

## SECTION 6: KEY ENVIRONMENTAL ISSUES

### 6.1 INTRODUCTION

The scope of an environmental impact assessment is defined by the range of issues and alternatives to be considered, and the approach towards the assessment that will follow (DEAT 2002). The scoping exercise has been undertaken by incorporating the following basic elements:

- It was an open process, that involved authorities, the applicant and stakeholders;
- Feasible alternatives have been identified and selected for further assessment in the EIA phase;
- Important characteristics of the affected environment that are highlighted in Section 4.

Key factors that have been considered in determining the scope of issues or impacts for further investigation include:

- The nature of the activities to be undertaken in the proposed upgrade and expansion of the port;
- The legal, policy and planning context of the proposed expansion;
- The environmental priorities or sensitivities of the affected population (DEAT, 2002); and
- Wide I&AP consultation and involvement in the scoping exercise (see Section 5).

It was therefore decided that the scoping exercise will concentrate on addressing key issues, i.e. issued-focussed as opposed to all issues raised in the process. The methodology employed in this report involves a circular route, which allows for the evaluation of the efficiency of the process itself. The identification of issues/potential impacts of each activity was conducted in the following order:

- a) Detailed analysis of the activities relating to the proposed development
- b) Identification of key activities to be undertaken in the expansion project, which could potentially impact on the environment;
- c) Identification of potential issues and / or impacts that could arise due to these activities;

- d) Determination of those activities that require further investigation in the EIA phase; and
- e) Recommendations to be taken into account in developing detailed Terms of Reference for further specialist studies in the EIA phase.

## 6.2 KEY ISSUES

### 6.2.1 Introduction

The key issues listed in the following section have been determined through an internal process based on similar developments, desktop analysis, revision of existing information, historical data, previously issued environmental authorisations, consultation with Interested and Affected Parties, stakeholders and the existing Environmental Monitoring Committee (EMC). In addition, a preliminary site visit was conducted by a team of specialists.

### 6.2.2 List of Key Issues

It is necessary to accurately identify the range of issues that must receive detailed assessment in the EIA phase, so that the process is focussed on the issues most pertinent to the site and the nature of the proposed development. It is noted here that the impacts arising from the current operation of the iron ore expansion facility are limited mainly to the specific operations such as iron ore stockpiling and ship loading. The list of key issues is as follows:

#### *6.2.2.1 Key issue 1: The physical and biological environment*

The issues identified here are based on an overview of the entire study site that was obtained from the site visit. This entailed a cursory assessment by a team of specialists that were commissioned to assess the environment and the likely impacts that the iron ore expansion facility could have on it. In this regard, the chosen site layout/location will need to bear in mind key impacts such as:

- Groundwater – i.e. contamination and dewatering of aquifers;
- Iron ore dust emissions, including the health and nuisance impact;

- Potential impact of dust emissions from current operations, e.g. PM10 other than iron ore dust;
- Noise pollution from the Tiplers and rail operations;
- Beach erosion and litter;
- Road traffic impacts including impacts on future development of the road network;
- Shipping traffic risks (including management and control of Ballast Water discharge);
- Impact of development on scarce resources such as water;
- The cumulative impact of dust generated by the expanded development (mainly operational phase);
- Engineering services (water supply, energy supply and availability);
- Potential increase in storm water runoff from the site;
- Waste management;
- Impacts on terrestrial ecology, such as the potential impact on sensitive dune system north of the stockyards;
- Impacts on avian and non-avian fauna;
- Impact of underwater blasting on marine vertebrate (e.g. penguins) and invertebrate macrofauna;
- Impact of dredging and construction works on the marine environment and resources. These include:
  - Impacts on the marine and benthic ecology in the bay, including ballast water risks;
  - London Convention on Dumping at Sea
  - Shoreline evolution and stability;
  - Sediment and water quality (turbidity);

- Sampling and characterisation of possible dredge disposal site; and
- The cumulative impact of the entire development on the integrity of marine environment in the bay.

