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Environmental Impact Assessment for the Proposed Temo Rail Loop, Road Diversion and Pipeline Project, near Lephalale, Limpopo Province

Socio-economic Impact Assessment

Project Number:

NAM5335

Prepared for:

Temo Coal (Pty) Ltd

February 2019

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Name	Responsibility	Signature	Date
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Amina Ismail	Baseline Review Report Compilation		12 February 2019
Jan Perold	Report Review		13 February 2018

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Appendix A: CVs of specialists



1 Introduction

Temo Coal Mining (Pty) Ltd (hereinafter Temo Coal), proposes to construct ancillary infrastructure associated with their approved coal mining operation, the Temo Coal Mine (“Temo Mine”), near Lephalale in the Limpopo Province (“the Project”). The proposed ancillary infrastructure includes a road diversion, rail loop and water pipeline.

Digby Wells Environmental (Digby Wells) was commissioned by Temo Coal to perform an Social Impact Assessment for inclusion in an Environmental Impact Assessment (EIA) for Environmental Authorisation for Listed Activities as detailed in the EIA Regulations, under the National Environmental Management Act No. 7 of 1998 (NEMA).

This report constitutes the Socio-economic Impact Assessment (SIA) report to inform the EIA and Environmental Management Plan (EMP). This socio-economic specialist report has been compiled in terms of Appendix 6 of the NEMA EIA Regulations, 2014, (as amended) for the Scoping and Impact Assessment of the EIA process. The requirements of Appendix 6 are presented in Table 1-1 and cross-referenced to the relevant sections of this Report.

Table 1-1: Structure of this report in accordance with the EIA Regulations

Regulatory Requirement for EIA Reports	Relevant Section of this report
(1) A specialist report prepared in terms of these Regulations must contain -	
(a) details of— (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 2 and Appendix A
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Declarations of Independence in Section 2
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 3
(cA) an indication of the quality and age of base data used for the specialist report;	Section 4.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 8
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4.2
(e) a description of the methodology adopted in preparing the report inclusive of equipment and modelling used;	Section 4
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Sections 8.1 and 9, and Figure 1
(g) an identification of any areas to be avoided, including buffers;	Section 10



(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 1, Section 9 and Section 10
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 5
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 10
(k) any mitigation measures for inclusion in the EMPr;	Section 10
(l) any conditions for inclusion in the environmental authorisation;	Section 10
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 10
(n) a reasoned opinion— (i) whether the proposed activity, activities or portions thereof should be authorised; (i) (A) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 10
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 4.3.
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 7
(q) any other information requested by the competent authority.	No additional information was requested.
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	No notice applicable



1.1 Project background and description

Temo currently has an approved mining right (MR) which was authorised by the Department of Mineral Resources on 27 September 2013 (Reference Number: LP 30/5/1/2/2/199 MR). That Project was also authorised in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations thereunder, dated 18 June 2010 (which have since been repealed). The Environmental Authorisation was granted by the Limpopo Department of Economic Development, Environment and Tourism (LEDET) on 13 July 2015 (Reference Number: 12/1/9/2-W55).

Temo Mine is located approximately 60km from Lephalale in the Limpopo Province. This project considers applying for Environmental Authorisation, in terms of NEMA, and a Water Use Licence (WUL) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) to construct a rail loop, road diversion and pipeline.

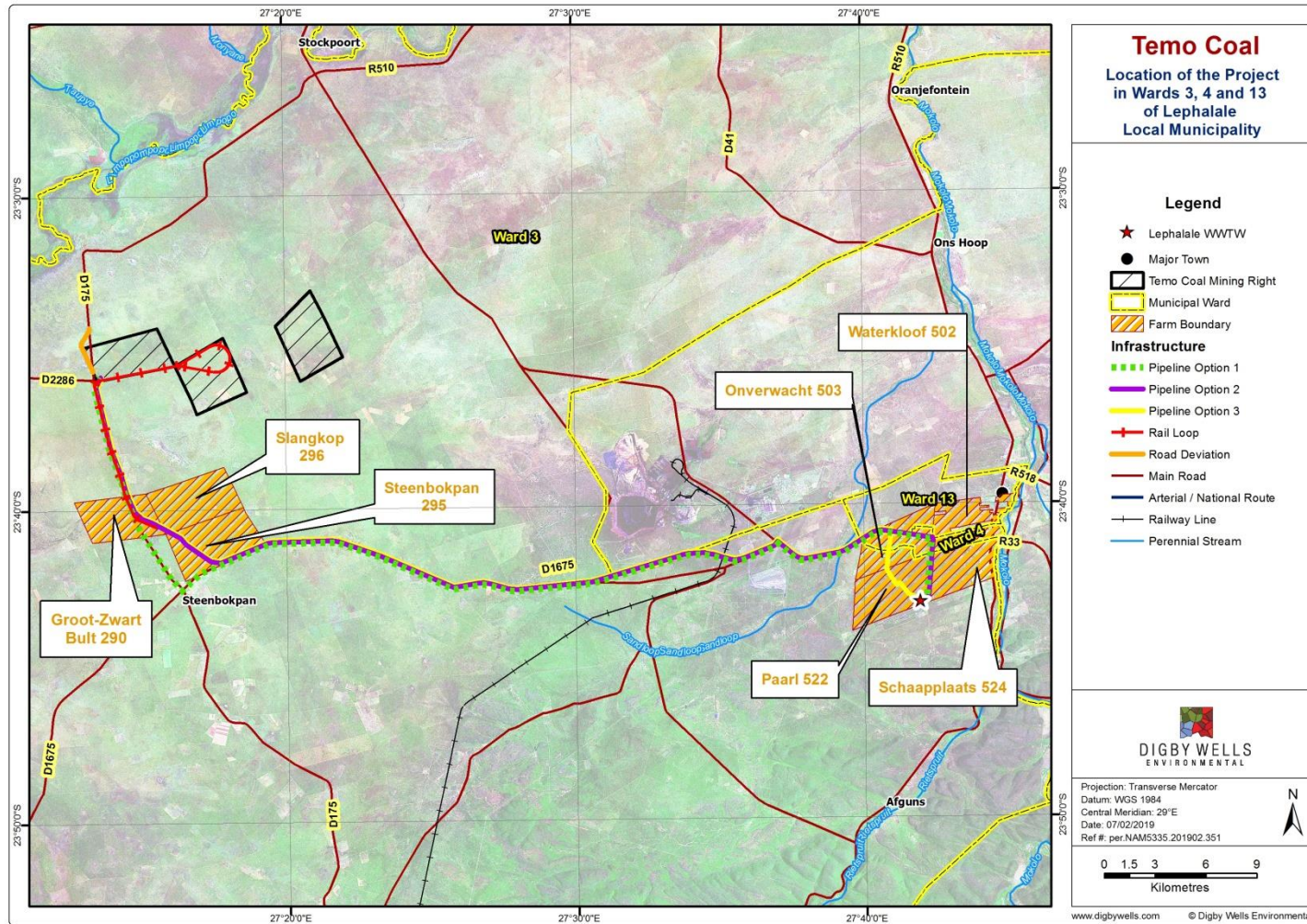
The farm portions on which the Temo Mine is situated comprise Verloren Valey 246 LQ, Duikerpan 249 LQ, Japie 714 LQ, Hans 713 LQ and Kleinberg 252 LQ. Temo proposes to mine coal using open pit methods and the open pit will be situated entirely within the Farm Verloren Valey 246 LQ.

In reference to this assessment, Temo proposes to divert the dirt road (D175) around the approved mining right area for mining to continue, to construct a rail loop for transportation of coal and construct a water pipeline to service the Temo mine. As detailed below:

- **Diversion of road D175:** The approved open pit area has a road, the D175, which transects the south-western corner of the future pit area and continues to exit the Mining Right boundary near the north-western corner. To facilitate continued mining and maximise the minable area at the Temo Mine, Temo proposes that the D175 be diverted around the mining area;
- **Proposed Rail Loop:** The purpose of the rail loop is to allow Temo to transport export-grade coal product to the Richards Bay Coal Terminal (RBCT), as well as for domestic use. The rail loop will include a loading loop which will be within the approved Mining Right boundary of the Temo Mine; and
- **Proposed Bulk Water Pipeline:** Construction of a bulk water pipeline (for which three different pipeline routes are proposed) connecting the Temo mine.

The abovementioned proposed developments requires an EIA Report and Environmental Management Programme, in terms of the new EIA Regulations, published in GN R982 dated 04 December 2014 (as amended December 2017).

Figure 1: Location of the Project in Wards 3, 4 and 13 of Lephalale Local Municipality





1.2 Project alternatives

At present, Temo Coal are considering three pipeline routing options. Table 1-2 presents summarised descriptions of these options.

Table 1-2: Summary of the three pipeline routing options

Pipeline	Description	Length
1	The pipeline would run along the western side of the Onverwacht Road reserve towards Nelson Mandela Drive from the WWTP pump station before changing direction at the intersection of Onverwacht Road and Nelson Mandela Drive. From here, the pipeline would run along the southern side of the Nelson Mandela Drive road reserve. At the intersection with the D1675, the pipeline will run along the northern side of the D1675 road reserve towards Steenbokpan. At the intersection of the D1675 and D175, the pipeline will run along the eastern side of the road reserve to the Temo Mine.	64.5 km
2	This pipeline route is similar to Option 1, until the intersection of the D1675 and D175. For option 2, the pipeline would divert before the intersection and will travel along the eastern side of the railway reserve instead. In this option, the water will be pumped for the first 31.8 km and will then gravitate the rest of the way to the mine.	62.4 km
3	This option moves from the WWTP pump station through the farm Paarl to join Palala Drive on the western side. The pipeline will change alignment at the intersection of Palala and Nelson Mandela Drives to run along the southern side of the Nelson Mandela Drive road reserve. This option would then follow the same layout at Option 2 until it reaches the mine.	61.1 km

Another option to be considered is the “no-go” alternative. Should the Project not obtain approval, the potential environmental impacts associated with the construction, installation and utilisation of the proposed infrastructure would not occur. However, the potential benefits associated with the Project would also not occur.

The SIA assessed the pipeline route options and justifies the selection of a preferred route. Expected impacts are described in Section 9 and recommendations regarding the various options are presented in Section 10.

2 Details of the Specialists

This Specialist Report has been compiled by the following specialists (CVs of the Project Team are included in Appendix A):

Table 2-1: Details of the Specialist(s) who prepared this Report

Responsibility	Reviewed the SIA report
Full Name of Specialist	Jan Johannes Perold
Highest Qualification	PhD (Research Psychology)
Years of experience in specialist field	18
Responsibility	Reviewed the baseline; Compiled impact assessment and mitigation measures, and Prepared report to meet requirements of Appendix 6
Full Name of Specialist	Amina Omar Ismail
Highest Qualification	MM (Public and Development Management)
Years of experience in specialist field	24
Responsibility	Compiled the baseline
Full Name of Specialist	Shannon Kelly Hardwick
Highest Qualification	MSc (Archaeology)
Years of experience in specialist field	2

2.1 Expertise of the specialists

Dr. Jan Perold has more than 20 years' experience ranging over several aspects of social research, including social impact assessment, resettlement planning, social and labour plans, social surveys and statistics, tertiary education and science communication. He has been involved in a variety of projects in the following countries: South Africa, Namibia, Botswana, Zambia, Lesotho, Swaziland, Mozambique, Malawi, Angola, Nigeria, Ghana, Tanzania, Rwanda, Burundi, Southern Sudan, the Central African Republic, Sierra Leone and Liberia.

Dr Perold is registered at the Health Professions Council of South Africa as a research psychologist. His doctoral thesis focused on the application of systems theory to analyse the psychosocial dynamics of public participation. He also has a strong natural science background, having attained an Honours Degree in Physics.



Dr Perold was a contributor to the book *New Directions in Social Impact Assessment: Conceptual and Methodological Advances* (Ed. Frank Vanclay and Ana Maria Esteves, Edward Elgar: 2012). He also currently acts as guest lecturer and research co-supervisor for the MA (Research Psychology) course at the University of Pretoria, South Africa. In addition, he was previously involved in lecturing on statistics and research methodology at various universities in South Africa.

His curriculum vitae is attached in Appendix A

Amina Ismail has more than 20 years of experience working on sustainable development projects and programmes, including 14 years as a senior consultant to government, industry and non-government organisations, and 7 years as a government official in environment and development functions.

She has a Master of Management degree (for Public and Development sectors) from the University of the Witwatersrand. She also has an Honours degree in Medical Sciences from the University of Durban-Westville (now University of Kwa-Zulu Natal) and a Postgraduate Diploma in Science (in Environmental Studies) from the University of the Witwatersrand. In 1997- 1998 she focused a one year Fellowship at Harvard University, United States, on Sustainable Development and Public Policy, and Health Research and Policy. She has also completed numerous short courses including in State of the Environment Reporting, Sustainable Environmental Impact Assessment for Local Urban Authorities, and Logical Framework Approach to Project Preparation. She has a Certificate of Competence in Results-Based Monitoring and Evaluation in the Public and Development Sectors, from the World Bank Regional Center for Learning on Evaluation and Results (CLEAR) at the University of the Witwatersrand.

She has worked on Environmental Impact Assessments (EIAs) and has prepared at least 20 Socio-economic Impact Assessments (SIAs) for mining and infrastructure development projects. She has also led and participated in many environment and development projects of national strategic importance. She was South African Country Manager of the United Kingdom funded "Partners for Water and Sanitation", building water and sanitation technical and management capacity in national, provincial and local spheres of the South African government. She was lead researcher for a discussion paper identifying good municipal practices for sustainable energy and water conservation nationally. She also led and managed a national survey to identify municipal good practices in labour intensive waste management, for addressing the national goals of poverty alleviation, job creation and good environmental management. She has co-authored a number of published papers and presentations, and a book chapter, covering various aspects of socio-economic and sustainable development.

Her curriculum vitae is attached in Appendix A.



Shannon Hardwick joined the Digby Wells team in May 2017 as a Heritage Management Intern, and has subsequently been appointed as an Assistant Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience in through the compilation of heritage reports and social baselines. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and researching Artisanal and Small-Scale Mining for input into a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance heritage surveys in South Africa and heritage and social fieldwork in Malawi.

Her curriculum vitae is attached in Appendix A

2.2 Declaration of the Specialists

I, **Jan Johannes Perold**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
 - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and

- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.in terms of the general requirement to be independent:



Signature of the specialist:

Jan Johannes Perold

Full Name and Surname of the specialist:

Digby Wells Environmental

Name of company:

13 February 2019

Date:



I, **Amina Omar Ismail**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.in terms of the general requirement to be independent:

Signature of the specialist:

Amina Omar Ismail

Full Name and Surname of the specialist:

Digby Wells Environmental

Socio-economic Impact Assessment

Environmental Impact Assessment for the Proposed Temo Rail Loop, Road Diversion and Pipeline Project, near Lephalale, Limpopo Province

NAM5335



DIGBY WELLS
ENVIRONMENTAL

Name of company:

13 February 2019

Date:



I, **Shannon Kelly Hardwick**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.in terms of the general requirement to be independent:

Signature of the specialist:

Shannon Kelly Hardwick

Full Name and Surname of the specialist:

Socio-economic Impact Assessment

Environmental Impact Assessment for the Proposed Temo Rail Loop, Road Diversion and Pipeline Project, near Lephalale, Limpopo Province

NAM5335



DIGBY WELLS
ENVIRONMENTAL

Digby Wells Environmental

Name of company:

12 February 2019

Date:



3 Purpose and Scope of this Report

The purpose of the SIA is to support the application for environmental authorisation for the Project by informing the EIA and Environmental Management Plan (EMP), in compliance with the relevant national legislation.

