPACT ASSESSMENT

September 2018

- Note 1:** The Environment and Resources Authority (ERA) reserves the right to modify these Terms of Reference according to any relevant environmental and planning considerations that may emerge at any relevant stage of the EIA or the permit application process, as well as in the event of any changes or updates to the proposed development. ERA also reserves the right to request additional or amended studies should the findings of the EIA be insufficient to adequately inform the decision-making process or if the EIA identifies matters which should be subject to further investigation.
- Note 2:** Unless otherwise agreed with ERA, all requirements set out in these Terms of Reference are to be complied with. If there are any aspects that the consultants deem irrelevant to this study, or if at any stage the consultants discover any environmentally-relevant aspect (not included in these TORs) that needs to be studied, the consultants shall inform ERA immediately, justifying their reasoning.
- Note 3:** Difficulties, including technical difficulties and lack of information, encountered by the consultants in compiling the required information shall be made clear in the EIA. All references to published works and sources of information shall be duly acknowledged in a manner that enables tracing of the information source and verification. No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the consultation period and thereafter, and for record-keeping and unhindered perusal by ERA. Any material which is based on unavailable proprietary data shall not be incorporated by reference.
- Note 4:** Any requirement for confidentiality of any section or detail of the EIA must be strongly justified and a formal request in this regard must be submitted to ERA. Should ERA grant confidentiality, alternative material that is still adequate for proper assessment, public consultation and decision-making must be provided.
- Note 5:** Agreement on method statements, and ancillary liaison with ERA, is not mandatory but is recommended. Nevertheless, ERA reserves the right to disagree with the methodology proposed, including proposed areas of influence, and with the EIA submissions in general, and to factor such disagreement in its critique of the EIA.
- Note 6:** During review of the EIA, ERA will submit comments for the consultants' consideration, as relevant. Following the consultants' response to ERA satisfaction, a revised second draft of the EIA, addressing the comments, will normally be required. This may take the form of a complete resubmission or of an Addendum detailing the revisions to the previous submissions, as deemed most expedient by ERA, taking into account continuity and traceability of the information, and overall user-friendliness vis-à-vis subsequent review, presentation, public consultation, record-keeping and decision-making. A complete resubmission will generally be required if changes are numerous or complex, whereas an Addendum may be preferred if changes are more limited.
- Note 7:** The consultants are not exonerated from obtaining any formal authorisation from ERA, and from other relevant entities, vis-à-vis any activity ancillary to the EIA (e.g. collection, sampling, capture, or waiver of access restrictions) wherever such authorisation is legally required.
- Note 8:** These Terms of Reference, and all ancillary correspondence, are issued without prejudice to ERA's position on the project. Accordingly, their issuing (even when customised to address specific project details) should not be construed as evidence in favour or against the project or any component thereof, unless the contrary is clearly stated.
- Note 9:** Wherever relevant, references to land also include the sea, and ancillary terms such as land-take, ground cover, landscape, vehicles, access roads, etc. should be interpreted accordingly.
- Note 10:** Wherever any baseline studies required by these Terms of Reference is covered by already-existing data, such data should be used in preference to unnecessary duplication of baseline studies, unless the consultants or ERA or both are of the opinion that the existing data is unavailable, incorrect, outdated, unreliable, insufficient, or otherwise inadequate for the purpose of the EIA.

An Environmental Impact Assessment (EIA) Report is to be prepared as required by the Schedule I, Category I, Section 7.1.1.1 (*Construction or extension of hotels, holiday complexes, holiday villages, hostels, accommodation facilities, homes for the elderly, hospitals, or associated development, if located wholly or partly outside development zones and having: (ii) a gross floor area of 10,000m² or more; or a site area of 2.5 ha or more;*) of the Environmental Impact Assessment Regulations, 2017 (S.L. 549.46). The required components of the EIA are:

- i. A **Coordinated Assessment Report**, in conformity with the following Sections of these Terms of Reference. This report should assess the project in its totality;
[Note: The coordinated assessment should seek to analyse and integrate the main considerations emerging from the technical reports, rather than just reproducing excerpts from the reports.]
- ii. A separate **Appendix (or Appendices)** containing all technical studies and original survey reports as prepared by the individual specialist consultants for specific topics;
[Note: Experts contributing to the EIA should be specifically asked to consider impact interactions and cross-cutting issues, and to communicate information between each other accordingly].
- iii. A separate **Non-Technical Summary** of the EIA, in both the Maltese and English languages. This should have enough details for the public to understand the project and the related environmental considerations, and should be written in reader-friendly language (e.g. avoiding unnecessary technical jargon);
- iv. A **declaration of conformity** with regards to the identification of consultants and contributors, and conflict of interest, in accordance with sub-regulations 17(3) of the EIA Regulations (refer to Appendix 1 to these Terms of Reference); and
- v. An addendum detailing the **feedback received from stakeholders, from the public, and from ERA** during the relevant consultation stages of the EIA, and how they were addressed.

Wherever relevant and appropriate, all components of the EIA should include tables and figures (e.g. maps, plans, photographs, photomontages, charts, graphs, diagrams, cross-sections) and quantifications.

The complete EIA Report (including all the above components) should be submitted as a printable digital copy (in .pdf format, with copying fully enabled throughout) and as a printed copy. Likewise, in case further revisions are to be made to the EIA Report, both a printable digital copy (in .pdf format, with copying enabled throughout) and a printed copy of the revised EIA Report, or an Addendum, is to be submitted to ERA.

Wherever any other study not forming part of the EIA (e.g. Appropriate Assessment or Feasibility Study) is also envisaged, this is to be submitted separately from the EIA. Cross-referencing between the EIA and any such study should be clear and reasonably limited, such that both of the following considerations are duly satisfied:

1. Alerting the reader to the fact that the aspect in question is also being addressed in another parallel study;
and
2. Enabling the reader to easily follow both the EIA and the other studies as stand-alone documents.

More detailed specifications are identified in the following pages.

1.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT AND ITS CONTEXT

The description of the proposal is to include the aspects outlined below, and should take into account the entire proposal and any ancillary facilities and infrastructure connected with, or arising due to, the project.

1.1 Justification for the Proposal

1.1.1 Objectives

The purpose and objectives of the development and whether these are related to current legal obligations, policies or plans.

1.1.2 Demand

The current and expected requirement or demand for the proposed land uses, also explaining how the proposal will address the requirement/demand.

1.2 Description of the Physical Characteristics of the Whole Project and the Land Use Requirements during the Construction, Operational and Decommissioning Phases

The following aspects should be addressed for all phases of the project, clearly distinguishing between aspects relating to construction phase, operational phase, decommissioning phase, or more than one phase. References to the construction phase and decommissioning phase also include ancillary site preparation, clearing, excavation, demolition/dismantling, and site reinstatement works, as relevant.

1.2.1 General characteristics

Description of the proposed development including size, area, height, volume, configuration/layout, general design, location and proposed elevations of buildings/structures/installations, hard and soft landscaping, access arrangements, boundary demarcation arrangements, land use requirements, and land take of ancillary facilities (including infrastructure, storage, servicing, security etc.). The description is to be consistent with the details submitted in the relevant permit applications, throughout both the EIA process and the development permission application process.

1.2.2 Construction, Operational and production processes

The relevant operational and production processes and their main characteristics, including:

- The nature and quantity of materials used or generated;
- The source, type, quantity, composition and concentration of residues and emissions including water, air, soil pollution, noise (including impulsive underwater noise), vibration, light, heat, radiation etc. resulting from the proposed project; the parameters to be reported should be in line with relevant EU policy; and
- The expected annual and total emissions, including Greenhouse Gases (GHG), and the contribution to total national GHG emission on an annual basis.

1.2.3 Project management

An indicative framework outlining the key parameters and site management arrangements during construction, operation and decommissioning phases, including:

- Works methodology;
- Expected duration of all phases, as well as season, frequency and duration of interventions;
- Depths and volumes of excavation, and type of material to be excavated; and
- Types and quantities of raw materials and primary resources to be consumed, including water, energy, stone and other resources, and measures to reduce such consumption.

1.2.4 Access, transportation and related infrastructure

1. A forecast of the type, quantity and size of vehicles (and/or vessels) envisaged during each phase and their respective frequency of use, as well as an identification of the routes that vehicles will use to/from and within the site. The required arrangements should also be compared with the relevant existing situation (in terms of structural considerations, stability and state of roads, road width and gradient, turning circles and

junctions, type of surfacing, and other physical or environmental constraints, etc). Interventions that would need to be carried out to accommodate the required vehicles (e.g. new or altered access roads), and sites/buildings/structures/features likely to be affected as a result, should be identified accordingly.

2. Facilities for the storage, parking, on-site servicing, loading/unloading of equipment, vehicles and other machinery.

1.2.5 Water, sewerage, runoff management, energy, telecommunications, and ancillary infrastructure

1. Estimates of water management specifications of the development and the identification of the sources of water to be used, including the following:
 - The features and processes of the proposed development and its ancillary facilities which consume water, including estimates of water consumption and runoff/effluent generation during operation;
 - The sources of water (e.g. second-class water, public potable water mains, on-site production) envisaged to meet the projected demand and details of distribution and storage;
 - The water-saving measures, where applicable, that are envisaged (e.g. use of low-flow fittings, reuse of harvested storm water runoff and rainwater, treatment and reuse of grey water/sewage), and details as to how such water will be used/managed; and
 - The facilities and structures to be installed in connection with the above (e.g. water production, purification, collection, storage, distribution and saving) including estimates of the sizing of pipelines, reservoirs and equipment.
2. Estimates of the energy-related specifications, including:
 - The features and processes of the proposed development and its ancillary facilities which consume energy, including estimates of consumption during operation. The analysis should consider, as relevant, the connected load (in MW or MVA), the overall power factor, the annual MWh split in terms of end-use (lighting, climate cooling/heating/ventilation, plant etc.) which reflects the expected use of the facilities;
 - The energy sources envisaged to meet the projected demand;
 - The facilities and structures to be installed in connection with the above (e.g. energy production, storage, distribution and saving) including estimates of the sizing of cables, buildings and equipment; and
 - The expected energy performance of the proposal, including building orientation, natural ventilation, construction materials, integration of low/zero-carbon technologies to meet energy needs; avoidance of features which increase energy consumption; and energy efficiency measures in the finishing and operation of the development.
3. Infrastructural services and utilities related to water and power supplies, sewerage, telecommunications and runoff management, and ancillary works (e.g. trenches, tunnels, culverts, switching/transformer stations, pump houses, inspection chambers).
4. The extent to which the project can realistically be self-sufficient with regard to its energy and water needs, through appropriate measures such as the efficient use of energy and water, collection of rain and storm water for reuse, reuse of treated wastewater/sewage, technologies that reduce energy consumption, and the integration of alternative energy sources. Alternatives in terms of design, fabric and orientation of the buildings should also be explored and assessed.

