

APPENDIX K: ECONOMIC STUDY



Economic Impact Assessment for the proposed PPM Plant Expansion Project

prepared for SLR Consulting (Africa) (Pty) Ltd in support of the environmental impact assessment and the environmental management programme for the proposed plant expansion project for

Pilanesberg Platinum Mines (Pty) Ltd

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**Pilanesberg Platinum Mines (Pty) Ltd -
Economic Impact Assessment for the proposed PPM Plant
Expansion Project**

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PILANESBERG PLATINUM MINES (PTY) LTD - ECONOMIC IMPACT ASSESSMENT FOR THE PROPOSED PPM PLANT EXPANSION PROJECT

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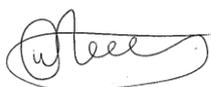
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DECLARATION OF INDEPENDENCE

Mercury Financial Consultants (Pty) Ltd (Mercury) was established in 2013 and primarily undertakes economic impact assessments in support of environmental impact assessments. The company also provides business development and support services to SMMEs (Small, Medium and Micro-sized Enterprises). Mercury comprises of a small team of professionals which focusses on delivering strategic and sustainable solutions to its clients. Mercury in its dynamic approach to an ever changing business environment have established strategic partnerships with key environmental and social consultants.

Werner Neethling is a senior consultant at Mercury and is a qualified management accountant with over 15 years experience. Werner Neethling, the primary author of this report, hereby declare that he is an independent economic assessment specialist. Werner Neethling CV is attached as Annexure A.

Mercury compiled this report based on independent research and analysis. I hereby confirm that I have no business, financial, personal or other interest in the activity proceeding other than remuneration for work performed as defined under “independent” in Chapter 1 of the Environmental Impact Assessment Regulations, 2010/2014.



January 2019

WERNER NEETHLING (ACMA)
(Author)

DATE

ACRONYMS AND ABBREVIATIONS

Below a list of acronyms, abbreviations and definitions used in this report.

ACRONYMS / ABBREVIATIONS	DEFINITION
BPDM	Bojalana Platinum District Municipality
DMR	Department of Mineral Resources
EIA	Environmental impact assessment
EMP	Environmental management plan
GDP	Gross Domestic Product is defined by the Organisation for Economic Co-operation and Development (OECD) as an aggregate measure of production equal to the sum of the gross values added of all resident, institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).
HPC	Heritage Park Corridor
IDP	Integrated Development Plan
IRR	Internal Rate Of Return is the discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project.
LED	Local economic development
LOM	Life of mine
Mercury	Mercury Financial Consultants (Pty) Ltd
MKLM	Moses Kotane Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act, Act 28 of 2002
NPV	Net present value is difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyse the profitability of an investment or project.
NWP	North West Province
NWPTB	North West Parks and Tourism Board
PGMs	Platinum Group Metals
PPM	Pilanesberg Platinum Mine (Pty) Ltd
PNP	Pilanesberg National Park
PV	Present value
SLP	Social and labour plan
SLR	SLR Consulting (Africa) (Pty) Ltd

PILANESBERG PLATINUM MINES (PTY) LTD - ECONOMIC IMPACT ASSESSMENT FOR THE PROPOSED PPM PLANT EXPANSION PROJECT

1 INTRODUCTION

Pilanesberg Platinum Mines (Pty) Ltd (PPM) is a wholly-owned subsidiary of Platmin South Africa (Pty) Limited (PSA) (previously known as Boynton Investments (Pty) Ltd). PSA's ultimate holding company is Sedibelo Platinum Mines Limited (previously known as Platmin Limited). Active participation in the control of PSA takes place through representation of PSA's black economic empowerment (BEE) shareholder, the Bakgatla-Ba-Kgafela Tribal Authority, on the Board of Directors of the aforesaid ultimate holding company of PSA, viz Sedibelo Platinum Mines Limited (SPM).

PPM has approached SLR Consulting (Africa) (Pty) Ltd (SLR) to undertake an EIA and EMP for the expansion of the existing PPM processing facility.

2 STUDY OBJECTIVES AND METHODOLOGY

2.1 OBJECTIVE OF THIS REPORT

The objectives of the Economic Impact Assessment specialist investigation are to determine the following in support of undertaking the EIA and the compilation of the Environmental Management Programme (EMPr):

- undertake a baseline assessment to determine property value or infrastructure assets, to determine current commercial and economic contributions of potentially directly affected persons and to identify and quantify potential alternative land use activities;
- determine the impact on economic conditions of directly affected persons by determining the potential impact, in financial terms, of the loss in property value or infrastructure assets and determining the economic loss, in terms of net present value, of commercial, economic or as a result of the proposed mining activity; and
- undertake a comparative assessment of the identified land use and development alternatives and their potential on the environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors.

2.2 PROPOSED APPROACH AND METHODOLOGY

The following approach and methodologies were applied in the process of identifying and evaluating potential economic impacts:

- As part of the project initiation and scoping process, Mercury undertook a preliminary analysis to identify and prioritise economic impact considerations and to identify the information requirements.
- Profiling baseline conditions focused on the gathering of information about the economic environment and context of the proposed development.
- Predicting impacts, quantifying impacts and model development: This step involved the analysis of the information which was collected, baseline profiling and past experiences to predict possible economic impacts. Trade-offs between the adverse and beneficial impacts of a proposed development were determined. Where applicable, issues raised by interested and affected parties were taken into consideration in the process of identifying and evaluating potential economic impacts.
- By using various assumptions and financial modelling techniques the possible outcomes were quantified in financial terms, incorporating economic risk factors.
- The impact assessment methodology as prescribed and outlined in Section 6 was utilised.
- Mitigation plan and recommendations were defined to ensure potential risks are adequately mitigated.

2.3 REQUIREMENTS FOR SPECIALIST REPORTS

This economic impact assessment report was compiled in compliance with the requirements specified in Appendix 6 of the Environmental Impact Assessment Regulations (R982 of 2014, as amended) published in terms of the National Environmental Management Act, 107 of 1998 as outlined in Table 1.

TABLE 1: APPENDIX 6 REQUIREMENTS

REQUIREMENT	REFERENCE IN BASELINE REPORT, IF APPLICABLE
1.(1) A specialist report must contain:	
(a) details of- (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Curriculum vitae included as Appendix A
b) a declaration that the specialist is independent in a form as may	A declaration of

REQUIREMENT	REFERENCE IN BASELINE REPORT, IF APPLICABLE
1.(1) A specialist report must contain: be specified by the competent authority;	independence is included in the beginning of the report.
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2 and 3
(cA) an indication of the quality and age of base data used for the specialist report;	Section 3, 4, and 7
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Sections 6 and 7
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	No site visit was undertaken
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 2
(f) details of an assessment of the specific identified sensitivities of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Not applicable
(g) an identification of any areas to be avoided, including buffers;	Not applicable
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Not applicable
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 9
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Sections 7 and 10
(k) any mitigation measures for inclusion in the EMPr;	Section 8
(l) any conditions for inclusion in the environmental authorisation;	None identified
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	None identified
(n) a reasoned opinion- (i) as to whether the proposed activity or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; And (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 10
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 2.4
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 2.4
(q) any other information requested by the competent authority.	None requested

2.4 ISSUES RAISED DURING PUBLIC CONSULTATION

SLR is undertaking a public consultation process. The consultation process has included various interested and affected parties. The economic issues which were raised by interested and affected parties are summarised as follows:

To date, interested and affected parties have raised issues relating to economic indicators:

- employment opportunities for locals;
- training and skills development for locals;
- mechanisms for recruitment and procurement;
- mechanisms for local businesses to supply services to the facility;
- the loss of grazing land to livestock;
- consideration to be given to the overall environmental and socio-economic costs and benefits of mining and well as the potential strategic importance of the minerals to the country;
- inclusion of detailed economic sustainability plan and financial expenditure plan (this falls outside the scope of work for the economic assessment);
- assessment of financial provision mechanisms for closure and rehabilitation (this is dealt with by a separate specialist); and
- details of funding set aside for community projects with regards to the nature of projects, time periods and economic sustainability (this is dealt with through PPM's social and labour plan).