The scope of the SIA study is to identify and assess socio-economic impacts associated with the Project, and recommend measures to mitigate significant negative impacts and enhance the main benefits.

Impacts are assessed at the primary level - constituting Wards 3, 4 and 13 where the Project infrastructure will be located in – and within the secondary context where the wards are located, that is, the Lephalale Local Municipality in the Waterberg District Municipality of Limpopo province (see Table 6-1).

Comments and queries about socio-economic aspects of the Project received through the public participation process from Interested and Affected Parties (I&APs) are included in this SIA report, together with responses from the socio-economic specialist.

4 Methodology

A socio-economic baseline was prepared of the communities that could potentially be impacted on, both positively and negatively, by the Project. Possible impacts of the Project were identified by relating the socio-economic aspects of the planned activities of the Project to the communities that could be impacted on. Impacts were assessed for their significance using the baseline and Project socio-economic data. Management measures were recommended for mitigating potential negative impacts, and enhancing potential positive impacts associated with the Project.

4.1 Determining the Baseline Environment

Wazimap (2019) was used as a primary source of desktop data to prepare the baseline socio-economic profiles of potentially affected communities. Wazimap data is supported by the South African government, specifically through the Department of Public Service and Administration's (DPSA's) initiative to develop www.data.gov.za as a central point for accessing public government data. Wazimap is a featured app on the website (South Africa National Data Portal, 2019) and provides Census 2011 socio-economic data adjusted to 2016 ward boundaries.

4.2 Site inspection

No site inspection was necessary to prepare the SIA and there was no timing to consider for undertaking the site visit.

Google Earth imagery was however used to examine the potentially affected sites. A Geographic Information System (GIS) map generated by DWE (Figure 1) also provided the geographic context of the project infrastructure layout, as it related to affected socio-



economic characteristics such as potentially affected properties, communities and public infrastructure like roads, and governance considerations such as ward boundaries.

4.3 Public participation

Public participation processes were undertaken for the overall EIA process and are described in the overall EIA report. Comments received from Interested and Affected Parties (I&APs) during the public participation process that were pertinent to the SIA were taken into consideration in this specialist report.

4.4 Proposed Method of Assessing the Socio-economic Aspects including the Proposed Method of Assessing Alternatives

The methodology utilised to assess the significance of potential socio-economic impacts is aligned with the methodology for assessing environmental, socio-economic and heritage impacts, as submitted in the Final Scoping Report for this Project. The significance rating formula is as follows:

$$\text{Significance} = \text{Consequence} \times \text{Probability}$$

where

$$\text{Consequence} = \text{Type of Impact} \times (\text{Intensity} + \text{Spatial Scale} + \text{Duration})$$

and

$$\text{Probability} = \text{Likelihood of an Impact Occurring}$$

In addition, the type of impact is characterised as either positive or negative when calculating consequence:

$$\text{Type of Impact (Nature)} = +1 \text{ (Positive Impact) or } -1 \text{ (Negative Impact)}$$

The weights assigned to the various parameters for positive and negative environmental, socio-economic and heritage impacts are provided for in the formulae and is presented in Table 4-1. The probability and consequence matrix for the impacts is displayed in Table 4-2, with the impact significance rating described in Table 4-3.

Table 4-1: Impact Assessment Parameter Ratings

Rating	Intensity		Spatial scale	Duration	Probability
	<i>Negative Impacts</i> (Type of Impact = -1)	<i>Positive Impacts</i> (Type of Impact = +1)			
7	<p>Very significant impact on the environment. Irreparable and irreplaceable damage to highly valued species, habitat or ecosystem. Persistent severe damage.</p> <p>Irreparable and irreplaceable damage to highly valued items of great cultural significance or complete breakdown of social order.</p>	<p>Noticeable, on-going socio-economic and environmental benefits which have improved the livelihoods and living standards of the local community in general and the environmental features.</p>	<p><u>International</u></p> <p>The effect will occur across international borders.</p>	<p><u>Permanent:</u> No <u>Mitigation</u></p> <p>The impact will remain long after the life of the Project. The impacts are irreversible.</p>	<p><u>Certain/ Definite.</u></p> <p>There are sound scientific reasons to expect that the impact will definitely occur.</p>
6	<p>Significant impact on highly valued species, habitat or ecosystem. Significant management and rehabilitation measures required to prevent irreplaceable impacts.</p> <p>Irreparable damage to highly valued items of cultural significance or breakdown of social order.</p>	<p>Great improvement to livelihoods and living standards of a large percentage of population, as well as significant increase in the quality of the receiving environment.</p>	<p><u>National</u></p> <p>Will affect the entire country.</p>	<p><u>Beyond Project Life</u></p> <p>The impact will remain for some time after the life of a Project.</p>	<p><u>Almost certain/Highly probable</u></p> <p>It is most likely that the impact will occur.</p>

Rating	Intensity		Spatial scale	Duration	Probability
	<i>Negative Impacts</i> (Type of Impact = -1)	<i>Positive Impacts</i> (Type of Impact = +1)			
5	<p>Very serious, long-term environmental impairment of ecosystem function that may take several years to rehabilitate.</p> <p>Very serious widespread socio-economic impacts. Irreparable damage to highly valued items.</p>	<p>On-going and widespread positive benefits to local communities which improves livelihoods, as well as a positive improvement to the receiving environment.</p>	<p><u>Province/Region</u></p> <p>Will affect the entire province or region.</p>	<p><u>Project Life</u></p> <p>The impact will cease after the operational life span of the Project.</p>	<p><u>Likely</u></p> <p>The impact may occur.</p>
4	<p>Serious medium term environmental effects. Environmental damage can be reversed in less than a year.</p> <p>On-going serious socio-economic issues. Significant damage to structures / items of cultural significance.</p>	<p>Average to intense socio-economic benefits to some people. Average to intense environmental enhancements.</p>	<p><u>Municipal Area</u></p> <p>Will affect the whole municipal area.</p>	<p><u>Long term</u></p> <p>6-15 years to reverse impacts.</p>	<p><u>Probable</u></p> <p>Has occurred here or elsewhere and could therefore occur.</p>
3	<p>Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month.</p> <p>On-going socio-economic issues. Damage to items of cultural significance.</p>	<p>Average, on-going positive benefits, not widespread but felt by some.</p>	<p><u>Local</u></p> <p>Extending across the site and to nearby settlements.</p>	<p><u>Medium term</u></p> <p>1-5 years to reverse impacts.</p>	<p><u>Unlikely</u></p> <p>Has not happened yet but could happen once in the lifetime of the Project, therefore there is a possibility that the impact will occur.</p>

Rating	Intensity		Spatial scale	Duration	Probability
	<i>Negative Impacts</i> (Type of Impact = -1)	<i>Positive Impacts</i> (Type of Impact = +1)			
2	<p>Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants.</p> <p>Minor medium-term socio-economic impacts on local population. Mostly repairable. Cultural functions and processes not affected.</p>	<p>Low positive impacts experience by very few of population.</p>	<p><u>Limited</u> Limited to the site and its immediate surroundings.</p>	<p><u>Short term</u> Less than 1 year to completely reverse the impact.</p>	<p><u>Rare/ improbable</u> Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the Project but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures.</p>
1	<p>Limited damage to minimal area of low significance that will have no impact on the environment. No irreplaceable loss of a significant aspect to the environment.</p> <p>Minimal socio-economic impacts, low-level repairable damage to commonplace structures.</p>	<p>Some low-level socio-economic and environmental benefits felt by very few of the population.</p>	<p><u>Very limited</u> Limited to specific isolated parts of the site.</p>	<p><u>Immediate</u> Less than 1 month to completely reverse the impact.</p>	<p><u>Highly unlikely/None</u> Expected never to happen.</p>



Table 4-2: Probability Consequence Matrix for Impacts

		Significance																																					
		7	6	5	4	3	2	1																															
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Consequence		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Table 4-3: Significance Threshold Limits

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the Project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the Project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and/or socio-economic) environment.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the Project. These impacts will usually result in positive medium to long-term effect on the socio-economic and/or natural environment.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the socio-economic and/or natural environment.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the socio-economic and/or natural environment. The impacts are reversible and will not result in the loss of irreplaceable aspects.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the Project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the socio-economic and/or natural environment.	Minor (negative)



Score	Description	Rating
-73 to -108	A serious negative impact which may prevent the implementation of the Project. These impacts would be considered by society as constituting a major and usually a long-term change to the (natural and/or socio-economic) environment and result in severe effects. The impacts may result in the irreversible damage to irreplaceable environmental or socio-economic aspects should mitigation measures not be implemented.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the Project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts will be irreplaceable and irreversible should adequate mitigation and management measures not be successfully implemented.	Major (negative)

5 Assumptions and limitations

- It was assumed that the project description provided to the SIA team was sufficient to undertake the desktop socio-economic impact assessment.
- As there are overlaps between some socio-economic impacts and impacts assessed by other specialists, such as those related to traffic control and water availability, the SIA indicates where other specialist studies are expected to be providing mitigation measures for managing these impacts.

6 Baseline socio-economic environment

The socio-economic baseline profile presented here focuses on the primary and secondary study areas. Table 6-1 summarises these study areas. Ward 3 is a fairly extensive area and is mostly rural in nature. It includes the Mepudi Power Station, a portion of the Grootegeluk Coal Mine and several airstrips. There are no major towns within this ward. Onverwacht and the Lephalale town are unevenly divided into Wards 4 and 13. Ward 4 includes most of the urban area of both these urban centres and is smaller than Ward 13, which also includes some of the rural surrounds.

Table 6-1: Primary and secondary study areas

Primary Study Area	Secondary Study Areas		
Ward 3	Ward 11	Waterberg District Municipality (WDM)	Limpopo Province
Ward 4			
Ward 13			



Data for this baseline was sourced primarily from Wazimap (2017). This data was used because it realigns the Statistics South Africa 2011 Census data, (2011) with new municipal boundaries used in the 2016 Municipal Elections (Open Up, 2017). This socio-economic study uses the Census 2011 data as the Community Survey (2016) data is not yet available at ward level. The data is supplemented by the Integrated Development Plans (IDPs) developed for LLM (2018) and WDM (2018).

6.1 Geographical Setting

The Limpopo province is located in the north-eastern part of South Africa and borders Mozambique, Zimbabwe and Botswana. The province includes approximately 125 806 km² of land, or 10.23% of the land within South Africa and represents the median point compared to other provinces. Limpopo is divided into five district municipalities which include a total of 22 local municipalities. Of these, WDM is the largest district municipality, comprising 35.71% of the province (Wazimap, 2017). WDM is divided into five local municipalities: Bela-Bela, Lephalale, Modimolle-Mookgophong, Mogalakwena and Thabazimbi. LLM Lephalale Local Municipality is the largest of the local municipalities within WDM.

The Project area is located within Wards 3 and 4 and may potentially cross into Ward 13 (this depends on the chosen pipeline routing). The Project may also have impacts reaching beyond these municipal areas. These effects are considered within the secondary study area.

The ward boundaries within LLM have regularly changed since 2001. For example, the Project would have been located in Ward 2 if this study was undertaken in 2006 or 2009 and in Ward 1 in 2000. This has implications for the socio-economic data as the shapes, sizes and populations of the wards have changed and the past datasets aggregated to ward level are not readily compatible.

6.2 Population demographics

The 2011 Census registered 5 404 868 people, or approximately 10.44% of the population of the country, in the Limpopo province. (Statistics South Africa, 2011; Wazimap, 2017). Within the province, Vhembe District Municipality is the largest (in terms of population size) and includes 1 294 722 people. WDM is the smallest of the district municipalities by population and includes 679 336 people or 12.57% of the population of Limpopo. Within WDM, Lephalale is the second largest local municipality in terms of population with 118 865 people (17.50% of the WDM population).

Figure 6-1 shows the distribution of the population of Limpopo across the 22 local municipalities in the province. LLM has been separated slightly to highlight the area of interest. Table 6-2 below provides a summary of the indicative population statistics for the wards under consideration as compared to the secondary study area. Some of the statistics in the following sections will be presented in relation to households, and not per capita.

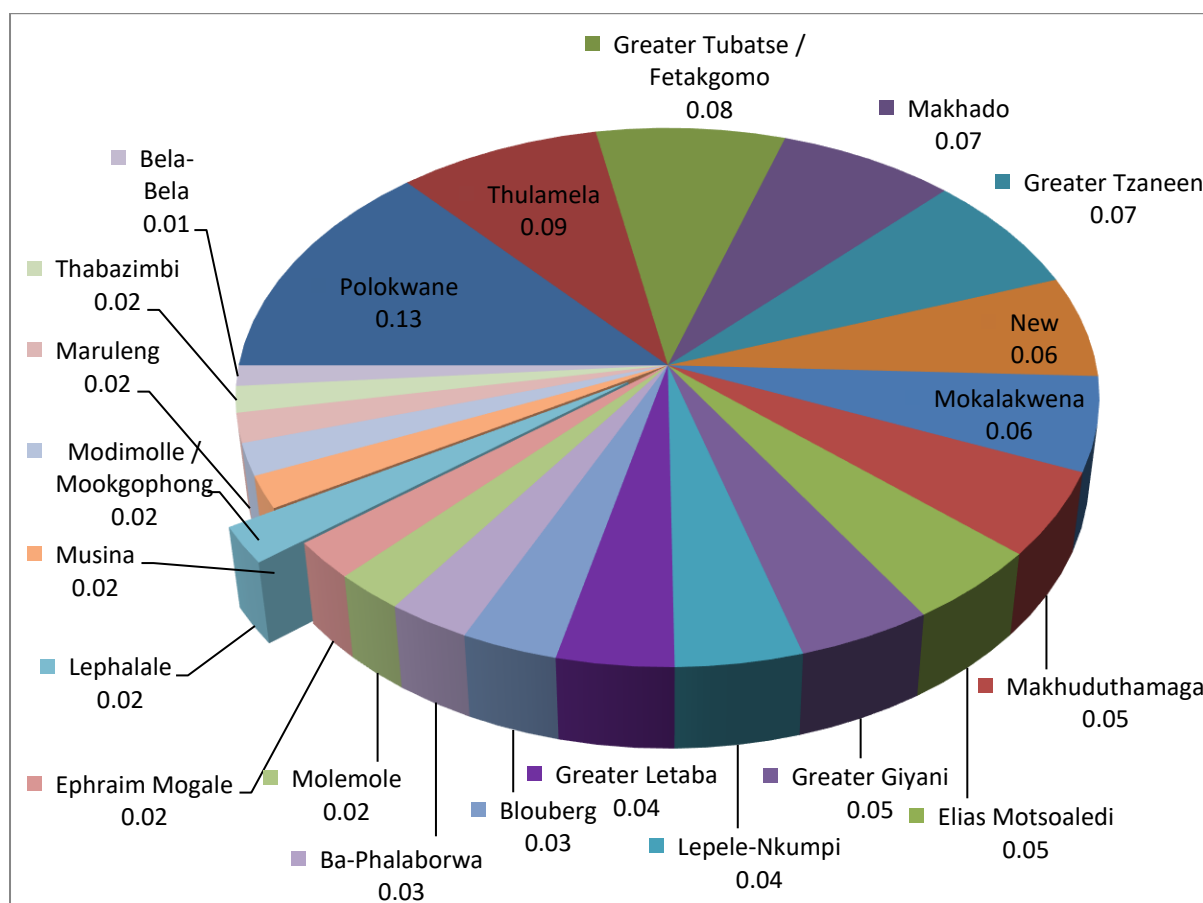


Figure 6-1: Population of the Limpopo Province distributed across the Local Municipalities in percentages.