1.2.6 Waste management

1. A sufficiently detailed indication of the waste management implications likely to arise from the project, including wastes generated by ancillary facilities and wastes which may arise from accidental spillages and leakages and from repair works. Wastes should be subdivided according to the relevant project phases.
2. The following information is to be provided for each waste stream, as relevant to each phase:
 - Identification of processes or activities that would result in waste generation;
 - European Waste Catalogue Codes for each waste stream, as per relevant legislation;
 - The projected quantities and rate of generation for each type of waste;
 - Information on waste handling and storage, on site as well as off site;
 - The method of transportation and frequency; and
 - The method of characterizing the chemical composition of dredged waste; where applicable.

This information should be presented in table format as follows, and should also include cross-references to the relevant regulations, particularly The Waste Regulations (S.L. 549.63):

Phase	Type of waste	EWC Code	H-Code	Activity (e.g. sanding, scraping, power washing etc.)	Estimated quantities	Final permitted disposal location

3. The envisaged waste management arrangements using the Best Practicable Environmental Options (BPEO) available, and the envisaged efforts to minimise waste generation and to divert waste to reuse or recycling rather than disposal.
4. Layout plans (to scale) clearly showing all relevant waste management infrastructure and related facilities (e.g. bunded areas for storage of waste fuels, wheel-wash facilities, etc.), clearly distinguishing between temporary and permanent structures for each phase.

1.2.7 Longer-term developments

Additional future developments, land uses and other commitments that are ancillary or consequent to the project or are likely to arise in relation to the same project or its expansion, as well as longer-term needs of the proposal, including: ancillary infrastructure not accounted for in the previous sections; any consequent interventions/arrangements required to accommodate the development; any foreseeable extensions or updates to the proposal; any displacement of existing uses; and decommissioning.

2.0 ASSESSMENT OF ALTERNATIVES

An outline of the main alternatives studied and an indication of the main reasons for this choice, taking into account the relevant environmental effects and their prevention (or optimisation) at source. The following alternatives need to be duly considered, as relevant to the development itself (or to one or more phases thereof) and its requirements and constraints:

2.1 Alternative sites

2.2 Alternative technologies

2.3 Alternative layouts (including building heights, where relevant)

2.4 Downscaling of the project, or elimination of project components

2.5 Zero option (do-nothing scenario) - *i.e.* an assessment of the way the site would develop in the absence of the proposed project.

[Note: The zero option should be considered in sufficient detail as a plausible scenario in the EIA, wherever relevant, and not discarded upfront without proper discussion of its implications.]

2.6 Hybrids/combinations of the above

The findings of the assessment of alternatives should be summarised in a table format for ease of comparison.

3.0 A DESCRIPTION OF THE SITE AND ITS SURROUNDINGS (*i.e.* ENVIRONMENTAL BASELINE)

The existing environmental features, characteristics and conditions, in and around the proposed development site as well as in all locations likely to be affected by the development or by ancillary interventions and operations, are to be identified and described in sufficient detail, with particular attention to the aspects elaborated further in the next sections.

The consultants should also identify (and justify) wherever relevant:

1. The geographic area (e.g. viewshed or other area of influence) that needs to be covered by each study;

2. The relevant sensitive receptors vis-à-vis the environmental parameter under consideration (e.g. residential communities, other users, natural ecosystems, specific populations of particular species, or individual physical features);
3. The location of the reference points or stations (e.g. viewpoints, monitoring stations, or sampling points (including depth of multiple sampling points at a single sampling point in the case of water media and sediment, where applicable) to be used in the study; and
4. Other methodological parameters of relevance, also noting that the assessment will normally require both desk-top studies and on-site investigations (including visual observations and sampling, as relevant).

Note: It is recommended that these details are discussed in advance with the ERA prior to commencement of the relevant parts of the studies, in order to pre-empt (as much as possible) later-stage issues.

Wherever relevant to the environmental aspects under discussion, reference to legislation, policies, plans (including programmes and strategies) standards and targets, should also be made, such that the compatibility (or otherwise) of the proposal therewith is also factored into the assessment required by **Section 4** below. The discussion should cover the following aspects, in the appropriate level of detail:

- Supra-national (e.g. European Union; United Nations; or other international or regional) legislation, directives, policies, conventions, protocols, treaties, charters, plans and obligations;
- National legislation, policies and plans (e.g. Structure Plan; National Environment Policy); and
- Sub-national legislation, policies and plans (e.g. local plans, site-specific regulations, action plans, management plans, and protective designations such as scheduling or Natura 2000).

Note: In addition to already in-force legislation, policies and plans, the discussion should also cover any foreseeable future updates (or new legislation, policies and plans) likely to be fulfilled, affected or compromised by the proposed project. Furthermore, it should be noted that some cross-cutting legal/policy instruments (e.g. Water Framework Directive and Marine Strategy Framework Directive) may need to be factored into more than one aspect of the discussion.

3.1 Land cover and Land

A description of the land cover and land uses, including agricultural land within the area of influence of the project, including roads, footpaths and public access routes. Details including nature, magnitude, proximity to site, etc. should be included.

3.2 Landscape Character and Visual Amenity

3.2.1 Landscape Character

The study should describe the landscape-related area of influence and landscape setting of the proposed site, identifying the component character areas and local landscape tracts, and the landscape elements, characteristics and degree of sensitivity thereof, so as to enable the prediction and assessment of:

- The changes to the landscape attributable (in full or in part) to the proposed development;
- The implications of such changes on the quality and perception of the landscape and its elements, in each of the identified landscape character areas and local landscape tracts; and
- The effects of such changes on relevant receptors (the receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Reference should also be made to the 'Draft Landscape Assessment Study, 2004,' and to the *Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute & IEMA)*, as relevant.

3.2.2 Visual Amenity

The following need to be identified and submitted for prior ERA approval:

- The Zone of Theoretical Visibility (ZTV; also known as Zone of Visual Influence) of the site and the development under consideration; and
- Assessment viewpoints representative of short-, medium- and long-distance views towards the site. A baseline photograph taken from each proposed viewpoint is also required. The submission should cover all the important views of the site, whilst avoiding the inclusion of superfluous or inappropriate viewpoints (e.g. positions from which the site is not visible, or where the view is obstructed or dominated by physical obstacles in the foreground).

Thereafter, for each approved viewpoint, the projected situation and appearance of the site (*i.e.* as it would look with the proposed development in place) should be compared to the current baseline situation (*i.e.* without the proposed development). The following should be predicted and assessed accordingly:

- The expected changes to visual amenity as a result of the proposed development;
- The effects of such changes on the quality of the visual amenity of the site; and
- The effects of such changes on relevant receptors. (The receptors should also be duly identified and their degree of sensitivity should also be indicated and justified).

Note: *The baseline photographs and the photomontages should, unless otherwise directed by ERA, satisfy the following:*

- (a) *The location of each viewpoint should be shown on a map that also depicts the viewshed for the proposed site as described above. The visual angle of the photograph should also be indicated and should not be greater than 50°. Stitched photos that illustrate the field of vision towards the site from each viewpoint are acceptable as long as they are additional to the 50-degree photograph.*
- (b) *The photographs and photomontages submitted should:*
- *Be at least A3 in size. Strips which are A3 in width but not in length are not appropriate except as supplementary illustrative material;*
 - *Include the date and time at which the photo was taken;*
 - *Be of good quality, with faithful reproduction approximating as much as reasonably possible what would normally be visible to the naked eye. The photos should be taken in good weather, and should be taken at least 2 hours after sunrise and 2 hours before sunset. Colours should not be digitally or otherwise manipulated. As a guideline, the image should have a printing density of 200 dots per inch or better. In some instances, digital images having a resolution of 1024 x 728 or better may be required for multimedia presentation purposes;*
 - *Be taken in such a manner that near-field objects do not overpower or dominate features near the image plane passing through the project area;*
 - *Be taken from a height above ground level that is representative of the eye level of the viewer, and such height should be duly documented; and*
 - *Ensure that all additional/replacement structures and features depicted in the photomontages have a scale which proportionately tallies with the existing nearby features.*
- (c) *Wherever relevant, the photomontage(s) should cover the following scenarios:*
- *The development without the proposed landscaping scheme, representing the worst-case scenario;*
 - *The development complete with the proposed landscaping scheme as it is expected to look when the trees reach maturity, also providing an indicative timeframe as to when such maturity is expected to be attained; and*
 - *(where relevant in relation to impact of nocturnal lighting) the development and its ancillary lighting as it would appear during night-time.*

3.3 Geology, Geomorphology, Hydrogeology, and Soils

A comprehensive investigation of:

1. The geology and geomorphology of the site and its surroundings, including: existing lithological, stratigraphical, palaeontological, hydrogeological and physiographic features and soil types;
2. The geo-technical properties and considerations relevant to the site and its area of influence, including: land stability; mechanical, erosional and structural properties of the terrain and land mass; any relevant fissures, faults, hollows, or weak points; the vulnerability of the site to natural forces such as wave action, erosive elements, landslides and mass movements; and any other considerations affecting the implications and risks posed by the proposed development or by any of its ancillary interventions such as site clearance, earth-moving, and excavations; and
3. The quality of the material that will be excavated (including soil, rock/mineral resource, and any existing fill material) and its potential for reuse.

