



## Draft Basic Assessment Report

Expansion of PG Bison's Mkhondo  
plant: New MDF plant and  
additional MFB line

Submission date: July 2021

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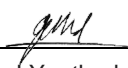
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# Contents

<b>1</b>	<b>EAP details.....</b>	<b>12</b>
<b>2</b>	<b>Location.....</b>	<b>12</b>
2.1	Property Description/ Physical Address .....	12
2.2	General Environment.....	14
2.2.1	Climate.....	14
2.2.2	Geomorphology .....	16
2.2.3	Geology and Soils .....	16
2.2.4	Surface and Ground water .....	16
2.2.5	Flora and Fauna .....	18
2.2.6	Land Use Character of Surrounding Area .....	19
2.2.7	Cultural and Historical features .....	20
2.2.8	Socio-economic .....	20
<b>3</b>	<b>Activity description .....</b>	<b>20</b>
3.1	Proposed activities .....	20
3.1.1	Medium Density Fibreboard (MDF) .....	21
3.1.2	Melamine Faced Board (MFB) .....	22
3.1.3	Associated infrastructure .....	22
3.2	Listed activities triggered.....	23
3.3	Alternatives .....	25
3.3.1	Activity Alternatives .....	25
3.3.2	Site Alternatives.....	25
3.3.3	Layout alternatives .....	27
3.3.4	Design Alternatives.....	27
3.3.5	Technology Alternatives .....	27
3.3.6	No-Go Alternative .....	28
3.4	Alternatives selected for further assessment .....	29
<b>4</b>	<b>Need &amp; desirability .....</b>	<b>29</b>
<b>5</b>	<b>Activity context.....</b>	<b>30</b>
5.1	Legislative and policy frameworks.....	30
5.2	Compliance with legislative and policy frameworks .....	30
5.2.1	Gert Sibande District Municipality SDF .....	30
5.2.2	Gert Sibande District Municipality IDP .....	31
5.2.3	Mkhondo Local Municipality IDP .....	31
5.2.4	Mkhondo Local Municipality SDF .....	31
5.2.5	Mpumalanga Biodiversity Sector Plan (MBSP) .....	31
5.2.6	Air quality policies, norms & standards .....	31
5.2.7	Economic Reconstruction and Recovery Plan .....	31
<b>6</b>	<b>Period for which authorisation is required and closure date .....</b>	<b>32</b>
<b>7</b>	<b>Public Participation Process .....</b>	<b>32</b>
7.1	IAP identification and register.....	32
7.2	Advertisement.....	32
7.3	Site notices .....	32
7.4	Background Information Document.....	33
7.5	Community meeting.....	33
7.6	Comments and Responses .....	33

<b>8</b>	<b>Process followed to reach proposed preferred site .....</b>	<b>34</b>
<b>9</b>	<b>Impact Assessment Methodology .....</b>	<b>34</b>
<b>10</b>	<b>Impact assessment .....</b>	<b>36</b>
10.1	Planning and design impacts .....	36
10.1.1	Integrated planning.....	36
10.2	Construction related impacts .....	36
10.2.1	Vegetation clearing.....	36
10.2.2	Noise and dust.....	37
10.2.3	Traffic.....	38
10.2.4	Waste disposal .....	38
10.2.5	Existing infrastructure .....	39
10.3	Operational phase impacts.....	40
10.3.1	Air quality impacts .....	40
10.3.2	Climate change.....	42
10.3.3	Stormwater management .....	43
10.3.4	Effluent management .....	44
10.3.5	Water resources - quantity .....	45
10.3.6	Economic impacts .....	46
10.3.7	Job creation & retention.....	46
10.3.8	Air quality impacts on human health .....	47
10.3.9	Noise and dust.....	49
10.3.10	Traffic.....	49
10.3.11	Solid waste disposal .....	50
10.3.12	Fire hazards.....	50
10.4	Decommissioning phase impacts.....	51
<b>11</b>	<b>Impact assessment assumptions and uncertainties .....</b>	<b>51</b>
<b>12</b>	<b>Environmental Impact Statement .....</b>	<b>52</b>
<b>13</b>	<b>EAP opinion and recommendations.....</b>	<b>53</b>
13.1	Opinion regarding authorisation .....	53
13.2	Recommendations.....	54

## Figures

- Figure 1. Provincial location of the site
- Figure 2. Location of the PG Bison site in relation to eMkhondo
- Figure 3. Location of the existing plant and proposed new MDF development area
- Figure 4. Precipitation and wind diagram of the Mkhondo area (Meteoblue, 2021)
- Figure 5. Wind rose indicating the dominant wind direction and speed (hours per year) (Meteoblue, 2021).
- Figure 6 Critical Biodiversity Areas – aquatic (MBSP)
- Figure 7. Strategic Water Source Areas and catchment boundaries
- Figure 8 Critical Biodiversity Areas – terrestrial (MBSP).
- Figure 9. Land uses around the PG Bison plant
- Figure 10 Schematic representation of the MDF manufacturing process.
- Figure 11. The MFB and MDF finished products
- Figure 12. Site alternatives considered

## Tables

- Table 1: Summary of content of report as required by NEMA EIA Regulations of 2014, as amended
- Table 2. Listed activities triggered in terms of the EIA listing notices
- Table 3 Applicable legislation and policies
- Table 4. Average yearly pollutant levels – Ermelo region
- Table 5. Emission levels tested at the plant (Yellowtree report)
- Table 6. Impact summary

# Executive summary

## Proposed development:

PG Bison is proposing to expand their current operations at their plant in eMkhondo (previously Piet Retief). The plant currently manufactures particleboard (chipboard) and MFB (melamine faced board) and the proposed development would involve:

- i) expanding the existing MFB manufacturing capacity by installing an additional 35 000m<sup>2</sup> per day MFB line. MFB is produced by laminating resin-impregnated paper onto particle board. This is done by laying the paper onto the board and applying heat and pressure in a short cycle press. The heat activates the resin and bonds the paper tightly to the board.
- ii) expanding the range of products made by the plant, by adding in an 800m<sup>3</sup> per day Medium Density Fibreboard (MDF) manufacturing facility. MDF is a manufactured wood product produced by breaking softwood down into fibres (via chipping, steaming and refining), mixing these fibres with wax and resin and then compressing this into a board in a heated press. The heat for the process (heating of thermal oil for the press, drying of wood fibre and heating of the water for steam) is produced by an on-site thermal energy plant. The proposed development thus also includes the construction of a new biomass-fired 38MW heating plant.

The proposed MFB line will be accommodated within the existing PG Bison premises while the new MDF plant will be built next to the existing facility.

The main associated infrastructure requirements are:

- Additional water supply as the on-site boreholes are insufficient. A source has not yet been finalised but is likely to be either from the Assegai River or from the Heyshoop Dam. This will be dealt with as a separate application process due to timeframes.
- Power supply. Eskom will be responsible for undertaking the required power line upgrades to the existing sub-station.
- Treatment facilities for process wastewater and sanitation. The MDF process produces wastewater during the chip washing and cooking processes. The water is not hazardous but needs to be treated before being discharged. An on-site effluent treatment package plant that will also be able to accommodate the sewage that currently goes to conservancy tanks is proposed.

These proposed activities will trigger the need for environmental authorisation and a basic environmental assessment process is thus being carried out.

It should be noted that application for an MDF plant was previously made and was authorised in 2011 (EA Ref 17/2/3GS-42). The project however couldn't go ahead due to Eskom power supply shortages at that time and the authorization lapsed. There have been some changes to the previously proposed activity as well as to the EIA legislation in the meantime, and re-application is now being made.

It should also be noted that the proposed activity was recently accepted as one of the key investments in the president's COVID19 Economic Reconstruction and Recovery Plan (Appendix G) and is therefore of critical, national importance.

## Development alternatives identified

The following project alternatives were identified:

Alternative Type		Preferred Alternative	Screened-out Alternative(s)
Site	Alternative sites for the new MDF plant	Site 5	Sites 1-4
Technology	Types of heating plants that could be used for the MDF process	Biomass fired energy plant	Fossil fuel fired energy plant
Layout	Alternative layouts for the new MDF plant	No feasible alternatives	
Design	Alternative plant designs	No feasible alternatives	
Activity	Alternatives to MDF and MFB production	No feasible alternatives	
Process	Alternative ways to produce MDF and MFP	No feasible alternatives	
No Go			

The Technology alternatives were selected as the most significant alternatives for further assessment, i.e.:

- Alternative 1 – use of a biomass fired thermal plant (preferred)
- Alternative 2 – use of a fossil fuel fired thermal plant
- No Go alternative

## Public Participation

An initial public participation process was carried out via the distribution of Background Information Documents, erecting site notices and placing adverts in two newspapers.

Interested and Affected Parties (I&APs) were provided with a 30-day comment and registration period, and the following comments received:

- Sonae Arauco – registered interest as the company sources wood logs, chips etc. from the same area and has an interest in water availability in the area due to their Panbult plant. They also have an interest in the potential air emissions, waste etc. that could result from the proposed development. Their comment has been noted and they will be kept informed as a registered I&AP.
- Transnet – indicated they would not be affected as no work was being done in the railway reserve.
- Mpact (neighbour) – existing infrastructure and potential fire risks need to please be considered. This will be addressed in the Basic Assessment Report (BAR).
- Mondi (neighbour) – raised a query about disposal and testing of effluent and potential impact on surrounding plantations. This concern was noted and is addressed further in the impact assessment section.
- SANRAL – request to be registered and noted that a traffic assessment would need to be submitted. This is being done as part of a separate process.

I&APs will now be afforded a 30-day comment period on the draft BAR (DBAR). Comments will be addressed in the final BAR (FBAR) before submission of the FBAR to the Department.

## Environmental impact assessment:

A summary of the outcomes of the environmental impact assessment is given in the table below:

Impact	Alternative 1 - biomass		Alternative 2 - fossil fuel		No Go
	Not mitigated	Mitigated	Not mitigated	Mitigated	
<b>Pre-construction phase</b>					
Integrated planning	Med-	Med+	Med-	Med+	Med-
<b>Construction phase</b>					
Vegetation	Low-	Very low-	Low-	Very low-	Neutral
Noise and dust	Low-	Very low-	Low-	Very low-	Neutral
Traffic	Low-	Very low-	Low-	Very low-	Neutral
Waste disposal	Low-	Very low-	Low-	Very low-	Neutral
Existing infrastructure					
<b>Operational phase</b>					
Climate change	Med+	Med+	Med-	Med-	Very low-
Stormwater management	Low-	Very low-	Low-	Very low-	Neutral
Effluent management	Med-	Low-	Med-	Low-	Neutral
Water resources - quantity	Med high-	Med-	Med high-	Med-	Neutral
Economic	High+	High+	Med+	Med+	Fatal flaw
Job creation/retention	Med+	Med high+	Med+	Med high+	Med-
Air quality - human health	Med-	Low-	Med high-	Med-	Neutral
Noise and dust	Med-	Low-	Med-	Low-	Neutral
Traffic	Med-	Low-	Med-	Med-	Neutral
Solid waste disposal	Low-	Low-	Med-	Low-	Neutral
Fire hazards	Low-	Very low-	Low-	Very low-	Neutral
<b>Decommissioning phase</b>					
N/A					
<b>Total impact score</b>	-472	-205	-618	-369	-241

Based on the outcomes of the impact assessment, the following was concluded:

### Alternative A (biomass-fired energy plant)

This was confirmed as the preferred alternative. Negative impacts can be sufficiently mitigated to acceptable levels.

### Alternative B (fossil fuel-fired energy plant)

This alternative has the greatest number of negative biophysical and socio-economic impacts.

### No Go alternative

This alternative, although having the fewest negative biophysical impacts, is considered fatally flawed from a socio-economic perspective due to the importance of the project as a key investment in the country's Covid-19 Economic Reconstruction Plan.

## Recommendations

### General

- That the activity be authorised.
- That Technology Alternative 1 (preferred alternative) be authorised.



- That the EMPr be implemented and adherence to it monitored.

#### **Pre-construction**

- Environmental awareness training should be included in any SHE inductions to contractors and affected plant personnel. Training to include knowledge of EMPr and authorisation conditions.
- A full-time ECO must be designated or appointed prior to construction
- Details regarding water source and effluent treatment must be finalised

#### **Construction**

- Construction must be carried out in line with the approved EMPr and conditions of authorisation
- The implementation of the EMPr must be overseen by a competent ECO

#### **Operation**

- Operational impacts should be managed in line with the approved EMPr, conditions of relevant authorisations and existing plant operating procedures.

#### **Conclusion**

The project is of national economic strategic importance and offers significant socio-economic benefits. Negative impacts on the bio-physical environment can be largely mitigated to magnitudes of “Low” to “Very Low”. The project is aligned to the various planning documents and key NEMA principles; and its need and desirability can be justified.

Authorisation, with the preferred technology alternative, is therefore recommended.

## Report structure

As the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) does not have a specified BAR template, this report has been structured in line with the requirements for a BAR as set out in Appendix 1 the Environmental Impact Assessment (EIA) regulations (2014, as amended). The Table below shows where each of the BAR requirements in the regs can be found in this report.

