

8.1 INTRODUCTION

The purpose of the Impact Assessment Phase of an EIA is:

- to address issues that have been raised during the Scoping Phase;
- address and assess alternatives to the proposed activity in a comparative manner;
- address and assess all identified significant impacts; and
- formulate mitigation measures.

A key outcome of screening and Scoping activities undertaken to date (described in *Chapter 6*) is the Plan of Study for the EIA.

This *Chapter* provides the proposed Plan of Study for the EIA and is structured as follows.

- Overview of the Impact Assessment Phase;
- Specialist studies;
- Impact Assessment methodology;
- Proposed structure of the EIA Report; and
- Provisional schedule for the EIA process.

8.2 OVERVIEW OF IMPACT ASSESSMENT PHASE

Once public comments on the Scoping Report have been concluded, the Final Scoping Report will be submitted to the DEA for consideration. This represents the end of the Scoping Phase of the EIA. The subsequent Impact Assessment phase is described in more detail below.

8.2.1 Impact Assessment

Following the Scoping phase, the EIA team will:

- update and finalise the technical project description as further engineering details become available, working closely with project engineers to confirm information such as the final facility layout, pipeline routing and construction and operation plans;
- conduct additional consultation and further refine the scope of the EIA as necessary;

- collect additional baseline data through desktop research and field studies in the Project Area of Influence (AoI) to complete a comprehensive description of the environmental and social conditions;
- undertake an impact assessment of the project activities interactions with the key environmental and social resources and receptors;
- develop mitigation and enhancement measures and outline an environmental and social management plan (ESMP) including an approach for monitoring; and
- report findings in a comprehensive EIR.

8.2.2 *Stakeholder Engagement Activities*

During the Impact Assessment phase the following stakeholder engagement activities will be undertaken:

- The draft EIA and EMP document will be made available for a 30-day comment period to stakeholders and the relevant authorities.
- A notification letter will be sent to all registered I&APs on the project database. This letter will invite I&APs to comment on the draft EIA Report.
- All comments made during the comment period will be compiled in a comments and responses report in the final EIR. The final EIA Report will then be compiled and submitted to the DMR for decision-making.
- I&APs will be notified of the Environmental Authorisation and the statutory appeal period.

8.2.3 *Authority Interaction*

Authority consultation is integrated into the public consultation process, with additional one-on-one meetings held with the lead authorities where necessary. The competent authority (Department of Mineral Resources) as well as other lead authorities will be consulted at various stages during the EIA process.

8.3 *SPECIALIST STUDIES*

8.3.1 *Defining the Area of Influence (AoI)*

The extent of the effect of a project activity on a particular physical, biological or social resource will vary and is termed the Area of Influence (AoI).

Specifically, the AoI encompasses the following:

- the area likely to be affected by the Project its facilities and planned activities, and unplanned, but predictable development caused by the Project that may occur later or at a different location ;
- associated facilities, which are not part of the Project but are required and would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable; and
- cumulative impacts that result from the incremental impact on areas or resources directly impacted by the Project from other existing, planned or reasonably defined developments.

The impact assessment considers that the AoI will vary depending on the type of effect, but in each case it is defined to include the entire Project area where it is likely that significant impacts could result. A conservative but reasonable approach will be taken in defining the AoI.

8.3.2 *Desktop Studies*

Desktop studies shall be undertaken to acquire environmental and social data for the AoI. A significant amount of information already exists, including:

- numerous EIA's conducted in the immediate and surrounding area;
- air quality monitoring data from a number of stations in the area;
- Critical Biodiversity Area mapping; and
- Local Municipality IDP's.

8.3.3 *Field Studies*

Based on the existing available information it is anticipated that limited primary data collection will be required to define and understand the sensitivity of the various components of the environment. The following field studies will be undertaken:

- Flora and Fauna (biodiversity);
- Heritage;
- Aquatic and Wetland Ecology;
- Soils, Land Use and Land Capability; and
- Visual and Landscape.

Primary data collection will be carried out by specialists with qualifications in the particular resource area and knowledge of the local conditions.

8.3.4 *Identified Specialist Studies*

A number of issues have been identified during this Scoping Study which require specialist studies to understand the potential impact in more detail. The following specialist studies have been identified to address the key issues and data gaps:

- Flora and Fauna;
- Aquatic and Wetland Ecology (including wetlands delineation);
- Heritage;
- Soils, Land Use and Land Capability;
- Visual and Landscape; and
- Socio-economic.

