



# **SOCIAL ASSESSMENT FOR THE PROPOSED SIGMA COLLIERY ASH BACKFILLING PROJECT**

**SASOL MINING (PTY) LIMITED**

**OCTOBER 2013**





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**Report Title:** Social Assessment for the Proposed Sigma Colliery Ash Backfilling Project

**Project Number:** SAS1691

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## EXECUTIVE SUMMARY

### Introduction

This document presents the results of a social assessment for the proposed ash backfilling project for Sasol Mining's (Pty) Ltd (Sasol) Sigma Colliery located near Sasolburg in the Free State Province, South Africa. The following terms of reference (ToR) was developed for the assessment:

- Update the socio-economic baseline description using 2011 Census statistics; and
- Identify potential social risks and impacts that may arise as a direct result of the proposed project activities, as well as indirectly as a result of impacts on other aspects of the environment (such as ground and surface water).

Three concentric study areas were defined for the purposes of this study, as follows:

- The **site-specific study area** – defined as the municipal ward in which the proposed project infrastructure is to be located, namely Ward 14 of the Metsimaholo Local Municipality.
- The **local study area** – defined as Sasolburg, located directly adjacent the site-specific study area and made up of Wards 15, 16 and 17 of the Metsimaholo Local Municipality, and Zamdela, a lower-income residential area just south of Sasolburg, made up of Wards 2, 8, 9, 10, 11, 12 and 13 of the same local municipality.
- The **regional study area** – defined as the Metsimaholo Local Municipality and Fezile Dabi District Municipality.

### Methodology

The methodology according to which this assessment was conducted included secondary data collection by means of a desktop review and consultation with other specialists (including the public participation team), the compilation of a socio-economic baseline profile, and the identification of potential social risks and impacts.

### Project description

The Sigma Colliery project proposes to backfill potential mine voids with ash in order to stabilise old underground mine workings and reduce the risk of subsidence. The ash backfilling process will utilise several pipelines located above ground to transport the ash slurry from the Infrachem ash pump station to the underground voids. The proposed pipeline will be constructed as the filling progresses, and will run within existing servitudes where possible. Where this is not possible, existing culverts and crossings will be used, alternately, new agreements will be negotiated with landowners.

### Baseline profile of the site-specific and local study areas

The Metsimaholo Local Municipality has a total population of just more than 149 000 individuals divided into almost 45 800 households, 62% of whom are residing in Zamdela. The local municipality has experienced a growth rate of 2.5% per annum, which is much higher than that of the district municipality. Migration into the municipality is focused towards Sasolburg, Deneysville and Oranjeville (including their lower income residential areas).

The Black African racial group is dominant in the MLM, as well as in Zamdela where all the residents belong to this group. Just more than 60% of Sasolburg's residents, and almost 80% of residents in Ward 14, are White. Afrikaans and Sesotho are the dominant languages.

Individuals resident in Ward 14 and Sasolburg are better educated than those in Zamdela, where only 36% of individuals have either completed their secondary or tertiary education. The proportion of the population with either no schooling (5%), or only some primary schooling (14%) is also much higher in Zamdela than the other areas.

Only 43% of the local municipality's population is contributing towards the local economy, compared to 40% in Zamdela, 68% in Ward 14 and 58% in Sasolburg. The average household income is lowest in Zamdela, where approximately 14% of households have no income, and a further 30% a monthly income of R1 600 or less.

The provision of services is lower in Zamdela than Ward 14 or Sasolburg, but is by no means poor. The local municipality is experiencing a housing backlog of about 40 000 houses, 15 000 of which are needed in Zamdela. Both Sasolburg and Zamdela are currently constrained for future growth by the undermined areas (and the potential risk associated with subsidence over them), and by future mining and prospecting opportunities located in and around the town.

### Potential social impacts and risks

The potential social impacts and risks that may result from the proposed project activities are limited, mainly due to the nature of the proposed project and the receiving environment. Potential positive impacts pertain to the creation of a safer physical environment. Negative impacts and risks pertain to a perceived safety risk, impact on livelihood activities, disruption of movement patterns and other, relatively minor, nuisance impacts. Additional impacts and risks may arise as more detailed information about the proposed project comes to light.

### Recommendations

The following recommendations are made to aid the successful implementation of the proposed project:

- The management measures that come into effect in the event of a pipe burst should include the management of the social milieu (particularly the private landowners in Ward 14). A clear consultation strategy should be in place, which includes a stakeholder notification and feedback process regarding the burst and its cleanup, as well as a grievance mechanism that enables stakeholders to notify Sigma Colliery of any potential adverse impacts directly related to the burst;

- Where new pipes have to be laid, Sigma Colliery's intension to do so along property boundaries and on Sasol property should be adhered to as far as possible, so as to minimize the impact construction will have on private landowners. Where pipes have to be laid on privately owned land, the alignment of these pipes should be decided on in conjunction with the land owner;
- Private landowners should be informed of construction and operation activities, particularly when this takes place on properties adjoining theirs;
- For the peace of mind of landowners in the immediate vicinity of the proposed project infrastructure, construction workers should be easily identifiable through, for example, uniforms or identification tags. This will likely reduce the landowners' suspicion of individuals working in the vicinity of their property;
- Surrounding land owners should be kept abreast of any possible changes relating to Sigma Colliery's provision of piped water. Even if such changes are not in sight, land owners should be reassured of their water supply; and
- Stakeholders (including the MLM and the DMR) should be informed once the backfilled areas have been stabilised and are safe for the construction of infrastructure.

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## Acronyms and abbreviations

BA	Basic Assessment
FDDM	Fezile Dabi District Municipality Region
IDP	Integrated Development Plan
MLM	Metsimaholo Local Municipality
NEMA	National Environmental Management Act
PPP	Public Participation Process
SDF	Spatial Development Plan

## 1 INTRODUCTION

### 1.1 Context and terms of reference

This document presents the results of a social assessment for the proposed ash backfilling project for Sasol Mining's (Pty) Ltd (Sasol) Sigma Colliery located near Sasolburg in the Free State Province, South Africa. The social assessment is one of ten specialist studies conducted as part of the Basic Assessment (BA) for the proposed project, in aid of an integrated Environmental Authorisation application in terms of the National Environmental Management Act, Act 107 of 1998 (NEMA) and associated license applications. The other specialist studies are as follows:

- Fauna and flora impact assessment;
- Wetlands assessment;
- Aquatic assessment;
- Noise impact assessment;
- Visual and topographical impact assessment;
- Geohydrological assessment;
- Surface water assessment;
- Archaeological and heritage baseline study; and
- Legal assessment.

The necessity for a social assessment was identified during a gap analysis conducted by Digby Wells Environment (Digby Wells) in July 2013. The following terms of reference (ToR) was developed for such an assessment:

- Update the socio-economic baseline description using 2011 Census statistics; and
- Identify potential social risks and impacts that may arise as a direct result of the proposed project activities, as well as indirectly as a result of impacts on other aspects of the environment (such as ground and surface water).

