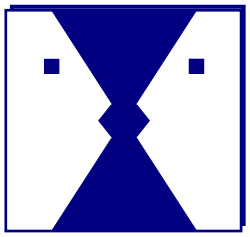
Tetra4 Cluster 2 Gas Production Project

Social Impact Assessment



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Prepared for:
EIMS

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Executive Summary

The purpose of this document is to provide a baseline description of the receiving socio-economic environment and to identify social impacts associated with the expansion of the Tetra4 natural gas operations project.

The receiving environment is located in the Masilonyana and Matjhabeng Local Municipalities that are located in the Lejweleputswa District Municipality in the Free State Province. The closest towns are Welkom, Virginia and Theunissen. The economy of the district relies heavily on the gold mining sector. Agriculture is also one of the key drivers of the economy.

The Cluster 1 project is in the process of being implemented. The proposed Cluster 2 project will impact on high quality agricultural soil which is used to grow crops that contribute to food security in South Africa. One of the most significant potential social impacts associated with the proposed project is the potential impacts on livelihoods of the farming community. There are high levels of uncertainty about exactly how the Cluster 2 project will unfold. Farmers fear that their land rights and property values will be affected. The project will require access to farms, and because of the current socio-political issues in South Africa, this is a sensitive matter. Farmers are concerned about the impact of the Cluster 2 project on their existing way of life, and on the infrastructure on their farms. Although they are appreciative of Tetra4's efforts to communicate with them, there has been instances where the communication was insufficient, of where some of the Tetra4 staff have not followed procedures that was agreed to.

A number of stakeholder groups will be affected by the proposed project, and the most affected groups are the farmers and farm workers. Although the Tetra4 project will have a positive economic impact in South Africa, the direct benefit for the local communities is limited. The job creation benefits, both primary and secondary are not significant. Therefore, it is of utmost importance that the local social impacts must be managed and monitored to the best of Tetra4's ability, since the parties who pay the social cost of the development will not be beneficiaries of the development.

Based on the findings of this study, the following key recommendations are made:

- There is a possibility that Tetra4's activities will cause economic displacement for some of the affected farmers. The actual impact on their livelihoods must be assessed by an agricultural economist and compensation must be done according to international best practice;

- There are several questions from the landowners that Tetra4 should respond to in writing before any contracting can proceed. These questions are related to timeframes and the construction phase;

- The impacts of servitudes on the land value of the affected properties must be considered and mitigated by means of negotiation. If the negotiation process is unsuccessful, it must be arbitrated by a lawyer with knowledge about environmental law, the MPRDA and property law. This should be a last resort;

- Farm safety must be a priority and the landowners and Tetra must agree on security measures;

- Tetra4 must consult with landowners about any new work or potential changes that may take place on their properties;

- Protocols on farm access, compensation, communication, and road maintenance must be agreed upon and be in place before construction commences. The affected landowners must have input in the development of these protocols;

- A grievance mechanism and claims procedure must be in place and shared with all the stakeholders before the construction commences; and

- A special meeting must be conducted with farm workers and other vulnerable parties, in their mother languages, to ensure that they understand the technical and safety aspects of the project.

The potential impact on the livelihoods of some of the directly affected farmers will be severe. This will have a spinoff impact on farm workers, food security and the local

economy. Every possible measure must be implemented to ensure that the production of the farmers is not permanently impacted. The project can only be recommended if the livelihood impacts are mitigated and managed successfully.

Declaration of Independence

Equispectives Research and Consulting Services declare that:

- All work undertaken relating to the proposed project was done as independent consultants;
- They have the necessary required expertise to conduct social impact assessments, including the required knowledge and understanding of any guidelines or policies that are relevant to the proposed activity;
- They have undertaken all the work and associated studies in an objective manner, even if the findings of these studies were not favourable to the project proponent;
- They have no vested interest, financial or otherwise, in the proposed project or the outcome thereof, apart from remuneration for the work undertaken under the auspices of the above-mentioned regulations;
- They have no vested interest, including any conflicts of interest, in either the proposed project or the studies conducted in respect of the proposed project, other than complying with the relevant required regulations; and
- They have disclosed any material factors that may have the potential to influence the competent authority's decision and/or objectivity in terms of any reports, plans or documents related to the proposed project as required by the regulations.

Record of Experience

Ilse Aucamp and San-Marié Aucamp compiled this report.

Ilse Aucamp holds a D Phil degree in Social Work obtained from the University of Pretoria in 2015. She also has Masters' degree in Environmental Management (Cum Laude) from the Potchefstroom University for Christian Higher Education, which she obtained in 2004. Prior to that she completed a BA degree in Social Work at the University of Pretoria. She is frequently a guest lecturer in pre- as well as post-graduate programmes at various tertiary institutions. Her expertise includes social impact assessments, social management plans, social and labour plans, social auditing, training as well as public participation. She is a co-author of the *Social Impact Assessment: Guidance for assessing and managing the social impacts of projects* document published by the International Association for Impact Assessment.

San-Marié Aucamp is a registered Research Psychologist with extensive experience in both the practical and theoretical aspects of social research. She has more than 10 years' experience in social research, and she occasionally presents guest lectures on social impact assessment. Her experience includes social impact assessments, social and labour plans, training, group facilitation as well as social research. She is a past council member of the Southern African Marketing Research Association (SAMRA).

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1 Introduction

The project proponent wishes to expand their natural gas (helium and methane) operations, located within an approved production right area. The planned expansion to the existing approved production activities will involve up to 300 production wells, gas transmission pipelines and associated infrastructure, compressor stations and a Liquid Natural Gas (LNG) and Liquid Helium (LHe) plant ("LNG/LHe Plant") and associated infrastructure (including powerlines) as part of the Cluster 2 expansion of the Project in order to meet the future production requirements.

The Cluster 2 project will comprise of two components namely (1) the gas gathering network and (2) the LNG/LHe Plant. Exploration drilling is approved in the Production Right and therefore does not fall within the scope of this application.

As the specific location of new production wells and subsequent pipelines and associated infrastructure can only be confirmed once exploration activities are undertaken, this application is focussing on infrastructure transects (buffer areas) in addition to a broad assessment of the entire study area. Through this process any potential no-go areas or highly sensitive areas will be delineated, and appropriate mitigation measures identified where relevant.

The full field well development will comprise 3 phases/groups of wells during which exploration and drilling will be undertaken. The first phase will target approximately 15 million Standard Cubic Feet per Day of gas (MMSCFD) followed by the second phase of approximately 30 MMSCFD and finally the third phase of approximately 45 MMSCFD. The construction of the gas gathering network (including pipelines, booster and compressor stations, etc) is planned to commence in May 2023 and be completed by December 2023. Construction of the LNG/LHe plant and associated infrastructure is planned to commence in March 2023 and be completed by February 2025. The operational (gas production) timeframe for the project is approximately 20 years (2025 to 2045).

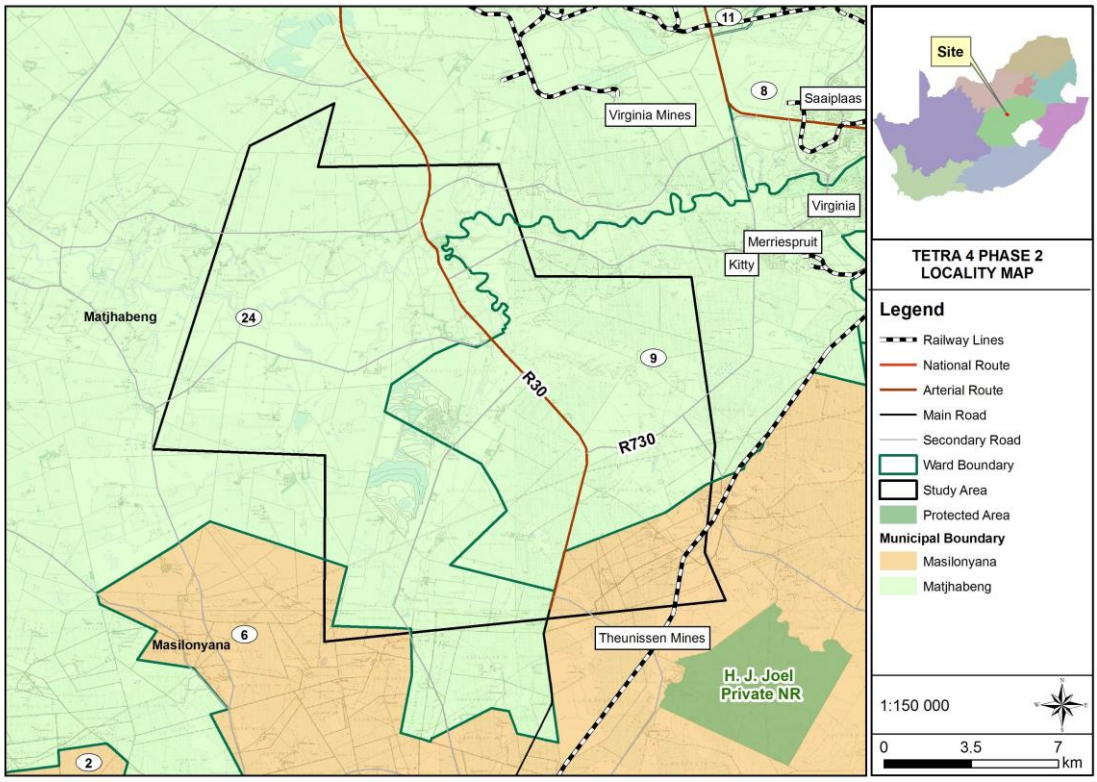
The proposed project falls within the Masilonyana and Matjhabeng Local Municipalities, in the Lejweleputswa District Municipality, Free State Province. The site boundary is 5km south west of the town of Virginia, 9km south the town of Welkom and 16km north of the town of Theunissen. The application area covers approximately 27 500 hectares, and the approximate centre point of the site is located at 28 10'20.47"S and 26 43'50.79"E.

The project covers various farm portions. Below is a list of parent farms of which certain portions of each are included under this application:

Adamsons Vley No. 655, Annex Glen Ross No. 562, Annex Grusde No. 474, Annex Mooivlakte No. 208, Blaauwdrift No. 188, Bloemhoek No. 509, Boschluis Spruit No. 278, Braklaagte No. 41, Brakspruit No. 121, Bruintjies Hoogte No. 367, Bryan No. 561, Cabriere No. 215, Carlo No. 596, Damplaats No. 341, Dankbaarheid No. 16, De Klerks Kraal No. 231, Die Mond No. 479, Digito No. 642, Doorn River No. 330, Doorndeel No. 236, Enkeldoorn No. 360, Frisgewaag No. 550, Glen Ross No. 734, Grusde No. 229, Hakkies No. 695, Hakkies No. 742, Harmonie No. 579, Helpmekaar No. 47, Jonkers Rust No. 72, Jordaan No. 1, Jordaans Rust No. 59, Kaalpan No. 65, Kalkoenkrans No. 225, Klein Palmiet Kuil No. 407, Klein Pan No. 320, Kleinbegin No. 134, Kovno No. 235, Langlaagte No. 110, Leeuwaarden No. 171, Leeuwbult No. 52, Leeuwbult No. 580, Lekkerlewe No. 643, Middelplaas No. 583, Mond Van Doornrivier No. 38, Mooifontein No. 639, Mooivlakte No. 199, Mooivlei No. 357, Nortier No. 361, Palmietkuil No. 548, Palmietkuil No. 328, Paulina No. 470, Richelieu No. 135, Rondehoek No. 200, Siberia No. 464, Spoorleggerswoning 54 No. 167, Stille Woning No. 703, Terra Blanda No. 155, Toulon No. 368, Vaalbank No. 190, Vlakpan No. 358, Welgelegen No. 382, Weltevrede No. 638, Weltevreden No. 443, Zoetendal No. 243, Zonderzorg No. 342, Zonderzorg No. 640

Figure 1 shows the proposed location for the project within municipal context.

Figure 1: Locality of proposed Tetra4 Cluster 2 project.



The purpose of this report is to provide baseline information regarding the socio-economic environment, to identify possible social and economic impacts and to suggest ways in which these impacts can be mitigated. This will assist decision-makers on the project in making informed decisions by providing information on the potential or actual consequences of their proposed activities. The process entailed the following:

- A baseline socio-economic description of the affected environment;
- Identification of potential social and economic change processes that may occur as a result of the project; and
- Identification of potential social and economic impacts.

One of the ways in which social risk can be managed is by conducting a social impact assessment (SIA). Such an assessment can assist with identifying possible social impacts and risks. Disregarding social impacts can alter the cost-benefit equation of development and in some cases even undermine the overall viability of a project. A

proper social impact assessment can have many benefits for a proposed development (UNEP, 2002) such as:

- Reduced impacts on communities of individuals;
- Enhanced benefits to those affected;
- Avoiding delays and obstruction – helps to gain development approval (social license);
- Lowered costs;
- Better community and stakeholder relations; and
- Improved proposals.

More detail on the scope of each of these phases is included in the section below.

2 Scope of Work

The purpose of the SIA is to provide input in the Environmental Impact Assessment (EIA)/ Environmental Management Programme (EMPr) Report for the proposed gas production and ancillary service/activities that will take place on site.

3 Methodology

Scientific social research methods were used for this assessment. To clarify the process to the reader, this section will start with a brief explanation of the processes that have been used in this study.

3.1 Information base

The information used in this report was based on the following:

- A literature review (see list provided in the References);
- Data from Statistics South Africa;
- The public participation records provided by EIMS;
- Professional judgement based on experience gained with similar projects; and
- Consultation with affected stakeholders in April 2022.

3.2 Assumptions and limitations

The following assumptions and limitations were relevant:

1. Not every individual in the community could be interviewed therefore only key people in the community were approached for discussion. These key people include all the directly affected landowners. Additional information was obtained using existing data.
2. The social environment constantly changes and adapts to change, and external factors outside the scope of the project can offset social changes, for example changes in local political leadership, droughts or economic conditions. It is therefore difficult to predict all impacts to a high level of accuracy, although care has been taken to identify and address the most likely impacts in the most appropriate way for the current local context within the limitations. In addition, it is also important to manage social impacts for the life of the project, especially in the light of the changing social environment.

3. Social impacts can be felt on an actual or perceptual level, and therefore it is not always straightforward to measure the impacts in a quantitative manner.

4. Social impacts commence when the project enters the public domain. Some of these impacts will occur irrespective of whether the project continues or not, and other impacts have already started. These impacts are difficult to mitigate and some would require immediate action to minimise the risk.

5. There are different groups with different interests in the community, and what one group may experience as a positive social impact, another group may experience as a negative impact. This duality will be pointed out in the impact assessment phase of the report.

6. Social impacts are not site-specific, but take place in the communities surrounding the proposed development.

3.3 Social Impact Assessment Model

The theoretical model used for this impact assessment was developed by Slootweg, Vanclay and Van Schooten and presented in the *International Handbook of Social Impact Assessment* (Vanclay & Becker, 2003). This model identifies pathways by which social impacts may result from proposed projects. The model differentiates between social change processes and social impacts, where the social change process is the pathway leading to the social impact. Detail of how the model works is not relevant to this study, but it is important to understand the key concepts, which will be explained in the following paragraphs.

Social change processes are set in motion by project activities or policies. A social change process is a discreet, observable, and describable process that changes the characteristics of a society, taking place regardless of the societal context (that is, independent of specific groups, religions etc.) These processes may, in certain circumstances and depending on the context, lead to the experience of social impacts (Vanclay, 2003). If managed properly, however, these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place (Vanclay,

2003). Social change processes can be measured objectively, independent of the local context. Examples of social change processes are an increase in the population, relocation, or the presence of temporary workers.

For the purpose of this report, the following social change process categories were considered:

- Demographic processes;
- Economic processes;
- Geographic processes;
- Institutional and legal processes;
- Emancipatory and empowerment processes;
- Socio-cultural processes; and
- Other relevant processes.

The *International Association for Impact Assessment* (2003) states that Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by these interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment.

A social impact is something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense. Therefore, two types of social impacts can be distinguished:

- **Objective social impacts** – i.e. impacts that can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety.
- **Subjective social impacts** – i.e. impacts that occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life.

It is important to include subjective social impacts, as these can have far-reaching consequences in the form of opposition to, and social mobilisation against the project (Du Preez & Perold, 2005).

For the purpose of this SIA, the following Social Impact Assessment categories were investigated:

- Health and social well-being;
- Quality of the living environment;
- Economic impacts and material well-being;
- Cultural impacts;
- Family and community impacts;
- Institutional, legal, political and equity impacts; and
- Gender impacts.

Relevant criteria for selecting significant social impacts included the following:

- Probability of the event occurring;
- Number of people that will be affected;
- Duration of the impact;
- Value of the benefits or costs to the impacted group;
- Extent to which identified social impacts are reversible or can be mitigated;
- Likelihood that an identified impact will lead to secondary or cumulative impacts;
- Relevance for present and future policy decisions;
- Uncertainty over possible effects; and
- Presence or absence of controversy over the issue.

For the purpose of this study, the model was adapted to suit the South African context, and where processes and impacts were not relevant to the study, it was omitted. Each

category has a number of sub-categories, which also have been investigated. The Equator Principles, International Finance Corporation Performance Standards and World Bank Environmental, Health and Safety guidelines were consulted in the writing of this report and the mitigation suggested adheres to these requirements.

3.4 Literature study

A literature search was undertaken to obtain secondary data for the baseline description of the socio-economic environment. The information in this report was acquired via statistical data obtained from Statistics South Africa, SIA literature (see References), previous SIA studies conducted in the area, EIMS's public consultation process and information from reputable sources on the World Wide Web.

3.5 Research approach

Traditionally there are two approaches to SIA, a technical approach, and a participatory approach. A technical approach entails that a scientist remains a neutral observer of social phenomena. The role of the scientist is to identify indicators, obtain objective measures relevant to the situation and provide an expert assessment on how the system will change (Becker, Harris, Nielsen & McLaughlin, 2004). A participatory approach uses the knowledge and experiences of individuals most affected by the proposed changes as the basis for projecting impacts. In this case the role of the scientist is facilitator of knowledge sharing, interpretation, and reporting of impacts (Becker et al, 2004). Both approaches were followed in this study.

3.6 Ethical issues

The most basic principle of research is that participants should not be harmed by participation in the research project. It is important that research not only does no harm, but also potentially contributes to the wellbeing of others. At times this might place a researcher in a difficult position – what is beneficial to one group may not be beneficial to another (Bless, Higson-Smith & Kagee, 2006). Furthermore, an individual has the autonomy to decide whether to participate in research or not. No person should be forced, either overtly or covertly, to participate in research. Other important principles include justice (based on the assumption that all people are

equals), fidelity (keeping promises or agreements, specifically between the researcher and the participant) and respect for participants' rights and dignity. In addition to these overarching ethical principles, important ethical principles that should be met are informed consent, confidentiality, anonymity, and discontinuance. This is in line with international as well as national research practice such as the World Association for Market, Social and Opinion Researchers (ESOMAR) and Southern African Marketing Research Association (SAMRA) codes of conduct. The researcher has an ethical obligation to develop well-designed projects and execute them with care. Researchers are not allowed to change their data or observations and should report on technical shortcomings, failures, limits of the study, negative findings, and methodological constraints. The honest and accurate reporting of data is also an essential component of scientifically accurate and ethically legitimate research and conclusions should be supported by data.

4 Legislative and Policy Framework

Although there are no explicit acts referring directly to SIA, there are many acts and policies that require specific social outcomes that can be related to this project, and these are discussed in the section below.

4.1 The Constitution of the Republic of South Africa 1996

The current Constitution of the Republic of South Africa 1996 can be regarded as one of the most progressive constitutions in the world. Human rights are enshrined in the South African Constitution, which forms the basis of all the country's legislation. Chapter 2 consists of a Bill of Rights, which explicitly spells out the rights of every South African citizen. Human rights and dignity are fundamental to SIA and it recognises fundamental human rights and the prerogative to protect those rights as core values (Vanclay, 2003). The human rights relevant to the environmental management field that are safeguarded by the Constitution of the Republic of South Africa 1996 in the Bill of Rights, include:

- Right to a healthy environment;
- Right of access to land and to security of tenure; and
- Right to adequate housing and protection against evictions and demolitions.

The right to a protected biophysical environment, the promotion of social development and trans-generational equity is explicitly included in the Constitution of the Republic of South Africa 1996, which states:

"Everyone has the right -

1. To an environment that is not harmful to their health and wellbeing, and
2. To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that*:*
    1. *Prevent pollution*
    2. *Promote conservation, and*

3. *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

When considering an environment that is not harmful to peoples' health and wellbeing, it is important to reflect on the interconnectedness of biophysical, economic, and social aspects. The impact of development on people, and the true cost of development, as well as the consideration of "who pays the price?" versus "who reaps the benefits?" cannot be ignored in a discussion about human rights and the environment.

The right to a generally satisfactory environment is increasingly seen as a human right in Africa (Du Plessis, 2011), and South Africa's environmental legislation supports this.

4.1.1 The National Environmental Management Act 107 of 1998

The National Environmental Management Act (NEMA) 107 of 1998 states that the State must respect, protect, promote, and fulfil the **social**, economic, and environmental rights of everyone and strive to meet the needs of previously disadvantaged communities. It states further that sustainable development requires the integration of **social**, economic, and environmental factors in the planning, evaluation, and implementation of decisions to ensure that development serves present and future generations.

Chapter 1 of NEMA contains a list of principles and states clearly that environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests (NEMA, 1998). It states further that negative impacts on the environment and on peoples' environmental rights must be anticipated and prevented, and if they cannot be prevented, they should be minimised and remedied. It elaborates further on the equity of impacts, and the fact that vulnerable communities should be protected from negative environmental impacts. It refers to the principle that everyone should have equal access to environmental resources, benefits, and services to meet their basic

human needs (NEMA, 1998). Therefore, there is a clear mandate for environmental and restorative justice in the act, something that must be considered in this project.