**Table 1: Summary of content of report as required by NEMA EIA Regulations of 2014, as amended**

Section of EIA regs	Description	Section in this BAR
3.1.(a)	Details & expertise of person preparing BAR.	1
3.1.(b)	The location of activity including SG code; physical address and farm name.	2
3.1.(c)	A plan which locates the proposed activity as well as associated infrastructure at an appropriate scale.	App B
3.1.(d)	A description of the scope of the proposed activity, including all listed activities and a description of the activities to be undertaken including associated infrastructure.	3
3.1.(e)	A description of the policy and legislative context within which the development is proposed, including a description of all relevant legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and planning instruments applicable to the activity; and how the proposed activity complies.	5
3.1.(f)	A motivation for the need and desirability for the proposed development, including in the context of the preferred location.	4
3.1.(g)	A motivation for the preferred site, activity and technology alternative.	8
3.1.(h)	<p>A full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <ul style="list-style-type: none"> <li>(i) details of all the alternatives considered;</li> <li>(ii) details of the public participation process undertaken, including copies of the supporting documents and inputs;</li> <li>(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</li> <li>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- can be reversed, may cause irreplaceable loss of resources; and can be avoided, managed or mitigated;</li> <li>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</li> <li>(viii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>(ix) the possible mitigation measures that could be applied and level of residual risk;</li> <li>(x) the outcome of the site selection matrix;</li> </ul>	3; 5; 7; 10

Section of EIA regs	Description	Section in this BAR
	(xi) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and a concluding statement indicating the preferred alternatives, including preferred location of the activity.	
3.1.(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will have on the preferred location through the life of the activity.	9
3.1.(j)	An assessment of each identified potentially significant impact and risk.	10
3.1.(k)	A summary of the findings and impact management measures identified in specialist report; and how these have been included in the final report.	N/A
3.1.(l)	An environmental impact statement which contains: (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	12
3.1.(m)	Inclusion of the impact management objectives in the EMPr.	App D
3.1.(n)	Inclusion of any aspects which were conditional to the findings of the assessment included as conditions of authorisation.	13
3.1.(o)	A description of any assumptions.	13
3.1.(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, with conditions of authorisation.	11
3.1.(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	6
3.1.(r)	Undertaking/oath by the EAP.	App A
3.1.(s)	Details about financial provisions for decommissioning.	N/A
3.1.(t)	Any specific information that may be required by the competent authority.	N/A

# 1 EAP details

The basic assessment process has been undertaken by the following Environmental Assessment Practitioner (EAP):

## **Dr Jenny Youthed (EAPASA)**

Jenny holds a PhD in Geography from Unisa, with the focus of her thesis being on assessing and managing compliance with conditions of environmental authorization. She has 23 years' experience in the integrated environmental management field, 10 of which were with the EIA section of the competent environmental authority in the Eastern Cape. She thus has experience in assessing applications for environmental authorization and setting conditions for authorization. She also has experience in conducting basic assessments and EIAs; compiling environmental management plans; undertaking environmental audits and providing input into environmental planning documents.

She is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA – registration number 2019/1797)

# 2 Location

## 2.1 Property Description/ Physical Address

The PG Bison plant is situated in the industrial area at “Kemp Siding”, which is located on a portion of the Farm Vroegeveld (Farm 509/portion 20/SG 0000 0000 0509 00020) about 8km north of Mkhondo town along the N2 towards Ermelo. The area lies within the Mkhondo Local Municipality (MLM) of the Gert Sibande District Municipality (GSDM) in the Mpumalanga Province (Figure 1 and 2).

The new MFB line will be located within the existing plant, while the new MDF plant will occupy an area adjacent to the existing plant (Figure 3). PG Bison is in the process of buying this additional section of land.

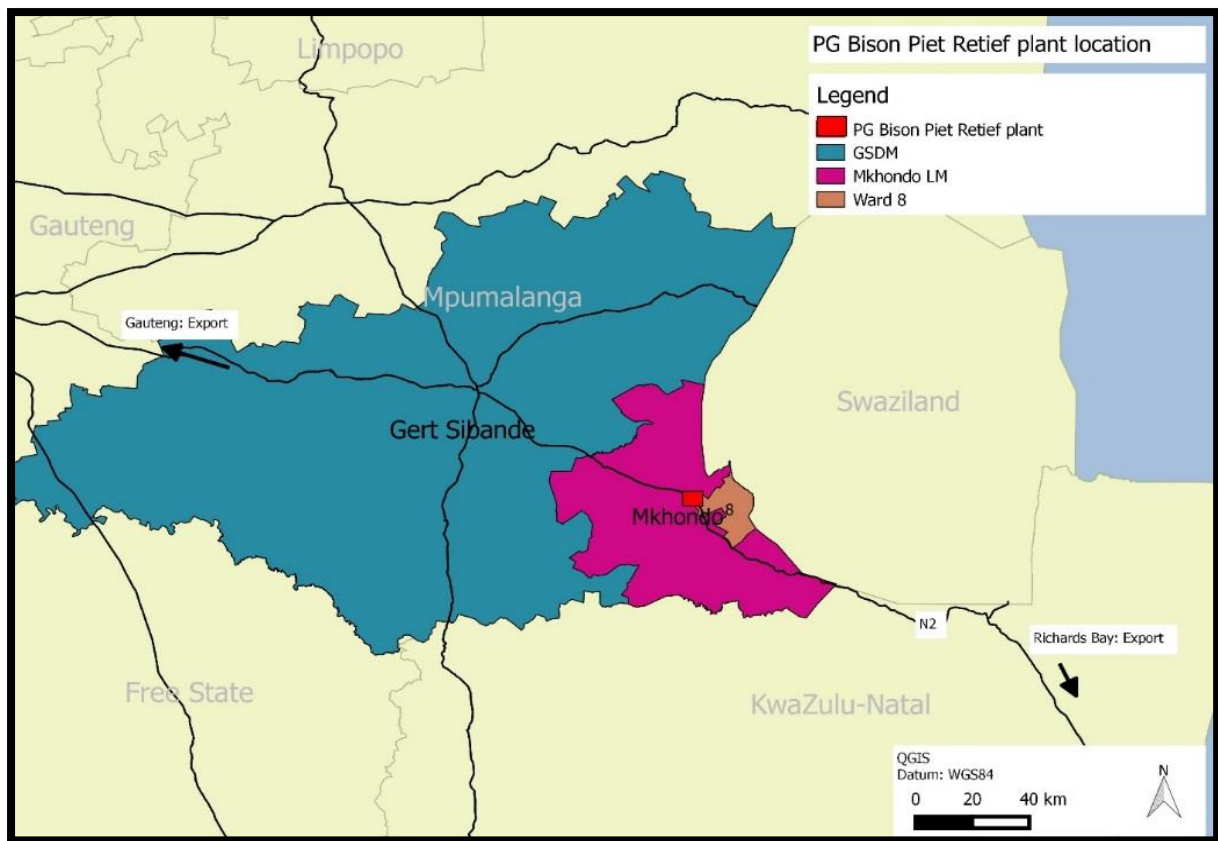


Figure 1. Provincial location of the site



Figure 2. Location of the PG Bison site in relation to eMkhondo



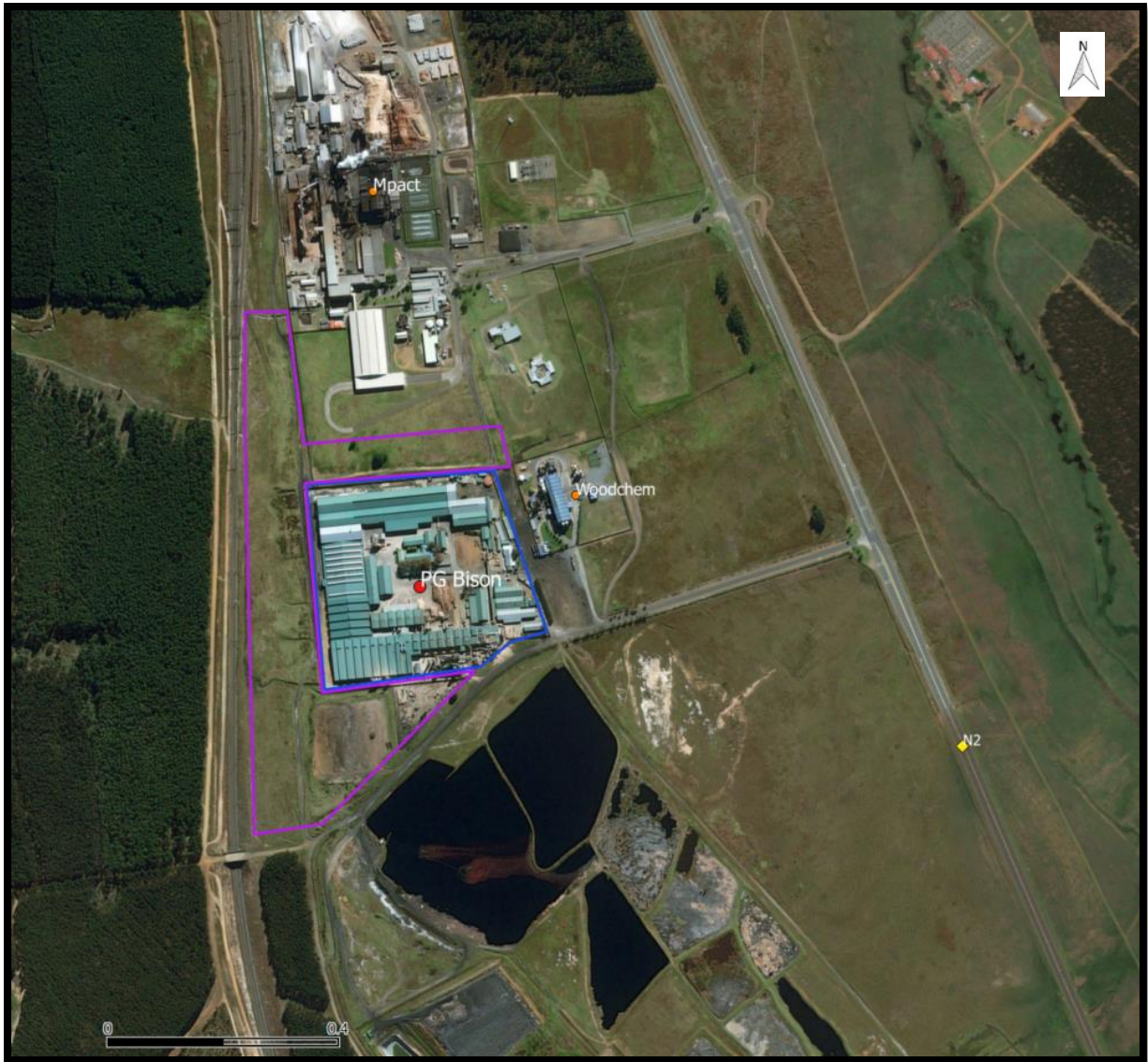


Figure 3. Location of the existing plant and proposed new MDF development area

## 2.2 General Environment

### 2.2.1 Climate

The climate of the Mkhondo area is generally mild and temperate, with rainfall occurring even in the dry winter months. The temperatures range from the coldest in June at 19.4°C (with night-time temperatures dropping to 3.2°C) to the highest in January at 26.3°C. On average the area receives 746mm of rainfall per year, with most rainfall occurring during summer. The lowest rainfall occurs in June, with the highest rainfall occurring in December.

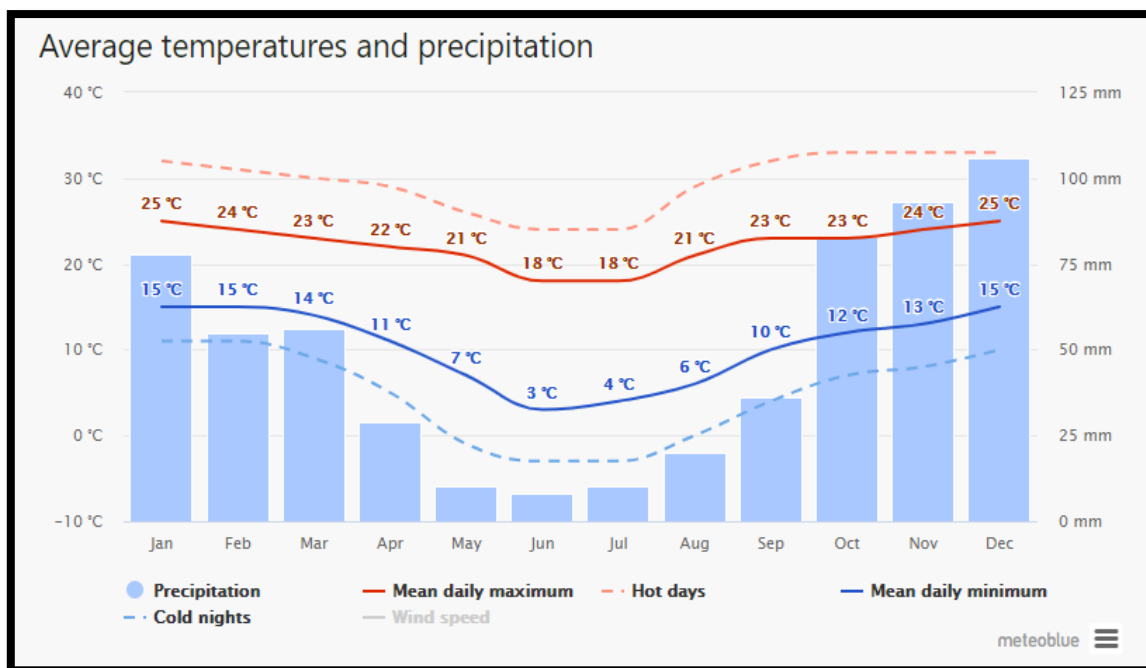


Figure 4. Precipitation and wind diagram of the Mkhondo area (Meteoblue, 2021)

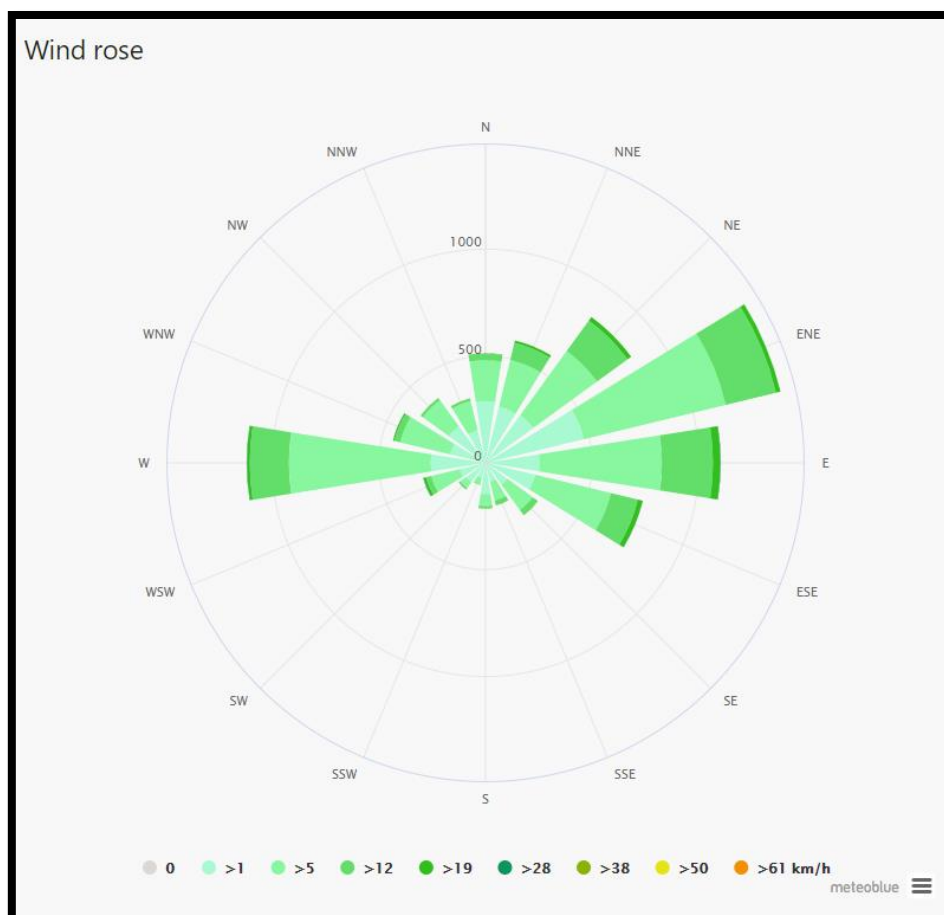


Figure 5. Wind rose indicating the dominant wind direction and speed (hours per year) (Meteoblue, 2021).