### 1.2 Legal framework

The social specialists are cognisant of the following pieces of national legislation relevant to the proposed project:

- The ***National Environmental Management Act*** (NEMA; Act 107 of 1998), which provides the legal framework for implementing the state's constitutional obligations with regard to environmental management. NEMA sets forth a number of principles for guiding decision-making on proposed activities that could affect the social, economic and biophysical environment. The following principles are relevant to a social assessment:



- Decisions regarding a proposed activity should not only be based on their environmental impact and economic feasibility, but should also take into account their social sustainability;
  - Decisions must take into account the interests, needs and values of all interested and affected parties, and must recognise all forms of knowledge, including traditional and ordinary knowledge;
  - The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated and decisions must be appropriate in the light of such considerations and assessment; and
  - Decisions must be taken in an open and transparent manner and access to information must be provided in accordance with the law.
- The **Occupational Health and Safety Act** (Act 85 of 1993): The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, as far as reasonably practicable, the employers must ensure that their activities do not expose *non-employees* to health hazards.
  - **Mine Health and Safety Act** (Act 29 of 1996): To provide for protection of the health and safety of employees and other persons at mines and
  - **The Constitution**: outlines the objectives and development duties of municipalities (S152 and S153). Section 155 further outlines categories of municipalities.
  - The **Development Facilitation Act** (Act 67 of 1995), which sets out the principle that policy, administrative practice and laws should support effective integrated planning, the optimal use of existing resources, the promotion of sustainable development, the requirement that land use should be judged on its merits.

### 1.3 Structure of the report

The remainder of this report is structured as follows:

- Section 2 details the methodology employed for the social assessment and includes details on the study areas, the data collection activities, information on the completion of the baseline profile, as well as the identification of project-related risks and impacts.
- Details of the proposed project are presented in Section 3, which includes background information, as well as description of the construction and operational activities associated with the proposed project.
- Section 4 provides a baseline description of the study area, and includes the socio-economic context of both the regional and local study areas.
- Section 5 is dedicated to the identification and assessment of potential social risks and impacts that may arise as a result of both the proposed project, as well as

impacts on other aspects of the environment. It includes the identification of “triggers” that may give rise to additional social risks and impacts.

- Finally, Section 6 presents the main conclusions of the social assessment, as well as high-level recommendations aimed at minimising the probability and severity of the negative risks, and enhancing the potential for positive social impacts to materialise.

## 2 METHODOLOGY

The activities undertaken as part of the assessment are outlined below.

### 2.1 Definition of the study areas

Study areas were defined for this social assessment based on the type of risks and impacts each area is expected to experience as a result of the proposed project. Generally the social risks and impacts of a project can be divided into three broad categories, as follows:

- Impacts related to the **physical intrusion** of project infrastructure and **project-related activities** on the surrounding environment (which may include risks relating to and impacts arising from land acquisition, noise and changes in the visual characteristics of the landscape);
- Impacts related to concomitant risk of increased social pathologies and community conflict); and
- **Indirect** or **induced** risks and impacts that are by-products or ripple-effects of the risks and impacts in the foregoing two categories. These could include increased pressure on local services and resources (as a result of population influx), multiplier effects in the local and regional economy (as a result of the creation of new jobs and project-related expenditure), macroeconomic benefits of the project and benefits derived from corporate social investment by the project proponent.

Accordingly, three concentric study areas were defined for the purposes of this study, corresponding to the three categories of impacts listed above. The study areas are as follows:

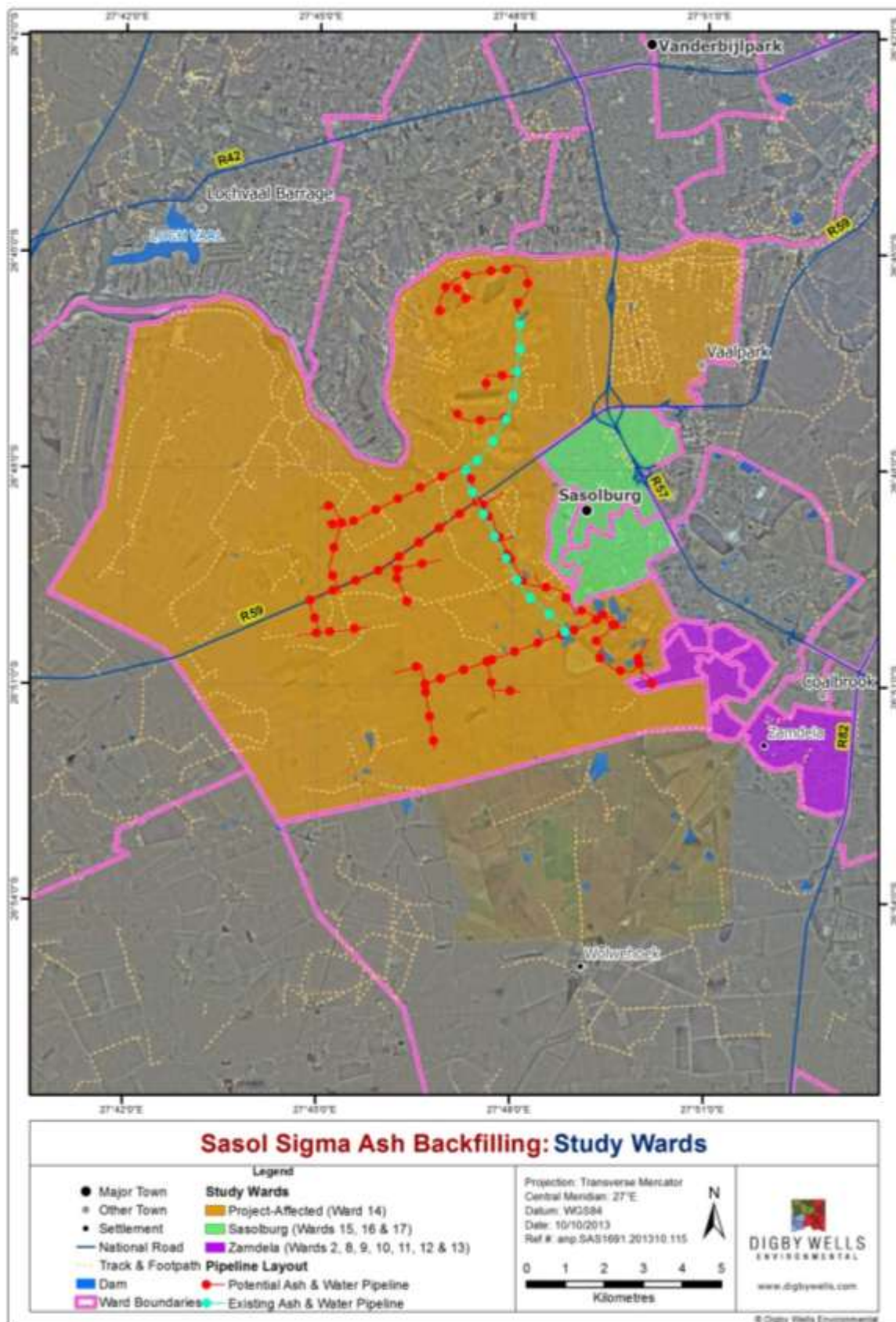
- The **site-specific study area** – the area likely to experience impacts related to the physical intrusion by project infrastructure and project-related activities. This study area is defined as the municipal ward in which the proposed project infrastructure is to be located, namely Ward 14 of the Metsimaholo Local Municipality (MLM) (refer to Plan 1).
- The **local study area** – the area likely to experience impacts related to the “economic pull” exerted by the project. This area is defined as (a) Sasolburg, located directly adjacent the site-specific study area and made up of Wards 15, 16 and 17 of

the MLM, and (b) Zamdela, a lower-income residential area just south of Sasolburg, made up of Wards 2, 8, 9, 10, 11, 12 and 13 of the MLM (refer to Plan 1).<sup>1</sup>

- The **regional study area** – the area likely to experience the indirect or induced impacts of the project. This area is defined as the MLM and Fezile Dabi District Municipality (FDDM), which includes the towns of Parys, Kroonstad, and Villiers (see Plan 2).