Another important aspect of NEMA is the principle of public participation. It states that people should be empowered to participate in the environmental governance processes, and that their capacity to do so should be developed if it does not exist. All decisions regarding the environment should take the needs, interest, and values of the public into account, including traditional and ordinary knowledge (NEMA, 1998). There are also specific environmental management acts that fall under NEMA, such as the National Environmental Management, Air Quality Act 39 of 2004 (NEM: AQA), and the National Environmental Management, Waste Act 59 of 2008 (NEM: WA). These acts require similar public participation processes to NEMA and the principles of NEMA also apply to them (Department of Environmental Affairs & Development Planning [DEA&DP], Provincial Government of the Western Cape, 2010).

Chapter 6 of NEMA elaborates on the public participation requirements. This is supplemented by the EIA regulations published in GN 982 of 4 December 2014, which contained requirements for public participation (GN 982 in GG 38282 of 4 December 2014). It provides requirements for the public participation, the minimum legal requirements for public participation processes, the generic steps of a public participation process, requirements for planning a public participation process and a description of the roles and responsibilities of the various role players. A compulsory Public Participation Guideline that was published in 2012 (GN 807 of 10 October 2012) in terms of section J of NEMA (NEMA, 1998) complements these requirements. According to the guidelines, public participation can be seen as one of the most important aspects of the environmental authorisation process. Public participation is the only requirement of the environmental impact assessment process for which exemption cannot be given, unless no rights are affected by an application. This stems from the requirement in NEMA that people have a right to be informed about potential decisions that may affect them and that they must be given an opportunity to influence those decisions.

The principles of the National Environmental Management Act 107 of 1998 declare further that community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, sharing of environmental knowledge and experience and any other appropriate means. It states that the social, environmental, and economic impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions taken must be appropriate given the assessment and evaluation. NEMA 107 of 1998 recognises that the environment is held in public trust for the people, and therefore the beneficial use of environmental resources must serve the peoples' interest and protect the environment as the peoples' common heritage.

NEMA takes a holistic view of the environment, and promotes the consideration of social, economic, and biophysical factors to obtain sustainable development and achieve effective management of the biophysical environment.

4.1.2 The National Water Act 36 of 1998

Chapter 1 of the National Water Act (NWA) 36 of 1998 states that sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management, and control of water resources. It affirms that the guiding principles recognise the basic human needs of present and future generations and the need to promote social and economic development using water. Chapter 2 of the NWA states amongst others that the purpose of the act is to ensure that everyone has equitable access to water, and that the results of past racial and gender discrimination are redressed. It aims to promote the efficient, sustainable, and beneficial use of water in the public interest, and to facilitate social and economic development. The NWA recognises that the nations' water resources are held in public trust for the people, and therefore the sustainable, equitable and beneficial use of water resources must serve the peoples' interest.

4.1.3 The Mineral and Petroleum Resources Development Act 28 of 2002

The Mineral and Petroleum Resources Development Act (MPRDA) 28 of 2002 is the only environmental act that explicitly requires a social development output, in

addition to a public participation process, in the form of a Social and Labour Plan (SLP). In the preamble to the Act, it recognises the need to promote local and rural development and the social upliftment of communities affected by resource development. In Section 2 it states that some of the objectives of the act are:

- To substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nations' mineral and petroleum resources;

- To promote economic growth and mineral and petroleum resources development in the Republic;

- To promote employment and advance the social and economic welfare of all South Africans, and

- To ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.

The MPRDA acknowledges that mineral and petroleum resources are the common heritage of all the people of South Africa and that the State is the custodian thereof for the benefit of all. It states that the Minister of Mineral Resources must ensure the sustainable development of South Africa's mineral and petroleum resources within a framework of national environmental policy, norms and standards while promoting economic and social development (MPRDA, 2002).

In Section 37 of the Mineral and Petroleum Resources Development Act 28 of 2002 it endorses the principles set out in Chapter 1 of the National Environmental Management Act 107 of 1998. In Section 39 of the MPRDA the act explicitly requires a social impact assessment as well as an environmental impact assessment when it states that applicants must:

"…investigate, assess, and evaluate the impact of his or her proposed prospecting or mining operations on:

(i) The environment;

(ii) The **socio-economic conditions of any person** who might be directly affected by the prospecting or mining operation…"

Section 3, Chapter 2, Part I, of the regulations (Government Notice 527, 23 April 2004) published under the MPRDA refers to the public participation process, which must be followed according to the Act. It includes advertising and an invitation to comment on the process.

Sections 40 to 46, Chapter 2, Part II, of the regulations published under the MPRDA deal with the Social and Labour Plan (SLP) requirements (Government Notice 527, 23 April 2004). The Department of Mineral Resources provided guidelines for the development of the SLP (Department of Mineral Resources, 2010). The guidelines specify the objectives of the SLP as:

- Promote economic growth and mineral and petroleum resources development in the Republic;
- Promoting employment and advancing the social and economic welfare of all South Africans;
- Ensuring that holders of mining or production rights contribute towards the socio-economic development of the areas in which they are operating as well as the areas from which the majority of the workforce is sourced, and
- To utilise and expand the existing skills base for the empowerment of Historically Disadvantaged South Africans and to serve the community (Department of Mineral Resources, 2010).

The crux of this section is that the SLP requires applicants for mining and production rights to develop and implement comprehensive Human Resources Development Programmes including Employment Equity Plans, Local Economic Development Programmes, and processes to save jobs and manage downscaling and/or closure (MPRDA 28 of 2002). According to the regulations, the above programmes are aimed at promoting employment and advancement of the social and economic welfare of all South Africans whilst ensuring economic growth and socio-economic development. The management of downscaling and/or closure is aimed at minimising the impact of commodity cyclical volatility, economic turbulence and physical depletion of the

mineral or production resources on individuals, regions or local economies. All mines in South Africa are required to compile an SLP, and they must report compliance on a yearly basis (MPRDA, 2002). Compiling an SLP must be done in a participatory manner, and local economic development initiatives must be aligned with the municipal integrated development planning processes. An SLP is not a social impact management plan per se, although it does aim to manage some negative social impacts. The guideline is very clear about the fact that measures put in place for the mitigation of impacts cannot be seen as mine community development projects (Department of Mineral Resources, 2010).

4.1.4 The National Heritage Resources Act 25 of 1999

Although the National Heritage Resources Act (NHRA) 25 of 1999 is not an environmental act per se, it is relevant in the field of environmental management. The NHRA affirms that every generation has a moral responsibility to act as trustee of the national heritage for later generations and that the State is obliged to manage heritage resources in the interest of all South Africans. The general principles for heritage management in Chapter 5 of the Act state that in order to ensure that heritage resources are effectively managed, the skills and capacities of persons and communities involved in heritage resources management must be developed. The Act further elaborates on the fact that heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

The general principles (Chapter 5) state that the identification, assessment, and management of the heritage resources of South Africa must:

- Take account of all relevant cultural values and indigenous knowledge systems;
- Take account of material or cultural heritage value and involve the least possible alteration or loss of it;
- Promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;
- Contribute to social and economic development, and

- Safeguard the options of present and future generations.

The National Heritage Resources Act 25 of 1999 therefore protects the cultural rights and heritage of the people of South Africa. It does not require explicit public participation or give any guidelines on how the public should participate. It does refer, like the National Environmental Management Act 107 of 1998 and the National Water Act 36 of 1998, to social and economic development. Public participation processes may be requested by the South African Heritage Resources Agency if it deems it necessary for a specific project.

4.1.5 Promotion of Administrative Justice Act 3 of 2000

The Bill of Rights in the Constitution of the Republic of South Africa 1996 states that everyone has the right to administrative action that is legally recognised, reasonable and procedurally just. The Promotion of Administrative Justice Act (PAJA) 3 of 2000 gives effect to this right. The PAJA applies to all decisions of all State organisations exercising public power or performing a public function in terms of any legislation that negatively affects the rights of any person. The Act prescribes what procedures an organ of State must follow when it takes decisions. If an organ of State implements a decision that impacts on an individual or community without giving them an opportunity to comment, the final decision will be illegal and may be set aside. The Promotion of Administrative Justice Act 3 of 2000 also forces State organisations to explain and give reasons for the manner in which they have arrived at their decisions and, if social issues were involved, and how these issues were considered in the decision-making process.

The Promotion of Administrative Justice Act 3 of 2000 therefore protects the rights of communities and individuals to participate in decision-making processes, especially if these processes affect their daily lives.

4.1.6 Gas related legislation

The introduction of natural gas into South Africa's mainstream energy supply is an important step in the fulfilment of one of the major objectives of the White Paper on Energy Policy.

The Department of Minerals and Energy has formulated:

The Gas Act 2001, Act 48 of 2001 and the Government / Sasol regulatory agreement referred to in section 36 of the Act, which aims to:

- Promote the orderly development of the piped gas industry;
- Establish a national regulatory framework; and
- Establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework.

The Gas Regulator Levies Act 2002, Act 75 of 2002, which provides for the imposition of levies for the functioning of the national gas regulator and for matters connected therewith.

Piped Gas Regulations. After the establishment of the National Energy Regulator, the Department of Energy has promulgated the Piped Gas Regulations, 2007, to promote the orderly development of the piped gas industry.

4.2 Additional governance tools

Legislation is not the only tool that authorities can use to achieve sustainable development and social development outcomes. There are several tools, policies and strategic planning instruments that can contribute to this.

4.2.1 Integrated Development Plans

For the purpose of this project, Integrated Development Plan (IDP) documents of three municipalities need to be considered: the Lejweleputswa District Municipality; the Matjhabeng Local Municipality; and the Masilonyana Local Municipality.

The Lejweleputswa District Municipality IDP (2021/22) highlights that the purpose of municipal integrated development planning is to:

- Ensure sustainable provision of services;

- Promote social and economic development;
- Promote a safe and healthy environment;
- Give priority to the basic needs of communities; and
- Encourage involvement of communities.

Matjhabeng Local Municipality identified the following mayoral strategic priorities (IDP 2022/23):

- Road maintenance;
- Local economic development;
- Replacement of ageing infrastructure;
- Achieving housing accreditation;
- Build internal capacity;
- Develop climate change strategy, adaptation, and mitigation;
- Improve private-public partnerships for growth and development; and
- Economic corridors linking six towns.

The Masilonyana Local Municipality listed its strategic objectives as:

- Sustainable services to the community;
- Promotion of a sound environmental management system;
- Provision of sound governance for local communities; and
- Ensuring sound governance practices within the municipality.

4.2.2 Provincial Growth and Development Strategies

The Free State Provincial Growth and Development Strategy (FGDS) is based on six pillars, each with its own set of drivers (FSDF, 2012). The drivers and pillars are:

1. Inclusive economic growth and sustainable job growth creation

    a. Diversify and expand agricultural development and food security.

    b. Minimise the impact of the declining mining sector and ensure that existing mining potential is harnessed.

c. Expand and diversify manufacturing opportunities.

d. Capitalise on transport and distribution opportunities.

e. Harness and increase tourism potential and opportunities.

2. Education, innovation and skills development

    a. Ensure an appropriate skills base for growth and development.

3. Improved quality of life

    a. Curb crime and streamline criminal justice performance.

    b. Expand and maintain basic and road infrastructure.

    c. Facilitate sustainable human settlements.

    d. Provide and improve adequate health care for citizens.

    e. Ensure social development and social security services for all citizens.

    f. Integrate environmental limitations and change into growth and development planning.

4. Sustainable rural development

    a. Mainstream rural development into growth and development planning.

5. Build social cohesion

    a. Maximise arts, culture, sports and recreation opportunities and prospects for all communities.

6. Good governance

    a. Foster good governance to create a conducive climate for growth and development.

The Free State Provincial Spatial Development Framework (FSDF) supplements the FGDS as guidance document for the province to use resources in a way that will ensure sustainable outcomes based on provincial development needs and priorities (FSDF, 2012). The FSDF outlines Vision 2030, a collective response to the need for the province to describe and map its future destiny through long-term development planning, and to forge a common and shared development agenda across a wide spectrum of service delivery mechanisms. The Free State Vision 2030 envisages that, by 2030, *the Free State shall have a resilient, thriving and competitive economy that is inclusive, with immense prospects for human development anchored on the principles of unity, dignity, diversity, equality and prosperity for all* (FSDF, 2012).

Encouraged by this vision, the Free State of 2030 will be characterised by an economy that encourages the development of new growth sectors with emphasis on the knowledge-based industries and the green economy (FSGDS).

The Free State Vision 2030 furthermore envisages that, *by 2030, ownership and control patterns of the economy will be transformed, spatial under-development will be addressed, basic services such as healthcare, education, electricity, water and sanitation will be equitably accessed by the people of the province. In the quest for inclusive economic growth and development, the environment will be protected for future generations. Lasting responses to climate changes will be part of the landscape of the development of the province. Steeped within the democratic principles, the Provincial Government will be accountable, transparent, effective, efficient, responsive to people's needs, and corruption will be eliminated* (FSDF, 2012).

The Tetra4 project therefore aligns with at least the first two pillars of the FGDS that address economic development, job creation and skills development.

4.2.3 National Development Plan

On 11 November 2011 the National Planning Commission released the National Development Plan: Vision for 2030 (NPC, 2012) for South Africa and it was adopted as government policy in August 2012. The National Development Plan (NDP) was undertaken to envision what South Africa should look like in 2030 and what action

steps should be taken to achieve this (RSA, 2013). The aim of the NDP is to eliminate poverty and reduce inequality by 2030. The report identifies nine central challenges to development in South Africa:

1. Too few people work.
2. The standard of education for most black learners is of poor quality.
3. Infrastructure is poorly located, under-maintained and insufficient to foster higher growth.
4. Spatial patterns exclude the poor from the fruits of development.
5. The economy is overly and unsustainably resource intensive.
6. A widespread disease burden is compounded by a failing public health system.
7. Public services are uneven and often of poor quality.
8. Corruption is widespread.
9. South Africa remains a divided society (NPC, 2012).

The plan focuses on creating an enabling environment for development and wants to shift from a paradigm of entitlement to a paradigm of development that promotes the development of capabilities, the creation of opportunities and the involvement of all citizens (NPC, 2012). The National Development Plan (NPC, 2012) wants to achieve the following:

1. An economy that will create more jobs.
2. Improving infrastructure.
3. Transition to a low-carbon economy.
4. An inclusive and integrated rural economy.
5. Reversing the spatial effects of apartheid.

6. Improving the quality of education, training and innovation.
7. Quality healthcare for all.
8. Social protection.
9. Building safer communities.
10. Reforming the public service.
11. Fighting corruption.
12. Transforming society and uniting the country.

Each of the points above is a chapter in the plan, and contains a range of targets and proposals. Some are general statements of policy intent, while others are specific policy proposals, actions or processes that should take place (NPC, 2012). Through its contribution to the economy, the Tetra4 project will assist with achieving the goal of creating an economy that will create more jobs.

4.2.4 Sustainable Development Goals

All 189 Members States of the United Nations, including South Africa, adopted the United Nations Millennium Declaration in September 2000 (UN, 2000). The commitments made by the Millennium Declaration are known as the Millennium Development Goals (MDGs), and 2015 was targeted as the year to achieve these goals. The United Nations Open Working Group of the General Assembly identified seventeen sustainable development goals, built on the foundation of the MDGs as the next global development target (UN, 2014). The sustainable development goals include aspects such as ending poverty, addressing food security, promoting health, wellbeing and education, gender equality, water and sanitation, economic growth and employment creation, sustainable infrastructure, reducing inequality, creating sustainable cities and human settlements, and addressing challenges in the physical environment such as climate change and environmental resources (UN, 2014). These aspects are included in the NPD, and it can therefore be assumed that South Africa's development path is aligned with the international development agenda. Tetra4 can

assist with contributing to achieving goals such as economic growth and employment creation and promoting health, wellbeing and education through their SLP.

4.3 National and international standards

National and international industry standards aimed at sustainable development and social justice specifically have become abundant in the last decade. Many industries use these standards as indicators for best practice. The discussion below highlights only a few of these standards.

4.3.1 ISO 26000:2010/SANS 26000:2010

Performance standards have long been a voluntary tool used by industry to achieve certain outcomes. The first standard on social responsibility, ISO 26000 was published on 1 November 2010 (ISO, 2010). It was developed using a multi-stakeholder approach involving experts from more than 90 countries and 40 international or broadly based regional organisations involved in different aspects of social responsibility (ISO, 2010).

The South African Bureau of Standards (SABS), a statutory body that is mandated to develop, promote and maintain South African National Standards (SABS, [sa]) adopted the ISO 26000 Standard as a South African National Standard (SANS) 26000:2010.

Social responsibility is defined in the standard as the responsibility of an organisation for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour that contributes to sustainable development, including health and welfare of society; takes into account the expectations of the stakeholders; complies with applicable law and is consistent with international behaviour norms, and is integrated throughout the organisation and practiced in its relationships (ISO, 2010).

The document identifies seven principles for social responsibility and seven core subjects that should be addressed by organisations. The seven principles for social responsibility are accountability, transparency, ethical behaviour, respect for stakeholder interests, respect for the rule of law, respect for international norms of behaviour and respect for human rights (ISO, 2010). The core subjects that should be

addressed include organisational governance, human rights, labour practices, environment, fair operating practices, consumer issues and community involvement and development (ISO, 2010). Economic aspects, health and safety and the value chain are dealt with throughout the seven core subjects, and gender issues are considered.

ISO 26000 is a good introduction to what social responsibility is and what measures should be taken to move towards being a more socially responsible company. It deals with equity issues and can encourage social development initiatives by companies through activities such as social investment projects, employment creation, skills development and income creation. Any company operating in area where people are affected by their activities has a social responsibility towards the affected community, and as such it would be in the interest of Tetra4 to address the core subjects as suggested by ISO 26000:2010.

4.3.2 International Social Performance Standards/Initiatives

There is a profusion of global initiatives aiming at assisting companies to make their operations more sustainable. Human rights, environmental protection and social justice are gaining support from industry. The social agenda forms an important part of this trend. Only a few relevant initiatives will be mentioned in this section.

The Global Reporting Initiative (GRI) is a leading organisation in the sustainability field that promotes sustainability reporting as a way for companies to become more sustainable and contribute to sustainable development. A company publishes a sustainability report to report the economic, social and environmental impacts of its everyday activities, present its values and governance model and explain the link between its strategy and its commitment to sustainable development (GRI, [sa]). The GRI have strategic partnerships with the United Nations Environment Programme, the United Nations Global Compact, the Organisation for Economic Co-operation and Development and the International Organisation for Standardisation, amongst others (GRI, [sa]). The social category relates to the impact of the company on the social systems in which it operates. The social category consists of four subcategories namely labour practices and decent work; human rights; society; and product responsibility.

Each of the categories is unpacked by using a number of aspects that should be considered (GRI, [sa]). GRI Focal Points are national offices that drive the initiatives in particular countries and regions. On 26 February 2013 the GRI Focal Point South Africa was launched. South Africa is one of the countries with the largest number of GRI reporters in the world. The GRI Focal Point South Africa aims to work with multi-national companies to expand and share best practices across the continent (GRI, [sa]).

Many of the multi-lateral funding agencies such as the World Bank have social standards that they must uphold. The most frequently used in the EIA industry is the International Finance Corporation's (IFC) principles (IFC, 2012). The IFC is a member of the World Bank group, and as a part of their sustainability framework they created performance standards on environmental and social sustainability (IFC, 2012). The standards relevant to the social environment are the following:

1. Environmental and Social Standard 1. Assessment and Management of Environmental and Social Risks and Impacts
2. Environmental and Social Standard 2: Labour and Working Conditions
3. Environmental and Social Standard 4: Community Health and Safety
4. Environmental and Social Standard 5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
5. Environmental and Social Standard 8: Cultural Heritage
6. Environmental and Social Standard 10. Stakeholder Engagement and Information Disclosure (World Bank, 2016)

Issues such as gender, climate change, water and human rights are addressed across the standards. A guidance note accompanies each standard (IFC, 2012:4). Environmental and social risks and impacts must be managed by using an Environmental and Social Management System. The standard applies to all the activities funded by the IFC for the duration of the loan period. A number of private

banks adopted most of the IFC standards in an initiative known as the Equator Principles (Esteves, Franks & Vanclay, 2012).

4.3.3 International Principles for SIA

The practice of SIA is guided by a set of *International Principles* that defines the core values, fundamental principles for development and principles specific to SIA practice (Vanclay, 2003). When the *International Principles* are considered, it is clear that SIA aspires to more than just assessing the impact of development on people, and includes sustainable outcomes. The following specific principles refer to these sustainable outcomes (Vanclay, 2003):

1. Development projects should be broadly acceptable to the members of those communities likely to benefit from, or be affected by, the planned intervention.
2. The primary focus of all developments should be positive outcomes, such as capacity building, empowerment, and the realisation of human and social capital.
3. The term "environment" should be defined broadly to include social and human dimensions, and in such inclusion, care must be taken to ensure that adequate attention is given to the realm of the social.
4. Equity considerations should be a fundamental element of impact assessment and of development planning.
5. There should be a focus on socially sustainable development, with the SIA contributing to the determination of best development alternative(s) – SIA (and EIA) has more to offer than just being an arbiter between economic benefit and social cost.
6. In all planned interventions and their assessments, avenues should be developed to build the social and human capital of local communities and to strengthen democratic processes.
7. Local knowledge, experience and acknowledgement of different cultural values should be incorporated in any assessment.

8. Development processes that infringe the human rights of any section of society should not be accepted.

In addition to the *International Principles*, the international SIA community produced a document titled: *Social Impact Assessment: Guidance for assessing and managing the social impacts of projects* (Vanclay, Esteves, Aucamp & Franks, 2015) in April 2015. The purpose of this document is to provide advice to various stakeholders (including proponents) about good practice SIA and social impact management (Vanclay et al., 2015). This document aspires to provide a much-needed benchmark for SIA practice across the globe.