#### 6.2.2.2 Key issue 2: The social environment

In order for any development to be sustainable it must be ensured that the environment surrounding the development is safe and secure, and in all respects acceptable to the approving authority. In this regard the social issues flagged during the site visit, as well as the concerns raised in the public consultation process must be taken into account. It is anticipated that the following social issues (including perceptions) that could arise as a result of the port expansion:

- Economic impacts, i.e. potential spin-offs (benefits) or negative impacts;
- Social impact;
- Visual and aesthetics impacts;
- Cultural and heritage impacts
- Impact of the influx of construction workers – number of workers and time that will be spent in the community;
- Impact on tourism;
- Job creation and recruitment;
- Management of construction camps; and
- Management of crews of ships entering the harbour.

### 6.3 SPECIALIST STUDIES PROPOSED

Table 9 below summarises the full complement of studies envisaged for the EIA phase of this study. An integration workshop will be held to ensure that the issues raised by the various specialists can be harmonised and incorporated into the final EIA Report. The plan of study for the EIA provides a detailed analysis of the Terms of Reference for each study.

All specialist studies will be subjected to an independent review process, whereby an expert in each field will be required to continuously review the study. Thus, each reviewer will be expected to comment on the development of the terms of reference, the literature review and data gathering, the methodology and the final report. A tentative list of reviewers for the specialist investigations will be provided in Plan of Study for the EIA.

**Table 9: List of planned specialist studies**

Study	Specialist	
	Person	Organization
<b>Air Quality</b>		
- Dispersion Modelling Study	Vis Reddy	SRK
<b>Avi-fauna</b>	Lukas Niemand	SEF
<b>Non-Avian Fauna</b>	Lukas Niemand	SEF
<b>Cultural Heritage</b>	Tim Hart	UCT
<b>Groundwater</b>	Des Visser	SRK
<b>Marine Studies</b>	Roy van Ballegooyen	CSIR
- Sediment Quality	Andrew Pascall	CSIR
- Water Quality Assessment		
~ Turbidity Modelling	Roy van Ballegooyen	CSIR
~ Water Quality Modelling	Dr Pedro Monteiro	CSIR
~ Ecological Assessment		
- Basic Ecological Assessment	Dr Robin Carter / (alt) Silke Bohllmor	Llwandle
- Ballast Water Issues	Dr Robin Carter	Llwandle
- Blasting Assessment	Dr Robin Carter	Llwandle
- Shoreline Stability	Dr Koos Schoonees	Entech
- Incremental Shipping Risk Study	Hans Moes	CSIR
- Report Integration	Roy van Ballegooyen	CSIR
<b>Social Impact</b>	Ilse Aucamp	SEF
<b>Economic</b>	Hugo van Zyl	Independent Economic Researchers
<b>Vegetation</b>	TBA	
<b>Noise</b>	Demos Dracoulides	Demos Dracoulides & Assocs
<b>Traffic and Transportation</b>	Brian Roberts	PDNA
<b>Electrical Power</b>		PDNA
<b>Visual Impact Assessment</b>	O'Rourke	SEF
<b>Health Impact Assessment (Dust)</b>	TBA	
<b>Integrated Water and Waste Management</b>		PDNA/SRK
- Report Integration	Jackie Burke	SRK
- Potable Water	Chris Warner	PDNA
- Stormwater	Martyn Warren	PDNA
- Sanitation	Chris Warner	PDNA
- Domestic Waste	Larry Eichstadt	RMS (PDNA)
- Hazardous Waste	Larry Eichstadt	RMS (PDNA)
- Construction Waste	Larry Eichstadt	RMS (PDNA)
- Industrial Effluent/Wastewater	Chris Warner	PDNA

\*TBA – To be announced.

The terms of reference for some of these studies are discussed below.

