



**Final 2026/2027
Integrated
Development Plan
(IDP) Review**

**Annexure O: Midvaal
Electricity Master
Plan 2021**

Midvaal Local Municipality Electricity Master Plan

FINAL DRAFT REPORT ELECTRICITY MASTER PLAN

December, 2021

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MLM	Midvaal Local Municipality
CAPEX	Capital Expenditure
CBD	Central Business District
CoGTA	Department of Cooperative Governance and Traditional Affairs
DBSA	Development Bank of Southern Africa
DMRE	Department of Minerals Resources and Energy
EMP	Electricity Master Plan
GDP	Gross Domestic Product
HV	High Voltage
LPU	Large Power User
LV	Lower Voltage
MISA	Municipal Infrastructure Support Agent
MTS	Major Transmission Network
NERSA	National Energy Regulator of South Africa
NSP	Network Service Provider
OC/EF	Overcurrent / Earthfault
PUC	Point of Utility Connection
SCADA	Supervisory Control and Data Acquisition

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SECTION 1- EXECUTIVE SUMMARY

SRQS was appointed on 26th March 2021 as the service provider to support Midvaal Local Municipality (MLM) with their Electrification Master Plan (EMP).

This report provides a load forecast of electricity demand and its impact on the existing MLM electrical network. Network constraints resulting from the growth in electricity demand are identified and appropriate solutions proposed to ensure and maintain the network's adequacy and reliability of supply. Lastly, the cost of each proposed solution is provided along with the year, thereby combining all project cost into a CAPEX for a period of twenty years.

SECTION 2- INTRODUCTION

2.1 Background

The DBSA has entered into a memorandum of agreement (MOA) with the Midvaal Municipality regarding the establishment and resourcing of a Provincial Programme Management Unit (PMU) to provide technical support to municipalities that are clients of the DBSA. In this regard, the DBSA procured professional services from suitably qualified and experienced Professional Services Providers (PSPs) to upscale its technical capacity in order to provide infrastructure planning and project implementation support to the identified municipalities.

SRSQS consulting was appointed on 22 February 2021 as the service provider to support Midvaal Municipality with their Electrification Master Plan (EMP).

The overall objective of the project is to potentially provide strategic infrastructure and project planning and project implementation support to this municipality. Discussions with the Midvaal Municipality will take place to unearth the areas and work that has already been covered, in various areas within the municipality, and collating an overall master plan that meets the requirements of the Municipality.

2.2 Purpose

The plan aims to:

Document the nature, extent, age, utilization, condition, performance, and value of the infrastructure network.

Advise the municipality on growth in electricity usage.

Identify existing and proposed levels of service to be achieved over a minimum period of 20 years or for the life of the current installed plant and infrastructure, as well as any expected changes in demand.

Identify the life-cycle management needs (development, renewal, operations and maintenance and any disposal) over the 20-year period.

Assess capital and operational budget needs.

Assess the prevailing infrastructure asset management practice and identify a first iteration of improvements.

Increase capacity and extension of networks to be addressed.

2.3 Objectives

The overall objective of the project is to provide infrastructure planning, project planning, preparation, and project implementation support to Midvaal Local Municipality through the development of an Electricity Master Plan. The Master Plan is to give clear direction so that the recommendations on priority projects may be implemented.

2.4 Scope of Services

The Electricity Masterplan will be prepared according to the DBSA framework document as received.

The DBSA framework Electricity Master Plan breaks down the deliverables in the following distinct phases:

Phase 1: Project Inception which includes Stakeholder engagement and the establishment of a Project Steering Committee.

This phase involves developing of the master plan which is to include officials, political representatives, and applicable spheres of Government. The scope of works will thus involve SRSQS– (the appointed professional services provider) making provisions for an inclusive participation process involving all relevant stakeholders. The technical process will rely on the participation of relevant officials and political representatives from the municipality, provincial and national government regarding technical inputs and the decision-making process (where required).

Phase 2: Existing Situation and Needs Assessment

Assessment of the existing status of the Electrical infrastructure and the identification, and costing, of actions required to provide services in an optimal and sustainable manner. Assessment and findings to be presented in a comprehensive report. This phase fundamentally deals with the understanding and presentation of the status quo, and sector plans and programmes. This phase in its entirety is directed at determining the present and past demands and the position of the municipality's current electricity infrastructure.

Phase 3: Future Demand Assessment

The forecasting of the future demand scenario and a detailed investigation of the capacity of the existing infrastructure to meet this demand. Recommended infrastructure solutions to meet the future demand across the entire Local Municipality. Assessment and findings to be presented in a comprehensive report and is to include a forecast model and the consideration of alternative technologies.

Phase 4: Institutional Arrangements and Required Authorizations

Review of existing institutional arrangements and formulation of proposals to develop systems and procedures and to build capacity as required to operate and maintain electricity infrastructure. Provide recommendations to facilitate the provision of land and servitudes for electrical infrastructure, wayleave applications from/to national, provincial, authorities and agencies where applicable, and Environmental Impact Assessments where required.

Phase 5: Project Prioritization and Cost Estimates.

Based on the findings of Phases 2 and 3, projects will be identified, costed and prioritized in order to be phased in the short-, medium- and long-term development plans. The projects may include refurbishment, maintenance, upgrades and capital projects.

Phase 6: Funding and Implementation Arrangements.

This phase deals with the identification, assessment and recommendations with regards to sources of funding, methods of service delivery and resources required to implement envisioned projects.

Phase 7: Risk Management.

The development of an electricity risk assessment to identify critical areas which are vulnerable to failure, the level of exposure and potential impact of the risk and methods on how these risks may be mitigated or reduced.

2.5 OVERVIEW OF MIDVAAL LOCAL MUNICIPALITY

2.5.1 Municipal Location and Extent

The Midvaal Local Municipality (GT422) is a Category B municipality as defined in the Municipal Structure Act (Act 117 of 1998). It comprises of fifteen wards and is one of three local municipalities situated within the Sedibeng District Municipality. The other two Municipalities in the district being the Emfuleni Local Municipality (GT421) and the Lesedi Local Municipality (GT423). Midvaal acknowledges the changes to the municipal boundary as well as internal changes to ward boundaries adopted by the Municipal Demarcation Board as per Gazette 184 Notice 472 on 7th October 2020 Midvaal will adopt such changes when effected after the 2021 Local Government Elections.



Fig 1 Midvaal Municipality location in Gauteng Province

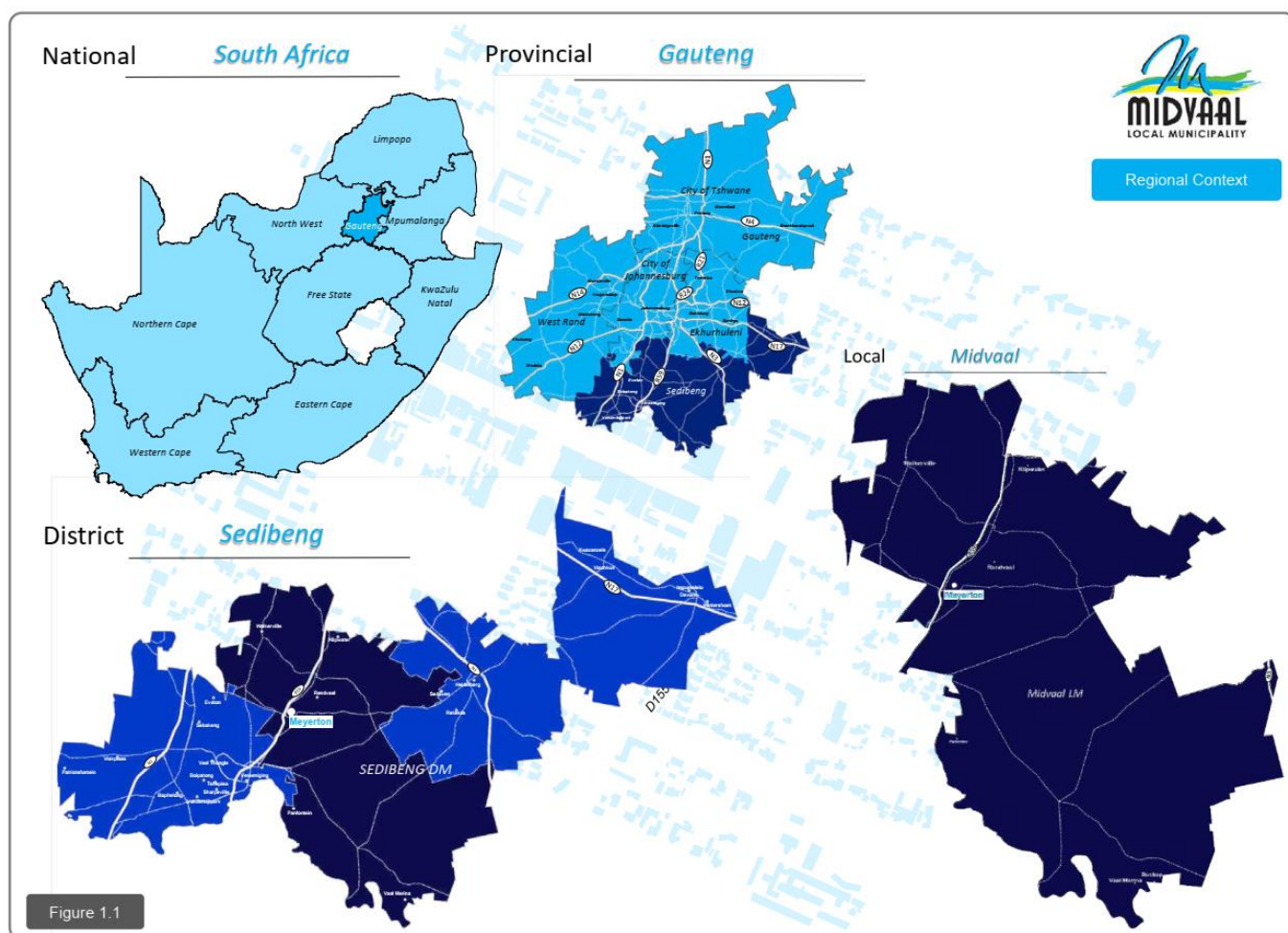


Fig 2 Midvaal location in relation to South Africa, Province and District

Demographic Profile

As shown in Fig 3 Midvaal is the smallest of the three local municipalities in the Sedibeng District, comprising 11% of the Sedibeng District population. The total municipal population in Midvaal grew from 95 301 in 2011 to 111 613 in 2016. This represents an increment of 16 311 from 2011 to 2016. The year-on-year growth for the total population for the past 5 years was 3.2% – representing 3 262 people per year (far above the district growth rate which stands at 0.8% for this period). From the Midvaal gender and age distribution profile, it is evident that the local municipality has more Male residents (51.6%) compared to Female residents (48.8%), with the largest segment for both being aged 20-39 years. According to Census 2011, the highest population concentration within the LM is in and around Meyerton, representing 58.0% of the total population.

Fig 3 indicates that the local population is predominantly a low to middle-income community. In terms of the Individual Monthly Income, it is evident that approximately 55.4% of individuals earn a monthly income of less than R800 per month (as per the food

poverty line), which indicate high dependence on government grants. Assessing the Annual Household Income, it is evident that 57.6% of households within the Midvaal LM qualify for a housing subsidy (<R3500 p/m of R42 000 p/a). Within the Midvaal LM, 42.5% of the population have not completed secondary education (up to Grade 12). But it is positive that 12.9% of the population has a form of tertiary education (degree/diploma). According to Census 2011, approximately 55.6% of the total Midvaal economically active population (EAP), is employed, of which 73.2% of the employed population, is employed within the formal sector.

From the Midvaal tenure Status, it is evident that 30.4% of households occupy the property they reside in, rent-free, whilst 25.4% rent the property they reside in. The tenure profile correlates with the income profile and affirms a consumer market with a predominant demand for lower-to-lower middle-end residential and commercial products.

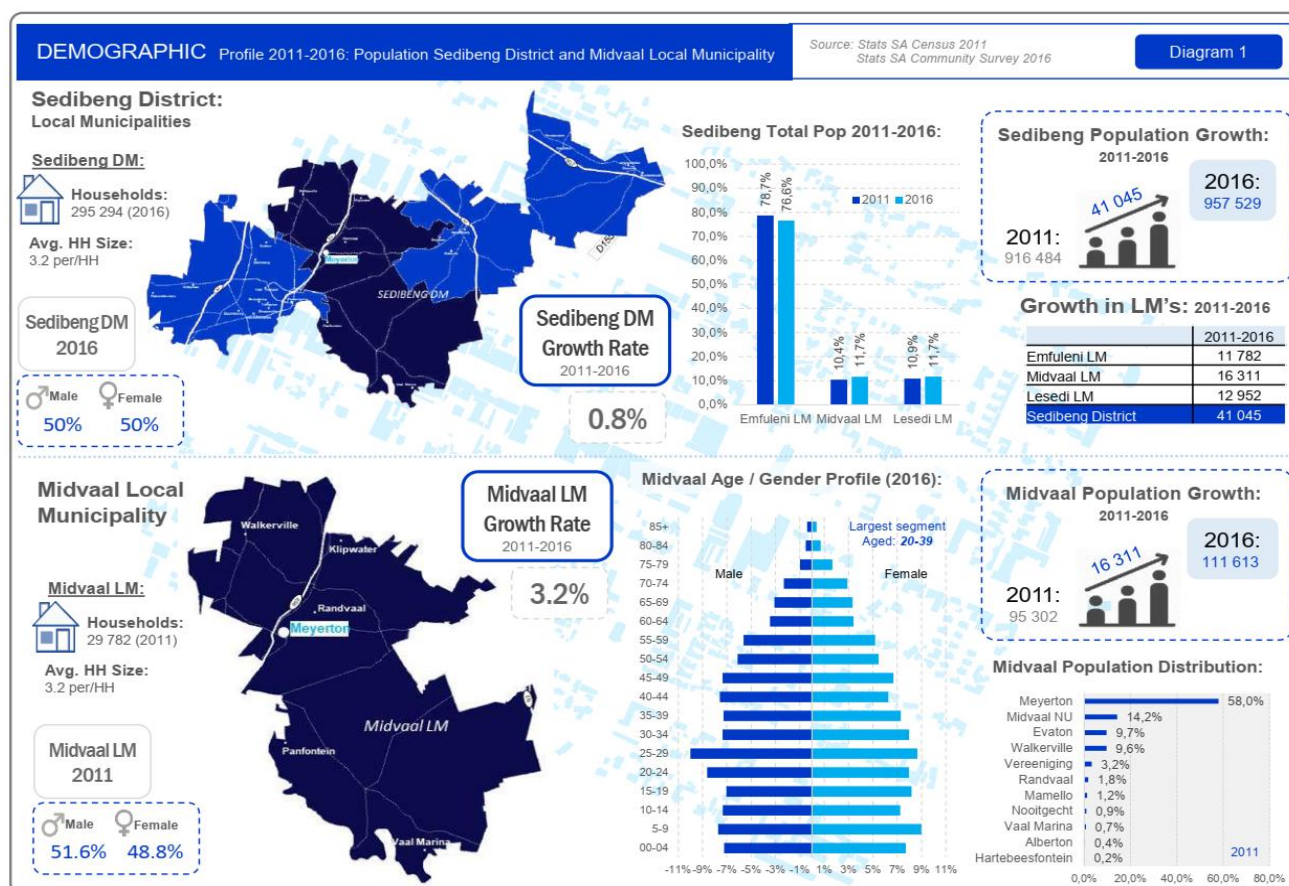


Fig 3 – Midvaal population distribution.