3 PROJECT OVERVIEW

3.1 CORPORATE OWNERSHIP AND STRUCTURE

Sedibelo Platinum Mines Limited (previously known as Platmin Limited) is currently involved in the following operations or projects in the vicinity of PPM:

- PPM, an existing open pit platinum mining operation with metallurgical processing facility, which currently operates on the farms Tuschenkomst 135 JP and Witkleifontein 136 JP, which is being extended onto the farms Wilgespruit 2 JQ and Rooderand 46 JQ.
- Sedibelo Mining Project, a planned mine, with a life of mine of 23 years, located on the farms Wilgespruit 2 JQ, Portion 1 of Rooderand 46 JQ, Legkraal 45 JQ and Koedoesfontein 42 JQ. The Sedibelo operation comprises open pit, underground mining, processing facilities and associated surface infrastructure.

- Magazynskraal Mining Project, a planned underground platinum mining operation with a life of mine of 30 years, on the farm Magazynskraal 3 JQ which will include processing facilities.

3.2 PROJECT LOCATION

The proposed plant expansion will take at PPM's existing mineral processing plant on the farms Tuschenkomst 135 JP and Witkleifontein 136 JP, located approximately 5km northwest of Moruleng within the Moses Kotane Local Municipality (MKLM) in the North West Province within the larger Bojanala Platinum District Municipality (BPDM). The proposed project area is furthermore situated approximately 1-2km north of the Pilanesberg National Park in the North West Province.

3.3 PROJECT DESCRIPTION

The expanded mineral processing facility will include the following:

- UG2 milling and flotation circuit to process ore from the SPM operation;
- hydrometallurgical plant for the extraction of PGMs and base metals (Kell plant). This plant replaces the conventional PGM smelting and base metals refining processes;
- additional support and services infrastructure, including, the upgrade of the existing sewage treatment facility.
- In order to create sufficient space withing the plant area the waste storage area and training centres will be relocated.

Currently PGM concentrate is toll refined via contracts with Northam Platinum Limited ("Northam") and Impala Refining Services Limited ("IRS") to produce platinum, palladium, rhodium, and gold (collectively referred to as "4E"), plus iridium, ruthenium, copper and nickel.

The hydrometallurgical process will generate the following products:

- nickel cathode and cobalt concentrate;
- copper cathode; and
- PGM and gold sponge concentrate.

The nickel cathode and cobalt concentrate, and copper cathode will be sold to third parties. The PGM and gold concentrate will be transported to an off-site precious metals refinery for the extraction of the various precious metals or sold to third parties.

Furthermore, a number of community based initiatives have been established at the mine, such as:

- an aggregate crusher and brick making project;
- nursery and vegetable garden (including a composting area); and
- car wash.

It should be noted that the community based projects have already been established.

3.4 EMPLOYMENT OPPORTUNITIES

The construction phase workforce is expected to be approximately 70 skilled and 300 unskilled people. Construction workers will be accommodated in the nearby housing facilities, communities and towns.

The operational phase workforce associated with the proposed project is expected to be approximately 70 skilled and 70 unskilled people. Workers will be accommodated in the nearby housing facilities, communities and towns. The skilled employees currently working at the existing concentrator plant will be move to the new KELL processing facility as the KELL facility will utilise highly advanced technology. These workers will be replaced by new workers which will be sourced, where possible, from the local community.

3.5 PROJECT SCHEDULE

It is envisaged that it will take approximately 18 months to establish the UG2 milling and flotation circuit and 24 months to establish the Kell plant. For the remaining components (upgrade of the sewage treatment facility, waste storage area) the construction phase is expected to be 1 to 2 months.

A number of community-based initiatives have already been established and are included in this report at the request of the DMR.

The proposed expansion to the processing facilities will have the potential to extend the life of the PPM processing plant from the current 12 years by an additional 40 years. This will also offer an opportunity for future treatment capacity of ore from neighbouring mining operations.

3.6 COMMUNITY BASED PROJECTS

The following additional projects, located within the PPM operational areas, have been identified for the purpose of benefiting the local community:

- aggregate crusher and brick making project located next to the dense media separation (DMS) stockpile area located on the farm Tuschenkomst 135 JP. DMS material is sorted into sizeable aggregates to produce approximately 8000 bricks per annum. This is an existing facility, located in an area allocated for the approved DMS stockpile. It has been included in the project scope at the request of the DMR;
- vegetable garden and nursery located near the stormwater control dam at the tailings storage facility on the farm Witkleifontein 136 JP;
- organic composting project located on the farm Witkleifontein 136 JP, within the vegetable garden, is a community based project where wood chips and other organic wastes will be used to manufacture compost. The compost will be used as fertilizer.
- a car wash bay has been established adjacent to the current sewage treatment plant.

3.7 DECOMMISSIONING AND CLOSURE

The closure objectives for the project are aligned with the closure objectives of PPM. The closure objective for the mineral processing plant complex including the TSF is to establish the pre-mining potential of the land – wilderness/ecotourism and grazing land. This is being further refined through on-going closure planning where the final end land use would likely be a wilderness area which would be incorporated into the heritage park corridor.

4 NATIONAL, PROVINCIAL AND REGIONAL SOCIO-ECONOMIC FRAMEWORK

South Africa faces the challenge of simultaneously meeting the following two imperatives:

- developing the economy to meet the needs of all South Africans; and
- ensuring that the productivity and viability of the underlying ecosystems and ecosystem services are maintained at healthy levels over time.

Essentially, these imperatives are embedded in the concept of sustainable development, which is commonly defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Several national, provincial and local policies, strategies and plans have been developed in view of sustainable development in South Africa, of which the most pertinent ones are outlined in Figure 1 and discussed in the sections below.

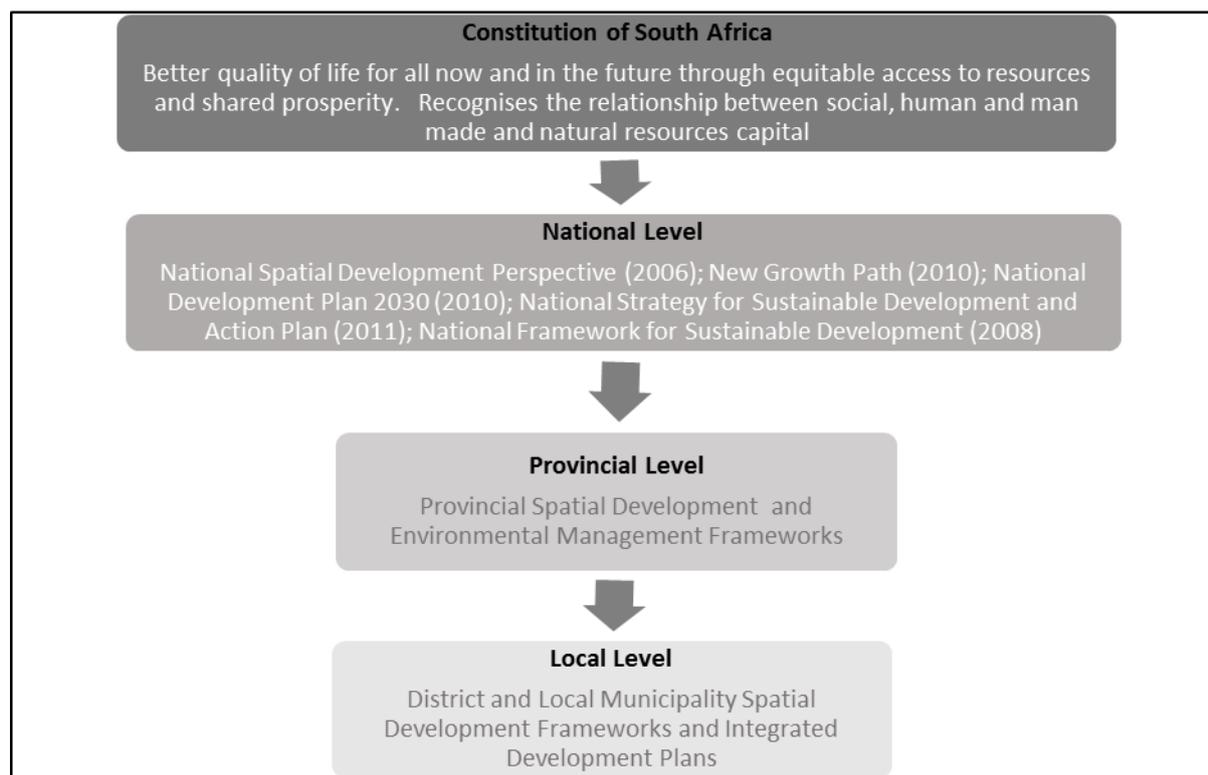


FIGURE 1: NATIONAL, PROVINCIAL AND LOCAL CONSIDERATIONS

4.1 NATIONAL POLICIES AND STRATEGIES

The Constitution guarantees South African citizens a better quality of life for all now and in the future through equitable access to resources and shared prosperity and recognises the relationship between social, human and man-made and natural resources capital.

