

## 17.1

## INTRODUCTION

The cumulative impact assessment (CIA) for the Project is undertaken in accordance with the IFC Performance Standards, the IFC's *Good Practice Handbook: Cumulative Impact Assessment and Management Guidance for Private Sector in Emerging Markets* (the "IFC Handbook") and ADB's Safeguards Policy Statement 2009.

Cumulative impacts are generally considered as those, which are additive or interactive in nature that arises as a result of an impact from the Project interacting with an impact from another activity to create significant adverse and/or beneficial impact that would not be expected on a stand-alone project.

In order to gain an understanding of the Projects overall contribution to impacts within Myingyan Township and the broader Mandalay region, a cumulative impact assessment (CIA) is required to be undertaken. Whilst total cumulative impacts due to multiple projects within a given area should be identified within government led spatial planning efforts (generally as part of a Strategic Environmental Assessment), the Sponsor needs to determine the degree to which it is contributing to these overall cumulative impacts on Valued Environmental and Social Components (VEC). In this regards, the objectives of the CIA are:

- Use the outcomes of the preceding chapters of this ESIA to determine spatial and temporal boundaries, identify VEC's and all development and external natural and social stressors affecting them;
- Recognise and identify how the project, along with other existing and future projects may contribute to cumulative impacts on the predicted future condition of the identified VEC's; and
- Develop measures to ensure these are avoided and/or minimised to the greatest extent possible.

To achieve these objectives and gain an understanding of the complexities of cumulative impacts, this Chapter presents a Rapid Cumulative Impact Assessment (RCIA), which has been undertaken largely in accordance with the IFC's *Good Practice Handbook: Cumulative Impact Assessment and Management Guidance for Private Sector in Emerging Markets* (the "IFC Handbook"). This has been supplemented by other guidance such as:

- The European Union's "Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions" (1999);
- The Canadian Environmental Assessment Agency's "Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act" (2012);
- The USA NEPA Council on Environmental Quality's "Considering Cumulative Effects under the National Environmental Policy Act" (1997); and
- ADB Environmental Assessment Guidelines (2003).

This CIA has also been used to assess impacts related to associated facilities described within **Chapter 2**. The Sponsor has limited capacity to influence the

environmental and social performance of these facilities (as they are being developed directly by the GOM) and also have limited access to information such as final alignment, land acquisition processes, regulatory EIA documents and details of contractor measures. In this regards, the approach has been taken to include them within the CIA to ensure that their impacts are considered and allow the Sponsor to identify any high-level mitigation measures, which it may reasonably be able to enforce.

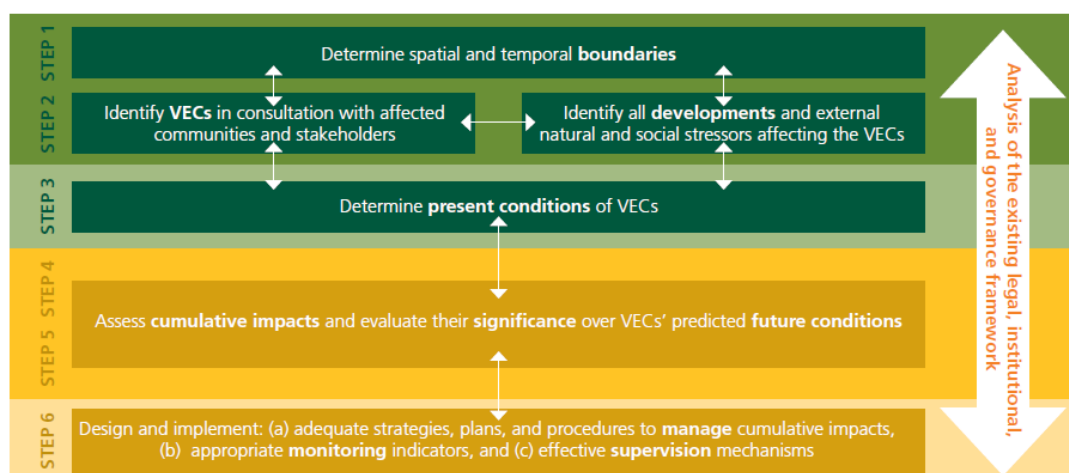
## 17.2 METHODOLOGY

### 17.2.1 Overview

This chapter presents a rapid cumulative impact assessment (RCIA) in accordance with the IFC Handbook and therefore has been undertaken having regard for the six-step process outlined below. As this RCIA forms part of the overall ESIA, the general conditions and trends of the VEC's are already known (established during environmental and social baseline condition assessments), as are the impacts from the Project (as part of the impact assessment) and the proposed mitigation, management and monitoring measures. Given this, VEC's and impacts have been established, with an emphasis able to be placed on the steps pertaining to cumulative impact assessment and management.