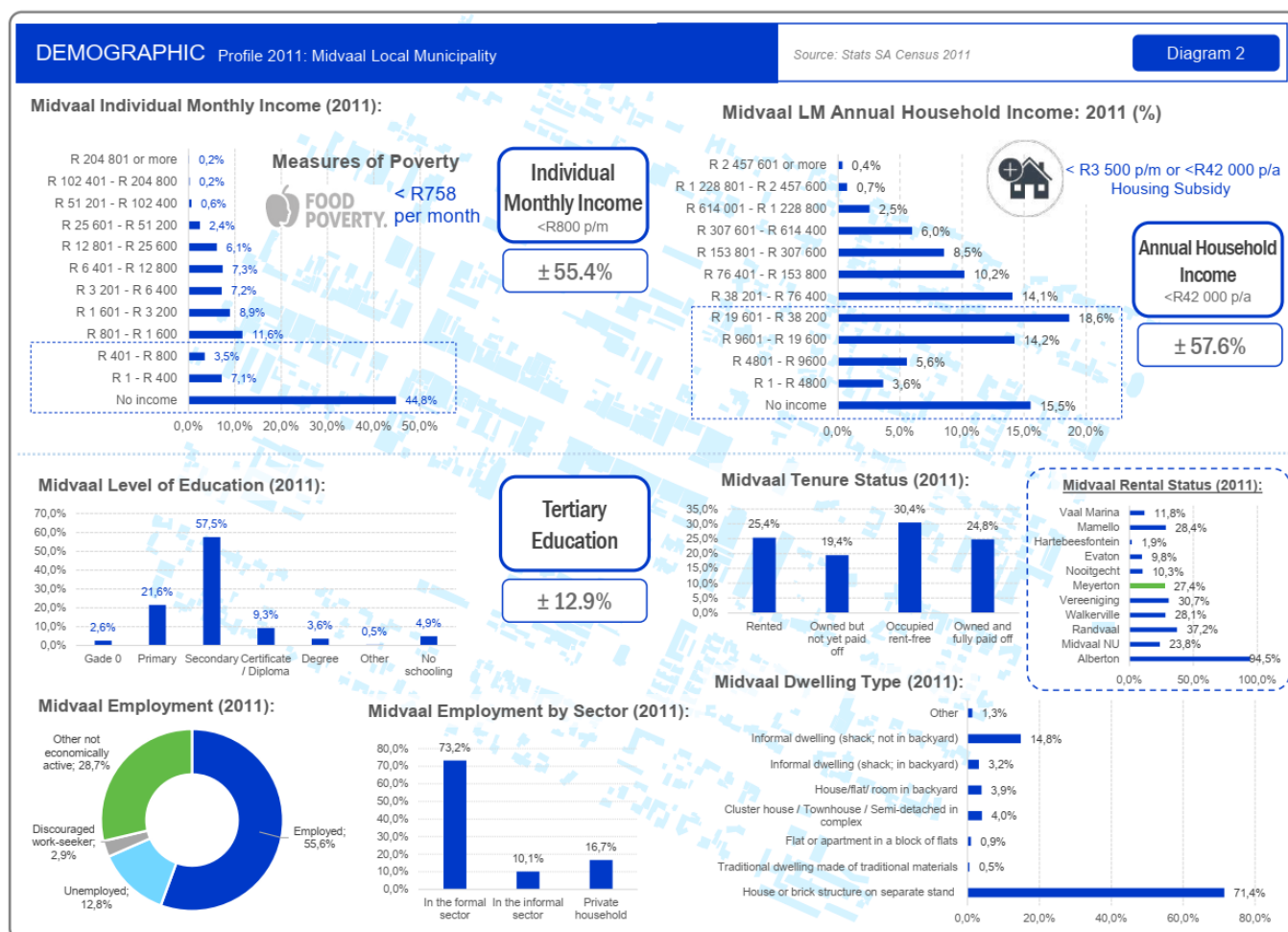


Fig 4- Demographic profile

The Midvaal local Municipality covers an area of approximately 1722 km² compared to approximately 966 km² and 1484 km² for neighboring Emfuleni and Lesedi Municipalities, respectively.

The spatial layout of the Midvaal Local Municipal area is predominantly that of a rural area with extensive farming constituting approximately 50% of the total area of jurisdiction.

Midvaal possesses the following spatial structures¹.

Spatial Structures of Midvaal	
Areas	Total number
Townships	58 (30996 Stands)
Farms	85 (3415 Portions)
Agricultural Holdings and other Settlements	34 (4334 small / agricultural holdings)
Nature Reserves	1
Conservancies	10

Table 1- Demographic profile

Racial Profile

The racial profile of the Midvaal population is largely dominated by African Black and White populations together making up more than 90% of the population.

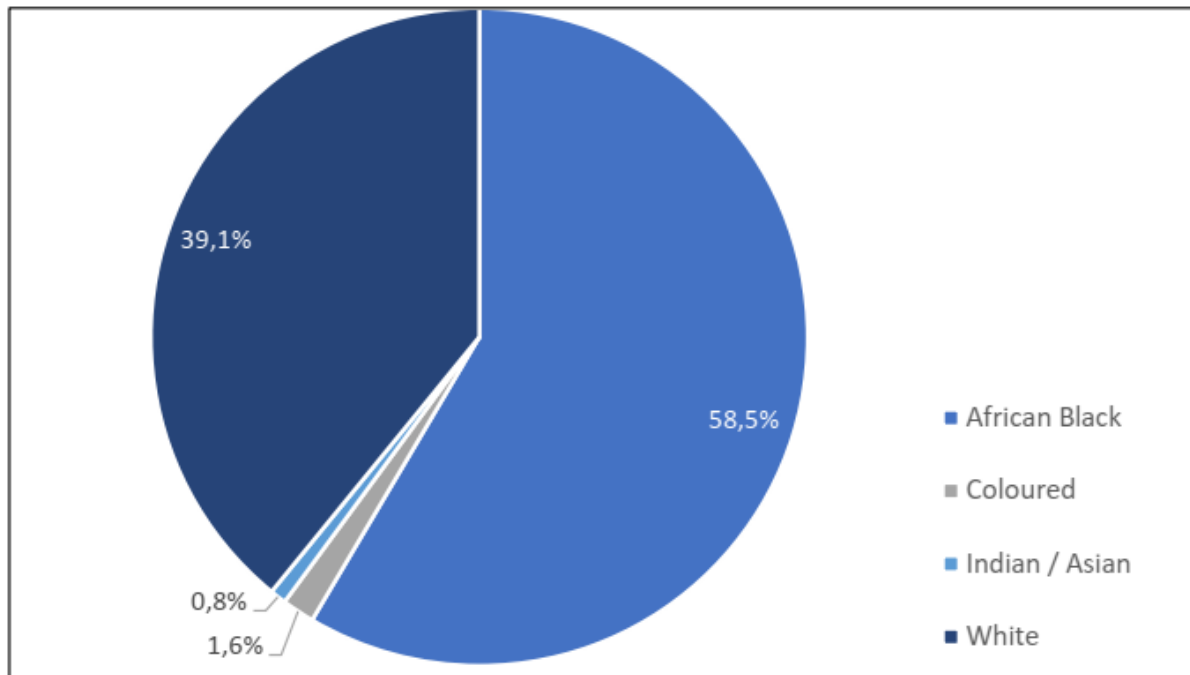


Fig 5 - Demographic profile

2.6 Economic Perspective

The economic indicators of an area form the basis for current demand for residential and commercial product offering and also serve as the drivers for future growth in demand. An improving economy has positive implications for disposable income growth and thus residential purchasing power in the short term.

2.6.1. Economic growth

Midvaal falls within the Sedibeng District alongside two other municipalities, Emfuleni and Lesedi. Emfuleni is the largest municipality within the District, contributing 72.81% to its GVA, whilst Midvaal and Lesedi contributed 14.98% and 12.21% respectively¹³. GVA measures output (total production) of a region in terms of the value that was created within that region. GVA indicates the level of economic activity within a region.

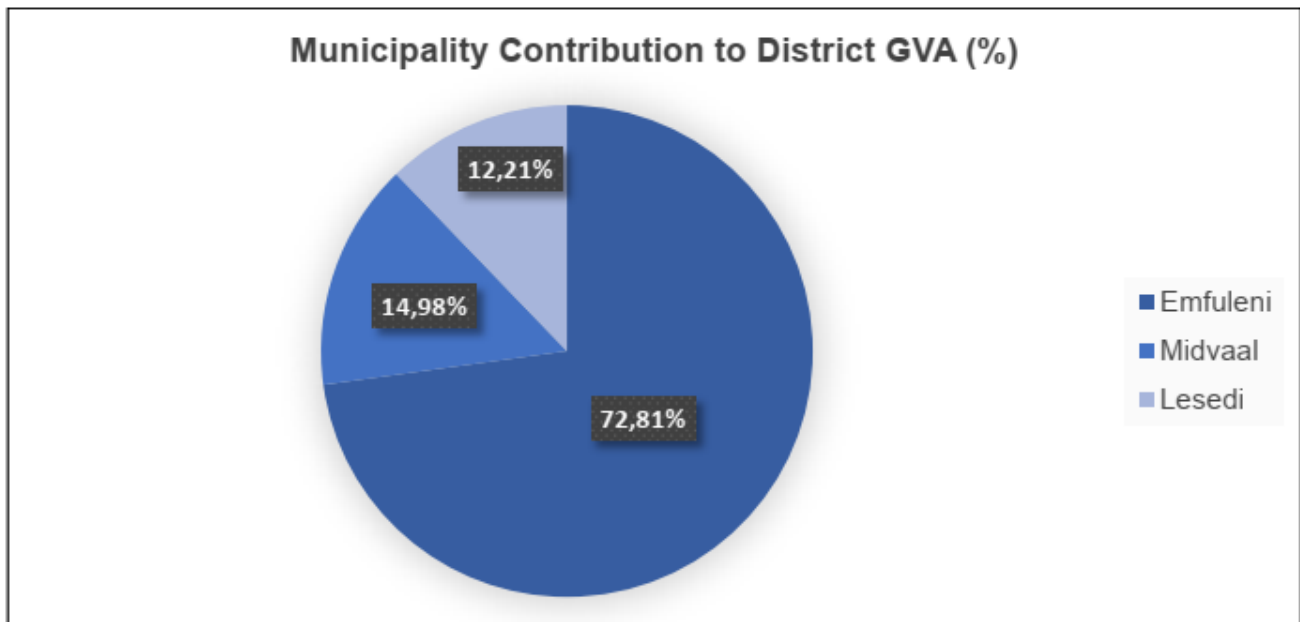


Fig 6: Municipality contribution to district GVA

The total GVA for Sedibeng was R49 billion in 2018, of which Midvaal contributed R7 billion and Lesedi, R6 billion and Emfuleni 36 billion.¹⁴ Midvaal had the second highest GVA growth rate of 2.79% between 2001 and 2018. Lesedi's growth in GVA was 3.07%, and Emfuleni, at 2.03%.

Table 2: GVA - Local municipalities of Sedibeng District Municipality, 2001 to 2018, share and growth¹⁵

District	GVA (2001-2018)	Share of district municipality	Average annual growth rate
Emfuleni	36.025	72.81	2.03%
Midvaal	7.141	14.98	2.79%
Lesedi	6.042	12.21	3.07%
Sedibeng	49.626	100%	

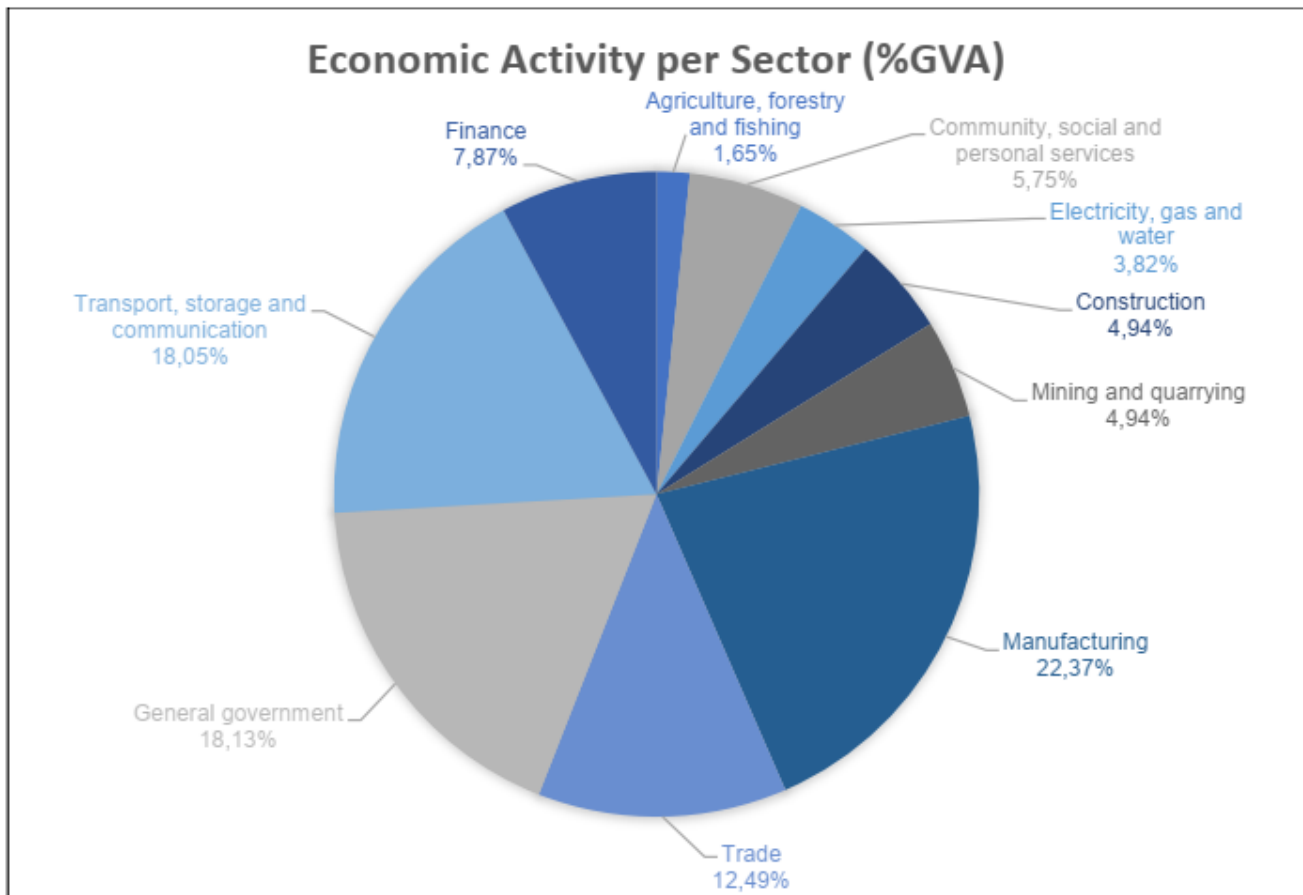


Fig 7: Economic activity by sector

As seen in the table above, the pillars of the local economy are Manufacturing, General government, Transport, storage and communication, and Trade. These cumulatively 71.04% of GVA to the local economy.

Ranking the sectors from highest to lowest:

1. Manufacturing - 22,37%
2. General government - 18,13%
3. Transport, storage and communication - 18,05%
4. Trade - 12,49%
5. Finance - 7,87%
6. Community, social and personal services - 5,75%
7. Construction - 4,94%
8. Mining and quarrying - 4,94%
9. Electricity, gas and water - 3,82%
10. Agriculture, forestry and fishing - 1,65%

In terms of average sectoral growth, Midvaal's strongest sectors included Mining and Quarrying (6.88%), Construction (5.31%) and Transport and logistics (4.43%). Both Emfuleni and Lesedi had similar sector growth trends, with Mining and Quarrying and Construction exceeding the 5% average annual growth.

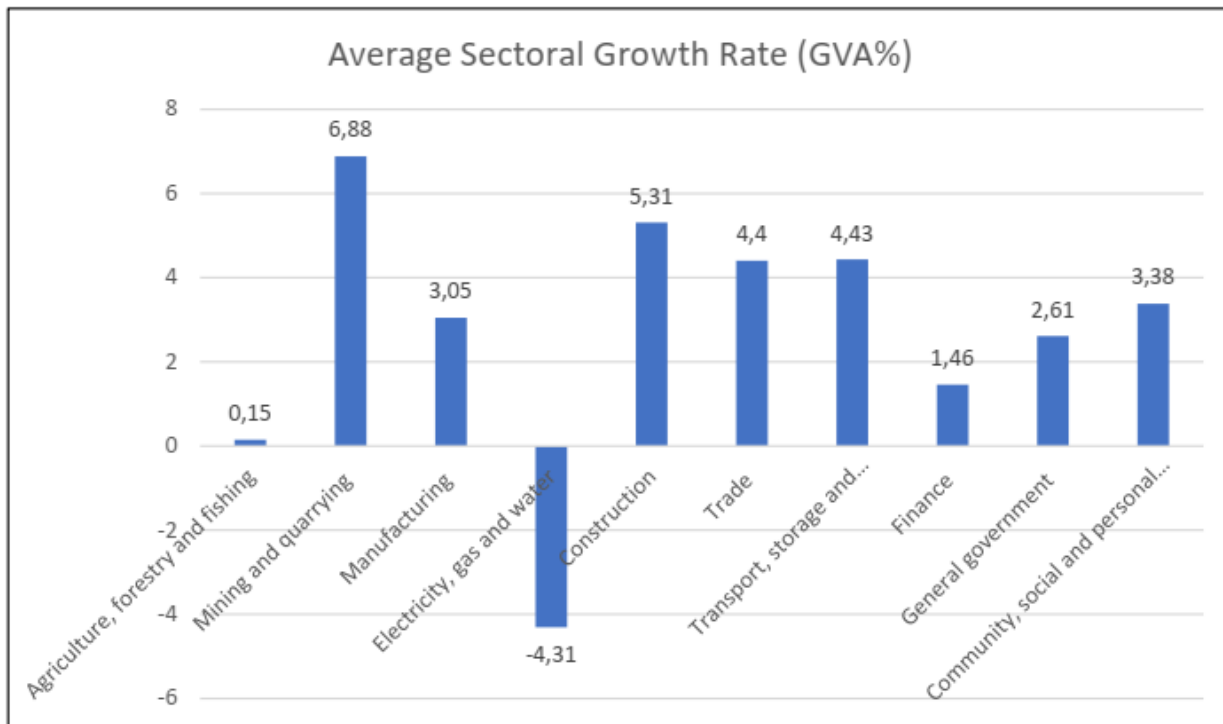


Fig 8: Average Sectoral Growth Rate

Due to the stagnation in economic activity and the rising unemployment epidemic facing South Africa and its provincial, metropolitan, district and local economies, interventions are needed for Midvaal municipality to industrialize, create jobs and grow the economy. Midvaal is mainly agricultural and rural/township land with important natural structures and conservation areas. The area R59 Development Corridor, offering transport and distribution opportunities. The Manufacturing sector is the largest, best-performing sector and has a relatively high comparative advantage; however, the sector's vulnerability to external factors must be considered in future development. This is one of the reasons why Midvaal municipality must focus on diversifying its economy.