4.1.1 National Strategy for Sustainable Development and Action Plan (2011)

The Strategy for Sustainable Development and Action Plan (NSSD1) is a proactive strategy that regards sustainable development as a long-term commitment, which combines environmental protection, social equity and economic efficiency with the vision and values of the country. It is a milestone in an ongoing process of developing support, and initiating and up-scaling actions to achieve sustainable development in South Africa (DEA, 2011) and has outlined the following strategic objectives:

- enhance systems for integrated planning and implementation;
- sustain ecosystems and use natural resources efficiently;
- move towards a green economy;
- build sustainable communities; and

- respond effectively to climate change.

4.1.2 National Development Plan 2030 (2010)

The national Development Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality by 2030. The core elements of a decent standard of living identified in the plan are:

- housing, water, electricity and sanitation;
- safe and reliable public transport;
- quality education and skills development;
- safety and security;
- quality health care;
- social protection;
- employment;
- recreation and leisure;
- clean environment; and
- adequate nutrition.

4.1.3 New Growth Path (2010)

South Africa has embarked on a new economic growth path in a bid to create 5 million jobs and reduce unemployment from 25% to 15% over ten (10) years. The plan aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector and identifies five priority areas (green energy, agriculture, mining, manufacturing and tourism) as part of the programme to create jobs

4.1.4 National Framework for Sustainable Development (2008)

The purpose of the National Framework on Sustainable Development is to enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It proposes a national vision, principles and areas for strategic intervention that will enable and guide the development of the national strategy and action plan.

The national framework for sustainable development seeks to build on existing programmes and strategies that have emerged in the first 14 years of democracy. It aims to identify key, short, medium and long-term challenges in our sustainable development efforts, sets the framework for a common understanding and vision of sustainable development; and defines strategic focus areas for intervention (DEAT, 2008).

4.1.5 National Spatial Development Perspective (2006)

The NSDP 2006 provides a framework for a focused intervention by the State in equitable and sustainable development. It represents a key instrument in the State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty. It provides:

- a set of principles and mechanisms for guiding infrastructure investment and development decisions;
- a description of the spatial manifestations of the main social, economic and environmental trends that should form the basis for a shared understanding of the national space economy; and
- an interpretation of the spatial realities and the implications for government intervention.

4.1.6 Mining legislation

Mining development in the past has characteristically been synonymous with a disregard for its social impacts and affected communities. In many instances, mining companies have invested huge amounts of capital for mining development and openly stated that they are contributing to socio-economic development at a grass roots level in mine-affected communities. In reality, however, communities in the developing world have usually been completely bypassed by any development benefits from the project and are often left in a marginalised state, in which they are far worse off than before the mine opened.

Recent legislation in South Africa, such as the Broad Based Socio-Economic Empowerment Charter (BBSEEC) for the Mining Industry and the Mineral and Petroleum Resources Development Act (MPRDA) have confirmed the requirement for mining companies to assess the social impacts of their activities from start to closure, and beyond. Unless a mining operation has considered the social impact and documented it, the Department of Minerals and Energy (DME) will not issue a mining

right to the applicant (MPRDA Regulations, 2002). Mining companies also have to compile and implement a Social and Labour Plan (SLP) to promote socio-economic development in their affected communities and to prevent or reduce negative social impacts.

4.2 PROVINCIAL, REGIONAL AND LOCAL SOCIO-ECONOMIC PROFILE

A number of rural villages closest to the proposed development have been identified exist in the area surrounding PPM. All of these villages fall under the Moses Kotane Local Municipality and under the traditional leadership of the Bakgatla Ba Kgafela Traditional Authority (BBKTA).

The NWP employed 741 899 people in 2013, of whom 13.6% or 101 057 people were employed in the informal sector. Economic sectors with the largest employment numbers were government / community services, mining, and wholesale and retail trade (Department of Finance, Economy and Enterprise Development (DFEED) - North West Provincial Government, June 2015). Since 2008 (and since the post-crisis period), the mining sector has experienced diminishing employment growth. This is a concern particularly given the fact that it is the largest economic sector in the NWP that also supports 20.6% of the provincial employment. While the production output in the mining sector declined in the past few years, the number of jobs created by it has been increasing. Moreover, the expansion of the agricultural GDP coincided with the contraction of its employment numbers (DFEED, 2015).

The NWP's unemployment rate was 26.2% in 2013, which was the fifth highest unemployment rate in the country. While the unemployment rate has remained stable since 2008, the actual number of unemployed in NWP has decreased. NWP contributes 5.3% of national employment, while being the home of 5.8% of national Economically Active Population. NWP accounts for 6.1% of national unemployment (DFEED, 2015).

Within the Bojanala Platinum District Municipality mining (30-35%), community services (15-20%), finance (10-15%), trade (10-15%), transport (5-10%), and manufacturing (5-10%) comprise the main economic sectors (DFEED, 2015).

The economy of Moses Kotane Local Municipality is mainly tourism, mining and agriculture owing to its location within the major tourism and mining belt of the North West province, Pilanesberg and Sun City. A large area of the municipality can be classified as rural with very low densities, which makes the provision of basic services very difficult and expensive. The regional economy is

dominated by the mining industry, which forms the backbone of the provincial economy, contributing 42% to the GDP and 39% to the employment figure (DFEED, 2015).

According to StatsSa, the mining sector was a dominant industry in 2011 in the region contributing 33.6% to the regions GDP as illustrated in Figure 2. Government services and the financial sector contributed 12.1% and 11.1% respectively while the agricultural sector contributed only 2.1% to the regional GDP.

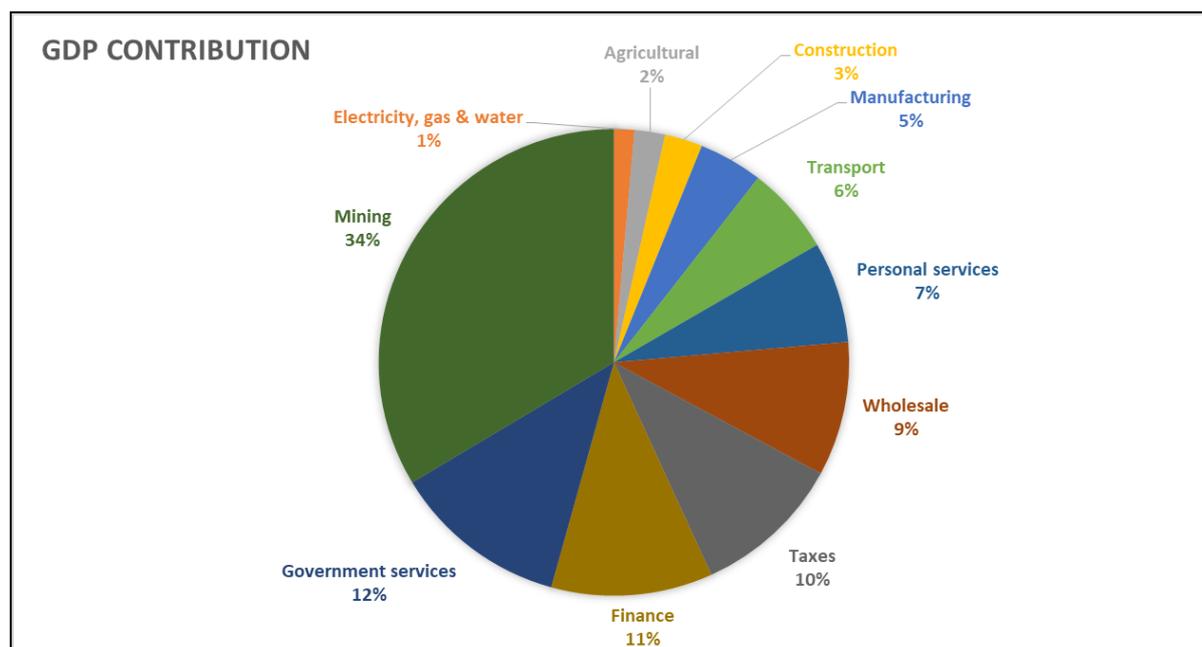


FIGURE 2: SECTORAL CONTRIBUTION TO THE GDP WITHIN THE SURROUNDING REGION IN 2011

Based on 2011 census data, the total population within the Moses Kotane Local Municipality (MKLM) is 242 554 of which there are 74 744 people in the municipality who are economically active (employed or unemployed but looking for work), and of these 37.9% are unemployed. Almost half (47.4%) of the economically active youth (15 – 34 years) in the municipality are unemployed. The most dominant employment sector contributing to the MKLM's economy was the mining industry, employing 25% of the population. In 2007, 50.2% of households in the MKLM received no income, with 35.4% of households receiving an income of less than R1 600 per month.