The wind in Mkhondo is predominately East to North-East with alternate Westerlies (Figure 5). Mkhondo lies to the south of the plant, meaning it is out of the main wind direction from the plant.

Wind speeds are the highest in spring and early summer (August – October) and the lowest in autumn (March – May). The wind speeds seldom exceed three (3) on the Beaufort Scale, meaning that the area generally has light or gentle breezes, with an occasional increase to a moderate breeze. Given the climatic conditions and topography, the area is prone to fog. The light wind can mean that air quality impacts are intensified as pollutants are not as easily mixed and dispersed.

### 2.2.2 Geomorphology

The Drakensberg Escarpment divides Mpumalanga north to south. The Mkhondo area lies on the transition between the Highveld and Lowveld, south-east of the escarpment. The area is characterised by gently undulating hills. The PG Bison plant is positioned approximately 1343 meters above sea-level. An east-west profile indicates that the area is slightly elevated above the surrounding area, with gentle slopes to the east and west.

### 2.2.3 Geology and Soils

Mkhondo is situated on Pre-Pongola geological basement material with the Pongola succession near Mkhondo being mainly represented by volcanic rocks of the Nsuze Group which extend into Swaziland and are intruded by post-Pongola granites. The mainly felsic volcanic rocks, minor clastic sedimentary layers give rise to deep loams. The soils range from strong brown to red in colour and can be described as soft, friable clay (National soils (AGIS) - general soil descriptions). The geology and soils are not expected to have a significant impact on the project.

### 2.2.4 Surface and Ground water

#### *Surface water*

The development falls within the Upper Usutu Sub-Water Management Area (WMA) of the Usutu to Mhalthuze WMA. The plant lies on the border of quaternary catchments W51C (from which the Assegai River drains) and W51F (from which the Blesbokspruit and Ndlozane Rivers drain) - Figure 7. The preferred site falls within the W51C catchment. The majority of the preferred site is classified by the Mpumalanga Biodiversity Sector Plan (MBSP) as “heavily modified” – Figure 6. A portion falls into an ESA: Fish support area, although ground-truthing shows that the entire site is modified and that there are no streams on site. It is thus likely that the classification of the site as an ESA is incorrect.

The entire development also falls within a Strategic Water Source Area (MBSP) (Figure 7), which has important implications as the development will require significant quantities of water (approximately 500m<sup>3</sup> of water per day). However, the current proposal is to obtain water from sources (Assegai River or Heyshoop dam) outside of the SWRA.



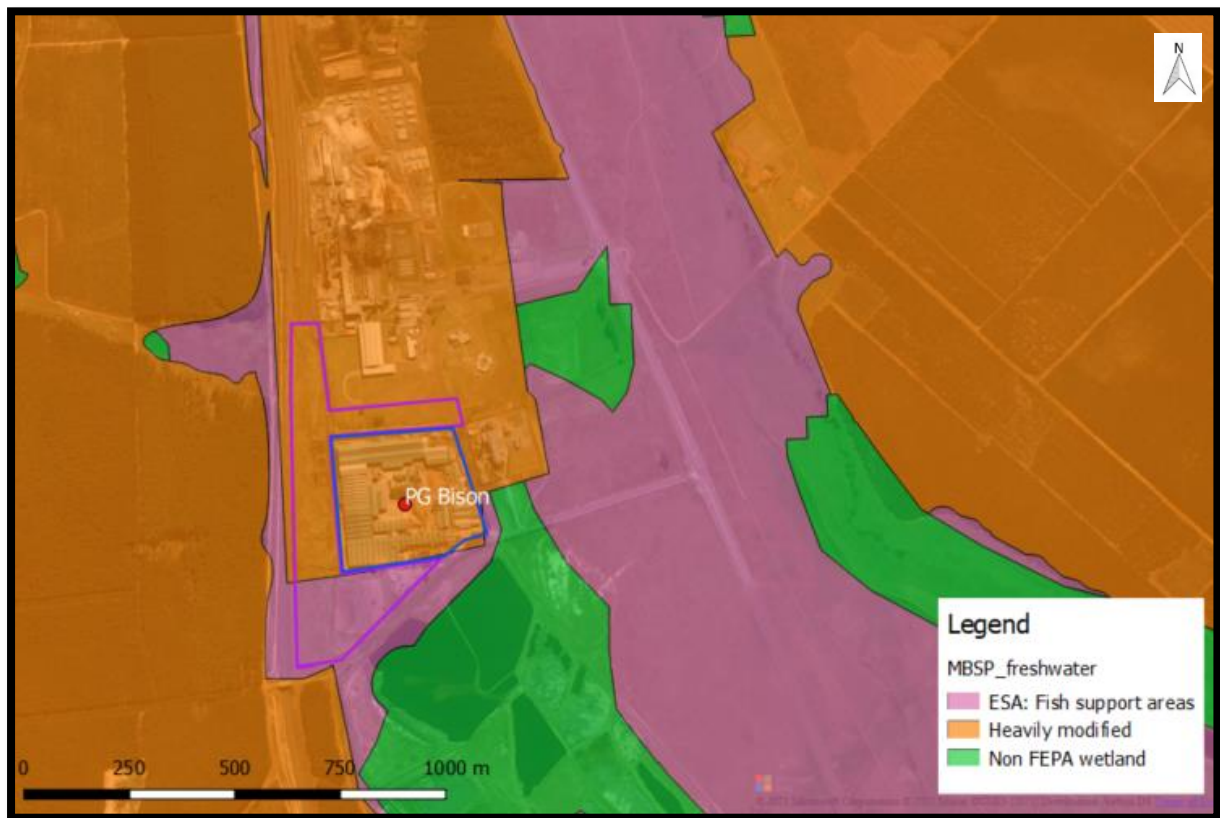


Figure 6 Critical Biodiversity Areas – aquatic (MBSP)

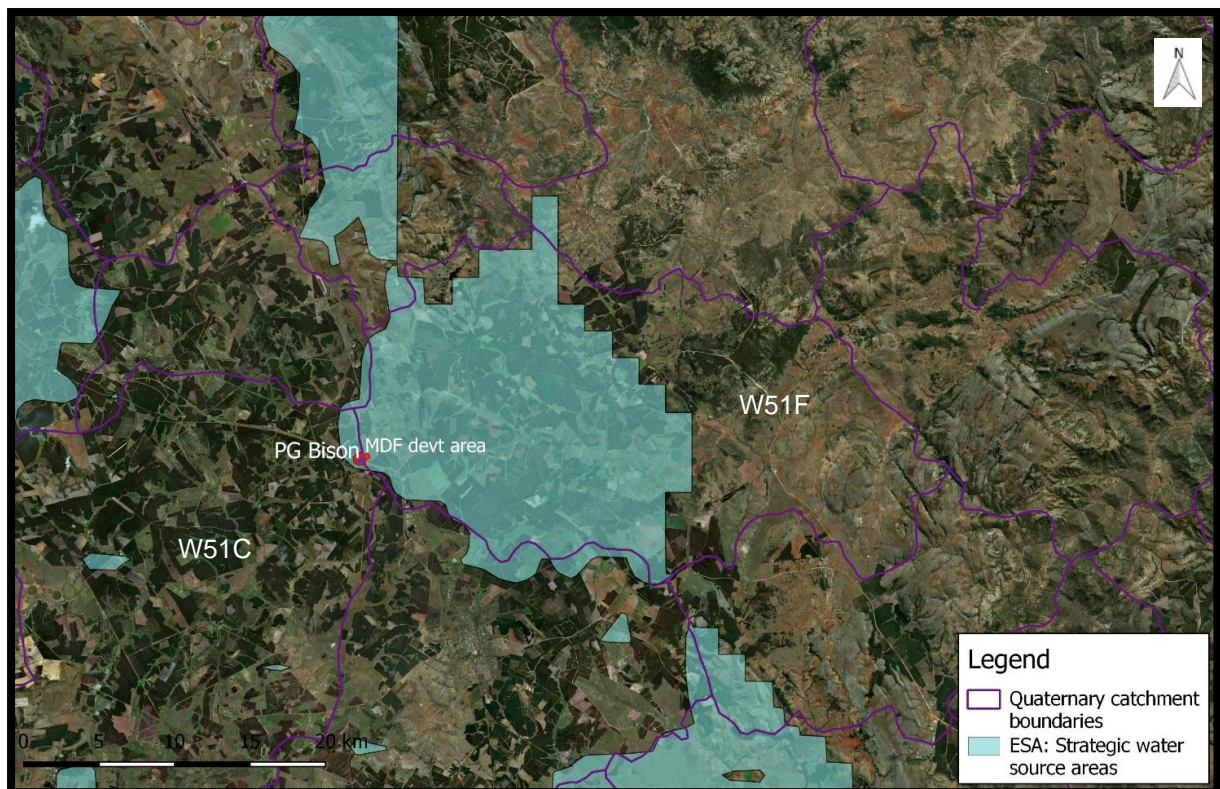


Figure 7. Strategic Water Source Areas and catchment boundaries

### Ground water

Ground water use in the area appears limited due to low yields and relatively poor water quality. Three boreholes exist on site with the water being used for plant processes, firefighting equipment, ablution facilities and gardening purposes. They are shallow boreholes (<25m) and the yield and water quality will not be sufficient for the development.

## 2.2.5 Flora and Fauna

### Flora

Vegetation in the area is classified as KaNgwane Montane Grassland (Mucina and Rutherford, 2006; MBSP). Although this vegetation type is classified as vulnerable and poorly protected, the impact of the proposed development on the overall vegetation group is likely to be very low as the area is already significantly modified and the vegetation transformed by industry, grazing and commercial forestry. The affected site is also already fragmented and does not form part of a CBA (Figure 8). The site is classified by the MBSP as moderately or heavily modified. A small section is classified as “other natural areas”, but is in the same heavily modified condition as the rest of the site.

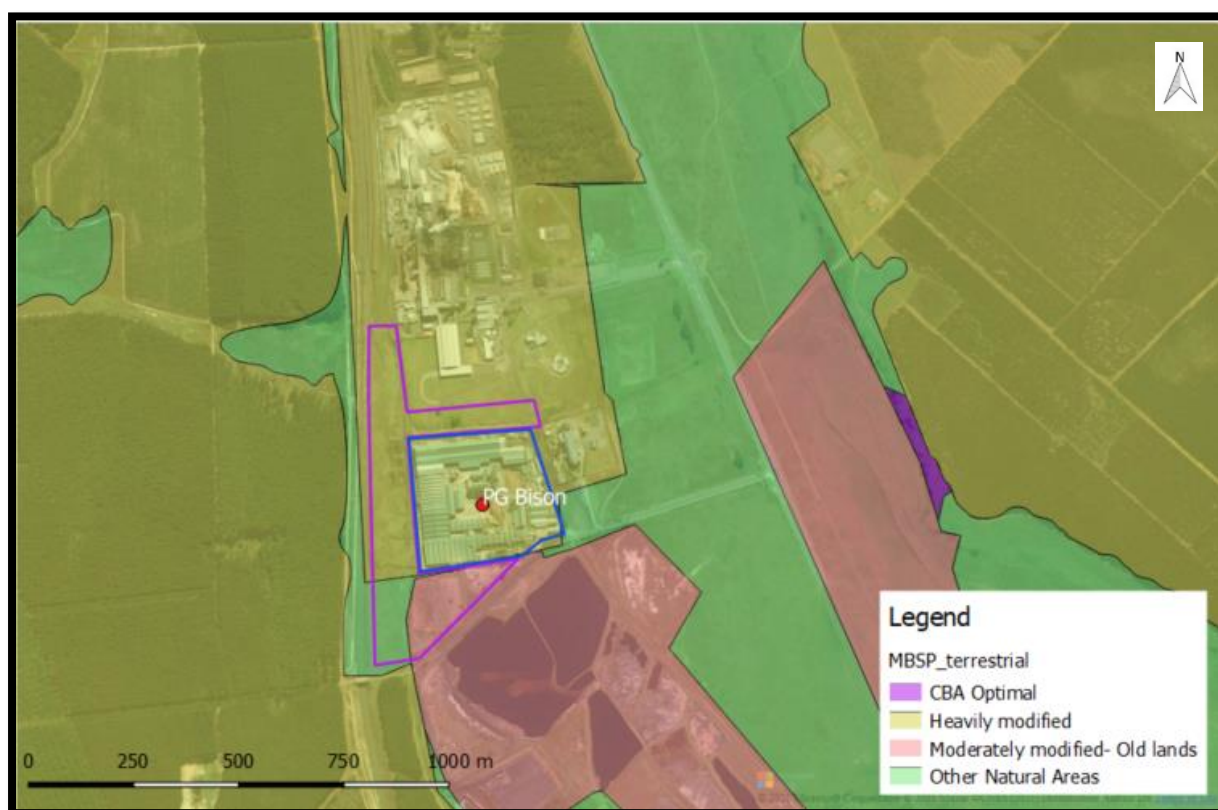


Figure 8 Critical Biodiversity Areas – terrestrial (MBSP).

### Fauna

The Mpumalanga Biodiversity Sector Plan (MBSP) classifies the area as moderately to heavily modified (Figure 8). This is in accordance with the industrial setting of the plant. It is not expected that the



proposed activity will have a significant impact on the terrestrial biodiversity of the area as the development will take place within the existing PG Bison premises and on the adjacent land which is degraded by human activity and over-grazing. The area is also not part of a CBA.