The table below identifies the provisional Terms of Reference for each proposed specialist study.

Specialist studies will not be undertaken for the following aspects as they are not deemed necessary for this project:

- Traffic;
- Noise; and
- Air quality.

These specialist studies have been excluded as the impacts associated with these aspects are not anticipated to be significant and are manageable through best practice/standard mitigation measures. Further detail will however be provided on these potential impacts in the EIA and standard best practice management measures will be included in the EMPr.

Table 8.1 *Scope of Work for Specialist Studies*

| Topic | Terms of Reference |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flora | <ul style="list-style-type: none"> • Legal review, including local regulatory requirements, IFC Performance Standards and other relevant local and international regulations, including permit requirements. • Describe the vegetation in the study areas, and note the presence or likelihood of any plant Species of Conservation Concern (SCC; previously known as Red Data Book species). • Collection of baseline biodiversity data through infield assessment and desktop review to establish the biodiversity value of the study area, particularly hotspots where biodiversity is concentrated and / or where populations of threatened species, Red Data Species, conservation worthy species, medicinal plants and critical habitats are confirmed to occur. Considerable data is available from the South Deep Biodiversity Management Plan, and only a single season of assessment during the mid-summer season was therefore implemented. • Preparation of a Biodiversity Value map/Sensitivity map of the study area with the proposed infrastructure overlaid. • On the basis of the above value assessment, the significance of the impacts will be assessed and suitable measures to mitigate or avoid the impacts will be recommended. • Assess cumulative impact of development with current and planned developments in the area. |
| Fauna | <ul style="list-style-type: none"> • A description of the broad ecological characteristics of the site and its surrounds. • Legal review, including local regulatory requirements, IFC Performance Standards and other relevant local and international regulations, including permit requirements. • Undertake a faunal survey to describe the baseline faunal characteristics of the affected area and place this in a regional context. • Using primary and secondary data, provide a detailed baseline assessment (including species lists) of faunal species and habitats found and expected at the site. • Compile a sensitivity map depicting the distribution of faunal species, habitats and sensitive biological areas. • Comment on faunal sensitivity in terms of Red Data Sensitivity Index Score of species, habitats, ecological corridors and linkages with other ecological systems on and adjacent to the site. • Describe the existing impacts of current land use as they affect the fauna. • Clarify species of special concern (SSC). • A faunal sensitivity analysis which describes any risks posed by the project; and outlines possible avoidance and mitigation measures. • Describe and assesses the impact to the terrestrial fauna (and avifauna) present in the area. • Assess cumulative impact of development with current and planned developments in the area. |
| Aquatic and Wetland Ecology | <ul style="list-style-type: none"> • Desktop delineation of the wetlands located within the preferred alternative (also referred to as the primary study area) and within a 500m radius (also referred to as the secondary study area) thereof. • A field verification of wetlands (1:10 000 scale) within the preferred alternative, in line with the methods outlined in: "A practical field procedure for identification and delineation of wetlands and riparian areas" (DWAF, 2005). Wetlands located within a 500m radius will be delineated and assessed on a desktop level. • A classification of wetlands using the "Classification systems for wetlands and other aquatic ecosystems in South |