#### 6.3.1.1 Air Quality

The following scope of work is required to assess the impact that the proposed expansion of the facility will have on air quality and to provide management and mitigation measures where necessary:

- Site inspection and baseline information collection;
- Baseline data review and gap analysis
- Preparation of emissions inventory;
- Quantification of emissions;
- Modelling ambient PM10 dust - baseline conditions
- Modelling ambient PM10 dust for the proposed expansion without mitigation;
- Modelling ambient PM10 for proposed expansion with mitigation;

#### 6.3.1.2 Avian and Terrestrial Fauna

The scope of work for Avifaunal assessment will entail the following:

- To review existing information concerning the status and sensitivity of bird communities within the Saldanha Bay region through a desktop and literature survey of the affected environment (collation of baseline information). The study will also focus on the preferred foraging grounds, flight routes from roosting sites to foraging grounds and vice versa;
- To conduct a site visit to assess the status quo and possible risks associated with the proposed activity on the nesting and foraging activities of bird populations and their associated habitat. It is not considered necessary to conduct concise bird population studies or counts since the area has been well documented by studies in the past;
- To review and analyse current shipping volumes (traffic volumes) including anticipated volumes after

commissioning. Such a review will provide the necessary information regarding the impacts (or direct disturbances) associated with passing ships on bird populations of the region;

- To assess and predict the impacts/risk associated with oil/metal spillage/re-sedimentation on important foraging habitat, and to identify areas that are of great risk;
- To provide practical recommendations and mitigation measures to minimise negative impacts and maximise positive impacts; and
- To assess the impact of overhead power lines and other electrical infrastructure on the bird populations in the study area.

The scope of work for Non-Avifaunal assessment (terrestrial component) will entail the following:

- To review existing information concerning the status and sensitivity of the non-avian faunal community (focussing on mammals) within the Saldanha Bay region through a desktop and literature survey of the affected environment. The study will include a Red Data scan;
- To initiate a site visit to assess the status quo and possible risks associated with the proposed activity on the foraging and roosting activities of faunal populations and terrestrial (land-based) faunal habitat;
- To review and analyse current shipping volumes (traffic volumes) including anticipated volumes after commissioning. Such a review will provide the necessary information regarding the impacts (or direct disturbances) associated with passing ships on mammal populations of the region;
- To assess the risks associated with possible alien faunal introductions from foreign ships that may impact on the indigenous faunal populations;

- To assess and predict the impacts/risk associated with oil spillage/re-sedimentation on important foraging habitat, and to identify areas that are of great risk;
- To obtain collection permits for the purpose of conducting this study; and
- To provide practical recommendations and mitigation measures to minimise negative impacts and maximise positive impacts.

#### 6.3.1.3 Cultural Heritage

Land based heritage will be handled by a phase 1 heritage pre-disturbance surveys as part of this project. During this time the area will be searched for and an inventory of heritage material compiled which will be included as an appendix in the specialist report. Maritime archaeology issues will initially be dealt with by means of consultation with SAHRA's maritime archaeology section and a desktop study. A field study is not envisaged at this time, as most of the work will depend on the findings of the bathymetric survey. However, the need for this will be assessed as a goal of the desktop study. It is appropriate to mention that a maritime survey may be required – either a dive survey or proton magnetometer/side scan sonar survey.

#### 6.3.1.4 Groundwater

The scope of work for Groundwater assessment will entail the following:

- Assess existing reports and data.
- Hydrocensus and sampling of existing monitoring boreholes for independent chemical analysis. This will be aimed at identifying the potential areas from which groundwater could be extracted;
- Conduct a feasibility study to drill and test exploration boreholes;
- Consider the effects of abstraction on the environment, adjacent water bodies and other groundwater users; and

- Analyze data and compile a groundwater impact report.

#### 6.3.1.5 Marine and Benthic Ecology

In order to ensure that the ecological impact of the project is accurately predicted, the following will be addressed:

- Undertake an extension study on the fish community of Saldanha Bay.
- Acquire the necessary permits for sampling fish and macro-benthic organisms.
- Sampling to take place as soon as the necessary permits are acquired.
- Assessment of the impact of sediment generated from dredging on fish communities and macro-invertebrates.