Other sectors and activities it could develop include:

those which are labor-intensive (specifically those that can grow by drawing on unskilled and semi-skilled workers) with strong backward and forward linkages. Those with rapidly growing comparative advantage (e.g., Mining) and investor interest, and those which the broader economy is moving towards, such as green industries.

In the case of agriculture activities, these could be increased significantly by promoting the efficient use of the vast arable land. This sector could further stimulate other high-growth and job-generating industrial activities, particularly agro

-processing. Agro-processing can also drive agriculture and create markets for farmers.

The aim of industrialization interventions should be to transition the Midvaal economy towards higher value-added activities and technological innovation, particularly for advanced manufacturing activities. Clustering of industrial activities and building and

strengthening value chains are crucial as suppliers can maximize on their proximity to each other and share costly infrastructure. However, the economic conditions and the required time and effort must be recognized as increased industrialization cannot be attained merely with the existing industrial structure. Thus, proper planning is essential to ensure that industrialization strategies are realized, and impacts are maximized. infrastructure. However, the economic conditions and the required time and effort must be recognized as increased industrialization cannot be attained merely with the existing industrial structure. Thus, proper planning is essential to ensure that industrialization strategies are realized, and impacts are maximized.

2.5.3. Employment profile

Employment is the primary means by which individuals who are of a working age may earn an income that will enable them to provide for their basic needs. With the exception to the provincial level, Midvaal has the highest level of economically active population – 70.4%. Midvaal local municipality therefore has a large supply of labor. The unemployment rate for Midvaal, as per the broad definition, is 18.8%¹⁷. This translates to the highest employment rate (81.2%), when compared to the provincial and district situation.

The youth unemployment rate, however, stands at 25.4% for those aged 15-24 (i.e. those eligible to work). Since 2006, the labour force participation rate for Midvaal local municipality deviated from the provincial level, declining as the province's rate increased.

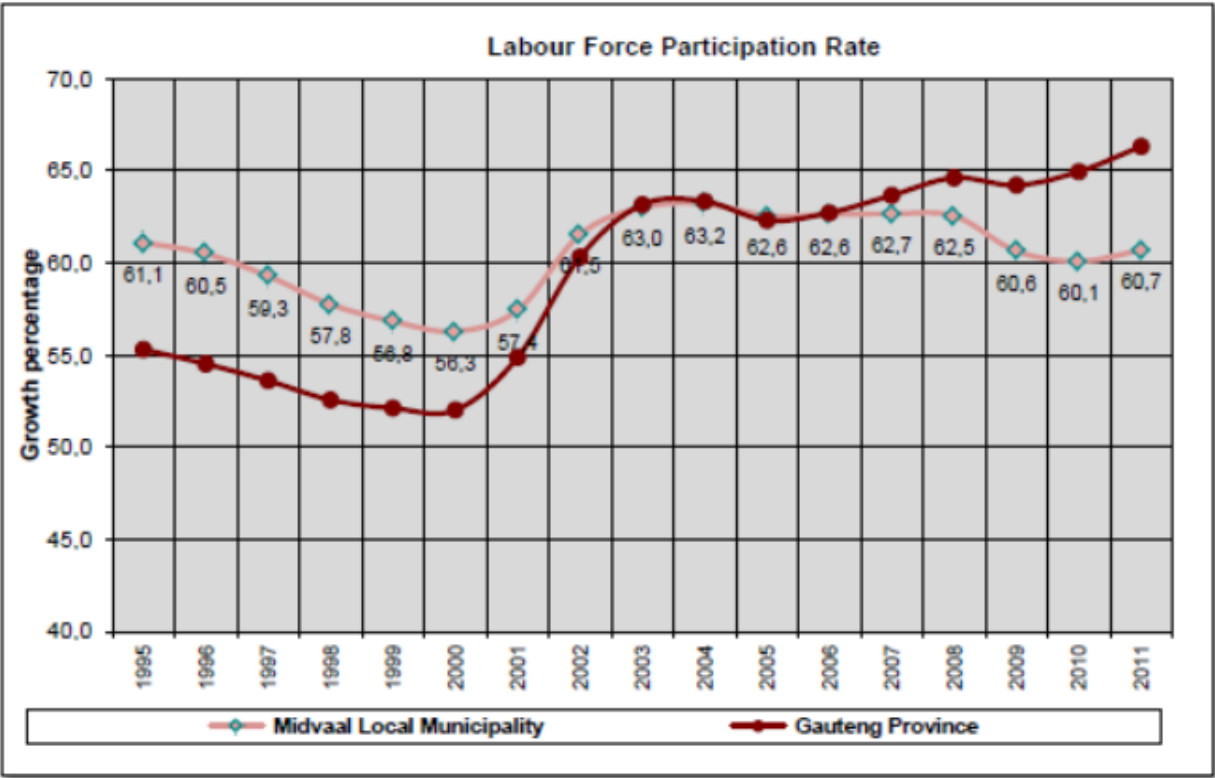


Fig 9: Labour Force Participation Rate

2.7 Spatial Perspective

Midvaal is the 2nd largest municipality in Gauteng in terms of land, covering an area of 1722 km². Midvaal has strong regional linkages to major economic cores like Johannesburg, Ekurhuleni and the Vereeniging-Vanderbijlpark complex and is predominantly rural, with urban development predominantly consolidated along routes R59 and R82 in the northwestern parts of the municipal area. Meyerton is the highest order town in the area with a relatively large business and residential component. Smaller settlements and agricultural holdings in the surrounds act as service centers to the surrounding local communities. The local population is relatively well educated, and unemployment levels are low compared with provincial and national averages. The strongest economic driver in Midvaal is Manufacturing however the Manufacturing sector is declining creating a need to diversify the Midvaal economy.

The Spatial Development Framework map of the municipality is represented below

MIDVAAL SPATIAL DEVELOPMENT FRAMEWORK **Composite Map 2021 - 2022**

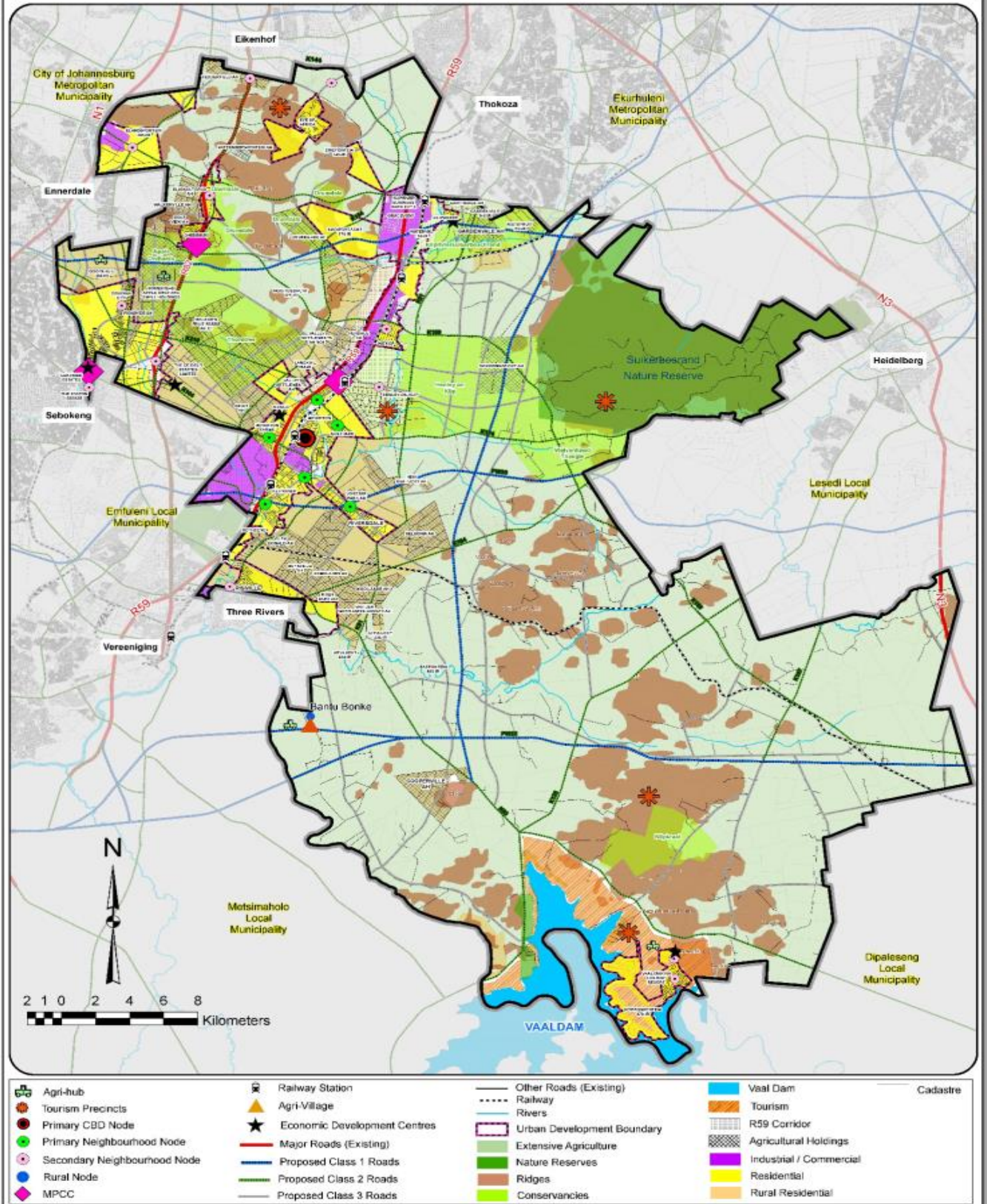


Fig 10: Spatial Development Framework for the Midvaal Municipality 2020/2021

2.7.1 Development Potential

The location on Midvaal in relation to Johannesburg, Ekurhuleni and Emfuleni provide a strong north-south linkage along the R59 and R82. The R59 Corridor Urban Design Framework encourages residential densification, businesses, commercial and industrial activities in designated areas along the R59 Corridor. The development of the Savanna City Mega housing

project to the west of the municipality and bordering on City of Johannesburg, provides development opportunities along the R82 in De Deur, Walkerville and Doornkuil.

The future development of route K154 will provide direct access from the N1 into Midvaal igniting the development potential as outlined in the Elandsfontein precinct plan.

The Vaal Dam, Vaal Marina, Suikerbosrand Nature Reserve and the numerous ridges in Midvaal should be promoted as tourist attractions. This includes the support and hosting of recreational events to attract day visitors and development of tourist towns in Walkerville and Henley on Klip.

Agri-tropolis: Growing the Midvaal Vision

Midvaal Local Municipality spans 1722 km² of which about 1621 km² consists of agricultural land (comprising farms and small/agricultural holdings). Yet agriculture contributes less than 1% to the Midvaal economy and showed the greatest decline in the long term (1996-2011) when compared to the national, provincial, and district economies (-7.3% annually).

In the medium term (-5.3% per annum between 2001-2011) and short term (1.2% per annum between 2006-2011) it fared worse than the national and provincial growth rates, but better than the district economy. The positive of this is that the Agricultural Sector is showing some improvement. This improvement can be linked to the increased government spending in this sector. The municipality has identified agriculture as a sector that can grow the economy and create jobs. Council has since adopted an Agricultural Growth Strategy. As part of implementation of the Agricultural Growth Strategy, the municipality is streamlining its stakeholder engagement and support for farmers. Land has been identified by Council to be leased for agriculture. It is the municipality's view that the intervention above will impact on the agricultural growth and development. In terms of the total employment in Midvaal Local Economy, the Agricultural Sector housed 2.0% of all employees, the second smallest employment providing economic sector in the local economy. Employment growth (both formal and informal employment) shows the same pattern between 1996 and 2011, though the informal employment pattern fluctuated much more in extreme than formal employment.

In total, employment growth in agriculture, forestry & fishing has been on a slight increase between 1996 and 2011, but even with the agricultural initiatives implemented in 2009-2010,

employment growth has steadily stayed in the negative. Thus, indicating that government investment did not have the same impact on job creation as what it had on economic growth.

South Africa is faced with increased volatility in food security, and this is intensified in the Gauteng Province by the high rate of immigration and the resultant high population growth experienced. Midvaal Local Municipality assessed its comparative advantages and concluded that the agricultural sector has the potential to be a socio-economic game-changer that can grow the economy and create jobs.

The role that Midvaal Local Municipality could play has been expressed by the Gauteng Premier in his State of the Province Address (SOPA) "The second area of focus is to unlock the agricultural potential of Sedibeng as the food basket of the Gauteng City Region and position the region as an Agri-tropolis."⁶⁸ The reviving of agriculture and the agro-processing value chain is key for radical economic transformation, says Trade and Industry Minister Rob Davies. "Much more value is created in agro-processing than it is in agriculture. There are high quality jobs if we actually process the products that we produce. Agro-processing can exist and add value where there is agriculture. But agro-processing can also drive agriculture and create a market for farmers," said Minister Davies.

The minister was speaking at the Eat Well, Eat Safe Local campaign at Cofimvaba High School, in Cofimvaba village, Eastern Cape. The result of this is the recognition of the "Agritropolis" concept as a major "game-changer" programme to propel the Midvaal Economy towards modernization and leading the municipality towards the re-industrialization of Gauteng. The impact would be beyond the revitalization of the township economy and will drive Midvaal towards decisive spatial and economic transformation and accelerated social transformation as we will start to address unemployment through enhanced employment of women, youth and people with disabilities in agriculture and agricultural beneficiation. The "Agri-tropolis" initiative will be an important enabler in the growth of the agricultural sector. Rigorous investment and the anticipation would be to give effect to the Midvaal vision for Midvaal to be renowned for robust economic growth and a high quality of life for all.

2.8 Sector plans and programmes

The sector plans, programmes, projects and initiatives by the DMRE and MLM which may affect the development and viability of the electricity service under consideration was identified. The development strategy and IDP of MLM played a vital role here.

Allocations from the Integrated National Electrification Programme (INEP) grants are intended to fund the capital costs of providing electrical connections to poor households and providing the bulk infrastructure needed to ensure a stable supply of electricity. INEP funding for year 2021-2022 equated to R 27 million. The 2022-2023 budget is at R 20 million and the 2023-2024 budget is at R 21 million.

Section 23 of the Local Government: Municipal Systems Act, 2000, states that municipal planning should be developmentally orientated. A developmentally orientated plan will enable the municipality to strive to achieve the objects of the local government and developmental duties of municipalities as set out in section 152 and 153 of the constitution, respectively and to uphold the rights of the people who resides within the boundaries of the municipality.

The integrated development plan (IDP) must provide a clear and viable framework for the local municipality's development, by aligning the resources of the municipality with the implementation of the plans. If this goal is to be realized, a steady influx of residents is to be expected.

The main objective of the electricity master plan is to provide the municipality with a clear overview of the current and future electricity status based on the current growth rate and identified new developments and projects that will result in a greater demand for electricity.

2.8.1 Sector visions and strategies

The sector strategies and plans which were considered (including that included in the existing master plan), are for water and sanitation, Roads and transport, Storm water, Electricity and Energy, Solid waste, Municipal amenities, Integrated housing (human settlements) sectors. They include Growth and Development Strategies, Spatial Development Frameworks (SDF), Integrated Development Plan (IDP), Service Delivery and Budget Implementation Plan (SDBIP), and the Government's Medium Term Strategic Framework (MTSF).

Other planning and strategy documents include but are not limited to Environmental strategies and plans, Municipal Growth and Development Plans, Local Economic Development strategies and plans, Urban Renewal Strategy. Typical national documentation to be consulted will include the National Spatial Development Framework, the National Growth and Development Strategy, National Development Plan, and the National Economic Development Framework.