| Topic | Terms of Reference |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Africa" (Ollis, et al., 2013).</p> <ul style="list-style-type: none"> • The application of appropriate buffers using the: "Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries, consolidated report" (Macfarlane et al., 2014). • An assessment of baseline conditions through the application of the following methodologies, were applicable: • Present Ecological State (PES) using the Wet-Health methodology (MacFarlane et al., 2009). • Ecological Importance and Sensitivity (EIS) (DWAF, 1999). • Assess the functionality of identified wetlands by applying relevant and available methodologies (Wet-EcoServices - Kotze et al., 2009). • Mapping of the wetland areas. • Identify perceived impacts associated with the proposed development activities on wetland ecology and provide suitable mitigation measures. • Risk based Impact assessment. |
| Visual | <ul style="list-style-type: none"> • Literature and policy review and mapping. • Preparation of visual baseline. • Assessment of viewshed landscape context. • Identification and Assessment of main receptors. • Assessment of site scenic quality of landscape. • Contrast rating from Key Observation Points. • Impact assessment as per defined criteria. • Describe relevant and implementable mitigation measures to reduce, avoid, or minimise negative impacts and enhance positive impacts and recommendations. • Review of I&AP / Relevant Authority comments. |
| Soil, Land Use and Land Capability | <ul style="list-style-type: none"> • Impacts of the proposed project on all aspects of the ability of soil to serve as a possible medium for food production (crop and livestock farming) and/or its role in the current ecosystems present on site. It excludes an evaluation of the structural properties of soil and its uses in aspects of mine planning and engineering on site. • Fulfil the requirements of the most recent South African Environmental Legislation with reference to the assessment and management of these natural resource aspects. • A detailed soil survey (150 m x 150 m) will be conducted in the proposed alternatives for the development area. Observations will be made regarding soil texture, depth of soil, soil structure, organic matter content and slope of the area. The soil characteristics of each sample point will be noted and logged with a global positioning system. The soils will be described using the S.A. Soil Classification Taxonomic System (Soil Classification Working Group, 1991) published as memoirs on the Agricultural Natural Resources of South Africa No.15. Soils will be grouped into classes with relatively similar soil properties and pedogenesis. A cold 10% hydrochloric acid solution will be used on site to test for the presence of carbonates in the soil. • An estimated 10 soil samples (five topsoil and five subsoil) will be collected on site from selected modal profiles, stored in perforated soil sampling plastic bags and sent to the laboratory for analyses. The modal profiles are |

| Topic | Terms of Reference |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>considered representative of the range of soil conditions across the study area. The samples will be analysed for pH (KCl and H₂O), phosphorus (Bray1), exchangeable cations (calcium, magnesium, potassium, sodium), organic carbon (Walkley-Black) and texture classes (relative fractions of sand, silt and clay).</p> <ul style="list-style-type: none"> Land capability classes were determined using the guidelines outlined in Camp and Schoeman et al. (2001). The land capability classes are representative of a combination of soil suitability and climate conditions. |
| Heritage | <ul style="list-style-type: none"> Collect secondary data (publicly available data) on the occurrence and distribution of heritage, archaeological and paleontological sites in the project area. Legal review, including local regulatory requirements, IFC Performance Standards and other relevant local and international regulations, including permit requirements. Survey the project affected area, identify and describe sites of interest. Explain how the different elements of the project may affect any heritage sites within the project area. Evaluate the potential impacts on sites of interest. Assess cumulative impact of development with current and planned developments in the area. Describe mitigation/management measures that may be implemented to avoid or reduce any negative impacts on these sites and enhance benefits of the development. Provide recommendations for any ongoing monitoring that may be necessary, limitations of the study and indicate any additional studies that may be required, if any. Liaise, submit and follow-up on all relevant permits, project applications and associated documents to Heritage Authorities, as required. |
| Socio-economic | <ul style="list-style-type: none"> Undertake site visit to confirm the Area of Influence, extent of engagement around baseline data gathering. Legal review, including local regulatory requirements, IFC Performance Standards and other relevant local and international regulations, including permit requirements. Attend key stakeholder meetings to understand key social and health issues/ concerns. Compile a Scoping socio-economic and health baseline, based on secondary data, gathered from publically available sources. Gather relevant primary socio-economic data through key informant interviews, focus groups discussions and stakeholder engagement. Update socio-economic and health baseline with primary data gathered from primary data gathering. Identify and assess potential social and health (including occupational health and safety) impacts using the ERM Standard. Assess cumulative impact of development with current and planned developments in the area. Draft mitigation measures will be drafted and incorporated into the Environmental and Social Management Plan. |

An EIA methodology should minimise subjectivity as far as possible and accurately assess the Project impacts. In order to achieve this ERM has followed the methodology defined below.

8.4.1 *Impact Identification and Characterisation*

An 'impact' is any change to a resource or receptor caused by the presence of a project component or by a project-related activity. Impacts can be negative or positive. Impacts are described in terms of their characteristics, including the impact's type and the impact's spatial and temporal features (namely extent, duration, scale and frequency). Terms used in this EIA are described in *Table 8.2*.