#### 6.3.1.6 Social impact assessment

The next step in the Social Impact Assessment process is an in-depth baseline study to determine the actual state of the community. This will be done via desktop studies of existing literature and reports, statistical data and in-depth interviews with key people in the community, as well as focus groups.

#### 6.3.1.7 Vegetation

The objectives of this specialist vegetation study are to:

- Establish the baseline condition of potentially affected vegetation communities and species found on the proposed project areas and investigate the changes that have occurred to date;
- Determine the impacts of the proposed expansion on the existing plant communities; and
- Suggest measures to manage/mitigate negative impacts and enhance the positive impacts identified during the study.

The proposed scope of work for the specialist vegetation study is outlined below.

- Literature review: review existing data concerning the extent and conservation status of the flora in the Saldanha Bay area.
- Field survey: A field survey will be undertaken during the last week of September. Saldanha is located in a winter rainfall region and September is thus an appropriate time to undertake a field survey for this area as it is late spring and all the geophytes and annuals should be flowering allowing for a more comprehensive vegetation survey. Based on current information the field survey will cover the following three areas:
  - the dunes behind the lagoon (approximately 1 km) in the vicinity of the proposed expansion;
  - Salkor yard and loop one; and
  - Additional railway spur of approximately 5km: although this is proposed within the existing servitude the servitude may be extended.

The following activities will be included in the scope of field survey and subsequent reporting:

- Description of the biotic environment of the project area, including the following as a minimum:
- edaphic and structural characteristics of plant communities identified (links with soil study);
- species composition of each distinct community (identification of dominant species of each community);
- identification of rare and endangered plant species and photographic record of each such species (to be included in an appendix to the report);
- identification of exotic invader species, if present, and photographic record of each species;
- comment on the conservation status and conservation importance of the vegetation communities and habitats

and state whether there are any sensitive habitats and/or landscapes on the proposed project area;

- describe any risks to the deterioration of the vegetation status;
- comment on plants of cultural, commercial or recreational significance and the medicinal value of plant species present where possible;

The vegetation communities identified on site will be depicted on a topographical map. Should plant species identifications need to be verified this will be done by the Kirstenbosch herbarium.

The Impact assessment will make reference to the following factors:

- A description of important ecological relationships between fauna and flora (and where possible comment will be provided on the integrity of these ecological processes on site).
- The present ecological “successional status” of the habitats in the study area, in relation to human impact on them will be described.
- Identification of impacts and provide management recommendations including future monitoring requirements and rehabilitation procedures. The impact assessment should take into consideration cumulative impacts and assess the local, regional and national effect of the proposed upgrade project on the flora, taking into consideration the technical details of the project and the conservation significance of the affected species and communities. This should include the potential for dust, emissions and water contamination to affect on site and neighbouring flora/fauna communities (including livestock and game).
- Conservation priorities will be identified for the project, with a detailed discussion on potential biodiversity offsets.
- Where necessary, a strategy will be developed for the relocation and subsequent protection of flora and fauna for conservation purposes.

- A list of potential species to be propagated in nurseries from seed, root stock or cuttings etc, that is, the rescue and rehabilitation of potential key species for rehabilitation and/or conservation purposes.
- Comment will be provided on the appropriateness of the legal requirements in light of site specific factors.
- An indication of additional legal and other requirements that will need to be followed should disturbance to protected or sensitive species, communities, habitats and landscapes be unavoidable.

#### 6.3.1.8 Noise

The modelling study will be performed using the internationally recognised software MITHRA. This noise model is capable of predicting 3-dimensional noise contours for ground and elevated noise sources. It enables different scenarios to be realised and tested in order to optimise layouts of potentially noisy activities, industrial plants and equipment, as well as test the effect of potential mitigation measures.