### 2.2.6 Land Use Character of Surrounding Area

The Mkhondo area is an important timber-growing region of Mpumalanga. As such, the surrounding land uses are mainly related to the timber industry (Figure 9). The Mpact pulp and paper plant lies to the north of PG Bison, with forestry plantations immediately beyond that. The Woodchem resin manufacturing plant – which supplies resin to PG Bison – lies to the east of PG Bison. Immediately south of the plant are Mpact's black liquor ponds and the registered landfill site shared with Mpact.



Figure 9. Land uses around the PG Bison plant

The surrounding infrastructure connects the plant with the industrial centre of Gauteng, as well as the import/export harbour of Richards Bay. These connection points are through the N2 and railway lines,

which run parallel to the plant. Mkhondo town lies approximately 8km to the south of the plant. An informal settlement, eMaphepheni, is located approximately 1km to the south of the plant.

### 2.2.7 Cultural and Historical features

The Mkhondo area has a diverse cultural heritage, ranging from Zulu, Afrikaans and British history. Sites such as the Intombe Battle Fields, where Zulu forces defeated British troops, and the Voortrekker Monument, with imprinted ox-wagon tracks from the Great Trek, occur within the greater municipal area. Other important heritage sites include Rooikraal, Confidence, Kalkoenvlakte and Heyshope Dam. The Morgestond and Athole Nature Reserves and Amsterdam Conservation are two sites managed by the Mpumalanga Parks Board.

The site however lies within an existing industrial area with no known significant heritage resources either on site or in the immediate surrounding area.

### 2.2.8 Socio-economic

Mkhondo is considered the gateway to the province of Mpumalanga from KwaZulu-Natal and Swaziland. It is situated halfway between Johannesburg and the Natal coast in GSDM, acting as the main link for both industrial and commercial transport from Gauteng to the import/export harbour at Richards Bay. The municipality consists of the main towns of Amsterdam and Mkhondo. Much of the economy is based on forestry and timber-related industries, with companies such as Mondi, SAPPI, Mpact, Sonae Arauco, Tafibra and PG Bison being among the key role-players.

The Integrated Development Plan (IDP, 2020/21) notes that Mkhondo Local Municipality has shown a population growth rate of 2.1% between 2011 and 2016 (community survey census count dates). The population is dominated by African black people (98%). The majority (61%) of the population is between 15 and 64 years of age, i.e. of working age; but the unemployment levels are high (35.5% at the last census count), which makes the creation of job opportunities important. Education levels are however low, with only 28.8% of people aged 20 or older having completed matric. This indicates that job demand is likely to be greatest in the unskilled or moderately skilled sectors. Overall, Mkhondo Local Municipality has a HDI (Human Development Index) of 0,53 which falls within the United Nations “Low Human Development” Category.

## 3 Activity description

### 3.1 Proposed activities

PG Bison is proposing to expand their current operations at their plant in Mkhondo (Piet Retief). The plant currently manufactures particleboard (chipboard) and MFB (melamine faced board) and the proposed development would involve:

- iii) expanding the existing MFB manufacturing capacity by installing an additional 35 000m<sup>2</sup> per day MFB line;
- iv) expanding the range of products made by the plant, by adding in a 800m<sup>3</sup> per day Medium Density Fibreboard (MDF) manufacturing facility. This will include a new biomass-fired 38MW energy plant to provide the necessary heat for the process.

The MFB line will be within the existing PG Bison footprint while the MDF plant will be next to the existing plant.

### 3.1.1 Medium Density Fibreboard (MDF)

MDF is essentially produced by breaking softwood down into fibres (via chipping and steaming), mixing these fibres with wax and resin and then compressing this into a board in a heated press (Figure 10). The heat for the process (heating of thermal oil for the press, drying of wood fibre and heating of the water for steam) is usually produced by an on-site energy plant.

The proposed activity involves the installation of a MDF manufacturing facility with an estimated production rate of 800m<sup>3</sup> of MDF per day. The thermal energy for the plant will be provided by a new biomass-fired 38MW energy plant.

The manufacturing process would be generally as follows:

Logs (typically from pine or gum trees) will be brought to site and stored in the log yard (the existing log yard will be expanded) before being debarked and chipped. The wood chips will then be screened and, if necessary, washed before being fed into a defibrator where they will be steamed and pulped to break the wood into fibres. The boiler on the new energy plant will be used to heat the water to provide the steam for this step. The fibres will then be fed into a blowline where they will be mixed with resin (urea formaldehyde) and wax before being sent to a dryer. Hot air for the dryer will come from the energy plant. After drying, the resin impregnated fibre will be formed into a mattress which will be fed into a Controll type press that will subject the mattress to heat and pressure, thus forming MDF. The new energy plant will be used to heat the thermal oil that provides heat to the press. After pressing, the boards will be cooled, sanded and trimmed to finish them off. Trimmings and dust from the sanding process can be used as biomass fuel in the energy plant.

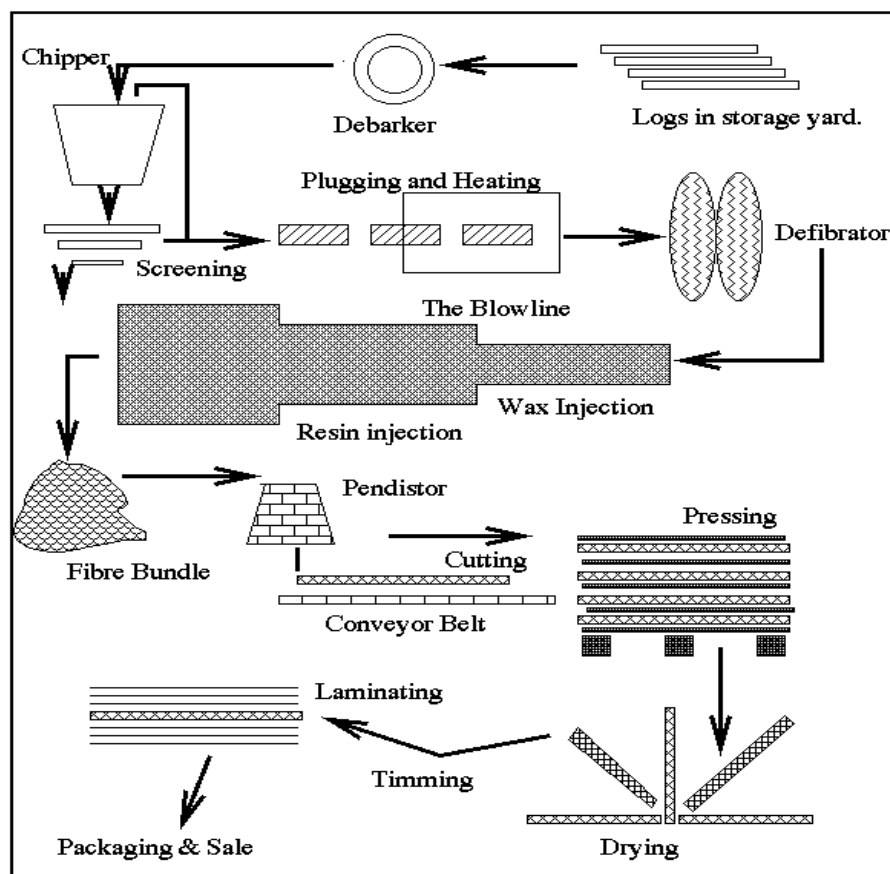


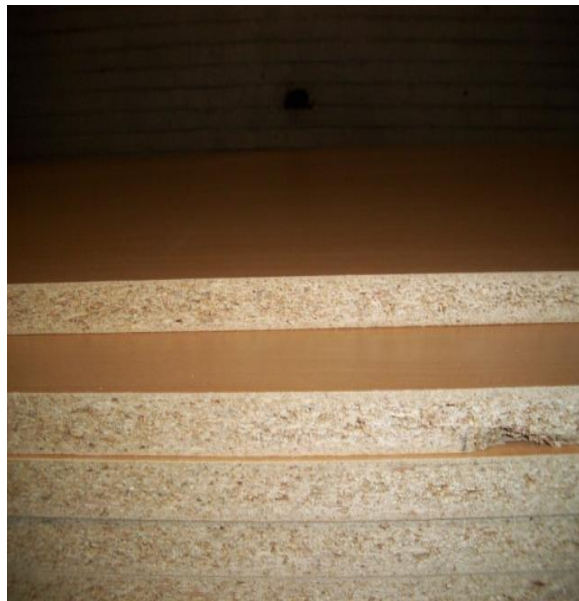
Figure 10 Schematic representation of the MDF manufacturing process<sup>1</sup>.

<sup>1</sup> <https://fennerschool-associated.anu.edu.au>

### 3.1.2 Melamine Faced Board (MFB)

MFB is produced by laminating resin-impregnated paper onto particle board. This is done by laying the paper onto the board and applying heat and pressure in a short cycle press. The heat activates the resin and bonds the paper tightly to the board. The heat for the press is provided by an existing energy plant which heats thermal oil.

MFB is already produced at the PG Bison plant, and the proposed activity involves the installation of an additional 35 000m<sup>2</sup> per day MFB line. The thermal energy will be supplied from the new MDF line energy plant (biomass fired) and have a LO10 backup burner. The MFB line will be located within the existing PG Bison premises.



Close-up of Melamine Faced Board (MFB)



Close-up of Medium Density Fibreboard (MDF)

Figure 11. The MFB and MDF finished products

### 3.1.3 Associated infrastructure

The main associated infrastructure requirements are:

- Additional water supply as the on-site boreholes are insufficient. A water source is still being finalised but will likely be either from an existing abstraction point in the Assegai River or from the Heyshoop Dam. This will form part of a separate application if listed activities are triggered.
- Power supply. Eskom will be responsible for undertaking any required power line upgrades up to the substation. From the substation 2 x 11kv lines will be erected adjacent to the existing line to the plant.
- Treatment facilities for process wastewater and sanitation. The MDF process produces wastewater during the chip washing and cooking processes. The water is not hazardous but needs to be treated before being discharged. An on-site effluent treatment package plant that will also be able to accommodate the sewage that currently goes to conservancy tanks is proposed (details not yet available).



## 3.2 Listed activities triggered

The proposed development potentially triggers activities listed in terms of the EIA regulations Listing Notices (2014, as amended) as indicated in the Table below.

**Table 2. Listed activities triggered in terms of the EIA listing notices**

<b>Government Notice R983 (as amended) Activity No.</b>	<b>Describe the relevant Basic Assessment Activity in writing as per Listing Notice 1 (GN No. R983, as amended)</b>	<b>Describe the portion of the development as per the project description that relates to the applicable listed activity</b>
27	<i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i>	<i>The overall MDF site footprint is approximately 12ha, although only a portion of that will need to be cleared (approximately 6ha). The land has not been formally cultivated at any point and will require clearing. Vegetation cover at present consists largely of grasses and low-growing forbs and herbs. It is in a transformed state.</i>
28	<i>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</i>	<i>The development is industrial in nature and will be within the Kemp Siding industrial area. However, as this area falls outside of the town planning scheme, the undeveloped land is still zoned as agricultural. The new site for the MDF plant will require rezoning. This will be dealt with by a town planner</i>
32	<i>The continuation of any development where the environmental authorisation has lapsed and where the continuation of the development, after the date the environmental authorisation has lapsed, will meet the threshold of any activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014</i>	<i>The project previously received authorization in terms of the 2010 EIA regulations (ref 17/2/3GS-42) but had to be put on hold and the authorization lapsed.</i>
34	<i>The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution</i>	<i>The proposed development will result in an increase in air emissions and will therefore require a variation of the existing Air Emissions Licence.</i>
48	<i>The expansion of i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more where such expansion occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding— (aa) the development of infrastructure or structures within existing ports or harbours...; (bb) where such development activities are related to the development of a port or harbor...;</i>	<i>Existing water discharge culverts may need to be upgraded or provided with additional erosion control measures. Final design details are not available at this stage.</i>

Government Notice R983 (as amended) Activity No.	Describe the relevant Basic Assessment Activity in writing as per Listing Notice 1 (GN No. R983, as amended)	Describe the portion of the development as per the project description that relates to the applicable listed activity
	<p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, or road reserves or railway line reserves ...</p>	
51	The expansion and related operation of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by more than 80 cubic metres.	Additional storage facilities will be required for thermal oil (for use in the heating systems) and for urea-formaldehyde resin. Approximately 200 000l (200m3) of thermal oil will be required (current storage amt is 50m3), but the majority (170 000l) will be within the heating system itself and not stored separately. Additional resin (UF) storage of approximately 450 000 litres (450m3) will be required.
Government Notice R985 (as amended) Activity No:	Describe the relevant Basic Assessment Activity in writing as per Listing Notice 3 (GN No. R985, as amended)	Describe the portion of the development as per the project description that relates to the applicable listed activity
14	<p>The development of—</p> <ul style="list-style-type: none"> <li>i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</li> <li>ii) infrastructure or structures with a physical footprint of 10 square metres or more;</li> </ul> <p>where such development occurs—</p> <ul style="list-style-type: none"> <li>within a watercourse;</li> <li>in front of a development setback; or</li> </ul> <p>if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours...</p> <p><u>f Mpumalanga</u></p> <p>i. Outside urban areas:</p> <p>... (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;...</p>	The development falls within a strategic water resource area. Upgrading and/or construction of stormwater and/or treated effluent discharge outlets close to drainage lines might be required (final design details not yet available)

In addition to the above, the project will require authorisation in terms of the following:

**National Environmental Management: Air Quality Act (No. 39 of 2004)** – The existing plant has an Air Emissions Licence (Mkhondo/PGB/0003/2015/F02) for the listed activity of “Wood burning, drying and the production of manufactured wood products” (Category 9, Sub-category 9.5 of the listed activities published in terms of NEM:AQA), but this will require variation in order to cater for the additional stacks and emissions from the new activities. Variation will be applied for at a later date once the necessary details relating to the energy plant have been finalised. Applications for variation would be made via the on-line SAAELIP (South African Atmospheric Emission Licensing and Inventory Portal). The relevant authority for Air Quality in the area is the GSDM.



**National Water Act (NWA)** – A Water Use Licence or General Authorisation in terms of the National Water Act will be required for the discharge of or irrigation with treated effluent (process water and sewage); and possibly also (depending on the water source found) for water abstraction and S21c & i activities. Details on water sources and on treatment processes and effluent generated are not yet available and the necessary WUL applications to IUCMA will only be made once these details are known.