Table 8.2 Impact Characteristics

| Characteristic | Definition | Terms |
|----------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type | A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect). | <p>Direct - Impacts that result from a direct interaction between the Project and a resource/receptor (eg, between occupation of a plot of land and the habitats which are affected).</p> <p>Indirect - Impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (eg, viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).</p> <p>Induced - Impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project.</p> <p>Cumulative - Impacts that arise as a result of an impact and effect from the Project interacting with those from another activity to create an additional impact and effect.</p> |
| Duration | The time period over which a resource / receptor is affected. | <p>Temporary - (period of less than 3 years -negligible/ pre-construction/ other).</p> <p>Short term - (period of less than 5 years i.e. production ramp up period).</p> <p>Long term - (period of more than 5 years and less than 19 years i.e. life of plant).</p> <p>Permanent - (a period that exceeds the life of plant - i.e. irreversible.).</p> |
| Extent | The reach of the impact (i.e. physical distance an impact will extend to) | <p>On-site - impacts that are limited to the Project site.</p> <p>Local - impacts that are limited to the Project site and adjacent properties.</p> <p>Regional - impacts that are experienced at a regional scale.</p> |

| | | |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>National - impacts that are experienced at a national scale.</p> <p>Trans-boundary/International - impacts that are experienced outside of South Africa.</p> |
| Scale | Quantitative measure of the impact (e.g. the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.). | Quantitative measures as applicable for the feature or resources affects. No fixed designations as it is intended to be a numerical value. |
| Frequency | Measure of the constancy or periodicity of the impact. | No fixed designations; intended to be a numerical value or a qualitative description. |

Unplanned events (e.g. incidents, spills) are considered in terms of likelihood (*Table 8.3*). The likelihood of an unplanned event occurring is determined qualitatively, or when data is available, semi-quantitatively. It is also important to distinguish that likelihood is a measure of the degree to which the unplanned event is expected to occur, not the degree to which an impact or effect is expected to occur as a result of the unplanned event.

Table 8.3 *Definitions for Likelihood*

| Likelihood | Definition |
|------------|-----------------------------------------------------------------------------------------------|
| Unlikely | The event is unlikely but may occur at some time during normal operating conditions. |
| Possible | The event is likely to occur at some time during normal operating conditions. |
| Likely | The event will occur during normal operating conditions (i.e., it is essentially inevitable). |

8.4.2 *Determining Impact Magnitude*

Once impact's are characterised they are assigned a 'magnitude'. Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- extent
- duration
- scale
- frequency

Magnitude (from small to large) is a continuum. Evaluation along the continuum requires professional judgement and experience. Each impact is evaluated on a case-by-case basis and the rationale for each determination is noted. Magnitude designations for negative effects are: negligible, small, medium and large.

The magnitude designations themselves are universally consistent, but the definition for the designations varies by issue. In the case of a positive impact, no magnitude designation has been assigned as it is considered sufficient for the purpose of the impact assessment to indicate that the Project is expected to result in a positive impact.

Some impacts will result in changes to the environment that may be immeasurable, undetectable or within the range of normal natural variation. Such changes are regarded as having no impact, and characterised as having a negligible magnitude.

In the case of impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is used. The likelihood factor is also considered, together with the other impact characteristics, when assigning a magnitude designation.

Determining Magnitude for Biophysical Impacts

For biophysical impacts, the semi-quantitative definitions for the spatial and temporal dimension of the magnitude of impacts used in this assessment are provided below.

High Magnitude Impact affects an entire area, system (physical), aspect, population or species (biological) and at sufficient magnitude to cause a significant measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) or a decline in abundance and/ or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any population or species dependent upon it, to its former level within several generations (physical and biological). A high magnitude impact may also adversely affect the integrity of a site, habitat or ecosystem.

Moderate Magnitude Impact affects a portion of an area, system, aspect (physical), population or species (biological) and at sufficient magnitude to cause a measurable numerical increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) and may bring about a change in abundance and/or distribution over one or more plant/animal generations, but does not threaten the integrity of that population or any population dependent on it (physical and biological). A moderate magnitude impact may also affect the ecological functioning of a site, habitat or ecosystem but without adversely affecting its overall integrity. The area affected may be local or regional.

Low Magnitude Impact affects a specific area, system, aspect (physical), group of localised individuals within a population (biological) and at sufficient magnitude to result in a small increase in measured concentrations or levels (to be compared with legislated or international limits and standards specific to the receptors) (physical) over a short time period (one plant/ animal

generation or less, but does not affect other trophic levels or the population itself), and localised area.

Determining Magnitude for Socioeconomic Impacts

For socioeconomic impacts, the magnitude considers the perspective of those affected by taking into account the likely perceived importance of the impact, the ability of people to manage and adapt to change and the extent to which a human receptor gains or loses access to, or control over socio-economic resources resulting in a positive or negative effect on their well-being. The quantitative elements are included into the assessment through the designation and consideration of scale and extent of the impact.