The accurate determination of the noise power spectra of the different sources is essential for the accurate determination of noise propagation. The iron ore facility is a complex environment with a number of simultaneously operating noisy machinery. The MITHRA's noise source estimation module, appropriate for such complex noise situations and coupled with 1/3rd octave band noise measurements, will be utilised for the determination of the power spectra of the different noise sources.

The power spectra noise determination study will be based on noise measurements in accordance with ISO 9613. The study will determine the power spectra of the noise sources that have a potential impact on the environment. This will cover:

- The tippler building;
- The Stacker Reclaimers;
- The conveyers and conveyer motors;
- The ore train and the shunting of train trucks;
- The Ship Loaders.

The capacity increase will introduce new equipment similar to that already existing. The estimation of the cumulative noise levels will be accomplished by adding the appropriate new noise sources and utilising the relevant estimated power spectra for each source.

The modelling will also take into account the planned positions of the machinery and the potential screening of the existing ground, as well as the meteorological conditions in the area and the type of ground for noise propagation and noise reflection, such as the sea surface. The resulting noise levels will be determined in order to establish:

- The resulting future ambient noise levels due to the expansion up to 93 MTPA at selected locations within the boundaries and along the perimeter of the site, as well as at selected sensitive locations within the noise exposed communities such as Blue Water Bay and Saldanha.
- The noise impact of the proposed expansion on the relevant affected communities.

The impact assessment will be based on local regulated noise limits, SANS 10103: 2003 as well as WHO guidelines.

#### 6.3.1.9 Shoreline Evolution

The work for Study (B): EIA specialist shoreline study will consist of the following:

- The impact of the proposed new port configuration on Langebaan beaches and lagoon, as well as on Small Bay will be estimated and listed in standard impact tables. The differences in wave, current and sediment transport patterns determined in Study (A): the engineering shoreline study will be used. One-line modelling will not be conducted for the area south of Club Mykonos (including Langebaan). Prediction of impacts on this area will be addressed by relying on work done previously in the greater bay.
- The impact of the proposed new port configuration on the beach between Club Mykonos and the causeway will be determined and listed in standard impact tables.

- Possible mitigation measures to limit shoreline erosion or to select an alternative layout that allows accretion where required in the bay, will be identified.
- A recommendation will be made as to what monitoring of the shoreline will be required before and after the extensions to the iron ore terminal.

#### 6.3.1.10 *Dredging and disposal impacts*

A study will be commissioned to identify several possible dredge disposal sites. This study will conduct the necessary site characterisation studies as well as sediment quality investigations. The final choice of the disposal site at sea or land will be based on the findings of this study. The appropriate permits for dumping/disposal will be obtained once the disposal site has been selected. Direct liaison with Marine and Coastal Management is central to this exercise.

#### 6.3.1.11 *Visual and aesthetic impacts*

The Visual impact assessment will be undertaken in accordance with the standard level 4 methodology and will focus on addressing the issues identified below.

A number of issues and potential impacts have been flagged based on a high level desktop study and the initial site visit to Saldanha. These are summarized below:

##### *Visual Exposure/Visibility*

The site of the proposed project is highly visible throughout the bay, from the towns of Saldanha and Langebaan, from portions of the West Coast National Park and from elevated terrain surrounding the bay.

This high visual exposure is mitigated firstly by compatibility with similar infrastructure already in place and secondly in terms of reduced visibility due to the low visual contrast of this infrastructure against the elevated terrain surrounding the bay.

##### *Sensitivity of Visual Receptors (Viewer Groups)*

Although the high visual exposure is mitigated, the view shed includes a number of viewer groups that are typically highly sensitive to changes to the quality and scenic value of their views especially

those that may be considered to be detrimental. The viewer groups must be identified and their sensitivity assessed.

#### *Visual Contrast and Visual Absorption Capacity*

There is a noticeable difference between the visual contrast between the existing infrastructure and the backdrop when viewed from the north to that when viewed from the south. When viewed from the north the contrast between light and dark and intensity of colours (hues) is far more pronounced thereby increasing one's ability to detect and recognise these structures.