As this RCIA forms part of a largely high level ESIA, the data available to pursue a quantitative cumulative impact assessment (such as determining numerical thresholds for various VEC's) has not been undertaken. Emphasis in developing the methodology has therefore been placed upon following a largely qualitative approach, allowing for identification of general trends and developing appropriate management, mitigation and monitoring measures. Given this approach, the majority of the methodology relies upon the use of professional judgements, complemented by ERM's understanding of the Project, experience with similar projects in similar settings, and the elements of the ESIA based on quantitative assessment.

**Figure 17.1 – General RCIA Methodology (Source: IFC Handbook, 2013)**



### 17.2.2 *Determine Spatial and Temporal Boundaries and VECs*

The methodology used in the setting of the spatial and temporal boundaries is largely qualitative and based upon the general “rules of thumb” suggested within Box 7 (*Rules of Thumb – How to set Geographical and temporal boundaries*) of the IFC Handbook. The following factors have been set within the methodology:

- Temporal boundaries have been set based on desktop review of available information pertaining to other proposed Projects within the area (see below), the present Project schedule, understanding of Government strategy with regards to the long term development of the area, and the continual nature of some of the external stressors; and
- Geographic boundaries are a composite of the location of the identified VEC’s (see section 17.2.3 below), assessed impacts of the Project and the degree to which they may overlap with other external projects and stressors to impact upon an identified VEC.

### 17.2.3 *Identify VEC’s and their Present Conditions*

As this RCIA is part of an ESIA, the identification of VEC’s is able to be largely drawn upon work already undertaken, supplemented by stakeholder engagement. VEC’s are defined as follows:

- Those defined as sensitive receptors within the ESIA. An example of this is any village, house or hospital identified as a sensitive receptor for the purposes of air quality modelling;
- Any particular resource or ecosystem service identified as being utilised by sensitive receptors. An example of this would be a groundwater resource used by the local community for domestic purposes; and
- Those identified as part of stakeholder engagement, regardless of whether or not they meet either of the above definitions.

### 17.2.4 *Identify all Developments and External Natural and Social Stressors Affecting the VECs*

External developments known as reasonably foreseeable future actions. are also identified utilising knowledge gained through the ESIA process (including field observations), stakeholder engagement and the interpretation of readily available external data. The outcomes of these considerations will be a simple binomial decision, i.e. yes the project is likely and therefore will be included within the CIA, or no, it is unlikely and therefore will not be included within the CIA.

The second step is to determine the extent of the various impacts of these projects. This allows for a decision to be made as to whether there is the potential for an overlap in Project impacts that could lead to a measurable cumulative impact. Key to this are the following elements:

- **Identification of appropriate geographical/spatial boundaries.** Where potentially interacting projects are not located close enough, or sufficiently linked through various ecological and social processes, for relevant impacts to overlap, cumulative impacts are less likely;

- **Identification of temporal boundaries.** Where the schedules of various components of projects do not overlap in time, particularly with regards to the construction phase of large projects, cumulative impacts are less likely. Additionally, where projects are going to be short term, cumulative impacts will generally be of limited duration;
- **Consideration of impact type.** Whilst there may be no direct geographical overlap in project boundaries, there is the possibility that their offsite impacts may directly overlap elsewhere and cause offsite cumulative impacts. Examples are sediment discharges into river systems, air pollutant emissions, and social impacts associated with overall migration influx;
- **Determination of any “aggravating factors”** that may be evident within a particular project identified for inclusion within the CIA. This includes elements such as the size of the project, environmental management performance, and the regulatory regime under which it operates; and
- **Identification of potential externalities**, that is a project ability to influence (either positively or negatively) the behaviours of other operations in the area.

The other element identified as part of this scope is external natural and social stressors which aren't related to a single project or source. As these are ongoing stressors it has been assumed that they have already been captured as part of the Project baseline conditions (refer to Chapter's 5 and 6) and the impact assessment. Specific additional identification and assessment of these is therefore not considered necessary as part of this RCIA.

#### 17.2.5 *Identification and Assessment of Impacts*

Impact scoping and identification needs to be in alignment with those assessed throughout the main body of the ESIA, and needs to include those which are recognised as important on the basis of genuine scientific concerns and the views of affected communities and other stakeholders. This allows for impacts to be appropriately grouped and added to impacts identified as likely to occur from other projects.

A largely qualitative approach was taken for the RCIA. This is to enable a focus upon identification of trends across the various projects in the area, their temporal and spatial interactions and how these are likely to impact upon VEC's. Whilst impacts arising from the Project have been defined and assessed in isolation, it can be difficult to accurately quantify cumulative impacts as there can be a high degree of uncertainty in interactions with other projects and activities that may be occurring in the area as well as a lack of confirmed project information. Therefore, the impacts are to be assessed qualitatively based on the identified trends and grouped according to impact type, rather than VEC, in accordance with the overall methodology adopted for the ESIA. The RCIA is also based on the assumption that all assessed residual impact levels within the ESIA are achievable.