Sampling and testing should comply with the relevant standards (unless otherwise agreed, BS standards or other recognised equivalents should be used), and should extend to a sufficient depth below the deepest level of the proposed development (taking into consideration all proposed excavations and underground structures). Wherever the study involves the drilling of core samples, the number, depth and location thereof should also be submitted for ERA approval prior to carrying out of any *in situ* tests.

3.4 Architectural, Archaeological, Historical & Cultural Heritage and related Material Assets

Refer to Appendix 2.

3.5 Air Quality

This study should clearly establish the current background levels of pollution (including dust, chemical emissions such as VOCs, and odours) and should include a clear comparison to the relevant reference and limit values as specified in the relevant legislation as well as in any other relevant guidance documents. Details on prevailing wind and climate conditions should also be included, amongst other relevant parameters.

The methodology to be used should be submitted for ERA's evaluation prior to commencement of the studies. The Air Quality Study shall be conducted in accordance with Appendix 3 to these terms of reference.

3.6 Noise, Vibrations and Exterior Lighting

This study should provide sufficiently detailed information on representative background levels of noise, vibration and nocturnal lighting (as relevant), as a baseline for assessing the levels and effects expected to result from the development, including any short- and long-term changes, peaks and fluctuations as well as their acute or chronic impacts. The study should also take into account other relevant factors such as:

- Cumulation with other existing sources including traffic and with other predicted sources such as new developments;
- Additional effects of road traffic associated with operations on the site;
- Sensitive receptors (e.g. residents, schools, hospitals, recreational areas, fauna and avifauna, natural ecosystems); and
- The potential for attenuation or exacerbation by 'environmental' factors (e.g. topography, vegetation, physical barriers etc.), and for mitigation (e.g. shielding, muffling/soundproofing, reduced lighting, etc.).

Note 1: *In the case of light pollution, the study needs to consider, among others, glare (e.g. the blinding light which is a danger to motorists/pedestrians and to fauna), skyglow, light trespass (light straying into an area where it is not desired or required) and sky glow ('wasted' light directed upwards), together with any other relevant variables which are relevant to the determination of impact on the surrounding receptors with particular focus on Buskett.*

The study results should include measurable parameters (e.g. frequency, intensity) as relevant, and should be evaluated against appropriate reference values². The reference points and measurement locations used should be approved by ERA prior to commencement of studies and, unless otherwise indicated, should be at ground level.

The methodology to be used should be submitted for ERA's evaluation prior to commencement of the studies. The Noise Assessment shall be conducted in accordance with Appendix 4 to these terms of reference.

3.7 Infrastructure and Utilities

The assessment should investigate the currently available infrastructural services (including water supply, energy supply, sewerage, telecommunications infrastructure, access roads, parking, etc.), including details about their carrying capacity, physical condition and other relevant practical considerations. It should also compare this information to the infrastructural demands of the project as identified in **Section 1** above, so as to clearly indicate:

1. whether the current utilities are adequate to meet the demand arising from the proposed development;
2. whether any significant loading, congestion or damaging of the infrastructural or transport network is envisaged; and
3. whether any new or upgraded services/arrangements will be rendered necessary, both in the short-term and in the longer-term. If any requirement for new infrastructure (or upgrading, alteration or extension of the existing infrastructure) is envisaged, the relevant details including associated works and their environmental implications should also be indicated.

The assessment should also identify any existing or projected infrastructural services located within the area of influence of the development (even if not related to the demands of the development) that might be affected by the development or which may need to be displaced or diverted as a consequence of the development or its ancillary operations and interventions.

² Unless otherwise specifically indicated, it is recommended that: ISO 1996 and ISO 9613 (all series) standards are used for the noise assessment; BS6472 (relating to human exposure to vibration) and BS7385 (covering the effects on buildings) are used when studying vibration; BS 5228 is used for the assessment of construction noise; and BS 4142 is used vis-à-vis noise complaints.

3.8 Public Access

The assessment should identify the current public access arrangements (particularly the accessibility of the countryside, coast, and public open spaces), including existing footpaths and other public access routes, and should clearly indicate whether these would be affected and how.

Wherever any new or altered arrangements are proposed, these should be clearly identified and their environmental implications should also be indicated.

3.9 Other relevant environmental aspects and features

Other relevant environmental features or considerations not identified in the preceding sections should also be identified and described, as relevant.

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL RISKS

All likely significant effects and risks posed by the proposed project on the environment during all relevant phases (including construction/excavation/demolition, operation and decommissioning) should be assessed in detail, taking into account the information emerging from Sections 1, 2 and 3 above. Apart from considering the project on its own merits (*i.e.* if taken in isolation), the assessment should also take into account the wider surrounding context and should consider the limitations and effects that the surrounding environmental constraints, features and dynamics may exert on the proposed development, thereby identifying any incompatibilities, conflicts, interferences or other relevant implications that may arise if the project is implemented.

In this regard, the assessment should address the following aspects, as applicable for any category of effects or for the overall evaluation of environmental impact, addressing the worst-case scenario wherever relevant:

1. An exhaustive identification and description of the envisaged impacts;
2. The magnitude, severity and significance of the impacts;
3. The geographical extent/range and physical distribution of the impacts, in relation to: site coverage; the features located in the site surroundings; whether the impacts are short-, medium- or long-range; and any transboundary impacts (*i.e.* impacts affecting other countries);
4. The timing and duration of the impacts (whether the impact is temporary or permanent; short-, medium- or long-term; and reasonable quantification of timeframes);
5. Whether the impacts are reversible or irreversible (including the degree of reversibility in practice and a clear identification of any conditions, assumptions and pre-requisites for reversibility);
6. A comprehensive coverage of direct, indirect, secondary and cumulative impacts, including:
 - interactions (*e.g.* summative, synergistic, antagonistic, and vicious-cycle effects) between impacts;
 - interactions or interference with natural or anthropogenic processes and dynamics;
 - cumulation of the project and its effects with other past, present or reasonably foreseeable developments, activities and land uses and with other relevant baseline situations; and
 - wider impacts and environmental implications arising from consequent demands, implications and commitments associated with the project (including: displacement of existing uses; new or increased pressures on the environment in the surroundings of the project, including pressures which may be exacerbated by the proposal but of which effects may go beyond the area of influence; and impacts of any additional interventions likely to be triggered or necessitated by situations created, induced or exacerbated by the project);
7. Whether the impacts are adverse, neutral or beneficial;
8. The sensitivity and resilience of resources, environmental features and receptors vis-à-vis the impacts;
9. Implications and conflicts vis-à-vis environmentally-relevant plans, policies and regulations;
10. The probability of the impacts occurring; and
11. The techniques, methods, calculations and assumptions used in the analyses and predictions, and the confidence level/limits and uncertainties vis-à-vis impact prediction.

The impacts that need to be addressed are detailed further in the sub-sections below.

4.1 Effects on the environmental aspects identified in Section 3

The assessment should thoroughly identify and evaluate the impacts and implications of the project on all the relevant environmental aspects identified in Section 3 above, also taking into account the various considerations outlined in the respective sections.

With regards to Section 3.4 and 3.5 above, the ecological status of the area in question is to be evaluated, taking into consideration the definition of status by relevant EU Policy, and assessing the extent to which the project will cause deterioration in status or compromise the achievement of good status in line with Article 4(7) of the EU Water Framework Directive.

4.2 Impacts related to Climate Change and Climate Change Adaptation

The assessment should address the following aspects, as relevant:

1. The contribution of the project to greenhouse gas (GHG) emissions and climate change, including:
 - (i) The direct, indirect and off-site GHG emissions and related impacts during all relevant phases of the project, including those arising as a result of the electrical power demand of the project;
 - (ii) Any massive GHG emissions that may occur as a consequence of accidents or malfunctions;
 - (iii) The impacts of the proposal on carbon sinks (e.g. wooded/afforested areas, agricultural soils, landfills, wetlands, and marine environments);
 - (iv) The components of the project that are expected to contribute to renewable energy generation on site or to a reduction in GHG emissions through substitution of current generation facilities, including a quantification and critique of their reliability and actual net contribution to climate change mitigation as well as an identification of the impacts of such components on other aspects of the environment (e.g. landscape, land take, avifauna); and
 - (v) The implications of the project and its operations and ancillary demands on National GHG emission targets.
2. The implications of climate change on the proposal, including:
 - (i) The aspects/elements of the project that are likely to be affected by changes or variability in climate-related parameters (e.g. temperature, humidity, weather patterns, sea level, etc.);
 - (ii) The potential impacts that such changes may have on the proposal, including any possible impacts resulting from changes to multiple parameters; and
 - (iii) The adaptability of the project and its components and operations vis-à-vis the relevant climate change parameters and trends.

4.3 Environmental risk

The assessment should also address, in sufficient detail, any relevant environmental risk (including major-accident scenarios such as contamination, emissions, blast, major spillages, etc.) likely to result in environmental damage or deterioration. The range of accident scenarios considered should exhaustively cover, as relevant:

1. one-time risks (e.g. during construction or decommissioning works);
2. recurrent risks during project operation; and
3. risks associated with extreme events (e.g. effect of earthquakes or natural disasters on the project).