Adapted from Wazimap (2017)

Table 6-2: Indicative statistics related to the population of the primary and secondary study areas as per 2011 Census

Statistic	Secondary study area			Primary study area		
	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Population	5 404 868	679 336	118 865	10 836	5 428	6 054
Size (km ²)	125 806.1	45 315.6	13 826.1	4509.0	7.8	31.4
Population density (as whole people/km ²)	43	15	9	2	696	193
Number of households	1 447 658	191 214	33 599	3 762	1 832	1 976
Average household size	3.73	3.55	3.54	2.88	2.96	3.06



Number of child-headed households ¹	20 595	1 896	288	11	1	9
Percentage of child-headed households ²	1.42	0.99	0.86	0.29	0.05	0.46

Adapted from Wazimap (2017)

Ward 4 is the smallest, in terms of both land size and population size and is the second-most densely populated ward in LLM. Ward 13 is the second smallest in terms of population and has a relatively larger land size and so is slightly less-densely populated than Ward 4. Ward 3 has a relatively large population and land size and has the second-lowest population density in the LLM. Figure 6-2 presents the population density data for Limpopo, WRD, LLM and all wards within the LLM to provide more context for comparison.

WDM reported increases in population between 2011 and 2016 (WDM, 2018). This included an increase in the population of WDM (of 9.78% between these years) as well as population increases in individual local municipalities, which ranged from 3.4% to 18.02%. Previous assessments showed increases in some local municipalities and decreases in others.

¹ Head of the household is younger than 18 years

² Child-headed households expressed as a percentage of the total number of households in the area.

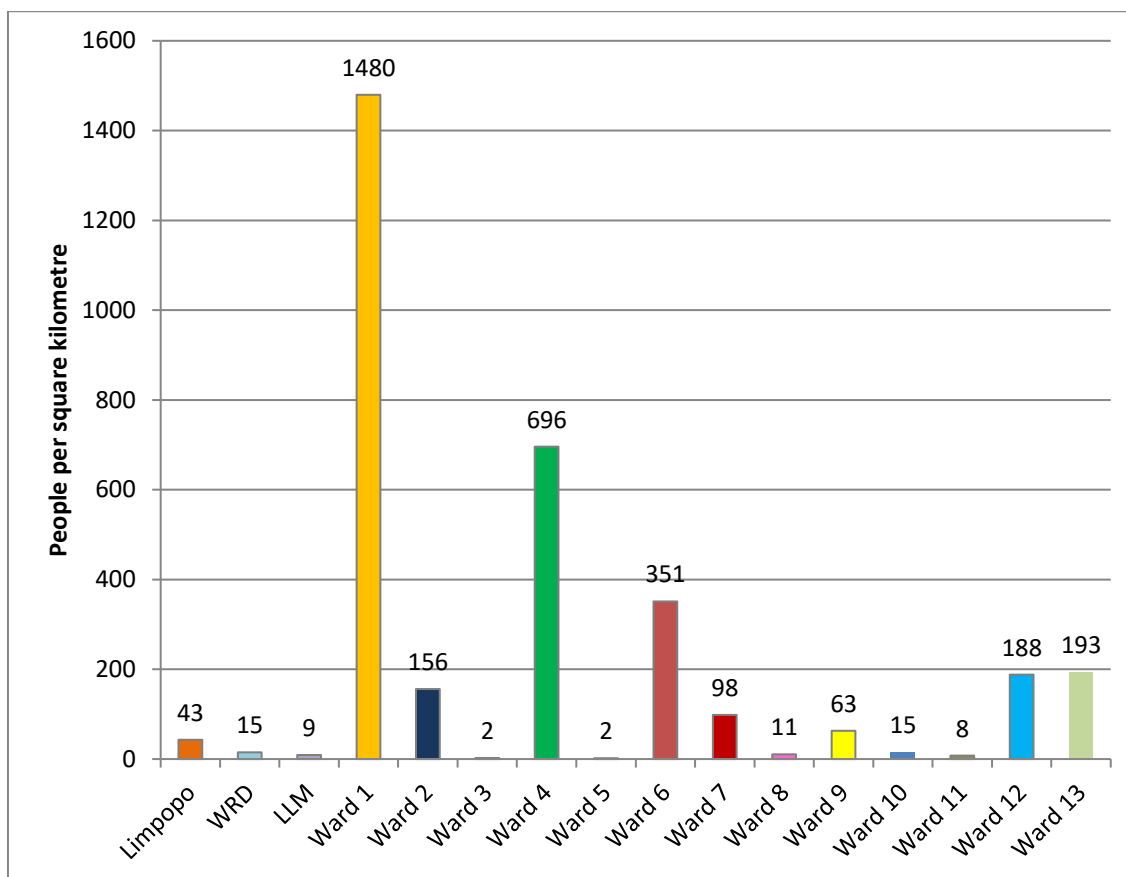


Figure 6-2: Population density at Ward, Local and District Municipality and Province levels

Adapted from Wazimap (2017)

Table 6-3 provides a summary of the racial distribution of the population of the regional study area. Across all levels of the study area, the majority population is black African, followed by white. “Other” population groups constitute the smallest portion of the population. The percentage component of Indian/Asian and coloured varies across the study areas, but the coloured population is generally larger than the Indian/Asian population.

Table 6-3: Distribution of the population of the greater study area by race (in percentages)

Race	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Black African	96.7	91.2	90.9	68.4	51.8	65.7
Coloured	0.3	0.5	0.9	2.0	3.3	4.0
Indian or Asian	0.3	0.4	0.3	0.6	0.9	1.5
White	2.6	7.6	7.7	28.6	43.8	28.1



Race	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Other	0.2	0.3	0.3	0.4	0.2	0.7

Adapted from Wazimap (2017)

Figure 6-3 presents an overview of the population by age. Across the areas of study, the '75-79', '80-84' and '85+' categories represent the three smallest components of the population. The three largest age components differ between the different areas, but include groups between zero and 34 years of age. The population in the wards is older (the larger population groups include the '20-24', '25-29' and '30-34' categories) compared to the secondary study area level.

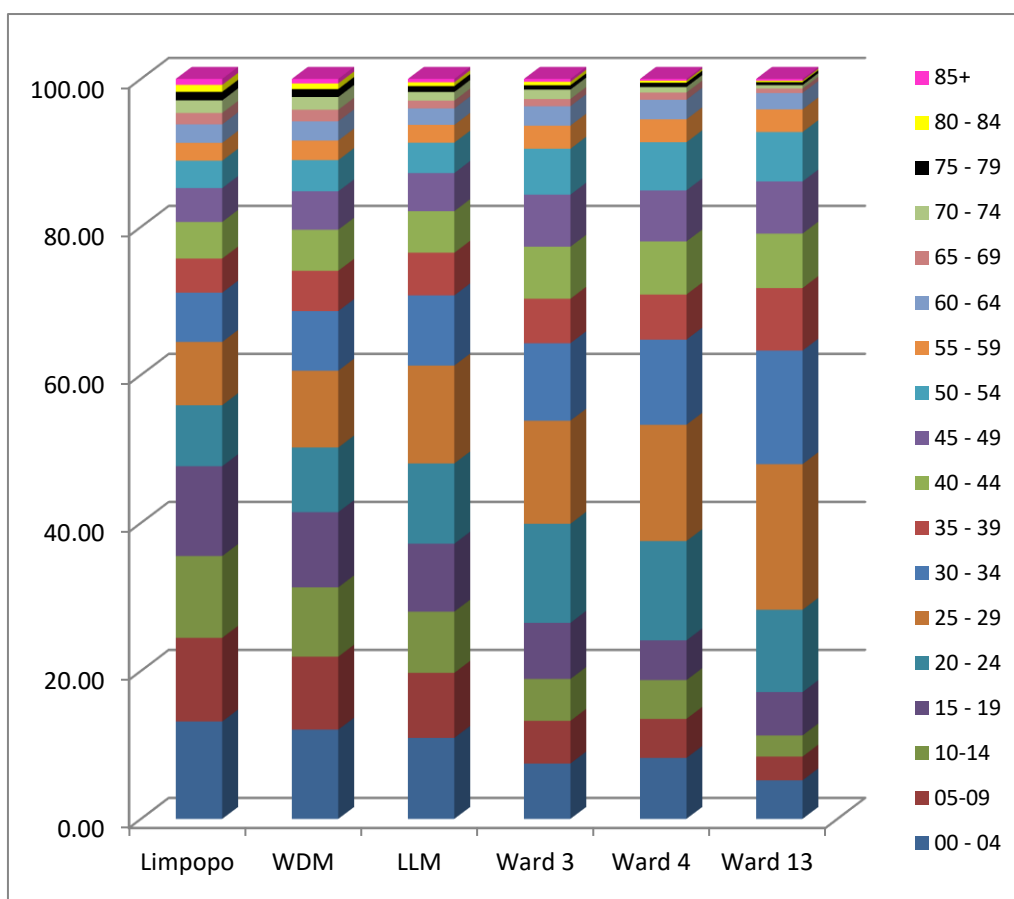


Figure 6-3: Age distribution of the population of the greater study area (in percentages)

Adapted from Wazimap (2017)

Figure 6-4 presents the distribution with respect to gender within the population of the greater study area. Gender is divided fairly equally across the study area, with females comprising slightly larger portions of the population, with two exceptions: Ward 13 has the largest gender disparity (females account for 69.29% of the population) and in the Limpopo Province, there are more males than females (53.3% of the population is male).

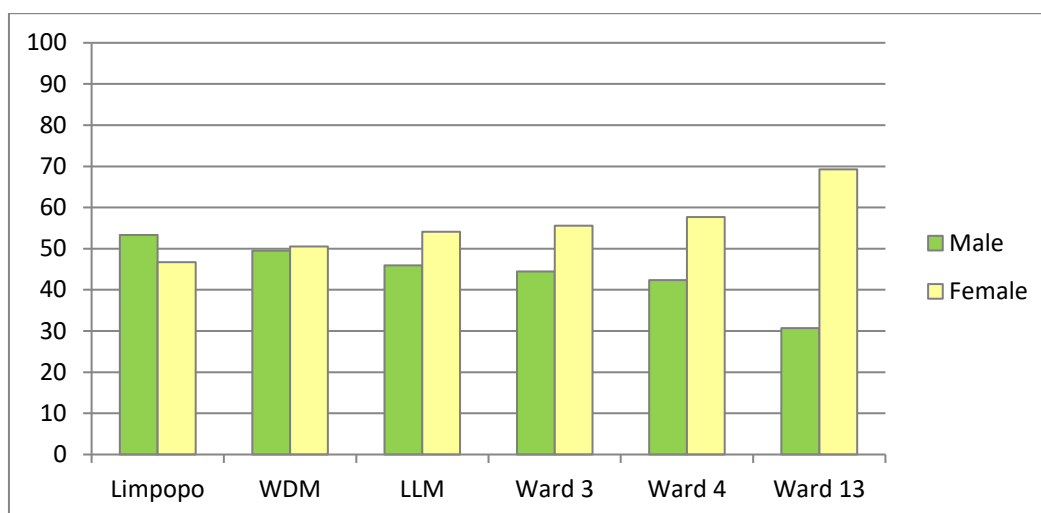


Figure 6-4: Gender distribution within the greater study area, in percentages

Adapted from Wazimap (2017)

Table 6-4 below provides an overview of the most and least common languages spoken at the various levels of interest. The trends across these areas are very variable. No respondents within the areas of interest marked their language as ‘unspecified’. Between 1.29% and 3.54% responded with ‘other’.

Table 6-4: Most and least common home languages within the areas of interest

Language	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Most common	Sipedi	Sipedi	Sipedi	Afrikaans	Afrikaans	“Not applicable”
Second-most common	Xitsonga	Setswana	Setswana	Setswana	Sipedi	Afrikaans
Third-most common	Tshivenda	Xitsonga	Afrikaans	Sipedi	English	Sipedi
Least common	Sign Language	Sign Language / SiSwati	Sign Language	Sign Language	Sign Language	Sign Language

Adapted from Wazimap (2017)

6.3 Education

The State of the Nation (SONA) address from 2018 reported an increase in the matric pass rate nationally from 6.6% in 2009 to 75.1% in 2017 (WDM, 2018). In contrast, the Limpopo Province reported a ‘sharp decline’ in the matric pass rate in the State of the Province (SOPA) address in 2018 from the previous year. The rate of the population completing tertiary education studies is expected to increase with the roll-out of programmes from 2016



aimed at making tertiary studies affordable, or free, to eligible households who cannot ordinarily afford it.

The LLM IDP (2018) reports that the quality of education for learners, notably black African learners, remains poor. The LLM highlights the need to improve the level and quality of education and provide more opportunities for training. LLM includes a Mayoral Initiative Programme which provides several training programmes and includes learnerships, artisanal training and skills training (including security and drivers licenses).

Table 6-5 presents the learner to educator ratio within the WDM (WDM, 2018). The ratio ranges from one educator to between 31 and 35 learners. The LLM has 94 schools with a total of 1 146 classrooms and 1 290 teachers. The WDM IDP notes a backlog in terms of service delivery to the schools: at the time of reporting, 60% of the schools did not have water supplies, 43% did not have adequate sanitation and 24% did not have their electricity needs met.

Table 6-5: Educator to learner ratio in Public ordinary Schools

Local Municipality	Learners	Educators	Ratio
Bela-Bela	13 707	395	1:35
Lephalale	34 692	1 066	1:33
Modimolle-Mookgophong	26 129	841	1:31
Mogalakwena	89 542	2 915	1:31
Thabazimbi	11 477	368	1:31

Adapted from WDM (2018)

Table 6-6 presents the percentages of population within the study areas to have completed Grade 9 and Grade 12. This includes only the population older than 20 years old. Figure 6-5 below shows highest level of education completed by the population of the study areas. This includes again only the population that is older than 20.