The local level of education in the people that comprise the workforce age (19 to 65 years) is poor. According to 2011 census statistics, 33.9% of the population on average were recorded as having no or limited primary education. A mere 19% of the residents across the MKLM were recorded as having completed Grade 12 while an average of only 3.5% have a higher qualification.

The socio-economic conditions of the communities surrounding the project area range from poor to fair depending on a variety of variables. The proposed project has the potential to alleviate the levels of unemployment in the affected communities as far as job continuity and job creation are concerned and in so doing could contribute to the development of the area socially as well as economically.

The challenges, which the district and local municipality face, relate to employment and infrastructure provision.

4.3 CONCLUSION

Although the growth of the South African economy is of strategic importance, consideration should be given to social and natural resources considering proposed developments. In view of the concept of sustainability the proposed project will have to contribute towards achieving sustainable development whilst contributing towards achieving these higher level objectives.

5 LAND USE

The area around the PPM operations is rural and densely settled in places with the main land uses including residential areas, subsistence dry land agriculture, small-scale commercial agriculture and communal livestock grazing. PPM is also surrounded by mining operations, conservation and eco-tourism activities, associated with private land, the proposed Heritage Park Corridor, Black Rhino Game Reserve and the Pilanesberg National Park.

5.1 PRE-MINING LAND USE

The PPM mining area was historically used for community activities, such as livestock grazing and subsistence farming. In the approved EMP (Metago, 2007) for PPM the pre-project land use was documented as mainly open land used for livestock grazing and general community activities. There was also evidence of mining and prospecting activities in the area.

It should be noted that this documented pre-project land use has since been disturbed due to mining activities within and adjacent to the project area. PPM's mining activities commenced after the approval of the EMP in 2007/8.

5.2 CURRENT LAND USE

The proposed project infrastructure falls within the existing PPM operations. Current land use activities within the broader area include subsistence farming (livestock grazing and crops); formal (villages) and informal (livestock herders and farmers) residential, mining and conservation/eco-tourism activities associated with the Pilanesberg National Park and private lodges such as Black Rhino.

Information contained in the sections below was obtained from EIA/EMP reports compiled by SLR for the Sedibelo and Magazynskraal mining projects.

5.2.1 Agricultural

Agricultural activities in the Moses Kotane Local Municipality (MKLM) consist of subsistence crop and livestock farming. Crop farming mainly includes maize, sorghum and sunflowers, with relatively low yields for home consumption. Livestock farming mainly includes cattle and goat farming. Livestock is commonly kept in subdivided communal farms reserved for grazing. In this area, crop farming typically takes place close to residences at a subsistence level.

5.2.2 Retail businesses

Most of the retail businesses are located within the major towns of Saulspoor/Moruleng, Northam and Mogwase. Typically, the villages in close proximity of the mines have retail businesses in the form of general traders, supermarkets and taverns.

5.2.3 Ecotourism/ Recreational facilities in the vicinity

Recreational facilities within the vicinity include:

- Pilanesberg National Park (PNP) located south of the project site, including the following private lodges/park camps which are situated near the north of the Pilanesberg National Park
 - Black Rhino Private Game Reserve, which is linked with the PNP;
 - Bakgatla camp; and
 - Ivory Tree Lodge;
- various lodges and resorts located in the southern section of the Pilanesberg National Park, including Manyane, Bakubung, Kwa Maritane, Tshukudu, Shepherd's Tree;

- Sun City, which lies on the southern edge of the Pilanesberg National Park, approximately 25km south of the project site;
- BBKTA cultural museum based in Saulspoort/Moruleng located south east of the project site;
- sports centre located in Saulspoort/Moruleng located south east of the project site; and
- Madikwe Game Reserve lies approximately 60km to the north west of the project site.

5.2.4 Conceptual Heritage Park Corridor

The conceptual Heritage Park Corridor (HPC) is an initiative being put forward by the North West Parks and Tourism Board (NWPTB) where it is planned that over 167 000ha of private, state and community land will be incorporated into the corridor over a 20 year period to allow the joining of the Madikwe Game reserve and the Pilanesberg National Park. This is a piece of land that stretches north of the Pilanesberg towards Dwaalboom and then follows the Dwarsberg Mountain range west before joining the Madikwe Reserve at Molatedi. This initiative forms part of a larger initiative to establish a significant conservation area in the province approaching 1 000 000ha. The objective will be to establish a core corridor that would have the potential to be expanded over time to increase the nature based tourism to the area and thus increase the socio-economic benefits to the area. The concept of the heritage park is being promoted based on the following principles:

- to act as a nature-based tourism anchor project and a primary catalyst for the region;
- to establish a corridor that will ultimately link two primary tourism destinations in the North West Province (i.e. the Pilanesberg national Park and the Madikwe Game Reserve);
- to promote socio-economic development; and
- to aid in conserving the natural and cultural heritage of this under-developed and rural area (NWPTB, 2002).

As a result of the current mining operations on the farms Tuschenkomst 135 JP and Witkleifontein 136 JP, as well as the future mining on Wilgespruit 2 JQ, PPM approached the NWPTB in 2007 to propose an alternative route for the “Big Five” corridor that would be available in the short term should the HPC proceed in the near future. The alternative alignment redirects the “Big Five” corridor along the western boundary of the farm Witkleifontein 136 JQ, after which it joins up with the original alignment north of the mining area.

5.2.5 Mining

Various mining operations are located and/or planned in the immediate vicinity of the proposed project and include:

- PPM is situated on the farms Tuschenkomst 135 JP, Witkleifontein 136 JP, Portion 3 of Rooderand 46 JQ, various portions of Ruighoek 169 JP, a portion of Wilgespruit 2 JQ and a portion of Portion 1 of Rooderand 46 JQ;
- Sedibelo Platinum Mine (not yet constructed) is situated on the farms Wilgespruit 2 JQ, Portion 1 of Rooderand 46 JQ, Legkraal 45 JQ and Koedoesfontein 42 JQ;
- Magazynskraal Platinum Mine (not yet constructed) is situated on the farm Magazynskraal 3 JQ;
- Sails Group mine is situated on Portion 2 and the remaining extent of the farm Rooderand 46 JQ.

Additional proposed mining interests in the immediate vicinity include:

- Bakgatla/Anglo interests, situated on Portion 2 of Rooderand 46 JQ;
- Sails Group (Portion RE of Rooderand 46 JQ);
- Rise Africa Mining and Exploration (various Portions of the farms Magazynskraal 3 JQ, Wildebeestkuil 7 JQ, Haakdoorn 6 JQ, Middelkuil 38 JQ, Syferkuil 9 JQ)

Other mining operations located further afield include:

- Rustenburg Minerals on the farm Groenfontein 138 JP;
- Chrome Corporation on the farm Ruighoek 169 JP;
- Merafe - Xstrata Horizon Mine on the farms Ruighoek 169 JP and Vogelstruisnek 17 JP;
- Siyanda (Union Section) on the farm Zwartklip 405 KQ.