It is recognised at this stage that this approach may not be accurately able to define the cumulative impacts from a purely VEC-centred perspective (i.e. proposed actions impact on VEC + other past, present and future impacts on VEC = Cumulative Impacts). However, given the clustered nature of the human VEC's (refer to section

17.3), the large scale extent of the environmental VEC's (such as the groundwater system, which is also heavily relied upon by human VEC's) it is considered safe to assume that all impacts will accumulate to each VEC. Therefore, attempting to address impacts by nature is a suitable approach and is able to produce effective management, mitigation and monitoring measures.

#### 17.2.6 *Development of Management, Mitigation and Monitoring Measures*

Based upon identification of broad impact trends, broad scale mitigation measures will need to be developed. Generally, these are based upon:

- Effective application of, and adherence to, the mitigation hierarchy in environmental and social management of the specific contributions by the project expected cumulative impacts. This is generally achieved through stringent implementation of the measures developed specifically for the project; and
- Development of best efforts to engage in, enhance and/or contribute to a multi-stakeholder, collaborative approach to implementing management actions which are beyond the capacity of an individual project proponent.

Any measures developed to address concerns identified within this CIA will take into account these general concepts. There also needs to be scope to develop these measures further when detailed information regarding projects becomes available.

### 17.3 *IDENTIFICATION OF VEC'S AND THEIR PRESENT CONDITIONS*

The ESIA identifies and describes the current condition of a range of Sensitive Receptors, defined as VEC's for the purposes of this RCIA. These are:

- Representative air sensitive receptors (ASR's) identified within **Chapter 7**;
- Representative noise sensitive receptors (NSR's) identified within **Chapter 10**;
- In general, the inhabitants of the villages of Sa Khar, Hnan Ywa, Hpet Taw, Nyaung Kan, Gyoke Pin, Thien Pin, Thien Ywa and Tha Pyay Thar. It is noted that the ASR's and NSR's are included within these villages;
- Given the high dependency of the local community on groundwater for domestic purposes, the entire groundwater resource is defined as having high sensitivity within the ESIA and is therefore defined as a VEC; and
- Visually sensitive receptors were identified, being VSR 1 – Inhabitants of Villages, and VSR 2 – Recreational Visitors and Tourists.

The following are considered as resources directly utilised by those defined as sensitive receptors and are therefore considered as VEC's:

- Soils are an important commodity within the agricultural setting, which is the core livelihood type for the aforementioned villages. Given this, all soils have been defined as a VEC; and
- Given the high reliance of the local community on surface water sources throughout the area (including the irrigation canal to which wastewater will be discharged, and the Ayeyarwady River itself which is the source of water for the irrigation canal), all surface water bodies have been defined as VEC's.

No specific additional VEC's were identified during stakeholder engagement. Given the highly modified state of the area, there are no biodiversity features or species considered to be VECs (refer to **Chapter 14**).

## **17.4 IDENTIFICATION OF ALL DEVELOPMENTS AND EXTERNAL NATURAL AND SOCIAL STRESSORS**

### **17.4.1 Associated Facilities**

As described within **Chapter 2** of this ESIA, there are two associated facilities, the 230KV overhead transmission Line beyond the upgraded Myingyan Steel Mill sub-station to the broader national electricity grid and the new MOGE Gas Receiving Station. All other elements of the Project, including the Power Plant, gas supply pipeline, water supply pipeline and the 230kV overhead transmission line connecting the power plant to the upgraded Myingyan Steel Mill substation are all to be developed by the Sponsor and have had their impacts assessed throughout the ESIA.

The degree to which the 230kV overhead transmission line past the sub-station can be influenced by the Project and likely impacts considered for inclusion within the CIA are outlined within **Table 17.1** below.

### **17.4.2 Projects External to the Sponsor**

The power plant site is situated in a small cluster of industrial facilities within a broader rural environment. Based upon a desktop review of readily available online information and site investigations, the following Projects are either existing, under construction or planned within the immediate Project area:

- Existing No (4) Steel Plant Myingyan which produces billets and slabs from recycled material such as scrapped metals and cars;
- Aggreko temporary gas fired power plant on the north of the Project site boundary;
- The MOGE gas receiving station on the east of the Project site; and
- An expansion of the No (4) Steel Plant Myingyan, which based upon existing information is presently under construction.

Based upon revision of available documents, and the nature of the remainder of the area (small villages scattered amongst valuable agricultural land), it is concluded that it is unlikely to be more large projects planned in the area which need to be taken into account within the CIA.