5 Receiving environment

According to the National Environmental Management Act (NEMA, 1998) environment refers to the surroundings in which humans exist. When viewing the environment from a socio-economic perspective the question can be asked what exactly the social environment is. Different definitions for social environment exist, but a clear and comprehensive definition that is widely accepted remains elusive. Barnett & Casper (2001) offers the following definition of human social environment:

> *"Human social environments encompass the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labour markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the arts; religious institutions and practices; and beliefs about place and community. The social environment subsumes many aspects of the physical environment, given that contemporary landscapes, water resources, and other natural resources have been at least partially configured by human social processes. Embedded within contemporary social environments are historical social and power relations that have become institutionalized over time. Social environments can be experienced at multiple scales, often simultaneously, including households, kin networks, neighbourhoods, towns and cities, and regions. Social environments are dynamic and change over time as the result of both internal and external forces. There are relationships of dependency among the social environments of different local areas, because these areas are connected through larger regional, national, and international social and economic processes and power relations."*

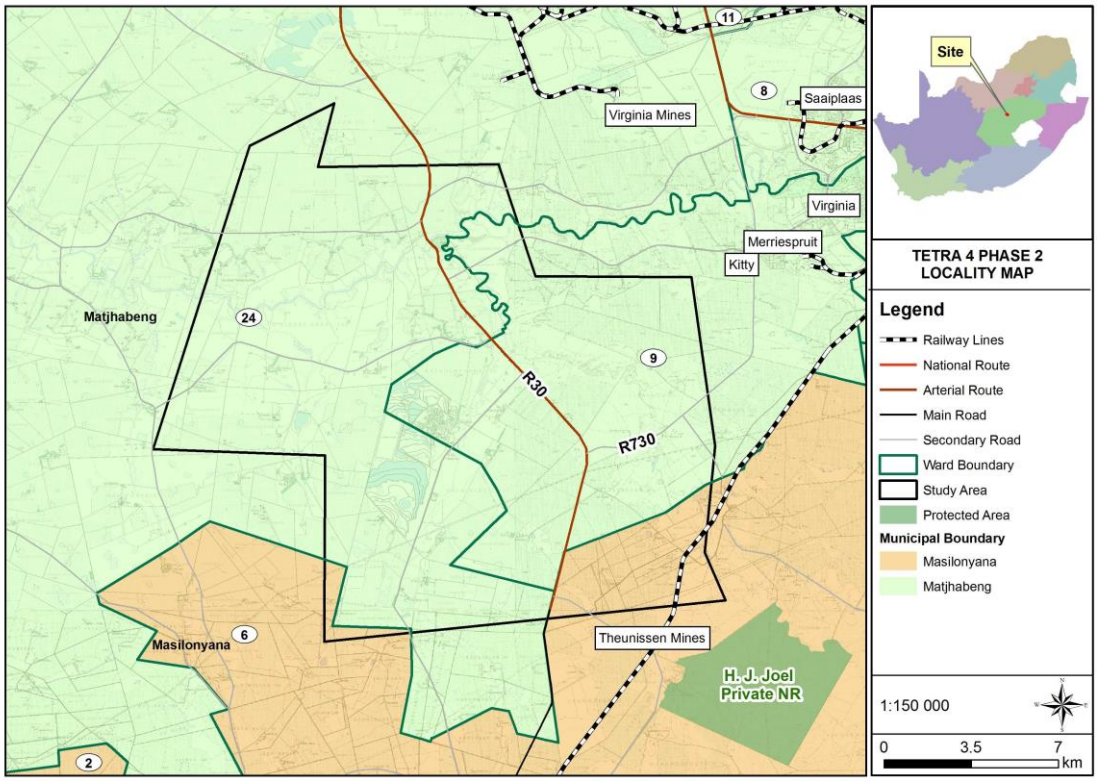
Environment-behaviour relationships are interrelationships (Bell, Fisher, Baum & Greene, 1996). The environment influences and constrains the behaviour of people, but behaviour also leads to changes in the environment. The impacts of a project on

people can only be truly understood if their environmental context is understood. The baseline description of the social environment will include a description of the area within a provincial, district and local context that will focus on the identity and history of the area as well as a description of the population of the area based on a number of demographic, social and economic variables.

5.1 Description of the area

The proposed site for the Cluster 2 project is located in Wards 9 and 24 of the Matjhabeng Local Municipality and Ward 6 of the Masilonyana Local Municipality that forms part of the Lejweleputswa District Municipality in the Free State Province. The baseline description of the environment will include these areas. Figure 2 shows the location of the proposed Cluster 2 project as well as social and physical infrastructure in the area.

Figure 2: Location of the proposed Cluster 2 Project.



5.1.1 Free State Province

The Free State province lies in the centre of South Africa between the Vaal River in the north and the Orange River in the south. The province borders on the Northern Cape,

Eastern Cape, North-West, Mpumalanga, KwaZulu-Natal and the Gauteng province. It also shares a border with Lesotho. With a total area of 129 825 km^2, the Free State is the country's third-largest province but has the second-smallest population (www.municipalities.co.za).

The Free State is a rural province, and its economic activities are dominated by mining, agriculture and manufacturing. The province is the fifth-largest producer of gold in the world and is also home to Sasol, the large synthetic fuels company.

About 90% of the Free State is used for agricultural production (www.municipalities.co.za). About 34% of the total maize production of South Africa, 37% of wheat, 53% of sorghum, 33% of potatoes, 18% of red meat, 30% of groundnuts and 15% of wool is produced in the Free State.

Bloemfontein is the capital of the Free State and South Africa's judicial capital. The province is divided into one metropolitan municipality (Mangaung Metropolitan Municipality) and four district municipalities, namely Fezile Dabi, Lejweleputswa, Xhariep and Thabo Mofutsanyane. Other important towns in the Free State include Welkom, Kroonstad, Sasolburg and Bethlehem.

5.1.2 Lejweleputswa District Municipality

The Lejweleputswa District Municipality (LDM) is situated in the north western part of the Free State and borders the North West Province to the north; the Fezile Dabi and Thabo Mofutsanyane District Municipalities to the north-east and east respectively; the Xhariep District Municipality and Mangaung Metropolitan Municipality to the south; and the Northern Cape Province to the west. The LDM is accessible from Johannesburg, Cape Town, Klerksdorp and Kimberley through one of South Africa's main national roads, the N1. The district covers an area of 32 286 km^2 and make up almost a third of the Free State province. It consists of the Masilonyana, Matjhabeng, Nala, Tokologo and Tswelopele Local Municipalities (www.lejweleputswa.co.za).

The economy of the district relies heavily on the gold mining sector which is dominant in the Matjhabeng and Masilonyana Local Municipalities (Lejweleputswa DM IDP 2021/22). The mining sector is on a downward trend and many businesses that have

traditionally depended on the mining sector have either closed down are in the process of closing down. The other municipalities are dominated by agriculture.

5.1.3 Matjhabeng Local Municipality

The main towns in the Matjhabeng Local Municipality are Welkom, Odendaalsrus, Virginia, Hennenman, Allanridge and Ventersburg (www.matjhabeng.fs.gov.za). The economy of the municipality is centred on mining activities in and around Welkom, Allanridge, Odendaalsrus and Virginia. Manufacturing aimed at the mining sector exists to a limited extent in the above towns, with other activities being limited. Other main economic sectors include manufacturing, tourism, agriculture, gold jewellery, transportation (logistics), and retail (Matjhabeng LM IDP 2022/2023).

5.1.4 Masilonyana Local Municipality

The main towns in the Masilonyana Local Municipality are Theunissen, Brandfort, Winburg, Verkeerdevlei and Soutpan (www.masilonyana.fs.gov.za). It is a semi-rural municipality that is dependent on agriculture and mining as the key drivers of its economy (Masilonyana LM IDP 2019/20). In 2016 the mining sector contributed about 52.4% to the municipality's economic output, but only about 8% of the employment in the municipality. With the decline in the mining sector the municipality plans to turn its focus on tourism. The municipality prides itself on its tourism destinations.

5.2 Description of the population

The baseline description of the population will take place on three levels, namely provincial, district and local. Impacts can only truly be comprehended by understanding the differences and similarities between the different levels. The baseline description will focus on the Matjhabeng Local Municipality and the Masilonyana Local Municipality in the Lejweleputswa District Municipality in the Free State Province (referred to in the text as the study area), as these are the areas that will be most affected by the proposed project. Where possible, the data will be reviewed on a ward level – Ward 9 and 24 of the Matjhabeng LM and Ward 6 of the Masilonyana LM. The data used for the socio-economic description was sourced from Census 2011. Census 2011 was a *de facto* census (a census in which people are enumerated according to where they stay on census night) where the reference night

was 9-10 October 2011. The results should be viewed as indicative of the population characteristics in the area and should not be interpreted as absolute.

The following points regarding Census 2011 must be kept in mind (www.statssa.co.za):

- Comparisons of the results of labour market indicators in the post-apartheid population censuses over time have been a cause for concern. Improvements to key questions over the years mean that the labour market outcomes based on the post-apartheid censuses must be analysed with caution. The differences in the results over the years may be partly attributable to improvements in the questionnaire since 1996 rather than to actual developments in the labour market. The numbers published for the 1996, 2001, and 2011 censuses are therefore not comparable over time and are different from those published by Statistics South Africa in the surveys designed specifically for capturing official labour market results.

- For purposes of comparison over the period 1996–2011, certain categories of answers to questions in the censuses of 1996, 2001 and 2011, have either been merged or separated.

- The tenure status question for 1996 has been dropped since the question asked was totally unrelated to that asked thereafter. Comparisons for 2001 and 2011 do however remain.

- All household variables are controlled for housing units only and hence exclude all collective living arrangements as well as transient populations.

- When making comparisons of any indicator it must be considered that the time period between the first two censuses is five years and that between the second and third census is ten years. Although Census captures information at one given point in time, the period available for an indicator to change is different.

5.2.1 Population and household sizes

According to the Community Survey 2016, the population of South Africa is approximately 55,7 million and has shown an increase of about 7.5% since 2011. The household density for the country is estimated on approximately 3.29 people per household, indicating an average household size of 3-4 people (leaning towards 3) for most households, which is down from the 2011 average household size of 3.58 people per household. Smaller household sizes are in general associated with higher levels of urbanisation.

The greatest increase in population since 2011 has been on local level (Table 1), but still lower than the national average. Population density refers to the number of people per square kilometre and the population density on a national level has increased from 42.45 people per km^2 in 2011 to 45.63 people per km^2 in 2016. In the study area the population density has increased since 2011 with the highest density in the Matjabeng LM.

Table 1: Population density and growth estimates (sources: Census 2011, Community Survey 2016)

Area	Size in km^2	Population 2011	Population 2016	Population density 2011	Population density 2016	Growth in population (%)
Free State Province	129,825	2,745,590	2,834,714	21.15	21.83	3.25
Lejweleputswa DM	31,930	627,626	649,964	19.66	20.36	3.56
Matjhabeng LM	5,155	406,461	428,843	78.85	83.19	5.51
Masilonyana LM	6,796	63,334	66,084	9.32	9.72	4.34

The number of households in the study area has increased on all levels (Table 2). The proportionate increase in households were greater than the increase in population on all levels and exceeded the growth in households of 12.3% on a national level. The average household size has shown a decrease on all levels, which means there are more households, but with less members.

Table 2: Household sizes and growth estimates (sources: Census 2011, Community Survey 2016)

Area	Households 2011	Households 2016	Average household size 2011	Average household size 2016	Growth in households (%)
Free State Province	823,316	946,639	3.33	2.99	14.98
Lejweleputswa DM	183,163	219,014	3.43	2.97	19.57
Matjhabeng LM	123,195	149,021	3.30	2.88	20.96
Masilonyana LM	17,575	22,802	3.60	2.90	29.74

The total dependency ratio is used to measure the pressure on the productive population and refer to the proportion of dependents per 100 working-age population. As the ratio increases, there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. A high dependency ratio can cause serious problems for a country as the largest proportion of a government's expenditure is on health, social grants and education that are most used by the old and young population.

The total dependency ratio in the Masilonyana LM is higher than on district or provincial level (Table 3), while in the Matjhaneng LM the total dependency ratio is lower that on district or provincial level. The same trend applies to the youth, aged and employment dependency ratios. Employed dependency ratio refers to the proportion of people dependent on the people who are employed, and not only those of working age. The employed dependency ratio for the Matjhabeng LM is lower than on district and provincial level, while for the Masilonyana LM it is higher. This suggests high levels of poverty in the Masilonyana area.

Table 3: Dependency ratios (source: Census 2011).

Area	Total dependency	Youth dependency	Aged dependency	Employed dependency
Free State Province	52.88	44.48	8.39	76.34
Lejweleputswa DM	51.33	43.71	7.61	77.16
Matjhabeng LM	46.93	40.09	6.85	75.46
Ward 9	31.92	24.88	7.04	68.37
Ward 24	31.54	29.01	2.53	69.84
Masilonyana LM	54.99	45.99	9.00	82.14
Ward 6	40.36	33.35	7.01	88.18

Poverty is a complex issue that manifests itself in economic, social and political ways and to define poverty by a unidimensional measure such as income or expenditure

would be an oversimplification of the matter. Poor people themselves describe their experience of poverty as multidimensional. The South African Multidimensional Poverty Index (SAMPI) (Statistics South Africa, 2014) assess poverty on the dimensions of health, education, standard of living and economic activity using the indicators child mortality, years of schooling, school attendance, fuel for heating, lighting and cooking, water access, sanitation, dwelling type, asset ownership and unemployment.

The poverty headcount refers to the proportion of households that can be defined as multi-dimensionally poor by using the SAMPI's poverty cut-offs (Statistics South Africa, 2014). The poverty headcount has increased on all levels since 2011 (Table 4), indicating an increase in the number of multi-dimensionally poor households.

The intensity of poverty experienced refers to the average proportion of indicators in which poor households are deprived (Statistics South Africa, 2014). The intensity of poverty has increased slightly on all levels. The intensity of poverty and the poverty headcount is used to calculate the SAMPI score. A higher score indicates a very poor community that is deprived on many indicators. The SAMPI score has increased in the Masilonyana LM area, indicating that households in this area might be getting poorer. In the Matjhabeng LM area the SAMPI score has decreased, suggesting an improvement in some respects relating to poverty in this area.

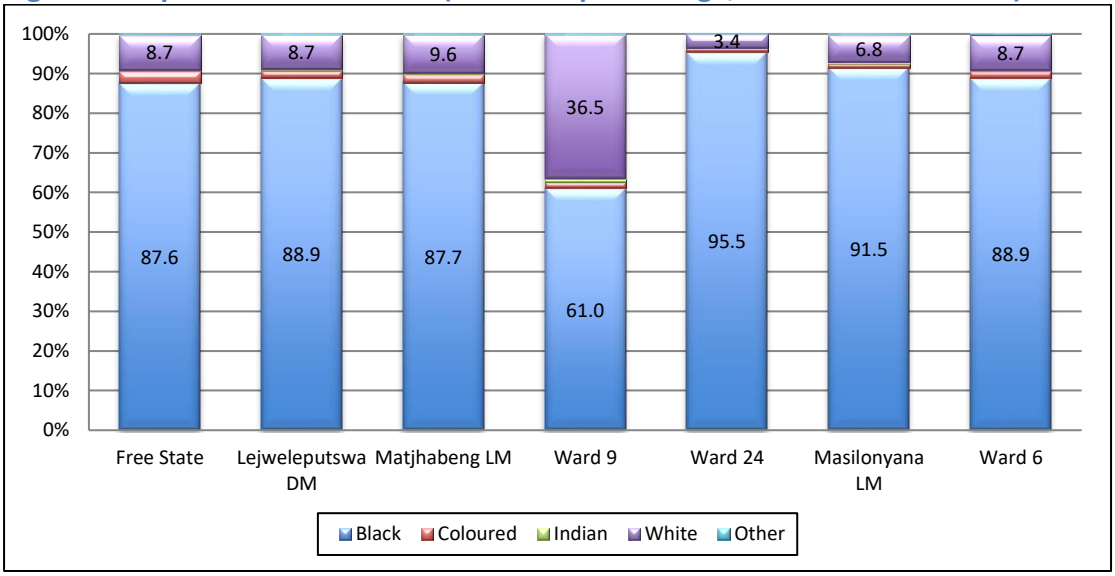
Table 4: Poverty and SAMPI scores (sources: Census 2011 and Community Survey 2016).

Area	Poverty headcount 2011 (%)	Poverty intensity 2011 (%)	SAMPI 2011	Poverty headcount 2016 (%)	Poverty intensity 2016 (%)	SAMPI 2016
Free State Province	5.5	42.2	0.023	5.5	41.7	0.023
Lejweleputswa DM	5.6	42.8	0.024	4.8	42.2	0.020
Matjhabeng LM	5.5	43.0	0.024	4.3	41.8	0.018
Masilonyana LM	5.3	41.8	0.022	6.5	41.8	0.027

5.2.2 Population composition, age, gender and home language

In all the areas under investigation, the majority of the population belongs to the Black population group (Figure 3), but the proportions differ. Ward 24 has the highest proportion of people belonging to the Black population group, while Ward 9 has the highest proportion of people belonging to the White population group.

Figure 3: Population distribution (shown in percentage, source: Census 2011)



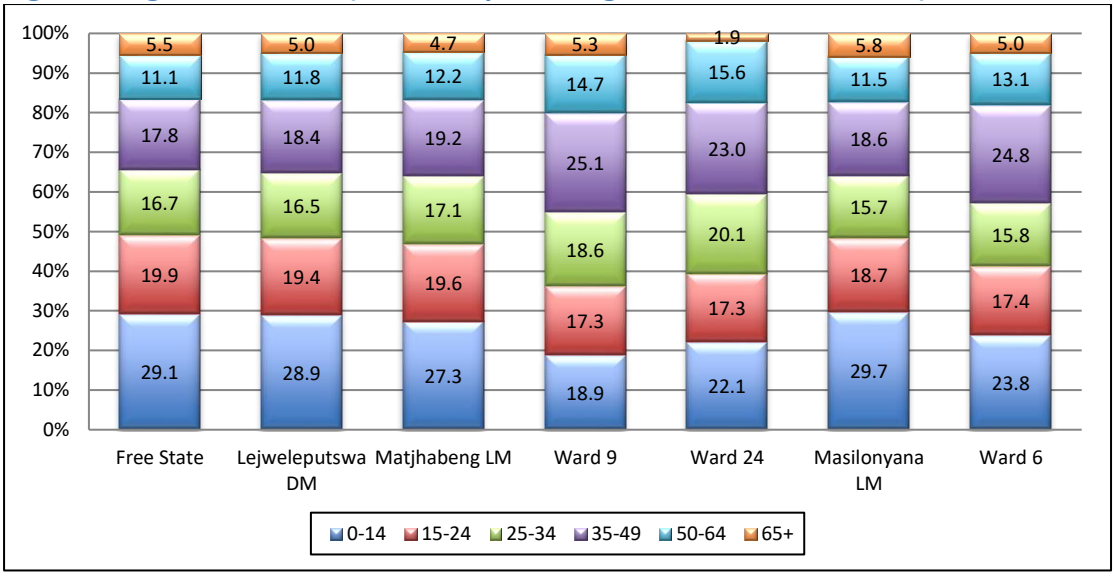
The average age on local level is higher than on district and provincial level (Table 5). The highest average age is in Ward 9 of the Matjhabeng LM.

Table 5: Average age (source: Census 2011).

Area	Average Age (in years)
Free State Province	28.38
Lejweleputswa DM	28.52
Matjhabeng LM	28.89
Ward 9	32.84
Ward 24	30.46
Masilonyana LM	28.73
Ward 6	31.21

The age distribution of the areas under investigation shows that the population in on a ward level tend to be older than on district or provincial level, with a greater proportion of people aged between 35 years to 64 years (Figure 4).

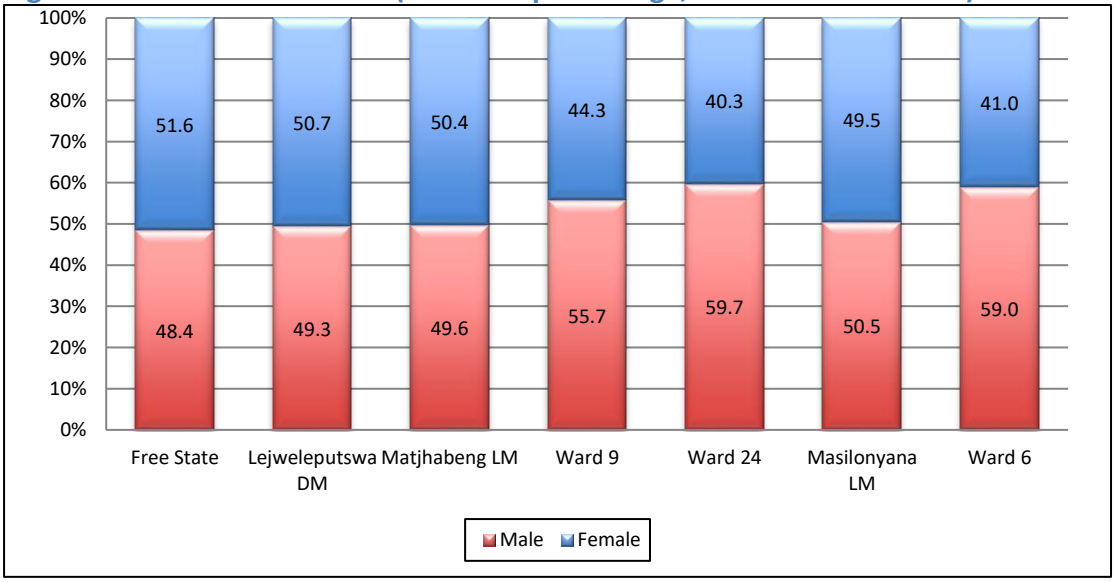
Figure 4: Age distribution (shown in percentage, source: Census 2011)



5.2.3 Gender

The gender distribution on provincial, district and local level is balanced (Figure 5), but on a ward level there is a bias towards males. A higher incidence of males is usually found in mining areas and all three the wards have mining areas that appear to have residences for mine workers.