5.3 **ALTERNATIVE LAND USE**

Currently, the area where the proposed project will be located is utilised for mining and mineral processing. In view of the approved life of mine of 12 years, of which only six years remain, an option would be for the mine to close and the area rehabilitated in line with the approved EMP conditions. Once the area has been rehabilitated, alternative land uses such as livestock grazing, general community activities, or conservation/hospitality could be considered; bearing in mind that

Sedibelo and Magazynskraal mining projects are still in a development phase on neighbouring properties.

The establishment of the alternative route for the “Big Five” corridor could commence should the HPC proceed in the near future. This could however proceed regardless of the proposed project proceeding or not.

6 ECONOMIC IMPACT ASSESSMENT METHODOLOGY

Various direct and indirect factors may influence the macro and micro economic environment because of the current land use as well as proposed development activities. The extent to which these factors are influenced, will depend on the nature and scale of current and proposed land use activities. It is therefore important to understand and assess the economic footprint of the proposed development in comparison to the alternative land use. Factors, which may be applicable during an economic assessment, include various economic, social and environmental indicators, broadly illustrated in Figure 3. These factors may have a potential impact, in various degrees of significance, on the local, regional, provincial or national environment during the various phases of the project life cycle.

It is however not possible to assign an economic value to all of these aspects, in particular external factors. External factors or externalities refer to the impact (positive or negative) of economic activity associated with the proposed development that are not incurred directly by those participating in the activity, but are instead borne by society and/or future generations (Nahman et al, 2009).

Typical external factors (externalities) associated with mining developments, will include social aspects such as additional pressures on infrastructure (housing, road network) and basic services (education, health care, transport, security, municipal services) due to an influx of people; increase in social ills (crime, HIV/AIDS); health related impacts as a result of environmental pollution; and the general degradation of an area. External environmental factors include pollution; cost of environmental management and rehabilitation; increase in water demand; and the change in post closure land use potential.

The potential social and environmental impacts which may result from the proposed development will be investigated and assessed by various specialists as part of the environmental impact assessment process.

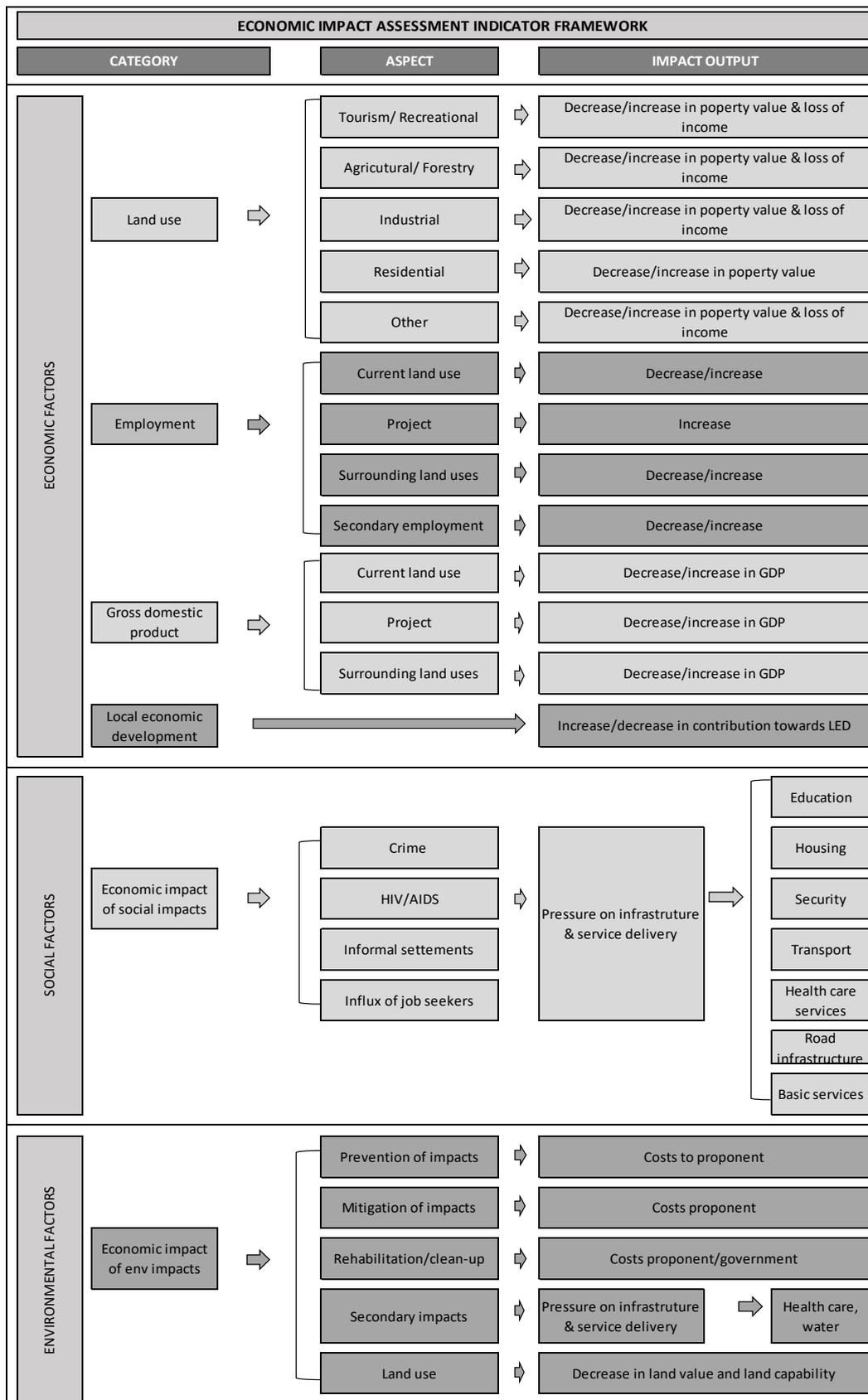


FIGURE 3: ECONOMIC IMPACT FRAMEWORK

6.1 IMPACT ASSESSMENT METHODOLOGY

The impact assessment methodology was prescribed by SLR and is based on the Hacking method of determination of significance of impacts as tabulated in Table 2 below and complies with the method provided in the EIA guideline document. Part A provides the approach for determining impact consequence (combining severity / nature, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. The unmitigated scenario is considered for each impact.

TABLE 2: CRITERIA FOR ASSESSING IMPACTS (PROVIDED BY SLR)

PART A: DEFINITION AND CRITERIA*		
Definition of SIGNIFICANCE		Significance = consequence x probability
Definition of CONSEQUENCE		Consequence is a function of severity, spatial extent and duration
Criteria for ranking of the SEVERITY of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE					
SEVERITY = L					
DURATION	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium
SEVERITY = M					
DURATION	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium
SEVERITY = H					
DURATION	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High
			L	M	H
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
SPATIAL SCALE					

PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M= medium and L= low and + denotes a positive impact.

7 ECONOMIC IMPACT ASSESSMENT

The proposed project has the potential to continue to impact on the local and regional economy on both a positive and negative level. Negative impacts may arise from the potential loss in land value and loss of existing economic activities associated with current and potential future land-use opportunities. It should however be noted that several mines, including PPM are already operating, or in development stage, in the area and existing economic activities, particular those associated with tourism have been exposed to mining in the region for a number of years. The proposed project will contribute towards the local, regional and national economies through the following:

- increased foreign investment and income;
- direct impacts arising from wages, taxes and profits. This includes money spent to pay for salaries, supplies, raw materials, and operating expenses;
- indirect impacts from the initial and operational spending which will create additional activity within the local and regional economy, as local businesses will be benefiting directly from the proposed development and will subsequently increase spending at other local businesses (indirect effect) as well as hiring additional staff members; and
- induced impacts as a result of increased personal income or spending power. Businesses will be experiencing increased revenue from the direct and indirect effects and will subsequently increase payroll expenditures (by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will in turn, increase spending at local businesses. The induced effect is therefore a measure of this increase in household-to-business activity.

Although the proposed project will contribute towards the issues listed above, it should be kept in mind the existing PPM operations as well as the planned Sedibelo and Magazynskraal mining projects are already contributing towards these aspects.

In addition to the direct and indirect economic impacts discussed above, the mine through its corporate social investments and social and labour plan, contributes towards the local economic development in the area. The proposed plant expansion will continue to contribute towards positive socio-economic benefits to its employees and surrounding communities which includes but is not limited to the following:

- community based projects;
- development of skills through its skills development plan;
- learnership programs to provide learners with an occupational qualification; and
- investment in infrastructure development through local economic development and integrated development programmes.