## 3.3 Alternatives

The following alternatives were considered:

### 3.3.1 Activity Alternatives

Both MDF and MFB manufacture are very specific processes which need to be compatible with the existing PG Bison activities. The processes cannot be replaced by alternative activities. No reasonable activity alternatives were thus identified.

### 3.3.2 Site Alternatives

Five potential sites were considered, but only one proved suitable.

#### a) Site Alternative 1

This site is behind the existing PG Bison plant and directly next to it. It lies between the plant (to the east) and the railway line (to the west) and is approximately 8.5ha in size. The site is not formally developed but is in a transformed state. Vegetation consists of grass and small forbs.

It was later rejected for economic (particularly cost of land purchase) and logistical (existing infrastructure) issues.

#### b) Site Alternative 2

This site is located a short distance to the east of the existing plant and lies between the Woodchem resin manufacturing plant and the N2 national road. It is approximately 7.6ha in size and is not formally developed.

After further investigation it was not considered viable because:

- There were traffic safety concerns as there was insufficient space to safely queue trucks while loading/offloading. The site is also next to the N2 which would make any dust problems significant for motorists.
- The site is too small on its own.
- Run-off from the Woodchem plant is channelled across the site. This run-off has created a channel as well as wet conditions.
- There is a perched localised wetland in the eastern corner of the site.
- Three species of protected plants occur on the site

#### c) Site Alternative 3

This site lies between the N2 and the Mpact black liquor ponds and is slightly to the south east of the existing plant. It is approximately 4ha in extent. The site is not formally developed but is in a transformed state. Vegetation consists of grass and small forbs.

It was not considered viable because:

- There are traffic safety concerns as there is insufficient space to safely queue trucks while loading/offloading.
- The site is too small.
- There are logistical issues as the site is not directly next to the existing plant.
- Landowner negotiations are needed.

**d) Site Alternative 4**

This site is a combination of Site 2 and a portion of Site 1, as well as a strip of land along the northern boundary of the plant linking the two sites. It was initially up for consideration as it offered a lot of space; but after further investigation was not considered viable because:

- It has the same disadvantages as Site 2.
- The proposed development was scaled down and not as much land was needed.
- Land purchase would be costly due to the size of the site.

**e) Site Alternative 5 - preferred**

Site 5 is similar to Site 1 and wraps around three sides (northern, southern and western) of the existing plant. The entire site is transformed and remaining vegetation consists of grass and small forbs. This site is approximately 7 ha in extent, although approximately only 3 ha of it will be developed.

It is the preferred site because:

- It is right next to the existing plant which is preferable from an economic, logistical and energy-saving perspective
- It is safer from a traffic perspective as it is further away from the N2 national road and has enough space to allow trucks to be queued for loading and offloading.
- The current landowners (Mpact and Mondi) are willing to sell
- The site is already considerably disturbed and not within any sensitive areas



Figure 12. Site alternatives considered

### 3.3.3 Layout alternatives

No significant layout alternatives were identified as the development has to link into existing processes.

### 3.3.4 Design Alternatives

No significant design alternatives were identified.

### 3.3.5 Technology Alternatives

A significant technology alternative was identified with regards to the type of energy plant that will power the MDF and other processes. These plants are typically designed to use either fossil fuel (coal, fuel oil or gas) or biomass (wood fines) as their main fuel source. The type of fuel used can have significant impacts, especially in terms of air emissions and cost.

The following two significant alternatives were identified for further assessment in this report<sup>2</sup>:

**a) Technology alternative 1 – biomass-fired energy plant (preferred)**

This alternative would involve using a biomass (wood/dust) fired energy plant for the MDF. This is the preferred and most feasible option because:

- A biomass fired plant can meet the required energy demands.
- Biomass is readily available on site, which reduces transport and operational costs, increases operational and energy efficiency and lowers the risk of shutdowns due to a lack of fuel availability.
- Waste is reduced by using the dust and wood by-products already being produced (e.g. offcuts, sanding dust, broken boards, unsuitable wood chips etc). Biomass burning produces less process waste (e.g. ash) compared to fossil fuels.
- It is the most economically viable option.
- Biomass burning has the most acceptable emissions profile:
  - o It has a lower carbon footprint when burnt compared to fossil fuels and is typically cleaner as well.
  - o It has the lowest indirect air emissions profile as it does not involve the mining of coal (which would be required if fossil fuels are used) or transporting of large quantities of fuel (which reduces vehicle emissions).
- PG Bison has extensive operational experience with biomass-fired energy plants (familiar and well-known technology).

**b) Technology alternative 2 – fossil fuel-fired energy plant**

This alternative would involve using a fossil-fuel (coal, oil or gas) fired energy plant. While it is theoretically feasible and will be assessed; is not the preferred alternative as:

- Fossil fuel is not available on site (unlike biomass) and would have to be trucked in. This makes it too expensive and puts the plant at risk of having to stop operations if fuel is not available. This is a real possibility given the coal shortages that have recently been experienced by the Eskom power stations in the area. Stopping operation, even for a short while is extremely costly, requires complex equipment shut-down and start-up procedures, and has significant negative knock-on effects.
- Air quality impacts are higher. Fossil fuels have an unfavourable emissions profile, both directly (higher SO<sub>2</sub> and NO<sub>x</sub> emissions than biomass) and indirectly (from mining of the coal and transporting it).
- It is the least energy and waste efficient process. Fossil fuel is not as energy efficient as biomass for this particular process and will result in large quantities of process waste (e.g. fly ash).
- Considerable amounts of coal or fuel oil would need to be stored on site which poses a risk of fuel spills, whether on-site (direct impact) or while being transported to site (indirect impact).

### 3.3.6 No-Go Alternative

This alternative would entail maintaining the *status quo*.

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<sup>2</sup> As the main impact of the plant is likely to be on air quality, alternatives most likely to be of significance in that aspect were chosen for further assessment.

### 3.4 Alternatives selected for further assessment

Based on the above, the following most significant alternatives were selected for further assessment:

- Technology alternative 1 – biomass-fired energy plant (preferred option)
- Technology alternative 2 – fossil fuel-fired energy plant
- No-go Alternative

Note: Technology alternatives were selected for further assessment as they are the ones that are likely to be of most significance for the main project impacts (air emissions).

## 4 Need & desirability

The project is desired and needed for the following reasons:

- It is of strategic national importance. It has been committed to the president as a key investment (R1.98 billion) for the country's Covid-19 Economic Reconstruction and Recovery Plan.
- The project is of strategic importance to the applicant. The two biggest market share controllers of the chipboard and MDF sector are PG Bison and Sonae Arauco. Both manufacturers operate in the province and PG Bison wishes to keep a competitive advantage.
- The project is aligned to the district and local municipal IDPs, SDF and other planning documents. The land use is appropriate and will not set a negative development precedent.
- The PG Bison plant provides employment opportunities to the local community. The increased production due to the proposed upgrades will lead to further (direct and indirect) job opportunities in the future. The number of new jobs during construction will be about 500 with approximately 150 permanent jobs created during the operational phase.
- Considerable investments to the plant (approx. R 600 million) have recently been made to upgrade equipment and operations and the proposed development would allow these investments to be capitalised on and economic benefits to be maximised.
- The proposal for an MDF plant was previously approved (ref 17/2/3GS-42)

## 5 Activity context

### 5.1 Legislative and policy frameworks

Key legislation and policy frameworks are summarised in the Table below.

**Table 3 Applicable legislation and policies**

<b>Title of legislation, policy or guideline:</b>	<b>Administering authority:</b>
The South African Constitution	-
National Environmental Management Act (NEMA)	DEFF
The EIA regulations published in terms of NEMA (2014, as amended)	DEFF/DARDLEA
National Environmental Management: Air Quality Act and associated regulations	DEFF/District Municipalities
National Framework for Air Quality Management in South Africa	DEFF
National Ambient Air Quality Standards	DEFF
Hazardous Substances Act	-
Occupational Health and Safety Act	-
Gert Sibande District Municipality SDF	GSDM
Gert Sibande District Municipality IDP	GSDM
Gert Sibande District Municipality Air Quality Management By-Law	GSDM
Mkhondo Local Municipality IDP	MLM
Mpumalanga Biodiversity Sector Plan	MTPA/DARDLEA
Mpumalanga Nature Conservation Act	DARDLEA
Guideline – needs and desirability	DEFF
Guideline – Public Participation in the EIA Process	DEFF
Mpumalanga Vision 2030	-
National Water Act	DWS

### 5.2 Compliance with legislative and policy frameworks

The proposed activity is in agreement with the relevant strategic planning documentation, including the following.

#### 5.2.1 Gert Sibande District Municipality SDF

One of the key development principles in the GSDM SDF is to unlock the industrial development potential of existing towns through developing industry specific Special Economic Zones/ Economic Clusters throughout the District. eMkhondo has been identified as a Forestry Cluster area and earmarked for further development as a Forestry Hub. The proposed activity (which involves the beneficiation of wood products) therefore fits in with this spatial development planning.

### 5.2.2 Gert Sibande District Municipality IDP

The GSDM IDP (2019/20) outlines Local Economic Development as a key performance area for the municipality. The forestry industry is identified as a key economic driver and economic development objectives include the promotion and support of existing forestry-related businesses within the District. PG Bison is one of the key wood processing industries in the area and the proposed expansion activities will increase its economic contribution, thus supporting Local Economic Development (LED). The proposed development is thus in line with the IDP

### 5.2.3 Mkhondo Local Municipality IDP

The 2020/21 IDP notes that “forestry is the primary economic sector in Mkhondo and related companies such as Mondi and Sappi invest in human settlements in the region”. It further identifies the “beneficiation of forestry products” as one of the LED strategies for the current IDP cycle. The proposed developments at PG Bison can be thus seen as in line with the IDP as it will be in support of the primary economic sector.

### 5.2.4 Mkhondo Local Municipality SDF

The proposed development is in line with the Mkhondo SDF in that it fits with the designated land use (existing industrial area) and meets the key Spatial Development Objective of “expanding the involvement in and benefit extracted from the farming and forestry activities in the MLM”.

### 5.2.5 Mpumalanga Biodiversity Sector Plan (MBSP)

According to the MBSP, the western portion of the site can be classified as “heavily modified” from both a terrestrial and aquatic biodiversity perspective. Impact on biodiversity here is expected to be minimal and development is in line with MBSP land-use recommendations.

The development is also within a Strategic Water Resource Area (SWRA), but the proposal is to source water from either the Assegai River or the Heyshoop dam which lie outside the SWRA.

### 5.2.6 Air quality policies, norms & standards

The plant has an AEL for the existing activities and regular air quality compliance tests are carried out (copies of AEL and test results attached in Appendix F and G respectively). According to the latest test results (August 2020), the plant meets the South African norms and standards, and except for PM emissions from the Recalor dryer (which is in the process of being replaced by new equipment), complies with all other required emission limits.

### 5.2.7 Economic Reconstruction and Recovery Plan

The proposed activity forms part of PG Bison’s R1.98 billion pledge to help kick-start the South African economy as part of the Covid-19 Economic Recovery Plan. It is one of the key investments that has been committed to the country’s economic reconstruction and development plan and is therefore of critical, national importance.

## 6 Period for which authorisation is required and closure date

Authorisation is requested for the lifespan of the activity (it is noted that decommissioning will require separate application when/if it occurs).

It is anticipated that construction will take approximately 24 months and would start shortly after receipt of environmental authorisation and the conclusion of the appeal timeframes. Desired construction start date is March 2022.

## 7 Public Participation Process

Public participation has involved the following to date:

### 7.1 IAP identification and register

An Interested and/or Affected Parties (IAP) register was compiled during the pre-application phase and was updated as the public participation process proceeded (copy of register attached in Appendix C). Stakeholders identified during the pre-application phase included: relevant regulatory authorities, ward councillors, the local municipality, adjacent landowners, relevant parastatals and IAPs that registered during the previous application process.

### 7.2 Advertisement

Newspaper adverts notifying the public of the proposed activity were placed in the following newspapers:

- The Excelsior – 4 December 2020
- Highveld Tribune – 1 December 2020

The papers are distributed on a weekly basis in the greater Mkhondo area. A copy of the adverts and proof of placement is attached in Appendix C.

### 7.3 Site notices

Notices were placed on site at the following locations:

- At the turn-off from the N2 to the PG Bison plant.
- At the entrance gate to the proposed new site.
- Along the perimeter fence of the proposed new site adjacent to the gravel road going past the site.

Please refer to Appendix C for the notice wording and proof of placement.



## 7.4 Background Information Document

A Background Information Document (BID) was sent to all identified stakeholders on 4 December 2020 informing them of the project and providing additional information. A copy of the BID is attached in Appendix C.

## 7.5 Community meeting

Due to the restrictions imposed by the Covid-19 pandemic, a community meeting could not be held. The relevant Ward Councillors were however contacted and no concerns or requests for a public meeting were received.

It should also be noted that many of the workers at the PG Bison plant are from the local community and would be aware of the proposed developments and would also be informed by the notices that were placed on site.

## 7.6 Comments and Responses

All comments and responses have been recorded in a Comments and Response Register (copy attached in Appendix C).

The following comments have been received to date:

- Transnet (Freight Rail section) has indicated that they will not be affected if the railway line or reserve is not going to be impacted on. No development will take place in or close to the railway reserve.
- Mpact raised the following:
  - Concern about potential impact on their existing infrastructure, in particular:
    - The pipeline that takes effluent from Mpact to the black liquor ponds. It was since agreed that the pipeline would be rerouted to avoid the proposed developed area.
    - The dirt road that runs in front of the Woodchem plant and provides a shortcut from the Mpact plant to the landfill site. This is no longer an issue as no development will take place on the affected site.
  - Potential fire hazards such as close proximity when making annual fire breaks, risk of factory fires and explosions and forest fire impacts. This potential impact was noted and is addressed further in the impact assessment section.
- Sonae Arauco SA
  - Registered interest as the company sources wood logs, chips etc. from the same area and has an interest in water availability in the area due to their Panbult plant. They also have an interest in the potential air emissions, waste etc. that could result from the proposed development. Their comment has been noted and they will be kept informed as a registered I&AP.
- Mondi
  - Raised a concern about wastewater/effluent disposal and potential impact thereof on their tree plantations. This concern was noted and is addressed further in the impact assessment section.

## 8 Process followed to reach proposed preferred site

Please refer to Section 3.3 on site alternatives considered.