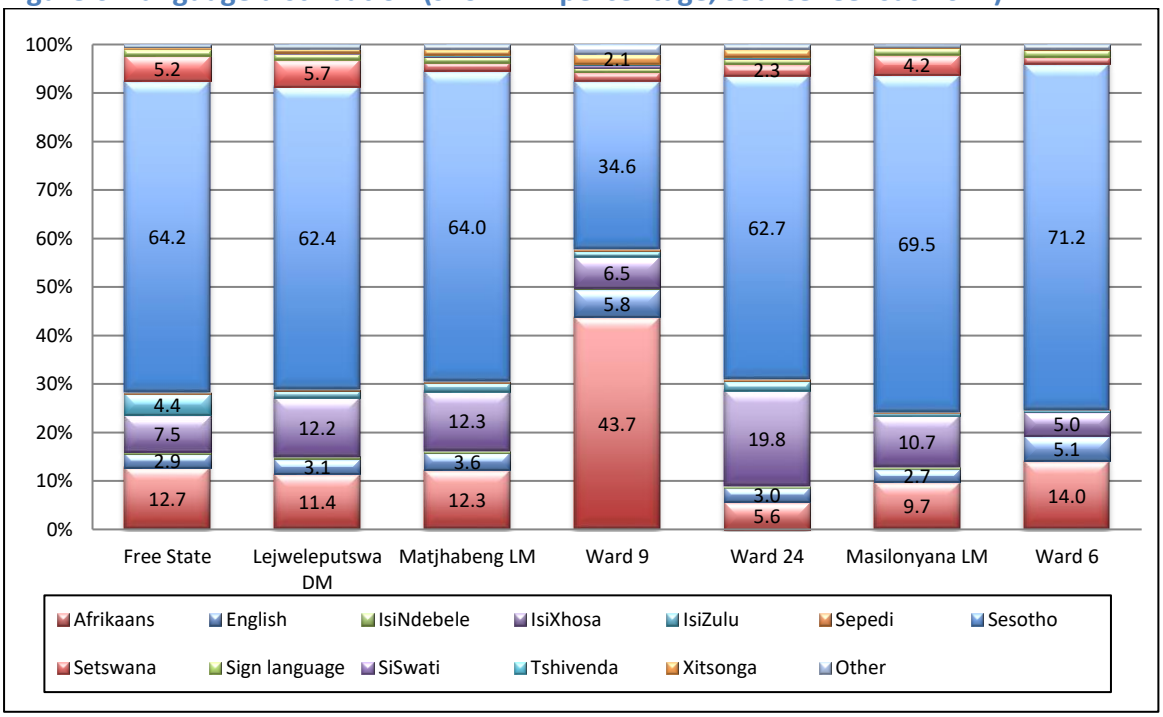
Figure 5: Gender distribution (shown in percentage, source: Census 2011)



5.2.4 Language

Almost two thirds of people in the area under investigation have Sesotho as home language (Figure 6), except in Ward 9 where it is only about a third of people. In Ward 9 more than 40% of people have Afrikaans as home language. Almost a fifth of people in Ward 24 has IsiXhosa as home language, suggesting a high incidence of migrant mine workers residing in this ward. Home language should be taken into consideration when communicating with the local communities and based on the profile of the area communication should take place in Sesotho, Afrikaans and English.

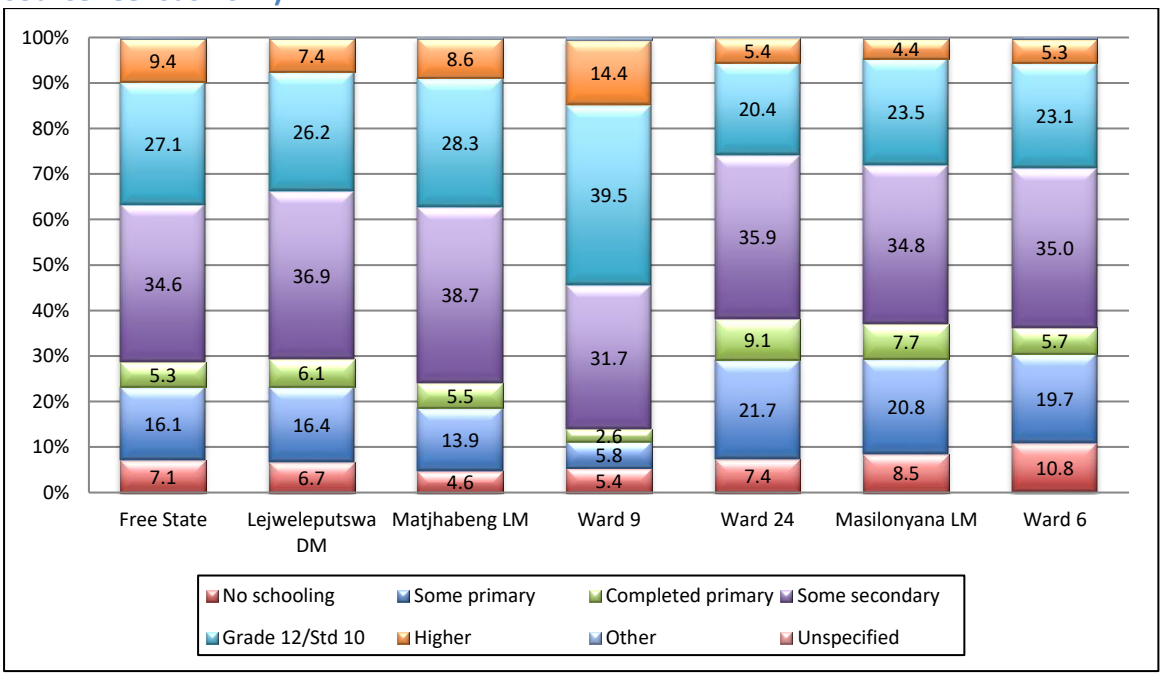
Figure 6: Language distribution (shown in percentage, source: Census 2011)



5.2.5 Education

Figure 7 shows the education profiles for the areas under investigation for those aged 20 years or older. Ward 9 has the highest proportion of people who have completed Grade 12 or higher, while more than 70% of people in Wards 6 and 24 have not completed secondary school.

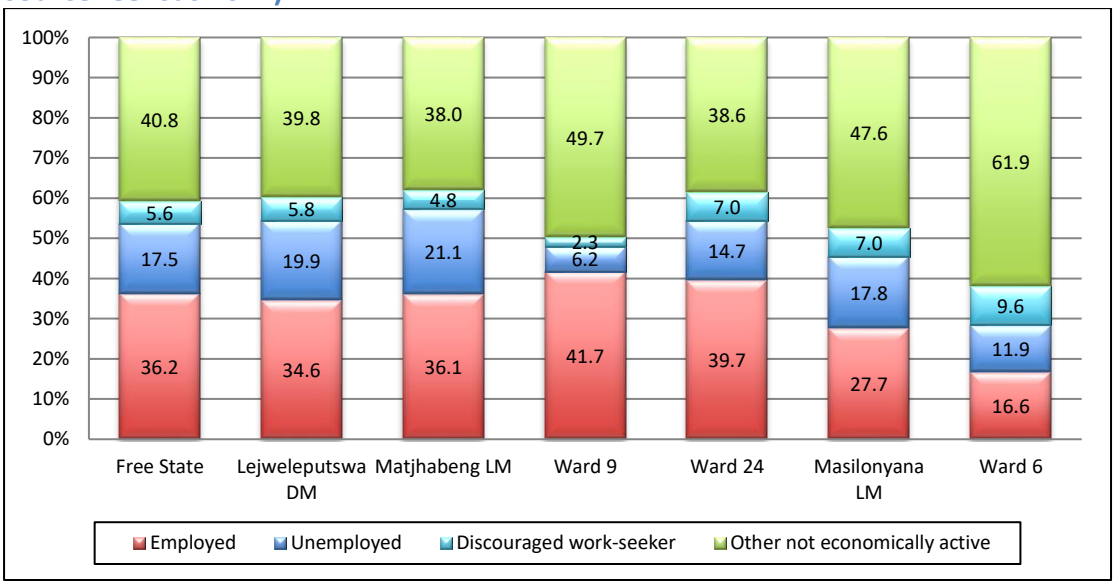
Figure 7: Education profiles (those aged 20 years or older, shown in percentage, source: Census 2011)



5.2.6 Employment

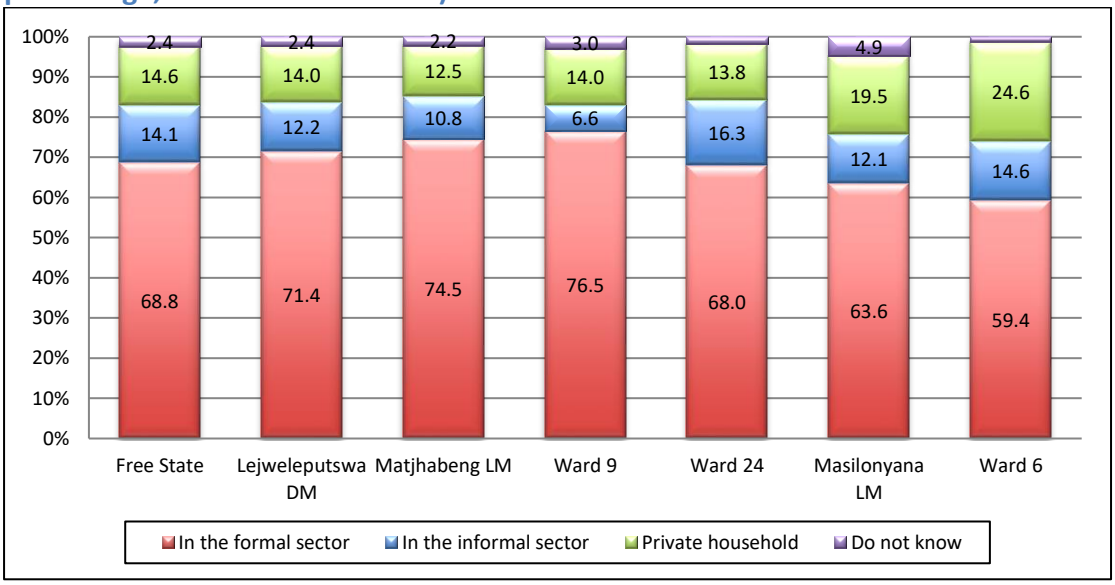
Ward 6 has the lowest proportion of people of economically active age (aged between 15 years and 65 years) that are employed (Figure 8), while Wards 9 and 24 have the highest proportions. Since 2010 employment in the gold mining industry showed a steady decline from 157 019 in 2010 to 94 399 in 2020 (www.mineralscouncil.org.za). As such the proportion unemployed people in the area are likely to have increased since 2011.

Figure 8: Labour status (those aged between 15 - 65 years, shown in percentage, source: Census 2011)



The majority of the employed people in the areas under investigation work in the formal sector (Figure 9). Ward 9 has the highest proportion of people working in the formal sector while Ward 6 has the highest proportion of people working for private households.

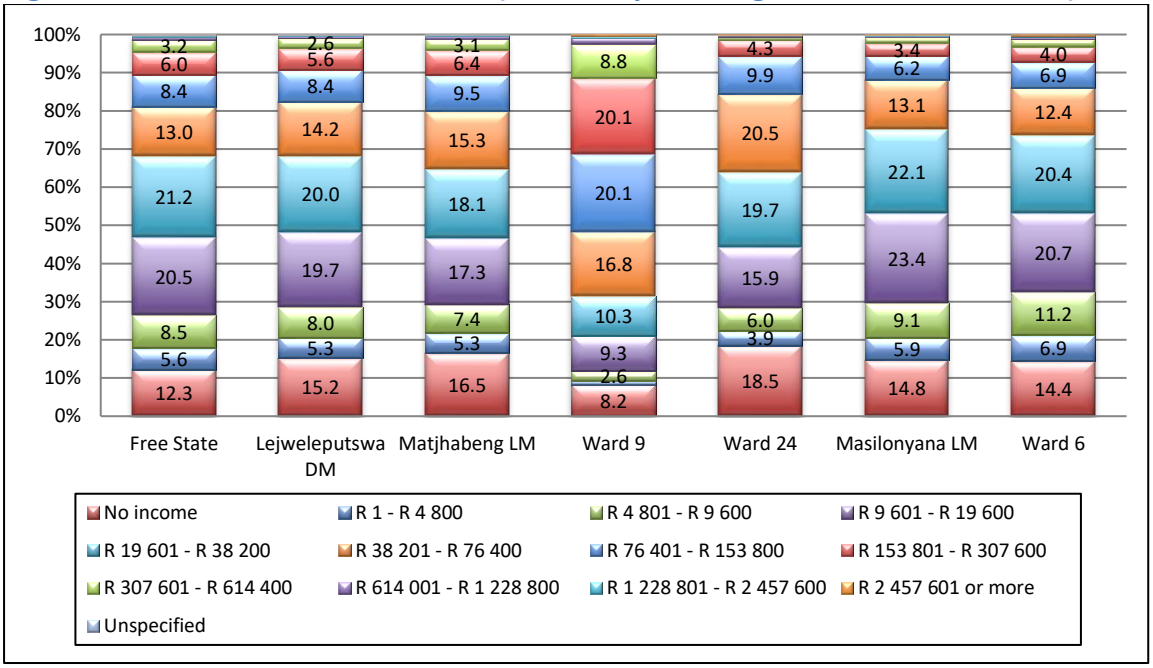
Figure 9: Employment sector (those aged between 15 - 65 years, shown in percentage, source: Census 2011)



5.2.7 Household Income

Ward 24 has the highest proportion of households that have no annual household income (Figure 10), while Ward 9 has the highest average household income.

Figure 10: Annual household income (shown in percentage, source: Census 2011)



5.2.8 Housing

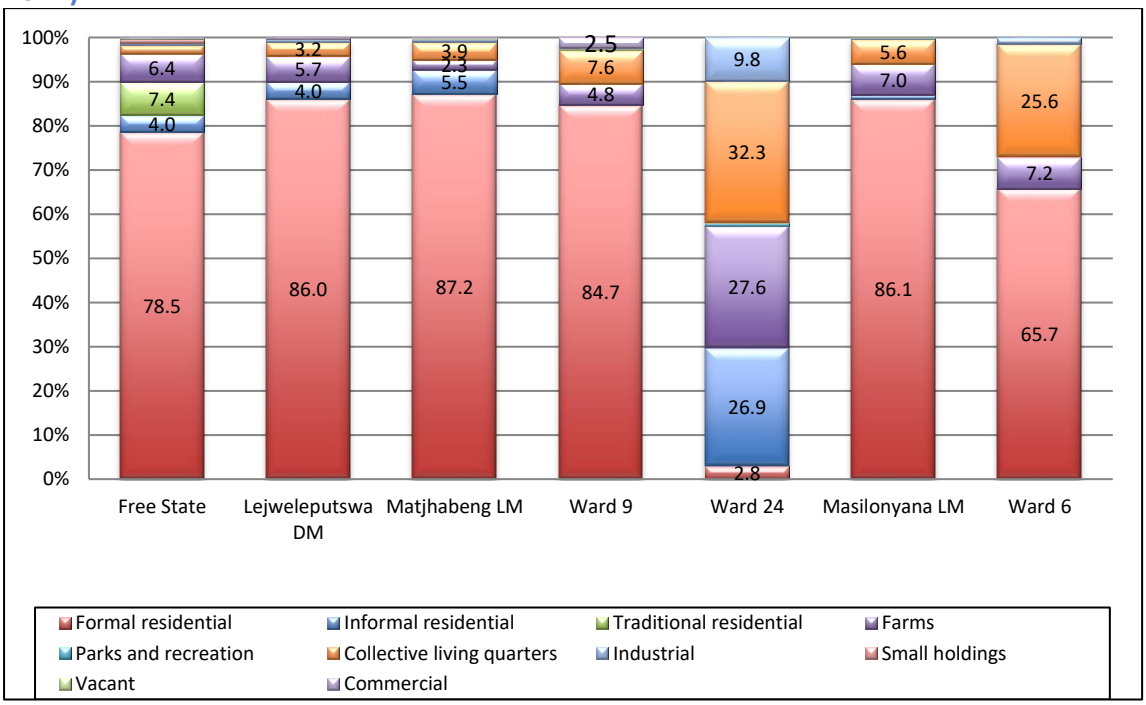
On a ward level the majority of households live in areas classified as urban. Wards 24 and 6 have the highest incidence of households living on farms. In Ward 24 almost a quarter of households live on farms. Ward 9 includes a large portion of the town of Virginia.

Table 6: Geotypes (source: Census 2011, households)

Area	Urban	Tribal/Traditional	Farm
Free State Province	84.5	8.8	6.7
Lejweleputswa DM	93.9	0.0	6.1
Matjhabeng LM	97.7	0.0	2.3
Ward 9	94.2	0.0	5.8
Ward 24	75.2	0.0	24.8
Masilonyana LM	91.4	0.0	8.6
Ward 6	87.4	0.0	12.6

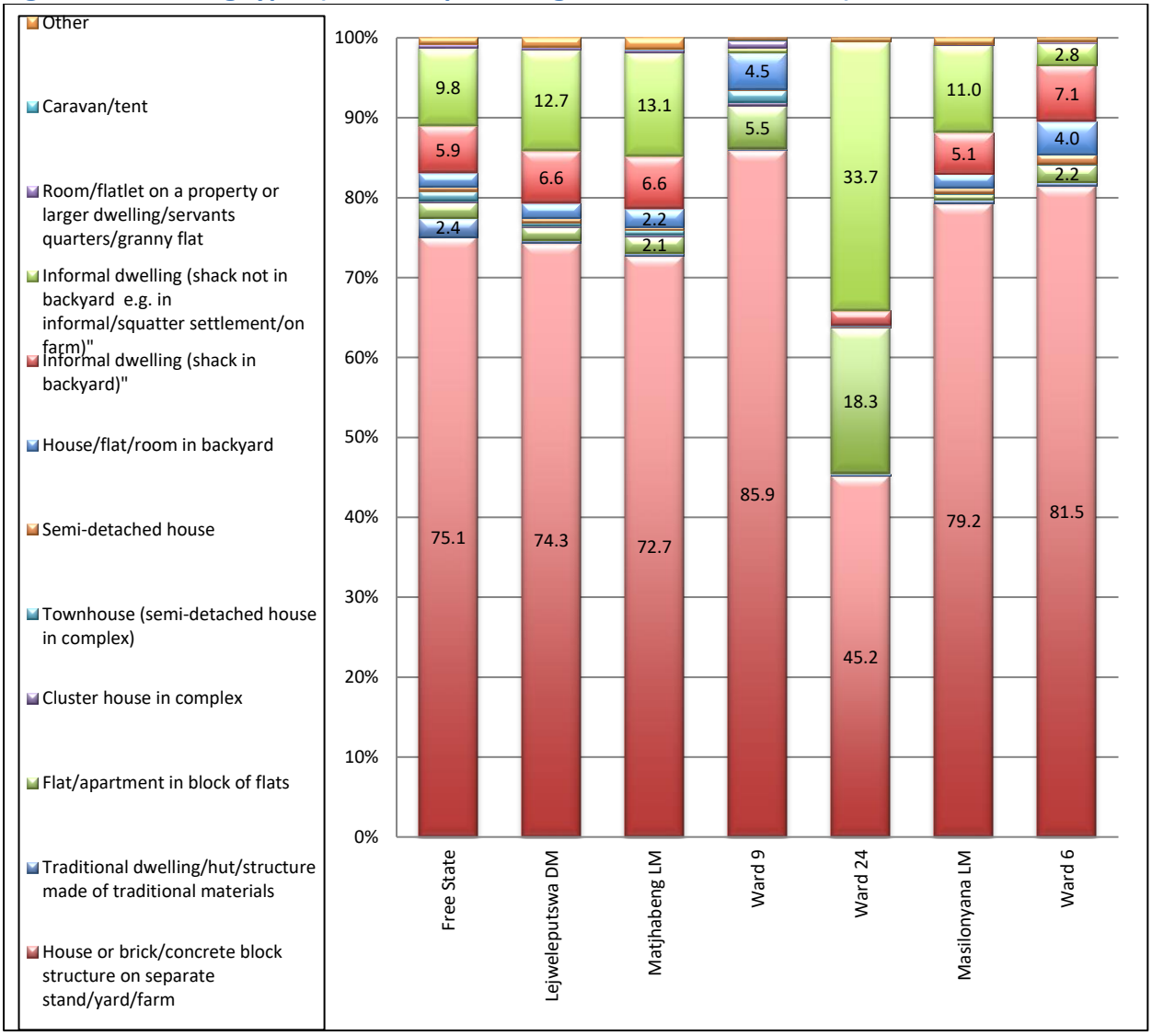
Most households live in formal residential areas (Figure 11), with about a quarter of households in Ward 6 and a third of households in Ward 24 residing in collective living quarters. Just over a quarter of households in Ward 24 live in informal residential areas.

Figure 11: Enumeration area types (persons, shown in percentage, source: Census 2011)



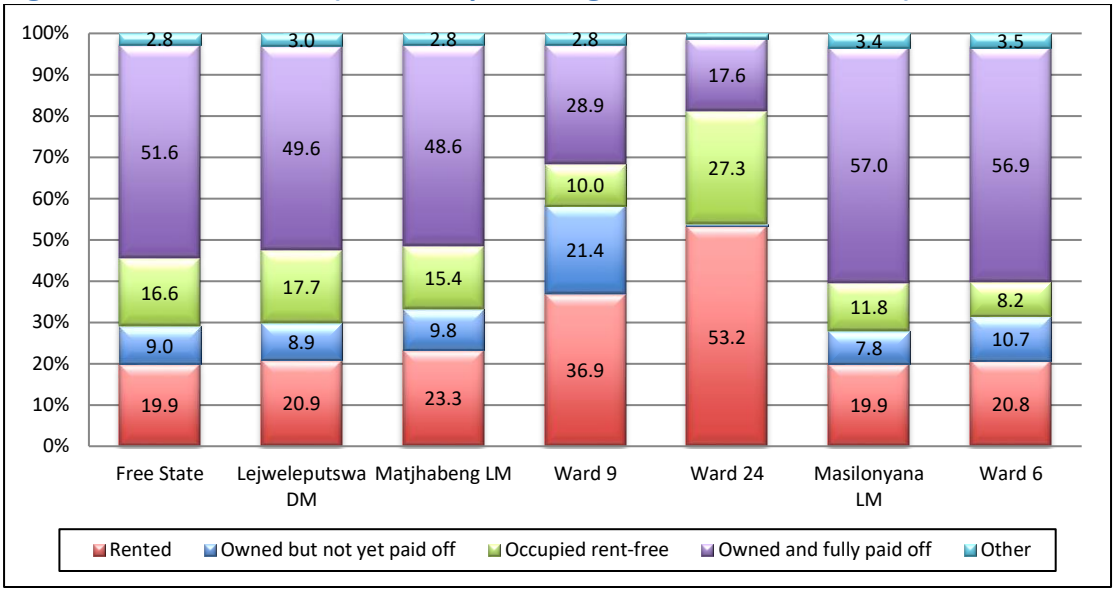
Most of the dwellings in the area are houses or brick/concrete block structures that are on a separate yard, stand or farm (Figure 12), except in Ward 24 where about a third of the dwellings are informal and a fifth live in a flat or an apartment in a block of flats.