The assessment should include, as relevant: a quantification of the risk magnitude and probability; and risk analysis vis-à-vis any hazardous materials stored, handled, or generated on site or transported to/from the site.

4.4 Effects on Human Populations resulting from impacts on the environment

This assessment should also identify any impacts of the development on the surrounding and visiting population (e.g. effects on public health or on socio-economic considerations), that may result from impacts on the environment. In the case of health-related effects, reference should be made to published epidemiological and other studies, as relevant, and the views of the Environmental Health Directorate should be sought.

4.5 Other Environmental Effects

Any other environmental effects deemed relevant to the project but not fitting within any of the above sections should also be identified and assessed.

5.0 REQUIRED MEASURES, IDENTIFICATION OF RESIDUAL IMPACTS, AND MONITORING PROGRAMME

5.1 Mitigation Measures

A clear identification and explanation of the measures envisaged to prevent, eliminate, reduce or offset (as relevant) the identified significant adverse effects of the project during all relevant phases including construction, operation and decommissioning [see **Section 1.2.3** above].

As a general rule, mitigation measures for construction-phase impacts should be packaged as a holistic Construction Management Plan (CMP). Whilst the detailed workings of the CMP may need to be devised at a later stage (e.g. after the final design of the project has been approved and/or after a contractor has been appointed), the key parameters that the CMP must adhere to for proper mitigation need to be identified in the EIA. Broadly similar considerations also apply vis-à-vis operational-phase impacts [which may need to be mitigated through an operational permit] and decommissioning-phase impacts [see **Section 5.4** below], where relevant.

Mitigation measures for accident/risk scenarios should be packaged as a holistic plan that includes the integration of failsafe systems into the project design as well as well-defined contingency measures.

The recommended measures should be feasible, realistically implementable to the required standards and in a timely manner, effective and reliable, and reasonably exhaustive. They should not be dependent on factors that are beyond the developer's and ERA's control or which would be difficult to monitor, implement or enforce. The actual scope for, and feasibility of, effective prevention or mitigation should also be clearly indicated, also identifying all potentially important pre-requisites, conditionalities and side-effects.

5.2 Residual Impacts

Any residual impacts [*i.e.* impacts that cannot be effectively mitigated, or can only be partly mitigated, or which are expected to remain or recur again following exhaustive implementation of mitigation measures] should also be clearly identified.

5.3 Additional Measures

Compensatory measures (*i.e.* measures intended to offset, in whole or in part, the residual impacts) should also be identified, as reasonably relevant. Such measures should be not considered as an acceptable substitute to impact avoidance or mitigation.

If the assessment also identifies beneficial impacts on the environment, measures to maximise the environmental benefit should also be identified.

In both instances, the same practical considerations as indicated vis-à-vis mitigation measures should also apply.

5.4 Decommissioning Plan

A decommissioning plan (DP) should also be proposed to address the following circumstances, as relevant:

1. Removal of any temporary or defined-lifetime development (or of any structures, infrastructure or land use required temporarily in connection with it) upon the expiry of their permitted duration; and
2. Removal of the development (or of any secondary developments, infrastructure or land use ancillary to it) in the event of redundancy, cessation of operations, serious default from critical mitigation measures, or other overriding situations that may emerge in future.

The DP should also include, as relevant, a phasing-out plan, proposals for site remediation or decontamination, and methodological guidance on site reinstatement or appropriate after-use.

5.5 Monitoring Programme

A realistic and enforceable programme for effective monitoring of those works envisaged to have an adverse or uncertain impact. The monitoring programme should include:

1. Details regarding type and frequency of monitoring and reporting, including spot checks;
2. The parameters that will be monitored, their units of measurement, the monitoring indicators to be used; and standard analytical methods in line with relevant EU policy;
3. An effective indication of the required action to address any exceedances, risks, mitigation failures or non-compliances for each monitoring parameter;
4. An evaluation of forecasts, predictions and measures identified in the EIA; and

5. An indication of the nature and extent of any additional investigations (including EIAs or ad hoc detailed investigations, if relevant) that may be required in the event of any contingencies, unanticipated impacts, or impacts of larger magnitude or extent than predicted.

The programme should address all relevant stages, as follows:

- (a) Where relevant, monitoring of preliminary on-site investigations that may entail significant disturbance or damage to site features (e.g. archaeological excavations, geological sampling, or any works that require prior site clearance or any significant destructive sampling);
[Note: Official written consent from the competent authorities (e.g. Superintendence of Cultural Heritage) may also be required for such interventions.]
- (b) Monitoring of the construction phase, including the situation before initiation of works (including site clearance), during appropriate stages of progress, and after completion of works;
- (c) Monitoring of the operational phase, except where otherwise directed by ERA (e.g. where monitoring would be more appropriately integrated into an operating permit); and
- (d) Where relevant, monitoring of the decommissioning phase, including the situation before initiation of works, during appropriate stages of progress, and after completion of works.

5.6 Identification of required authorisations

The assessment should also identify all environmentally-relevant permits, licences, clearances and authorisations (other than the development permit to which this EIA is ancillary) which must be obtained by the applicant in order to effectively implement the project if development permission is granted. Any uncertainty, as to whether any of these pre-requisites is applicable to the project, should be clearly stated.

Note on Sections 5.1 to 5.6 above:

The expected effects, the proposed measures, the residual impacts, the proposed monitoring etc. should also be summarised in a user-friendly itemised table that enables the reader to easily relate the various aspects to each other. An indicative specimen table is attached in **Appendix 5**.

Signed Declaration: Identification of consultants and contributors

This declaration is to be submitted with each environmental survey report forming part of the EIA.

Attn: Director of Environment and Resources (ERA).

I _____, who carried out the study (or part thereof) on
_____ for the EIA for the proposed
_____, hereby declare that I take responsibility for
the study any statement and conclusion contained therein.

Date

Signature

ENVIRONMENTAL

Signed Declaration: Conflict of interest

Signed declaration in accordance with sub-regulation 17(3):

This declaration is to be submitted with each environmental survey report forming part of the EIA.

Attn: Director of Environment and Resources (ERA).

I, _____, hereby declare that, I have no personal or financial interest in the proposed development. Moreover, I declare that I am not in any way associated with any individual, company, association or grouping that has any direct or indirect, personal, professional or financial interest in the proposed development.

Date

Signature

ENVIRONMENTAL

1.0 Preamble

The proposed project would involve development over an extensive area and may lead to intensification of activity over a larger area. Potential impacts may occur within the footprint of the project, in the immediate environs, and along access routes to the site. Potential impacts may include direct and immediate material impacts, as well as subsequent impacts that might arise from the modification of the existing situation.

2.0 Scope and Definitions of the EIA

For the purposes of this document, cultural heritage is defined by Article 2 of the Cultural Heritage Act (2002). This includes movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological and geological importance.

2.1 The study area shall include the total footprint of the proposed development.

2.2 In the context of this particular application, cultural heritage considerations may include:

- Features of archaeological value and potential;
- Military or civil architecture from the Knights period to British period;
- Vernacular structures; and
- Field systems and agricultural features such as irrigation systems.

The above cultural heritage definitions and considerations are not to be considered as exhaustive. The EIA must consider all other forms of cultural heritage, both known and unknown.

2.3 The Environmental Impact assessment will:

- Describe the Cultural Heritage assets within the study area;
- Analyse the cultural heritage features within the context of the cultural landscape;
- Assess the physical, spatial and visual impacts of the proposed development on the cultural heritage assets; and
- Propose corrective measures for the protection of the cultural resources.

3.0 Methodology

In quantifying the cultural heritage assets within the study area, and assessing the impacts of the proposed development, the EIA will undertake:

- Description and assessment of the property;
- Desktop and archival research limited to the study area;
- Fieldwork and research, including "field walking", topographic survey and remote sensing as may be necessary within the site. All fieldwork has to be authorised by the Superintendence of Cultural Heritage as defined below under point 4;
- Consultations with any relevant bodies, including the Superintendence of Cultural Heritage, Heritage Malta, the University of Malta, NGOs and Local Councils;
- Compilation of an inventory of the cultural heritage assets identified within the study area. The features of cultural heritage are to be described and plotted with grid references, on Data Capture Sheets, the design of which should be approved in advance by the Superintendence of Cultural Heritage. The Data Capture Sheets will be presented as an appendix to the EIS. The analysis of the features will be included in the main report; and
- A cultural heritage Risk Assessment Map examining the various impacts of the proposed project is to be included in the EIA.

4.0 Authorisation by the Superintendence of Cultural Heritage

As per Cultural Heritage Act 2002, any form of investigation or prospection required for the identification of cultural heritage (including excavation, field walking, topographic survey and remote sensing) may only be undertaken by the Superintendence of Cultural Heritage or with its written approval.

PROTECTIVE INVENTORY OF THE MALTESE CULTURAL HERITAGE HERITAGE DATA CAPTURE SHEET						Ref. No.
Location	Category	Type	Site Location (Address)			
Eastings	Northings	Feature	Period - Year			
S.S. No. 1	S.S. No. 2	Description				
S.S. No. 3	S.S. No. 4					
Date						
Negative No.	Film No.					
Present Utilization						
Existing Legal Protection		GN. Number	GN. Date			
Comments						
Buffer Zone	A	B	C	D	E	Others
Eastings						
Northings						
Site Map						
Scale 1 : 2500						

Archaeological Characteristics – Sketch/Scaled drawings:	
Condition:	Degree of Protection (Structure Plan policies UC07 or ARC 2):
State of Security:	Proposed Utilization:
Basic Bibliography:	
Compiled by:	Revised by:
Checked by:	Checked by:
Date:	Date:

Legal background:

Regulation 29 of S.L. 549.59, grants ERA the power to issue guidance notes on the conduction of Air Quality Studies which are required by any Regulations issued under the Environment Protection Act including the EIA Regulations (S.L. 549.46).