Table 6-6: Percentage of the population older than 20 achieving education milestones

Milestone	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Completed Grade 9	57.76	56.50	54.45	57.94	67.83	52.14
Completed Matric	30.33	29.51	28.12	37.72	54.92	40.05

Adapted from Wazimap (2017)

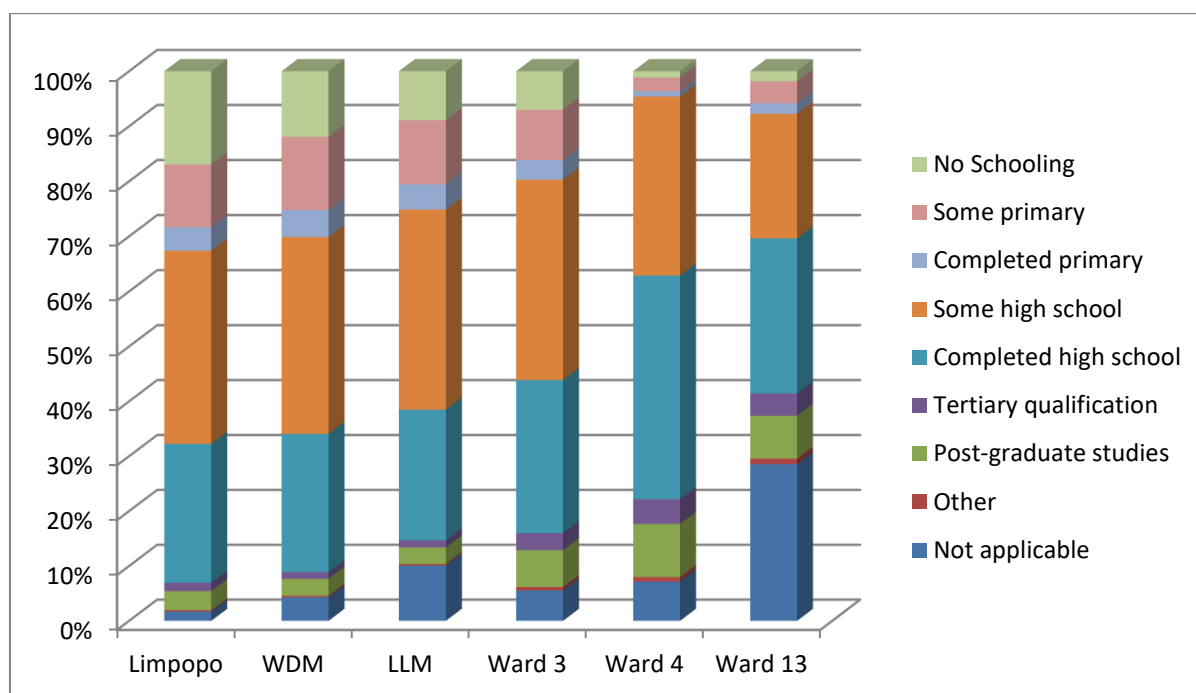


Figure 6-5: Highest level of education completed by the population 20 years and older, within the greater study area

Adapted from Wazimap (2017)

6.4 Economy

The key sectors contributing to the WDM economy include: agriculture, manufacture, mining and tourism (WDM, 2018). Mining activities centre around Mokopane, Lephalale and the Northam-Thabazimbi area. Minerals mined within the WDM include: chrome, coal, iron nickel, platinum, tin, and tungsten. The Waterberg field contains an estimated 76 billion tons of coal, which is more than 40% of the national coal reserve. The WDM produces the most platinum within the Limpopo Province and contributes the most in terms of GDP to the national mining sector. Mining contributes 47.4% of the WDM GDP.

Agriculture is a significant source of employment within the WDM (WDM, 2018). Predominant crops include cotton, soya beans, sunflower and tobacco. Predominant crops are variable, as fluctuating international prices and the climate influence the success of a crop in terms of yield, profit and sustainability. Additional, alternative, crops cultivated in the WDM include groundnuts, Lucerne, paprika, potato and wheat, with varied levels of success and security. Most crop cultivation within the WDM requires some form of irrigation. This is leading to increased stress on the limited water supply within the district.

As a result of these water constraints, the cattle and game industry is experiencing transformation in some areas (WDM, 2018). Areas that have previously been used for dry-land and irrigated farming have now been consolidated and converted for extensive livestock production. Other cultivated land, and land previously used for livestock grazing, has now

been converted to game ranching and used for ecotourism. Some game ranch owners are now diversifying into lodges and ecotourism as well.

Tourism is another significant economic sector. Important tourism hotspots within the WDM include:

- The Waterberg Biosphere Reserve, which forms part of the World Network of Biosphere Reserves and is registered with UNESCO;
- The Makapans Valley, a historical site of a siege event between Trekboers and the Ndebele;
- The Nylsvley Wetland, which is a registered Ramsar site and covers approximately 16 000 ha; and
- Bela-Bela, which is a tourist town originally known as Warmbaths after the hot springs present in this area.

The manufacturing sector includes the brick, steel and wood carving industries and the production of dried fruit and fruit juices.

Agriculture, mining and manufacture are the three most important contributors to the LLM Gross Domestic Product (GDP) (LLM, 2018). Agriculture is the largest provider of employment within the LLM, employing 38.85% of the workforce. The community services industry is the second largest, employing 15.71% of the workforce. Agriculture has the potential to expand further and contribute more to the LLM economy, especially within the red meat sub-industry.

Tourism is an important part of the LLM economy, including hunting and ecotourism (LLM, 2018). It is possible that this industry may also grow to include business tourism related to the growth of industrial operations within the municipality.

6.4.1 Development Context

The WDM has identified a number of potential developments within the more significant economic sectors (WDM, 2018). This includes the development of mining tourism and a platinum corridor within the mining sector and the expansion into agro-tourism, game farming, agro-processing and a “meat and horticulture cluster”. Suggested future agricultural enterprises include: citrus, game, grapes, hydroponics, irrigated vegetable production, milk production and poultry. Development potential within the tourism industry includes the development or support of tourism transport operators, tour operators, business tourism and theme parks or additional recreational facilities.

The LLM aims to achieve the following goals in terms of its economy:

- Improving infrastructure;
- Transitioning to a low-carbon economy through using water more sustainably and reducing carbon emissions;



- Creating an inclusive and integrated rural economy by 2030; and
- Realising a green economy (LLM, 2018). Goals for the green economy range from the short term, which includes generating 'green' employment and improving the environmental quality of the municipality, to the long term, which includes a paradigm shift for the local municipality in terms of the relationship between the economy and the environment.

6.5 Employment

Figure 6-6 presents an overview of the employment status of the population within the WDM and within each area of interest. In this figure, 'not applicable' refers to those who are not considered to be of working age (i.e. individuals younger than 18 and older than 65 years of age).

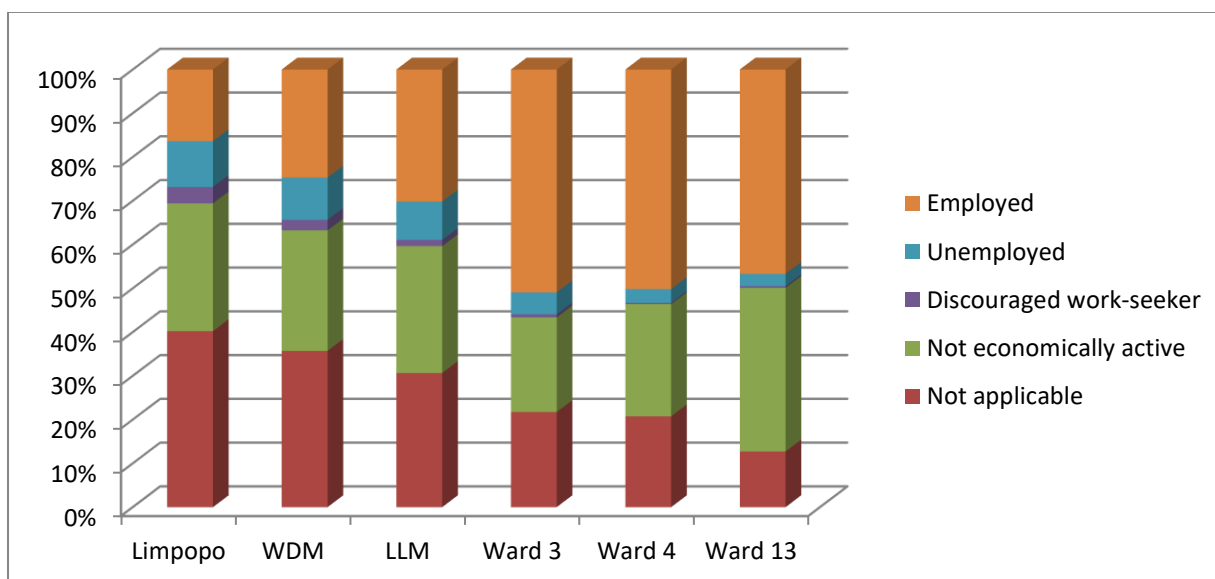


Figure 6-6: Employment statistics within the greater study area

Adapted from Wazimap (2017)

Employment trends are not consistent within the broader study area. The employment rate varies from 16.39% in the Limpopo Province to 50.93% in Ward 3. Discouraged work-seekers (i.e. individuals who are unemployed but who are not actively seeking work) account for between 3.75% and 0.29% of the population. Unemployment is highest in the Limpopo Province (10.45%) and lowest in Ward 13 (2.79%). All participants in the census specified their employment status.

Figure 6-7 provides an overview of the employment per sector within the WDM. In this figure, "Not applicable" refers to individuals who are not employed (i.e. unemployed, not economically active, not of working age and discouraged work seekers). This category is the largest in each of the areas of interest, but is especially large in the Limpopo Province, accounting for 83.32% of respondents.



Between 0.97% and 1.22% of respondents did not know in which sector they were employed. Across all the study areas, the formal sector is the largest provider of employment. The informal sector is the smallest provider of employment in the LLM, Ward 3 and Ward 4 and the private household is the smallest provider of employment for Limpopo, WDM and Ward 13.

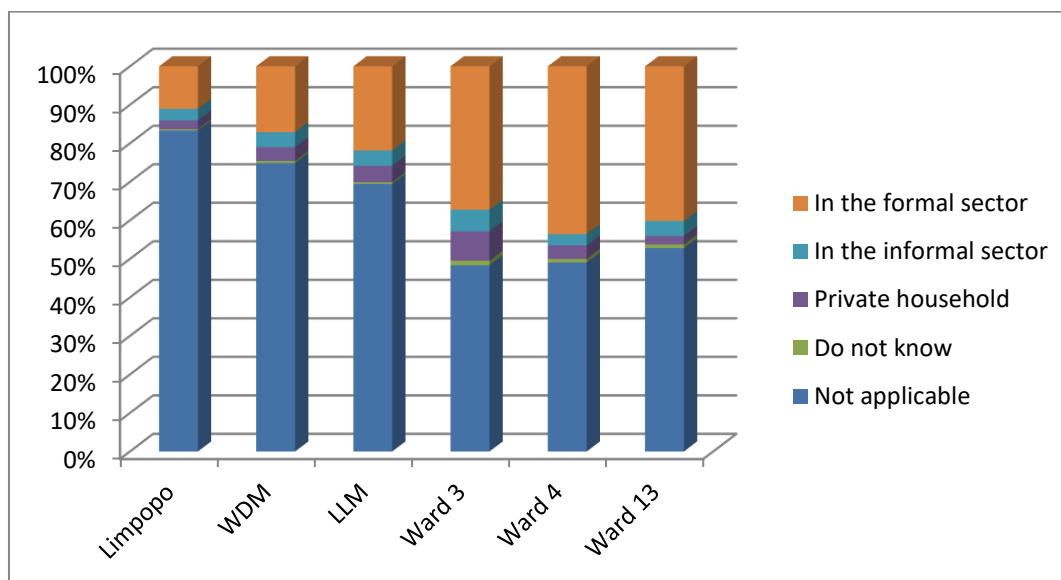


Figure 6-7: Employment per section within the broader study area

Adapted from Wazimap (2017)

Figure 6-8 summarises the annual income for employed individuals. These figures are as per the 2011 census and have not been updated to consider inflation. Between 2.51% and 6.76% of the respondents did not specify their annual earnings. Between 2.79% and 9.55% of the respondents reported they earned no income. This category was largest in the Limpopo Province and smallest in Ward 3.

The smallest proportion of the employed population earned R 2 457 601.00 or more in all areas of interest except in Ward 3, in which fewer people earn between R 1 228 801 and R 2 457 600 annually as well (between R 102 400.00 and R 204 800.00 per month).

The majority incomes are more varied within the various areas of interest. In Limpopo, WDM and LLM, most people earn between R 9 601.00 and R 76 800.00 annually. In Ward 3, income is slightly higher as more employed individuals earn between R 9 601.00 and R 38 400.00 and R 153 601.00 and R 307 200.00 annually. More of the employed individuals in Ward 13 earn between R 19 201.00 and R 38 400.00 and R 76 801.00 to R 307 200.00 annually. In Ward 4, a greater portion of the population earn higher salaries, as more of the employed population earn between R 76 801.00 and R 614 400.00 annually.

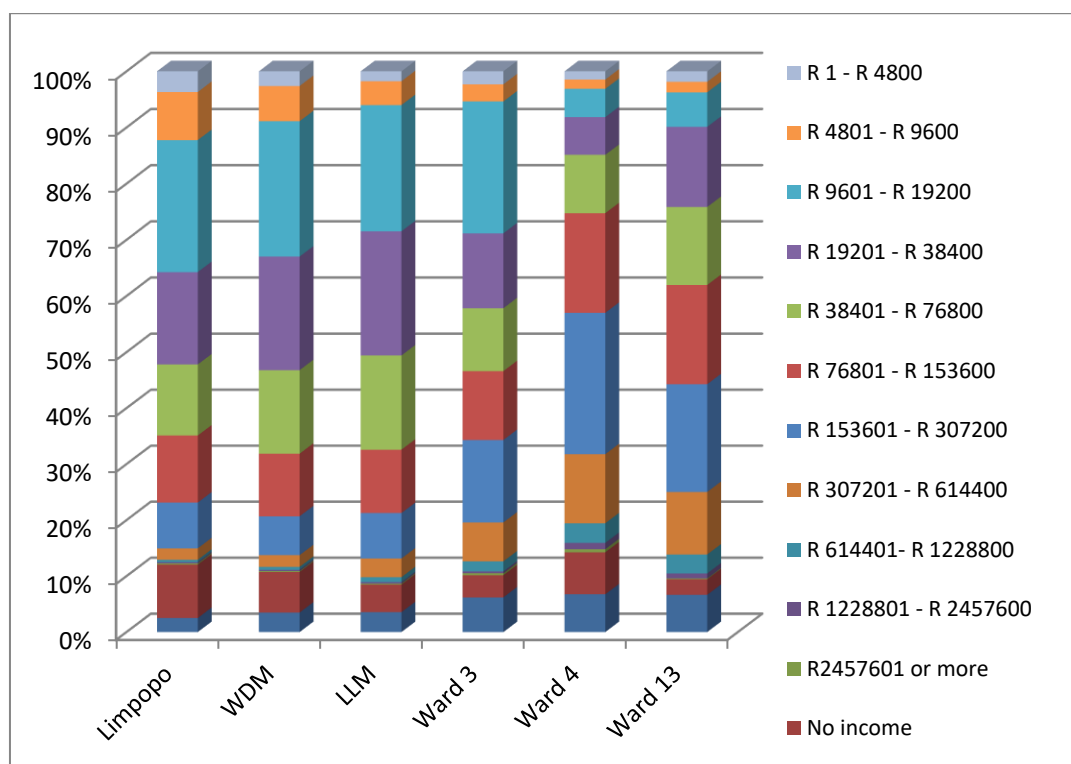


Figure 6-8: Annual income for employed individuals within the broader study area (as of 2011 figures)

Adapted from Wazimap (2017)

A family of four with a monthly household income of R 1 600.00 or less would be considered to live in poverty, as this income would leave the family unable to meet their food needs with no money left for non-food items. This would equate to an annual income of R 19 200.00 or less. If all the individuals earning an income represent a single breadwinner for a family of four, between 12.68% (in Ward 13) and 45.3% (in Limpopo Province) of the population would be at risk of living in poverty, including those who report they earn no income.

6.6 Household services

6.6.1 Water

The urban water supply within LLM originates from the Mokolo Dam (LLM, 2018). Grootegeluk Coal Mine originally constructed the main supply lines, pump station, balancing dam and purification works and still maintains the dam and the supply today. The Marapong township receives water from the Matimba Power Station. The rural areas obtain their water mostly from groundwater sources, predominantly boreholes.

Figure 6-9 illustrates the sources of water for the households within the areas of interest. In this figure, the regional/local water scheme refers to a scheme that is operated by the municipality or other water services provider. Stagnant water includes dams and pools of



water. Across the board, the regional or local water scheme is the most common supplier of water, supplying between 62.89% and 96.2% of the households. Rain water tank is the least common supplier of water within the Limpopo Province and LLM. Springs are the least common suppliers of water in the WDM, Ward 3 and Ward 13. No households in Ward 4 obtain their water from either of these sources. Between 0.1% and 0.17% of the respondents indicated this was 'not applicable,' suggesting they do not have a private source of water. No households indicated the water source was not applicable in Ward 4.