**Table 17.1 Assessment of Impacts**

Project Name	Comments	Anticipated Impact Types
Myingyan Steel Mill – Phase One	<p>Located directly to the south of the Project Site, it is presently producing 200,000 tonnes of steel billet and slab products per year, primarily from pig iron and scrap products from elsewhere. Large volumes of scrap steel are stored around the perimeter of the site. The precise technology utilised for this steel mill is unknown.</p> <p>Given its proximity to the site, it is likely that measurable cumulative impacts would occur during the period in which the Project is operational. This is particularly the case for environmental impacts such as air quality, greenhouse gases, noise, surface water and groundwater. Additionally, steel mills can produce large amounts of waste, which would need to be disposed of within the same waste management network the Project would utilise.</p>	Operational impacts relating to Air Quality, Greenhouse Gases, Noise, Surface Water, Soil, Groundwater and Waste
Myingyan Steel Mill – Phase Two	<p>A large scale expansion of the steel mill is presently under construction. Based on available information a Direct Reduction Plant (DRP) is being developed to produce different sizes of hot roll sheets, colour sheets, and corrugated zinc shields. The overall production will increase from 200,000 to 400,000 tonnes per year.</p> <p>Whilst detailed information regarding the construction schedule is unknown, based on observations made on site it would appear likely that there will be some overlap in the construction schedule with the Project. This would therefore likely lead to cumulative construction related impacts in regards to noise, air quality, traffic, surface water, soils and groundwater and socio-economic impacts (both positive associated with job creation, as well as negative such as those to community health and safety due to increased traffic volumes and a migrant workforce interacting with the local community).</p> <p>This upgraded/expanded mill will be operational at the same time as the Project and given its proximity it is likely that measurable cumulative impacts will occur for air quality, greenhouse gases, noise, surface water and groundwater. Additionally, steel mills can produce large amounts of waste, which would need to be disposed of within the same waste management network the Project would utilise.</p>	<p>Construction impacts relating to noise, air quality, traffic, surface water, soils and groundwater, and socio-economics</p> <p>Operational impacts for air quality, greenhouse gases, noise, surface water, soils and groundwater and waste.</p>
Aggreko Gas Fired Power Plant	This is a temporary 95MW gas fired power plant, which is intended to be decommissioned immediately once the new Power Plant is online. Therefore, there will be no cumulative impacts aside from some minor noise and traffic generation as it is being decommissioned. It has, therefore been removed from further consideration in the CIA.	None
230kV Overhead Transmission line	This is to be developed by MEPE and will link the upgraded substation with the broader electricity network. As the final option/alignment has not yet been chosen, it is being assessed within the CIA based on an understanding of the surrounding area and typical impacts associated with transmission infrastructure development.	Impacts in relation to land acquisition, livelihoods restoration and construction related impacts such as noise, air quality, surface water and groundwater and soils.

Project Name	Comments	Anticipated Impact Types
	<p>Generally it is not common practice for the entire width of the corridor to be acquired and therefore land acquisition issues (particularly within agricultural areas) will be likely refined to the actual footprint of the poles, and the likely installation of a narrow one land road for maintenance access.</p> <p>Construction related impacts would be extremely similar for the other linear infrastructure being developed by the Project and therefore cumulative impacts can be looked at in this context. Operational impacts for the transmission line would be negligible (particularly if full access to the corridor is allowed for agricultural purposes) and therefore not considered within the CIA.</p>	

## 17.5 SUMMARY OF TRENDS, VEC'S AND SCOPE REFINEMENT

### 17.5.1 Summary of Trends

Some basic key trends and issues have been identified through investigating the nature of existing and proposed development within the area. These trends and issues, which will be used for qualitative cumulative impact assessment, are:

- Industrial style development is entirely restricted to the Project site and the Steel Mill. It is unlikely that development further afield will occur which would spread cumulative impacts further, however this should be confirmed based upon engagement with the GOM (at local and regional level) to confirm if there is any plans for future intensive development in the area;
- There will be an overlap in construction activities of the Project, 230kV overhead transmission line (associated facility) and the Steel Mill expansion;
- Given the proximity of the site to the Steel Mill, operation impacts will generally all be cumulative in nature; and
- Given the high reliance of the local community on groundwater and surface water bodies for domestic and agricultural purposes, these are core VEC's which may be impacted by all elements of the Project, plus any other external Projects in the area. Limiting cumulative impacts to these is considered to be high priority.

Based on this, the scope of the cumulative impact assessment will be limited to this area only, plus a very general overview of impacts associated with transmission line development.

### 17.5.2 Scope Finalisation

**Table 17.2** presents the outcomes of scoping, based upon identified VEC's, assessed project impacts, the identified external projects, and the summary of trends. The core outcome of this table is that cumulative impacts will be assessed with regards to the following key impact types:

- Air quality;
- Noise;
- Surface water;
- Soil and groundwater; and
- Socio-economic impacts divided into economic development (being those classified as positive impacts), physical and economic displacement, and influx.

The remainder of impacts either have already been assessed in a cumulative manner within the ESIA, or the Project will only have negligible impacts and therefore will not contribute to any broader cumulative impacts to VEC's.