8.4.3 *Determining Receptor Sensitivity*

In addition to characterising the magnitude of impact, the other principal step necessary to assign significance for a given impact is to define the sensitivity of the receptor. There are a range of factors to be taken into account when defining the sensitivity of the receptor, which may be physical, biological, cultural or human. Where the receptor is physical (for example, a water body) its current quality, sensitivity to change, and importance (on a local, national and international scale) are considered. Where the receptor is biological or cultural (i.e. the marine environment or a coral reef), its importance (local, regional, national or international) and sensitivity to the specific type of impact are considered. Where the receptor is human, the vulnerability of the individual, community or wider societal group is considered. As in the case of magnitude, the sensitivity designations themselves are universally consistent, but the definitions for these designations will vary on a resource/receptor basis. The universal sensitivity of receptor is low, medium and high.

For ecological impacts, sensitivity is assigned as low, medium or high based on the conservation importance of habitats and species. For the sensitivity of individual species, *Table 8.4* presents the criteria for deciding on the value or sensitivity of individual species.

For socio-economic impacts, the degree of sensitivity of a receptor is defined as the level of resilience (or capacity to cope) with sudden social and economic changes. *Table 8.4* and *Table 8.5* present the criteria for deciding on the value or sensitivity of biological and socioeconomic receptors.

Table 8.4 Biological and Species Value / Sensitivity Criteria

| Value / Sensitivity | Low | Medium | High |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Criteria | Not protected or listed as common / abundant; or not critical to other ecosystem functions (e.g. key prey species to other species). | Not protected or listed but may be a species common globally but rare in South Africa with little resilience to ecosystem changes, important to ecosystem functions, or one under threat or population decline. | Specifically protected under South African legislation and/or international conventions e.g. CITIES Listed as rare, threatened or endangered e.g. IUCN |

Note: The above criteria should be applied with a degree of caution. Seasonal variations and species lifecycle stage should be taken into account when considering species sensitivity. For example, a population might be deemed as more sensitive during the breeding/spawning and nursery periods. This table uses listing of species (e.g. IUCN) or protection as an indication of the level of threat that this species experiences within the broader ecosystem (global, regional, local). This is used to provide a judgement of the importance of affecting this species in the context of project-level changes.

Table 8.5 Socio-economic Sensitivity Criteria

| Sensitivity | Low | Medium | High |
|-------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Criteria | Those affected are able to adapt with relative ease and maintain pre-impact status. | Able to adapt with some difficulty and maintain pre-impact status but only with a degree of support. | Those affected will not be able to adapt to changes and continue to maintain pre-impact status. |

8.4.4 Assessing Significance

Once magnitude of impact and sensitivity of a receptor have been characterised, the significance can be determined for each impact. The impact significance rating will be determined, using the matrix provided in *Figure 8.1*.

Figure 8.1 Impact Significance

| | | Sensitivity/Vulnerability/Importance of Resource/Receptor | | |
|---------------------|------------------|-----------------------------------------------------------|------------|------------|
| | | Low | Medium | High |
| Magnitude of Impact | Negligible | Negligible | Negligible | Negligible |
| | Small | Negligible | Minor | Moderate |
| | Medium | Minor | Moderate | Major |
| | Large | Moderate | Major | Major |
| | Positive Impacts | | | |
| | Positive | Minor | Moderate | Major |

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/importance designations that enter into the matrix. *Box 8.1* provides a context for what the various impact significance ratings signify.

An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/ vulnerability/ importance. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of IA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

8.4.5

Mitigation Potential and Residual Impacts

A key objective of an EIA is to identify and define socially, environmentally and technically acceptable and cost effective measures to manage and mitigate potential impacts. Mitigation measures are developed to avoid, reduce, remedy or compensate for potential negative impacts, and to enhance potential environmental and social benefits.

The approach taken to defining mitigation measures is based on a typical hierarchy of decisions and measures, as described in *Table 8.6*. The priority is to first apply mitigation measures to the source of the impact (i.e. to avoid or reduce the magnitude of the impact from the associated Project activity), and then to address the resultant effect to the resource/receptor via abatement or compensatory measures or offsets (i.e. to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

Once mitigation measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures. The approach taken to defining mitigation measures is based on a typical hierarchy of decisions and measures, as described in *Table 8.6*.