These potential impacts will be explored in more detail below.

7.1 CURRENT LAND USE ACTIVITIES: POTENTIAL ECONOMIC IMPACT

Currently, the area where the proposed project will be located is utilised for mining, more specifically existing PPM operations which include the open pit and the processing facility. The approved life of mine was 12 years, with five years remaining. Furthermore, the planned Sedibelo and Magazynskraal mining projects are approved land uses. It should also be noted that the eco-tourism ventures in the region continue to function in the context of existing and developing mining activities in the area.

7.1.1 Land value

The capital investment required for establishing additional infrastructure was not taken into account to determine the land value post mine closure as the infrastructure is mining specific and it was assumed that it will be removed and the area completely rehabilitated during the decommissioning and closure phases of the mine in line with the approved EIA and EMP closure objectives.

Currently PPM carries an environmental liability of R 284,5 million over the mining rights area. It could therefore be argued that the current mining area, prior to rehabilitation, carries a net liability (negative value) of R 284,5 million. This liability will increase with the establishment of proposed additional infrastructure.

Current PPM mining activities, in line with the approved EMP, will be closed within six years, when the land will be rehabilitated and made available for alternative land uses. This could potentially improve the value of the land. No quantitative value can however be attached at this stage as land has potentially been earmarked for the HPC or communal use.

7.1.2 Direct employment

Current PPM mining activities include mining and processing. Based on information provided by PPM for November 2018, the gross remuneration for 583 employees equated to R 25 817 115. This is equivalent to R44 283 per employee per month. Utilising these figures, current employment will equate to a value of R1.48 billion in present value over the remaining six years of life of mine. This number however does not take any turn down activities into consideration and it is therefore most likely an over estimation. It should also be noted that this land use and therefore the employment benefits arising from pit mining activities, will come to end at the end of life of mine which is anticipated by 2025.

When taking only the plant into consideration the present value for the wages for the remaining 6 years life of mine amounts to R861million.

The employment value of current surrounding land uses was not determined, but it is noted that eco-tourism ventures in the region, and associated employment, continue to function in the context of existing and developing mining activities in the area. The employment value derived from the planned Sedibelo and Magazynskraal mines were not included.

7.1.3 Economic impact

In the Sedibelo Platinum Mines Ltd Management's Discussion and Analysis Paper, published on the Sedibelo website in March 2018, the revenue for the PPM operations made provision for contribution from the following:

- open pit west and east;
- PGM concentrator and
- chromite removal plan.

According to this information, PPM generated a revenue of US\$130 million (R1.78 billion based on an exchange rate of R13.69/US\$) for the 12 months ending December 2017. The revenue generation will continue towards mine closure, although it is expected to decrease as the production levels decrease. Once the ore reserves have been depleted no other sources of revenue will be available for the PPM operations.

The economic values of current surrounding land uses were not determined. It is noted that eco-tourism ventures in the region continue to function in the context of existing and developing mining activities in the area. The economic impacts from the planned Sedibelo and Magazynskraal mines were not included in this study.

Indirect effects

The direct effects from operational spending creates additional activity within the local and regional economy, as businesses benefiting directly from the proposed development increase spending at other local businesses (indirect effect) as well as hiring additional staff members. This will however cease once the end of life of mine is reached. Sedibelo and Magazynskraal developments will continue to stimulate indirect economic activities in the region.

Induced Effects

Induced effects are the results of increased personal income as a result of the proposed project, including indirect effects. Businesses experiencing increased revenue from the direct and indirect effects will subsequently increase payroll expenditures (by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will in turn, increase spending at local businesses. The induced effect is therefore a measure of this increase in household-to-business activity. These benefits will continue for PPM until mine closure, although the Sedibelo and Magazynskraal developments will continue to stimulate induced economic activities in the region.

7.1.4 Contribution towards socio-economic development

In addition to the direct and indirect economic impacts discussed above, PPM through its corporate social investments and social and labour plan, contributes towards the local economic development

in the area. The operation of the proposed project has the following positive socio-economic benefits to its employees and surrounding communities:

- development of skills through its skills development plan;
- learnership programs to provide learners with an occupational qualification; and
- investment in infrastructure development through local economic development and integrated development programmes.

These initiative will continue with the Sedibelo and Magazynskraal developments.

7.2 PROPOSED PLANT EXPANSION: POTENTIAL ECONOMIC IMPACT

The proposed expansion to the processing facilities will have the potential to extend the life of the existing PPM processing plant from the current life of mine 12 years (6 years remaining) to an additional 40 years. This will result in a remaining 46 years life of operation of the processing facility. This, together with the community-based projects, has the potential to impact positively on the economy. The proposed project may potentially delay the onset of alterative land use activities. However, the project is not expected to have an impact on the potential economic viability of the eco-tourism ventures for the following reasons:

- the proposed project is located within the footprint of an existing mining operation;
- the eco-tourism ventures continue to function in the context of existing mining activities in the area; and
- it is expected that tourists and visitors to the Pilanesberg National Park in general would not experience significant impacts from the mine.

7.2.1 Land value

As indicated in Section 7.1.1, PPM currently has an environmental liability of R 285.5 million over the mining area. An additional amount of R11.86 million will be added to this liability with establishment of the proposed infrastructure. It could therefore be argued that the mining area, will carry a net liability (negative value) of R297.36 million.

Current PPM mining activities in line with the approved EMP, will be closed within five years, when the land will be rehabilitated and made available for alternative land uses. No quantitative value

can however be attached at this stage as land has potentially been earmarked for the conceptual HPC or communal use.

7.2.2 Direct employment

Sustained Employment

Current PPM operational activities consist of mining and processing facilities. The proposed project incorporates an extension of the life of these processing facility and therefore creates an opportunity to sustain 365 which equates to existing job opportunities. Utilising monthly wages of R14 980 751 for the 365 Employees this equates to a present value of R1.93billion over 40 years. It further creates an opportunity for additional job creation with construction, the expansion of facilities, additional processing activities and community based projects.

The project is not expected to have an impact on the economic viability of the eco-tourism, and subsequently employment opportunities, for the reasons discussed above in Section 7.2.

Construction Employment

The construction phase workforce is expected to be approximately 70 skilled and 300 unskilled people. Construction will take place during day time hours only. Construction workers will be accommodated in the nearby housing facilities, communities and towns.

According to labour rates provided by Bowker Greaves Quantity Surveyor (BGQS), skilled employees, will on average earn R120/h and unskilled workers R42/h, in the mining construction industry. This equates to a value of R37.5 million for skilled workers and R56.3 million for unskilled workers in present value terms for a construction period of 24 months. The total construction employment is therefore valued R93.8 million. This is an over estimation as the number of 370 (300 unskilled and 70 skilled) construction workers will not be sustained over the full construction period.

Additional employees:

The operational phase workforce associated with the proposed project is expected to be approximately 70 skilled and 70 unskilled people. Workers will be accommodated in the nearby housing facilities, communities and towns. It is anticipated that unskilled people in the community will work at the plant. People will be moved from the current plant and the current plant workforce will be replaced.

Based on information provided by PPM for November 2018, the gross remuneration for 583 employees equated to R 25 817 115. This is equivalent to R44 283 per employee. Utilising these figures, additional employment will equate to a value of R783 million in present value for a period of 33 years for 140 additional employees. Utilising the payscale.com rate of R219 405/annum this figure will equate to R323 million in present value over 33 years.

Community based projects

The community based initiatives have been established at the mine, such as:

- an aggregate crusher and brick making project;
- nursery and vegetable garden (including a composting area); and
- car wash.

These projects will continue to employ members from the local community.

Other mining developments

The employment value from the planned Sedibelo and Magazynskraal mines have also not been included. It is however uncertain whether a PGM concentrator will be established at either Sedibelo and/or Magazynskraal, bearing in mind that the infrastructure at PPM could be utilised. This will affect the employment values originally anticipated for these two projects.