**Table 17.2 – Scoping for RCIA**

Impact Type	VEC's Likely to be Impacted	Existing Assessment in ESIA	RCIA Scope
Air quality impacts during construction and operation	Representative air sensitive receptors identified within Table 7.5;	Chapter Seven presents the outcomes of detailed air quality modelling during both construction and operation phases. It is based upon baseline data capturing existing external projects such as the steel mill. This methodology captures only the predicted future emissions from the Project plus the existing baseline (which is noted to be defined as a degraded airshed).	A qualitative assessment will be undertaken, focusing on identification of ways in which cumulative air quality impacts may occur and appropriate mitigation strategies to adopt.
Greenhouse Gases	In regards specifically to greenhouse gases and the nature of their impacts, none of the identified VEC's are likely to be impacted directly by either the Project or the external projects identified.	Chapter Eight of the ESIA considers the greenhouse gas emissions from the Project in the overall context of Myanmar	No further assessment required as the existing impact assessment in Chapter 8 is already considered cumulative.
Noise during construction and operation	In general, the villages of Sa Khar, Hnan Ywa, Hpet Taw, Nyaung Kan, Gyoke Pin, Thien Pin, Thien Ywa and Tha Pyay Thar	Chapter Eight presents the outcomes of detailed noise modelling during both construction and operations phase. It is based upon baseline data capturing existing external projects such as the operating steel mill, plus the construction activities. This methodology captures only the predicted additional noise emissions from the Project, plus the existing baseline and therefore does not accurately assess all future cumulative impacts to the VECs.	A qualitative assessment will be undertaken focusing on identification of ways in which cumulative noise impacts may occur in the future and appropriate mitigation strategies to adopt.
Surface Water	Given the high dependency of the local community on a range of surface water bodies for domestic and agricultural purposes (particularly the irrigation canal which channels water from the Ayeyarwady River to within 500m of the site), all surface water bodies are considered as VEC's.	Chapter Nine presents the surface water impact assessment during both construction and operations phase. It is largely a qualitative assessment based on the existing baseline (i.e. factors in existing external stressors), looking at the impacts of the Project in isolation.	A qualitative impact assessment will be undertaken, focusing on identification of ways in which cumulative impacts may occur to surface water VEC's, and develop appropriate mitigation strategies.
Soils and Groundwater	Soils are an important commodity within the agricultural setting, which is the core livelihood type for the aforementioned villages. Given this, all soils have been defined as a VEC;  Given the high dependency of the local	Chapter 10 presents the soils and groundwater impact assessment for both construction and operations phase. It is largely quantitative, based on the existing baseline (i.e. factors in existing external stressors), looking at the impacts of the Project in isolation.	A qualitative assessment will be undertaken, focusing on identification of ways in which cumulative impacts may occur to surface water VEC's, and develop appropriate mitigation strategies.

Impact Type	VEC's Likely to be Impacted	Existing Assessment in ESIA	RCIA Scope
	community on groundwater for domestic purposes, the groundwater in general has been defined as a VEC.	The ESIA noted the nexus between soil quality and groundwater quality, thus developing management and mitigation measures for the protection of these in an integrated manner.	
Landscape and Visual	Two broad types of VSR's were identified and are thus considered as VEC's for the purpose of this RCIA.	The visual impact assessment undertaken was highly qualitative and took into account all existing projects in establishing visual baseline. Given this, it is considered to largely already have been undertaken on a cumulative basis.	No further assessment required
Waste	No VEC's are likely to be impacted by waste.	Waste has also not been considered in the CIA as the impact assessment and associated mitigation, management and monitoring measures specifically took into account the fact that the Project's waste stream would already be adding to the waste streams from all surrounding current and future developments.	No further assessment required
Terrestrial and Marine Biodiversity	No VEC's are likely to be impacted.	Chapter 14 presents a detailed biodiversity impact assessment, based on Project impacts only	No further assessment is required as no VEC's defined based upon biodiversity values were identified.
Socio-Economics: Community Health and Safety	The VEC's likely to be impacted are those people residing in the various villages listed.	Chapter 15 presents a detailed assessment of impacts relating to community health and safety during construction and operations phase. None of these were considered cumulatively.	A qualitative assessment will be undertaken, focusing on identification of ways in which cumulative impacts may occur to VEC's, and develop appropriate mitigation strategies.
Socio-Economics: Land acquisition	The VEC's likely to be impacted are those people residing in the various villages listed	The SIA has addressed the impacts associated with the acquisition of the project site, plus all associated facilities and therefore essentially addressed impacts in a cumulative manner.	No further assessment is required within this RCIA.
Socio-Economics: Employment and Business Opportunities	The VEC's likely to be impacted are those people residing in the various villages listed	Positive social impacts from the Project include impacts to employment and economy during both the construction and operation phases, were assessed as part of Chapter 15. None of these were considered cumulatively.	A qualitative assessment will be undertaken, focusing on identification of ways in which cumulative impacts may occur to VEC's, and develop appropriate mitigation strategies to ensure that positive impacts are maximised.

## 17.6 AIR QUALITY CUMULATIVE IMPACT ASSESSMENT

### 17.6.1 Project Impacts

With regards to construction, changes to air quality as a result of fugitive dust emissions were noted to be minor. This was due to the distance between the site and the nearest ASR (Sa Ka village 600m to the north-east of the Project site) and the fact that fugitive dust is localized within 100m of disturbed areas due to the relatively large particle size. Specific measures have been developed to ensure that dust is appropriately managed at all times.