## 9 Impact Assessment Methodology

### Note:

- Please refer to Appendix E for the assessment matrix
- As most of the mitigation measures are already outlined in the EMP, they have not been repeated here. Only key measures are highlighted as necessary.

The impact assessment methodology used is set out in the table below. Each potential impact was rated against set criteria, and scores assigned where relevant. The overall significance of the impact was then calculated as follows: **Significance = (duration + extent + magnitude) x probability of the impact occurring**

CRITERIA	CATEGORY	DESCRIPTION	Score
Project phase	Planning		
	Construction		
	Operation		
	Decommissioning		
Degree to which impact can be mitigated	Low	Mitigation not possible; or will only slightly reduce the significance of impacts	
	Medium	Mitigation exists and will notably reduce significance of impacts	
	High	Mitigation exists and will considerably reduce the significance of impacts	
Nature	Positive		1
	Negative		-1
Duration	Immediate	Impact will self-remedy immediately	1
	Brief	Impact will not last longer than 1 year	2
	Short term	Impact will last between 1 and 5 years	3
	Medium term	Impact will last between 5 and 10 years	4
	Long term	Impact will last between 10 and 15 years	5
	On-going	Impact will last between 15 and 20 years	6
	Permanent	Impact may be permanent, or in excess of 20 years	7
Extent	Very limited	Limited to specific isolated parts of the site	1
	Limited	Limited to the site and its immediate surroundings	2
	Local	Extending across the site and to nearby settlements	3
	Municipal area	Impacts felt at a municipal level	4
	Regional	Impacts felt at a regional / provincial level	5
	National	Impacts felt at a national level	6
	International	Impacts felt at an international level	7
Intensity	Negligible	Natural and/ or social functions and/ or processes are negligibly altered	1
	Very low	Natural and/ or social functions and/ or processes are slightly altered	2

	Low	Natural and/ or social functions and/ or processes are somewhat altered			3
	Moderate	Natural and/ or social functions and/ or processes are moderately altered			4
	High	Natural and/ or social functions and/ or processes are notably altered			5
	Very high	Natural and/ or social functions and/ or processes are majorly altered			6
	Extremely high	Natural and/ or social functions and/ or processes are severely altered			7
Probability	Rare	Conceivable, but only in extreme circumstances (< 5% chance of occurring)			1
	Unlikely	There is a small chance that the impact could occur although it is not expected (<30% chance of occurring)			2
	Possible	There is a moderate chance that the impact could occur			3
	Likely	It is most likely that the impact will occur (> 60% chance)			4
	Almost certain	There are sound reasons to expect that the impact will definitely occur (> 90% chance)			5
Confidence	Low	Judgement is based on intuition			
	Medium	Determination is based on common sense and general knowledge			
	High	Substantive supportive data exists to verify the assessment			
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified			
	Medium	The affected environment will only recover from the impact with significant intervention			
	High	The affected environmental will be able to recover from the impact			
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce			
	Medium	The resource is damaged irreparably but is represented elsewhere			
	High	The resource is irreparably damaged and is not represented elsewhere			
Significance	Significance	Negative	Positive	Score (- or +)	
	Neutral/Negligible	neutral/negl -	Neutral/negl +	0-15	
	Very low	very low -	very low +	15-30	
	Low	low -	low +	31-45	
	Medium	med -	med +	46-60	
	Medium-high	med-high -	med-high +	61-75	
	High	high -	high+	76-90	
	Fatal flaw	fatal flaw	Very high +	>90	

## 10 Impact assessment

During initial screening (refer to the Screening and Screening Verification Reports – Appendix 4 of the application form), the following aspects were identified as being very unlikely to be significantly impacted on and are not considered further: geology; civil aviation; defence; agricultural potential; palaeontology; heritage and fauna.

### 10.1 Planning and design impacts

#### 10.1.1 Integrated planning

##### Direct & indirect:

The project needs to be in line with the relevant spatial and environmental planning documents such as the IDP, SDF and Mpumalanga Biodiversity Sector Plan (MBSP) so that development takes place in an integrated manner. Failure to plan the project without consideration of the larger planning picture can lead to fragmented environmental management, unsustainable development, the setting of negative development precedents and non-identification of cumulative development impacts e.g. impacts on air quality.

The proposed expansion at PG Bison is also aligned with the national COVID19 Economic Reconstruction and Recovery Plan and was committed to the president as a key investment for South Africa. In addition, the project is part of the long-term development vision for the Mkhondo area and can be seen as integrated into the relevant planning for the area. The impact is therefore considered positive.

##### Cumulative:

No significant cumulative impacts identified.

##### Alternatives:

There are no significant differences between alternatives 1 and 2. The “no go” is negative as the development is identified as a presidential priority project and is also aligned with the IDPs and SDFs.

##### **Mitigation:**

- Not applicable. An assessment of the alignment of the project with the required spatial planning documents has been done and discussed in the previous section.

### 10.2 Construction related impacts

#### 10.2.1 Vegetation clearing

##### Direct & indirect:

Clearing of vegetation would be required on the areas to be surfaced. Vegetation (mainly grasses and small forbs) has already been disturbed by activities such as informal grazing; and no species of special concern were noted. The MBSP classifies most of the site as moderately to heavily modified. Biodiversity loss is therefore considered minimal.

Indirect impacts of vegetation removal include the exposure of soil. This can result in dust and mud generation and erosion of the exposed soil by wind or water. Erosion is however expected to be minimal due to the very gentle slope of the site.

Overall impacts on vegetation are expected to be very low.

Cumulative:

No significant cumulative impacts were identified.

Alternatives

There are no significant differences between Alternatives 1 and 2.

**Mitigation:**

- Vegetation removal should be minimised and the construction footprint kept as small as possible.
- Additional general measures relating to vegetation clearing are outlined in the EMPr.
- The alien invasive plant management plan in the EMPr should be implemented

## 10.2.2 Noise and dust

Direct & indirect:

Noise is unlikely to be a significant problem given that the development will take place within an industrial area, well away from any residential areas.

Dust will be generated during the clearing of ground for the new MDF plant, and if not well managed could potentially be a nuisance to surrounding land users. This is mitigated by the sheltered nature of site.

Dust could also be created by construction vehicles tracking mud onto the main road which, when dry, could create dust.

Dust is unlikely to be a problem for residents of the area, as the closest settlement (eMphapheni) is over 1km away and the prevailing wind direction is not towards the town.

Cumulative:

No significant cumulative impacts were identified.

Alternatives

There are no significant differences between Alternatives 1 and 2.

**Mitigation:**

- There are effective mitigation measures available which are detailed in the EMPr. They include measures such as: limiting areas to be cleared of vegetation, use of dust suppression measures and use of rumble strips on the access road to help truck tyres shed mud before reaching the main road, if required.

### 10.2.3 Traffic

#### Direct & indirect:

The industrial area borders the N2 national road and access to the development will be directly off this road. During delivery of materials there might be a minor disruption in traffic flow. This impact will be limited to set times and can be managed by implementing traffic safety measures as required by SANRAL.

#### Cumulative:

No significant cumulative impacts were identified.

#### Alternatives

There are no significant differences between Alternatives 1 and 2.

#### **Mitigation:**

- Traffic and road safety regulations need to be obeyed and the necessary safety measures (eg signalmen and warning signs) implemented. All SANRAL requirements must also be implemented.

### 10.2.4 Waste disposal

#### Direct & indirect impacts:

Waste will be generated during construction and will likely include general construction waste such as litter; broken and waste materials; spoil (rubble and unsuitable earth material) and packing material (mostly plastic and wood) from around the new equipment. No significant hazardous waste will be generated.

This impact can be mitigated to a significance rating of “very low” as:

- PG Bison already has an existing and functional waste disposal system.
- There is a licenced (G:M:B+ classification, permit number 16/2/3/7/W/511/B14/Z1/P379) landfill site nearby that can accept the general waste. The site belongs to PG Bison and Mpact.
- Spoil material (rubble, rocks) can potentially be re-used during building (eg for platforms) or by the crushing plant outside eMkhondo.

#### Cumulative impacts:

No significant cumulative impacts were identified.

#### Alternatives

There are no significant differences between Alternatives 1 and 2.

#### **Mitigation:**

- Effective measures exist (refer to EMPr) and there is an existing waste disposal system and landfill site.

## 10.2.5 Existing infrastructure

### Direct & indirect impacts:

The following infrastructure exists on or adjacent to the site:

- Stormwater outlets – PG Bison  
The existing stormwater outlets will remain as is and continue to function. Care will however need to be taken to avoid damage to the culverts by heavy vehicles driving over them.
- Railway line – Transnet  
No work is proposed to take place within or close to the rail reserve. No impact on the line is expected and Transnet have indicated they have no objection to the development
- Black liquor pipeline – Mpact  
A pipeline that takes the effluent from the Mpact plant to the black liquor ponds runs across the site. This pipeline will be realigned prior to construction to ensure it is not damaged and remains functional.
- Informal dirt road – PG Bison and Mpact  
An informal dirt road runs across the site behind the existing PG Bison plant. It is mostly used by Mpact as a shortcut link between their plant and the landfill site and black liquor ponds. After construction the road will be re-established behind the extended PG Bison plant. Alternative routes are available that can be used as detours during construction (e.g. dirt road that runs along the front of the Woodchem plant). No significant impacts are therefore expected.

### Cumulative impacts:

No significant cumulative impacts were identified.

### Alternatives

There are no significant differences between Alternatives 1 and 2.

### **Mitigation:**

- Identify existing infrastructure and potential impacts early in the planning process
- Establish clear communication and contact channels between affected parties
- Ensure labour is informed about existing infrastructure, the location thereof and what measures must be taken to avoid damage to it
- Clearly demarcate existing infrastructure where it is not easily visible (e.g. location of pipeline or stormwater culverts)
- Maintain a buffer from the railway line
- Ensure infrastructure remains functional during construction or is re-aligned before construction starts.

## 10.3 Operational phase impacts

### Biophysical impacts

#### 10.3.1 Air quality impacts

##### Direct & indirect impacts

The proposed activity would result in an increase in emissions. The emissions would be primarily from:

- The new energy plant (main pollutants released during biomass burning are PM10, NO<sub>x</sub> and Volatile Organic Compounds (VOCs)).
- Dryers (main pollutants are PM10 and VOC evaporated from the wood).
- The new press lines (main pollutant released is formaldehyde during pressing of the board).
- Increased generation and handling of dust/fines (eg from board sanding and stockpiles; main pollutant released is PM10).

Potential impacts of these emissions are discussed below. Note: this section for impacts on ambient air quality; impacts on human health are discussed separately further on.

- Nitrogen Oxides (NO<sub>x</sub>)

NO<sub>x</sub> are important greenhouse gasses, particularly due to their ability to deplete ozone. Health effects are usually minor at ambient concentrations, but irritation of the respiratory tract is possible. In high concentrations NO<sub>x</sub> may decrease visibility as a brown smog. NO<sub>x</sub> emissions will be higher when the waste wood which is burned contains urea formaldehyde resin.

- Particulate Matter (PM)

Particulate matter (PM) refers to small solid particles which are suspended in a gaseous stream or in the atmosphere. The burning and drying of wood results in particulate matter. Other sources include dust from e.g. stockpiles and sanding. Particulate matter can result in various health and environmental impacts such as irritation to the respiratory system, triggering asthma, clogging waterways, impairing plant photosynthesis due to coating of the leaves with dust etc (refer also to section on impacts on human health).

- Volatile Organic Compounds (VOCs)

The key VOC expected would be from formaldehyde. Formaldehyde forms part of the resin mix used to bind the wood chips and fibres and is released particularly during the forming, pressing and trimming processes. It is also released slowly over the lifetime of all manufactured wood products that use a formaldehyde resin.

Formaldehyde is recognised as a human carcinogen and Occupational Exposure Limits have been set in term of the Occupational Health and Safety Act 85 of 1993. Regulations published in terms of this Act require all employers to undertake relevant precautionary and regular monitoring measures to ensure levels remain within acceptable limits. PG Bison undertakes this testing as required and operates a formaldehyde scrubber.

Additional pollutants which may occur during use of the backup burners (which are fuel-oil powered), or if Alternative 2 is chosen, include the following.

- Sulphur Dioxide (SO<sub>2</sub>)



Sulphur dioxide is the primary environmental pollutant resulting from combustion of fossil fuels. Sulphur in the fuel combines with oxygen to give rise to sulphur oxides (SO<sub>x</sub>). When combined with water, sulphur oxide gas forms a sulphuric acid which can result in acid rain and the corrosion of stacks, buildings and thermal equipment. SO<sub>2</sub> can also have a negative impact on the surrounding pine plantations (SO<sub>2</sub> can cause leaf drop in pines).

- Carbon Dioxide (CO<sub>2</sub>)

When hydrocarbon (fossil) fuels are combusted, the hydrocarbons are converted into carbon dioxide and water (H<sub>2</sub>O). The burning of fossil fuel will thus release carbon dioxide and water vapour to the atmosphere. Carbon dioxide is designated as a greenhouse gas (as promulgated under NEM:AQA).

## Ambient air quality and compliance levels

Table 4 (extracted from SAAQIS<sup>3</sup>) shows the average levels of selected pollutants recorded over the last year in Ermelo (the closest monitoring station). As can be seen, levels are within the National Ambient Air Quality Standards, i.e. the average recorded air pollutants did not exceed the limits provided within standards. PM<sub>10</sub> levels are approaching the air quality standard limits, but this is likely due to emissions from the large Eskom power stations near Ermelo and levels are expected to be considerably lower in Mkhondo which is further away.

Table 4. Average yearly pollutant levels – Ermelo region

Station Name: Ermelo, Type: Average, TimeBase: 24 Hour, Yearly: 01/01/2020 - 01/01/2021				
Type	SO <sub>2</sub>	NO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10_s</sub>
	ppb	ppb	ppb	µg/m <sup>3</sup>
<b>Avg</b>	9.059	3.758	7.656	37.77
<b>Data %</b>	71.9	23.2	23.2	82.6
<b>Max</b>	45.784	12.885	27.239	133.796
<b>Min</b>	0.312	0.636	2.359	2.609
<b>Max Date</b>	26/07/2020	04/06/2020	04/06/2020	14/02/2020
<b>Min Date</b>	28/03/2020	28/03/2020	28/03/2020	12/10/2020
<b>National std (1yr avg)</b>	19	21	-	40

The Table below shows the compliance of the existing operation at PG Bison with emission limits (extract from the Yellowtree report in Appendix G). As can be seen, the plant is well within its emission limits, with the exception of the Recalor dryer which is currently in the process of being replaced.