Figure 12: Dwelling types (shown in percentage, source: Census 2011)



Ward 24 has the largest proportion of households that are renting their dwellings (Figure 13), with more than half of the households renting, while Ward 6 has the largest proportion of households that own their dwellings and have paid them off in full.

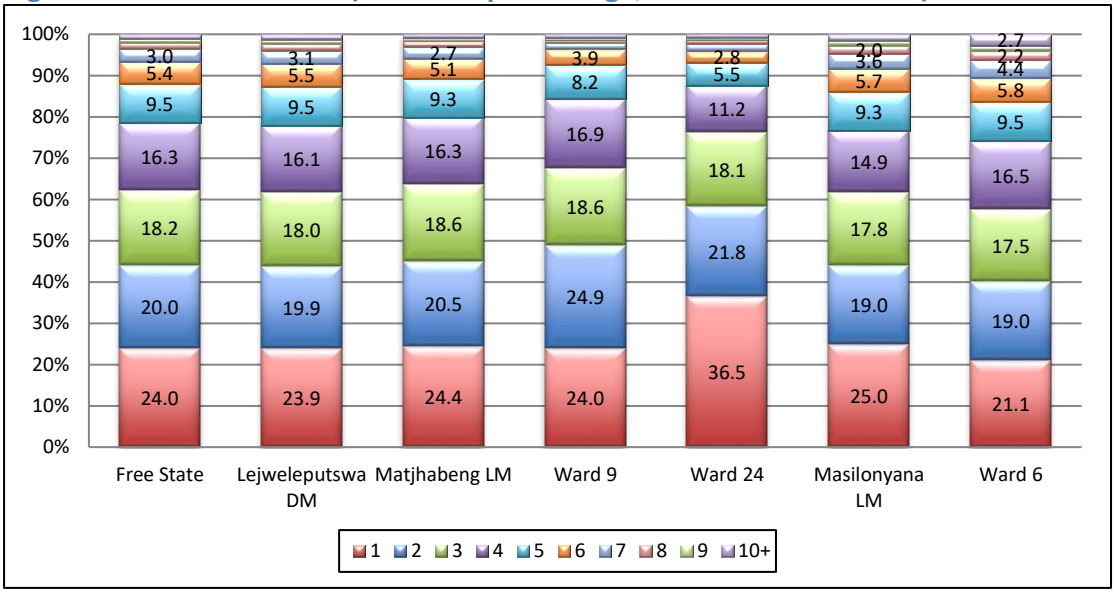
Figure 13: Tenure status (shown in percentage, source: Census 2011)



5.2.9 Household Size

Household sizes on a ward level in the Matjhabeng LM tend to be smaller than on local, district or provincial level (Figure 14), with approximately 50% or more of households on ward level consisting of one or two people, compared to just over 40% on local, district and provincial level. In Ward 6 of the Masilonyana LM households sizes tend to be larger than on local, district or provincial level.

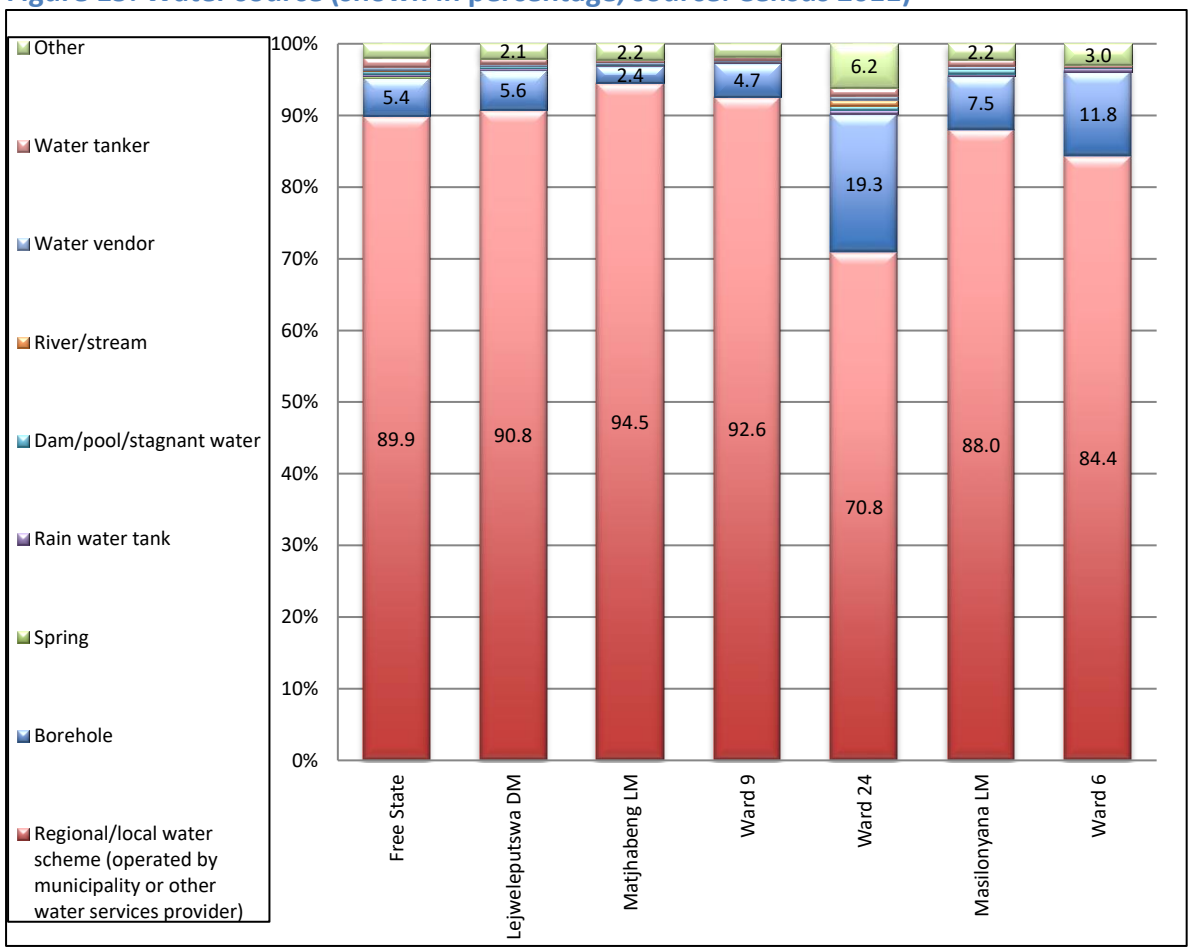
Figure 14: Household size (shown in percentage, source: Census 2011)



5.2.10 Access to water and sanitation

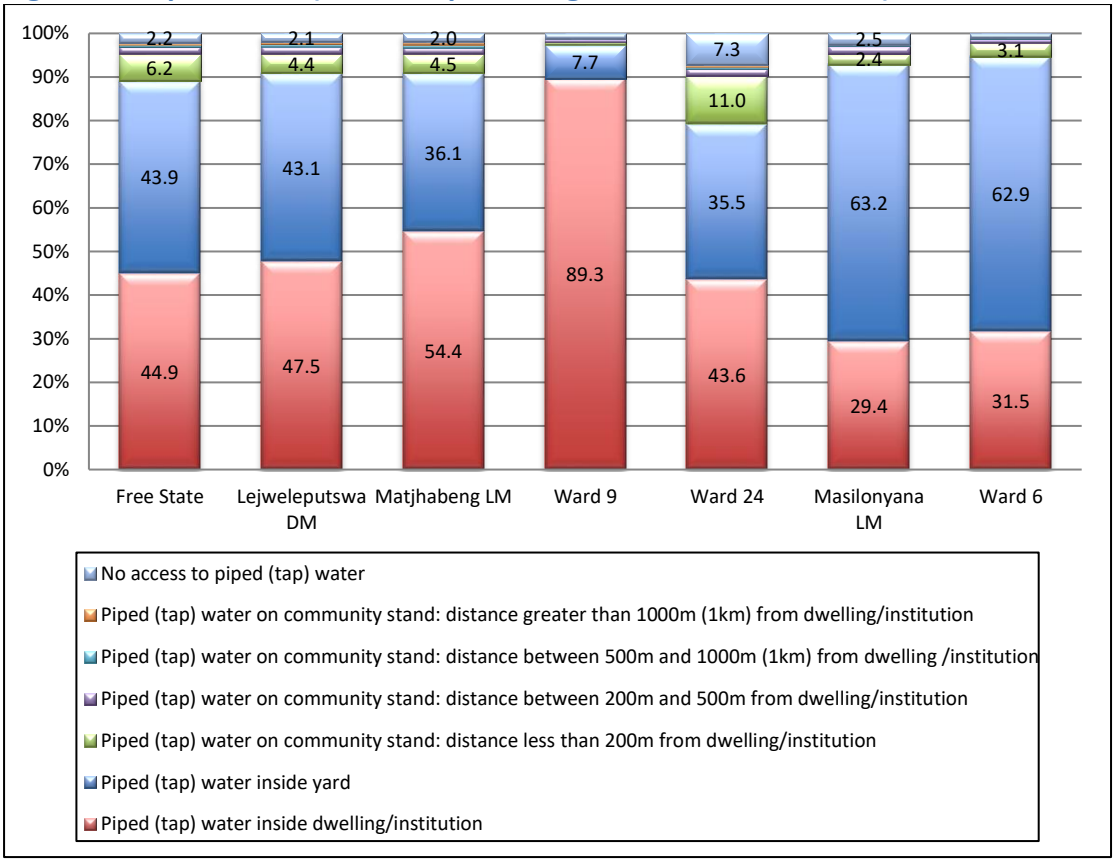
Ward 24 has the lowest incidence of households that access to water from a local or a regional water scheme, but the highest incidence of households that get their water from a borehole or another source (Figure 15).

Figure 15: Water source (shown in percentage, source: Census 2011)



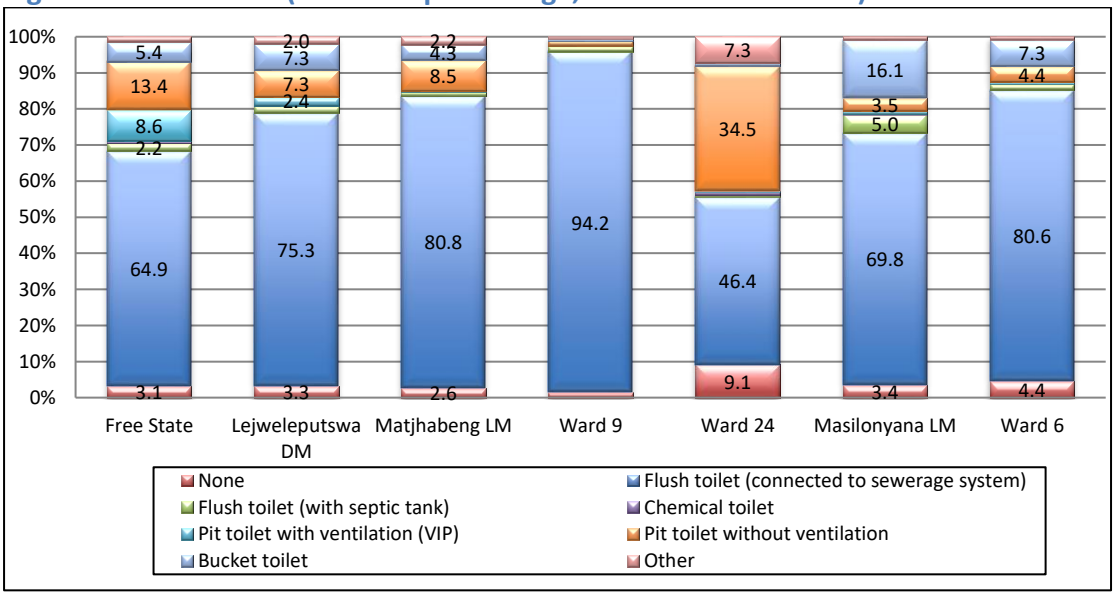
Access to piped water, electricity and sanitation relate to the domain of Living Environment Deprivation as identified by Noble et al (2006). Almost 90% of households in Ward 9 has access to piped water inside the dwelling (Figure 16). In Ward 6 more than 90% of households have access to water insider their dwelling or stand, compared to almost 80% in Ward 24.

Figure 16: Piped water (shown in percentage, source: Census 2011)



The highest incidence of households that do not have access to any sanitation services is in Ward 24 (Figure 17), with approximately a third of the households in the ward having access to pit toilets without ventilation.

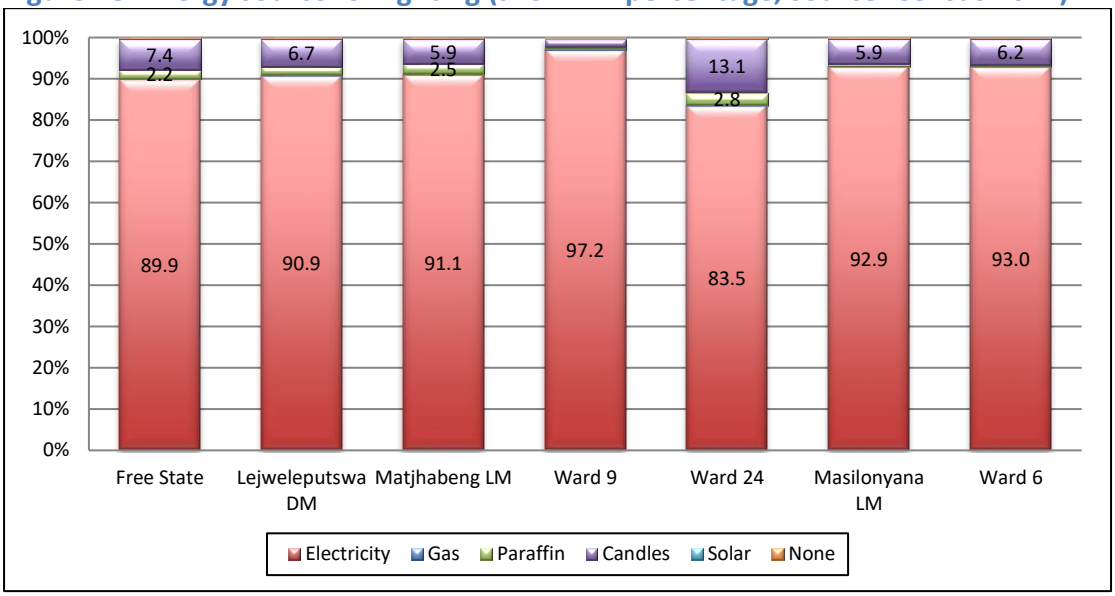
Figure 17: Sanitation (shown in percentage, source: Census 2011)



5.2.11 Energy

Electricity is seen as the preferred lighting source (Noble et al, 2006) and the lack thereof should thus be considered a deprivation. Even though electricity as an energy source may be available, the choice of energy for cooking may be dependent on other factors such as cost. More than 80% of households have access to electricity as energy source for lighting (Figure 18), with candles the second most used source.

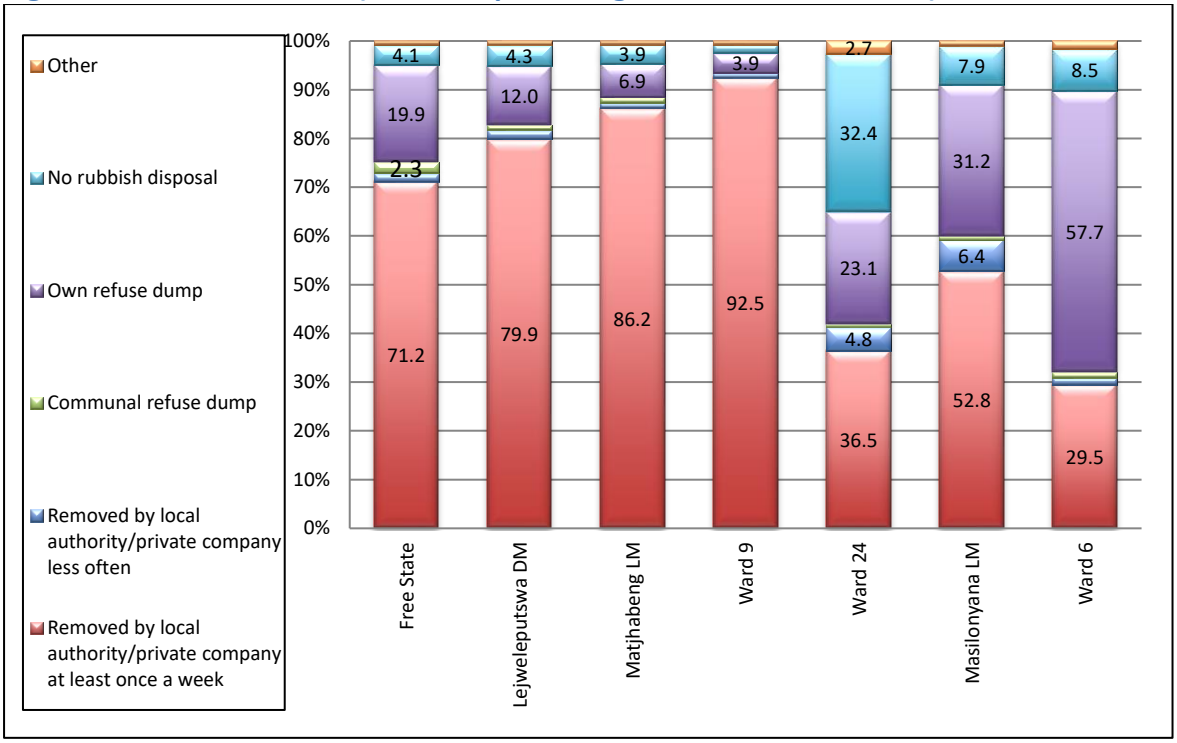
Figure 18: Energy source for lighting (shown in percentage, source: Census 2011)



5.2.12 Refuse removal

Wards 6 and 24 have the lowest incidence of households that have their refuse removed at least once a week by a local authority or private company (Figure 19), with almost a third of households in Ward 24 having no rubbish disposal.

Figure 19: Refuse removal (shown in percentage, source: Census 2011)



6 Stakeholder Identification and Analysis

6.1 Approach

Stakeholders include all individuals and groups who are affected by, or can affect, a given operation. Stakeholders consist of individuals, interest groups and organizations (Vanclay, Esteves, Aucamp & Franks, 2015). Stakeholder analysis is a deliberate process of identifying all stakeholders of a project - the individuals and groups that are likely to impact or be impacted by it - and understanding their concerns about the project and/or relationship with it (Vanclay et al, 2015). Stakeholder analysis assists the proponent with understanding the local cultural and political context. It is acknowledged that different stakeholder groups have different interests, and that there are individual differences within stakeholder groups. The purpose of this section of the report is to introduce the stakeholder groups that will be affected by the proposed projects. The following stakeholder groups were identified and their interest in the projects will be discussed briefly in the section below.

6.2 List of stakeholders

The following stakeholders that may have an interest in or affected by the proposed Tetra4 project have been identified:

Table 7: Detail of Stakeholder Groups.

Stakeholder Grouping	Organisation
Internal Stakeholders	
Renergen	Renergen Staff involved with the Tetra4 project
Tetra4 (Pty) Ltd	Tetra4 Management Team Employees of Tetra4
Government	
Governmental departments and directorates	• Free State Provincial Government • Petroleum Agency of South Africa • National Energy Regulator of South Africa (NERSA) • Department of Environment, Forestry and Fisheries • Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs • Free State Department of Water and Sanitation • Free State Department of Police, Roads, and Transport • Department of Mineral Resources and Energy • Lejweleputswa District Municipality • Masilonyana Local Municipality • Matjhabeng Local Municipality

Stakeholder Grouping	Organisation
	• South African Heritage Resources Agency (SAHRA)
State-owned entities and regulators	• Eskom Distribution • Eskom Transmission • National Energy Regulator of South Africa (NERSA) • South African National Roads Agency Limited (SANRAL)
Business	
Local Businesses	Various in Virginia, Welkom, Thabong, Theunissen and Riebeeckstad Free State Goldfields Chamber of Business
Contractors / Suppliers	Contractors providing sub-contracting services to Tetra4 Suppliers of goods to Tetra4 Suppliers receiving agricultural produce from the farmers in the project affected area Suppliers of agricultural goods to farmers in the project affected area
Other industries	Sibanye Gold
Environmental	
Environmental Interest groups	Endangered Wildlife Trust WESSA Birdlife South Africa Centre for Environmental Rights
Societal	
Social Organizations	Community forums (e.g., employment, youth)
Residents/ Community	
Residents	Residents of informal settlements, homeowners/tenants Virginia, Welkom, Thabong, Theunissen and Riebeeckstad
Local farmers	Farmers and farm workers on directly affected by boreholes or other infrastructure and neighbouring properties Other farmers and farm workers in the area

The identified level of interest of each stakeholder helps assist with designing the stakeholder engagement strategy for the project, and to decide how much time to devote to engaging with each stakeholder or group. This is a qualitative analysis that should ideally be done by the stakeholder engagement team and revisited as needed, as the interest of stakeholders may change after the construction phase and in the operation phase. The engagement levels required for each group of stakeholders as revealed through this analysis may be more than consultation, for example they may include partnerships, involvement in community development plans or community monitoring, strategic planning, or any other activity. Knowing the needs, issues and expectations of affected stakeholders assist with building and retaining good relationships with them, and with managing their expectations.