Table 8.6 *Mitigation Hierarchy*

| |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Avoid at Source; Reduce at Source: avoiding or reducing at source through the design of the Project (e.g. avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).</p> |
| <p>Abate on Site: add something to the design to abate the impact (e.g. pollution control equipment).</p> |
| <p>Abate at Receptor: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g. traffic measures).</p> |
| <p>Repair or Remedy: some impacts involve unavoidable damage to a resource (e.g. material storage areas) and these impacts require repair, restoration and reinstatement measures.</p> |
| <p>Compensate in Kind; Compensate Through Other Means where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g. financial compensation for degrading agricultural land and impacting crop yields).</p> |

8.4.6 *Residual Impact Assessment*

Once mitigation measures are declared, the next step in the impact assessment process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the assumed implementation of the additional declared mitigation measures.

8.4.7 *Cumulative Impacts*

A cumulative impact is one that arises from a result of an impact from the Project interacting with an impact from another activity to create an additional impact. How the impacts and effects are assessed is strongly influenced by the status of the other activities (eg already in existence, approved or proposed) and how much data is available to characterise the magnitude of their impacts.

The approach to assessing cumulative impacts is to screen potential interactions with other projects on the basis of:

- projects that are already in existence and are operating;
- projects that are approved but not as yet built or operating; and
- projects that are a realistic proposition but are not yet built.

An outline of the proposed contents of the EIA Report is *Table 8.1* below.

Table 8.7 *Proposed EIA Report Structure*

| Chapter Number | Contents Heading | Explanatory Note |
|----------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Acronyms and Abbreviations | |
| | Executive Summary | Summary of the entire EIA report. |
| 1 | Introduction | This <i>Chapter</i> will outline the development and structure of the EIA report including the background, terms of reference and declaration. |
| 2 | Project Description | This <i>Chapter</i> will provide a concise description of the project and its geographical and temporal context. It will include a site description, an overview of the facility Project design and details of project inputs and outputs. |
| 3 | Administrative Framework | This <i>Chapter</i> will outline the policy, legal and institutional framework within which the EIA has been conducted. |
| 4 | Baseline Condition | This <i>Chapter</i> will summarise the available baseline data on the environmental and social resources and receptors within the Facility Project Study Area. It will be based on both primary and secondary data sources and will consider changes in the baseline condition without the development in place. |
| 5 | Public Participation Process | This <i>Chapter</i> will present the results of consultation undertaken as part of the EIA, plus plans for future consultation. It will identify key project stakeholders and present their feedback on the Project. |
| 6 | Impact Assessment Methodology | This <i>Chapter</i> will summarise the methodology used to assess the impacts of the Project on the bio-physical, terrestrial and socio-economic environment. |
| 7 | Impact Assessment | This <i>Chapter</i> will summarise the predicted positive and negative impacts of the Project, outline general and specific mitigation measures to reduce, remove or avoid negative impacts to environmental and social receptors as well as measuring for monitoring these impacts. Any residual impacts (post mitigation) will be outlined. Cumulative impacts will be assessed as appropriate. |
| 8 | Environmental Management Programme (EMP) | The EMP will draw together the possible mitigation measures; group them logically into components with common themes; define the specific actions required and timetable for implementation; identify training needs, institutional roles and responsibilities for implementation; and estimate the costs of the measures. |
| 9 | Conclusion | This <i>Chapter</i> will summarise conclusions that are made based on the assessment as well as outline any further recommendations. |
| | Bibliography & References | All references made in the report and documents drawn upon during the course of the assessment |
| | Annexes | These will include technical annexes with details of specific technical surveys, the bibliography and list of acronyms. |

8.6

PROVISIONAL SCHEDULE FOR THE EIA PROCESS

A provisional schedule for the EIA is provided in *Table 8.8* below.

Table 8.8 *Provisional EIA Schedule*

| Activity | Timing |
|-----------------------------------------------------------|-------------------------|
| Final Scoping Report Submission | Beginning -July 2017 |
| Authority Review of Scoping Report | Beginning -July 2017 |
| Scoping Report Approval (43 day from the date of Receipt) | September 2017 |
| Specialist Field Surveys | May - August 2017 |
| Disclosure of Draft EIA Report to Public | August - September 2017 |
| Submission of Final EIA Report | Late September 2017 |
| Record of Decision (107 days from date of Receipt) | Early January 2018 |