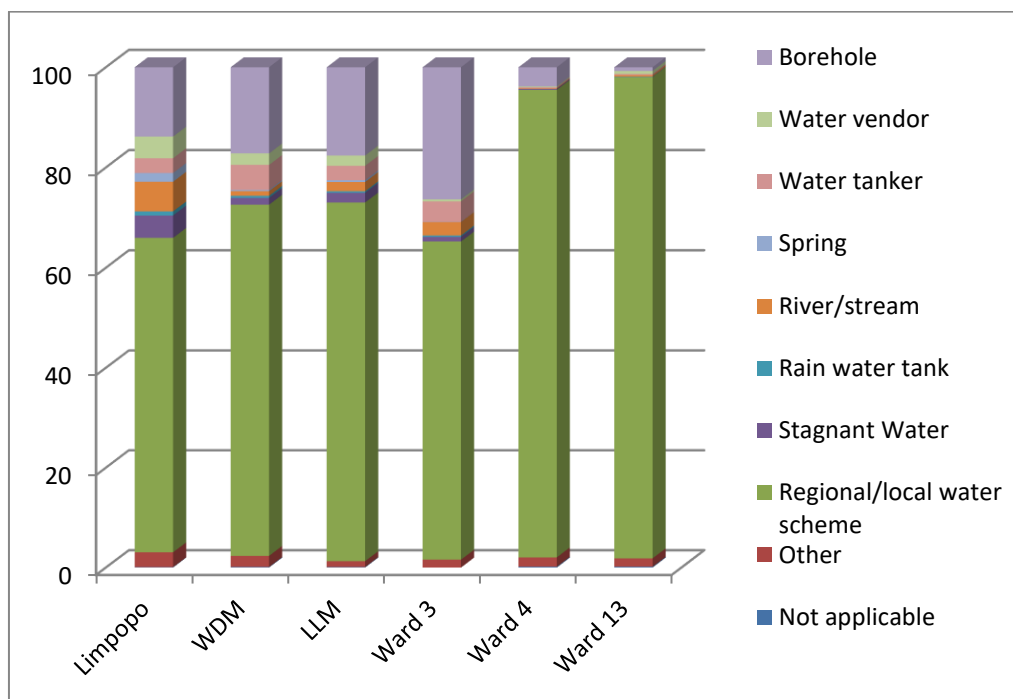


Figure 6-9: Sources of water for households within the greater study area

Adapted from Wazimap (2017)

6.6.2 Sanitation and toilet facilities

Figure 6-10 illustrates the access to toilet facilities within the broader study area. This includes pit toilets with and without ventilation and flush toilets connected to septic tanks or the sewerage system.

Across the study area, most households have access to a flush toilet connected to the sewerage system. Between 19.99% and 96.74% of households have access to this type of toilet facility. The least common toilet facility is the bucket latrine, with the exception of Ward 13 in which fewer people use pit latrines with ventilation. No households in Ward use either pit latrines with ventilation or bucket latrines.

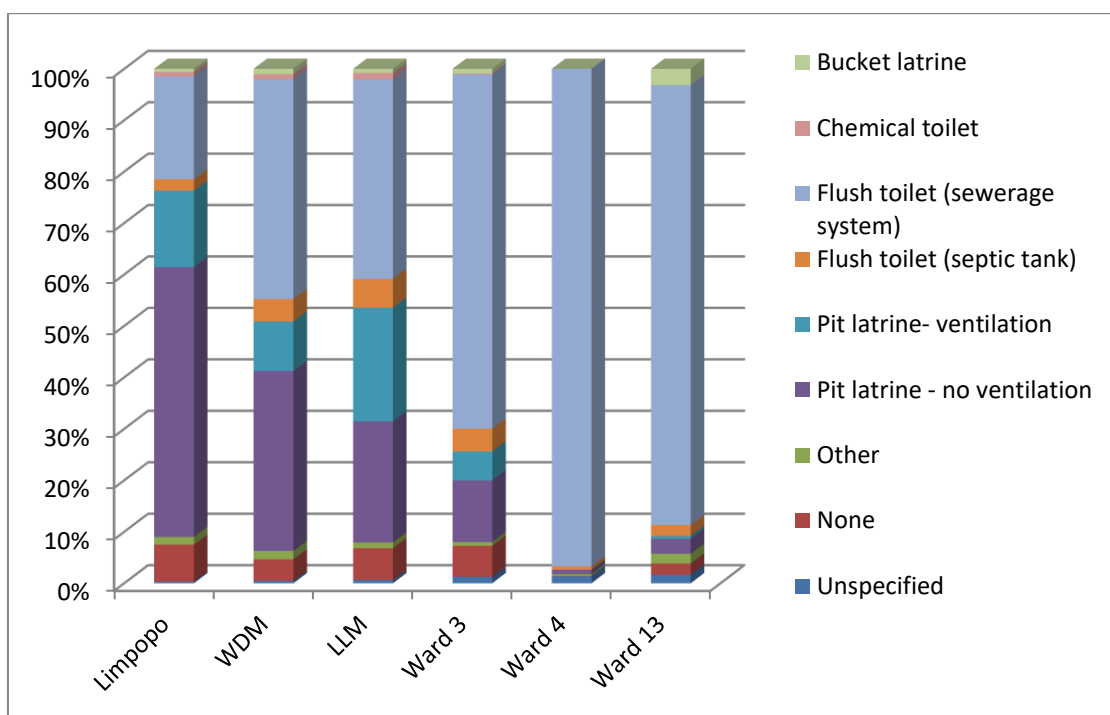


Figure 6-10: Household toilet access within all areas of interest

Adapted from Wazimap (2017)

6.6.3 Waste

Waste management within the LLM is not without challenges, as described in the IDP (LLM, 2018). Refuse removal services are not delivered in some rural communities. LLM has one permitted waste disposal facility and is in the process of conducting feasibility studies for the development of another. The refuse receptacles for waste storage are inadequate. At present, the municipality is in the process of rolling out 6 m³ bins to replace the 1.75 m³ bins which have been provided to communities and businesses. The illegal dumping of garden waste in Marapong and Onverwacht especially is an issue, due to the lack of adequate garden refuse sites in these areas.

LLM includes no drop-off point, garden sites, transfer stations, material recovery facilities or buy-back facilities for recycling (LLM, 2018). As such, the municipality is wholly dependent on private companies and community programmes for recyclable goods recovery. Privates companies including Collect-a-can, Consul, Mondi, Nampak and Transpaco are involved in the recovery of paper, plastic and aluminium recyclables. Informal recyclers also collect these materials at landfills within the municipality.

Figure 6-11 provides an overview of the refuse removal strategies available to the households of the areas of interest. Between 0% and 0.17% of households responded that refuse disposal was not applicable to them and a further 0.22% to 1.47% of the households did not specify which refuse disposal method they employed.



There are two main trends across the areas of interest: one within the Limpopo Province, WDM and LLM and the other within the three wards. Within the secondary study area, the most common method of dealing with refuse are individual refuse dumps, which is employed by between 45.11% and 67.58% of households at this level. The least common is refuse removal by a local authority or private company less than once per week. This service reaches between 0.63% and 0.78% of the households. Within the primary study area, communal refuse dumps are the least common refuse management strategy employed by 0.08% to 1.02% of the households. The most common strategy is refuse being removed by a local authority or private company once a week. This option is available to between 65.44% and 95.80% of the households in the wards.

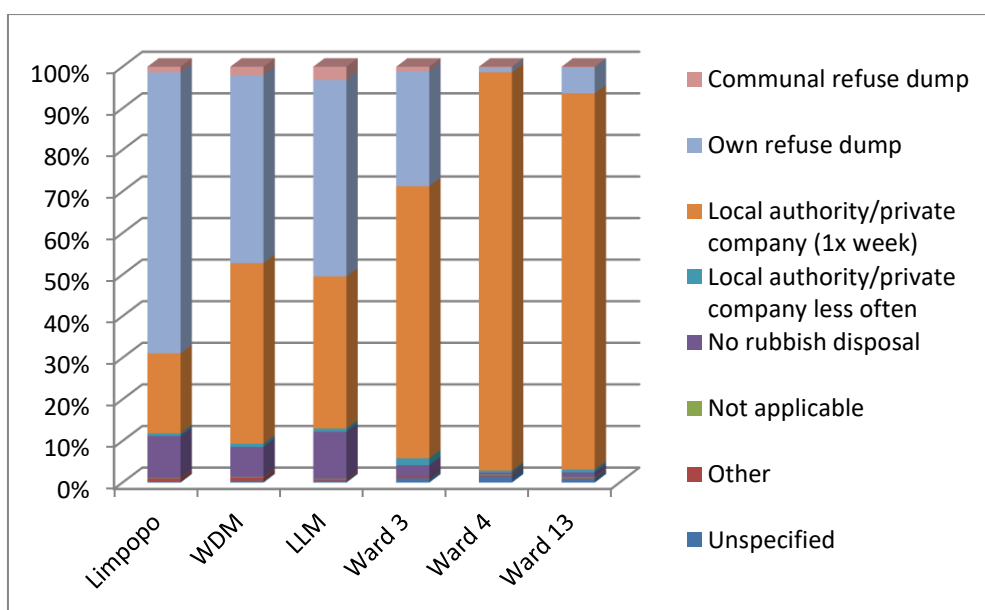


Figure 6-11: Refuse removal strategies within the larger study area

Adapted from Wazimap (2017)

6.7 Housing

The WDM IDP (2018) highlights the need for more housing, as there is a total backlog of 68 828 houses of varying types. The LLM accounts for 20 575 of these houses (29.89% of the backlog). This is the second-highest housing backlog with Mogalakwena requiring 26 441 houses. The WDM IDP described the challenges to the provision of housing, which include the poor quality of the RDP houses and inadequate land for development.

Table 6-2 above summarises the numbers of households within each of the areas of interest. The following section describes the types of structures within which these households reside and how these structures are owned.

Figure 6-12 presents an overview of the type of dwellings household reside in. In this figure, a cluster house refers to one in a complex and a townhouse refers to a semi-detached house within a complex. A flat or apartment is considered as a flat or apartment within a

block of flats. A house, flat or room in the backyard refers to a room, flatlet, granny flat or servants quarters on the same property as a larger dwelling or attached to a larger dwelling. A dwelling on a separate stand refers to a house or a brick or concrete structure on a separate property (yard or stand) or on a farm. Informal dwellings are sub-divided into two types: those in a backyard and those which are not. The latter may refer to shacks in an informal or squatter settlement or on a farm. Traditional dwellings refer to any dwelling, hut or structure made of traditional materials. The WDM IDP (2018) defines the ‘not applicable’ category as including collective living quarters.

Across the study areas, between 0.4% and 1.5% of the households reported a different (‘other’) dwelling type. Between 1.81% and 20.88% responded that this was ‘not applicable’ to their household and between 0.29% and 1.65% of the respondents did not specify their dwelling type.

Dwellings on separate stands are the most common dwelling type across the larger study area. The other trends are very variable across the different areas of interest. Table 6-7 below highlights the most and least common dwelling types for each area.

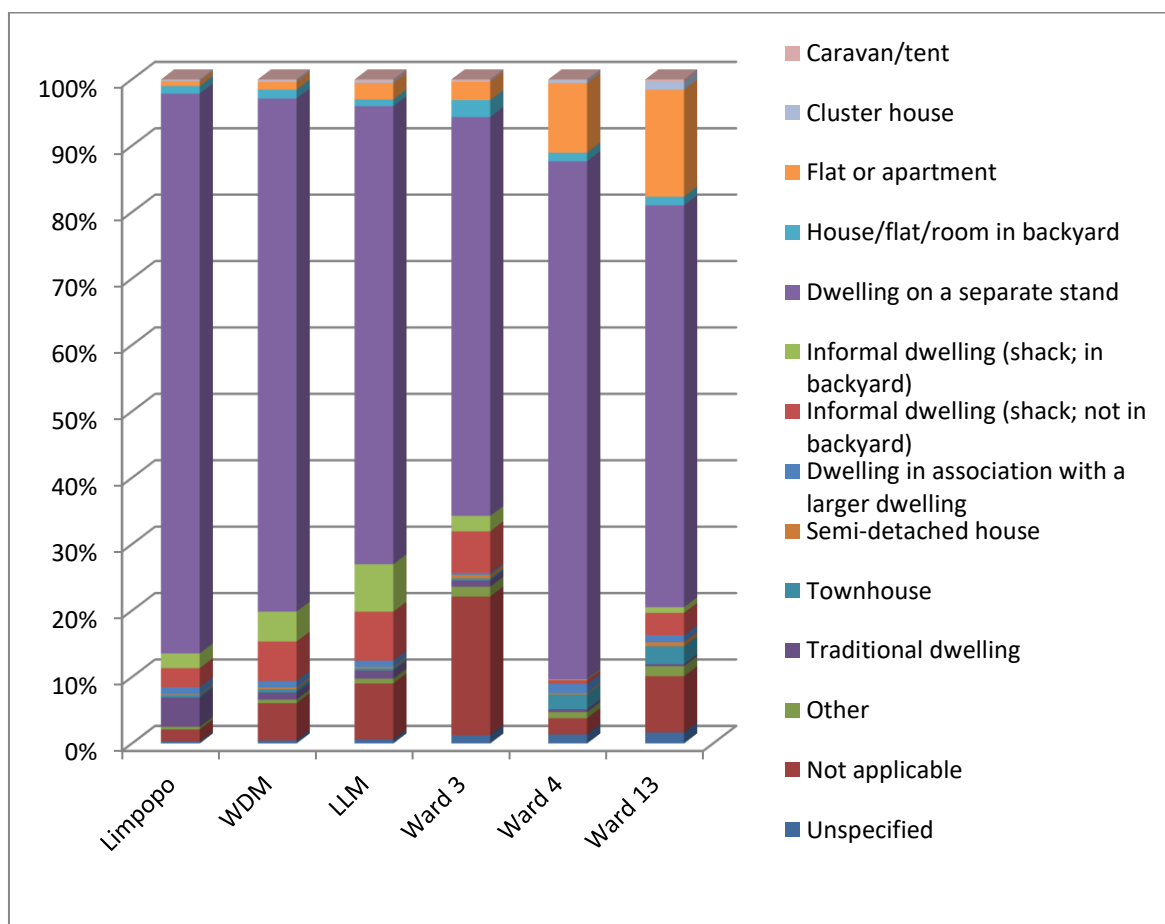


Figure 6-12: Household dwellings by type

Adapted from Wazimap (2017)



Table 6-7: Most and least common dwelling types within the areas of interest

Dwelling type	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Most common	Separate stand	Separate stand	Separate stand	Separate stand	Separate stand	Separate stand
Second-most common	Traditional Dwelling	Informal, other	Informal, other	Informal, other	Flat or apartment	Flat or apartment
Third-most common	Informal, other	Informal, in backyard	Informal, in backyard	Flat or apartment	Townhouse	Informal, other
Least common	Caravan / Tent	Caravan / Tent	Semi-detached	Cluster house	Caravan / Tent	Traditional Dwelling

Adapted from Wazimap (2017)

Figure 6-13 presents the types of ownership within the larger study area. The trends across the different areas of interest are varied. Table 6-8 provides a summary of the most and least common ownership types. Between 2.38% and 5.46% reported a different (“other”) type of house ownership. Between 1.81% and 20.88% responded that this was not applicable to their household. A further 0.29% to 1.65% did not specify in which way their house is owned.