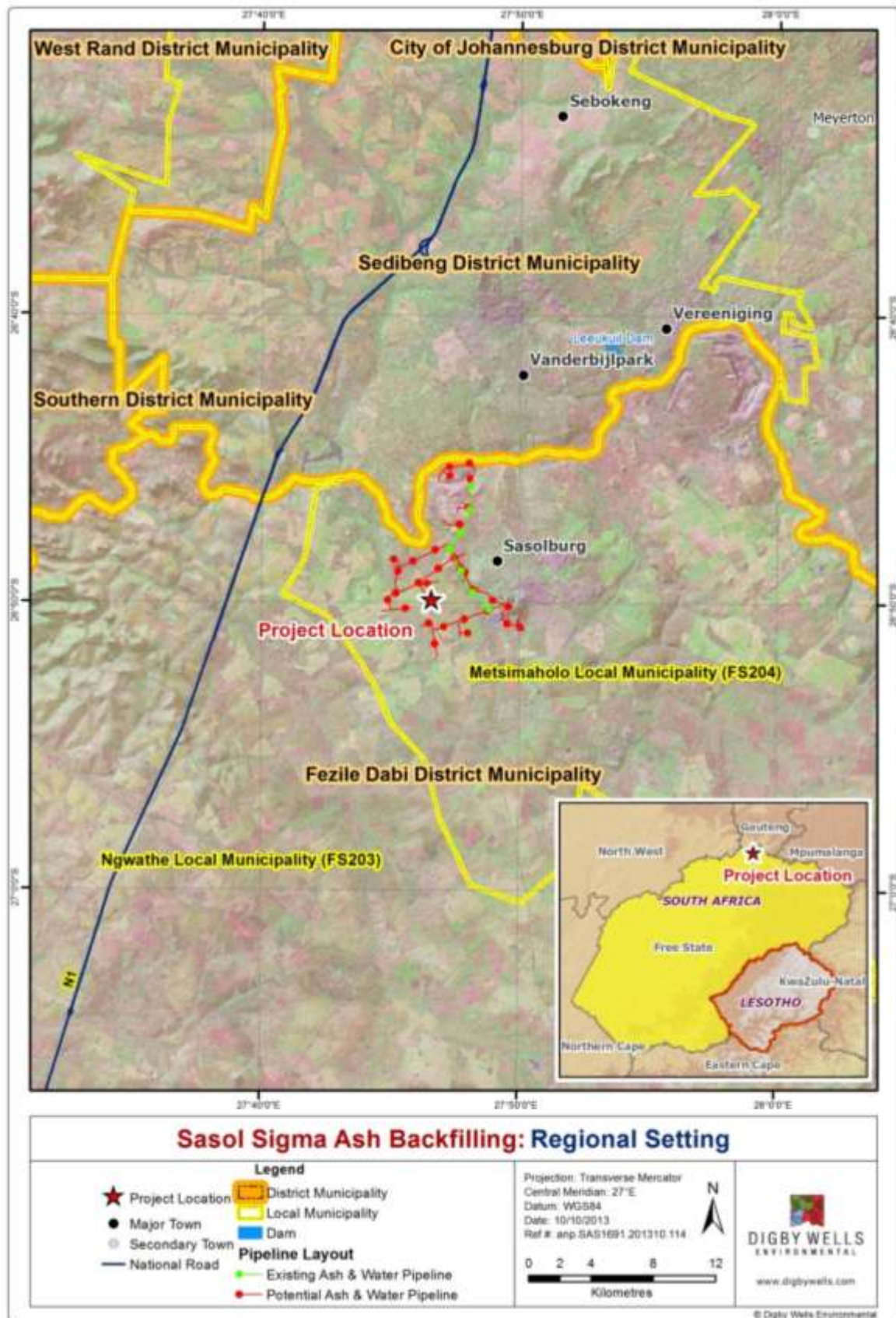
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<sup>1</sup> Only the residential areas within Sasolburg were included in the study area. The exclusion of the industrial area is motivated by the fact that its secondary data is very different to that of a residential area and would thus have distorted the socio-economic characteristics of Sasolburg. Similarly, small sections of Zamdela were excluded as these areas comprise a small percentage of much larger wards. Including the secondary data for these wards would have resulted in a misrepresentation of the socio-economic conditions within Zamdela itself.



Plan 1: Site-specific and local study areas





Plan 2: Regional study area

## 2.2 Data collection

The information presented in this document was obtained through the following data collection activities:

- A **desktop review** of available documents to obtain relevant baseline socio-economic information on the different study areas. Documents reviewed include the following:
  - Integrated Development Plans (IDPs) and Spatial Development Plans (SDFs) of the local and district municipalities;
  - Census 2011 data;
  - Previous reports concerning the proposed project, specifically the gap analysis completed by Digby Wells in 2013;
  - Available maps and satellite imagery.
- **Information from other specialist studies.** The specialist studies conducted as part of the BA are listed in Section 1.1 above. Many of these specialist studies focus on impacts that have possible, although indirect, social implications. For example, the noise impact assessment focuses more on the level of noise that will be generated as a result of construction and operational activities and how this will change the ambient noise levels in the area, as opposed to investigating the effect this noise will have on the quality of life for the surrounding landowners and communities. The social assessment thus included a review of the findings of these specialist studies to aid the identification of socially relevant risks and potential impacts.
- **Information from the public consultation process**, including the Background Information Document and Comments and Response Report. Reviewing this information provided the social specialist with information regarding the concerns, attitudes and perceptions relating to the proposed project.

## 2.3 Compilation of a socio-economic baseline profile

On the basis of the information collected through the desktop review, a socio-economic baseline profile was compiled of the study areas defined in Section 2.1. Topics considered as part of this profile include the following:

- Population size, growth rate and migration;
- Demographic characteristics;
- Education;
- Employment and income; and
- Access to services.

## **2.4 Identification of potential social risks and impacts**

Social risks associated with the proposed project activities, as well as potential impacts that may arise as a result of the project were identified on the basis of information obtained through the public participation process (PPP) and specialist opinion. In light of the identified risks and potential impacts, recommendations aimed at aiding the successful implementation of the project are also made.

## **3 PROJECT DESCRIPTION**

### **3.1 Background information**

Sasol's Sigma Colliery commenced operations in 1952 holding mineral rights to coal deposits in the Sasolburg district. Underground mining methods were the primary method of extracting these reserves, including board-and-pillar, rib pillar, long wall and high extraction methods. Access to the underground operations was via several shafts and then conveyed to a "dry" coal handling plant at 3 Shaft where the coal was screened and fed to silos. In 1992, the Wonderwater and Mohlolo strip mines were developed to extract coal from the north-eastern side of the reserves and the underground mining was scaled down and ceased by 1999.