7.2.3 Economic Impact

The following input data was provided by the client:

- KELL process will result in a R2000/ton concentrate reduction in operating expenses in comparison to current toll contracting fees;
- KELL process will result in a 2% increase in metal recovery;
- current production rate is 48 000-60 000 ton concentrate per annum;
- KELL process production capacity will be 100 000 -120 000 tons concentrate per annum and caters for SPM related projects in that belt (PPM, Magazynskraal, Sedibelo); and
- Toll treatment will be undertaken to maintain production capacity.

The following is noted in regards to the revenue generating potential and other potential economic impacts of the project:

- Revenue could potentially increase as a result of the additional 2% recovery through the KELL process. This will be passed on the other for SPM related projects in that belt (PPM, Magazynskraal, Sedibelo);
- revenue could potentially increase due to additional chrome recovery;
- revenue could potentially increase due to additional metal recovery from the tailings re-treatment plant;
- no additional PGM reserves will be accessed and therefore a potential increase in revenue will only be associated with additional metal recovery;
- concentrate does not need to be transported to an off-site smelter, which will result in an operational cost saving and potentially increased profits;

It should be noted that revenue is impacted by a number of factors, which include, but are not limited to, metal and exchange rate fluctuations. Furthermore should the KELL process be established, existing toll smelting and base metals refining contracts with external smelting operations would be terminated. This could negatively impact on the revenue of these operations.

The following community based initiatives have been established at the mine:

- an aggregate crusher and brick making project;
- composting area;
- nursery;
- vegetable garden; and
- car wash.

These projects employ members from the local community. No employment numbers were provided and value could therefore not be calculated.

The project is not expected to have an impact on the economic viability of the eco-tourism for the reasons discussed above in Section 7.2.

Indirect effects

The direct effects from the initial capital and operational spending will create additional activity within the local and regional economy, as businesses benefiting directly from the proposed development will subsequently increase spending at other local businesses (indirect effect) as well as hiring additional staff members. This will be enhanced by the planned Sedibelo and Magazynskraal projects.

Induced Effects

Induced effects are the results of increased personal income as a result of the proposed project, including indirect effects. Businesses experiencing increased revenue from the direct and indirect effects will subsequently increase payroll expenditures (by hiring more employees, increasing payroll hours, raising salaries, etc.). Households will in turn, increase spending at local businesses. The induced effect is therefore a measure of this increase in household-to-business activity. This will be enhanced by the planned Sedibelo and Magazynskraal projects.

7.2.4 Contribution towards socio-economic development

In addition to the direct and indirect economic impacts discussed above, the proposed project will continue, through its corporate social investments and social and labour plan, to contribute towards the local economic development in the area. PPM has the following positive socio-economic benefits to its employees and surrounding communities:

- development of skills through its skills development plan;
- learnership programs to provide learners with an occupational qualification; and
- investment in infrastructure development through local economic development and integrated development programmes.

These initiatives will be enhanced with the Sedibelo and Magazynskraal developments.

7.3 ALTERNATIVE LAND-USE: POTENTIAL ECONOMIC IMPACT

Currently, the area where the proposed project will be located is utilised for mining. In view of the approved life of mine of 12 years, of which only five years remain, an option would be for the mine to close and the area rehabilitated in line with the approved EMP conditions. The proposed expansion to the processing facilities will have the potential to extend the life of the existing PPM

processing plant from the current life of mine 12 years (5 years remaining) to 40 years. This will result in a remaining 33 years life of operation of the processing facility. Once the area has been rehabilitated, alternative land uses such as livestock grazing, general community activities, or conservation/hospitality could be considered; bearing in mind that Sedibelo and Magazynskraal mining projects are still in a development phase on neighbouring properties.

The proposed project may potentially delay the onset of alternative land use activities. However, the project is not expected to have an impact on the potential economic viability of the current eco-tourism ventures as discussed in Section 7.2.

There is currently uncertainty over the feasibility of developing the conceptual Heritage Park Corridor (HPC). While the vision of the HPC is alive and is being promoted by a number of stakeholders with the NWPTB taking the lead in this initiative; there is uncertainty due to the lack of investors in this project. As discussed in Section 5.2.4, PPM approached the NWPTB in 2007 to propose an alternative route for the “Big Five” corridor that would be available in the short term should the HPC proceed in the near future

7.4 “NO-GO” ALTERNATIVE: POTENTIAL ECONOMIC IMPACT

In the “no-go” scenario, the current land use activities will remain in force for the remaining life of mine, which is five years. Proceeding with the project has the potential to extend the life of the processing facility with another 33 years.

Not proceeding with the project will result in the toll smelting and base metals refining contracts continuing at external treatment facilities.

7.5 EVALUATION OF ECONOMIC IMPACTS

The economic indicators have been discussed in Section 7 and are assessed in Table 3 below. It should be noted that the assessment only considered the construction and operational phases as the life of the operations is expected to continue well beyond the current anticipated life of 30 years. The decommissioning and closure phases were therefore not assessed

TABLE 3: ECONOMIC IMPACT ASSESSMENT ANALYSIS

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
Land value	<p>Currently, the area where the proposed project will be located is utilised for mining, more specifically existing PPM operations which include the open pit and the processing facility. The approved life of mine was 12 years. Furthermore, the developing Sedibelo and Magazynskraal mining projects are approved land uses.</p> <p>PPM currently has an environmental liability of R285.5 million which will increase by R11.86 million with the proposed project.</p> <p>Current PPM mining activities in line with the approved EMP, will be closed within five years, when the land will be rehabilitated and made available for alternative land uses. It should also be noted that the eco-tourism ventures in the region continue to function in the context of existing and developing mining activities in the area. No quantitative value can however be attached at this stage as land has potentially been earmarked for the conceptual HPC or communal use.</p> <p>In the unmanaged scenario it is possible that land surrounding the project will experience some degree of additional negative social and environmental impact, which could impact on current land use values. In the scenario where the project successfully implements the stipulated environmental and social management measures, these impacts can be managed</p>	Construction Operational Decommissioning and Closure	M	H	M	H	H	H	L	H	M	M	M	L

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>to acceptable levels which should not reduce surrounding land value.</p> <p>The area will however be rehabilitated in the decommissioning and closure phase in the mitigated scenario, which will enable alternative land uses to continue.</p>													
Employment	<p>Current PPM operational activities consist of mining and processing facilities. The proposed project incorporates an extension of the life of these processing facility and therefore creates an opportunity to sustain 365 (this is why we have asked for the current processing employment number) number of existing job opportunities. It further creates an opportunity for additional job creation (140 opportunities) with construction, the expansion of facilities, additional processing activities and community based projects.</p> <p>In the unmanaged scenario it is possible that land surrounding the project will experience some degree of additional negative social and environmental impact, which could impact on current land uses in the area, which could specifically impact eco-tourism employment.</p> <p>The project is not expected to have an impact, in the mitigated scenario, on the economic viability of the eco-tourism, and subsequently employment opportunities.</p> <p>Once the area has been restored, employment opportunities</p>	Construction Operational Decommissioning and Closure	M+	H	H	H	M	M+	M+	H	H	H	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	will be limited to that associated with alternative land uses. With mitigation PPM could create opportunities beyond the life of operations.													
Impact on the economy	<p>The project has the potential to provide a cash injection to the local, regional and national economy.</p> <p>The following is noted with regards to the revenue generating potential and other potential economic impacts of the project:</p> <ul style="list-style-type: none"> Revenue could potentially increase as a result of the additional 2% recovery through the KELL process, chrome recovery; additional metal recovery from the tailings re-treatment plant. concentrate does not need to be transported to an off-site smelter, which will result in an operational cost saving and potentially increased profits. <p>It is not expected that the revenue generation will be of the same magnitude as a new mine or the Sedibelo and Magazynskraal as no additional ore reserves will be accessed. Should the KELL process be established, existing toll smelting and base metals refining contracts with external smelting operations would be terminated. This could negatively impact on the revenue of these operations.</p> <p>The community based initiatives may further benefit the local economy. The project is not expected to have an impact on the economic viability of the eco-tourism for the reasons discussed</p>	Construction Operational Decommissioning and Closure	L+	H	H	M	H	M+	M+	H	H	H	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	The local and regional economy will benefit from the employment value created during the construction period and operational period. Mitigating measures must be implemented to ensure optimal operational efficiency to secure maximum economic benefit. Even without mitigation, the local and regional economy will benefit from the operation but to a lesser degree. With mitigation through local economic development and social investment plans, it will be possible to enhance the contribution the operations will have on a local and regional economic scale. With mitigation some initiatives will be able to be sustained post closure													
Socio-economic development	<p>PPM through its corporate social investments and social and labour plan, is already contributing towards the local economic development in the area. Without the project proceeding these contributions are expected to continue for the remaining of the life of mine. The proposed project has the potential to extend the following positive socio-economic benefits to its employees and surrounding communities:</p> <ul style="list-style-type: none"> • outlined community based projects included in the project scope; • development of skills through its skills development plan; • learnership programs to provide learners with an occupational qualification; and • investment in infrastructure development through local economic development and integrated development programmes. 	Construction Operational	L+	H	M	M	M	L+	L+	H	H	H	H	H+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>The intensity of the potential benefit is however not expected to exceed the current scenario, even with mitigation.</p> <p>These initiatives will be enhance with the Sedibelo and Magazynskraal developments, although it is not considered in the assessment of the impact.</p> <p>The duration of the potential impact was considered for the remaining 33 years operational life, in the mitigated scenario this could possible extended with the identification of alternative ore resources.</p>													
“No-go” alternative	<p>The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. Proceeding with the project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the project leaves the status quo.</p> <p>Currently, the area where the proposed project will be located is utilised for mining. In view of the approved life of mine of 12 years, of which only five years remain, an option would be for the mine to close and the area rehabilitated in line with the approved EMP conditions. The proposed expansion to the processing facilities will have the potential to extend the life of the existing PPM processing plant from the current life of mine 12 years (5 years remaining) to 40 years. This will result in a remaining 33 years life of operation of the processing facility.</p>		L+	L	H	L	H	L+	L+	H	H	M	H	M+