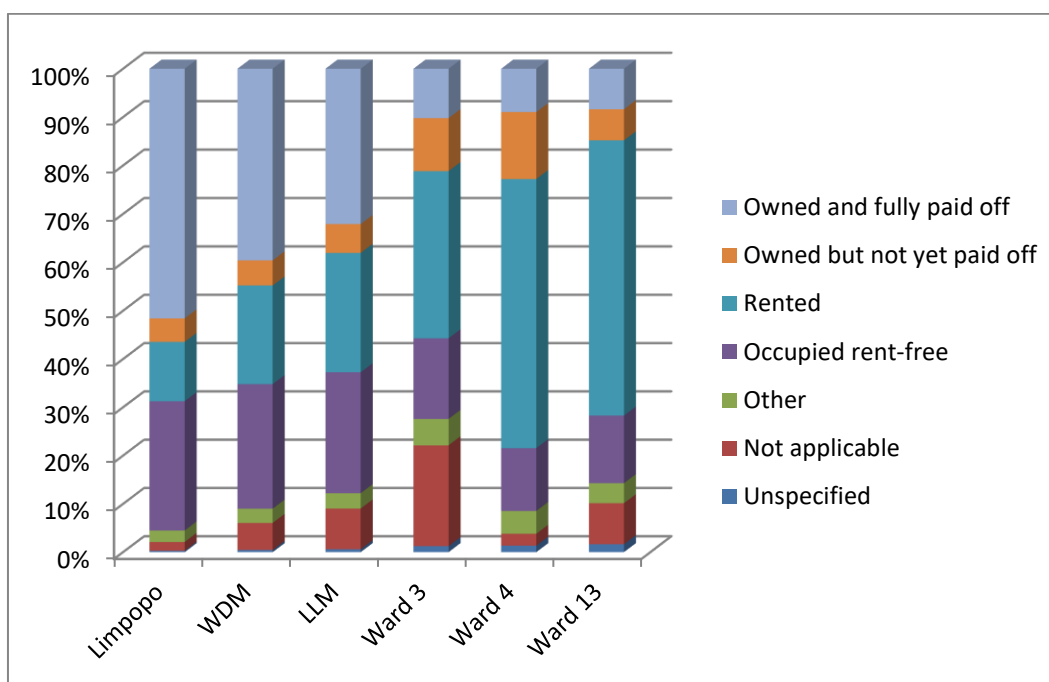


Figure 6-13: House ownership within the areas of interest

Adapted from Wazimap (2017)


Table 6-8: Most and least common dwelling types within the areas of interest

Dwelling type	Limpopo	WDM	LLM	Ward 3	Ward 4	Ward 13
Most common	Owned and fully paid off.			Rented.		
Least common	Owned but not yet fully paid off.			Owned and fully paid off.		Not yet paid off.

Adapted from Wazimap (2017)

6.7.1 Planned residential projects

The LLM IDP (2018) makes mention of the following development programmes and projects within the municipality and with relevance to housing within the next five years:

- Establishment of the Steve Biko township;
- Upgrading informal settlements (the number, names and extent of the settlements was not described);
- The Nelsonskop housing development project;
- Provision of Reconstruction and Development Programme (RDP) housing in 300 villages;
- Fast tracking construction for the Altoostyd housing development project; and
- Acceleration of the development of housing in rural areas and villages, including Richards Lager

6.8 Land use and land tenure

The most prevalent form of land tenure within the LLM is private land ownership (LLM, 2018). Lephalale Town, most of the local service points and all farms within the municipality are owned in this way. "Population concentration points" and all 38 villages within the LLM are communally owned. Communal land is technically vested in the national government but land is used by local residents. The Marapong Township is owned as a deed of grant which is not considered full ownership as the applicable legal proclamation has become obsolete. Large portions of this land are now owned by the Limpopo Department of Local Government and Housing.

In 2001, 197 land claims were lodged with the Land Restitution Commission within the LLM (2018). These land claims constitute approximately 197 831 hectares (ha). As of 2018, 52 claims have been accepted and 28 land claims in Lephalale have been settled and gazetted. The other land claims are in various stages of investigation and negotiation. Land claims have been investigated by the public participation specialist and are addressed in the overall EIA report.

The LLM IDP (2018) lists the following uses for land within the municipality: business, offices and industrial parks, residential and institutional. As part of the compilation of the LLM Spatial Development Framework (SDF), land has been divided into six functional zones: urban, rural, mining, agricultural, cattle and ranching and conservation. These areas were analysed for the SDF development, but the results were not reported in the IDP. The IDP does note that the above-mentioned land claims have the potential to impact land-use planning, management and socio-economic development in ways that have not yet been explored.

6.9 Safety and vulnerability

6.9.1 Health, Safety and Security

Table 6-9 presents an overview of the types and quantities of healthcare facilities within the WDM and at local municipality level.

Table 6-9: Health Care facilities within the WDM

Local Municipality	Government Hospital	Private Hospital	Clinic	Mobile Clinic	Community Health Centre
Bela-Bela	1	1	4	2	-
Lephalale	2	1	7	7	-
Modimolle-Mookgophong	1	0 (*1)	7	6	1
Mogalakwena	3	0	29	13	-
Thabazimbi	1	0	10	4	-
Total (WDM)	8	2 (1)	57	32	1

Modimolle-Mookgophong includes 1 specialised clinic, demarcated with the asterisk.

Adapted from WDM (2018)

Within the WDM, there are 25 police stations (WDM, 2018). Of these, six are in LLM. All six of these police stations are considered 'main stations'. Several challenges to safety and security are noted in the WDM IDP, which include:

- Monitoring the utilisation of licences and permits issued to liquor outlets;
- The illegal operation of unlicensed shebeens and taverns;
- Access to some crime scenes can be rendered difficult due to poor road conditions and lighting;
- Domestic violence; and
- Substance abuse issues.



6.9.2 Vulnerable groups

Within the WDM, there are a number of Non-Governmental Organisations (NGOs) running facilities that are funded by the government for vulnerable people (WDM, 2018). This includes four facilities for older persons and two for disabled persons. None of these facilities are located within the LLM.

Table 6-10 presents an overview of the childcare facilities that are available within the WDM and in each local municipality.

Table 6-10: Childcare and youth-focused facilities within the WDM

Municipality	Childcare and Protection Services	Early Childhood Development Sites	Child protection organisations
Bela-Bela	2	25	1
Lephalale	2	48	1
Modimolle-Mookgophong	0	115	2
Mogalakwena	0	49	1
Thabazimbi	1	24	1
Total (WDM)	5	261	6
Local Municipality	Foster Care Grant Beneficiaries	Foster Care Grant Children	Children to be placed into Foster Care
Bela-Bela	423	647	60
Lephalale	568	889	140
Modimolle-Mookgophong	1 241	1 756	376
Mogalakwena	507	769	164
Thabazimbi	258	401	60
Total (WDM)	2 997	4 462	800

6.10 Baseline Conclusions

Lephalale is one the fastest growing towns in South Africa, as more people move in to take advantage of job opportunities brought about by the coal fields. Government services and infrastructure provision in the town are however unable to keep up with the rapidly growing demand. This is particularly marked in Ward 3 where the rail loop, the road diversion and part of the road will be located. General waste management services in Ward 3, for example, are provided by municipal or the private sectors to 65.4% of households weekly and 1.7%



less often. The former figure is much higher in Ward 4 (95.8%) and Ward 13 (90.5%). Flush toilets were recorded in Census 2011 for 68.9% (connected to sewer) and 4.4 % (septic tanks) of households in Ward 3. Sanitation connected to sewers is found in a higher proportion of households in Ward 13 (85.6%) and Ward 4 (96.7%). The second most common housing in the WDM, LLM and in Ward 3 was informal dwellings, denoting an influx of job seekers into these areas. Large percentages of households were renting their homes in Ward 3 (34.5%), Ward 4 (55.7%) and Ward 13 (56.9%).

Available skills, according to the Lephalale municipality remain a challenge especially amongst Black Africans. Percentages of the population older than 20 that have completed matric in Wards 3, 4 and 13 were 37.7%, 54.9% and 40.0% respectively. These figures were, however, higher than in LLM, WDM and the province. Employment rates in the 3 wards under study was approximately 50%, which was higher than at local and district municipal and provincial levels. Household incomes amongst the wards varied from approximately 28% of households living in poverty (with an income of less than R19 200 per annum) in Ward 3 to 13.5% in Ward 4. Higher proportions of the population were earning more in the 3 wards however compared with the LLM as a whole, or the district and province. It appears therefore that much of the population in these wards, especially in Ward 4, are benefitting from positive impacts of the extractive projects.



7 Public Participation comments and responses

Comments received from Interested and Affected Parties (I & APs) were obtained during the stakeholder engagement process conducted for the EIA and are captured in the Comments and Responses Report (CRR) appended to the overall EIA. Comments relevant to assessing socio-economic impacts, together with the responses provided, are shown in the Table 7-1. These I & AP comments have been considered in the preparation of the SIA as indicated in the table.

Table 7-1: Comments related to socio-economic impact assessment obtained from I & APs during stakeholder participation

DWE Question & Comment Raised	Contributor	Organisation / Community	Date	Method of commenting	DWE response to comment & where in the SIA the comment is addressed
<p><i>"How do you think the project might (affect) your socio-economic conditions (e.g. livelihoods, farm, business, household)?"</i></p> <p>it will impact on:</p> <p>1. Workforce. My workforce will be exposed to the influence of the workers of the construction and other involved industries</p> <p>2. Security. I will have upgrade on the security myself and my workers and to prevent poaching."</p>	Chris van Niekerk	Farm Owner: Zyferbult 324 LQ Portion 1&2	29 October 2018	Email	<p>Noted, these impacts will be further investigated in the Impact Assessment phase</p> <p>Addressed in the SIA under the impact "Influx of construction workers".</p>
<p><i>"How do you think the project might (affect) your socio-economic conditions (e.g. livelihoods, farm, business, household) it will impact on?"</i></p> <p>Business function and authorisations</p>	Chris van Niekerk	Farm Owner: Zyferbult 324 LQ Portion 1&2	29 October 2018	Email	<p>Noted, this impact will be assessed in the Impact Assessment Phase</p> <p>Addressed in the SIA under the impact, "Business opportunities"</p>

<p><i>“How do you think the project might (affect) your socio-economic conditions (e.g. livelihoods, farm, business, household)?”</i></p> <p>It might impact on Nozala coal who has the PR on farm Gruisfontein and who intends submitting a MR application</p>	<p>Ms Marietjie Eksteem</p>	<p>Nozala coal</p>	<p>31 October 2018</p>	<p>Email</p>	<p>Noted. Addressed in the SIA under the impact, “Business opportunities”</p>
<p>My concern is regarding the housing accommodation for construction workers. It needs to be mentioned and looked into during this process</p>	<p>Hein Schonfeldt</p>	<p>Farm Owner/Representative of Exxaro</p>	<p>14 November 2018</p>	<p>Public meeting at Mogol Club</p>	<p>Noted we will do. Addressed in the SIA under the impact “Increased demand for public services”.</p>
<p>What sort of upliftment will Temo Coal do in terms of development as there are issues in schools and basic services are not meet?</p>	<p>Paul Maphuthu</p>	<p>I&AP (T Africa)</p>	<p>14 November 2018</p>	<p>Public meeting at Mogol Club</p>	<p>Temo Coal intends to create jobs in the local community. The impact “Temporary employment” is assessed for this project. (NB.The Temo mine EIA assesses the impact of permanent employment. Temo mine addresses support to community development projects in its Social and Labour Plan (SLP)).</p>



8 Impact Assessment

This section describes existing impacts on the Project sites, assesses the potential impacts of the proposed Project and discusses how they may contribute to cumulative impacts in the area.

8.1 Existing impacts on the site

The rail loop including the access road to the site is planned to be wholly within the mine property. The road diversion will also be constructed within the boundaries of the mine property. There are currently no developments on the site, as the rail and road development will precede mine construction activities.

With respect to the pipeline options, Option 1 will be located within a road reserve along its entire length and Option 2 will be initially located within a road reserve and then within a rail reserve as it travels from the WWTW pump station towards the mine site. Option 3 will traverse the Farms Paarl and Onverwacht when it leaves the WWTW pump station, then travel within the road reserve, and finally within the rail reserve as it heads towards the mine site. There are existing activities on the Farms Paarl and Onverwacht. In the former case, construction, maintenance and decommissioning activities may disrupt activity on the roads located within Farm Paarl. Option 3 is planned to pass through the Onverwacht formal residential areas with the associated housing and socio-economic structures such as schools. There is therefore considerable socio-economic infrastructure on the pipeline route if it passes through Farm Onverwacht, which also means socio-economic infrastructure would be heavily impacted on if Option 3 is selected.

If one considers the future mine that the ancillary infrastructure of this Project will support, the latter will constitute relatively minor cumulative impacts during construction, operations and decommissioning.

8.2 Potential Impacts

8.2.1 Identification of Potential Impacts

Project activities during construction, operations, decommissioning and post-decommissioning were used to identify the potential impacts associated with them. Potential positive and negative impacts were subsequently assessed for the construction, operations and decommissioning phases. No significant socio-economic impacts are expected during post-decommissioning.

Table 8-1: Project Activities and Associated Socio-economic Impacts

Construction Phase Activities	Potential Socio-economic Impacts
-------------------------------	----------------------------------



Appointment of contractors for construction and other services	Temporary improvement in livelihoods due to contract employment Some social risks due to presence of external construction workers Basic services required in construction camp/s
Procurement of goods	Temporary improvement in livelihoods due to short term procurement
Construction of access road(s)	Temporary improvement in livelihoods due to contract employment
Site clearing (removal of vegetation) (construction area to be fenced off along public roads)	Temporary improvement in livelihoods due to contract employment
Topsoil and subsoil removal and stockpiling (construction area to be fenced off along public roads)	Temporary improvement in livelihoods due to contract employment Community safety and health risks where pipeline crosses the road.
Temporary storage of construction materials and hazardous material (construction area to be fenced off along public roads)	Community safety and health risks where pipeline crosses the road.
Increased vehicular activity on road D175	Increase in community safety and health risks
Construction of the road diversion, rail loop and pipeline	Temporary improvement in livelihoods due to contract employment
Water storage for construction activities (sites will be fenced off from public)	Community safety and health risks if public gains access to site
Generation and removal of domestic and hazardous waste on Project sites (sites will be fenced off from public)	Basic services required on site and in construction camp/s
Operation Phase Activities	
Ongoing monitoring of socio-economic and environmental aspects	Reduced community safety and health risks Improvement of livelihoods due to increase in employment (limited number of staff who are expected to form part of mine operations workforce)
Continuous implementation of the management plans	Reduced community safety and health risks Improvement of livelihoods due to increase in employment (limited and staff expected to form part of mine operations workforce)



Maintenance and repair of rail loop and pipeline (maintenance and repair areas will be cordoned off)	<p>Reduced community safety and health risks</p> <p>Improvement of livelihoods due to increase in employment (limited and staff expected to form part of mine operations workforce)</p>
Vehicular activity on access roads and D175 main road (limited to repair and maintenance events for this Project)	Increase in community safety and health risks along the D175 main road (limited to repair and maintenance events for this Project)
Operation of the rail loop and pipeline (rail loop on private property and pipeline underground in public areas)	<p>No community exposure to infrastructure expected.</p> <p>Improvement of livelihoods due to increase in employment (limited number and staff expected to form part of mine operations workforce)</p>
Decommissioning Phase Activities (Rail loop and Pipeline)	
Retrenchment of staff	Loss of livelihoods due to decrease in employment (limited to maintenance staff who will be part of mine operations staff)
Demolition of rail loop, pipeline and associated infrastructure (activities fenced off in public areas)	<p>Temporary improvement in livelihoods due to contract employment.</p> <p>No community safety and health risks from demolition activities as these Project areas will be fenced off with no access to the public.</p>
Rehabilitation of area (activities fenced off in public areas)	<p>Increase in community safety and health risks from rehabilitation activities</p> <p>No community safety and health risks from demolition activities as these Project areas will be fenced off with no access to the public.</p>
Generation and disposal of demolition waste	<p>Generation of demolition wastes will be on fenced off Project site and expected to be safely transported on public roads for disposal.</p> <p>Reduced community safety and health risks following disposal.</p>
Rehabilitation of access road	No potential impacts as activities on private mine areas



Post-closure Phase (Rail loop and Pipeline)	
<p>Post-closure monitoring and rehabilitation will determine the level of success of the rehabilitation, as well as identify any additional measures that have to be undertaken to ensure that the area associated with the rail loop and pipeline route is restored to an adequate state. Monitoring will include surface water, soil fertility and erosion, natural vegetation and alien invasive species and potential dust generation.</p>	<p>Temporary improvement in livelihoods due to contract employment.</p> <p>Reduced community safety and health risks</p>

8.2.2 Assessment of Impacts

Potential impacts identified in the previous section are assessed for their significance in the tables below. Management measures are recommended for each impact, to ameliorate potentially negative ones and enhance potential benefits. Management measures take into consideration that Temo Coal is expected to establish a long term presence in the Project area following the establishment of its mine. The Project developing the rail loop, the road diversion and pipeline therefore provides an opportunity to set good corporate governance early in its relations with neighbouring communities. Moreover, the rapid development of the coal mining sector in Lephalale is taken into account when recognising that the Project, in addition to adding limited impacts to the Temo mine project, will also be a small contributor both positively and negatively towards impacts from this sector in the area.