The strategic grid plan (SGP) formulates long term strategic corridor requirements whereas the transmission development plan (TDP) formulates transmission network infrastructure investment requirements. The TDP allows for the determination of new network infrastructure requirements so as to allow the country to keep up with future demand growth.

MLM forms part of the Gauteng Province. The province gets its electricity supply mainly from the Mpumalanga power pool, Kelvin power station, Pretoria West Power Station and Rooiwaal power station. The main economic activity is in Manufacturing - 22,37%, General government - 18,13% and Transport, storage, and communication -18,05%.

Transmission within MLM is mainly at 88 and 11 kV as can be seen below. A 88kV intake arises from Eskom. The National Development Plan 2030 vision is to invest in a strong network of economic infrastructure which will support the country's medium and long-term economic and social objective. The economic infrastructure which is to be invested is required to provide basic services such as electricity.



SECTION 3 -LEVEL OF SERVICE

3.1 ELECTRICITY PROVISION LEGISLATION

3.1.1 Statutory Requirements and National Targets for Providing Access to Electricity

The technical and operational requirements under section 27(a) of the *Electricity Regulation Amendment Act* are embodied in the two specifications namely, NRS 047 (Quality of Service) and NRS 048 (Quality of Supply).

The preparation of NRS 047 on quality of service in the Electricity Supply Industry (ESI) has been driven by the National Energy Regulator of South Africa (NERSA) to facilitate liaison between customers and the licensed suppliers of electricity (licensees). NRS 047 is restricted to the measuring of those service activities and standards that have been agreed upon and defined by the ESI, various customer organisations and NERSA. NRS 047 also tabulates the various quality-of-service activities that licensees will report to NERSA. Should reporting show that certain targets are unrealistic, these targets can be changed in revisions of NRS 047. NRS 047 provides minimum standards. Licensees who render higher standards should maintain or improve on these minimum standards.

NRS 048 is aligned with the NERSA Directive on Power Quality, which defines the basis for managing power quality in South Africa. In accordance with the Directive, the levels and associated assessment methods in NRS 048 are minimum standards for licensing requirements. Limits have further been defined for some parameters to address voltage quality problems that might arise in short time periods. Quality of Supply needs to be measured, monitored and reported. *The applicable specifications to the Municipality are the South African National Specifications and NRS.*

3.2 Prioritization of Resource Allocation

The Municipal Systems Act has set a process, the Integrated Development Plan process (IDP), to be utilized to determine customer expectations. A public

participation process has not been affected to determine Electricity Services expectations. Municipalities must allow the community to participate in the setting of appropriate Key Performance Indicators and Performance Targets for the municipality.

Since there are limited resources at MLM's disposal, the municipality cannot satisfy all the identified needs. Section 3.2. of this report aims to give the municipality of the indication of the level of service residents are experiencing in terms of their electricity provision.

Currently, MLM has the supply Authority of Midvaal the and Eskom has Supply Authority over the Savanna city area. However, the municipality is tasked with providing basic services and facilitating development within all regions under their control – in this case, even though other areas are supplied by Eskom, it is the municipality's responsibility to ensure that all residents within its jurisdiction has access to electricity.

The local government is assigned with the role of mobilizing economic resources to improve the lives of its people. The delivery of adequate basic services is paramount in preserving human dignity and well-being of people.

The level of service delivery has a long-term consequence and a strong connection with the overall development in a community. Research shows that subtle changes in a community can have a significant impact on perceptions of community spirit and thereby, community wellbeing. Electricity is central to the functions of all modern society and plays an important role in both economic and human development. Hence, electricity infrastructure is a critical and basic service that all South Africans should have access to.

3.3 ELECTRICITY SERVICE DELIVERY

3.3.1 Electrified vs. Non-Electrified

From a level of service point of view, it is most important to understand the basics in terms of electricity supply. The starting point is to understand the non-electrified dwellings within the MLM.

Apart from the social benefits associated with access to electricity, there is the potential for local economic development. Approximately 91.4% of households in the national average of 87.6%. Midvaal Municipality has access to electricity of about 79% and the total number of households without access to electricity in Midvaal is 21%

The following graphs (from Census 2016 data) illustrate the electrified vs. non- electrified dwellings / households:

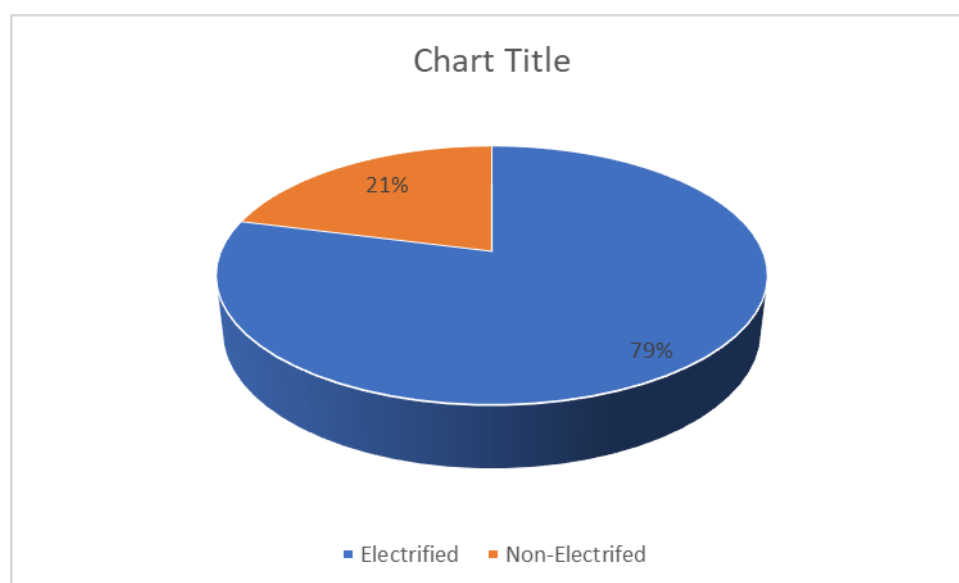


Figure 6: Access to Electricity in MLM

Targeted Levels of Services for Electrified Households

Levels of Service applicable to electricity, with a client centric view (what the client needs), is based on 3 elements:

- Availability of a Grid Connection.
- Level of Electricity Availability – (no of service interruptions, black outs).
- Level of quality of supply – (no of depressions, voltage changes).

The above elements are the outcome of sufficient planning in terms of geographic availability of services, capacity availability within current infrastructure (distribution capacity such as cables and wires, substation capacity such as busbar, transformer and panel capacity, overarching supply capacity such as own generation or bulk electricity supply from Eskom) and continuous maintenance, replacement and establishment of new capacity to ensure a quality of supply.

Electrification Backlogs

The main poverty alleviation priority in government lies vested in the electrification of households in historically disadvantaged communities. Large infrastructure backlog occurs in the Scelo area due to the informal settlement nature of this area, which is characterized by poverty. There will be back logs in savana city as and when the extensions are built, there is lack of bulk capacity at the moment but there is planned bulk for savanna city for 2021-

2025 financial years.

AREA CONNECTIONS	ESTIMATED	WARD NO.	FINANCIAL YEAR OF IMPLEMENTATION
Savanna City	3000	11	2021/2022
Scelo Bulk	88/11 kVA Substation	09	2021/2022
Savanna bulk		11	2021/2025

Table 4: Electrification Projects in MLM

AREA CONNECTIONS	ESTIMATED	WARD NO.	FINANCIAL YEAR OF IMPLEMENTATION
Savana City	3000		2021/2022

3.4 Experienced Levels of Services

Midvaal Local Municipality is a category B municipality. The extension of basic services such as electricity is pivotal in realizing socio-economic growth in such municipality.

The vision of the municipality is: "A stable, and prosperous district with caring leaders who serve with excellence in government, service delivery and economic development". The continuous assessment of the level of service thus a crucial aspect in sustaining excellence in service delivery. Map below depicts the Gauteng access to electricity at municipal level and Midvaal is at 75-86% level of access.

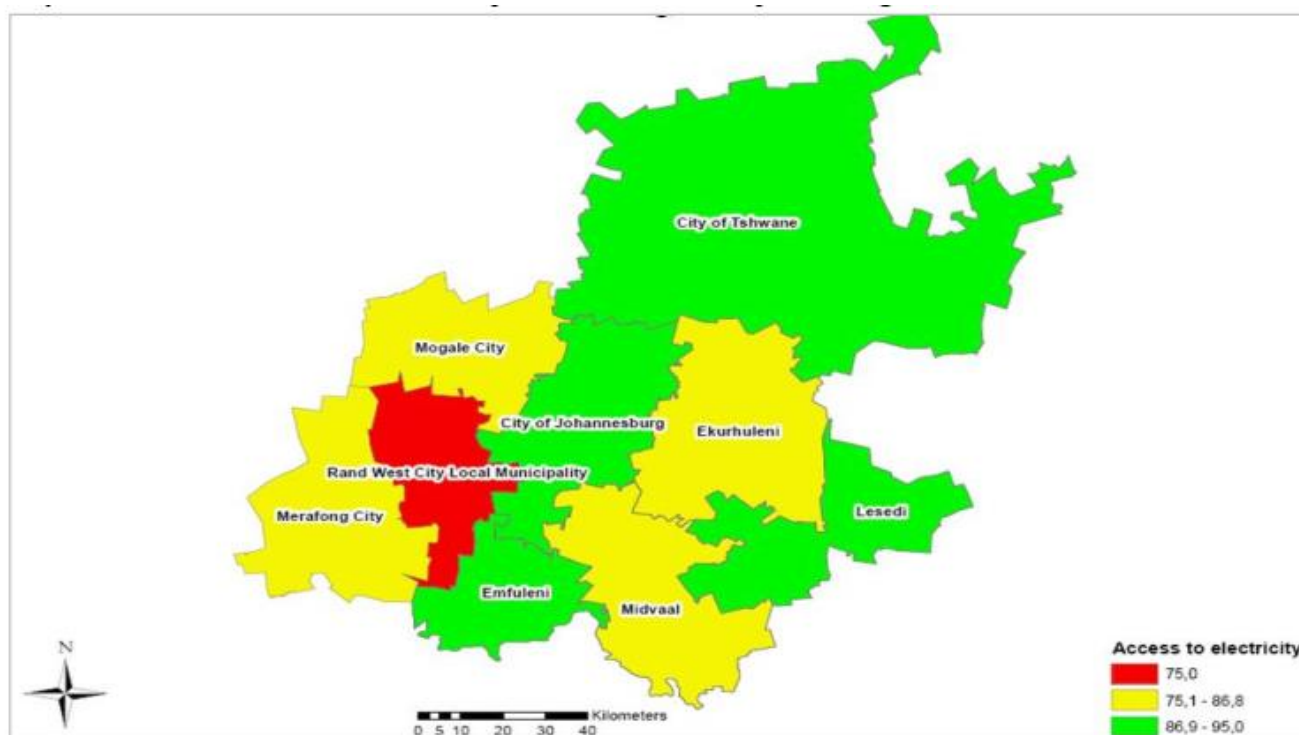


Table 8.18 Distribution of Household by access to electricity. (census 2016)

Table 8.16 shows the distribution of households by supplier of electricity, particularly to households with a in-house conventional and pre-paid meters electricity. Generally, about 4 175 597 households in Gauteng have electricity through the aforementioned systems and out of those, 1 768 978 use prepaid municipality electricity meters. Ekurhuleni has a higher number (566 952) of households using prepaid municipality electricity meters followed by City of Tshwane. The second most used electricity supplier is Eskom-prepaid in Gauteng with 1 431 446 households. The City of Johannesburg has the highest number (621 420) of households with Eskom-prepaid electricity followed by Ekurhuleni. For other

supplier of electricity, the City of Tshwane had the highest number (24 838) of households followed by the City of Johannesburg.

Table 8.16: Distribution of households by supplier of electricity, CS 2016

District/ local municipality	Municipality-prepaid	Municipality-receive bill from municipality	Eskom-pre-paid	Eskom-receive bill from Eskom	Other supplier (e.g. metering services such as impact meters)	Total
DC42: Sedibeng	114 666	19 503	146 390	13 505	1 218	295 282
GT422 : Midvaal	11 843	2 623	7 021	7 197	150	28 834
GT421 : Emfuleni	76 360	11 325	138 327	4 738	1 021	231 771
GT423 : Lesedi	26 463	5 555	1 041	1 571	47	34 678
DC48: West Rand	104 356	42 031	86 405	12 228	8 744	253 763
GT481 : Mogale City	25 162	24 485	63 554	6 139	1 305	120 644
GT484 : Merafong City	34 507	7 671	11 959	3 628	3 979	61 744
GT485 : Rand West City	44 687	9 875	10 892	2 461	3 460	71 375
EKU: Ekurhuleni	566 952	150 915	334 813	15 911	4 343	1 072 934
JHB: City of Johannesburg	482 456	241 153	621 420	183 913	21 734	1 550 676
TSH: City of Tshwane	500 548	223 921	242 418	11 216	24 838	1 002 942
Gauteng	1 768 978	677 523	1 431 446	236 773	60 877	4 175 597

Table 5: Distribution of households by supplier of Electricity.

Investigations were conducted on the available electrical engineering infrastructure services across South Africa. The infrastructure quality was classified on a scale from 1 – 5 described in table 1, where 1 represents no access to electricity and 5 represents a household connection with post / pre-paid meter.

Performance looks at the consumer-related service requirements, and the confirmation of these requirements through the consumer consultation process.

SERVICE LEVEL	DESCRIPTION
1	None
2	Minimum
3	Basic
4	Intermediate
5	Full

The level of service was then calculated by taking the average of the percentage of the population experiencing each level to give a relative index of the average level of service experienced. The national average for 2016, of the level of service index was 4.6, implying that most South Africans have access to either intermediate or full electricity services.

One of the prominent factors is the reliability of services. Due to a lack of maintenance and investment of electrical networks by municipalities, outage periods may become frequent. An overview of this aspect of the level of service is included in the asset management plan.

SECTION 4 - METHODOLOGY FOR EMP DEVELOPMENT

4.1 PLANNING CRITERIA

The planning criteria used for the report are based on the South African Electrical Grid Code as published by NERSA through various grid code document, national standards and rationalised user groups formed by Network Service Providers (NSP).

4.2 LOAD FORECAST

The municipality lacks historic information for its network. The load forecast in this report is based on information collected on the field at each substation as well as the availability of land for industrial, commercial and residential use.

The use of land for load forecasting based on the municipal vision as laid in its Integrated Development Plan (IDP) in which much of the development is centred on land use for industrial and commercial activities that is meant to create the much-needed jobs.

4.3 MODELLING

MLM electrical network for this EMP is developed in DlgSILENT Power Factory™ to represent the network at the various stages of development over the planning period.

4.3.1 Distribution network

MLM is supplied from seven Points of Utility Connection (PUC). Its distribution network used for connection of its bulk distribution point is largely 88 and 11 kV and it is completely considered in the electrical model.

4.3.2 MV Reticulation network

Depending on which part of MLM electrical network is concerned, the MV reticulation is designed and operated either at 11 kV. The MV network is modelled to include all primary and secondary switching stations. All feeders supplying MV to LV substations are modelled as lumped loads at the secondary switching stations.

4.3.4 LV Reticulation network

The LV network is represented as lumped loads at the secondary switching station.

4.4 ANALYSIS AND RESULTS

The critical input to the electrical model is the loading information, both present and forecast. For each case, the network is modelled to represent each EMP year as indicated from 2018 to 2038.

Load flow and Short-circuit analysis are used to produce this EMP. Each result is tested against the planning criteria to assess the performance of the network and to identify the need for additional infrastructure projects or change to operational requirement beyond the already committed investment at the various stages of development.

4.5 COSTING AND CAPITAL EXPENDITURE

The network analysis and results provide a view of how the network would behave when subjected to the load forecast. If any bottleneck is encountered, a solution is sought.

The cost of each solution proposed is estimated with the view to provide a clear planning to allow MLM to prepare a financial plan that include raising capital and also the revenue collection and debt repayment.

The costing and capital expenditure is based on the cost of elementary components of the electrical network and the associated labour, transport, professional fees, etc. All cost shall be expressed in South African Rand value in 2021.

SECTION 5- EXISTING NETWORK AND COMMITTED PROJECTS

A prerequisite for planning the network is status quo through a situational assessment. The purpose of a situational assessment is to acquire, collate and assemble the information regarding the network. Thus, it provides an understanding of the network's status quo and provides the required baseline information to allow for the master planning process to proceed.

Once the status quo is understood along with a load forecast, it is possible to plan for the required network expansion in terms of both cost and time required.

5.1 DATA ACQUISITION COLLATION AND ASSESSMENT

Information regarding MLM electrical network was sourced from data files provided to the consultant. The information gathered included the network single line diagrams, layouts in GIS format, photos, station electric diagrams, network performance data, etc. that formed the basis of the model used for the network expansion studies. Other information included were the ReticMaster network models, single line diagrams, the IDP as well as previous EMP reports.