Table 8 below plots the stakeholders according to their ability to influence the company's activities (horizontal axis) and the degree to which they are affected by the proposed Tetra4 activities, whether the impact is social, economic or environmental (vertical axis). In instances where the impact or influence is potentially significant individual stakeholder groups/organisations have been used. All other groupings are used in general.

Table 8: Stakeholder matrix.

Degree to which they are impacted on				
	High	Local Businesses Contractors / Suppliers Directly affected farm workers	Contractors Directly affected farmers	
	Medium	Neighbouring farmers and farm workers	State-owned entities and regulators Environmental Interest groups	Governmental departments and directorates
	Low	Social organisations Local residents		
		Low	**Medium**	**High**
		Ability to influence company's activities		

The stakeholders that will be impacted on most in both a positive and negative manner but have the least ability to influence the company's activities are local businesses, contractors, suppliers, and directly affected farmers. There are two groups of directly affected farmers. The first group have been affected by Tetra4 Phase 1 and will be affected by Phase 2 as well. The second group has not been impacted before and will experience the impacts for the first time. This means that the same impact will be a new impact for the one group, and a cumulative impact for the second group. The impact on the livelihoods of the farmers in the long term is a significant concern. The project is still in the negotiation phase about where infrastructure will be, and the relationship between Tetra4 and the landowners are mostly positive. Tetra4 is currently trying to accommodate the landowners' fears and issues, but there are high levels of uncertainty amongst the stakeholders. There is a power imbalance between Tetra4 and the landowners, and there is a risk that the precarious relationship can

turn from a good social licence to operate to no social licence to operate. It is therefore of great importance that Tetra4 and the directly affected parties communicate frequently in an open and honest manner to avoid a standoff.

7 Description of potential impacts

7.1 Social Impact Assessment

> *"Almost all projects almost always cause almost all impacts. Therefore more important than predicting impacts is having on-going monitoring and adaptive management."* Frank Vanclay

Considering the statement above, it must be considered that some social impacts will not be discussed in detail and that the focus will be on the most severe impacts. A number of impacts have been identified during the scoping phase of the project. However, during the impact assessment phase of the project when the impacts were investigated in more detail, it was found that some of the impacts will not be significant, and therefore these have not been included in the final impact assessment report. A list of the impacts identified during the scoping phase is included in Section 7.3, and the impacts that require no further investigation at this stage are highlighted in red. Nevertheless, it must be considered that the social environment is dynamic and adapts to change and it is highly likely that impacts predicted in this report will change throughout the life of the project. This has been a major concern amongst many of the directly affected stakeholders. The focus should rather be on the active management of social impacts than on the prediction and once-off mitigation thereof. Successful mitigation and management of social impacts requires long-term commitment and involvement and should form part of the strategic planning and management of the project until decommissioning. Suggestions for the management of social impacts are included in the report in the form of a social impact management plan (SIMP). The implementation of the relevant management suggestions should start as soon as possible, since the social impacts of the project started when the project was announced. Another important consideration in this project is the social context in which it will be executed. Impacts are assessed from a community perspective, and where it will influence a specific group of stakeholders it will be indicated as such. An attempt was made to simplify the impact assessment and to focus on aspects that can aid the decision-making process.

Social impacts are the result of social change, and to fully understand the potential impacts it is important to know the impact pathways. A social change process is a discreet, observable and describable process that changes the characteristics of a society, taking place regardless of the societal context (that is, independent of specific groups, religions etc.). Social change processes can be measured objectively. The way in which social change processes are perceived, given meaning or valued, depend on the social context in which various societal groups act. Some groups in society are able to adapt quickly and exploit the opportunities of a new situation. Others (e.g. vulnerable groups) are less able to adapt, and will bear most of the negative consequences of change. These social change processes may, in certain circumstances and depending on the context, lead to the experience of social impacts. Social impacts are therefore completely context-dependent (Vanclay, 2003).

7.2 Impact assessment criteria

It must be stated that the impact tables and ratings were adapted from the environmental sciences and that it is not always possible to compartmentalise the social impacts. For the sake of consistency this has been attempted, but it is not innate to social sciences. Allowance for the changing and adaptive nature of social impacts should be made when interpreting the impact tables.

The rating criteria used in determining the significance ratings are summarised in the tables below:

Table 9: Criteria for determination of impact consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),

	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Table 10: Probability scoring.

Aspect	Score	Definition
	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

Table 11: Criteria for the determination of prioritisation.

Aspect	Score	Definition
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.

	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).
Degree of Confidence	Low	<30% certain of impact prediction
	Medium	>30% and <60% certain of impact prediction
	High	>60% certain of impact prediction

7.3 Social impacts and mitigation

In this section each impact will be described once, and the phases of the project where the impact will take place will be identified. Mitigation measures for each impact that are relevant through the specific phases will be discussed after each impact.

7.3.1 Impact on livelihoods specific to farming communities

Description of impact

A livelihood refers to the way of life of a person or household and how they make a living, in particular, how they secure the basic necessities of life, e.g., their food, water, shelter and clothing, and live in the community (Vanclay et al., 2015). The farming community in the area is close-knit, and the majority of stakeholders that will be affected by the project rely on farming as a livelihood, in many cases for generations. This includes vulnerable parties like farm workers. The farms are not only their homes, but their businesses. They generate their income from the land. Any aspect that impacts on the ability of a farmer to make a living from his/her land can be seen as an impact on his/her livelihood.

Tetra4 Cluster 2 will involve up to 300 production wells, gas transmission pipelines and associated infrastructure, compressor stations and a Liquid Natural Gas (LNG) and

Liquid Helium (LHe) plant ("LNG/LHe Plant") and associated infrastructure (including powerlines) in order to meet the future production requirements. Some of the grain farmers have central pivots that will be affected, and in some instances their most productive land is impacted. In order to be an effective grain farmer, you must cover as much ground as possible for sowing and harvesting purposes. The width and distance of the land that they can plough, treat of harvest contribute to the number of hectares that they cover every day. The tractors follow a specific pattern when the fields are prepared. The implements that the farmers use is enormous - harvesters are 12 meters wide, and crop sprayer booms varies between 24 and 36 meters (Figure 20). These implements cannot travel underneath power lines. The position of some of the wells are indicated as being right in the middle of some of the fields. This means that the fields are fragmented, and the farmers will be unable to utilise sections of the fields. It is important to the farmers that each piece of land remain an economic unit. Given the size of the equipment it is difficult to plough on fragmented pieces of land. Farming on fragmented pieces of land is much more labour and time intensive and will have a significant impact on the size of the harvest.

Figure 20: Size of farm equipment (shown with person for scale).

Cattle and game farmers may lose some of the grazing areas, and the noise and movement around the animals is not ideal. Cattle and game farmers are concerned about an increase in poaching incidents due to more movement over their properties. There is small game that occurs naturally in the area. Experience with similar projects has shown that poaching incidents increase when there are construction activities in an area. This is often done via snares and traps, which also pose a risk to livestock. Another concern for game farmers is the hunting season. Hunting forms part of their income, and if there are construction activities on the farms, they cannot accommodate hunters due to safety concerns.

Currently Tetra4 offered the farmers compensation of R18 000 per hectare of their properties that are affected by the servitude per year. If a field is affected by drilling and pipelines, and the farmer cannot produce crops on that field, the financial impact would be much higher since the compensation will only cover the servitude area and not the extra land where no crops can be grown. Drilling in a farmer's field can potentially sterilise the field for up to two years. The reason for this is that the drill will compact the land. The farmer will then need to loosen the ground again. The soil must also be prepared for the harvest. Farmers invest significant amounts in measuring soil chemistry and preparing the soil to get the best possible harvest. Farming is approached from a scientific perspective and a seasonal endeavour. If a farmer misses a planting season, he can only plant his crops again in the next season. Preparing, planting, fertilising, and harvesting activities means that the farmers work their land all year long – there are never times when it just lies fallow. Due to the lack of information and timeframes, the farmers are uncertain about how long their fields will be occupied and how permanent the impact will be. They will lose the income generated by the specific field, which in some instances where the farmers are impacted by a lot of wells and trenches, forms a significant part of their income. This meets the International Finance Corporation (IFC) definition of economic displacement. According to the IFC economic displacement is the loss of income streams or means of livelihood resulting from land acquisition or obstructed access to resources (land, water, or forest) resulting from the construction or operation of a project or its associated facilities (IFC,2002).

Renting fields from farmers does not yield a similar income to harvesting a field. If the farm is out of commission for an extended time due to Tetra4's activities, it will mean that some farm workers may lose their jobs and houses, as the farmers cannot afford to keep paying staff without generating income or having work for them to do. Farmers must also continue to pay for water and electricity rights, whether they use it or not.

Any negative impact on the livelihood of a farmer impacts on farmworkers, who are much less resilient. Many of the affected people have dependents such as elderly parents and young children, in addition to their workers. Impacts on livelihoods are seen as some of the most significant impacts from a social perspective, as the ripple effect of this impact can be felt on so many levels, and people always experience this impact severely on a personal level.

Table 12: Potential mitigation for impacts on existing livelihoods.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	The Tetra4 community liaison officer (CLO) must continue to deal with the affected landowners throughout the life of the project	All phases	Throughout the life of the project	Tetra4	The CLO must keep records of all the communication with affected landowners throughout the life of the project	Establish good relationships with the affected landowners and protect their interests	Communication register, social risk and incident register
2.	In cases where there the farmer does not agree with the compensation offered by Tetra4 related to loss of potential income due to exploration, construction or operational activities, Tetra 4 must appoint an agricultural economist at their cost to determine what the actual losses will be to the farmers due to the drilling and trenching activities on their properties. Farmers must be	Exploration phase Construction phase Operation phase	Periodically when a farmer's source of income is affected	Tetra4	Revised yearly as long as the impact exist.	Ensure that there is no loss of income for the affected farmers due to Tetra4's activities	Report from agricultural economist Economic displacement action plan.

	compensated for the actual losses for the entire period that they cannot use the land due to Tetra's activities. This may be one or two years, depending on when in the season the drilling and trenching take place, and how long the property is affected. The principles explained in the **IFC Handbook for Preparing a Resettlement Action Plan** must be followed. This includes a land use/land capability inventory; an asset register and physical asset survey; an income stream analysis and entitlement matrix. Compensation must be determined with input from the landowners.						
3.	If any existing livelihood activities will be affected negatively Tetra4 must enter into negotiations with the affected parties as soon as reasonably achievable to ensure	All phases	Before the construction phase or activity that will interfere with their	Tetra4 CLO	Ad hoc – CLO must keep records and produce on request	Protect the livelihoods of landowners against negative social impacts	Proof of communication about prospective activity (minutes of meeting, e-mail, SMS)

	the affected parties are compensated fairly or can make additional arrangements. Interference with existing livelihoods should be avoided if possible. If any new activities are planned for a property, Tetra4 must consult with the landowner and obtain his consent to execute the activity on his/her land.		livelihoods commence				Written agreements
4.	If any interference takes place and there are actual losses, the landowner should be compensated for their losses. Tetra4 must have a claims procedure that is communicated to all affected landowners. There must be specific timeframes dealing with response times and time it takes to close out complaints. In order to receive compensation, the claim forms must be submitted to the Tetra4 CLO Compensation should follow the IFC principles, which states that market related prices should be paid, and if anything is restored, it must be to the	All phases	Commence in the planning phase and continue throughout the life of the project	Tetra4 CLO	As required – claims received by CLO and records of all claims must be kept	Ensures that landowners do not suffer actual losses because of the project.	Claims procedure distributed to all land owners Claims register Completed claim forms

	same or better standards than before.						
5.	If areas are fenced, the fences must be checked for snares on a daily basis for the duration of the construction period. All incidences must be reported to the closest police station. Anti-poaching toolbox talks should form part of the induction process of all the fencing teams. Any contractor or employee caught poaching should be removed from site.	Construction	Throughout the construction period	Tetra4	Daily	To ensure no poaching events take place or harm is done to livestock	Record of inspections Toolbox talk records

7.3.2 Impact of servitudes on land values

Description of impact

Tetra4 plans to register servitudes for all the wells, pipelines and other infrastructure that is on the property of the farmers. The farmers are concerned about the impact of having numerous servitudes registered on your property on the value of their properties. They also commented that some of the Cluster 1 servitudes has not yet been registered at the Deeds office. Due to the fact that there is not clarity at the moment about where exactly wells will be drilled and where the pipes will be, the landowners are not keen to have a multitude of servitudes registered before Tetra4 has exact locations for the wells that they are definitely going to use. The farming community suggested that temporary access and rent arrangement should be made to access the land until there are certainty about which wells will be used.

A praedial servitude is registered against immovable property in favour of other immovable property. The real right therefore, attaches to the land itself and not a person. In this instance, you will have a servient tenement and a dominant tenement. The servient tenement is the land burdened by the servitude, and the dominant tenement is the land that benefits from the servitude. Common examples of praedial servitudes are right of way, right of aqueduct, right of conduction of electricity and right of grazing servitudes.

Table 13: Potential mitigation for impacts from servitudes.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Servitudes should only be registered for the life of the operations or as long as the well and pipeline in use are productive. At the end of the life of operations, or when a well or pipeline is no longer productive od used, servitudes must be de-registered at the cost of Tetra4. Servitudes cannot be seen as access routes unless it has been specified as such and agreed on by both parties.	Pre-construction Decommission-ing	Negotiations must commence before any activities take place	Tetra4 Landowner	Servitude agreements must be revisited once a year to determine if it is still relevant and necessary	Protect the land values of the affected land owners.	Servitude agreements
2.	Temporary access and land arrangements must be made until there are more certainty on exactly where the wells will be. Servitudes should only be registered for productive wells.	Pre construction Operation	Before the drilling commence	Tetra4 Landowner	To be revisited whenever new wells are drilled or new infrastructure will be required.	Protect the land rights and property values of the landowners.	Temporary land agreement and access arrangement document.

7.3.3 Uncertainty

Description of impact

The farmers are the holders of the surface rights, whilst Tetra4 holds the production rights. This means, that according to the MPRDA, Tetra4 can give the land owner 21 days' notice, and then continue with their production activities, despite objections from the land owners. This is a cause of uncertainty and tension amongst the farmers, since they feel that they have no control over or say in what will happen on their property. Another source of uncertainty is how Tetra4 will implement the project and the way in which the contract with the landowners is structured. The farmers feel that the contract is too open, have few specifications, no explanation on exactly what they are agreeing too and no timelines. Since the impact on each individual landowner will be different, the farmers feel that there should be a basic contract which are then negotiated with the specific landowner.

The affected landowners would like to see a map of the project as a whole – it is difficult for them to see on the maps that only cover their property where the pipeline exit their property and enters their neighbour's property and what route is planned.

Farmers are also concerned about what the consequences will be if farmers or farm workers damage any Tetra4 property, for example when using large equipment such as tractors or harvesters. The farmers are unsure about who would be responsible to pay for the damages.

The land owners affected by Cluster 1 are especially concerned about the potential future expansion of the project. They are now affected by Cluster 2 as well, and fear that there may be more future expansion. They are concerned about their rights. Some of the landowners have lived on the properties for generations, and also see it as the future for their children. The uncertainty has a mental impact on the farmers as well and is a source of stress and worry.

Table 14: Potential mitigation for uncertainty

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 must provide detailed written information to the landowners to assist them with making informed decisions. The information must include: 1. Depth and route of the pipeline 2. Timeframe associated with the drilling and installation process – when will Cluster 2 start and end. 3. A3 or A2 maps of the entire project area for each affected landowner 4. Information about well heads and boreholes: How long does it take to drill a borehole? Can more than one borehole be drilled with the same drill point? What infrastructure are needed around the well heads and sketches of this infrastructure	All phases	Commence in the planning phase and continue throughout the life of the project	Tetra4	The CLO must keep records of all the communication with affected landowners throughout the life of the project	Establish good relationships with the affected landowners and protect their interests	Written information sheet Communication register, social risk and incident register

	Are all the drill points necessary? What will happen if there is a change in the infrastructure presented to the landowners? Can more than one wellhead be operated from one underground manhole? Will the boreholes be left open for a period of time after the holes were drilled? How are the wellheads connected to each other? What happens if no gas is found at a borehole? Will unproductive boreholes be investigated again later? 5. Positions of blowers, booster stations and compressors, if any. Sketches of all associated infrastructure. 6. Will there be overhead power lines or electric						

	cables? Will cables be buried? 7. What maintenance will be required, and how often will teams need access for maintenance? 8. Where will the condensation wells be? 9. How will condensation water be removed? The contract states it will be no more than once a week, but is it once a week per well, or once a week that the vehicle gets access? 10. Who will be responsible for damage to Tetra4 property?						
2.	Any future expansion plans must be communicated to any landowner that will be influenced by the expansion.	All phases	Before the construction phase or activity that will affect their land rights commence	Tetra4 CLO	Ad hoc – CLO must keep records and produce on request	Protect the land rights of the landowners	Proof of communication about prospective activity (minutes of meeting, e-mail, SMS) Written agreements

7.3.4 Nuisance factor due to increase in ambient dust and noise levels

Description of impact

Nuisance factors refers to aspects that may be within the legal limit, but still causes a nuisance or irritation to the receptors. The drilling and construction phase activities will create dust, especially if it is done in the dry season. This will mostly affect the stakeholders whose dwellings are close to where the work will be conducted. Another concern is the impact of the dust created by the drilling on the crops of the farmers.

Some of the new well sites are very close to dwellings. Drilling is an inherently noisy activity. The noise from the drilling will be worse than the noise from digging trenches. Although this is a temporary impact, it will create a major nuisance whilst happening.

Table 15: Potential mitigation nuisance factors.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	The relevant specialists will provide scientific mitigation measures for this aspect. Practical, visible solutions such as putting shade nets against fences close to dwellings during the construction phase should be investigated. No drilling or construction must take place on weekends or between sunset and sunrise.	Design and planning, construction, operation.	Commence in the planning phase and continue through to the operation phase of the project	Tetra4 EO CLO	As prescribed by specialists Meetings with affected landowners to discuss issues	Minimise the nuisance impact on affected landowners	Minutes of CLO meetings Monitoring results from relevant specialist studies. Practical solutions implemented by Tetra4 Minutes of meetings with affected landowners.

7.3.5 Change in travel patterns

Description of impact

Changes in travelling patterns can be experienced on different levels. People may need longer travelling times and need to change routes due to increase in traffic or lack of access. This may be especially relevant where people have more than one property and use internal roads to access their properties. Especially during the drilling and construction phase there may be instances where access routes will be obstructed, and people will need to change their existing movement patterns. This may have time and cost implications for the affected landowners. In some cases, they would need to construct new access routes, and in other instances they would need to incur costs to travel longer routes. Although construction is planned for a certain period, there are many external factors that can impact on construction plans, such as extreme weather events, labour unrest and changes in company structures. Should construction last much longer than intended, this impact will increase in severity. When considering access, the nature of the business that is operated from each property must be considered. Some properties need 24 hours access and any problem with accessing these properties will impact on the livelihoods of the residents. Mega-farm implements and their operating requirements must also be considered. There are also a few game farms in the area which farm with exotic game. The game is sensitive, expensive, and vulnerable to environmental stressors such as noise and movement. To support their livelihoods, farmers in the area have certain window periods when they need to cultivate their fields, especially during planting and harvesting time. During these periods they must be able to access their fields without any difficulties. At the end of the project access routes that provide access to land/ infrastructure that was cut-off by the project must be reinstated.

Table 16: Potential mitigation impacts on travel patterns.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	It may be unavoidable to change travel patterns. It is important to inform the affected stakeholders about the possibility of this impact as soon as possible. It will allow them time to get used to the idea and plan their activities accordingly. It is also important that locally affected parties give input in potential mitigation measures. Before construction and drilling commences Tetra4 must meet individually with each landowner to discuss their movement patterns and needs. Tetra4 must provide all the affected landowners with a construction and drilling schedule to ensure that they know when construction will take place on their properties. It is recommended that construction and drilling be done outside the peak planting and harvesting seasons. Any changes to the construction and drilling schedule must be communicated to the farmers at least a week in advance. As far as possible obstruction of access routes and sensitive areas must be avoided. If it cannot be avoided both parties must agree on	Design and planning, Construction, Operation, Decommission.	Commence in the planning phase and continue throughout the life of the project	Tetra4 CLO	Meetings with landowners Construction schedule communicated at least 7 days before construction commences.	Ensure that the access routes used by landowners are not affected by the project. If it is affected, to minimise disruption and costs	Minutes of meetings with landowners Construction schedule provided to landowners Proof of communication of changes in construction schedule. Written agreements in place where Tetra4 specify what costs they will carry if access routes need to change;

	alternative routes, and Tetra4 should carry the cost of implementing the alternatives. Industrial vehicles should not travel during peak traffic times. If practical and required by the landowner, access routes to land/infrastructure should be reinstated in the decommissioning phase. This must be done in conjunction with the landowners.						

7.3.6 Damage to farm roads, existing services, and infrastructure

Description of impact

Tetra4 is and will continue to use existing farm roads to access their infrastructure, and in some instances the infrastructure is and will be aligned with existing roads. There is a high possibility that the roads will be damaged during construction the process. Farmers maintain and construct their own roads. Road maintenance is especially tricky in the rainy season. The project area received unusual high rainfall during the past rainy season. The farmers acknowledge that Tetra4 is trying their best to accommodate farmers' requests to not access their land after heavy rains, but report that it still happens, despite them having asked explicitly that no one drive on the roads until it can be done without damage. The farmers feel that it is impossible for Tetra to control the movements of all the drivers at any given time. Some of the roads must be able to carry the weight of heavy farm implements or trucks that the farmers use in their daily tasks, but the farmers are still concerned about the drilling rigs and the potential damage it will cause to roads and fields. The roads are not very wide, and it may be problematic for big vehicles to pass each other on the roads – especially in the rainy season there is a high risk of getting stuck. The farmers reported that they had to help some of Tetra4's personnel who got stuck on the roads.

Landowners report that the trenches were not compacted properly during the Cluster 1 construction. As a result, some of the trenches formed ditches that lead to erosion and uneven road surfaces which made it challenging for the big farm equipment to traverse.