As a result of the underground mining activity, subsidence of the surface was identified as a risk. An Assessment Report on Surface Areas of Old Sigma Workings (Potential Failure Report) was compiled in 2012 and analysed the probability of incident occurrence on the properties overlaying the Sigma Workings, their current preventative or mitigation measures, the proposed next steps and immediate actions required. This report informed that some properties / areas, such as the Parys road (R59), are rated as having a very high potential risk due to incidences that can lead to possible injury. Sigma Colliery backfilled mine workings located beneath the Sasolburg-Parys Road (R26), certain privately owned farms and the sewage works (starting in 1992), to minimise the risk in the area, an intervention that has had a positive outcome.

The project component for which this social assessment is being conducted is aimed at backfilling additional high risk mine voids with ash from Infrachem. The project will be undertaken in order to stabilise old underground mine workings which are deemed to have a high potential risk for land subsidence, as determined in the Assessment on Surface Areas of Old Sigma Workings Report mentioned above. The ash backfilling process will utilise several pipelines located above-ground to transport the ash slurry (comprising 20% fine ash and 80% water) from the Infrachem ash pump station at Infrachem, to the undermined voids areas. The return water pipelines (some of which are already in place) will be used to dewater the voids prior to backfilling to prevent decant as a result of hydrostatic pressure. The water that will be pumped out will be sent for treatment at a planned Sasol Group water treatment plant (the authorisation of which is beyond the scope of this project).

## 3.2 Operations

The Sigma Colliery project proposes to backfill potential mine voids with ash in order to stabilise old underground mine workings and reduce the risk of subsidence. The ash backfilling process will utilise several pipelines located above ground to transport the ash slurry (comprising 20% fine ash and 80% water) from the Infrachem ash pump station to the underground voids. Infrachem has approximately 10 Million cubic meters of ash to use for backfilling and stabilising the surface.

The proposed pipeline will be constructed as the progresses. Sigma Colliery will, at all times, have one pipe for filling the void, and three additional pipes ahead of it. This will serve as a contingency plan, should something go wrong in the respective void being backfilled (e.g. should the void fill up at a faster rate / earlier than anticipated), they can move to the next void.

The proposed pipeline will run aboveground on property owned by both Sigma Colliery and private land owners, and within existing servitudes where possible. Where this is not possible, existing culverts and crossings will be used; alternatively new arrangements will be negotiated with landowners. The pipeline route will be specifically selected to ensure that the pipes run along existing servitudes, linear infrastructure and disturbed areas to minimise the impact on the receiving environment.

## 4 SOCIO-ECONOMIC BASELINE PROFILE

### 4.1 Regional study area

The project area falls under the jurisdiction of the Metsimaholo Local Municipality (MLM), which is situated in the northern part of the Fezile Dabi District Municipality (FDDM). The FDDM is one of five district municipalities in the Free State Province; its neighbouring municipalities include Sedibeng (Gauteng), Gert Sibande (Mpumalanga), Dr Kenneth Kaunda (North West), Lejweleputswa (Free State) and Thabo Mofutsanyane (Free State). Fezile Dabi covers an area of about 21 300km<sup>2</sup> and has a population of approximately 500 000 people (just less than a fifth of the province's population) resident in 38 different settlements, four of which are farming settlements, 15 formal urban towns, 17 urban townships and 2 informal urban settlements.

FDDM is not only home to the Sasol Ltd. group, but also produces a large percentage of South Africa's grain crops including maize, wheat and sunflowers. This area's climate is ideal for cultivation and supports its rich biodiversity. The district municipality is a major tourist destination as it plays host to South Africa's 7<sup>th</sup> world heritage site, Vredefort Dome, the world's largest and oldest meteorite crater. It also boasts with an array of nature reserves and the Vaal Dam, which is a main source of water.<sup>2</sup>

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<sup>2</sup> Fezile Dabi District Municipality (2013). Final Integrated Development Plan 2013 - 2014.



FDDM consists of four local municipalities namely Mqohaka, Ngwathe, Metsimaholo and Mafube. The project is located along the outskirts of Sasolburg in the MLM, the largest town in both the local and district municipalities. Sasolburg is the most prominent contributor to the local municipality's economy, and is the only town in the district where the private sector dominates the public sector, largely due to the predominant contribution Sasol makes to the chemical industry. As this town is located in the heart of worldly renowned coalfields, the economy is also supported by the manufacturing of a vast range of by-products, namely olefins, waxes, alcohols, tar products, inorganic chemicals, rubber, gases, plastics, fertilizers, etc.

The MLM has a total of about 149 000 inhabitations, of which roughly 90% are resident in urban (as opposed to rural) areas. This general tendency of migration from rural to urban areas can be attributed to the strong industrial and manufacturing character of this region, which holds the promise of potential employment. It is engagement in the agricultural sector that affords the populations in the rural areas their livelihood.

After Sasolburg, Deneysville and Oranjeville are the second and third largest towns in MLM. The economic activities in Deneysville and its lower income residential area (Refengkgotso) are insignificant compared to the larger industrial centers of Sasolburg (located 36km to the west), Vereeniging (50km north) and Vanderbijlpark (50km north-west). As a consequence, many of Deneysville and Refengkgotso's inhabitants work outside their home town, except for those involved in the boating industry. The agricultural sector is prominent in Oranjeville and its lower income residential area Metsimaholo, which is bound by three sides by the Vaal Dam. As a result of its location, it is relatively isolated from the rest of the region from a tourism perspective, limiting this sector's contribution to the local economy.

The Vaal River and Vaal Dam serve as a natural boundary between the Free State and Gauteng Provinces, and is often referred to as the Highveld's Inland Sea as it covers some 300 km<sup>2</sup>. It serves as a source of Gauteng's drinking water and is a popular water sports and adventure venue. A significant portion of the MLM is included in the Vaal River Complex Regional Structure Plan from 1996, which is a statutory land use control document applicable to, inter alia, land located along important water resources such as the Vaal Dam and Vaal River.<sup>3</sup>

## 4.2 Local and site-specific study areas

The local and site-specific study areas were defined in Section 2.1 as Ward 14, Sasolburg residential area, as well as Zamdela. The sub-sections below are each dedicated to an aspect of these areas' socio-economic baseline profile. Topics considered are population and demographic characteristics, education, employment, income and access to services.

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<sup>3</sup> Metsimaholo Local Municipality (2012), Final Integrated Development Plan 2012/13-2016/17

#### 4.2.1 Population size, growth rate and migration

As mentioned above, the MLM has a total population of just more than 149 000 individuals divided into almost 45 800 households. About 62% of the local municipality's population are resident in the informal settlement of Zamdela, which is experiencing continuous urban growth (refer to Table 1). This settlement is located close to the employment opportunities offered in both Sasolburg and other areas in the Gauteng Province (such as Vereeniging and Vanderbijlpark).<sup>4</sup> An additional 14% of the MLM's population resides in Sasolburg, and 7% in Ward 14 (the ward in which the proposed project infrastructure will be located).