Part II of Schedule 7 to S.L. 549.59 sets the following (legally binding limit values): an annual limit value of $40\mu\text{g}/\text{m}^3$ for PM_{10} , a daily limit value for PM_{10} of $50\mu\text{g}/\text{m}^3$ which can not be exceeded on more than 35 calendar days (90.4% of the daily readings in a calendar year should be $< 50\mu\text{g}/\text{m}^3$), an annual limit value $40\mu\text{g}/\text{m}^3$ for NO_2 and an hourly limit value of $200\mu\text{g}/\text{m}^3$, which can not be exceeded more than 18 times per calendar year.

Regulations 19 and 20 of LN 78 of 2010 give ERA the responsibility to ensure that the above mentioned limits are complied with across Malta and Gozo.

0. **Applicability**

These terms of reference are applicable to all development applications irrespective of whether or not it qualifies for an Environmental Impact Assessment, as long as the expected increase in traffic flows due to the operation of the project is ≥ 1000 passenger cars AADT or ≥ 200 HDV AADT.

The Air Quality study shall be conducted as follows:

1. **Content**

The air quality study shall *inter alia* include the following sections:

- a) *The relevant details of the proposed development:* This should include an overview of the expected traffic changes when the project is FULLY operational. The report should also include a brief introduction to the sensitivity of the area to increases in traffic flows and changes in air pollution levels keeping in mind the NO_2 levels registered by the passive diffusion tubes (include in ERA's network) sited closest to the site.
- b) *Description of the relevant immission standards with reference to S.L. 549.59.*
- c) *The assessment methods:* This section shall include any relevant details on the methods used in order to monitor the base line levels of NO_2 and PM_{10} , including any proof of equivalence to the reference method(s) as applicable (see 2.i and 2.n below). The section shall also include a part outlining the core details of the model (including version number) being used in order to predict the impact of the development. The consultants shall also include details on all the input data used and its source, including features of the traffic flows used, speeds, apportionment by vehicle type etc.
- d) *Site selection:* This section shall include the considerations made by the consultants in the selection of the monitoring site. The consultants shall also show how the selected site matches the site selection criteria in Annex I and the additional criteria Section 2 paragraph k).

- e) *Model verification*: Model verification involves a comparison between the predicted and the measured values for both PM₁₀ and NO₂. Any errors between modeled and measured values should be adequately corrected. In addition consultants are expected to include estimates of the uncertainties in the traffic flows, vehicle emission factors and background concentrations. Any modeled concentrations should include a cumulative sensitivity analysis for these uncertainties (the effect of each uncertainty should be clearly outlined). The limitations of the model should be clearly stated e.g. the software's inability to model dispersion of air pollutants if the air flow is affected by trees or the inability to model pollutant concentrations in street canyons.
- f) *Identification of sensitive receptors*: For the projects in Annex II to this document and within the scope of S.L. 549.46, the consultants will be required through the use of software modeling traffic flows, to delineate the extent of the area affected by increased traffic flows due to the project. Baseline studies may be required for more than one location. Any sensitive receptor within this area shall be clearly identified through the use of a GIS package. For any other project the identification of sensitive receptors shall be limited to a 3km radius around the site. Sensitive receptors include schools, retirement homes, residential units, hospitals, etc.
- g) *Description of the baseline conditions*: This section should details on location of the points at which the air quality monitoring was carried out, the reason for which this particular site was used the sampling period, data capture, the scale up factors provided by ERA and if possible a break-up of the base line levels of the pollutant by the source.
- h) *Assessment of impact*: Results of the modeling for the "with development" scenario should be clearly set out in tables and also through the use of contour maps (which shall include the sensitive receptors identified in e) above), this should be compared to the "without development" scenario with respect to both the table and the contour map. The comparison between both scenarios shall also be applied to each of the sensitive receptors identified in e) above.
- i) *Determination of the significance of the impact*: The table in section 4 (and the tool made available through the ERA website) shall be used for each of the sensitive receptors identified in e) as well as for the modeled concentrations at the site where the monitoring was carried out.
- j) *Cumulative impacts*: If in the area there are other planned developments, which have already been granted development consent then the contribution of these developments should also be considered at a point in the future when these are fully operational.
- k) *Mitigation measures*: If the effect of the project is substantially adverse or worse, then the report shall include any mitigation measures, which have been identified and, which will reduce the impact of the project to at least slightly adverse. Non-quantifiable measures will not be expected.
- l) *Summary of the report*: The report should be written in clear, concise, grammatically correct English. If the English of the report is unacceptable, the report shall be sent to the consultants for correction and ERA will not take any responsibility for any delays in the process.

2. **Base Line Studies**

- a) The baseline levels of PM₁₀ and NO₂ shall be established through *in-situ* monitoring;
- b) Baseline levels of PM₁₀ shall be determined using the reference method (EN 12341:2014) for the determination of PM₁₀;
- c) The consultants should use the reference method for the sampling and measurement of PM₁₀;
- d) The design criteria for the samplers shall be as per Annex B to the said standard and shall be as per Section IV of Annex IX: EN 12341: 2014;

Inlet Design	Flow rate		Filters
See Section 5.1.2 and Annex A of EN 12341:2014	To a nominal value of 2.3 m ³ .hr ⁻¹ see Section 5.1.5 of EN 12341:2014	The instantaneous value of the flow rate shall be kept within 5% of the nominal value. The volumetric flow rate averaged over the sampling period shall be within 2% of the nominal value, see Section 5.1.5	Circular: such that the diameter of the exposed area through which the sampled air passes is between 34mm and 44mm.

Figure 1.1 design criteria for the samplers.

- e) The resolution of the balance used for the weighing of filters sampled using an LVS shall be at least 10 µg, Section 5.2.2 of EN 12341:2014;
- f) The filters should be conditioned for at least 48 hours (Section 6.2 of EN12341:2014) at 50% relative humidity (+ or - 5%) with an uncertainty of ≤ 2% RH and at 20 °C (+ or - 1 °C) with an uncertainty of ≤ 0.2 °C, according Table 2, Section 5.2 of EN12341:2014.
- g) The filters should be weighed at least twice for concordance (the difference between successive readings shall ≤ 40µg, Section 6.2 of EN12341:2014) with a time lag of at least 12 hours between the two weightings;
- h) Flow rates are at ambient volumes not at normalised volumes. The weighing shall take place in the same climate controlled room at the same environmental conditions as in f);
- i) Consultants can use alternative sampling and measurement methods if they demonstrate to ERA's satisfaction, equivalence to the above mentioned method under the Maltese air pollution climate. Equivalence shall be determined using the [European Commission's method for the determination of equivalence](#); any other method shall be deemed unacceptable. ERA will accept certificates of equivalence issued by third parties, which have been based on the method herein;
- j) Compliance with non-European standards does not satisfy the requirements above;
- k) Regarding the siting of the sampler/diffusion tube, the consultant shall submit a method statement indicating the location of the sampler/diffusion tube. The sampling point(s) should not be within the site to be developed

or exactly adjacent to it, but should be sited at a location representative of the thoroughfare on which the highest traffic impacts (due to the project) are expected. In addition the consultant is obliged to use all the criteria in Annex I to determine the sampling location. In addition the ERA may at its discretion ask the consultant to change the location of the sampler;

- l) The sampling time shall be no less than 6 weeks and extendible by a further 3 weeks depending on the nature of the case and the consultant shall use a scale up factor to scale this up to a yearly average. The scale up factor shall be forwarded by ERA to the consultant;
- m) The consultants shall discard readings influenced by Saharan dust intrusions. These episodes are characterized by a marked spatial consistency, demonstrated by concomitant peaks in the levels of PM₁₀ (and PM_{2.5}) across the Maltese Islands (see Figure 1 below). The consultants shall use this in conjunction with following two tools to confirm the occurrence of these episodes a) [MACC ensemble](#) and b) [HYSPLIT back trajectory model](#).

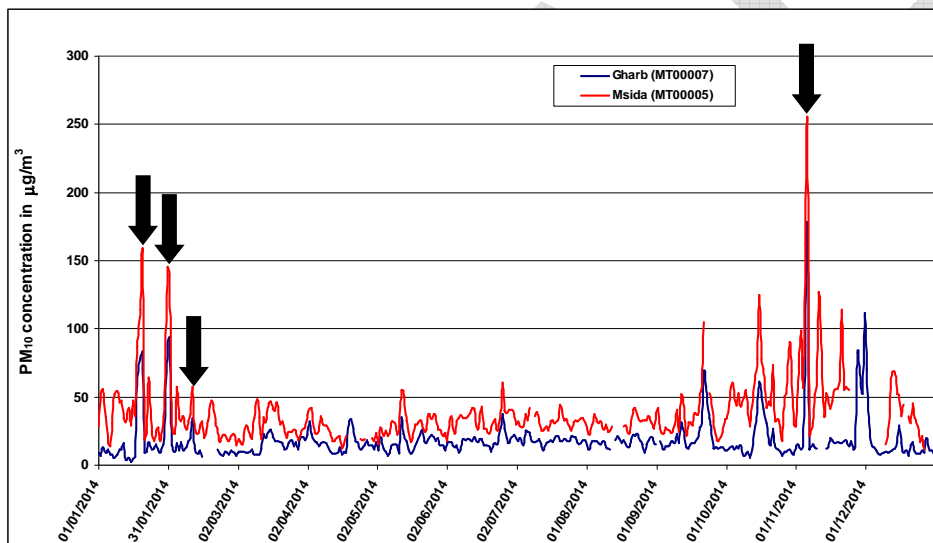


Figure 1: Comparison of the PM₁₀ levels in Għarb (blue) to the PM₁₀ levels in Msida (red) measured in 2014. The black arrows show some of the Saharan events throughout 2014.