There are services such as electricity lines and water lines installed by the farmers that must be protected, since interruption in these services will have time and cost implications for the farmers. The damage of roads and services are a major concern of the farmers.

Table 17: Potential mitigation impacts on farm roads and existing infrastructure.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	If private roads are affected by project activities, it is the responsibility of Tetra4 to maintain these roads as long as they use it. Tetra4 should engage with the relevant farmers about road maintenance, as some of them have preferential ways in which the roads must be maintained, for example if roads are only graded and not built up it turns into rivers when there is heavy rain. The road maintenance agreements must be formalised before construction and drilling commences to ensure all parties involved are protected and know their rights and responsibilities. Tetra4 must make sure that all compacting and rehabilitating of trenches are done to the specifications in the Environmental Management Plan. It is recommended that construction and drilling be planned for the dry season. Tetra4 must provide all the affected landowners with a construction and drilling schedule to ensure that they know when construction will take place on their properties. Any changes to the construction and	Design and planning, Construction, Operation, Decommission.	Before construction commence, throughout the life of the project	Tetra4 CLO	Road inspections with landowners and CLO every 4 months	Ensure that Tetra4's activities does not impact negatively on existing roads at the cost of the affected landowners	Signed road maintenance agreements Construction schedule Proof of communication of changes in construction schedule (E-mail, SMS, minutes of meeting)

	drilling schedule must be communicated to the farmers at least a week in advance.						
2.	Before the project commences Tetra4 should compile an asset and infrastructure baseline of any landowner infrastructure such as fences, pipes, electricity lines, roads and troughs that may be affected by the project. Photographs and GPS co-ordinates of the infrastructure must be included in the baseline. A copy of the baseline affecting their property should be given to each landowner, who should sign off the document to ensure that it is accurate. Tetra4 should keep the master document. If any damage occurs it should be reinstated to its pre-project status. If the infrastructure must move, it must be done at Tetra4's cost. Tetra4 must ensure that the construction team has a copy of the asset and infrastructure baseline to guarantee that no infrastructure will be damaged due to ignorance during the construction phase of the project.	Construction Rehab and closure	Must be compiled before construction and drilling commences. At project closure landowners must sign land release agreement that states all infrastructure has been reinstated to its original status.	Tetra4 CLO	CLO and landowners must have copy. Landowner to sign copy to indicate assets and infrastructure has been recorded correctly	Ensure that landowners property are returned to him/her in a similar or better condition than before the project started	Asset and Infrastructure Baseline report Proof that copies of report has been distributed to all relevant parties Signed land release agreements

7.3.7 Impacts on livelihoods due to behaviour of contractors

Description of impact

Tetra4 may use contractors to do some of the work required, or to do specialised work on the project during different phases of the project. Seemingly innocent acts may have severe consequences for affected parties. Gates that are left open can lead to road accidents if livestock wander into roads. It can also cause damage if livestock enter cultivated fields and eat the crops, which could in some instances kill them, or damage the crops to such an extent that it reduces the potential profit. In addition, open gates can give access to opportunistic criminals. People driving off-road may cause erosion, get stuck or scare sensitive livestock. If contractors' litter, the livestock may eat some of the garbage such as plastic bags, which could kill them. It is also unsightly. Food waste may attract pests like rodents. Contractors defecating and urinating in the fields due to a lack of sanitation facilities may unknowingly spread diseases, as animals may eat the excretions. No contactor must enter any property without the knowledge of the landowner.

Table 18: Potential mitigation impacts due to behaviour of contractors.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	All contractors should sign a code of conduct as part of their induction process. Induction must explicitly include aspects such as closing gates and littering. Toolbox talks must be designed to include social and environmental aspects. A fining system must be put in place for any transgressions affecting the landowners. It is important to instil respect for the landowners and their livelihoods from the beginning of the project.	Design and planning, construction, operation	Before construction commence, throughout life of project for any new contractors	Tetra4 Sub-contractors	At least one toolbox talk a month should be dedicated to social and environmental matters	Ensure contractors and sub-contractors treat landowners with respect.	Toolbox talk records Fining system for transgressions

7.3.8 Impacts on safety and security of local residents

Description of impact

Safety and security are a major concern of all of the affected landowners. The current socio-economic and political conditions in South Africa are such that people living in isolated areas such as farms are extremely vulnerable to crime and violence. The project will introduce unfamiliar people into the area who will be able to share current conditions with outsiders or opportunistic criminals. The farmers are acutely aware and distrusting of any strangers or strange cars moving in the area. Any movement at night is unusual. In some instances, vulnerable parties such as women and children are alone on the farms from time to time (this includes the farm workers). It is important for the farming community to control who access their property. This includes access between neighbouring farms – some farmers have gates in the fence between themselves and their neighbours, and they also need to control who uses these gates. Some of the farmers installed their own security cameras. Their other security concerns include vandalism, stock theft and fires. Erfenis Veiligheid is the preferred security service provider of the farmers, as most of them uses Erfenis already and they have sorted out some issues that they had. The farmers think that security is acceptable at the moment but must be intensified during the construction phase. Farmers prefer that the AgriSA access protocol should be used to access their farms.

Table 19: Potential mitigation impacts on safety and security.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 should work with the preferred farmers' security group (Erfenis Veiligheid) and implement the AgriSA farm access protocol for everybody that need to access the properties. Pictures, make and registration numbers of all vehicles used by Tetra4 on site should be provided to the farmer's security group and distributed to all affected landowners to ensure that they will be able to identify these vehicles if they access their properties. For scheduled and maintenance work Tetra4 should give a roster to the farmers stating dates and approximate times that contractors will be on the farms. Farmers emphasised that they need to know of people accessing the farm ahead of time. It is too late to inform them when entering the property. All access arrangements should be made at least 24 hours before access is required. Tetra4 must meet with the landowners before the construction and drilling phase commence and formalise security arrangements. This should be done in writing and include the existing forums that the landowners	All phases	Commence in planning throughout the life of the project	Tetra4 Local security groups CLO	Security check-ins should be done on a monthly basis to ensure all aspects are attended to.	Ensure the safety and security of affected land owners.	Signed formalised security agreements with existing security groups. Construction and maintenance schedule distributed to farmers

	know and trust.						
2.	All contractors and employees need to wear photo identification cards. Vehicles should be marked as construction vehicles and should have Tetra4's logo clearly exhibited. Entry and exit points of the site should be controlled during the construction and drilling phase. Areas where materials are stockpiled must be fenced. The schedules of the security company should be communicated to the farmers, especially to those farmers that have Tetra4 infrastructure that need to be guarded. It must be considered that guards changing shifts contribute to the impact of strangers accessing properties, and therefore a system that consider the safety of both the Tetra4 infrastructure and the safety of the landowners must be implemented. The necessary sanitation facilities must be made available, and some form of shelter from the elements. The security guards must not be allowed to make fires for cooking or heating purposes.	All phases	Commence in planning throughout the life of the project	Tetra4 Local security groups CLO Health and Safety officer	Security check-ins should be done on a monthly basis to ensure all aspects are attended to.	Ensure the safety and security of affected land owners.	All contractors and employees issued with photo identification cards. All vehicles marked Access control on site Schedule of security company communicated to farmers. Sanitation facilities for security forces erected.
3.	A system to arrange access to properties must be devised and formalised. The landowners must agree to the system. Access must be arranged at least 24	All phases	Before construction commence,	Tetra4 Contractors Sub-contractors	Every time a new contractor works on the project	Ensure access to properties are controlled and	A formalised access control system Communication register

	hours prior, except in emergencies, when the landowners should also be informed immediately. Landowners have the right to refuse people access to their properties if it was not arranged in advance. If routine access is required, the landowners must be provided with a roster indicating dates and approximate times that access will be required. Tetra4 must compensate the landowners for any damage to property or goods if it was due to behaviour of their contractors. Sub-contractors must be made aware of this and a clause spelling out their liability should be included in their contracts		throughout life of project	Landowners	As required	landowners do not incur any losses as a result of the behaviour of sub-contractors and contractors	Claim forms for any losses Incident register Clauses included in sub-contractor agreements

7.3.9 Impacts on sense and spirit of place

Description of impact

Sense of place refers to an individual's personal relationship with his/her local environment, both social and natural, which the individual experiences in his/her everyday daily life (Vanclay et al, 2015). It is highly personal, and once it is affected, it cannot be restored. It is also difficult to quantify. Part of the sense of place is the emotional attachment that the farmers have to their properties, and the hopes that they have for it to serve future generations (their children). The environmental philosopher Glenn Albrecht noted a consistent theme of distress caused by coal mining in Australia by the assault on the people's sense of identity, place, belonging, control, and good health. He identified a melancholia from the loss of solace and comfort connected with their home which he termed 'solastalgia' – a form of homesickness that one gets when one is still at 'home' associated with the major project impacts they experienced (Albrecht et al, 2007). Social impacts can therefore range from significant health impacts to the loss of a cherished landscape and associated loss of a sense of place.

The spirit of place associated with an area is an important factor in tourism and hunting and the marketing of these activities. Spirit of place refers to the unique, distinctive, and cherished aspects of a place. Whereas 'sense of place' is the personal feelings an individual has about a place, spirit of place refers the inherent characteristics of the place (Vanclay et al, 2015). In this case the spirit of place includes the vast rural landscape.

Many things can impact on a person's perception of sense of place. The area in question will have high levels of dust in the planting season. This dust has significance for the people and contributes to the sense of place. Dust outside of the planting season will not have the same meaning and will be seen as a nuisance that changes the way in which people experience the area, as it will be associated with industrial activities. Farms are generally noisy places if one considers animal-sounds and farming

activities. From the receptors' perspective, this kind of noise is acceptable and even attractive, because this is what living on a farm is all about. Noises associated with drilling, construction and trenching are not "normal" and disturb the sense of place and the value that people place on the auditory environment. Although lights are used as a security measure on farms, one of the things people values is the absence of bright lights and that they can see the stars. Lights for any other use than lightening up their direct environment is seen as invasive and disturbs the sense of place. Farmers affected by Cluster 1 that have infrastructure on their property commented on the extra lights and how difficult it is to get used to it. Farmers also commented on having to get used to people patrolling the infrastructure. Although it is encouraging that there are visible safety measures, farmers commented that they sometimes feel like they are trespassers on their own property when they are stopped at night and have flashlights pointing in their faces. Visual aspects are an important consideration in the experience of sense of place. If people are used to unspoiled vistas, or seeing open fields, the establishment of any buildings or infrastructure that they feel do not belong there can alter their sense of place. Game farmers are concerned about the markers on the pipeline, and do not want to see red beacons in their fields. The project will permanently alter the sense of place. Especially in the beginning this impact will be expressed in a severe manner, but as time goes on people will get used to the changing environment and adapt to it.

Table 20: Potential mitigation impacts as a result of sense of place.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	It is difficult to mitigate the impact on sense of place as it is experienced on a personal level. In general, the mitigation measures suggested in the visual, noise, ecological impact assessments and other relevant specialist studies should be adhered to. The relevant specialists will provide scientific mitigation measures for the aspects relevant to their studies. The direction and brightness of lights close to residences must be considered. Pipeline markers on game farms must be camouflaged by either painting it in a colour that blend in with the surrounding areas, or putting natural materials such as branches or wooden poles around it. This must be done in consultation with the affected landowners. Sense of place is a personal experience, but successful rehabilitation will go a long way in recreating a rural sense of place. The public perception would be negative or positive depending on the successful implementation of the rehabilitation.	Construction, Operation, Decommission.	Commence in construction phase, through the life of the project	Tetra4 CLO EO	As per the requirements of the relevant specialist	Minimise or soften the impact on the sense of place	Minutes of meetings with landowners about lights and beacons. Outcomes of environmental audits

7.3.10 Impacts on the social licence to operate

Description of impact

Social licence to operate (SLO) is a popular expression to imply that the acceptance of the community is also necessary for a project to be successful. Tetra4 has been working hard to build good relationships with the landowners and has mostly succeeded in keeping the relationship positive. Many of the landowners commented on the effectiveness of communication and especially the community liaison officer. However, despite this, there seem to be some things slipping through. A lot of the frustration is related to access issues, and changes to the project that has not been communicated to affected landowners. A number of new landowners will be affected by Cluster 2. It is important that Tetra4 continues with the positive relationships. The way in which landowner concerns are dealt with, and the time it takes to resolve issues will determine whether the SLO remains intact. The way in which the contracting issues will be dealt with can cause serious harm to the SLO if not handled with care.

Table 21: Potential mitigation impacts on social license to operate.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 has a dedicated person that communicate with the landowners with whom they have a positive relationship. It is important that this relationship is extended to the Cluster 2 landowners. Information sharing, frequent communication and quick responses to issues/complaints/enquiries will assist Tetra4 with maintaining their SLO	Construction, operation, decommission, closure and rehabilitation	Commence in construction phase and continue throughout the life of the project.	CLO		Optimise Tetra4's social license to operate	Communication registers

7.3.11 Increase in social pathologies

Description of impact

Cluster 2 of the Tetra4 project will include construction and drilling teams. The levels of activities on the farms and in the local areas will increase. People with access to more money and different value systems may mix with local community members. Given the high unemployment in the area, people may deploy livelihood strategies such as prostitution. Vulnerable parties such as young girls may also fall victim to sexual predators and there can be an increase in teenage pregnancies. Promiscuous behaviour can lead to an increase in the spread of sexually transmitted diseases. Especially in isolated areas there may be an increase in alcohol and substance abuse due to these things being more easily available.

Table 22: Potential mitigation impacts on social pathologies.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Toolbox talks should include talks about the impact of promiscuous behaviour. Tetra4 should develop an in-house infectious diseases strategy to address health issues within the workforce. A workforce code of conduct should be developed to maximise positive employee behaviour in the local community, and optimise integration.	Construction	Align with the construction period	Tetra4	CLO to ensure strategy implemented in construction phase.	To create awareness about social pathologies and the spread if diseases	In-house infectious diseases strategy Voluntary testing and counselling events organised Trained peer educators Accepted workforce code of conduct

7.3.12 Public perceptions about safety associated with gas production

Affected phases: Operation

Description of impact

The landowners are aware of the fact that helium is not an explosive gas. They are concerned about the methane that is mixed with the helium. The landowners want to know where and how the two gasses will be separated and transported. They are concerned that pipelines under pressure close to residences may explode. Another concern is that leaks or explosions in the pipeline may cause veld fires.

Table 23: Potential mitigation impacts associated public perceptions.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 should compile a background information document (BID) explaining the process and potential risks in laymen terms. This should be distributed to local stakeholders. Special sessions to inform the farm workers in their native languages must be conducted. They can also consider a media awareness campaign on local radio stations and press statements to local papers.	Operation	Start campaign before project commence. Consider to expand to other phases if required	Tetra4	BID distributed once. Communication procedures ad hoc as required	Increase awareness and educate people about the project and associated risks	Background information document Press releases Newspaper articles Minutes/records of meetings Attendance registers from farm worker meetings
2.	Tetra4 must become a member of the local firefighting association. Access routes and procedures in case of any veld fire must be determined and shared with the firefighting association, farm owners and Tetra4 staff.	Construction Operation	Before construction and drilling commence, for the life of the project.	Tetra4 Land owners Firefighting association	Reviewed quarterly	Improve emergency preparedness and reaction time when there are veld fires	Written procedures in case of veld fires/explosions
3.	Wells and pipelines must be kept away from residences as far as possible	Construction	Before construction commence	Tetra4	Every time new infrastructure is considered	Address safety concerns of landowners and residents	Position of pipeline and wells relative to houses.

7.3.13 Contribution to economy of South Africa

Description of impact

The Tetra4 project is unique in South Africa and can potentially contribute significantly to the economy of South Africa through exports of helium gas. The project is the first and only natural gas project to have been awarded an onshore petroleum production right in South Africa. All the liquefied natural gas produced will be available for local market consumption. The helium produced will meet local demand, and the balance will be exported (Makay, 2019). The economic impacts are discussed in the economic impact assessment, but from a social perspective there are greater societal benefits associated with the project.

Table 24: Potential mitigation impacts on economy of South Africa.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	No mitigation or enhancement is required. This is a positive impact that will occur if the project proceed.						

7.3.14 Secondary economic opportunities

Description of impact

Apart from the direct economic impacts of the proposed project, as described in the economic impact assessment, there will also be secondary economic opportunities that can potentially benefit local service providers. Opportunities include transport, domestic services, catering, drilling, security and fencing amongst others. The use of local service providers will ensure that the local economy benefits directly from the proposed project. Since there will be limited direct local economic benefits, this impact can potentially assist with ensuring social license to operate and that the local communities feel as if the project benefits them in some way.

Table 25: Potential mitigation impacts on secondary economic opportunities and local economy.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 should ensure at least 70% of **secondary economic opportunities** are given to local contractors. Services and goods must be procured locally as far as reasonably possible. Aspects of this positive impact will occur by default when the construction force lives locally and they utilise local services and support local shops.	Construction, operation, decommission, closure and rehabilitation		Tetra4 Local business chamber	Review supplier list on a yearly basis	To ensure Tetra4 contribute to the local economy through secondary opportunities	Signed service provider agreements

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7.3.15 Potential opportunity for education, skills development, and training

Description of impact

Through their Social and Labour Plan Tetra4 have the opportunity to contribute to education, skills development, and training. This can be done through specific technical training related to their core business, or supportive training such as helping local schools. Through internships and practical experience, they can contribute to skills development.

Table 26: Potential mitigation impacts on education, skills development and training.

No	Mitigation Measures	Phase	Timeframe	Responsible party for implementation	Monitoring party (frequency)	Target	Performance indicators (monitoring tool)
1.	Tetra4 should liaise with local training institutions to determine whether there are any opportunities to offer internships and practical experience for their students. Tetra4 must ensure that skills development requirements form part of their contracts with sub-consultants. The skills development requirements in their Social and Labour Plan (SLP) must be implemented. Tetra4 can liaise with local schools to participate in science classes or bring science pupils to visit the facility once it is operational.	Construction, operation	Once construction commence, throughout operation phase of the project	Tetra4	Will be monitored as part of the SLP	To ensure Tetra4 contributes to local education, skills development and training	Requirements written into sub-consultant agreements Number of internships and on-the-job training opportunities offered Records of liaison with science classes.

7.4 Impact ratings

Impact	Phase	Pre-Mitigation							Post-Mitigation							Confidence	Impact Prioritisation		Priority Factor	Final Score
		Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER		Cumulative Impact	Irreplaceable Loss		
Impact on livelihoods specific to farming communities	Construction	-1	2	2	4	4	5	-15	-1	2	2	2	3	5	-11.25	High	2	2	1.25	-14.06
Impact on livelihoods specific to farming communities	Operation	-1	3	4	5	4	5	-18	-1	3	3	4	3	3	-13	High	2	2	1.25	-16.25
Impact of servitudes on land values	Operation	-1	3	5	5	4	5	-21.25	-1	3	4	3	3	4	-13	High	2	2	1.25	-16.25
Uncertainty	Planning	-1	3	3	4	3	5	-16.25	-1	3	2	3	3	3	-8.25	High	2	2	1.25	-10.31
Nuisance factor due to increase in ambient dust and noise levels	Construction	-1	2	2	3	3	5	-12.5	-1	2	2	3	3	4	-10	High	2	1	1.13	-11.25
Changes in travel patterns	Construction	-1	2	2	4	2	5	-12.5	-1	2	2	3	2	4	-9	High	2	1	1.13	-10.13
Damage to farm roads, existing services, and infrastructure	Construction	-1	2	2	5	3	5	-15	-1	2	2	4	2	4	-10	High	2	1	1.13	-11.25
Damage to farm roads, existing services, and infrastructure	Operation	-1	2	4	5	3	4	-14	-1	2	4	4	3	4	-13	High	3	1	1.25	-16.25
Impacts on livelihoods due to behaviour of contractors	Construction	-1	3	2	4	2	4	-11	-1	2	2	3	2	3	-6.75	High	2	1	1.13	-7.59

Impacts on safety and security of local residents	Construction	-1	3	2	5	3	4	-13	-1	3	2	3	3	4	-11	High	3	3	1.50	-16.50
Impacts on safety and security of local residents	Operation	-1	3	4	5	3	5	-18.75	-1	3	4	3	3	4	-13	High	2	2	1.25	-16.25
impacts on sense and spirit of place	Construction	-1	2	2	5	3	5	-15	-1	2	2	4	2	4	-10	High	3	2	1.38	-13.75
impacts on sense and spirit of place	Operation	-1	2	5	4	5	5	-20	-1	2	5	4	5	5	-20	High	3	2	1.38	-27.50
Impacts on the social licence to operate	Construction	-1	3	2	4	3	4	-12	1	2	2	4	3	4	11	Medium	2	2	1.25	13.75
Impacts on the social licence to operate	Operation	-1	3	4	5	3	4	-15	1	3	4	4	2	4	13	Medium	2	2	1.25	16.25
Increase in social pathologies	Construction	-1	3	2	3	3	4	-11	-1	3	2	3	2	4	-10	Medium	2	1	1.13	-11.25
Public perceptions about safety associated with gas production	Operation	-1	3	3	4	2	4	-12	-1	3	2	2	2	3	-6.75	Medium	1	1	1.00	-6.75
Contribution to economy of South Africa	Operation	1	5	4	4	5	5	22.5	1	5	4	5	5	5	23.75	High	2	1	1.13	26.72
Secondary economic opportunities	Construction	1	3	2	4	2	4	11	1	4	4	4	2	5	17.5	Medium	2	1	1.13	19.69
Secondary economic opportunities	Operation	1	3	4	4	2	4	13	1	4	4	4	3	5	18.75	Medium	2	1	1.13	21.09
Potential opportunity for education, skills development, and training	Operation	1	3	4	4	2	4	13	1	4	4	4	3	5	18.75	Medium	2	1	1.13	21.09

7.5 Social inputs as described in the Generic Environmental Management Plan for Gas Transmission Pipeline infrastructure in South Africa.