Construction Phase

Criteria	Details/ Discussion
Influx of construction workers (Negative impact)	
Description of impact	<p>As with most development projects it can be expected that there will be an influx of construction contract workers and some job seekers into the Project area as a result of the Project. This is however of a limited scale for this Project, that is, up to a maximum of 150 workers are expected.</p> <p>The presence of an outside workforce, although small, may expose local communities' vulnerability and susceptibility to social pathologies, including drug and alcohol abuse, and increased incidence of sex work, teenage pregnancies, crime and domestic violence if not mitigated for adequately.</p>
Mitigation required	<p>House non-local construction workers some distance from the project area (i.e. at the Temo mine construction camp if available) to limit movement into surrounding communities.</p> <p>Depending on the duration of the work for the different components, contract worker schedules should allow for workers to visit their families at least for one week in every 2 months.</p>



Criteria	Details/ Discussion				
	<p>Develop a code of conduct for construction workers and sensitize them to abide by it so that their behaviour and engagement with local communities does not compromise either party.</p> <p>Condoms could be provided free of charge in the construction camp. Rules can be made restricting access of woman to the camp.</p> <p>Where possible, construction employees should be locally sourced as they will live with their families.</p> <p>Explore opportunities for collaboration with local police with regards safety and security issues relating to Project activities in general and any concerns about contractors.</p>				
Parameters	Severity	Spatial scale	Duration	Probability	Significant rating
Pre-Mitigation	4	4	4	6	-72 (Minor, almost Moderate)
Post-Mitigation	2	4	3	4	-36 (Minor, almost negligible)

Criteria	Details/ Discussion				
Temporary employment (Positive impact)					
Description of impact	<p>Regular monthly income for this period will be important for those employed but will be short lived and then they will either have to seek permanent employment or another sources of income at the end of construction period expected to be over 2 to 3 years.</p> <p>Should people from the study area be employed during the construction phase of the proposed Project this will also be temporary in the construction period.</p>				
Mitigation required	<p>Construction work offered is limited, conducted over a short period of time and carried out by specialised contractors. However, where possible, opportunities for local employment should be considered. For instance, contracts for construction can stipulate that at least 80% of unskilled labour be sourced from surrounding communities and should include the youth as far as possible.</p> <p>Skilled, semi-skilled and unskilled construction staff must be retained, where possible, for the subsequent construction of the mine.</p> <p>The Community Liaison Officer could be appointed at this stage, to monitor and address any community queries during the Project and as Temo prepares for construction of the mine.</p>				
Parameters	Severity	Spatial scale	Duration	Probability	Significant rating



Criteria	Details/ Discussion				
Pre-Mitigation	2	4	3	4	+36 (Minor, almost Negligible)
Post-Mitigation	4	4	4	6	+72 (Minor, almost Moderate)

Criteria	Details/ Discussion				
Business opportunities (Positive impact)					
Description of impact	<p>There may be opportunities for local businesses to provide some goods and services for this Project, for example, housing and camp facilities, and supplying food and building materials, facilities maintenance, general vehicle maintenance, laundry services and employee transport.</p> <p>However, locally owned businesses in the Lephalale area are relatively unsophisticated and the procurement opportunities that can be taken up by companies will be limited. There were also concerns from an I&AP that Temo's business activities may impact negatively on other businesses, for example, on authorisations other mines in the area may apply for. This comment, however, is applicable for the Temo mine development rather than this Project, as impacts here were assessed as minimal.</p>				
Mitigation required	<p>Temo should join local organised business partnerships to discuss any opportunities for procurement for the Project. Where goods are services can be sourced locally and Temo is satisfied that it will support the mine to achieve its procurement objectives, including for the SLP of the mine, contracts can be extended for mining activities as relevant.</p>				
<i>Parameters</i>	<i>Severity</i>	<i>Spatial scale</i>	<i>Duration</i>	<i>Probability</i>	<i>Significant rating</i>
Pre-Mitigation	2	5	3	4	+40 (Minor)
Post-Mitigation	4	5	5	5	+70 (Minor, almost Moderate)



Criteria	Details/ Discussion				
Increased demand for public services (Negative impact)					
Description of impact	<p>Government services and infrastructure in the Project area is already under pressure due to the increasing number of people moving into the area. General waste management services in Ward 3, for example, are provided by municipal or the private sectors to 65.4% of households weekly and 1.7% less often. The former figure is much higher in Ward 4 (95.8%) and Ward 13 (90.5%). Access to bulk infrastructure must be taken into account when planning for services at the construction camp. Flush toilets were recorded in Census 2011 for 68.9% (connected to sewer) and 4.4 % (septic tanks) of households in Ward 3. Sanitation connected to sewers is found in a higher proportion of households in Ward 13 (85.6%) and Ward 4 (96.7%).</p> <p>Construction workers will increase the demand for accommodation and basic services to the construction camp. Lack of potable water, energy and waste management services will increase risks of communicable diseases for workers and to locals if contact under these circumstances results in infection.</p> <p>Temo mine is planning to access electricity from the existing electrical supply point within the area and domestic waste will be transported by a waste contractor to a designated and registered waste disposal site. Water supply may have to be imported.</p>				
Mitigation required	<p>The mine's Storm Water Management Plan and Integrated Waste Water Management Plan (IWWMP) managing water on Project sites must include mitigation at construction camps where necessary.</p> <p>Join partnerships with organised business and government departments to secure access to services such as potable water, energy and healthcare as necessary.</p> <p>Explore opportunities for collaboration with local police with regards safety and security issues relating to Project activities in general and for contractors in particular.</p>				
<i>Parameters</i>	<i>Severity</i>	<i>Spatial scale</i>	<i>Duration</i>	<i>Probability</i>	<i>Significant rating</i>
Pre-Mitigation	5	4	3	5	-60 (Minor)
Post-Mitigation	1	1	2	3	-22 (Negligible)

Criteria	Details/ Discussion				
Increased risk to Community Health and Safety (Negative Impact)					
Description of impact	<p>Risks to community health and safety during construction will be introduced by increased vehicular activity, removing and stockpiling soil, and the temporary storage of construction materials, hazardous material and water on Project sites,</p>				



Criteria	Details/ Discussion				
	<p>specifically as they are relevant to public areas. Assessment of this impact is therefore limited to the public road area.</p> <p>There is a small likelihood that the community will come into contact with these potentially hazardous conditions, as construction activities will be fenced off along public roads. The public may be exposed to hazards where the pipeline crosses the road. It must be noted that there is not much pedestrian activity generally on the affected roads; except nearer the town of Lephalale and some activity near small businesses at the intersection of D1675 and D175, which is also about 500m away from the settlement of Steenbokpan. Residents from Steenbokpan may be exposed to safety hazards during construction activity at the intersection if pipeline Option 3 is selected. Both option 1 and 3 will also inconvenience people during construction and if any maintenance or repair work has to be undertaken on these sections of the pipeline, as the latter passes through formal residential areas.</p>				
Mitigation required	<p>Public safety risks to vehicles and pedestrians must be managed as part a Traffic Management Plan, including the placement of signs along the impacted area to indicate the presence of activities and vehicles.</p> <p>The Storm Water Management Plan and Integrated Waste Water Management Plan (IWWMP) must adequately manage excess water on Project sites, including on the road sites where relevant; and</p> <p>Access to Project sites, especially alongside the road, must be controlled to prohibit the public from entering them.</p>				
<i>Parameters</i>	<i>Severity</i>	<i>Spatial scale</i>	<i>Duration</i>	<i>Probability</i>	<i>Significant rating</i>
Pre-Mitigation	4	5	4	5	-65 (Minor)
Post-Mitigation	1	5	2	3	-24 (Negligible)

Operational Phase

Socio-economic impacts related to the operational activities of the rail loop, the road and the pipeline are:

- Employment for monitoring and maintenance of the infrastructure;
- Procurement for monitoring and maintenance of the infrastructure; and
- Decreased community safety from maintenance activities (specifically along public areas such as roads).

As employment during this period will be minimal and it is expected staff who undertake these activities will form part of the mine workforce, this impact is not assessed. Procurement for monitoring and maintenance is also expected to be limited and be subjected to procurement processes of the mine. It is also therefore not assessed for significance in this report.



It is also expected that community safety and health during incidents of breakdown and repair will have to be managed along public roads, as is the case in the construction phase. Accordingly, measures in the Traffic Management Plan, the Storm Water Management Plan, the Integrated Waste Water Management Plan (IWWMP) and waste management measures must reduce the likelihood of the public's exposure to hazardous conditions. Mitigation measures for reducing Community Health and Safety as listed under the Construction phase must therefore be in place during maintenance and repair of infrastructure in the Operational phase.

It is noted that an activity related to the Project will contribute towards improving community health and safety during operations. Although the Lephalale WWTW is not assessed in this SIA, the grey water delivered by the pipeline during operations will be maintained at an acceptable quality for a period of time, as per Temo's agreement to maintain of the WWTW operations for this period. Where effluent from WWTW is discharged into the river, it will of this same acceptable quality as the grey water in the pipeline.

Decommissioning Phase

Decommissioning is a specialised activity requiring specialists to undertake the work in a limited time-frame. It is expected that a small external workforce will be contracted to undertake the work. A limited number of locals could be employed for unskilled work. As the impact will be over a short period and will impact a limited number of people, it is not assessed for significance. It is also noted that during this phase the infrastructure monitoring and maintenance staff will be retrenched. It is expected that these workers will be part of the mine workforce and their retrenchment will be managed according to mitigation measures in the mine's Social and Labour Plan.

The other potential impact during the decommissioning phase is from activities that could be hazardous for communities, specifically at road crossings, as it is expected that decommissioning activities will be fenced off from public activities. All mitigation measures listed for managing Community Health and Safety during the Construction phase are therefore relevant for the decommissioning phase as well.

Post – closure

No significant negative impacts on the socio-economic environment are anticipated during this phase, as it is expected that other specialists' monitoring plans (air, surface and groundwater, soil fertility and erosion, etc.) will monitor the natural environment and alert the client to any deviations from expected targets, for remediation. It is also expected that results of monitoring will be submitted to the authorities. Post-closure monitoring therefore will reduce the likelihood of community health and safety risks. It is however recommended that the local community be made aware of monitoring activities being conducted to assess potential hazards during this phase, so that they can be vigilant and able to alert the client and authorities to any potentially hazardous condition.



8.2.3 Summary of Impacts

Potential impacts are summarised in Table 8-2 below. Most impacts are possible during the construction phase. Positive impacts will be realised from temporary employment, and to a lesser extent, from procurement from local businesses. Negative impacts with the highest significance are related to the influx of construction workers, followed by increased risk to Community Health and then increased demand for public services.

Although community health and safety risks and Increased demand for public services were regarded as minor impacts when assessed, introducing mitigation measures will reduce them significantly to negligible. These impacts are related to health and safety and have the potential for severe consequences even if one or a few people are affected. It is therefore important that mitigation measures for these impacts be in place.

Table 8-2: Summary of Impacts Associated with the Project Activities

Phase	Impact	Pre - Mitigation	Post - Mitigation
Construction	Influx of construction workers (negative impact)	-72 (Minor, almost Moderate)	-36 (Minor, almost Negligible)
	Temporary employment (Positive impact)	+36 (Minor, almost Negligible)	+72 (Minor, almost Moderate)
	Business opportunities (Positive impact)	+40 (Minor)	+70 (Minor, almost Moderate)
	Increased demand for public services (Negative impact)	-60 (Minor)	-22 (Negligible)
	Increased risk to Community Health and Safety (Negative Impact)	-65 (Minor)	-24 (Negligible)
Operational	Increased risk to Community Health and Safety (Negative Impact)	-65 (Minor)	-24 (Negligible)
Decommissioning	Increased risk to Community Health and Safety (Negative Impact)	-65 (Minor)	-24 (Negligible)

8.2.4 Cumulative Socio-economic Impacts

Cumulative effects caused by the accumulation and interaction of multiple stresses affecting the functioning of socio-economic systems. There is rapid development of existing and new coal mines in the areas surrounding the study area because of its rich coal deposits. All impacts associated with Project activities will contribute towards cumulative impacts for the coal sector in this area, including impacts from the Temo mine. It is therefore important that all positive and negative impacts be taken into account in the Environmental Management Plan, to realise acceptable levels of positive benefits and reduce negative impacts adequately.

As with other mining projects in the area, the Project has the potential to absorb unemployed workers coming off contracts such as the construction of the Medupi power station in Lephalale. Eskom Spokesperson, Khulu Phasiwe, speaking to eNCA on 31 May 2018 explained that at least 90% of construction at Medupi had been completed and most of the contractors had left. 18 000 people had been working on Medupi since 2007. The 13 000 workers on the site in May 2018 were expected to be reduced to 7 000 in the 7 months to the end of year. Construction of Medupi was expected to be completed by 2022; however, it was possible that all six units at Medupi would be operational by 2020.

Moreover, the SIA sets a target for contractors to secure at least 80% of their unskilled labour from local communities as far as possible. Temo mine's SLP will set targets for procurement; its implementation during construction of the ancillary infrastructure could begin to contribute towards meeting these commitments.

With respect to contributing towards improving public infrastructure, Temo mine will be maintaining the operations of the WWTW in Lephalale so that the water delivered by the pipes will be of an acceptable quality. Although not assessed as part of this SIA a spin-off of this activity will be that all water that leaves the WWTW, including that discharged to the river, will be of an acceptable and safe quality. Note, that a servitude agreement currently being negotiated with Lephalale Municipality to manage the WWTW in Lephalale.