- n) The PM₁₀ dataset shall in no case consist of <42 or <63 (depending on whether the baseline monitoring period has been set for 6 or 9 weeks) daily readings, excluding any discarded readings.

Baseline levels of NO₂.

- o) Baseline levels of NO₂ shall be determined using EN 14211:2005. The consultant may use passive diffusive tubes if it is shown that the latter are equivalent to the reference method.
- p) If the consultant opts for passive diffusion tubes, he shall forward at least 1 article in a peer reviewed journal e.g. Pfeffer *et al.* (2010) – *Gefahrstoffe-Reinhalt der Luft*. 70, 500-506, which shows that the equivalence of these tubes has been demonstrated for field trials (not exposure chambers) in at least 1 EU Member State. Equivalence should preferably, also have been demonstrated in Malta. The field trial shall include the

comparison of at least 40 individual measurements taken throughout a whole calendar year. Equivalence shall be determined using a modification of European Commission's method for the determination of equivalence for PM₁₀; any other method shall be deemed unacceptable

- q) The sampling point for NO₂ shall be the same as for PM₁₀.
- r) The sampling time shall be identical to the one for PM₁₀ (i.e. no less than 6 weeks and extendible by a further 3 weeks depending on the nature of the case). The consultant shall use a scale up factor to scale this up to a yearly average. The scale up factor shall be forwarded by ERA to the consultant.

Annualisation of the 6 (or 9) week averaged values for PM₁₀ and NO₂.

- s) The factor in l) and p) above shall be based on the use of the following equation (adapted from LAQM TG(16), April 2016 version:

$$CAA = \frac{p_{y+1}^{x \text{ weeks}}}{p_y^{x \text{ weeks}}} \times P_y^{52 \text{ weeks}}$$

Where:

CAA is the corrected annual average;

$p_{y+1}^{x \text{ weeks}}$ is the concentration of NO₂ or PM₁₀ measured by the consultants throughout the 6 (9) week (baseline) monitoring period;

$p_y^{x \text{ weeks}}$ is the concentration of NO₂ or PM₁₀ measured throughout the same 6 (9) week monitoring period of the preceding year at a comparable ERA fixed station; and

$P_y^{52 \text{ weeks}}$ is the annual average of NO₂ or PM₁₀ measured at the comparable ERA fixed station.

Traffic Counts.

- a) The consultant shall also take traffic counts at the main junctions near the monitoring site. The number and location of the counters are to be approved by ERA, (unless longer term traffic counts are already available).
- b) The traffic count shall take into consideration the vehicle type and the legislation class.
- c) The consultant shall use an appropriate model in order to scale the traffic counts obtained during the 6 (or 9) week period to AADT.

3. **Modeling**

- a) Once the baseline levels have been obtained the consultant shall determine the impact of the project on air quality through dispersion modeling.
- b) The following models are deemed acceptable by ERA:
IMMIS^{em}
BREEZE Roads.
ADMS-Urban
- c) The model used should use the logic outlined by e) below,
- d) The consultant shall use exclusively the emission factors in the latest version of the Handbook of emission factors for road transport emissions ([HBEFA v 3.2](#)). The average age of the Maltese vehicle fleet shall be taken as 13 years.
- e) The use of other emission factors is not acceptable.
- f) The consultant shall estimate the ambient background levels for both NO₂ and PM₁₀. The approach in Figure 2 below shall be deemed acceptable for both pollutants.

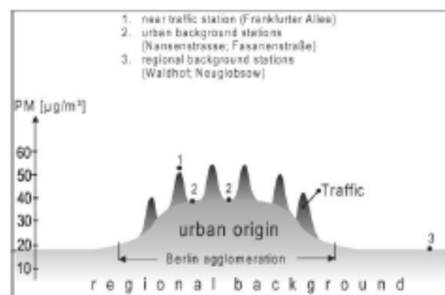


Figure 2: Horizontal profile for PM₁₀ concentration, Lenschow *et al.* (2001) – *Atmospheric Environment* 35, 29-33.

- g) The rural background can be captured through the use of the [EMEP](#) or [LOTOS-EUROS](#) model at a resolution of 50km × 50km (The [GAINS](#) model might have to be used for emissions data for the EU), the urban background can be captured through the use of a model such as [CHIMERE](#) at a resolution of 7km × 7km.
- h) The predictions of the model shall be assessed by comparing the modeled data to the monitoring data provided by the baseline studies. The modeled data must not deviate by more than ±20%.
- i) Other methods can be used in order to determine the background levels of NO₂ and PM₁₀, including statistical methods aimed at deriving “horizontal profiles” similar to the ones in Figure 1 (see e.g. Gómez-Losada *et al.*, 2016 – *Atmospheric Environment* 127, 255-261) and based on a full year’s dataset, interpolation of data from the nearest ERA diffusion tubes, etc.
- j) The consultant should clearly explain the rationale behind the determination of the background levels.
- k) The consultant shall use the model to project the annual PM₁₀ and NO₂ levels into the future, when the project is fully operational taking into account the cumulative impact of projects in the area, which have been granted development consent.

- l) The consultant shall model two distinct scenarios: A) without the project and B) with the project.
- m) Results shall be displayed as a colour-coded contour map with the modelled annual concentrations of NO₂ and PM₁₀ as well as the calculated 90.4th percentiles for the daily PM₁₀ levels (calculated using the equation in q) within a 3km radius and especially at the sensitive receptors in point 1e. The position of the sensitive receptors shall be clearly labeled.
- n) For the annual averages of NO₂ and PM₁₀ as well as for the 90.4th percentile of the PM₁₀ levels, the contour maps shall show the situation with the scheme and without the scheme.
- o) Contour plots for the 90.4th percentile of the PM10 levels shall include the error in the prediction of this value, which shall be calculated using the equation in q).
- p) For the three criteria above the consultants shall also draw colour-coded contour maps expressing the difference in the annual levels/90.4th percentile, between the two scenarios (with and without the scheme) in terms of the significance criteria in 4 b) and 4 c).

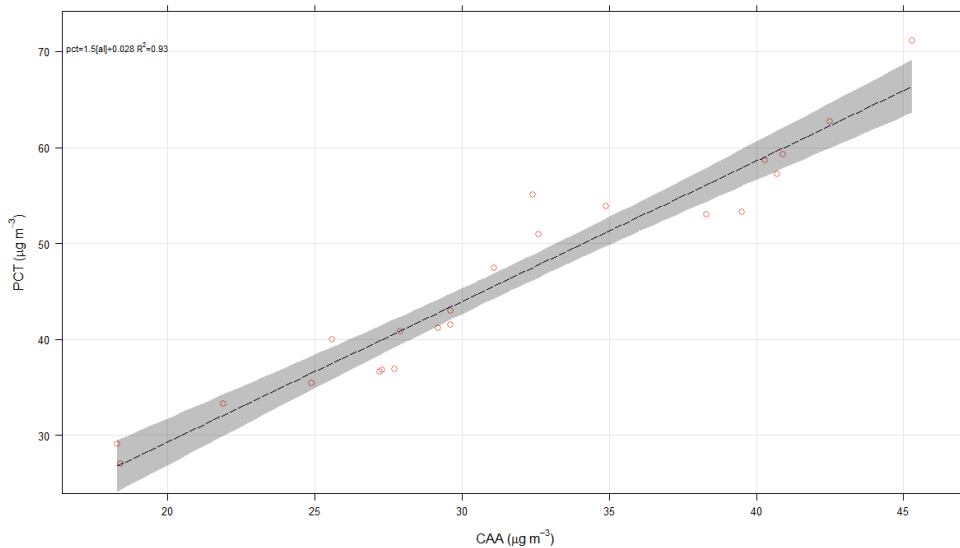


Figure 3: Plot of CAA vs PCT
see e.g. Querol *et al.* (2004) – *Journal of Aerosol Science* 35.9, 1151 – 1172.

- q) The consultant shall calculate the baseline of the 90.4th percentile of the daily PM₁₀ using the following equation:

$$\text{PCT} = (1.46 \times \text{CAA}) - 0.03$$

Where CAA (in $\mu\text{g/m}^3$) is the average of the 6 (or 9) week monitoring period and corrected to an annual average using a factor, which shall be determined by ERA, PCT is the 90.4th percentile of the daily PM₁₀ averages in $\mu\text{g/m}^3$. The equation above will be modified on a yearly basis by ERA.

- r) If $\text{PCT} > 50 \mu\text{g/m}^3$ then it is likely that the site is not in compliance with the 90.4th percentile criterion.

- s) The consultant shall also use the modeled annual levels for PM₁₀ (AA) to calculate the PCT due to the project using the same equation as in n) but substituting AA for CAA.
- t) For scaled up annual averages (CAA) <29µg/m³ the consultants will not be obliged to analyse for compliance with the 90.4th percentile criterion.
- u) For NO₂ the consultant shall assume that the annual mean is always exceeded before the allowed number of hourly exceedances.
- v) Any assumptions must be clearly stated by the consultant.

4. **Significance Criteria**

- a) The following criteria of significance (adapted from IAQM's Planning for Air Quality Guidance, January 2017 version) shall be used by the consultant to determine the significance of the impact at all sensitive receptors and at any point within the 3km radius at which the impact of the project on traffic increases is the highest.
- b) A significance criteria tool shall be made available on the ERA website, for guidance and interpretative purposes.
- c) For annual levels of NO₂/PM₁₀ in µg/m³.