The following aspects included in the Generic Environmental Management Plan for Gas Transmission Pipeline infrastructure in South Africa (CSIR,2020) are relevant to the social environment:

7.5.1 Planning/design

Table 27: Agriculture

Impact management outcomes: To achieve a reduced amount of disturbance on productive agricultural land as a result of the implementation of the impact management actions.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Plan the fine-scale positioning of the gas pipeline, block valves, pigging stations, access roads, storage areas and construction camps to have minimal disturbance on agricultural activities and agricultural land. 2. Where possible the gas pipeline infrastructure must be positioned on existing boundaries or edges of agricultural units of land (fields) wherever possible, so as not to interfere with agricultural activities within a unit. 3. Avoid, wherever possible, the pipeline route from running through:						

a. areas that are utilised for and/or are suitable for deep rooted agricultural and forestry crops; and b. lands that have contour banks. 4. Where the above avoidance is not possible, ensure that the construction is undertaken in the least productive agricultural season or period to minimise the impact on agricultural processes. 5. Existing farm-based accommodation and settlements must be taken into consideration during the fine-scale positioning of the gas pipeline and associated infrastructure, as best as possible.						

Table 28: Settlement Planning, Disaster Management and Social Aspects

Impact management outcomes: To build local community capacity and municipal support, avoiding key areas (where possible) and providing decision support.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Use existing infrastructure servitudes where viable and agreed to. 2. Ensure that the gas transmission pipeline is sited						

so as avoid the need for resettlement. Where involuntary resettlement cannot be avoided, the relocation of affected households and/or compensation for economic displacement should be guided by national and/or international best practice (such as a Resettlement Action Plan) to manage the impact of resettlement. 3. Ensure a fair compensation process is implemented by the EA holder, where required, in line with the most recent and relevant Standards (such as the International Finance Corporation (IFC) Performance Standards). 4. Timeous negotiations and detailed studies must be undertaken to minimise negative impact in vulnerable communities such as farm workers. 5. Ensure transparency in decision-making to provide clarity and ensure clean processes. 6. All negotiations and planning process should ensure that the phasing is clear, that schedules for the construction is limited and clearly communicated to limit the impacts on the population and their livelihoods. 7. A servitude agreement must be drawn up and signed by the EA holder and landowner(s). The						

agreement must stipulate the requirements of the agreement, as well as the activities that may and may not be undertaken within the servitude, such as growth of deep-rooted plants. 8. Ensure that pipelines are designed and built according to international and national standards and in accordance with the surrounding land-use. 9. The pipeline design must consider the latest technology to prevent leaks and to monitor volumes of natural gas transmitted. This must include a suitable system to manage and monitor the transmission of the gas through the pipeline. 10. A Leak Detection Monitoring Plan must be compiled. 11. Pigging stations must be located in areas accessible to 24 hour emergency services. 12. Develop an emergency plan for implementation during the construction and operational phases, based on widespread consultation and awareness-raising. 13. Include municipalities and Fire Protection Associations in their disaster management planning procedures. 14. Ensure that a community emergency response						

plan is devised and coordinated with appropriate community representatives. This should include: 15. a. The warning signs of a possible gas leak, such as: • Dirt being blown or appearing to be thrown into the air; • A white vapour stream or mist-like cloud over the pipeline; • Dead or dying vegetation in an otherwise green area; • A dry area in a wet field; • Flames coming from the ground or appearing to burn above the ground; • Continuous bubbling in wet or flooded areas; • Unexpected frost or ice on the ground; • A roaring, blowing or hissing sound; • An unusual “rotten egg” odour (Natural gas has no smell, but gas producers add chemicals to create a smell, and this helps with identification of leaks). b. Important steps emergency responders can take during the initial stages of an incident: • If it is safe to do so, turn off any						

mechanized equipment and ignition sources in the vicinity of the suspected leak; • Secure the site and determine a plan to evacuate or sheltering place; • Monitor for hazardous atmospheres; • Control and redirect traffic; and • Provide immediate access to representatives from the pipeline company. c. The role of the local responders: • Handling traffic control and evacuation; • Securing the site; • Firefighting; • Making appropriate contacts if it appears other agencies, facilities or local authorities are impacted by the pipeline incident; • Handling search and rescue; and • Providing medical assistance. d. The emergency response plan should also include a continuing-education program for all first responders and the public residing adjacent to the pipeline.						

7.5.2 Construction phase

Table 29: Access roads

Impact management outcomes: To establish effective access and movement of vehicles within authorised areas on site in order to minimise resultant environmental impacts.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Access to the construction right of way, site camps, storage areas, and pigging station positions must be negotiated with the relevant landowner. Such access roads must fall within the assessed and authorised area. 2. An access agreement must be formalised and signed by the Project Manager (PM), Contractor and landowner before commencing with the construction activities. 3. The access roads to the construction right of way, site camps, storage areas, and pigging station positions must be signposted after access has been negotiated and before the commencement of the construction activities. 4. All contractors must be made aware of all these access routes. 5. Restrict all vehicle traffic within the authorised						

disturbance area. 6. Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the expense of the Contractor. 7. Maximum use of both existing servitudes and existing roads must be made. 8. In circumstances where private roads must be used, the condition of such roads must be recorded prior to use and the condition thereof agreed by the landowner, the PM, and the Contractor. 9. All private roads used for access to the construction right of way and pigging station positions must be maintained and upon completion of the works, be left in at least the original condition. This must be agreed with the asset owner. 10. Access roads and bridges shall only be constructed where necessary at watercourses, on steep slopes or where boulders prohibit vehicular traffic 11. As far as possible, access roads must follow the contours in hilly areas, as opposed to winding down steep slopes.						

12. Access roads must be constructed in accordance with relevant design standards.						

Table 30: Fencing and gate instillation

Impact management outcomes: The erection of fencing and management of fencing is to be undertaken in accordance with relevant legislation.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Use existing gates available to gain access to all parts of the area authorised for development, where possible. 2. Existing and new gates are to be recorded and documented. 3. All gates must be fitted with locks and be kept locked at all times during the construction phase, unless otherwise agreed with the landowner. 4. At points where the pipeline routing crosses a fence in which there is no suitable gate within the extent of the construction right of way, on the instruction of the Project Manager (PM), a gate must be installed at the approval of the landowner. 5. Original tension must be maintained in the fence						

wires. 6. All gates installed in electrified fencing must be re-electrified. 7. All demarcation fencing and barriers must be maintained in good working order for the duration of the gas transmission pipeline construction activities. 8. Fencing must be erected around the construction site camp, batching plants, hazardous storage areas, and all designated No-Go and restricted areas, where appropriate and would not cause harm to sensitive flora and fauna. 9. Any temporary fencing to restrict the movement of livestock must only be erected with the permission of the landowner. 10. All fencing must be constructed with high quality, SABS approved, material. 11. The use of razor wire as fencing must be avoided. 12. Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff are away from site. Site security will be required at all times.						

Table 31: General Solid Waste Management

Impact management outcomes: To manage general solid waste in accordance with relevant national and provincial legislation and local by-laws.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. All measures regarding waste management must be undertaken using an integrated waste management approach. 2. Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided. 3. A suitably positioned and clearly demarcated waste collection site must be identified and provided on site. 4. The waste collection site must be maintained in a clean and orderly manner. 5. Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal. 6. Staff must be trained in waste segregation. 7. Recycling of waste types must be maximised. 8. Bins must be emptied regularly, and the resulting waste disposed of correctly. 9. General waste produced on site must be disposed of at a registered waste disposal sites or via a recycling company.						

10. Certificates of safe disposal for general and recycled waste must be maintained and retained on file. 11. Under no circumstances shall any waste be disposed of, burned or buried, on site.						

Table 32: Safety of the public

Impact management outcomes: All precautions are taken where possible to minimise the risk of injury, harm or complaints						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc. 2. All unattended open excavations must be adequately fenced or demarcated. 3. Adequate protective measures must be implemented to prevent unauthorised access to and climbing of protective scaffolding. 4. Ensure structures vulnerable to high winds are secured. 5. Maintain an incidents and complaints register in						

which all incidents or complaints involving the public are logged. 6. Ensure that an awareness campaign is undertaken prior to the commencement of construction to inform surrounding landowners, land users and occupiers, as well as Interested and Affected Parties of the proposed construction, and inform them of the potential risks associated with prohibited activities within the gas pipeline servitude, such as illegal excavations. 7. Ensure that all surrounding Interested and Affected Parties have access to a contact number for the Contractor and Pipeline Operator for emergency situations.						

Table 33: Sanitation

Impact management outcomes: No pollution or disease arises on-site as a result of sanitation facilities or lack thereof.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Mobile chemical toilets must be installed on site if no other ablution facilities are available. 2. The use of ablution facilities and or mobile toilets						

must always be used and no indiscriminate use of the environment for the purposes of ablutions must be permitted under any circumstances. 3. Ablution facilities shall be located within 100 m of any workplace and must be sufficient enough to accommodate the workforce (minimum requirement of 1:15 workers on site). 4. Where mobile chemical toilets are required, the following must be ensured: a. Toilets are located no closer than 100 m to any watercourse or water body. b. Toilets are secured to the ground to prevent them from toppling due to wind or any other cause. c. No spillage occurs when the toilets are cleaned or emptied, and the contents are managed in accordance with the EMPr; d. Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; and e. Toilets are serviced regularly, and the ECO must inspect toilets to ensure compliance to health standards. 5. A copy of the waste disposal certificates must be						

maintained.						

Table 34: Prevention of diseases

Impact management outcomes: The risk of the occurrence and spread of disease is minimised through the effective implementation of EMPr actions.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Undertake environmentally friendly pest control in the camp area. 2. Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV/AIDS, or other highly infectious viruses such as COVID-19. 3. The Contractor must ensure that information posters on HIV/AIDS and COVID-19 are displayed in the Contractor site camp area. 4. Information and education relating to sexually transmitted diseases and COVID-19 are to be made available to both construction workers and the local community, where applicable. 5. Free condoms at central points must be made available to all staff on site. 6. Medical support must be made available.						

7. Provide access to Voluntary HIV Testing and Counselling Services.						

Table 35: Noise

Impact management outcomes: Noise management is undertaken in accordance with SANS 10103 and requirements of the EMPr..						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. The Contractor must keep noise levels within acceptable limits. 2. Restrict the use of sound amplification equipment for communication and emergency only. 3. All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained. 4. Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction staff. 5. Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. 6. Operating hours during the construction phase as						

determined by the EA must be adhered to. Where not defined, it must be ensured that construction activities must still meet the impact management outcome related to noise management.						

Table 36: Fire prevention

Impact management outcomes: Fire prevention measures are carried out in accordance with relevant legislation and the EMPr, in order to prevent uncontrollable fires..						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Designate smoking areas where the fire hazard could be regarded as insignificant. 2. Open and unattended fires must not be allowed on site under any circumstances. 3. Educate workers on the dangers of open and/or unattended fires. 4. Firefighting equipment must be available on all vehicles located on site. 5. The local Fire Protection Agency (FPA) must be informed of construction activities. 6. Contact numbers for the FPA and emergency services must be communicated in the						

environmental awareness training and displayed at a central location on site. 7. The ECO must send the FPA their contact details and must also make a note of the FPA's contact details.						

Table 37: Agricultural Resources

Impact management outcomes: To maintain soil capability levels and to achieve reduced levels of erosion and disturbance on productive agricultural land as a result of the implementation of the impact management actions.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Implement an effective system of run-off control, using furrows and banks, wherever it is required, that collects and safely disseminates run-off water from all hardened and disturbed surfaces and prevents potential down slope erosion. Such a system is required wherever run-off water will tend to accumulate and then flow with the potential to cause erosion. 2. Apply soil surface stabilising measures in all areas that are highly susceptible to erosion or on which erosion occurs that cannot be controlled by the						

run-off control system. 3. If any contour banks are disturbed, fully restore their integrity and that of the run-off system of which they are a part, after disturbance. 4. Inspect the entire site for any evidence of erosion. Keep a record at each inspection of all occurrences of erosion with their GPS positions and photographs. If there are no occurrences of erosion, that must also be recorded. 5. Before excavation, the topsoil with its original vegetation, to a depth of 30 cm, must be stripped from the entire surface of the excavation area and stockpiled for re-spreading after backfilling. Underlying subsoil that is excavated must also be stockpiled, but separately from the topsoil. In addition, significantly different subsoil layers must also be stored in separate stockpiles from one another. 6. Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. 7. When backfilling, the separate soil layers must be backfilled in their same, original vertical sequence i.e. deepest soil layer at the bottom, and topsoil at						

the top. 8. Ensure that the trench is backfilled in a manner that allows the surface to be free draining and prevents erosion. Subsidence (and resultant channeling of run-off) can make the backfilled trench susceptible to erosion. 9. Erosion must be controlled, if necessary, on newly backfilled areas, which are likely to be susceptible to erosion. 10. Contractor and ECO must sign off after every backfilling event that soil has been backfilled in the correct order with topsoil at the surface, and that the backfilled area is higher than the surrounding surface. 11. Inspect the entire site for any evidence of erosion. Keep a record at each inspection of all occurrences of erosion with their GPS positions and photographs. If there are no occurrences of erosion, that must also be recorded.						

Table 38: Settlement Planning, Disaster Management and Social Aspects

Impact management outcomes: To build local community capacity and municipal support, avoiding key areas and providing decision support.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Ensure effective Disaster Management training capacity-building/awareness are established for municipalities. 2. Develop and implement communication strategies to facilitate public participation. 3. Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process. 4. Sustain continuous communication and liaison with neighbouring owners and residents. 5. Ensure contractors implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. 6. Develop a recruitment process and/or use a recruitment agency to advertise job and secure positions beforehand, thereby minimising the amount of job opportunities offered on-site during the construction phase. 7. Ensure that the number and availability of jobs is						

clearly mentioned and discussed during the awareness sessions that would be undertaken when the final alignment of a proposed section of the pipeline has been confirmed. 8. Develop a Code of Conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable, such as trespassing, hunting, stock theft etc. 9. The EA holder and/or the appointed contractor should provide transport to and from the site daily for construction workers. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site. 10. Depending on the duration of the contract, the EA holder and or the contractor(s) should make the necessary arrangements for construction workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks. 11. Where feasible, no construction workers, except for security personnel, should be permitted to stay over-night on the site. This would reduce the						

risk to local farmers. 12. Accommodation must be found in existing settlement, or the construction camp must be in or adjacent to existing settlements. 13. Ensure that construction camps do not remain permanent and should not be permanently occupied for more than 3 months. 14. Ensure that clear access to public facilities and public transport is maintained (e.g. detour less than 500 m (walking distance)), as well as clear 24 hour access to emergency services). 15. Ensure that competent personnel are appointed for welding operations.						

7.5.3 Decommissioning phase

Table 39: Settlement Planning, Disaster Management and Social Aspects

Impact management outcomes: To build local community capacity and municipal support.						
Impact management actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
1. Ensure maintenance is undertaken as per the required schedule and appropriate corrective actions implemented timeously. Normally, leaks						

are detected by abnormal pressure drops and a loss of transported volumes. Risk Based Inspection via scheduled intelligent pigging of the pipeline must be undertaken to set an initial baseline and thereafter monitor the condition of the pipeline. 2. Ensure that gas pipeline infrastructure is regularly inspected for signs of corrosion or any potential perforation of the pipeline walls that could result in gas leaks and subsequent explosions. 3. Ensure that the latest technology is used during integrity testing (to detect general corrosion, pitting corrosion, stress corrosion cracking, etc.) – for example automated ultrasonics, electromagnetic acoustic transducer (EMAT). 4. Ensure that risks to the pipeline due to any changes in the environmental conditions surrounding the pipeline (e.g. increase in moisture in the drainage line where the pipe is laid down) are considered. 5. Ensure that the location class of a section of existing pipeline is changed in the event of land use change. Where there are changes in land use planning (or existing land use) along the alignment						

of an existing pipeline, a safety assessment must be carried out and additional control measures determined to ensure that the risk associated with a rupture or leak is ALARP. 6. During a pipeline-related disaster, the key strategies that apply to all natural gas emergencies are to establish a command and safe staging area, secure the scene, evacuate at-risk occupants and bystanders, effect viable rescues, eliminate ignition sources, and co-operate with the local utility company. 7. Implement the community emergency response plan. 8. Plans should be developed for safeguarding critical infrastructure. 9. Training exercises of first responders must consider critical infrastructure. Preferably, joint exercises with providers of critical infrastructure services should be regularly scheduled.						

8 Stakeholder Engagement Plan

Social impacts already start in the planning phase of a project and as such it is imperative to start with stakeholder engagement as early in the process as possible. A stakeholder engagement plan will assist Tetra4 to outline their approach towards communicating in the most efficient way possible with stakeholders throughout the life of the project. Such a plan cannot be considered a once off activity and should be updated on a yearly basis to ensure that it stays relevant and to capture new information. Stakeholders must provide input in the Stakeholder Engagement Plan.

The Tetra4 Stakeholder Engagement Plan should have the following objectives:

- To identify and assess the processes and/or mechanisms that will improve the communication between local communities, the wider community and Tetra4.
- To improve relations between Tetra4 staff and the people living in the local communities.
- To provide a guideline for the dissemination of information crucial to the local communities in a timely, respectful, and efficient manner.
- To provide a format for the timely recollection of information from the local communities in such a way that the communities are included in the decision-making process.

The Stakeholder Engagement Plan should be compiled in line with International Finance Corporation (IFC) Guidelines and should consist of the following components:

- Stakeholder Identification and Analysis – time should be invested in identifying and prioritising stakeholders and assessing their interests and concerns.
- Information Disclosure – information must be communicated to stakeholders early in the decision-making process in ways that are meaningful and accessible, and this communication should be continued throughout the life of the project.

- Stakeholder Consultation – each consultation process should be planned out, consultation should be inclusive, the process should be documented and follow-up should be communicated.

- Negotiation and Partnerships – add value to mitigation or project benefits by forming strategic partnerships and for controversial and complex issues, enter into good faith negotiations that satisfy the interest of all parties.

- Grievance Management – accessible and responsive means for stakeholders to raise concerns and grievances about the project must be established throughout the life of the project.

- Stakeholder Involvement in Project Monitoring – directly affected stakeholders must be involved in monitoring project impacts, mitigation, and benefits. External monitors must be involved where they can enhance transparency and credibility.

- Reporting to Stakeholders – report back to stakeholders on environmental, social and economic performance, both those consulted and those with more general interests in the project and parent company.

- Management Functions – sufficient capacity within the company must be built and maintained to manage processes of stakeholder engagement, track commitments and report on progress.

It is of critical importance that stakeholder engagement takes place in each phase of the project cycle and it must be noted that the approach will differ according to each phase. The stakeholder analysis done in Section 6 of this report must inform the stakeholder engagement strategy.

9 Proposed Grievance Mechanism

In accordance with international good practice Tetra4 should establish a specific mechanism for dealing with grievances. A grievance is a complaint or concern raised by an individual or organisation that judges that they have been adversely affected by the project during any stage of its development. Grievances may take the form of specific complaints for actual damages or injury, general concerns about project activities, incidents and impacts, or perceived impacts. The IFC standards require Grievance Mechanisms to provide a structured way of receiving and resolving grievances. Complaints should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities and is at no cost and without retribution. The mechanism should be appropriate to the scale of impacts and risks presented by a project and beneficial for both the company and stakeholders. The mechanism must not impede access to other judicial or administrative remedies.

The grievance mechanism should be based on the following principles:

- Transparency and fairness;
- Accessibility and cultural appropriateness;
- Openness and communication regularity;
- Written records;
- Dialogue and site visits; and
- Timely resolution.

Based on the principles described above, the grievance mechanism process involves four stages:

- Receiving and recording the grievance;
- Acknowledgement and registration;

- Site inspection and investigation; and

- Response.

10 Conclusion and recommendations

The aim of this report is to identify potential social impacts associated with the proposed Tetra4 Cluster 2 project. The Cluster 1 project is in the process of being implemented. The proposed Cluster 2 project will impact on high quality agricultural soil which is used to grow crops that contribute to food security in South Africa. One of the most significant potential social impacts associated with the proposed project is the potential impacts on livelihoods of the farming community. There are high levels of uncertainty about exactly how the Cluster 2 project will unfold. Farmers fear that their land rights and property values will be affected. The project will require access to farms, and because of the current socio-political issues in South Africa, this is a sensitive matter. Farmers are concerned about the impact of the Cluster 2 project on their existing way of life, and on the infrastructure on their farms. Although they are appreciative of Tetra4's efforts to communicate with them, there has been instances where the communication was insufficient, of where some of the Tetra4 staff have not followed procedures that was agreed to.

A number of stakeholder groups will be affected by the proposed project, and the most affected groups are the farmers and farm workers. Although the Tetra4 project will have a positive economic impact in South Africa, the direct benefit for the local communities is limited. The job creation benefits, both primary and secondary are not significant. Therefore, it is of utmost importance that the local social impacts must be managed and monitored to the best of Tetra4's ability, since the parties who pay the social cost of the development will not be beneficiaries of the development.

Based on the findings of this study, the following key recommendations are made:

- There is a possibility that Tetra4's activities will cause economic displacement for some of the affected farmers. The actual impact on their livelihoods must be assessed by an agricultural economist and compensation must be done according to international best practice;

- There are a number of questions from the landowners that Tetra4 should respond to in writing before any contracting can proceed. These questions are related to timeframes and the construction phase;

- The impacts of servitudes on the land value of the affected properties must be considered and mitigated by means of negotiation. If the negotiation process is unsuccessful, it must be arbitrated by a lawyer with knowledge about environmental law, the MPRDA and property law. This should be a last resort;

- Farm safety must be a priority and the landowners and Tetra must agree on security measures;

- Tetra4 must consult with landowners about any new work or potential changes that may take place on their properties;

- Protocols on farm access, compensation, communication, and road maintenance must be agreed upon and be in place before construction commences. The affected landowners must have input in the development of these protocols;

- A grievance mechanism and claims procedure must be in place and shared with all the stakeholders before the construction commences; and

- A special meeting must be conducted with farm workers and other vulnerable parties, in their mother languages, to ensure that they understand the technical and safety aspects of the project.

The potential impact on the livelihoods of some of the directly affected farmers may be severe. This will have a spinoff impact on farm workers, food security and the local economy. Every possible measure must be implemented to ensure that the production of the farmers is not permanently impacted. The project can only be recommended if the livelihood impacts are mitigated and managed successfully.

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