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>Once the area has been rehabilitated, alternative land uses such as livestock grazing, general community activities, or conservation/hospitality could be considered; bearing in mind that Sedibelo and Magazynskraal mining projects are still in a development phase on neighbouring properties. These project will require for the establishment of processing facilities in the “no-go: scenario, which will potentially result in additional negative environmental impacts.</p> <p>In the “no-go” scenario, the current land use activities will remain in force for the remaining life of the PPM mine, which is five years. Also, not proceeding with the project will result in the toll smelting and base metals refining contracts continuing at external treatment facilities.</p> <p>From an economic perspective, the project will contribute positively towards the local, regional and national economy through its capital investment, creation of new employment opportunities and sustaining several other opportunities. This contribution will be far greater than the current status quo which will result in the end of the life of the processing facility.</p> <p>The project furthermore has the potential to create opportunities for SMME. Implementing management measures and commitments as outlined in the EMP will ensure that the project is executed within the framework of sustainable development, which will ensure that potential</p>													

ASPECT	POTENTIAL IMPACT	PROJECT PHASE	BEFORE MITIGATION						AFTER MITIGATION					
			INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	INTENSITY	DURATION	SPATIAL EXTENT	CONSEQUENCE	PROBABILITY	SIGNIFICANCE
	<p>negative impacts are minimised and positive impacts enhanced.</p> <p>There is no mitigation option available to the proponent to avoid the “no-go” alternative, as proceeding with the development is at the discretion of the decision-makers. For the purpose of this assessment, the status quo was considered in the unmitigated scenario in comparison to establishing the proposed development in the mitigated scenario.</p>													

8 MITIGATION MEASURES

It is assumed that PPM will implement the commitments detailed in the EMPr to avoid/mitigate/manage all environmental, social and economic impacts. More specifically, during all project phases, the operation must ensure the following mitigation measures are implemented to minimise potential negative economic impacts and to optimise positive economic impacts that may result from the proposed project to ensure that mining and other land-uses can co-exist sustainably in the same area:

- hire people from the surrounding area as far as is possible;
- introduce formal bursary and skills development programmes to the closest communities to increase the number of local skilled people and thereby increase the potential local employee base;
- where possible, procure local goods and services from the closest communities;
- facilitate local involvement in indirect business and service opportunities;
- implement a procurement mentorship programme which provides support to local and black owned businesses during the construction and operational phases;
- identify and develop sustainable business opportunities and skills, independent from the project for members of the local communities to ensure continued economic prosperity beyond the life of project.

9 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to the economic impact assessment:

- the mining project being evaluated is economically viable;
- the information supplied by the client in relation to project description, employment opportunities, life of operation, capital investment, current operational wage expenditure was assumed to be an accurate reflection;
- PPM provided an employment value for one month ie. November 2018. This constituted the number of employees employed at the time and a gross remuneration value. No detailed breakdown was received;
- no revenue figures, construction or operational wage values were supplied. Mercury applied available average wage figures for construction workers and mine workers to the construction and operational phases respectively.

- skilled and unskilled wages for workers the construction industry was obtained from Bowker Greaver Quantity Surveyors (BGQS), quantity surveyors specialising in construction work in the mining industry;
- average wages for mining personnel was obtained from payscale.com and information provided by the client. Information received from the client was for gross remuneration for a single calendar month ie. November 2018. This figure was multiplied to obtain an annualised wage figure. This number moreover does not differentiate between skilled and unskilled labour;
- the scope of work for the economic assessment did not include a review of the PPM rehabilitation liability, financial provision, operational and capital business plan.
- the economic contribution of the pre-mining land use activities was not assessed;
- the value of the construction employment determined in the report was based on an annualised number for the employment of approximately 300. This may be an over estimation as it is assumed that the construction workers will peak at 300.
- a discount factor (a financial factor which, when multiplied by a predicted future cash flow from a loan or some other form of debt, gives its present value) of 10% was used to calculate the net present value calculations;
- present value calculations were applied over a period of 33 years for the operational life, (40 years minus the 7 years, the operations have been in operation);

10 CONCLUSION

Mining development in the past has characteristically been synonymous with a disregard for its social impacts and affected communities. In many instances, mining companies have invested huge amounts of capital for mining development and openly stated that they are contributing to socio-economic development at a grass roots level in mine-affected communities. In reality, however, communities in the developing world have usually been completely bypassed by any development benefits from mining projects and are often left in a marginalised state, in which they are far worse off than before the mine opened.

Recent legislation in South Africa, such as the Broad Based Socio-Economic Empowerment Charter (BBSEEC) for the Mining Industry and the Mineral and Petroleum Resources Development Act (MPRDA) have confirmed the requirement for mining companies to assess the social impacts of their activities from start to closure, and beyond. Unless a mining operation has considered the social

impact and documented it, the Department of Minerals Resources (DMR) will not issue a mining right to the applicant (MPRDA Regulations, 2002). Mining companies also have to compile and implement a Social and Labour Plan (SLP) to promote socio-economic development in their affected communities and to prevent or reduce negative social impacts.

Therefore, although the growth of the South African economy is of strategic importance, consideration should be given to social and natural resources considering proposed developments. In view of the concept of sustainability the proposed project will have to contribute towards achieving sustainable development whilst contributing towards achieving these higher level objectives.

From an economic perspective it is recommended that the project proceed. The proposed project is not expected to contribute to the same level and magnitude as a mining operation such as the planned Sedibelo or Magazynskraal project as no additional reserves will be accessed. It will however still positively contribute towards the local, regional and national economy through its capital investment, creation of employment opportunities and revenue generation potential. The eco-tourism ventures in the region continue to function in the context of existing and developing mining activities in the area and it is not expected that the project will change this.

On a national level, the project will support amongst others, the following South Africa's strategies and initiatives:

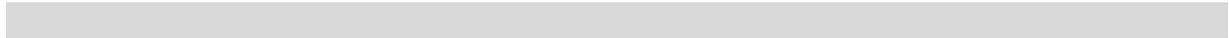
- Elimination of poverty and reduction of inequality by 2030 as outlined in the National Development Plan
- Creation of five million jobs and reduce unemployment from 25% to 15% over the next ten (10) years as outlined on the New Growth Path (2010), which aims to address unemployment, inequality and poverty by unlocking employment opportunities in South Africa's private sector.
- State's drive towards ensuring greater economic growth, buoyant and sustained job creation and the eradication of poverty.

Implementing management measures and commitments as outlined in the EMPr will ensure that the project is executed within the framework of sustainable development, which will ensure that potential negative impacts are minimised and positive impacts enhanced.



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