		Change in the annual NO ₂ /PM ₁₀ (dAA) levels due to scheme (µg/m ³).			
		dAA ≤ 0.4 µg/m ³	0.8 µg/m ³ ≤ dAA ≤ 2.0 µg/m ³	2.4 µg/m ³ ≤ dAA ≤ 4.0 µg/m ³	dAA > 4.0 µg/m ³
CAA for NO ₂ /PM ₁₀ (µg/m ³)	CAA ≥ 44µg/m ³	MODERATE	SUBSTANTIAL	SUBSTANTIAL	SUBSTANTIAL
	43.6 µg /m ³ ≤ CAA ≤ 41.2	MODERATE	MODERATE	SUBSTANTIAL	SUBSTANTIAL
	40.8 µg /m ³ ≤ CAA ≤ 38.0	SLIGHT	MODERATE	MODERATE	SUBSTANTIAL
	37.6 µg/m ³ ≤ CAA ≤ 30.4 µg/m ³	NEGLIGIBLE	SLIGHT	MODERATE	MODERATE
	CAA ≤ 30 µg/m ³	NEGLIGIBLE	NEGLIGIBLE	SLIGHT	MODERATE

- d) For compliance with the 90.4th percentile criterion for PM₁₀.

		Change in the PCT (dPCT) due to scheme (µg/m ³).			
		dPCT ≤ 0.5µg/m ³	1.0 µg/m ³ ≤ dPCT ≤ 2.5 µg/m ³	3.0 µg/m ³ ≤ dPCT ≤ 5.0 µg/m ³	dPCT > 5.0 µg/m ³
	PCT ≥ 55µg/m ³	MODERATE	SUBSTANTIAL	SUBSTANTIAL	SUBSTANTIAL

PCT ($\mu\text{g}/\text{m}^3$)	$54.5 \mu\text{g}/\text{m}^3 \leq$ PCT $\leq 51.5 \mu\text{g}$	MODERATE	MODERATE	SUBSTANTIAL	SUBSTANTIAL
	$51.0 \mu\text{g}/\text{m}^3 \leq$ PCT $\leq 47.5 \mu\text{g}$	SLIGHT	MODERATE	MODERATE	SUBSTANTIAL
	$47.0 \mu\text{g}/\text{m}^3 \leq$ PCT $\leq 38.0 \mu\text{g}/\text{m}^3$	NEGLIGIBLE	SLIGHT	MODERATE	MODERATE
	PCT $\leq 37.5 \mu\text{g}/\text{m}^3$	NEGLIGIBLE	NEGLIGIBLE	SLIGHT	MODERATE

- e) Whenever the impact of the project is determined to be “negligible” no further action will be required from the developer.
- f) If the impact of the project is classified as “substantially adverse” then ERA will not recommend approval unless the project is modified in such a way (including scaling down) that the significance of the impact is measurably lessened to at least “slightly adverse”. In this case a green travel plan will not be considered as sufficient.
- g) If the impact of the project is “moderate adverse” then the developer will be asked to modify the project. The modifications can include a green travel plan which has to include specific, measurable³ and achievable objectives together with their respective implementation time-frames. The developer will be asked to finance at least in part, the implementation of the green travel plan. The implementation of the plan will have to be audited and eventually updated by the developer on a periodic basis. If the green travel plan does not lower the significance of the impact then the developer will be asked to take additional measures, which may include scaling-down the project.
- h) If the impact of the project is slightly adverse then the developer will be asked to consider alternatives, which will lessen the impact of the project.

³ The term measurable in this context means that the green travel plan shall quantify the reduction in the pollutant levels (in $\mu\text{g}/\text{m}^3$), over the scenario leading to the classification of the impact as “moderately adverse”.

Concluding Remarks

- a) The air quality study shall consider the **cumulative** impact of all development taking place and/or which is planned for the site in question irrespective of the number of separate Planning Applications involved.
- b) If the applicant-decides to develop a part of the site at some point in the future, then a full air quality study will be requested and this will have to consider the cumulative impact from the whole site, in line with the ERA Guidelines on the issue. This requirement will apply irrespective of the incremental increase in traffic flow as a result of the latter development.

FINAL

ANNEX I

Site selection Criteria mention in Section 1 d) and in Section k).

- i. PM₁₀ samplers shall sited at least 500m from:
 - a) dust piles;
 - b) construction/demolition/excavation sites & quarries;
 - c) dirt tracks;
 - d) un-asphalted surfaces;
 - e) surfaces which are visibly covered with dust; and
 - f) any other surface or activity likely to lead to the entrainment of dust
- ii. There shall be absolutely no bends in between the PM₁₀ sampling head/sampling inlet for NO₂ and the analyser.
- iii. The height of the PM₁₀ sampling head/sampling inlet for the NO₂ analyser/NO₂ passive diffusive tube shall be $\geq 1.5\text{m}$ and $\leq 4\text{m}$ above the ground.
- iv. For active samplers, the exhaust outlet shall be positioned in such a way that recirculation of the exhaust air to the sampling inlet is avoided.
- v. The distance of the PM₁₀ sampling head/sampling inlet for the NO₂ analyser/NO₂ passive diffusive tubes from the edge of any road junction shall be $\geq 25\text{m}$.
- vi. The PM₁₀ sampling head/sampling inlets for the NO₂ analyser/NO₂ passive diffusive tube shall be placed at $\leq 10\text{m}$ from the kerbside.
- vii. The flow around the PM₁₀ sampling head/sampling inlets for the NO₂ analyser/NO₂ passive diffusive tube shall be unrestricted, without any obstructions in the vicinity of the sampler i.e. free in an arc of at least 270°.
- viii. The PM₁₀ sampling head/sampling inlets for the NO₂ analyser/NO₂ passive diffusive tube shall in no case be at < 0.5 from the nearest building.

Note: The selection of the site is solely the consultants' responsibility. ERA will not waive the requirement for in situ monitoring due to erroneous readings resulting from poorly chosen monitoring sites. The 6 (or 9) week monitoring period will apply regardless of any time constraint the consultants might have. ERA will therefore not assume responsibility for any delays caused by this issue.

ANNEX II

(Projects identified in section 1f).

Projects falling within the scope of the following categories in Schedule I of LN 412 of 2017 are covered by the article above:

All Section 1 (*General land use*) projects depending on the type of project.

The following projects within Section 2 (*Transport Infrastructure Projects*):

Section 2.1 (*Roads*) - Category I

2.1.1.1;

2.1.1.2.

Section 2.1 (*Roads*) - Category II

2.1.2.1.

All projects in Section 2.2 (*Airports*) irrespective of the Category;

The following projects within Section 6 (*Development on the coast or at sea – including ports*):

Section 6.1 (*Ports, Marinas and Waterways*)

6.1.1.1;

6.1.1.2.

All the projects in Section 7 (*Urban Development and Recreational Projects*), with the exclusion of:

Section 7.1 (*Urban Development Projects*)

7.1.2.2;

7.1.2.3 unless it is accompanied by a Section 2, Section 6 or a Section 7 project, which is not covered by this exclusion.

Section 7.2 (*Recreational or Sporting Establishments*)

7.2.1.1;

7.2.2.3;

7.2.2.4.

The following projects within Section 12 (*Industrial Development*)

Section 12.7 (*Industrial Estates*)

12.7.2.1.

Section 13.0 (*Changes or Extensions to approved projects, and reactivation of projects*) on a case by case basis.

APPENDIX 4: TERMS OF REFERENCE FOR A NOISE ASSESSMENT

Below TORs are to be applied to development permit proposals submitted to ERA and describe the key components of noise assessment; the stages involved in identifying sources; quantifying emissions; and assessing control requirements.

1. Introduction to the Noise Assessment

The below methodology is to be submitted as part of the method statement prior to undertaking the study, and should be agreed upon between the developers, and ERA, on all relevant noise generating sources and noise sensitive receptors (NSRs).

The collection of baseline data in order to determine the ambient noise level at the proposed area of development are determined via noise monitoring, in accordance with current ISO Standards and British Standards⁴ such as:

- ISO 1996-1:2016 Acoustics -- Description, measurement and assessment of sound pressure levels -- Part 1: Basic quantities and assessment procedures
- ISO 1996-2:2017 Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of environmental noise levels
- BS 4142:2014 -- Methods for rating and assessing industrial and commercial sound
- BS 7445-1:2003 – Description and measurement of environmental noise. Guide to quantities and procedures.
- BS 7445-2:1991 -- Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use
- BS 7445-3:1991 -- Description and measurement of environmental noise. Guide to application to noise limits.
- CRTN – Calculation of Road Traffic Noise, Department of Transport (UK), 1988
- IEC 61672 -- 2013 Electroacoustics - sound level meters Parts 1, 2 and 3
- IEC 61260 -- Ed. 1.0 (1995-08) plus Amendment 1 (2001-09), 1/1 and 1/3-octave Bands (octave-band and fractional-octave-band filters)
- IEC 60942:2018 Electroacoustics - sound calibrator

2. Baseline Study

- a. The noise monitoring report shall include details of the standards used for monitoring, equipment used including calibration details and calibration certificates, resultant monitoring data, and assessment methods.
- b. The study is to be commissioned according to the latest revisions of ISO1996 and the rating of operational noise affecting residential areas shall be according to BS4142:2014.
- c. The study should include baseline noise survey of sensitive receptor sites, noise impact on site sensitive receptors including day and night background levels.
- d. The noise monitoring study for the operational assessment, as proposed by the commissioned consultant should address the following issues:
- e. Maintenance and field calibration checks: The monitoring shall be performed exclusively using a calibrated and accredited type 1 sound level meter, conforming to BS6698/IEC 61672 Class 1. The use of type 2 sound level meters or less is not considered acceptable and will not be considered. The consultant shall ensure that:
 - Prior to the initial data collection and at the end of the monitoring day, all acoustic instrumentation system such as the sound level meters are calibrated, and checked immediately before and after each series of monitoring readings.
 - Results must be within ± 1.0 dB, otherwise discarded and read again.
- f. Measurement locations: The location for monitoring of ambient noise levels should be between:
 - 1.2 and 1.5m above the ground for a single storey development and;

⁴ In the case that the consultant proposes to use equivalent standards (ex. European or ISO) that are not covered by these TORs, the assessment methodology to be adopted is to be proposed for the approval of ERA together with the Method Statement.