Over and above the received information, the consultant undertook a site visit during which a high-level audit of all substations and switching stations was undertaken. The aim of the network audit was to collect network loading information and to carry out a visual assessment of the network with that could form input for the refurbishment and the asset management plans.

The loading information recorded during the site visit was deemed insufficient for the purpose of the EMP because of its singularity in time and the changing network topology due to switching. Therefore, power and logging devices will be installed on the network for a duration of 7 days in the network to record the load profile of each major injection point of the network.

5.1 Network topology and assets classification

5.1.1 General

MLM network has no generation capacity. The municipality buys bulk electricity from Eskom and resells to consumers located within its distribution license area of Midvaal. Meyerton area is the biggest in terms of area, electrical load and electricity revenue collection.

Analysing the network from the PUC to the consumer in the Low Voltage (LV) network, the network topology ranges from 88 kV to 400V as illustrated in **Fig 11**. At the highest level is a Major Transmission Substation (MTS) that supplies distribution substations at 88 kV as shown in Figure 11. In turn, each distribution substation supplies primary or secondary switching stations at 11 kV. Switching stations are designed to supply one or more miniature substations (minisubs) using one or more feeders. Each miniature substation supplies zone of LV customers. In some instances, Large Power Users (LPU) have private substation to transformer from 11 kV to LV for private reticulation within their properties.

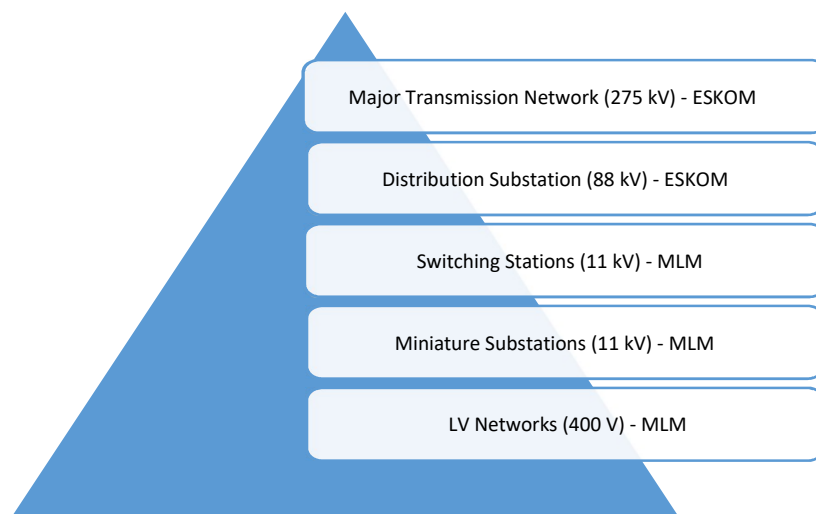


Fig 11: Hierarchy of MLM electrical network

Point of Utility Connection

The interface between the existing network and Eskom consists of seven Point of Utility Connection (PUC) located at Meyerton M1 substation 88/11kV, Eyestone 88/11kV, Ohenimuri 11kV, Vaal Marina 88/11kV, Savanna City 11kV Eskom 4 88/11kV, Duncanville ext. 3 11kV, Graceview 11kV and Rissiville 11kV.

. The transformation capacity of each PUC is given in Table 6.

Table 6: MLM network connection points to Eskom network

SUBSTATION NAME	VOLTAGE RATING	INSTALLED CAPACITY (MVA)
M1	88/11 kV	2x20
Eyestone	88/11 kV	2x20
Vaal Marina	88/11	1x20
Ohenimuri	11kV	-
Eskom 4 (Rissiville)	88/11	1x20
Savana City	11kV	-
Duncanville	11kV	-
Graceview	11kV	3x 20

All seven PUCs' supplying MLM belong to MLM. Eyestone injects power into MLM network through Eyestone substation from which two ring feeders departs. Meyerton town is supplied by M1 Substation fed from Eskom's Meyerton substation. Vaal Marina supplies the Vaal area, Eskom 4 Supplies all its surrounding areas, Oheinhmuri is a supply point which has a metering point going to the surround areas there is no yard or buildings, Savanna city is a switching building being supplied by 11kV underground network and distributing to Savanna city development and surrounding areas, Duncanville also has a metering point from Emfuleni Municipality and no yard.

MLM M1 distribution substations and line characteristics

MLM's Meyerton M1 network is composed of 8 distribution switching stations listed in Table 5. see single line diagram as illustrated by the layout of 9.

Table 7: MLM M1 network's bulk transformation points

SWITCHING STATION NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Maislaan	11 kV	3
Golf Park	11 kV	9
Ribbok	11kV	8
Gembok	11kV	6
Waterbok	11kV	4
African Products	11kV	5
Paul Potgieter	11kV	5
Atlas Organics	11kV	5

Eyestone is supplied from Eskom 88kV line and Substation and has 2 x20MVA transformers supplying various feeders as below.

Table 8: MLM EYESTONE network's bulk transformation points

RING NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Ring 1	11 kV	2
Ring 2	11 kV	2

Vaal Marina electrical network is supplied from Eskom substation.

Table 9: MLM VAAL MARINA network's bulk transformation points

FEEDER NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Feeder 1	11 kV	1
Feeder 2	11 kV	1
Feeder 3	11kV	1

Table 10: MLM Eskom 4 network's bulk transformation points

SWITCHING STATION NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Vaal Marina sub	11 kV	6
Ris 2	11 kV	3
Ris 3	11kV	6
Ris 4	11kV	3
Ris 7	11kV	3
Ris 8	11kV	3
Ris 6	11kV	4
Ris 9	11kV	3
Ris 14	11kV	3
Ris 15	11kV	3
Ris 16	11kV	4
RRL 8	11kV	4
RRL 1	11kV	3
RRL 8/8	11kV	3
TR 6	11kV	3

Table 11: MLM Savana City network's bulk transformation points

RING NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Ring 1	11 kV	2
Ring 2	11kV	2
Ring 3	11kV	2
Ring 4	11kV	2

Table 12: MLM Oheimuri network's bulk transformation points

RING NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Feeder 1	11 kV	1

Table 13: MLM Duncanville network's bulk transformation points

RING NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Feeder 1	11 kV	1

Table 14: MLM Graceview network's bulk transformation points

RING NAME	VOLTAGE RATING	No. FEEDERS (MVA)
Ring 1	11 kV	1
Ring 2	11 kV	1
Ring 3	11 kV	1
Ring 4	11 kV	1
Ring 5	11 kV	1

Fig 12: Map of MLM showing bulk transformation points and 132 kV lines

All lines circuit are strung with a single King Bird ACSR conductor that has a typical rating of 855A at 70°. Therefore, at 88 kV each line circuit is designed for 130 MVA thermal capacity. As give in Table 6, the longest line is 7.8 km between Eyestone and Graceville substation and the combined 88 lines' route length is 12.3km.

Table 14: List of MLM 88 kV lines

Line Name	Voltage (kV)	Configuration	Distance (km)
Eyestone- Graceview	88	Single Circuit	7,800
Kookfontein- Scelo	88	Single Circuit	4,500
Eskom-Eskom 4 (Emfuleni)	88	Single Circuit	3.500
TOTAL			12,300

Although the line thermal capacity values given in Table 14 are theoretical, MLM network 88 kV lines are short as in Table 14. This implies that the transfer capacity can get as close as possible to the thermal capacity with little prospect of voltage violations.

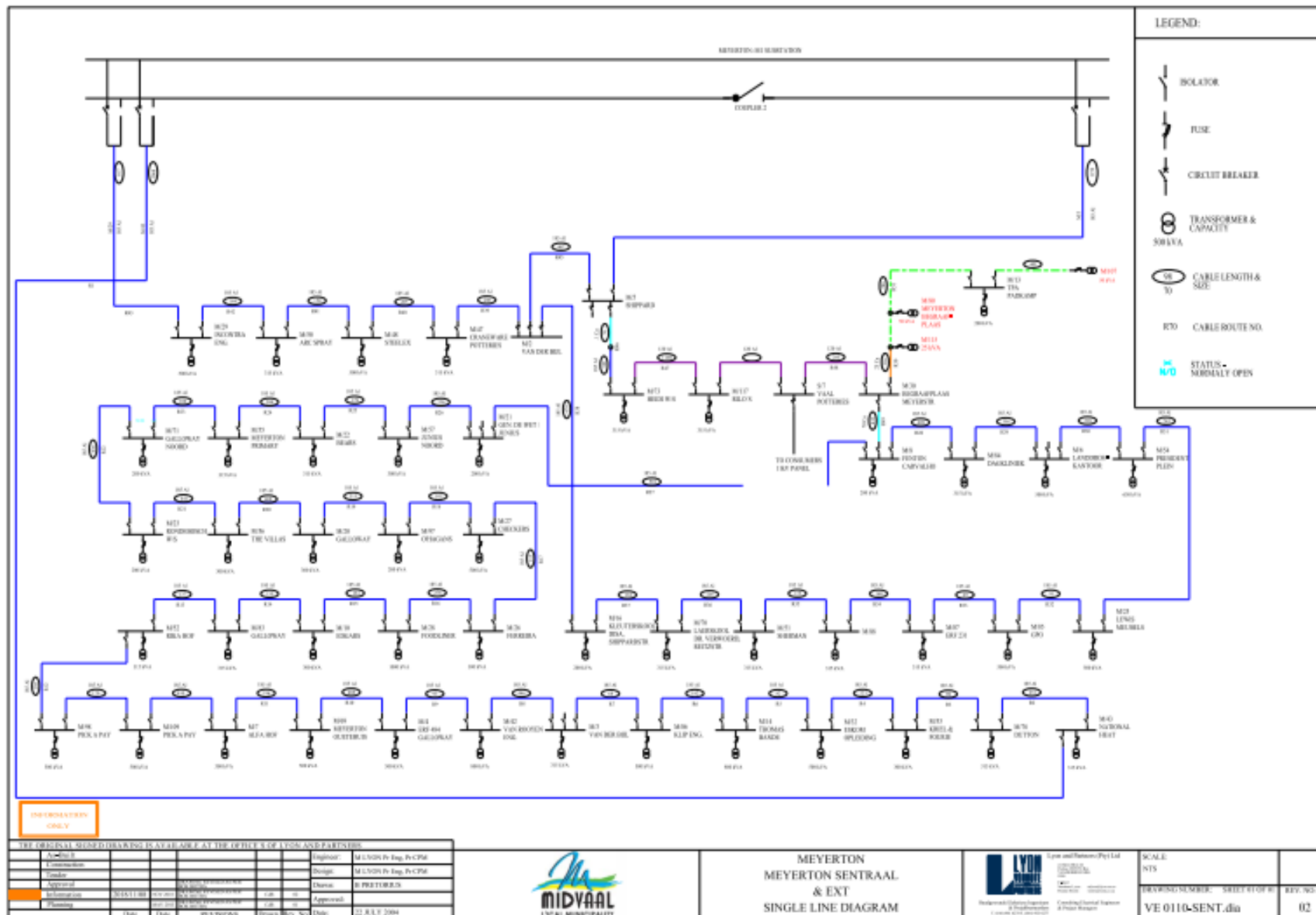
5.2 MLM 11 kV Reticulation Network

The reticulation network in MLM is designed and operated at 11 kV for all the areas.

Meyerton network is made up of switching stations, Ring Main Units (RMU), Miniature and brick substations, underground cables and Overhead lines (OHL). Connection between these major components predominantly uses underground cables. Its network is designed in such a way that the each switching station has either two incomers if supplied from the same source or a single incomer in the event it is supplied from different sources. In this way, each switching station can enjoy a certain degree of supply redundancy. For clarity, a connectivity diagram of the network in Meyerton area is given in Figure 13.

Eyestone network that is supplied from Eyestone substation is an underground cable network with miniature substations and RMU's.

From each MV to LV transformation point, the LV network is designed to meet the consumers demand and at the same time to meet the quality of supply as laid in NRS 048 series of the South African Bureau of Standards.



Revision: 02/2004/01/10 MIDYAAL/0110-S MEYERTON MASTERPLAN/ON DRAWING/01 SINGLE LINE DIAGRAM/MEYERTON SENTRAAL -EXT DIA REV2.DGN

Fig 13.2: Distribution network's schematic for MLM M1 Substation network SH3

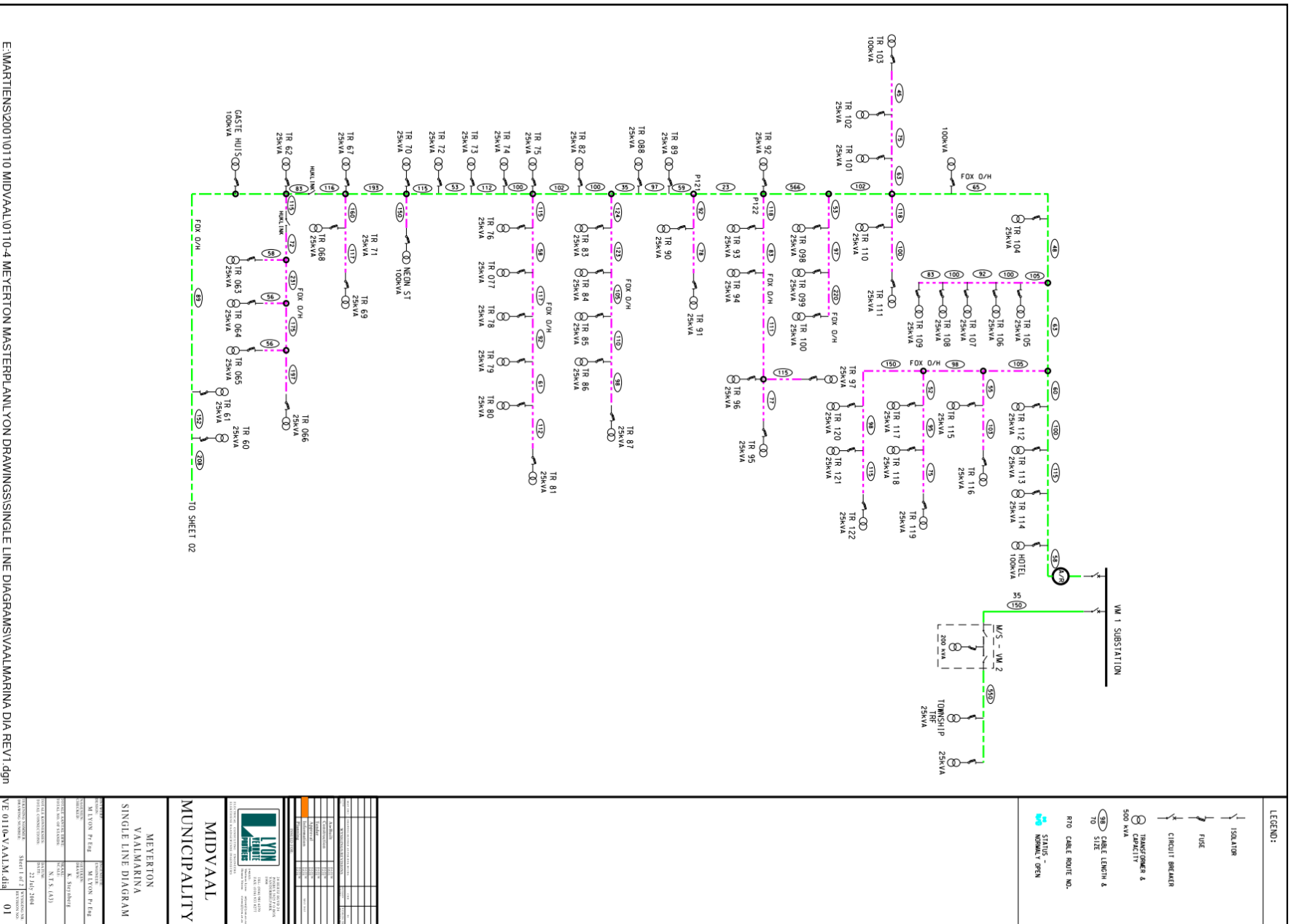


Fig 14: Distribution network’s schematic for MLM VAAL MARINA Substation network SH1