Operational air quality modelling for stack emissions of NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at the identified air sensitive receptors (VEC's) demonstrated that for Project contributions for all short-term and long-term impacts during normal combined cycle and simple cycle operations the Project contribution for all pollutants was very low. The highest project contribution to air quality standards at any of the ASR's is about 1.6% for 1-hour averaged NO<sub>2</sub>.

The background NO<sub>2</sub> levels at the Project site area were noted to already exceed the air quality standard for annual NO<sub>2</sub> and was considered a degraded air shed, which would likely be the direct result of the operations of the Steel Mill Details have been discussed in **Chapter 7**. The Project has proposed additional Built-in dry low NO<sub>x</sub> burners to reduce NO<sub>x</sub> emission at stack to below 25ppm at all times.

### 17.6.2 Relevant Cumulative Impacts with Other Projects

With regards to air quality impacts during the construction phase, there will likely be an overlap in the soil disturbing/exposing phase of all elements of the Project with both the construction of Phase 2 of the Myingyan Steel Mill and the 230kV overhead transmission line associated facility. Given the proximity of these features to each other, air quality impacts related to dust and other airborne particulates will likely accumulate.

**Section 7.9.3** of the ESIA presents an assessment of cumulative operational impacts of the Project in the context of the modelled contributions of the Project and the general background air quality of the site – which includes emissions from the existing steel mill and temporary power plant. The cumulative impact in this case was assessed to be **Minor** for operations based on the existing situation in the area. Building on from this, the expansion of the steel mill will likely lead to increased emissions, which will further degrade the air shed. When added to the existing modelled emission, they may increase the overall impact on air quality and the overall human health of the identified VEC's. This may be mitigated slightly by the fact that the existing 95MW power plant (which is closer to the nearest ASR than both the Project and steel mill) will be decommissioned and therefore its contributions to the air shed will be eliminated. The date of decommissioning has not yet been defined.

### 17.6.3 Specific Mitigation Measures for Cumulative Impacts

Given the likelihood for cumulative air quality impacts during the construction phase, the Projects management of its own emissions become highly important, particularly

during construction of linear infrastructure, which may at times be in close proximity to VEC's. This fact needs to be effectively communicated to all EPC Contractors. In addition to this, the following mitigation measures will need to be applied during the construction phase:

- Communicate, to the degree possible, with the contractors undertaking development of the Steel Mill expansion and installation of the additional 230kV overhead transmission line through MEPE to determine when will be the period of greatest overlap in soil disturbing/exposing activities. Based on the information provided by contractors this will then be disclosed as part of regular stakeholder engagement activities;
- Ongoing air quality monitoring data should be shared between projects should a large increase in NO<sub>2</sub>, SO<sub>2</sub>, TSP, PM<sub>2.5</sub> or PM<sub>10</sub> levels be noted; and
- The Project's grievance response plan will include provisions to identify where the cause of the grievance originates from an adjoining Project, means to communicate this to the relevant Project owner, and if possible, a way to cooperatively ensure that the grievance is responded to and closed out.

For operational air quality impacts, it is unlikely that the Sponsor can have any influence over the technology adopted in the expanded steel mill and therefore cannot easily influence management of future cumulative air quality impacts. The limit of what can reasonably be undertaken is to identify which VEC's are likely to be exposed to elevated levels of emissions once both the Project and expanded steel mill are operational and incorporate these locations into the monitoring program (refer to **Chapter 18**). Should the operation of the expanded steel mill significantly add to the already negative cumulative air quality, the monitoring program will be able to detect these immediately. Given the absence of air quality standards in Myanmar, it is difficult to enforce any emission standards directly on the Steel Mill. In this case, there are three options available to the Sponsor to assist in mitigating cumulative impacts:

- Continually share monitoring data and information regarding health impacts to works and the community with the operators of the Steel Mill. As it is already operational, it is unlikely that the operators would agree to retrofitting any pollution reduction measures. However, the Sponsor should seek to provide a continual example of best practice in pollution prevention and abatement;
- Where air quality monitoring and human health data (nominally gathered from local clinics) starts to indicate a rise in impacts to levels impacting human health of the VEC's, the Sponsor will work with the Steel Mill owners and GOM to determine if acquisition of land/houses in certain issues is an option to avoid impacts; and
- The Sponsor will work with the GOM to ensure that spatial planning in the area excludes the construction of any new sensitive receptors any closer than existing houses in the area.

## **17.7** *NOISE CUMULATIVE IMPACT ASSESSMENT*

### *17.7.1 Project Impacts*

Noise levels during the construction phase were noted to be well within the adopted criteria for both day-time and night-time periods. Noise mitigation measures were considered necessary to mitigate the construction noise impact, which includes the construction of a noise barrier. The outcome of this is that all construction noise impacts from the Project would be mitigated. Detailed noise modelling for power plant operations were noted to be within the adopted noise criteria – being a maximum increase in background levels of not more than 3dB(A).