**Table 1: Population size and distribution in the local study area**

Area	Total population (individuals)	Percentage of MLM
MLM	149 108	100%
Ward 14	10 627	7%
Sasolburg	21 375	14%
Zamdela	92 344	62%

The local municipality has experience a growth rate of 2.5% per annum, which is much higher than that of the district municipality (0.6% per annum) and highest of all the local municipalities in the FDDM (ranging between -0.5% and 0.2% per annum).

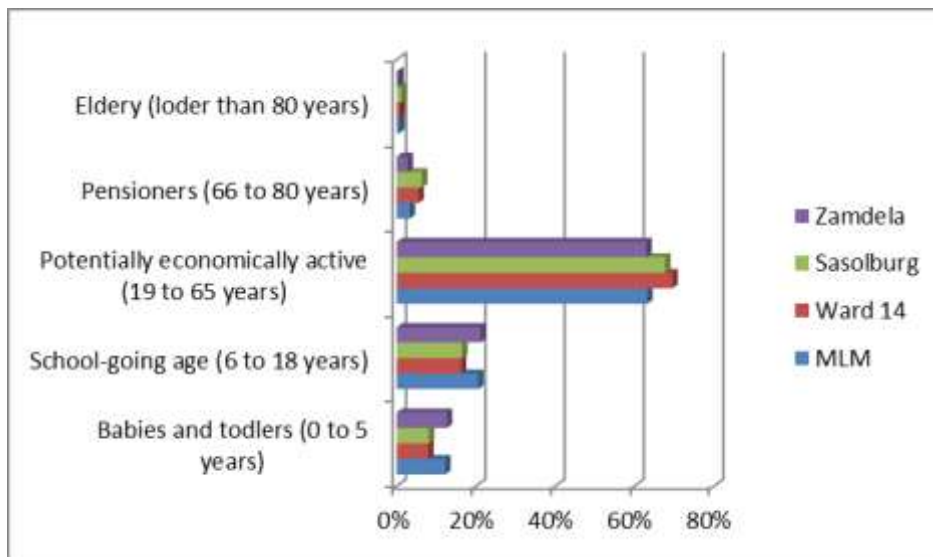
Migration into the municipality is focused towards Sasolburg, Deneyville and Oranjeville (including their lower income residential areas) presumably due the existing mining activities and the proximity of these areas to retail, factory, and industrial work opportunities. The migrant population consist of mostly unemployed job-seekers from rural areas in the MLM and neighbouring municipalities. People are also moving from smaller towns in the district into Sasolburg.<sup>5</sup>

#### 4.2.2 Demographic characteristics

As indicated in Figure 1, the age distribution in the site-specific and local study areas is largely similar: about a tenth of the population is aged five years or younger, roughly a fifth of school-going age (between six and 18 years), about two-thirds potentially economically active (aged 19 to 65 years), and between 3% and 6% are pensioners (aged 66 to 80 years). A very small percentage of the population (1% or less) is older than 80 years.

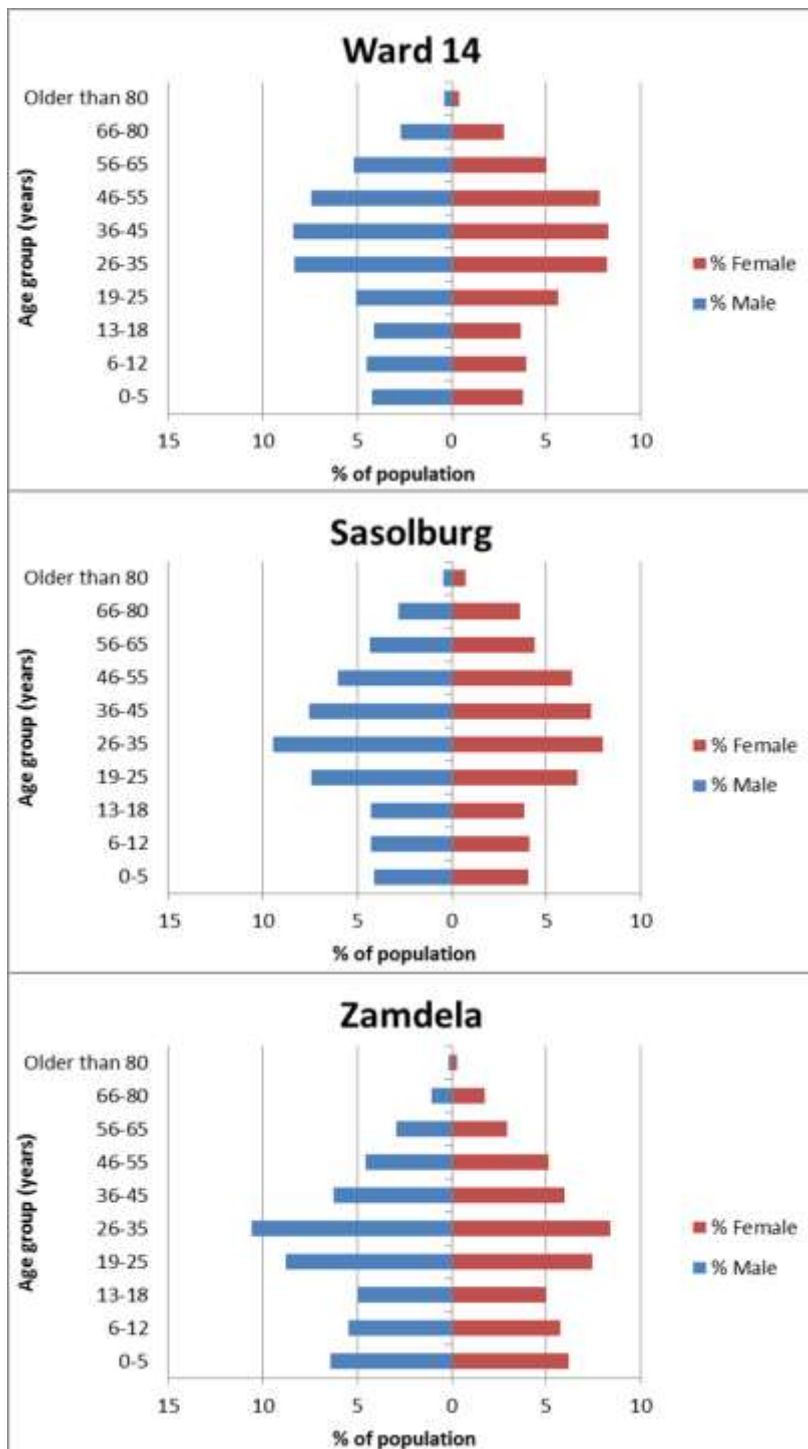
<sup>4</sup> Statistics South Africa (2012). Retrieved from [http://beta2.statssa.gov.za/?page\\_id=993&id=metsimaholo-municipality](http://beta2.statssa.gov.za/?page_id=993&id=metsimaholo-municipality)

<sup>5</sup> Metsimaholo Local Municipality. (2012). Spatial Development Framework: 2012 / 2013.



**Figure 1: Age distribution in the local study area**

The gender distribution is equal in all the areas under consideration, with the exception of Zamdela where 51% of the residents are male. This, coupled with the fact that the male cohort between the ages of 26 and 35 years is larger in Zamdela than the other areas under consideration, is indicative of a migrant population in search of employment opportunities in the area (see Figure 2).