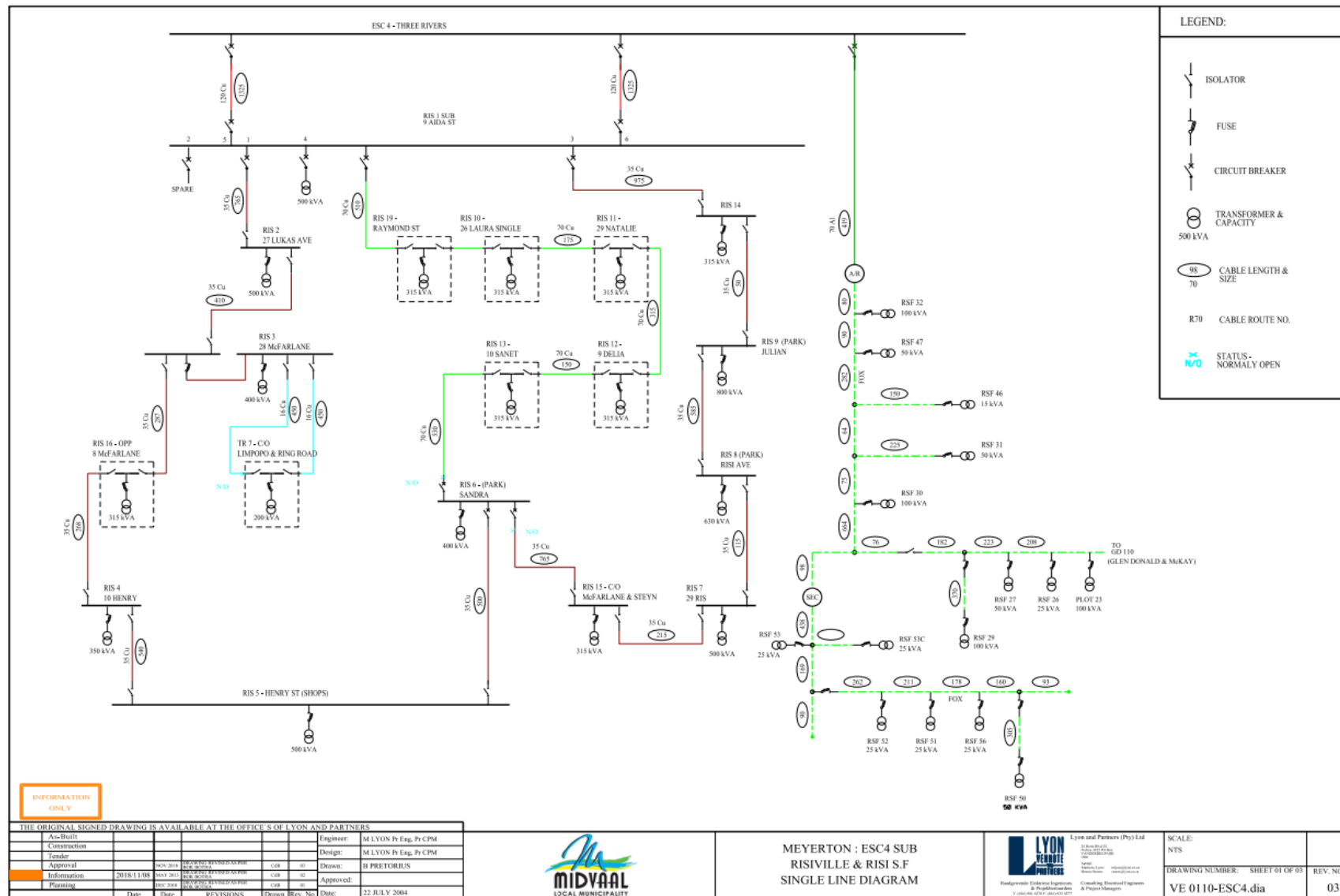


Fig 15: Distribution network's schematic for MLM ECS 4 Substation network SH1

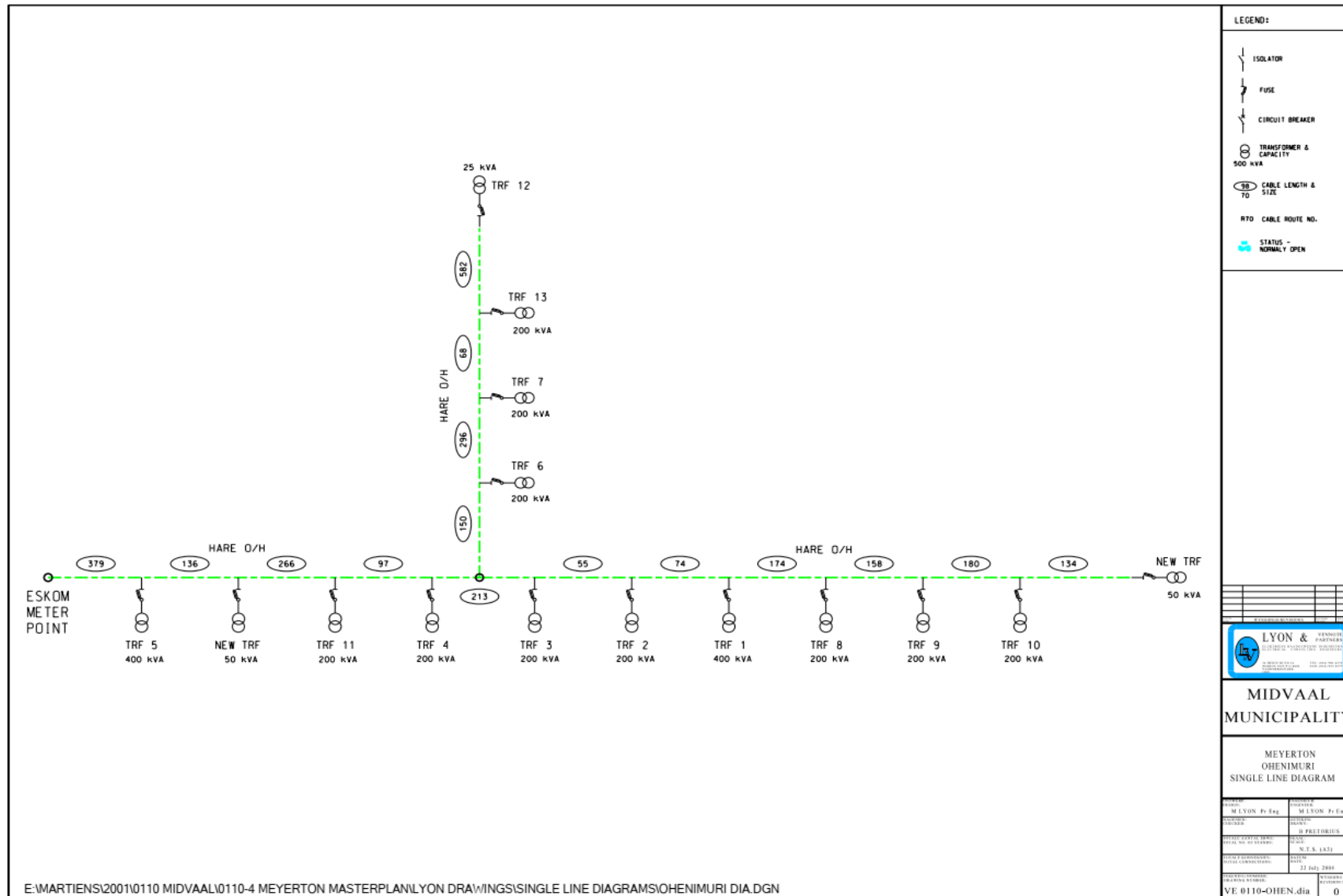


Fig 16: Distribution network's schematic for MLM OHEINMURI Substation network

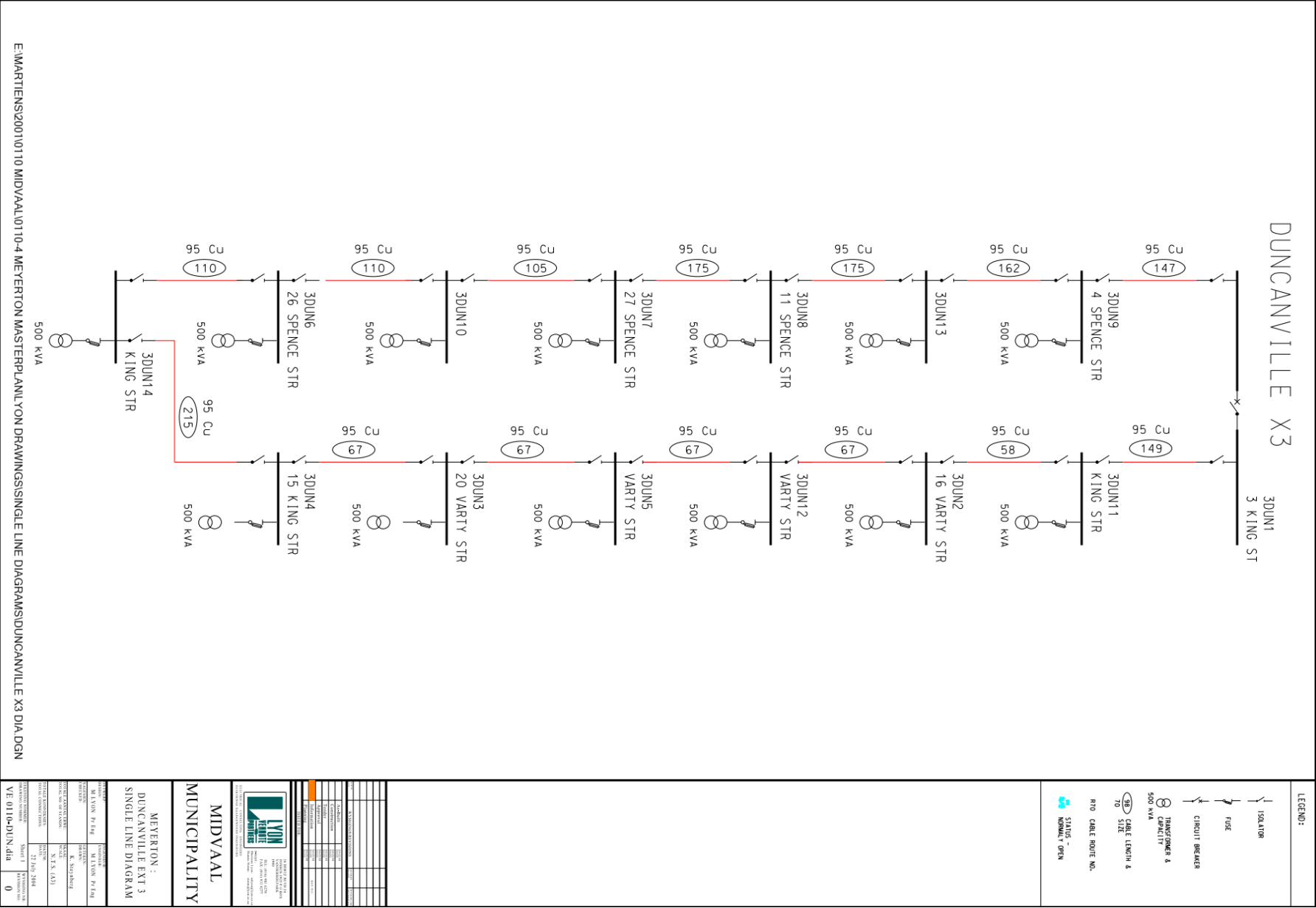


Fig 17: Distribution network’s schematic for MLM DUNCANVILLE Substation network

5.3 Committed projects.

From the information received, there are not a lot of committed projects for the MLM electrical network. The commitment to electrical project currently known to the consultant included: See Annexure A attached.

5.4 Network modelling and validation

Modelling platform

The electrical network model provided for MLM shall be modelled in ReticMaster. For this EMP, the network has been modelled in DIgSILENT™ because of its ease of use, flexibility and data exchange it offers. DIgSILENT is a powerful network modelling software used by most of the power utilities and Network Service Provider in South Africa, including Eskom.

5.5 Energy Efficient Levels and Losses

Task ID 9 of the Electricity Master plan framework requires us to look at the

Electricity Balance: The municipality's electricity balance shall be established using an approved methodology so as to determine the level of non-revenue electricity, technical losses, and non-technical losses. In addition:

- i. The performance of service delivery, judged from consumer complaints, must be assessed to determine the underlying causes of these complaints.
- ii. Furthermore, the effectiveness of operations and maintenance, judged from evaluation of the Service Delivery and Budget Implementation Plan (SDBIP) against unplanned repair/replacements, must be determined and assessed

Below is a table showing the number of customer complaints over a period April, May, and June 2021. Most of the complaints were directed toward the electricity department as can be seen there were a number of power outages due to load shedding or power faults. Up-to 650 complaints in June alone.

Technical losses

Phases 3 and 4 will deal in depth with the technical losses on all the HV and MV networks

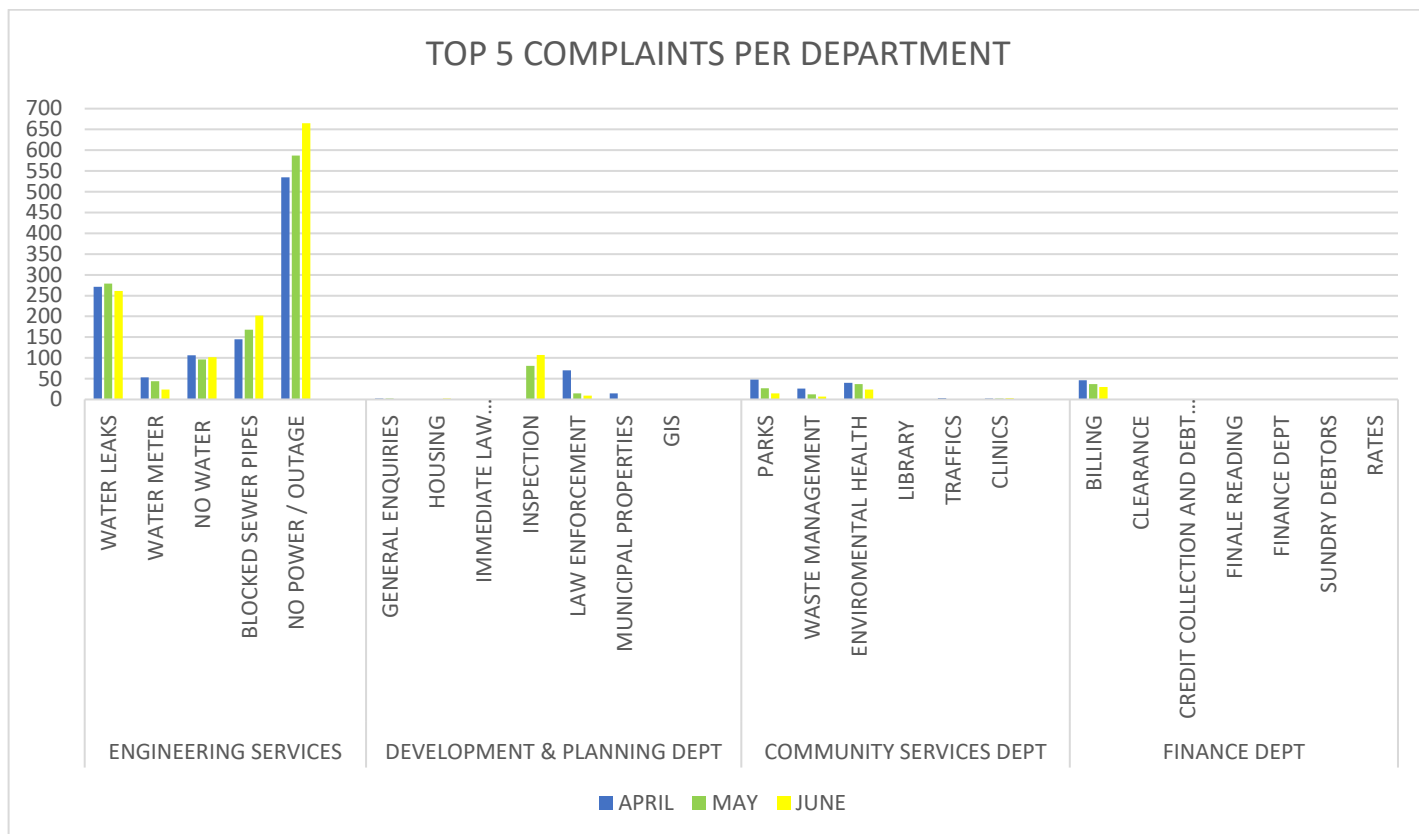


Fig 18 Top 5 Complaints per department

Fig below shows the 5 most affected areas during the 2nd quarter. The informal settlement of Scelo was hard hit with poor deliver of Engineering services and overall, out of all the departments the Engineering services was the most affected of all.

The figure further below shows the level of satisfaction and surprisingly the engineering department received a 61% level of satisfaction in the same period.