Table 5. Emission levels tested at the plant (Yellowtree report)

Pollutant (mg/Nm <sup>3</sup> )	Recalor	Babcock	Vyncke	PCS	Saw	MFB	Limit
Particulate matter (PM)	200	61	50	19	TBC	3	150
Oxides of nitrogen (NO <sub>x</sub> )	283	193	137	3	TBC	48	500
Sulphur dioxide (SO <sub>2</sub> )	0	7	0	3	TBC	1	-

<sup>3</sup> South African Air Quality Information System, <http://saaqis.environment.gov.za>

### Cumulative impacts

As indicated above, air quality in the overall area is well within the national air quality standard limits (Table 4) and the proposed development should not result in air quality emission limits in the region being exceeded.

The impacts on air quality are also mitigated by the following:

- From a country-wide perspective the contribution of the proposed activities to air pollution will be a fraction of a percent.
- The plant is not in an air quality priority area where significant air quality emissions are already present.
- The burning of biomass does not result in the release of significant amounts of greenhouse gasses (such as CO<sub>2</sub>), and the manufacture of wood products (such as MDF) can actually contribute to the **removal** of CO<sub>2</sub> from the atmosphere i.e. it has a positive impact. This is discussed in more detail in the section on Climate Change.

### Alternatives

Alternative 2 would have a significantly greater negative impact as it would result in emissions of SO<sub>2</sub> and CO<sub>2</sub> in addition to NO<sub>x</sub> and PM. The “no-go” option would mean the increased emissions would not occur (i.e. neutral impact), but it also means an opportunity to potentially reduce CO<sub>2</sub> could be lost, which would be a high negative impact (refer to section on climate change).

#### **Mitigation:**

- The emission abatement equipment would be the primary mitigation measure. Other key measures would include:
  - Regular testing with corrective action being taken when needed;
  - Maintaining optimum burning conditions; and
  - Maintaining pollution control equipment.

The success of mitigation measures could be measured against test results being within required limits.

## 10.3.2 Climate change

### Direct & indirect:

The project could have positive implications for climate change in that the wood product industry can promote carbon sequestration, resulting in an overall reduction in CO<sub>2</sub> from the atmosphere. The FAO (2010), for example, notes the following:

*“The forest products value chain accomplishes large net removals of CO<sub>2</sub> from the atmosphere as a result of uptake in forests and storage in forests, products in use and products in landfills*

*... on an annual basis, the use of wood-based building materials avoids, via substitution effects, emissions of 483 million tonnes of CO<sub>2</sub> equivalent per year. Also, by displacing fossil fuels, burning used products at the end of the life cycle avoids the emission of over 25 million tonnes of CO<sub>2</sub> equivalent per year. These avoided emissions could be increased to 135 million tonnes CO<sub>2</sub> equivalent per year by diverting material from landfills.*

*...The benefits are significant. As estimated previously, the use of wood-based building materials may be avoiding global greenhouse gas emissions of 483 million tonnes of CO<sub>2</sub> equivalent per year, via substitution effects. During use, the long-term storage of carbon in these wood-based building materials is equivalent to removing an additional 243 million tonnes of CO<sub>2</sub> from the atmosphere per year”*

The FAO (2020) further indicates that the wood processing industry “*can contribute to the achievement of multiple sustainable development goals (SDGs) including the promotion of sustainable economic growth, combating climate change and its impacts, and the protection, restoration and promotion of the sustainable use of terrestrial ecosystems*”. It is however important that the promotion of forestry is balanced against the loss of terrestrial biodiversity that extensive afforestation with alien species can cause.

#### Cumulative:

Cumulative impacts are difficult to assess accurately. However, the potential to reduce overall GHG (CO<sub>2</sub>) emissions is a positive, if difficult to quantify, impact.

#### Alternatives

Alternative 2 (fossil fuel fired energy plant) has significantly greater impacts as it would contribute to increased CO<sub>2</sub> levels and therefore have a negative impact on climate change. In terms of the loss of an opportunity to sequester additional carbon, the “no go” could be seen as negative.

#### **Mitigation:**

- Alternative 1 should be approved (i.e use of biomass as a fuel source for the energy plant).

### 10.3.3 Stormwater management

#### Direct & indirect impacts

The expansion of the plant footprint would result in an additional area under hard surfacing, which would increase the amount of stormwater running off the site. Additional stormwater can increase the risk of erosion at stormwater outlets.

Stormwater also needs to be managed in terms of potential pollution. The development would result in an increase in dust and fines which can be washed into the stormwater system. This can lead to pipe blockages and discharge of excess fines at outlets. The main dust sources include sanding dust, additional sawdust/fines stockpiles, and particulate matter that settles out. Some dust would be contained within buildings and captured during operation, but some fugitive and area emissions would remain and result in excess dust settling out. Cyclone wash-down water may also contain dust.

There is also the probability of pollutants (e.g. hydrocarbons, resin spills) generated during operation being washed into the storm water system. Spill management is part of the risk management procedures for the plant.

The impact of stormwater run-off is considered low. Much of the sediment in run-off would settle out near the stormwater outlets from where it can be cleaned up as necessary. The area that the outlets discharge to is largely flat and is not environmentally sensitive. The chances of pollution of stormwater can be much reduced by means such storing of hydrocarbons and resin in secondary containers or bunds.

#### Cumulative impacts

No significant cumulative impacts were identified.

#### Alternatives

There are no significant differences between Alternatives 1 and 2.

#### **Mitigation:**

- Effective general pollution prevention mitigation measures (eg proper storage of potential polluting substances) are available and detailed in the EMPr.

- Specific measures include:
  - Make use of swales to allow slowing, filtering and infiltration of stormwater.
  - Encourage dispersion of stormwater at outlets.
  - Manage stockpiles of fines to minimise water and wind dispersal (eg stockpile in sheltered areas and damp down if necessary).
  - Regularly sweep up fines.
  - Ensure that stormwater is not directly channelled straight into a watercourse.

### 10.3.4 Effluent management

#### Direct & indirect:

Wastewater from the MDF process is produced when water is squeezed out of the washed and steamed woodchips. Approximately 120m<sup>3</sup>/day (3.6ML/month) of process water would need to be treated and disposed of. The water is not hazardous, but typically has a high Chemical Oxygen Demand (COD) and a low pH. It thus cannot be discharged directly into a watercourse without treatment.

The current proposal is to erect a package plant to treat both process effluent and the on-site sewage that currently goes into conservancy tanks (total overall effluent approximately 250m<sup>3</sup> a day). Details on the type of package plant, treatment methods and likely quality of treated effluent are not yet available, which makes it difficult to assess this impact accurately. The quality of the treated effluent will also determine final disposal options, but alternatives being considered include: irrigation of plantations, release into a drainage line (where Mpact already discharges effluent) or putting the water into a dry borehole.

#### **Impact of effluent on Mondi's plantations**

Mondi raised a concern about potential impact of effluent on their pine plantations. As indicated above, it is difficult to assess the impact accurately and the quality of the effluent would only be able to be tested once the treatment plant is operating. However, based on treated effluent test results (for Jan 2020 and June 2020 i.e. summer and winter) from the PG Bison plant in Boksburg (which also makes MDF), the effluent has low amounts of N, P and suspended solids, moderate conductivity, low pH (4.6 – 5.6) and moderate Chemical Oxygen Demand (COD). This should not pose a significant risk in theory but cannot at this stage be confirmed.

Depending on treatment method (eg type of flocculant used), impact is also moderated by the following:

- The waste process water would be diluted with treated sewage effluent and stormwater.
- Pine trees prefer slightly acidic (low pH) soils.
- If disposal is into the nearby drainage line where Mpact already discharges effluent, it may help to dilute the Mpact discharge.

#### Cumulative impacts:

There would be a cumulative impact on the drainage line to the west as it is currently already receiving discharge from other surrounding industry (type, quality and quantity unknown). As the quality of the effluent from the proposed development is not yet known, the cumulative impact may be positive or negative. It could be positive if it dilutes (and thus improves) the quality of the existing discharge or negative if it is of poor quality.

#### Alternatives

There are no significant differences between Alternatives 1 and 2. The no-go option would be neutral.

**Mitigation:**

- The effluent treatment method and disposal should be finalised and approved by the DARDLEA, and the necessary WUL applications made before construction can commence.
- Effluent must be completely cool before being discharged.
- Regular water quality monitoring must take place.
- A contingency plan should be in place to deal with unexpected treatment plant breakdowns.

### 10.3.5 Water resources - quantity

**Direct & indirect:**

The MDF process would require a significant amount of water (approximately 500m<sup>3</sup>/day) for use mostly in the wood chip washing and cooking/steaming process. Some of the water from the cooking process can be recycled for use in the chip washing process but water has to meet specific quality standards or it will damage the equipment, so water re-use is limited. Water in the form of steam is also lost in the process.

The plant currently gets some of its water from on-site boreholes, but the yield would not be able to meet the demand. Additional sources are thus required. The current proposal is to obtain water either from an existing abstraction point in the Assegai River or directly from the Heyshoop Dam<sup>4</sup>.

Other long-term options such as deep boreholes are being considered but are not feasible right now due to landowner consents, costs and uncertainty of finding water.

The development is within a Strategic Water Resource Area (SWRA), but the proposed water sources are within non-SWRA areas. It is still critical that water is conserved as far as possible.

**Cumulative:**

There would be an additional demand on existing water sources. Water conservation and demand management is critical. No details on the capacity of the water supply, water treatment or supply infrastructure required to provide the additional water were available to the EAP at the time of writing, and these would need to be finalised by the Applicant before construction can commence.

**Alternatives**

There are no significant differences between Alternatives 1 and 2.

**Mitigation:**

- The water supply must be secured before construction can commence and the necessary WUL applications made.
- Water must be re-used and recycled wherever possible.
- Supplementary sources of water should be considered in the long-term.
- A contingency plan should be in place to deal with water shortages.

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<sup>4</sup> The Department of Trade and Industry has committed to providing water to site (as part of the Covid-19 investment support programme) and this would be a separate application.

## Socio-economic impacts

### 10.3.6 Economic impacts

#### Direct & indirect impacts

PG Bison is the leading particle board manufacturer in South Africa, so the economic impacts are therefore considered of high significance. The proposed activity would enhance PG Bison's current economic input to the area and to South Africa in general. There are indirect and cumulative impacts to this as well, largely due to knock-on, downstream effects e.g. where another business relies on the supply of board to manufacture their products.

The "Forestry Cluster" as identified in the IDP is a key focus for economic growth. PG Bison is part of this sector and strategically important.

The project also forms a key investment in the country's Covid-19 Economic Reconstruction and Recovery Plan. Economic impacts are thus at a national scale.

#### Cumulative impacts

Positive cumulative economic impacts could be expected due to further investment into the existing forestry industry in the area.

#### Alternatives

Alternative 2 has a greater negative impact as the use of fossil fuel (rather than biomass) would be prohibitively expensive, possibly making the project unviable. The "no go" has a high negative impact given the project's strategic importance in stimulating the South African economy.

#### **Mitigation:**

- Approval of Alternative 1

### 10.3.7 Job creation & retention

#### Direct & indirect impacts:

Jobs would be created during the construction phase (approx. 2 years), as well as during the operational stage (approximately 150 permanent jobs). The direct impact is thus high. Indirect job creation could also be highly significant as the project would result in increased product volumes which would then feed into downstream industries which then have the option to expand. This would increase the probability that existing jobs would be retained and that some new ones would be created.

#### Cumulative impacts

As per the indirect impacts described above.

#### Alternatives

There is no significant difference between the "go" alternatives. The "no go" alternative would be negative due to loss of opportunity for direct and indirect job creation. This negative impact is significant in light of the rising unemployment rates due to Covid-19 and the significant investment the project would bring as a key economic stimulation investment (see next section on economic impact for an assessment of the indirect impacts).



**Mitigation:**

- Preference should be given to the employment and upskilling of local labour as far as possible.
- Appointment of a Community Liaison Officer (CLO) and/or establishment of a PSC to facilitate labour issues where applicable.

### 10.3.8 Air quality impacts on human health

Direct & indirect:

The main pollutants of concern and their potential impact would be:

**Nitrogen Oxides (NO<sub>x</sub>)** - Health effects are usually minor at ambient concentrations, but irritation of the respiratory tract is possible. NO<sub>x</sub> emissions would arise from combustion processes (eg from the burning of biomass for the energy plant). Emissions can be exacerbated by poor operating procedures in which boilers are operated with too much air (relatively easy mitigation measures exist). Current NO<sub>x</sub> levels at the plant are well below the required compliance limits.

**Particulate Matter (PM)** - PM can cause respiratory problems. Generally, the finer the PM, the more health problems it can cause as finer particles can penetrate deeper into the lungs. Health effects thus include respiratory problems and the exacerbation of conditions such as asthma and bronchitis.

The main sources of PM would be from wood burning and drying; sanding of finished boards as well as the handling of fines stockpiles. An increase in PM can be expected and control measures would be required (such measures e.g. multicyclones readily exist). Problems with PM are currently experienced at the old Recalor dryer, however this is in the process of being replaced, which would improve the situation. The other point sources are well within the required compliance limits.

**Sulphur Dioxide (SO<sub>2</sub>)** – SO<sub>2</sub> can give rise to health problems such as wheezing and coughing and aggravate asthma, especially in susceptible individuals. High levels of SO<sub>2</sub> are however not expected, as the primary fuel source for the energy plant is biomass, the burning of which releases negligible SO<sub>2</sub>. Current emissions are well below the required limits.

**Carbon Monoxide (CO)** - CO is a product of incomplete combustion. It binds to haemoglobin in the blood stream preventing oxygen from binding with the haemoglobin. In the atmosphere, CO rapidly oxidises to carbon dioxide (CO<sub>2</sub>) which has no direct impact on human health. CO testing is not required by the AEL.

**Volatile Organic Compounds (VOCs)** – The main VOC emitted would be formaldehyde that is flashed off during the pressing process. Formaldehyde is recognised as a human carcinogen and Occupational Exposure Limits have been set in term of the Occupational Health and Safety Act 85 of 1993. Regulations published in terms of this Act require all employers to undertake relevant precautionary and regular monitoring measures to ensure levels remain within acceptable limits. PG Bison undertakes this testing as is required. Formaldehyde scrubbers are also used at the Controll presses. Some VOCs will also be released during the wood drying process as wood contains VOCs such as terpenes. The VOCs and levels thereof can vary widely, depending on the composition of the wood, process operating temperatures etc.