### *17.7.2 Relevant Cumulative Impacts with Other Projects*

During the construction phase, there will be an overlap in noise generating activities (earth moving equipment, heavy trucks, traffic, generators, machinery, civil works etc.) with that of the Steel Mill expansion. However, as the noise modelling was based upon baseline monitoring undertaken during a period in which construction activities were already underway at the Steel Mill site, these contributions to overall noise levels have already been accounted for in the model.

Similarly with the operations phase, noise modelling and compliance (background plus 3dB(A)) was based upon noise baseline data which already takes into account the existing operations of the steel mill. However, the future expansion of the steel mill was not taken into account. The modelled noise levels for operation at the NSR's were between 39dB(A) and 45dB(A) (well below adopted operational noise criteria detailed within Table 5.17) and it is therefore unlikely that these levels would be exceeded with the introduction of another large scale noise source.

### *17.7.3 Specific Mitigation Measures for Cumulative Impacts*

Given the above, no specific measures to manage cumulative noise impacts are recommended. The Projects grievance response plan will include provisions to monitor noise impacts and respond to noise related complaints accordingly, including cooperating with the steel mill owners should this be required.

## **17.8** *SURFACE WATER CUMULATIVE IMPACT ASSESSMENT*

### *17.8.1 Project Impacts*

The Project was identified to have a number of potential impacts to surface water VEC's, particularly with regards to surface water quality of bodies to be used by the local community (also defined as VEC's). To mitigate these impacts, during both construction and operation, a range of mitigation measures have been developed to ensure an integrated approach to surface water quality management.

### *17.8.2 Relevant Cumulative Impacts with Other Projects*

During the construction phase, the Steel Mill and 230kV overhead transmission line (associated facility) will also be under construction. There is the potential that surface water laden with TSS and other contaminants (particularly from improperly managed waste and hazardous materials) will be discharged to surface water flows (and

eventually groundwater) from a variety of sources. Where these directly overlap with the Project, they may further elevate surface water impacts if not adequately controlled.

The steel mill, both the current and expanded versions, has potential to be a source of contaminated surface water runoff. This can result from a number of sources, specifically relating to the storage of scrap steel throughout the site which may leach contaminants directly into the soil, and through spills and leaks of other hazardous materials used on site. As this directly adjoins the Project Site, then this issue when combined with the Project may cumulatively contribute to degradation in surface water flows and eventually impact upon soil and groundwater quality.

### *17.8.3 Specific Mitigation Measures for Cumulative Impacts*

For the construction phase, the Sponsor has committed to a large range of surface water management measures, which will greatly minimise the overall contribution that it will make to cumulative surface water impacts. In addition to this, the following measures will be implemented to ensure that the construction of the steel mill expansion and the 230kV overhead transmission line will also be undertaken in a manner that limits cumulative impacts:

- Ensuring that both projects comply with at least local regulatory standards for surface water discharge is essential in minimising overall cumulative impacts. In this regards, the Sponsor should, to the degree possible, work with local regulatory authorities to ensure that relevant regulations are being complied with; and
- The Sponsors grievance response plan will include provisions to identify where the cause of grievance originates from another Project, means to communicate this to the relevant project owner and, if possible, a way to cooperatively ensure that the grievance is responded to and closed out.

During operations phase, appropriate monitoring points are to be established as part of the regular surface water monitoring programme to determine the contribution of upstream water discharges to background levels.

## *17.9 SOIL AND GROUNDWATER CUMULATIVE IMPACT ASSESSMENT*

### *17.9.1 Project Impacts*

Impacts associated with soil loss were noted within the soil and groundwater impact assessment. A range of mitigation measures, closely related to surface water and air quality were proposed to reduce this impact to negligible. Given the silty nature of the soils and the high reliance of the local community of the groundwater resources, any importation of contaminated fill material to site during construction, and spills and leaks during operation could result in changes to the quality of soil and groundwater throughout the area. A range of measures to prevent contamination, respond to spills and leaks immediately and then monitor clean-up efforts have been recommended to limit these impacts.

### 17.9.2 *Relevant Cumulative Impacts with Other Projects*

The steel mill, both the current and expanded versions, has potential to be a source of soil and groundwater contamination. This can result from a number of sources, specifically relating to the storage of scrap steel throughout the site which may leach contaminants directly into the soil, and through spills and leaks of other hazardous materials used on site. As this directly adjoins the Project Site, then this issue when combined with the Project may cumulatively contribute to soil and groundwater quality degradation. Soil and groundwater sampling undertaken for baseline purposes only indicate that at present there is unlikely to be any plumes of subsurface contamination from the steel mill making their way offsite. This was based upon the results gathered from sampling in groundwater wells (GW-6, GW-7 and GW-8) in the Steel Mill site, which would be the logical source of any soil or groundwater contamination in the area. However, a sampling program specifically designed to detect sources of contamination, taking into account the specific hydrogeological characteristics of the area and likely contaminant types based on review of all activities within the steel mill, would need to be implemented to confirm this fact.