TOP 5 MOST AFFECTED AREAS

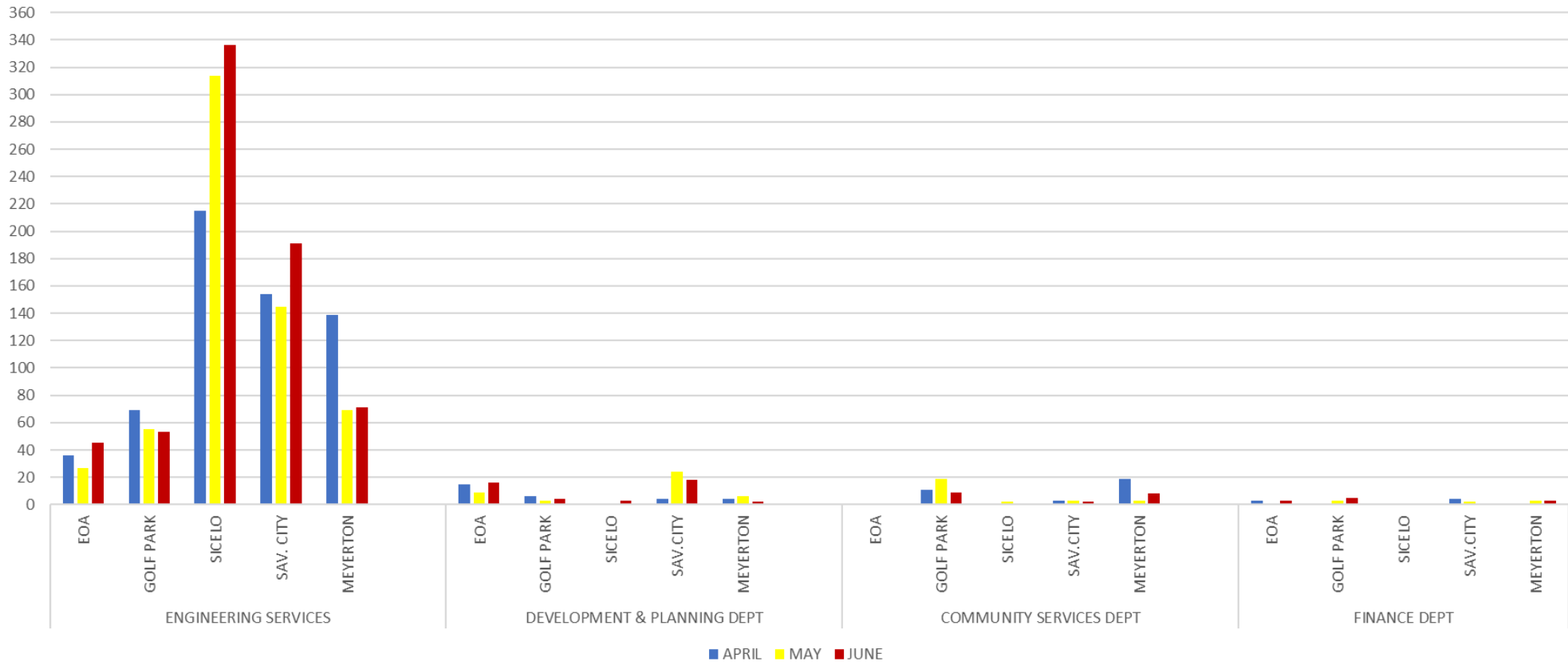


Fig 19 Top 5 Most affected areas

%LEVEL OF SATISFACTION PER DEPARTMENT

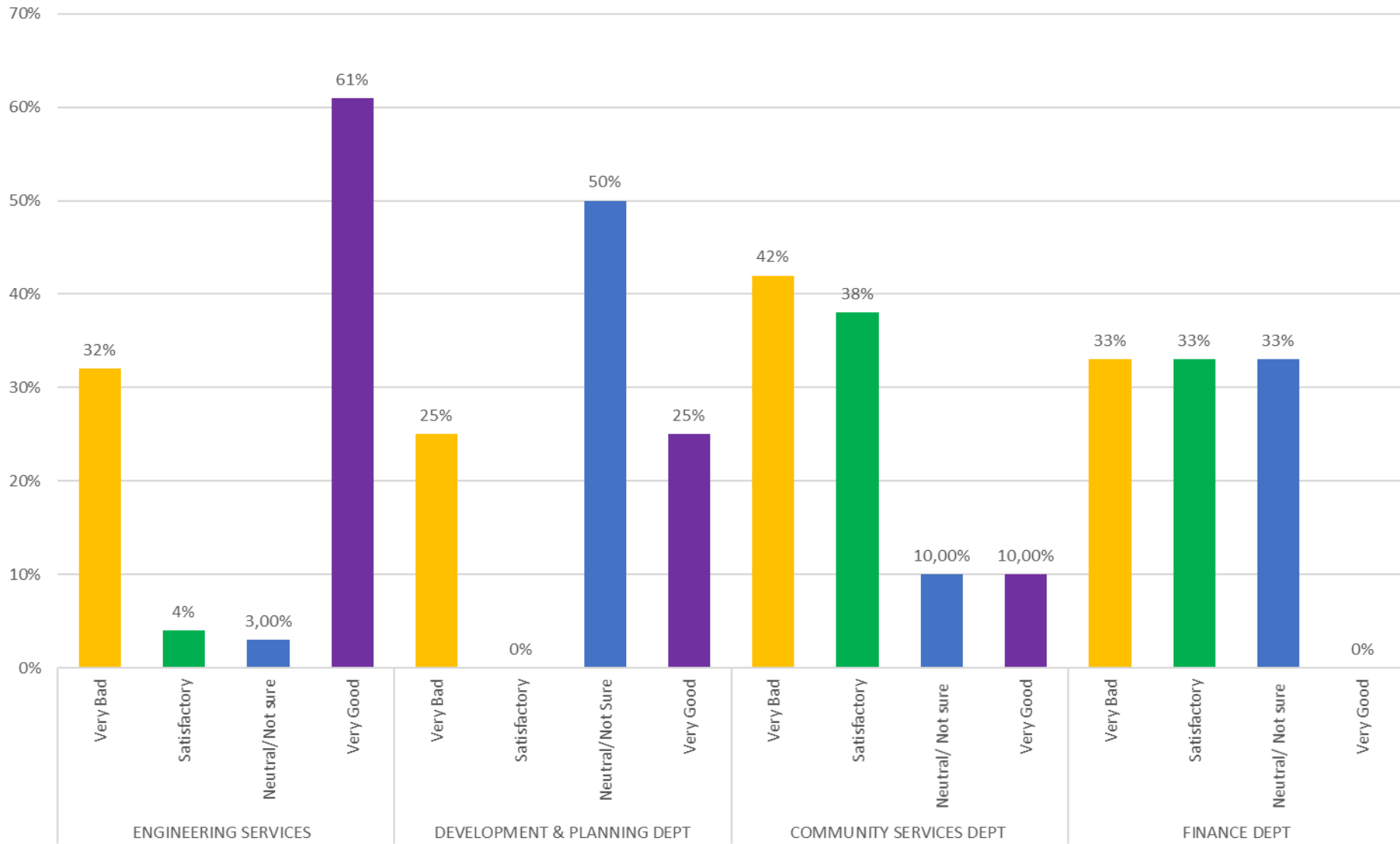
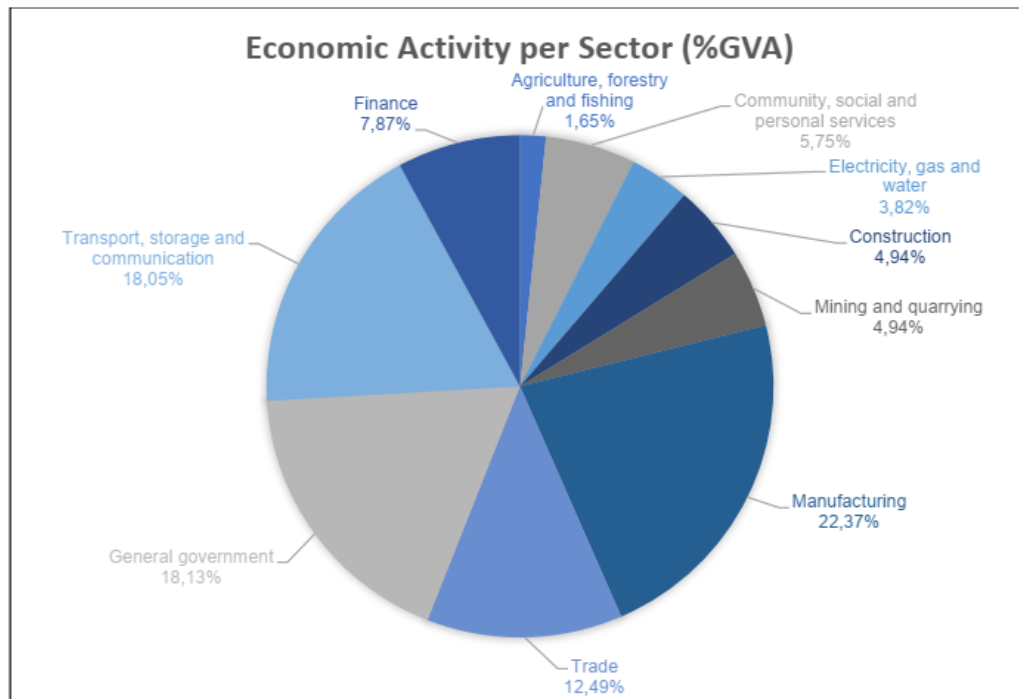


Fig 20 % level of Satisfaction

SECTION 6- NETWORK EXPANSION

6.1 ECONOMIC ACTIVITIES

MLM main activities are summarized in the following chart where manufacturing is the most dominant activity. Contrasting to other activities, industries use more electrical energy and therefore are the main drivers for electrical demand growth.



6.2 LOAD FORECAST AND BULK CAPACITY

There are many conventional ways to carry out a master plan but the ultimate choice is dictated by the availability of information. The linear curve is the simplest and is based on a fixed % increase per fixed period, for example a year.

The stepped method works where information is available regarding the development activities and it entails detailed and accurate information on the area of supply.

The S-curve is most practical in electrification projects where the initial uptake is slow, followed by a period of rapid growth and finally reaching saturation.

Finally, an exponential growth model can also be used in rare cases of electrification programs.

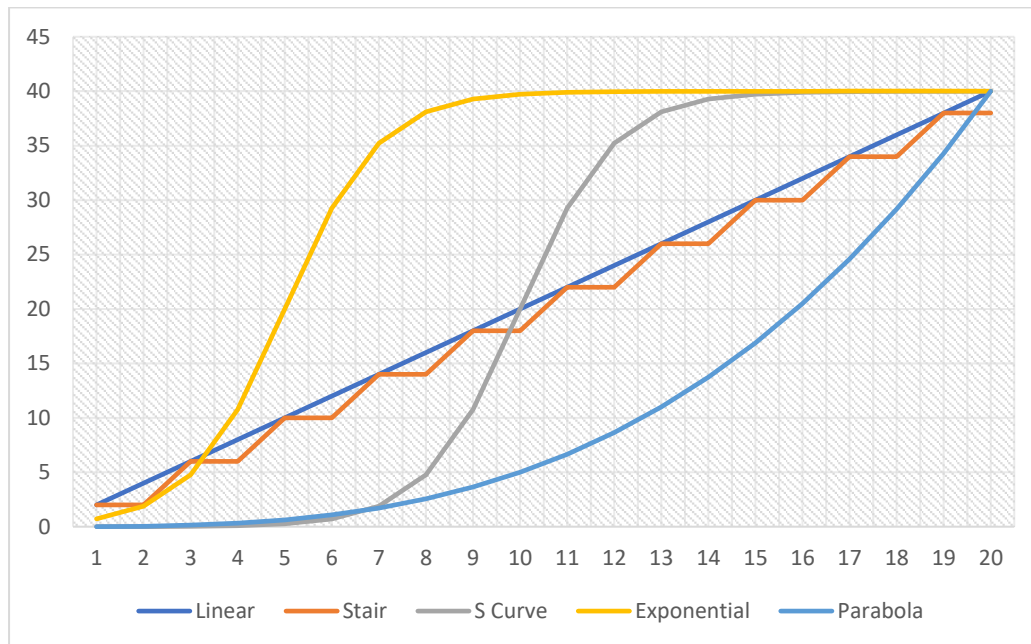


Figure 21: Some of the simple load forecast methods

Factors contributing to increase in electrical demand (over and above the existing load) are the new residential, commercial and industrial activities. In the case of MLM, little information was available regarding the future developments except for few residential electrification projects as discussed in SECTION 5. For this reason, the linear growth was deemed the best tool for projecting future demands.

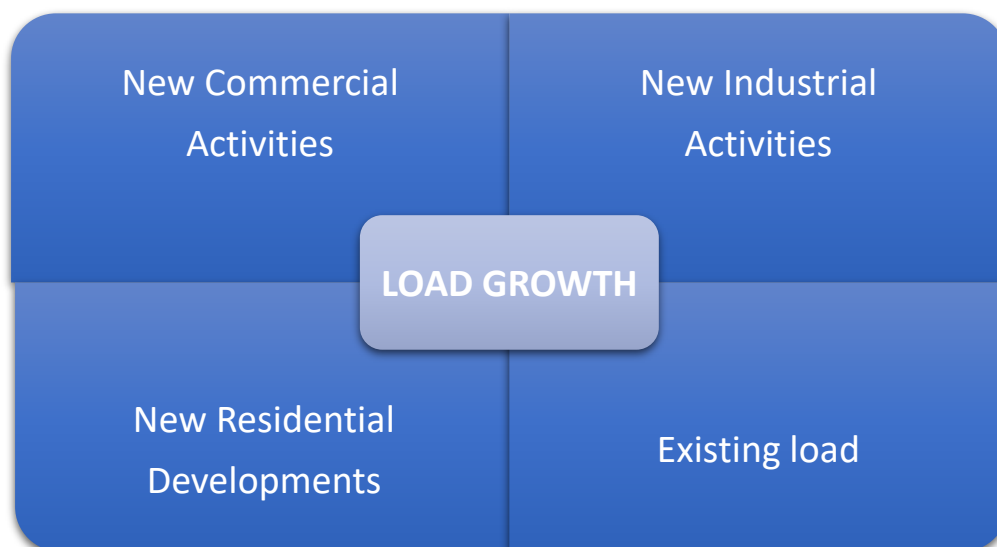


Figure 22: Contributors to load growth

On the economic outlook, the previous decade has delivered an average of 3.6% growth according to South Africa Statistics bureau. Given the lack of detailed information on the load growth, this EMP has adopted the use of a linear growth coupled to a growth rate of 4% per annum for each of the existing areas within MLM. It is on this basis that the following load forecast was carried out.

Table 15: Load Forecast for Load supplied from M1-88/11 kV – 2x20 MVA substation (in KVA)

Load Area	Meyerton Farms and Noldick - 1	Meyerton Farms and Noldick - 2	Valley Settlements	Sicelo Ext2	Sicelo	Meyerton Central	Rothdene	Kliprivier	Golf Park	Ext6	Sybrand v Niekerk Park	Chrissiesfontein	Rivesdale	Bolton World	Cumulative
2022	3,551	4,515	858	187	437	9,011	3,547	2,293	3,126	187	6,184	187	2,624	2,624	39,331
2023	3,693	4,695	892	195	454	9,371	3,689	2,385	3,251	195	6,431	195	2,729	2,729	40,904
2024	3,840	4,883	928	202	472	9,746	3,837	2,480	3,381	202	6,688	202	2,838	2,838	42,540
2025	3,994	5,078	965	211	491	10,136	3,990	2,580	3,517	211	6,956	211	2,952	2,952	44,242
2026	4,154	5,281	1,004	219	511	10,541	4,150	2,683	3,657	219	7,234	219	3,070	3,070	46,011
2027	4,320	5,493	1,044	228	531	10,963	4,316	2,790	3,804	228	7,524	228	3,192	3,192	47,852
2028	4,493	5,712	1,086	237	553	11,401	4,489	2,902	3,956	237	7,825	237	3,320	3,320	49,766
2029	4,672	5,941	1,129	246	575	11,857	4,668	3,018	4,114	246	8,138	246	3,453	3,453	51,757
2030	4,859	6,179	1,174	256	598	12,332	4,855	3,138	4,278	256	8,463	256	3,591	3,591	53,827
2031	5,054	6,426	1,221	266	622	12,825	5,049	3,264	4,450	266	8,802	266	3,735	3,735	55,980
2032	5,256	6,683	1,270	277	647	13,338	5,251	3,394	4,628	277	9,154	277	3,884	3,884	58,219
2033	5,466	6,950	1,321	288	672	13,871	5,461	3,530	4,813	288	9,520	288	4,039	4,039	60,548
2034	5,685	7,228	1,374	300	699	14,426	5,680	3,671	5,005	300	9,901	300	4,201	4,201	62,970
2035	5,912	7,517	1,429	312	727	15,003	5,907	3,818	5,205	312	10,297	312	4,369	4,369	65,489
2036	6,148	7,818	1,486	324	756	15,603	6,143	3,971	5,414	324	10,708	324	4,544	4,544	68,108
2037	6,394	8,131	1,545	337	787	16,228	6,389	4,130	5,630	337	11,137	337	4,726	4,726	70,832
2038	6,650	8,456	1,607	351	818	16,877	6,644	4,295	5,855	351	11,582	351	4,915	4,915	73,666
2039	6,916	8,794	1,671	365	851	17,552	6,910	4,467	6,090	365	12,046	365	5,111	5,111	76,612
2040	7,193	9,146	1,738	379	885	18,254	7,186	4,646	6,333	379	12,527	379	5,316	5,316	79,677
2041	7,480	9,512	1,808	394	920	18,984	7,474	4,831	6,587	394	13,028	394	5,528	5,528	82,864
2042	7,780	9,892	1,880	410	957	19,743	7,773	5,025	6,850	410	13,550	410	5,749	5,749	86,178