**Figure 2: Age and gender distribution in the local study area**

As shown in Table 2, the Black African racial group is dominant in the MLM, as well as in Zamdela where all the residents belong to this group. Just more than 60% of Sasolburg’s residents, and almost 80% of residents in Ward 14 are White.

**Table 2: Racial distribution**

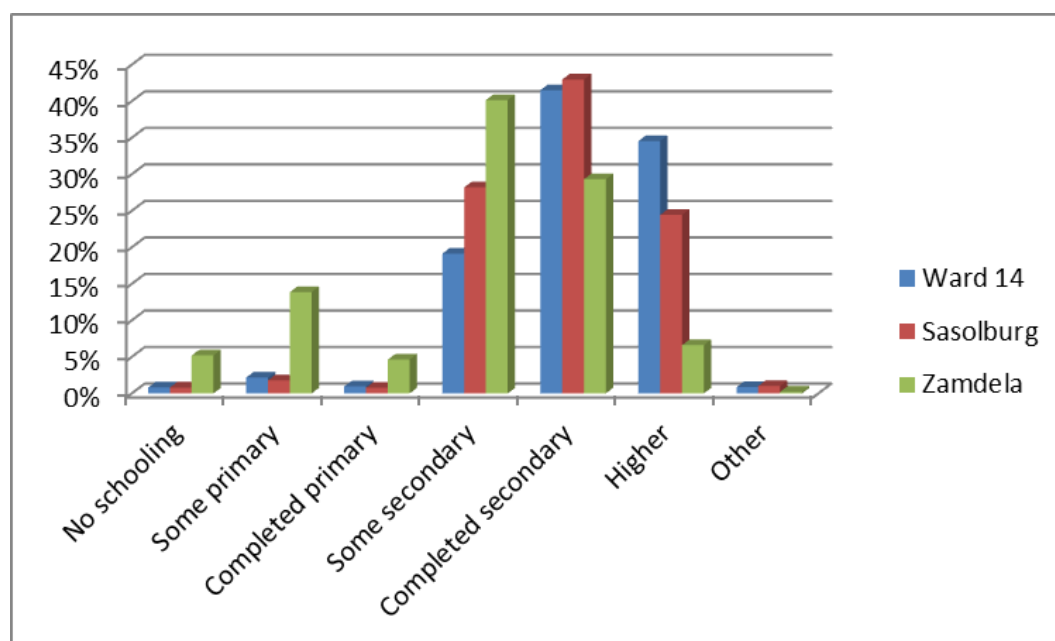
Population group	MLM	Ward 14	Sasolburg	Zamdela
Black African	82%	17%	37%	100%
White	16%	79%	61%	0%
Coloured	1%	1%	2%	0%
Indian or Asian	0%	1%	1%	0%
Other	0%	1%	0%	0%
Total	100%	100%	100%	100%

Afrikaans and Sesotho are the dominant languages in both the MLM and the study areas under consideration; Afrikaans is spoken by 73% of residents in Ward 14 and 58% in Sasolburg. Sesotho is the first language of about 70% of the population in Zamdela, as well as about a fifth of Sasolburg's population. English is the first language of about 7% of residents in Sasolburg, 11% in Ward 14, and only 1% in Zamdela.

### 4.2.3 Education

The highest level of education for individuals above the age of 18 is shown in Figure 3. This figure shows that individuals resident in Ward 14 and Sasolburg are better educated than those in Zamdela, where only 36% of individuals have either completed their secondary or tertiary education (compared to nearly three-quarters in both Ward 14 and Sasolburg). The proportion of the population with either no schooling (5%), or only some primary schooling (14%) is also much higher in Zamdela than the other areas.

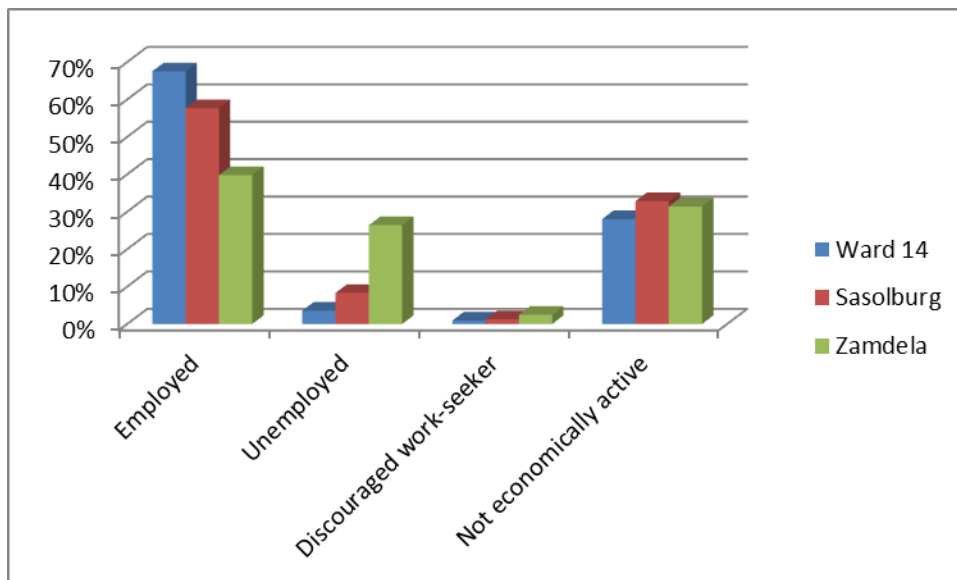
However, indications are that this discrepancy is being addressed among the younger generation, as 94% of individuals in Zamdela aged six to 18 years were attending school in 2011, compared to 96% in both Sasolburg and Ward 14.