Likewise, poor spill and leak prevention and management during construction of the 230kV overhead transmission line outside of the Projects influence may also increase impact areas.

### 17.9.3 *Specific Mitigation Measures for Cumulative Impacts*

There are no specific mitigation measures proposed with regard to cumulative soil and groundwater impacts. The measures contained within **Chapter 12** are considered sufficient for the Project to reduce its own contribution to overall groundwater emissions. The Project will give consideration to sharing of monitoring data with adjoining project owners should changes in groundwater quality be noted, and which may not be directly attributable to the Project – the Project has committed to taking samples from monitoring wells on/near the steel mill site throughout the construction and operations phase.

## 17.10 *SOCIO-ECONOMIC CUMULATIVE IMPACT ASSESSMENT – COMMUNITY HEALTH AND SAFETY*

### 17.10.1 *Project Impacts*

The impact assessment noted a number of impacts to community health and safety, which would be caused by the Project, particularly during the construction phase. These include:

- An increase in vehicles, particularly construction vehicles, leading to an increased potential for accidents to occur. This is exacerbated by the fact that people living immediately adjacent to roads and not being used to the presence of large vehicles and heavy volumes of traffic. An increase in traffic volumes may also lead to increased exposure of the community to noise levels and potentially dust.
- The presence of new infrastructure, particularly the linear infrastructure, can lead to safety issues such as community members falling in unsecured trenches or interacting with unsecured equipment.

- An increase in communicable diseases may occur as the result of the introduction of a large construction workforce into the area, creation of vector habitat and/or the presence of commercial sex works; and
- The existing local healthcare facilities have limited capacity to respond to an increase in volumes or an increase in the transmission of communicable diseases, leaving the local villagers vulnerable.

The Sponsor will implement a range of mitigation measures to reduce these impacts, including:

- Training for workers;
- Provision of a site medical facility for basic medical and first aid treatment. The facility shall be manned by clearly identifiable qualified first-aid personnel for all hours during which activity is taking place on the work site. Any requirement for treatment beyond first aid shall be referred to the nearest public hospital; and
- The development and implementation of a traffic management plan to minimise risks associated with transporting materials and workers to and from the site.

#### *17.10.2 Relevant Cumulative Impacts with other Projects*

There will be considerable overlap in the construction phase of the Project with the steel mill expansion and associated facilities. Therefore, all of the impacts caused by the Project will likely also be caused by other projects at the same time. This would mean that impacts caused by the Project, particularly with regards to traffic, in-migration and community health would be cumulative with the precise same impacts with the steel mill in particular.

#### *17.10.3 Specific Mitigation Measures for Cumulative Impacts*

The Sponsor is planning to implement a range of measures to comprehensively address its own impacts to community health and safety. The best approach to manage cumulative impacts in this regard is through a collaborative approach between the Sponsor, the adjoining steel mill, and the GOM. Consideration should be given to expanding the training for workers and traffic management measures to the steel mill.

### **17.11 SOCIO-ECONOMIC CUMULATIVE IMPACT ASSESSMENT – EMPLOYMENT AND BUSINESS OPPORTUNITIES**

#### *17.11.1 Project Impacts*

During the construction of the Project, it is estimated that up to 660 direct employment opportunities would be created, including 190 skilled, 220 semi-skilled and 250 unskilled workers. During operations, there would be 80 direct employment opportunities. In addition, it was also identified that there would be opportunities for local businesses to provide goods and services both directly and indirectly to the Project.

The Project therefore has the opportunity to capitalise on local content opportunities to provide local people employment and business opportunities, all of which are positive impacts. The Project has committed to putting in a range of measures to enhance these benefits, such as a local content plan, a skills training program and implementation of an internal standard to guide labour practices and supply chain management.

#### *17.11.2 Relevant Cumulative Impacts with other Projects*

The Project, when added to the existing and expanded steel mill, will provide a significant boost to the local and regional economics. There will be substantial opportunities for skilled and unskilled labour with both of these projects.

#### *17.11.3 Specific Mitigation Measures for Cumulative Impacts*

The Sponsor to give consideration to sharing information regarding its local content plan and skills training program with the Steel Mill developers and operators. A collaborative and integrated approach can lead to better outcomes rather than each project undertaking their own separate activities and ensure that potential cumulative positive economic impacts are realised and appropriately distributed throughout the local population.

### **17.12 CONCLUSION AND RECOMMENDATIONS**

This RCIA has been prepared based upon the impact assessment presented within the ESIA, plus an understanding of external projects and natural stressors. Whilst presented qualitatively, it has identified a number of cumulative impacts (grouped by impact type) on a range of VEC's. Management and mitigation measures have been developed to mitigate these impacts. These rely upon the Project meeting all of its commitments with regards to implementation of the ESMP, plus adopting a collaborative approach to management of impacts with adjoining developments. This recognizes the fact that the Project owner, being committed to complying with international best practice, is well placed to try to positively influence the practices of other users in the area.