9 Assessment of Pipeline Options

As described in Section 8.1, Option 3 will have the greatest negative socio-economic impact as it passes through formal residential areas and socio-economic infrastructure on the Farm Onverwacht. Option 1 will be constructed along roads and traverse the intersection between D1675 and D175, which has small retail shops and is within 500 metres of the Steenbokpan settlement. Option 2 will be least disruptive during construction, operations and decommissioning, as it runs along the road for part of its journey and then leaves the road to be placed within a rail reserve on private property. Option 2 is therefore preferred from a socio-economic perspective because it will have least public disruption and exposure to any public health or safety risks.



10 Conclusions and Recommendations

The Project which is subject of this SIA offers limited benefits for employment and procurement in this area. However, the Project is considered within its wider context, for recommendations for authorisation. It is the opinion of the socio-economic specialist that as the Project supports the development of the Temo mine, it will facilitate significant benefits in employment, skills development and procurement for local and regional communities and businesses. These benefits will be quantified in the mine's SLP. Moreover, the Project's limited positive impacts will contribute towards a rapidly developing economy amongst communities that can benefit immensely socio-economically. Another spin-off is the benefit from a related agreement that Temo will maintain the Lephalale public WWTW to ensure that its effluent is of a safe standard.

The Project will also potentially introduce negative socio-economic impacts. Most importantly are those related to worker and community health and safety. Mitigations measures are provided to reduce the likelihood of this occurring. It is therefore recommended that the Project be authorised and the EMP include the mitigation measures for all socio-economic impacts assessed in the SIA. Further, pipeline Option 2 is recommended as it is least disruptive to current community activity patterns and offers the least exposure for health and safety risks. The following indicators are recommended for inclusion in the EMP for monitoring during the construction phase:

- a) Contracts with construction stipulate that at least 80% of unskilled labour is sourced from surrounding communities, including the youth, as far as possible;
- b) A code of conduct is developed and communicated to construction workers to abide by so that their behaviour and engagement with local communities do not compromise either party;
- c) Access to the Project sites must be strictly controlled to prohibit the public from entering them.
- d) The Traffic Management Plan must include measures to reduce safety risks for vehicles and pedestrians.

The latter two measures should also be implemented during infrastructure maintenance and repair events where applicable.



11 References

- LLM, 2018. *Integrated Development Plan 2018/19*, Lephalale: Lephalale Local Municipality.
- Open Up, 2017. *Wazimap updated with 2016 Municipal Election Results and new municipalities*. [Online] Available at: <https://openup.org.za/articles/wazimap-2016-update.html> [Accessed 11 January 2019].
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- StatisticsSouth Africa, 2011. *Statistics by Place*. [Online] Available at: http://www.statssa.gov.za/?page_id=964 [Accessed 11 January 2019].
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- Wazimap (2019) <https://wazimap.co.za/> Accessed 7 February 2019.
- WDM, 2018. *2018/19 Integrated Development Plan*, Modimolle: Waterberg District Municipality.

Socio-economic Impact Assessment

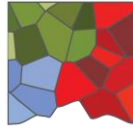
Environmental Impact Assessment for the Proposed Temo Rail Loop, Road Diversion and Pipeline Project, near Lephalale, Limpopo Province

NAM5335



DIGBY WELLS
ENVIRONMENTAL

Appendix A: CVs of specialists



DIGBY WELLS

ENVIRONMENTAL

Miss Shannon Hardwick
Assistant Heritage Resources Management Consultant
Social and Heritage Services Department
Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	MSc (Archaeology)	University of the Witwatersrand
2010	BSc (Honours) (Archaeology)	University of the Witwatersrand
2009	BSc	University of the Witwatersrand
2006	Matric	Rand Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Basic	Basic

3 Employment

Period	Company	Title/position
2018 to present	Digby Wells Environmental	Assistant Heritage Resources Management Consultant
2017-2018	Digby Wells Environmental	Intern: Heritage Resources Management
2016-2017	Tarsus Academy	Facilitator
2011-2016	University of the Witwatersrand	Teaching Assistant
2011	University of the Witwatersrand	Collections Assistant

4 Experience

Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern, and has subsequently been appointed as an Assistant Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of Notification of Intent to Develop (NID) applications as well as Heritage Basic Assessment Reports (HBARs), Heritage Scoping Reports (HSRs) and Heritage Impact Assessment (HIA) reports. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and researching Artisanal and Small-Scale Mining for input into a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance surveys in South Africa and fieldwork in Malawi.

5 Project Experience

My project experience is listed in the table below:

Project Title	Project Location	Date:	Description of the Project	Name of Client
Kilbarchan Colliery Environmental Authorisations and Closure Study	Newcastle, KwaZulu-Natal, South Africa	Ongoing	Heritage Impact Assessment	Eskom Holdings SOC Limited



Project Title	Project Location	Date:	Description of the Project	Name of Client
Belfast Implementation Project	Mpumalanga Province, South Africa	Ongoing	Section 34 Permit Application	Exxaro Coal Mpumalanga (Pty) Ltd
The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project	Northern Cape Province, South Africa	Ongoing	Heritage Impact Assessment and Conservation Management Plan	The South African Radio Astronomy Observatory (SARAO)
Heritage Resources Management Process for the Exxaro Matla Mine	Mpumalanga Province, South Africa	January 2018	Heritage Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd
Newcastle Landfill Project	Newcastle, KwaZulu-Natal, South Africa	March 2018	Heritage Impact Assessment	GCS Water and Environmental Consultants
Tharisa Apollo (UG1) Plant	Marikana, North-West Province, South Africa	Ongoing	Heritage Impact Assessment	GCS Water and Environmental Consultants
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 34 Permit Application Process for the Davin and Queens Court Buildings on Erf 173 and 174, West Germiston, Gauteng Province	Johannesburg, Gauteng, South Africa	April 2018	Section 34 Permit Application	IDC Architects
Environmental Impact Assessment for the proposed Future Developments within the Sun City Resort Complex	North West Province, South Africa	Ongoing	Heritage Impact Assessment	Sun International (Pty) Ltd
Basic Assessment and Environmental Management Plan for the Proposed pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province	Mpumalanga Province, South Africa	January 2018	Heritage Basic Assessment Report	HCI Coal (Pty) Ltd (Mbali Colliery)



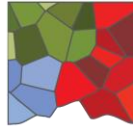
Project Title	Project Location	Date:	Description of the Project	Name of Client
Environmental Fatal Flaw Analysis for the Mabula Filling Station	Waterberg, Limpopo Province, South Africa	November 2017	Fatal Flaw Analysis	Mr van den Bergh
Zuurfontein NID	Ekurhuleni, Johannesburg, South Africa	July 2017	Notification of Intent to Develop	Shuma Africa Projects
Liwonde Additional Studies	Liwonde, Southern Region, Malawi	Ongoing	Resettlement Action Plan, Community Health, Safety and Security Management Plan	Mota-Engil Africa
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 35 Archaeological Investigations, Lanxess Chrome Mine, North-West Province	Rustenburg, North West Province, South Africa	July 2017	Phase 2 Mitigation Assessment	Lanxess Chrome Mines (Pty) Ltd
Environmental and Social Input for the Pre-Feasibility Study	Bougouni, southern Mali	July 2017	Pre-Feasibility Study	Birimium Gold

6 Professional Registrations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA)	451

7 Publications

Esterhuysen, A.B. & Hardwick, S.K. 2017. Plant remains recovered from the 1854 siege of the Kekana Ndebele, Historic Cave, Makapan Valley, South Africa. *Journal of Ethnobiology* 37(1): 97-119.



DIGBY WELLS

ENVIRONMENTAL

Name of Staff: Amina Omar Ismail

Date of Birth: 11 May 1962

Nationality: South African

1 Education

Table 1-1: Educational History

Dates	Institution	Degree(s) or Diploma(s) obtained
2015	University of the Witwatersrand, South Africa	Master's Degree in Management (Public and Development)
2012	World Bank Regional Center for Learning on Evaluation and Results (CLEAR), University of the Witwatersrand, South Africa.	Certificate in Results Based Management in the Public and Development Sectors
2011	University of the Witwatersrand, South Africa	Postgraduate Diploma in Science (Environmental Studies)
1998	Harvard University, United States of America,	Harvard-South Africa Fellowship (Focus: Sustainable Development and Public Policy)
1995	University of London, United Kingdom	Certificate: Environmental Science, Masters level pass
1986	University of South Africa	Microbiology Major
1985	University of Durban-Westville (now University of Kwa-Zulu Natal), Durban	Bachelor of Medical Science (Honours)

2 Language Skills

Table 2-1: Language competencies

Language	Speaking	Reading	Writing
English	Mother tongue	Excellent	Excellent
Afrikaans	Satisfactory	Satisfactory	Satisfactory
Urdu	Basic	Basic	Basic
Zulu	Basic	Basic	None

3 Employment

Table 3-1: Employment history

Period	Employing organization	Title/position (highest held)
05/2018 – present	Digby Wells Environmental	Senior Social Consultant
2015 – 04/2017	Independent Consultant	Senior Consultant: Sustainable Development and Socio-economic Impact Assessment
10/2005 – 2014	SRK Consulting	Senior Environmental Scientist
06/2003 – 08/2005	Wendy Ovens and Associates	Senior Consultant
10/2002 – 4/2003	University of the Witwatersrand	Sustainable Urban Development Research Co-ordinator
02/1994 – 9/2002	City of Johannesburg	Specialist: Environmental Planning and Management
01/1991 – 12/1993	L.M.S. Secondary School, Johannesburg	Teacher, Mathematics and Science
1988 - 1990	Novo-Nordisk Pharmaceuticals, Johannesburg.	Microbiologist and Chemist
1988	South African Institute for Medical Research, Johannesburg	Laboratory Assistant, Public Health Laboratory
1986	Medunsa University, South Africa	Demonstrator and Tutor in Anatomy

4 Countries of Work Experience

South Africa, Democratic Republic of Congo, Tanzania, United Kingdom, United States of America, Zambia, Zimbabwe,. Work tours in Chile and Denmark.

5 Project Experience

Table 5-1: Select project experience

Type of Project:	International Sustainable Development Partnership Facilitation and Co-ordination
Location:	Sub-Saharan Africa: Tanzania and South Africa. United States of America
Project duration & year:	January 2017 to April 2018
Client:	Pyxera Global
Name of Project:	Global Pro Bono
Project Description:	Plan and manage implementation of <i>pro bono</i> support programs for large corporations (for example, SAP and IBM), to progress Sustainable Development Goals.
Job Title and Duties:	Regional Global Pro Bono (GPB) Co-ordinator: Sub-Saharan Africa. Identify and liaise with potential in-country government and non- government (NGO) partners and international business clients, to develop Terms of Reference for partnership planning and implementation. Manage logistics and programme implementation for partnership outputs and outcomes. Provide inputs for Pyxera Global strategy in the region, including development of proposals.

Type of Project:	Socio-economic Impact Assessments and Management for Sustainability Reporting.
Location:	Four Petra Diamonds Operations in Free State, Northern Cape and Gauteng provinces in South Africa
Project duration & year:	August 2015 to September 2016
Client:	Petra Diamonds
Name of Project:	Social Impact Assessments for four Petra Diamond Mines' Global Reporting Initiative (GRI) G4 Sustainability Reporting
Project Description:	Undertaking Socio-economic Impact Assessments for Petra Diamonds, for its Cullinan, Kimberley, Finsch and Koffiefontein operations, in preparation for Petra's Global Reporting Initiative (GRI) G4 Sustainability Reporting Initiative.

Job Title and Duties:	<p>Socio-economic Impact Assessment (SIA) Practitioner.</p> <p>Preparation of status quo and assessment of significant socio-economic impacts and risks for four Petra operations in South Africa. The SIA was undertaken to meet the GRI G4 reporting requirements. Desktop research and extensive stakeholder engagements were undertaken and integrated into assessment reports. Strategies and management measures were recommended to enhance positive impacts and reduce negative impacts. Reports were presented to Petra Corporate, Mine Management and Labour. Findings will also be used to inform future Social and Labour Plans and Corporate Social Investment.</p>
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Type of Project:	Social and Labour Plan (SLP)
Location:	Lephalale, Limpopo province
Project duration & year:	September 2017 to April 2018
Client:	Glenover Phosphate Pty (Ltd)
Name of Project:	Social and Labour Plan for Glenover Mine
Project Description:	Prepare Social and Labour Plan as part of Mining Right Application. Included the preparation of Human Resources Development Plan and Local Economic Development Plan, for the Glenover Mine.
Job Title and Duties:	Project Manager, stakeholder engagements and liaison for identification of impacts and community needs, for preparation of SLP.

Type of Project:	Managing international partnerships for building capacity in water sector
Location:	South Africa and the United Kingdom
Project duration & year:	2.5years, 2007 to 2010
Client:	United Kingdom Department for International Development (UK DFID) and UK Non-Profit Organisation, Partners for Water and Sanitation (PAWS, later changed to PfWS) based at University of Loughborough's Water and Engineering Development Centre (WEDC).
Name of Project:	United Nations' Partnership for Sustainable Development registered Partners for Water and Sanitation capacity building programme

Project Description:	Building capacity in the South African water and sanitation sector to progress its Millennium Development Goals (MDGs) for water and sanitation. Technical and management capacity was built in relevant spheres of government for improvements in regulation of drinking water and effluent quality, water safety plans, wastewater treatment works operations, water conservation/ water demand management, customer care and asset management. Project presented at the Water, Engineering and Development Centre (WEDC) International Conference, Addis Ababa 18-22 May 2009.
Job Title and Duties:	South Africa Country Manager. Revised and implemented programme strategy. Consulted government stakeholders in national, provincial and local spheres to identify capacity building needs. Worked with PfWS to identify UK partners to build capacity to improve South African water and sanitation services delivery. Managed capacity building projects and deliverables for South Africa. Liaison and reporting to clients and UK partners including donors.

6 Professional Affiliations

Table 6-1: Professional registrations

Dates	Professional Body	Position
1999 to present.	Water Institute of Southern Africa (WISA),	Member

7 Publications and Papers

- “Implementing the Partners for Water and Sanitation model of capacity building in South Africa” A.O. Ismail and R. E. Scott. Presented at the Water, Engineering and Development Centre (WEDC) International Conference, Addis Ababa 18-22 May 2009.
- “The state of our environment: Safeguarding the foundation for development.” Donald Gibson, Amina Ismail, Darryll Kilian and Maia Matshikiza in State of the Nation: South Africa 2008. Kagwanja, P. & Kondlo, K. (eds) (2009) Cape Town: HSRC Press
- “Environmental Health in the West Coast: The Decentralisation Quandary”. R. Cameron and A.O. Ismail. Journal of Public Administration Vol 41 No 2 June 2006.
- “A survey of blood lead levels among young Johannesburg school children”. A. Mathee, Y. E. R. von Schirnding, J. Levin, A. Ismail, R. Huntley and A. Cantrell. Environmental Research Volume 90, Issue 3,

November 2002, Pages 181-184.

- "Waste Disposal Practices in Urban Communities - Use of the 'BASNEF' (Beliefs, Attitudes, Subjective Norms and Enabling Factors) Model to Address Illegal Dumping". Poster presented at the Poverty and Inequity Conference of the Epidemiological Society of Southern Africa (ESSA). February 2000 East London, South Africa.
- "The Application of 'Hazard Analysis Critical Control Point' (HACCP) systems for safe street food in South Africa" presented at the 'National Workshop on Street Food' hosted by Department of Health, Pretoria 1997.
- "Survey of blood lead burdens among school children and newborns in Greater Johannesburg". Angela Mathee, Yasmin von Schirnding, Amina Ismail and Renaire Huntley. Urbanization and Health Newsletter June- September 1996.