**Figure 3: Highest level of education for persons older than 18 years in the local study area**

#### 4.2.4 Employment and income

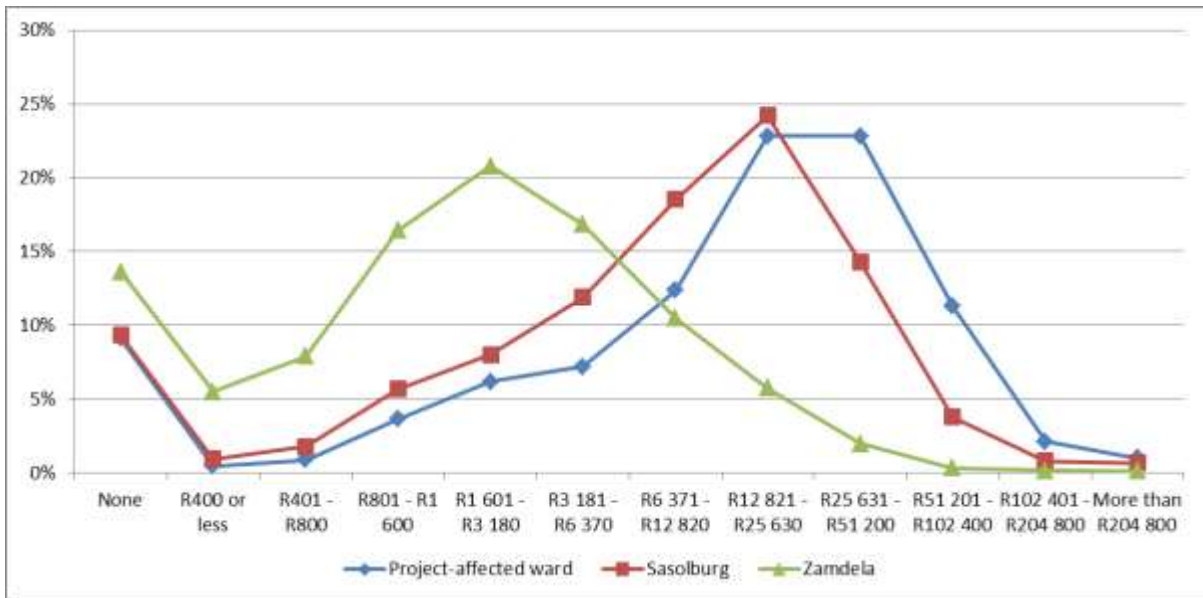
At a local municipal level, 23% of the population between the ages of 15 and 65 is either unemployed or classified as “discouraged work-seekers”, while a further 34% are not economically active. This leaves only 43% of the population actively contributing to the MLM’s economy. These statistics mimic that of Zamdela, where only 40% of residents between 15 and 65 years are employed, 28% either unemployed or “discouraged work-seekers”, and 31% not economically active (see Figure 4). In Ward 14 and Sasolburg, 68% and 58%, respectively, are employed. Of those who are employed, almost 90% in Ward 14 and Sasolburg, and 76% in Zamdela are employed in the formal sector, likely due to Sasol being a major employer in the area.



**Figure 4: Employment status of individuals between the ages of 15 and 65 in the local study area**

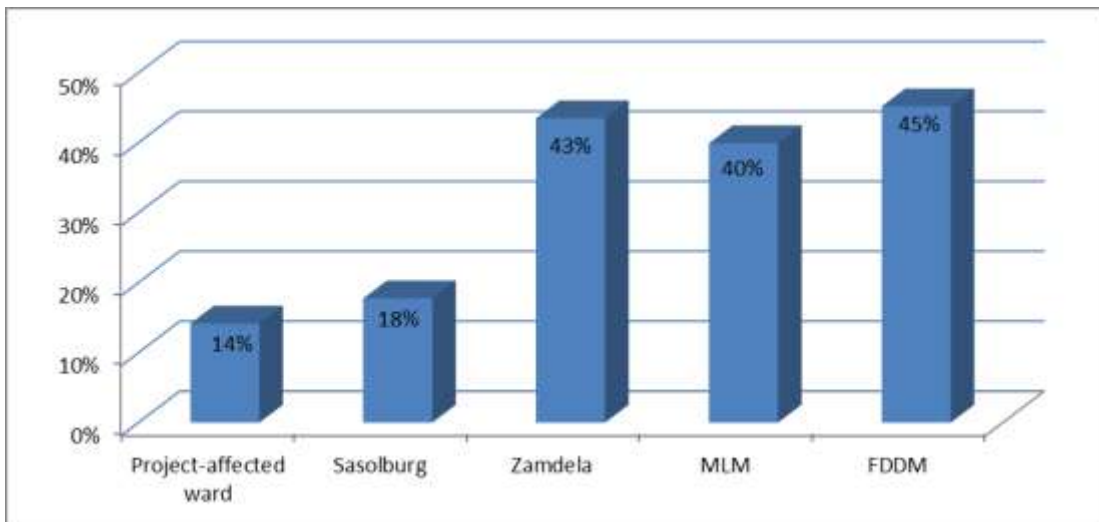
In the local study area, the average household income is lowest in Zamdela, where approximately 14% of households have no income, and a further 30% a monthly income of R1 600 or less (see Figure 5). An additional fifth of the population have a monthly income of R3 180 or less.

The income levels of Ward 14 are comparable to that of Sasolburg, where the largest proportion of households receives a monthly income of between R12 821 and R25 630. Despite the higher average household income, these two areas are also confronted with poverty, evidenced by almost 10% of its households not receiving any cash income. Of individuals between the ages of 19 and 64 years, 22% in Ward 14 have no income, 26% in Sasolburg and 47% in Zamdela.



**Figure 5: Monthly household income in the local study area**

Considering the food poverty line of R305 per person per month,<sup>6</sup> and the average household size of three members, any household with an income of less than R1 220 per month would be considered as living below the poverty line. As reflected in Figure 6, more than 40% of households in Zamdela find themselves in this category, which is on par with the local and district municipalities.



**Figure 6: Approximate percentage of households living on or below the poverty line**

<sup>6</sup> Statistics South Africa (2012). Poverty Profile of South Africa: Application of the poverty lines on the LCS 2008/2009.



#### 4.2.5 Access to services

As is evident from Figure 7, Sasolburg is the best serviced of the three areas under consideration; almost all the households (99% or more) resident in Sasolburg live in formal dwellings, and have access to electricity, a flush toilet, a refuse removal service and piped-water from a water scheme operated by the municipality or another water services provider. Service provision in Ward 14 is comparable to that of Sasolburg, with the exception of access to piped water and a refuse removal service. As the ward consists of mostly agricultural land, however, this is not necessarily a reflection of poor service provision; it is likely that households in this ward make use of borehole water.

As a lower-income residential area, it is not surprising that service provision is poorer in Zamdela than Sasolburg, although it is by no means unacceptable. More than 95% of households resident in Zamdela have access to electricity, refuse removal and piped water; however, there are more informal settlements in Zamdela (approximately 14% of dwellings), and about one in five households do not have access to a flush toilet.

With regards to housing, the MLM is experiencing a backlog of about 40 000 houses, which is increasing at the rate of about 3 000 houses annually.<sup>7</sup> In Zamdela, there is an estimated need for about 15 000 houses. Both Sasolburg and Zamdela are currently constrained for future growth by the undermined areas and by future mining prospecting opportunities located in and around the town. In response to the housing provision backlog, many people often are drawn to settle illegally on private or public property and provide themselves with inadequate, informal and illegal housing on informal or illegal settlements.<sup>8</sup>

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<sup>7</sup> Metsimaholo Local Municipality. (2012). Spatial Development Framework: 2012 / 2013.

<sup>8</sup> Metsimaholo Local Municipality. (2012). Spatial Development Framework: 2012 / 2013.