- Between 1.2 to 1.5m above the proposed internal floor level for each additional storey.
- g. For noise mapping the following microphone heights must be used:
- 4.0 ± 0.2 m in residential areas with multistorey buildings;
 - 1.2 ± 0.1 m or 1.5 ± 0.1 in residential areas with one floor buildings and recreational areas.
- h. To minimize the influence of reflections, the monitoring should either be taken under free-field conditions (more than 3.5m from any reflecting surface) or at 1m from the façade of a building and results treated accordingly.
- i. When a noise source is incident on a façade, the effect of reflected noise from the façade is generally to increase the “façade level” measured at 1m by 3 dB.
- j. For road traffic, generally the microphone is at 10m away from the carriageway edge (not less than 4m and not more than 15m) and microphone should be pointing vertically upwards (grazing incidence).
- k. Measurement settings
- The recommended time periods over a twenty-four hour period are categorized in terms of daytime, from 07:00-23:00 ($L_{Aeq,[16h]}$) and night-time from 23:00-07:00 ($L_{Aeq,[8h]}$).
 - A number of different noise indices are used due to the variation of different noise levels and frequency content over time in accordance to BS 4142:2014. Equivalent continuous noise level over a period of time index, $L_{Aeq,T}$ is to be used for measuring the specific sound and the residual sound. For traffic noise, $L_{A10,18h}$ is more widely used and $L_{A90,T}$ is an appropriate noise metric to measure background noise at the noise sensitive receptor or location.
 - When monitoring for a specific noise level at assessment location it should be adjusted over reference time intervals such as a period of 1 hour during the day, $L_{Aeq,1hour}$ and 15min during the night, $L_{Aeq,15min}$.
 - The measurement time interval should be sufficient enough to obtain a representative value of a typical background when the specific noise source will be operating.
- l. All noise monitoring results and any derived averages should be rounded to the nearest whole integer, with 0.5 being rounded up.
- m. All meteorological conditions and weather effects such as wind speed and direction, temperature gradient, relative humidity and cloud cover, are to be documented in the beginning of each monitoring period and monitoring point location. The following two points shall be considered, where relevant:
- Measurements should ideally be carried out under dry conditions; when the road surface is dry; and the wind velocity is of up to $2ms^{-1}$. (At this wind speed the noise levels are enhanced by up to 2dB(A) when compared to still conditions).
 - Monitoring should not be performed if wind speed exceeds $5ms^{-1}$ or wind gusts exceed $10ms^{-1}$ or if it is raining as stipulated in ISO standard.
- n. The background noise measurements shall be accompanied by a critical listening of all the other noise sources present in the background.
- o. Adjustments: Due to certain acoustic features such as tonality, impulsivity and intermittency the inclusion of specific noise level plus any adjustment for the different noise characteristic features, the rating level, $L_{Ar,Tr}$ should be reported in accordance with BS 4142:2014, depending on the subjective assessment made while taking the readings.

3. Construction Noise Study

The study on noise impacts by the use of equipment and machinery during all construction phases are to be evaluated by using Standard BS 5228-1:2009 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, or any update thereof, where in particular Annex C and F are to be used for methodology and Annex E for assessment.

4. Road Traffic Noise

In order to determine whether the proposed development shall give rise to an increase in noise level due to operational traffic, the potential increase in peak traffic needs to be identified (Peak Traffic Forecast).

The increase in traffic will have an influence on the existing noise climate. Typically, a halving or doubling of flow produces a 3dB change in noise levels, (The Institute of Environmental Management and Assessment UK, IEMA, Guidance Notes No I, Guidelines for the Environmental Assessment of Road Traffic).

- a. The baseline and future noise levels shall be estimated using the procedures set out in the Calculation of Road Traffic Noise (CRTN). These use the L_{A10} noise index, which corresponds to the arithmetic mean of the noise level exceeded for 10% of the time; typically one hour or 18hours (18 sets of measured $L_{A10,(1hr)}$ and $L_{Aeq,(1hr)}$ over the course of 18 hour period).
- b. Road traffic noise may require two separate considerations: day-time: $L_{Aeq,16hrs(0700-2300)}$ and night-time noise: $L_{Aeq,8hrs(2300-0700)}$.
- c. For the noise levels to be in terms of L_{Aeq} over a 16 hour period, an approximate conversion between L_{Aeq} and L_{A10} as estimated from CRTN is given by:

$$L_{Aeq,16hr(0700-2300)} \approx L_{A10,18hr(0600-2400)} - 2dB$$

And; $L_{A10(1hr)} = L_{Aeq(1hr)} + 3dB$

- d. For heavy traffic flow roads, it is usually the case that $L_{A10,1hr}$ is 1dB higher than an average 18hr value, however this depends on the nature of the traffic.

5. Report

The report shall include the following:

- a. A description of the surrounding areas within approx. 1km radius from the site– this shall include identification of the types of activities, whether residential or commercial, roads and other amenities. These shall be location-specific taking into account their location with respect to the site.
- b. Identification of the closest noise sensitive receptors – this shall be carried out after assessing the noise levels in the plant's perimeter and in the other locations identified in point 14 above under normal operating conditions of the plant. The various measurement points shall be identified with a unique code and an analyses of the ambient noise to which each monitoring point is subjected. The consultant, in collaboration with ERA, shall seek advice from the Local Council during the selection of the sensitive receptors.
- c. A summary of the data obtained after the survey has been commissioned in relation to the noise sensitive receptors identified above shall be submitted.
- d. Impact assessment of traffic noise on the sensitive receptors – this shall include an assessment according to the guidelines BS 4142:2014, ISO1996, ISO9613, ISO 8297: 1994, ISO 3744:2010and ISO 3746:2010; and any revision thereof.
- e. A noise map maybe required both for baseline studies and for prediction showing the sensitive receptor exposure to noise. The maps will be generated using the above highlighted standards.

6. Impact Significance

- a. The level of significance is determined in relation to the magnitude of impact together with the sensitivity of the receptor. Different Noise Sensitive Receptors (NSR) can be classified in three levels of sensitivity: High, Medium and Low.

Sensitivity	Description of Sensitive Receptors
HIGH	Receptors where people or operations are vulnerable to noise, <i>such as: Residential, Recreational Areas, Educational Institutions, Hospitals, Homes for the elderly, Places of worship.</i>
MEDIUM	Receptors are moderately sensitive to noise, if it causes some distraction or disturbance, <i>such as: Offices, Bars/Cafes/Restaurant.</i>
LOW	Receptors where distraction or disturbance from noise is minimal, <i>such as: Night Clubs, Sports Ground, Factories.</i>

TABLE 9.1: LEVEL OF SENSITIVITY ASSOCIATED WITH VARIOUS SENSITIVE RECEPTORS

- b. After all noise sensitive receptors have been identified and prioritised according to their level of sensitivity as identified in the table above, the magnitude of the impact is classified as none/negligible, minor, moderate or major according to the noise monitoring study.

		Noise level [dB]	Magnitude of Adverse Impact
Target Levels	Forecast – Existing Traffic Noise level	>5	Major
	< 3dB	≤5 but ≥3	Moderate
		<3 but ≥1	Minor
	Day Time: $L_{Aeq}[16hrs(07:00-23:00)]$	<1 but ≥0	Negligible
	Night Time: $L_{Aeq}[8hrs(23:00-07:00)]$	0	No Change

TABLE 9.2: CLASSIFICATION OF MAGNITUDE ON NOISE IMPACT CRITERIA

- c. The different levels of significance relating the magnitude of impact with the sensitivity of the receptor are defined below:

Magnitude of Adverse Impact	Level of significance Relative to NSR		
	Low	Medium	High
Major	Moderate	Substantial	Severe
Moderate	Minor	Moderate	Substantial
Minor	Minor	Minor	Moderate
Negligible / No Change	Minor/Neutral	Minor/Neutral	Minor/Neutral

TABLE 9.3: LEVEL OF SIGNIFICANCE

Where:

Severe environmental significance is associated with the impacts where mitigation is not practical or would be ineffective and could influence the decision whether or not to proceed with the project.

Substantial environmental significance is associated with the effects that are important considerations, which could result in adverse effects if they are not mitigated.

Moderate environmental significance could have an influence on the decision unless it is mitigated.

Slight/Neutral environmental significance will not have an influence on the decision or require modification on the project design or alternative mitigation and noise need not be considered as a determining factor in the decision process.

7. Mitigation for onsite impacts

A summary report of findings from the noise impact study and any remedial action and/or mitigation measures which are to be implemented by the developer in order to reduce impacts resulting from the site of operation should be included. A number of various ways to control the noise exposure to people should be limited through one of the following designs:

- Sound insulation and facade insulation treatment;
- Containing noise – acoustic screening and barriers around site; and
- Protecting noise-sensitive buildings and areas – improving sound insulation, screening with purpose-designed acoustic barriers.

ENVIRONMENTAL

APPENDIX 5: SPECIMEN IMPACT TABLE

Impact type and source			Impact receptor		Effect & scale							Probability of impact occurring (Inevitable, Likely, Unlikely, Remote, Uncertain)	Overall impact significance	Proposed mitigation measures	Residual impact significance	Other requirements (monitoring, authorisations, etc)
Impact type	Specific intervention leading to impact	Project phase (construction/ operation/ decommissioning)	Receptor type	Sensitivity & resilience toward impact	Direct/ Indirect/ Cumulative	Beneficial/ Adverse	Severity	Physical / geographic extent of impact	Short-/medium- / long-term	Temporary (indicate duration)/ Permanent	Reversible (indicate ease of reversibility) / Irreversible					

[Insert definition of relevant criteria used to describe the impacts]