In comparison the views from the south exhibit a low contrast between light and dark with very subdued colour; rather the infrastructure tends almost to blend in with the backdrop with similar tones and limited colour saturation. As a result one's ability to detect structures is reduced and requires one to focus one's attention on the structures to distinguish them from the background.

#### *Key Viewpoints*

During the initial site visit a few key viewpoints were identified. Additional viewpoints will be identified during the follow up site visit. The initial key viewpoints identified include:

Views from a public access point to the beach in Saldanha, the raised bridge that crosses the conveyors, the tourist "boulevard" in Langebaan terminating at the visitor parking area at the entrance to the lagoon and selected points within the West Coast National Park.

These viewpoints are frequented by visitors/tourists to the area who would be more sensitive to land uses that are not compatible with the overall naturalness and agricultural character of the region.

#### *Landscape Compatibility*

The presence of the Saldanha bay as a large scale industrial port contrasts with the less intrusive uses of fishing harbours, recreational boating and scenic appreciation of the natural landscape and seascape. However, the port has existed for some time as has become a familiar contributor to a new mixed use character.

The proposed extension of the port infrastructure includes the provision of additional structures adjacent to those already in place. The proposed structures are therefore compatible with the existing structures and land use. To a large extent these structures are screened from view by ships with a much larger visual magnitude.

The main consideration is the increased frequency and/or number of ships docking at the port and to what extent this will intrude on the visual quality and scenic value of views across the bay.

#### *Loss of Seascape Amenity*

The proposed enlargement of the breaker wall and creation of a much larger “dam” will impact on the local seascape both physically, by destroying and sterilising a stretch of the coastline and visually by increasing the visual magnitude of the stockpile area and thereby reducing the arc in which undisturbed views of and from the natural coastline can be experienced.

#### *Night Lighting*

The expansion of the port facilities may include additional night lighting. This could contribute to the ambient light conditions and associated night glow. The cumulative effect may be visible beyond the viewshed of the proposed structures thus expanding the zone of visual influence.

The primary goal of this specialist study is to identify potential risk sources resulting from the development that may impact on the visual environment of the study area, and to assess their significance. This goal will be reached through the realisation of the following objectives:

- Determine the extent of the study area, this includes the site and the surrounding landscape which is visually connected to the site;
- Determine the landscape and visual character of the study area through a desk top study and a site visit for orientation purposes and to capture the landscape character, views and proposed sites in photographic images;
- Identify elements of particular visual quality that could be affected by the proposed development;
- Define landscape units and landscape types using digital copies of the relevant topocadstral plans at a 1:50 000 scale sourced from the Surveyor General, Surveys and Mapping in Mowbray, Cape Town;
- Define the landscape setting, visual characteristics and land use of the study area;

- Determine and map the visual contour, ZVI of the pump stations and the proposed corridor within the study area;
- Identify and map Visual Receptors (critical viewers), Key Viewpoints and their Viewing Distances and Viewsheds;
- Run a visibility analysis in a GIS model from key Viewpoints points to determine the extent that the proposed development that would be visible;
- Determine and map the visual absorption capacity of the study area utilising topocadastral plans at 1:50 000 scale and verification through site visit;
- Assess the visual characteristics of the project components and identify their potential risk sources to the visual environment;
- Assess the significance of change to the landscape character and visual amenity of the study area;
- Assess the significance of the identified impacts on the visual quality of the study area;
- Assess the significance of the identified impacts to the visual receptors within the study area;
- Prepare a summary of the identified landscape and visual impacts and their significance; and
- Recommend mitigation measures to reduce the potential landscape and visual impacts within the study area that may result from the proposed development.

#### **6.4 ASSESSMENT OF IMPACTS**

As this report is only a Scoping exercise the impacts listed in section 6.2.2 above have been described in a cursory way that seeks to identify key issues and / or potential impacts and sources thereof. The identification of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure. These issues will need further assessment in the environmental impact assessment.