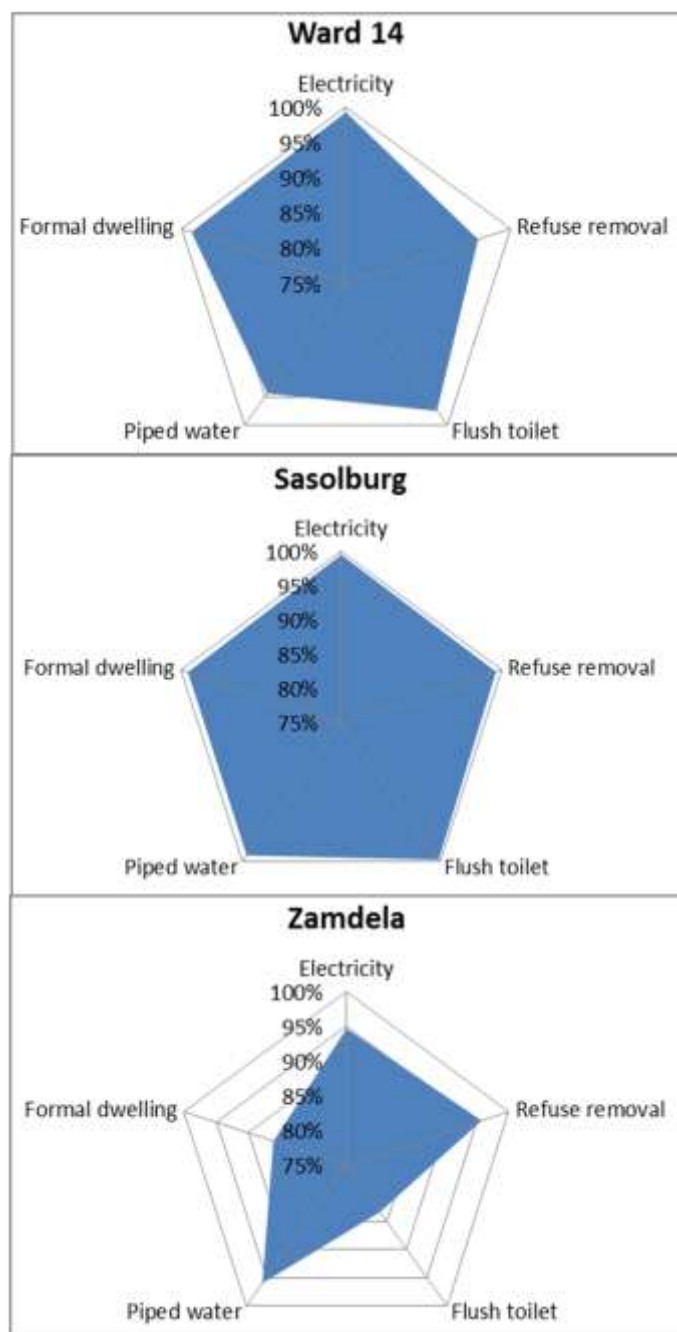


Figure 7: Access to services in the local study area

## 5 POTENTIAL SOCIAL IMPACTS AND RISKS

The impacts on the socio-economic environment expected to arise as a result of the proposed project are limited due to the following reasons:

- The construction and operational activities will mostly take place on either land owned by Sasol or along property boundaries (as opposed to transecting privately owned properties), no new employment opportunities will be created for individuals residing in the local study area, and the scale of the activities is relatively small.

- The local and regional study areas have been exposed to mining-related activities for many decades and are thus accustomed to such activities and the resultant changes it might bring to their environment. This reduces the potential impacts that may be experienced.
- Given the already scarred landscape, project-related activities may well be camouflaged among historical mining and current sand mining, or industrial activities taking place in the area, with the benefit that it will attract little attention and minimal expectations will be raised among job-seekers in the area.

Nevertheless, there are some social impacts likely to arise. These are as follows:

- **Potential positive impacts:**
  - Upon completion, the proposed project will create a **safer physical environment** for residents in nearby areas. As show in Plan 1, there are a number of footpaths running along undermined areas, implying that there is some degree of human and / or other activity above the voids that need backfilling. Given the potential risk of subsidence, the use of these footpaths may pose a safety risk to both people and livestock, albeit it a low risk. Once these voids have been filled, this risk will be significantly reduced, if not completely eliminated.
- **Potential negative impacts:**
  - Impacts on the natural environment could have indirect impacts on especially the livelihoods of surrounding landowners. Of particular relevance here is the **quality and quantity of groundwater**; it was mentioned in Section 4.2.5 that at least some of the landowners in Ward 14 are reliant on borehole water, presumably not only for household use, but also for agricultural and livestock purposes. Should the quality and quantity of underground water be further adversely affected by the proposed project, it will jeopardise the profitability (and possibly the sustainability) of livelihood activities dependent on underground water, including agricultural production and livestock husbandry. The issue of water supply is a sensitive topic among surrounding land owners, and the proposed project could increase the level of uncertainty regarding the provision of water to surrounding land owners. However, based on the groundwater report, there should not be any deterioration to groundwater as a result of this project.
  - Possible **disruption of movement patterns** (of both humans and livestock) in the event that pipes are constructed on private property, and not along existing servitudes or property boundaries; this could have a negative impact on land owners and their livelihoods. It is important for land owners to maintain their freedom of movement on their own property, and livestock grazing patterns should not be disrupted. As mentioned above, however, the intention is to avoid this impact as far as possible.
  - It is likely that some **nuisance impacts** may arise, particularly relating to noise pollution as a result of construction and operational activities. The significance of

these impacts is likely to be low, given that mining-related activities are an integral part of the study areas. Nevertheless, Sigma Colliery should be cognizant of these nuisance impacts as it could shed light on certain behaviours exhibited by stakeholders, such as a change in attitude towards the proponent. It should be noted that Sigma Colliery has never received any nuisance complaints relating to an ash backfilling project.

The above risks and impacts are identified based on the information currently available about the construction and operational activities. Additional social impacts could arise as more information becomes available. For example:

- If it transpires that the proposed project will give rise to new employment opportunities, and if a substantial percentage of these opportunities will go to members of the local population, this will constitute a positive impact on the socio-economic environment.

## 6 CONCLUSIONS AND RECOMMENDATIONS

The potential negative social impacts and risks that may result from the proposed project activities are limited, mainly due to the nature of the proposed project and the receiving environment. Potential positive impacts pertain to the creation of a safer physical environment. Negative impacts and risks pertain to a perceived safety risk, impact on livelihood activities, disruption of movement patterns and other, relatively minor, nuisance impacts. Additional impacts and risks may arise as more detailed information about the proposed project comes to light.

The following recommendations are made to aid the successful implementation of the proposed project:

- The management measures that come into effect in the event of a pipe burst should include the management of the social milieu (particularly the private landowners in Ward 14). A clear consultation strategy should be in place, which includes a stakeholder notification and feedback process regarding the burst and its cleanup, as well as a grievance mechanism that enables stakeholders to notify Sigma Colliery of any potential adverse impacts directly related to the burst;
- Where new pipes have to be laid, Sigma Colliery's intention to do so along property boundaries and on Sasol property should be adhered to as far as possible, so as to minimize the impact construction will have on private landowners. Where pipes have to be laid on privately owned land, and where some flexibility of the alignment exists, the alignment of these pipes should be decided on in conjunction with the land owner;
- Private landowners should be informed of construction and operation activities, particularly if this will take place on properties adjoining theirs;
- For the peace of mind of landowners in the immediate vicinity of the proposed project infrastructure, construction workers should be easily identifiable through, for

example, uniforms or identification tags. This will likely reduce the landowners' suspicion of individuals working in the vicinity of their property;

- Surrounding land owners should be kept abreast of any possible changes relating to Sigma Colliery's provision of piped water. Even if such changes are not in sight, land owners should be reassured of their water supply; and
- Stakeholders (including the MLM and the DMR) should be informed once the backfilled areas have been stabilised and are safe for the construction of infrastructure.