Overall, the impact on human health is expected to be very low because:

- The plant is in an industrial area 8km out of town. Surrounding land uses are industrial and forestry so there are no sensitive receptors close by.
- The prevailing wind directions (from the west in winter and from the ENE in summer) are away from populated areas (Figure 5).
- The flat landscape means that pollutants would tend to be dispersed and would not be trapped in inversion layers in valleys or between buildings.
- The air quality in the overall area is good and meets the national ambient air quality standards (Table 4). The proposed development should be able to be accommodated without the standards being exceeded. Current emissions monitoring (Appendix G) indicates high compliance, with the exception of PM emissions from the old Recalor dryer which is currently being replaced. The new equipment should result in a considerable improvement.
- Any health impacts are likely to be largely restricted to the site, and effective measures to mitigate and manage these exist. For example, use of Personal Protective Equipment (PPE), dust control, good operating procedures, regular emissions monitoring and maintenance of pollution control measures.
- The high level air quality screening (refer to the Air Quality Screening Report in Appendix 4 of the application form) indicates that currently, maximum pollutant levels for the main pollutants of NO<sub>x</sub> and PM are predicted to be less than 500m from the plant (ie very limited in extent). Stakeholders falling within this area are Woodchem (which is under the same parent company as PG Bison) and a portion of the Mpact plant.

#### Cumulative:

As indicated above, and discussed in the section on biophysical impacts, air quality in the overall area is well within the national air quality standard limits and the proposed development should not result in these limits being exceeded<sup>5</sup>. No significant cumulative impact on health is expected.

#### Alternatives

Alternative 2 would have a higher negative impact as the burning of fossil fuel would release significant amounts of SO<sub>2</sub> in addition to the other pollutants. The “no go” is neutral.

#### **Mitigation:**

Key measures include:

- Regular air quality testing both stack testing and including dust and formaldehyde assessments in Occupational Health Assessments.
- Continued close alignment with plant Health & Safety procedures/protocols. Inclusion of additional measures if required.
- Provision and enforcement of appropriate PPE.
- Optimum operation to reduce pollutants emitted.
- NO<sub>x</sub> can be reduced by reducing the amount of excess air in the combustion chambers and by minimising the burning of broken boards that contain UF resin.

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<sup>5</sup> Based on current and predicted emissions. Information on emissions from the nearby Mpact plant were not available

### 10.3.9 Noise and dust

#### Direct & indirect:

Increases in both noise and dust can be expected. Dust can become a problem if not well managed (eg by regular sweeping and stockpiling wood fines in sheltered areas out of the wind). Noise levels are not considered to be highly problematic, given that the plant is in an industrial area and noise levels are constantly monitored to ensure compliance with Occupational Health and Safety requirements.

Noise and dust impacts are also mitigated by the fact that prevailing winds are from the west and east-north-east i.e. away from any main settlements; and the town of Mkhondo is 8km away.

#### Cumulative:

No significant cumulative impacts were identified. The development would take place within an existing industrial area, where noise and dust are already impacts. Current noise levels are well within the limits required for industrial areas (pers com, PG Bison); the additional activity is not likely to result in them being exceeded.

#### Alternatives

No significant differences between Alternatives 1 and 2. The no-go would be neutral.

#### **Mitigation:**

Effective measures exist and include:

- Regular removal of dust from external areas.
- Stockpiling fines in areas where they can be contained and are sheltered from wind.
- Optimum operation of equipment to reduce PM.
- Access roads used by heavy vehicles and all stockpile areas to be surfaced to reduce mud and dust generation.

### 10.3.10 Traffic

#### Direct & indirect:

There would be an increase in vehicle traffic to and from the plant. This would be an increase of approximately 20 new heavy vehicle trips and 30 light vehicle trips each during the morning and evening peak hours according to the Traffic Study carried out. This has implications for road safety (higher chance of accidents) and road maintenance (increased wear and tear on the roads). The Traffic Study however indicated that *“the [road] network is not overloaded when development trips are assigned for any of the given tested peak hours, subject to the recommended road network improvements being undertaken”*.

#### Cumulative:

The increase in heavy vehicle traffic would add to wear and tear on the roads and thus lead to increased road maintenance costs.

#### Alternatives

Alternative 2 has a potentially higher impact as regular deliveries of fossil fuel would be required.

**Mitigation:**

- All SANRAL requirements need to be adhered to.
- Recommendations made in the Traffic Study should be implemented.

### 10.3.11 Solid waste disposal

Direct & indirect:

The following main (non-hazardous) waste products are expected: ash (from the energy plant), replacement consumables such as sander belts and filters, process residue (eg offcuts, broken boards, “cake” from the wood cooking process) and general business waste such as paper and litter. No hazardous waste is produced by the process.

Domestic waste is currently disposed of at the adjacent, registered landfill site that is shared by PG Bison and Mpact. Process waste is utilised as additional fuel in the energy plant.

Ash will also be disposed of at the landfill site where it can be used as cover material. No other viable disposal options exist (it is too alkaline to be used as fertiliser in the forestry plantations and no industries that could use the ash are present in the area). Approximately 40 tons per month of ash will need to be disposed of, which can be accommodated by the landfill site at present.

Cumulative:

No significant cumulative impacts identified.

Alternatives

The burning of fossil fuel (Alternative 2) will generate more waste in the form of ash.

**Mitigation:**

- Approval of Alternative 1 (to minimise the amount of ash to be disposed of)
- The plant already has a well-functioning waste management system in place which can be used.

### 10.3.12 Fire hazards

Direct & indirect:

An increase in the storage and manufacture of wood materials could in theory increase the hazard of fires as dry wood is readily combustible. The thermal oil in the systems is also flammable. The existing plant has however never experienced an uncontrollable fire, and the safety measures for the new plant are being proportionally increased; so the risk level should be very low.

Safety measures include:

- Explosion-decoupling system at the MDF
- Implementation of existing fire safety systems and protocols
- New dedicated fire hydrants
- Prior assessment and approval of all plans by the municipal fire chief for compliance
- Integrated spark and fire detection and protection systems

#### Cumulative:

No significant cumulative impacts were identified.

#### Alternatives

There are no significant differences between the alternatives.

#### **Mitigation:**

- Implement the proposed safety measures
- Maintain good neighbour relations particularly with regards to the burning of forestry firebreaks

## 10.4 Decommissioning phase impacts

Decommissioning is not expected at this point. Should it be required, then it would be subject to the provisions of the EIA regulations (2014, as amended).

# 11 Impact assessment assumptions and uncertainties

Environmental assessment is a predictive process and while predictions/assessments made here are made in good faith, based on current knowledge and professional judgement, there will always be a margin of error. Such errors are unintentional.

The following assumptions and uncertainties apply.

#### **Assumptions:**

The following has been assumed:

- That the information provided by the applicant is accurate and unbiased; and that all relevant information has been provided;
- That I&APs have taken the necessary opportunities to raise all issues that they feel are relevant to the proposed project;
- The project will be implemented as described; and
- That mitigation measures will be implemented to a reasonable degree

#### **Uncertainties:**

No details on the following were available to the EAP at time of writing:

- The package plant to be used to treat the sewage and process wastewater. Amounts and quality of treated effluent are thus not known.
- Quality and quantity of effluent being discharged by neighbouring industries
- Water supply. The Department of Trade and Industry has reportedly committed to ensuring water supply to the plant due to the importance of the project as a critical investment in the country's economic recovery plan. They will thus be driving the water supply process.

## 12 Environmental Impact Statement

The impacts and their predicted significance are summarised in the Table below.

Table 6. Impact summary

Impact	Alternative 1 - biomass		Alternative 2 - fossil fuel		No Go
	Not mitigated	Mitigated	Not mitigated	Mitigated	
<b>Pre-construction phase</b>					
Integrated planning	Med-	Med+	Med-	Med+	Med-
<b>Construction phase</b>					
Vegetation	Low-	Very low-	Low-	Very low-	Neutral
Noise and dust	Low-	Very low-	Low-	Very low-	Neutral
Traffic	Low-	Very low-	Low-	Very low-	Neutral
Waste disposal	Low-	Very low-	Low-	Very low-	Neutral
Existing infrastructure					
<b>Operational phase</b>					
Climate change	Med+	Med+	Med-	Med-	Very low-
Stormwater management	Low-	Very low-	Low-	Very low-	Neutral
Effluent management	Med-	Low-	Med-	Low-	Neutral
Water resources - quantity	Med high-	Med-	Med high-	Med-	Neutral
Economic	High+	High+	Med+	Med+	Fatal flaw
Job creation/retention	Med+	Med high+	Med+	Med high+	Med-
Air quality - human health	Med-	Low-	Med high-	Med-	Neutral
Noise and dust	Med-	Low-	Med-	Low-	Neutral
Traffic	Med-	Low-	Med-	Med-	Neutral
Solid waste disposal	Low-	Low-	Med-	Low-	Neutral
Fire hazards	Low-	Very low-	Low-	Very low-	Neutral
<b>Decommissioning phase</b>					
N/A					
<b>Total impact score</b>	-472	-205	-618	-369	-241

The following impacts (mitigated) are considered to be of the most significance (rating of Medium or above):

### Positive impacts:

Positive impacts could be expected in terms of economic investment into the economy (over R1.98 billion) and job creation (approximately 500 jobs during construction). The project is also aligned with the various development strategies (eg IDP, SDF) which promotes integrated development.

### Negative impacts:

The greatest potential negative impacts relate to:

- The economic repercussions of the no-go option (fatal flaw) and subsequent loss of job creation opportunities;
- Potential health-related impacts on air quality (if Alternative 2 is selected)



- Potential impacts of additional traffic and trucks on the road network for Alternative 2 (fossil fuel will need to be trucked into the site whereas for Alternative 1 – biomass – fuel is available on site or close by).

### Alternatives

Alternative 1 is the preferred option, having a total impact score of -205 (mitigated) against the score of -369 (mitigated) for Alternative 2. Alternative 2 has higher negative impacts particularly with regards to climate change (fossil fuels contribute to climate change); human health (fossil fuels release more harmful pollutants), traffic (fuel has to be trucked in whereas biomass is readily locally available) and economic viability (fossil fuel costs are considerably higher than biomass).

The no-go is considered fatally flawed from an economic viewpoint in that the project is one of the key investments into the South African Reconstruction and Economic Recovery Plan. The no-go will also have negative impacts on job creation, and on integrated planning (the project fits in with the vision of the SDF and IDPs).

### Overall assessment

The EAP is of the opinion that the expansion of the plant should be authorised, primarily due to the significant economic benefits that can be gained; the negative consequences of the no go (non-approval) alternative and the availability of sufficient mitigation measures to mitigate the negative impacts.

The significance of negative impacts can be reduced with effective and appropriate mitigation through an EMPr that is monitored by an ECO and full-time ESO. If authorised, the implementation of an EMPr should be included as a condition of approval.

## 13 EAP opinion and recommendations

### 13.1 Opinion regarding authorisation

If the physical and socio-economic environments are considered in tandem, then the economic benefits of the proposed activity (Alternative 1) appear to outweigh the lower negative impacts on the biophysical environment; provided these are mitigated.

It is further the opinion of the EAP that most of the negative impacts can be mitigated to a reasonable extent.

#### **NEMA Principles**

In terms of decision-making, the NEMA principles must also be borne in mind and from this perspective the proposed activity is supported for the following reasons:

- Principle 2 of NEMA states that “environmental management must place people and their needs at the forefront of its concern...” It is felt that the expansion of the existing facilities at PG Bison would be in line with this principle while at the same time adhering to principle 3 that “development must be socially, environmentally and economically sustainable”. This basic

assessment has not revealed any indications that the expansion of the existing facilities at the PG Bison plant will be unsustainable (subject to securing a sustainable supply of water). Significant economic benefits are likely.

- The proposed activities will furthermore not disturb sites of cultural heritage and will not unfairly discriminate against disadvantaged groups.
- In addition, the costs of preventing pollution will be borne by the applicant and not local society.

**In light of the above, it is recommended that the proposed development (with preferred alternative) be authorised.**

## 13.2 Recommendations

### General

- That the activity be authorised.
- That Technology Alternative 1 (preferred alternative) be authorised.
- That the EMPr be implemented and adherence to it monitored.

### Pre-construction

- Environmental awareness training should be included in any SHE inductions to contractors and affected plant personnel. Training to include knowledge of EMPr and authorisation conditions.
- A full-time on-site ESO must be designated or appointed prior to construction.
- Details regarding water source and effluent treatment must be finalised and applications for the required WULAs started.

### Construction

- Construction must be carried out in line with the approved EMPr and conditions of authorisation.
- The implementation of the EMPr must be overseen by a competent ECO and the on-site ESO.

### Operation

- Operational impacts should be managed in line with the approved EMPr, conditions of relevant authorisations and existing plant operating procedures.

## References

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- Water Research Commission (2013) Alternative Technology for Stormwater Management: The South African Guidelines for Sustainable Drainage Systems (WRC Report TT 558/13)

### General websites:

- BGIS – <http://bgis.sanbi.org/>
- DWS – ecological status of rivers - [http://www.dwa.gov.za/iwqs/rhp/eco/PESEIS\\_secondary.aspx#21](http://www.dwa.gov.za/iwqs/rhp/eco/PESEIS_secondary.aspx#21)
- Meteoblue – [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/piet-retief\\_south-africa\\_965241](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/piet-retief_south-africa_965241)
- Municipalities of South Africa - <https://municipalities.co.za/demographic/1151/mkhondo-local-municipality>

IUCN Red List (endangered species) - <https://www.iucnredlist.org>

SANBI's Red List - <http://speciesstatus.sanbi.org/taxa/distribution/point/1426/>

SAHRIS map layers <https://sahris.sahra.org.za>

South African Air Quality Information System (SAAQIS) - <http://saaqis.environment.gov.za>

Statistics South Africa - <http://www.statssa.gov.za>

**Appendix A:**

EAP Declaration and CV

**Appendix B**

Maps and layouts

**Appendix C**

Public Participation

**Appendix D**

Environmental Management Programme

**Appendix E**

Impact assessment spreadsheet

**Appendix F**

Other authorisations

- Air Emissions Licence
- Previous EA

**Appendix G:**

Other

- Air emissions test results (Yellowtree report)
- Traffic Study
- Investments committed as part of the Covid-19 economic recovery plan