Table 15: Load Forecast for Load supplied from three rivers substation and directly from Eskom

SUPPLIED FROM THREE RIVERS (kV)					SUPPLIED FROM ESKOM AT 11 kV		
Risiville	Risiville S.F.	Glen Donald	McKay S.F.	Cumulative	Vaal Marina		Ohenimuri
3,675	250	1,498	998	6,421	2,477		1,950
3,822	260	1,558	1,038	6,678	2,576		2,028
3,975	270	1,620	1,080	6,945	2,679		2,109
4,134	281	1,685	1,123	7,223	2,787		2,193
4,300	292	1,752	1,168	7,512	2,898		2,281
4,472	304	1,822	1,215	7,812	3,014		2,372
4,651	316	1,895	1,263	8,125	3,135		2,467
4,837	328	1,971	1,314	8,450	3,260		2,566
5,030	342	2,050	1,366	8,788	3,390		2,669
5,231	355	2,132	1,421	9,139	3,526		2,775
5,440	369	2,217	1,478	9,505	3,667		2,886
5,658	384	2,305	1,537	9,885	3,814		3,002
5,884	400	2,398	1,598	10,280	3,966		3,122
6,120	416	2,494	1,662	10,691	4,125		3,247
6,365	432	2,593	1,729	11,119	4,290		3,377
6,619	450	2,697	1,798	11,564	4,461		3,512
6,884	467	2,805	1,870	12,026	4,640		3,652
7,159	486	2,917	1,945	12,507	4,825		3,798
7,446	506	3,034	2,023	13,008	5,019		3,950
7,743	526	3,155	2,103	13,528	5,219		4,108
8,053	547	3,281	2,188	14,069	5,428		4,273

M1 supply area

Load forecast for areas supplied from M1 substation is given in **Table 15** for a 20 years period. The total observed in 2042 indicate a total load of 86 MVA. Current installed capacity is 80 MVA (4x20) and therefore a firm capacity under N-1 contingency of 60 MVA (3x20 MVA).

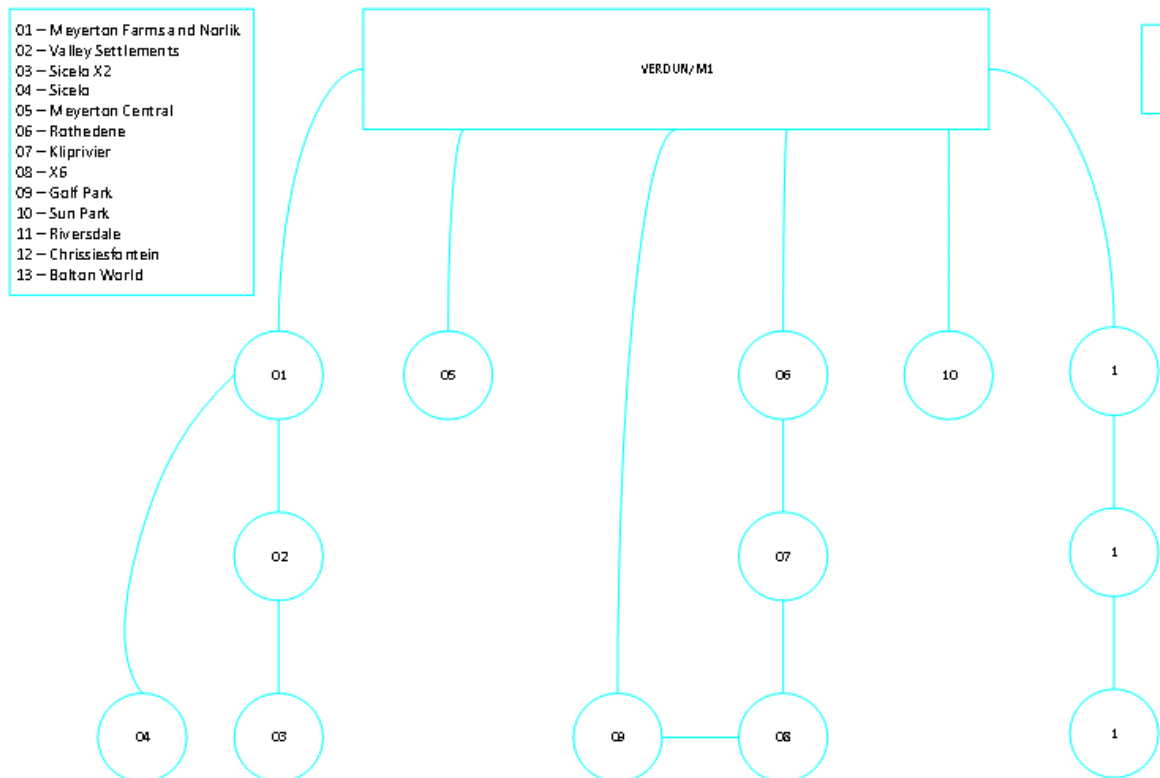


Figure 23: Overview of areas supplied from M1 substation

The projected full demand in 2042 is 86 MVA and clearly higher than the installed capacity at M1 substation, let alone when compared to the firm capacity of 60 MVA. This mismatch leads to the following issues that require the network to be upgraded:

- Lack of transfer capacity in existing 11 kV feeders to meet the rising demand;
- Voltage drops associated with the long feeder distances as the load center radius moves far from the source;
- The lack of sufficient bulk capacity at M1;
- Design capacity of substation could be reached and prevent any further expansion. This could be the thermal capacity or the space constraints.

Three Rivers supply area

At three rivers substation, the installed capacity is 2x20 MVA and the total forecast capacity is 14MVA (see **Table**). This implies that the bulk capacity is still sufficient. However, transferring this capacity to the load centers require upgrading to the network in terms of feeders (overhead or underground), switching stations and the MV/LV facilities (miniature substations or pole mount transformers). Like M1, one of the limitation in expanding the load at Three River substation is the distance to the load centers concerned that could lead to voltage drops and higher technical losses.

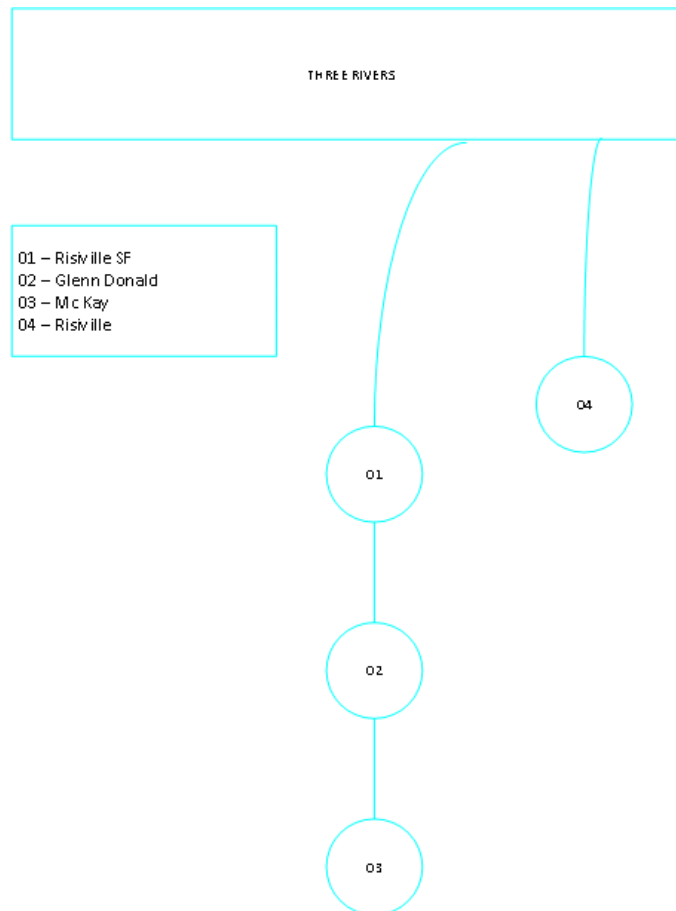


Figure 24: Overview of areas supplied from three rivers substation

Vaal Marina and Ohenimuri supply areas

These areas are supplied from Eskom at 11 kV. Their respective demands are forecast as 5MVA and 4MVA (see **Table**). At this level, there is no need for a substation but more feeders are needed to take the power to load centers. Furthermore, reinforcing MV/LV capacity is needed to ensure off-taking especially for residential and the small commercials.

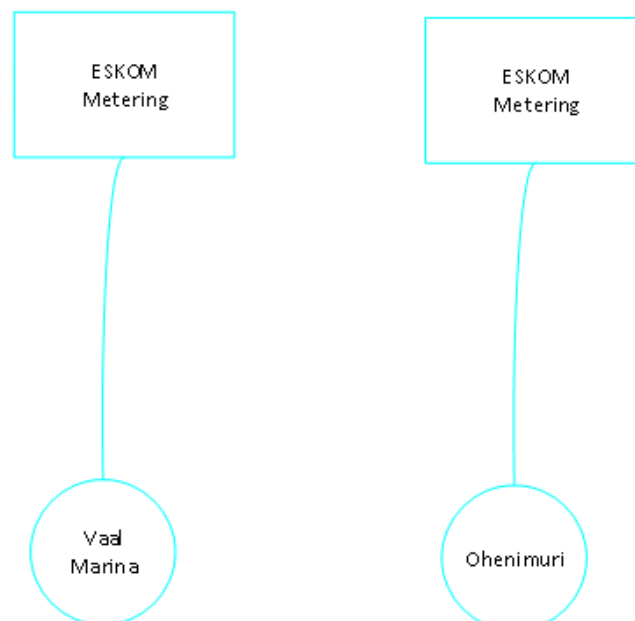


Figure 25: Overview of areas supplied from Eskom at 11 kV

Grace view and Eye stone supply areas

These substations are relatively new and the areas have a very low density in terms of consumers per square kilometer. Furthermore, both substations are located to the consumer sites and still have sufficient capacity to cater for a low growth herein considered 4% per annum.

6.3 PROPOSED SOLUTIONS

M1 supply area

Considering the voltage stability issues, technical losses and the capacity, it is proposed to divide the existing M1 supply area into three by introducing two additional substations Rivesdale in 2027 and Golf Park in 2030.

The additions of these two substation will free transformation capacity at Verдум (M1) substation, reduce technical loss from distribution lines (overhead and underground) and ensure a better voltage stability in the 11 kV network. Without these intervention, it is forecast that M1 substation firm capacity will be exhausted in 2033 and the installed capacity in 2040.

Both proposed substation shall be constructed with 2x20MVA-installed capacity to provide 20 MVA of firm capacity. Rivesdale substation will supply primarily Rothedene, Chrissiesfontein and Bolton world with the ability to back-feed a portion of M1 (switching dependent) via Rivesdale. Golf Park substation will supply extension 6, Golf Park and back-feed a portion of M1 (switching dependent) via Kliprivier and/or Golf Park supply area.

Table 16: Loading (demand) distribution between substations in M1 supply area

Substation	Loading (MVA)
Golf Park	12.28
Riversdale	19.68
M1 (no additional subs)	86.18
M1 (de-loaded)	54.21



Figure 6: Proposed Substation Location

As alluded previously, the construction of two additional substation reduces the loading at M1, the technical losses due to load transmission losses and improves the voltage stability. These gains are mainly driven by the reduced distances between 11 kV sources and the load centers. **Table 16** provides an overview of projected loading at each of the substation in year 2042. For M1, this is provided with and without the introduction of the additional substations.

Further to these two major interventions, it is worth noting the need for a significant number of miniature substations to which the consumers will be connected.



Three Rivers supply area

This area requires no intervention in terms of the bulk capacity. However, feeder and transformation infrastructure is needed to improve the network distribution capacity.

Vaal Marina and Ohenimuri supply areas

Both these areas demands are forecast to around 5MVA in 2042. Therefore each can be supplied at 11 kV and require only additional distribution feeders and the transformation capacity.

However, these loading should be provided to Eskom to allow them to improve and plan for the additional infrastructure needed to bring power into these areas.

Grace view and Eye stone supply areas

The existing capacity is sufficient to cover additional low growth load in the area. Any project for which the growth is significant should be studied independently.

6.4 NETWORK LOSSES

Analysis of losses in the network was carried out in two manners. The first was based on historic records available (FY2017/18 and FY2018/19). Historic information indicate on average 10% of losses in the network with a significant spread and large standard deviation (see Table). Furthermore, the analysis shows acceptable and strong correlations between the energy bought and that sold respectively for FY2018/19 and FY2017/18. However, there seem to be a weak negative correlation between the energy bought and the losses in the network for FY2017/18.

Although the average losses are on par with most utilities or the industry, various inconsistencies picked in this information point to a possible issue in the information collection, storage, interpretation and the billing value chain. On this basis, it is recommended to overhaul the metering and billing system to adopt a modern technology with smart metering and Enterprise Resource Plan that will not only provide better analytics but an overall view of the network from a revenue perspective.

Table 17: Loss analysis for FY2017/18 and FY18/19

Month	Purchase Units (kWh)		Sold Units (kWh)		Loss Units (kWh)		Loss %	
	2018/2019	2017/2018	2018/2019	2017/2018	2018/2019	2017/2018	2018/2019	2017/2018
JULY	25,038,593.00	23,385,225.66	20,374,235.50	20,518,606.30	-4,664,357.50	-2,866,619.36	-18.63	-12.26
AUG	23,260,159.00	23,011,505.86	20,709,603.10	19,415,697.80	-2,550,555.90	-3,595,808.06	-10.97	-15.63
SEPT	22,305,793.00	20,819,390.66	20,184,510.30	19,474,756.50	-2,121,282.70	-1,344,634.16	-9.51	-6.46
OCT	23,439,599.83	22,091,056.85	19,528,974.30	19,020,047.20	-3,910,625.53	-3,071,009.65	-16.68	-13.90
NOV	22,790,534.00	22,295,479.00	20,866,778.40	19,318,717.60	-1,923,755.60	-2,976,761.40	-8.44	-13.35
							11.43	2.66
JAN	21,869,777.00	19,733,574.47	17,170,115.80	16,359,368.00	-4,699,661.20	-3,374,206.47	-21.49	-17.10
FEB	19,855,981.00	19,553,547.52	19,191,838.40	16,948,151.70	-664,142.60	-2,605,395.82	-3.34	-13.32
MAR	20,842,658.00	21,535,920.77	18,188,285.40	18,534,817.40	-2,654,372.60	-3,001,103.37	-12.74	-13.94
APR	21,496,994.00	21,164,074.64	18,627,417.30	19,831,275.18	-2,869,576.70	-1,332,799.46	-13.35	-6.30
MAY	23,126,501.00	23,568,909.92	19,464,557.20	21,433,816.80	-3,661,943.80	-2,135,093.12	-15.83	-9.06
JUNE	0.00	23,857,453.26	0.00	20,959,507.30	0.00	-2,897,945.96	#DIV/0!	-12.15
TOTALS	224,026,589.83	260,034,865.33	194,306,315.70	231,338,811.88	-29,720,274.13	-28,696,053.45	-13.27	-11.04
DEC	19,406,498.00	19,018,726.72	21,624,006.00	19,524,050.10	2,217,508.00	505,323.38		
Mean							-10.87	-10.90
Standard							8.96	5.41
Deviation								
Correlation			0.556	0.879	-0.639	-0.178		

6.5 PROPOSED CAPITAL EXPENDITURE

This section provides cost estimates of various network expansion options covered in the previous sections. The investment plan is aimed at ensuring a reasonable capital expenditure to meet the technical requirement and business financial requirements.

The investment plan allows drafting a capital expenditure program while taking into consideration timing of the project (construction) and the financial return into account. At the same time, it is important to ensure that the capital program is affordable and that its impact on the tariff is minimised as much as possible.

Based on how the network is perceived to grow, the network investment plan uses the expansion plan to draw the timing for the provision of the capital expenditure.

6.5.1 PROPOSED CAPITAL EXPENDITURE

The network investment plan requires the cost of each technical intervention required on the network. The costing of each proposed technical option is based on high-level cost of various tasks as applicable to lines, substations, etc. While developing the cost for each option, the following assumptions were included in the cost database:

- All cost include supply, delivery and labour;
- Line bays are included in the substation cost and consequently, they are not part of the line costing;
- All Line costing include the cost of servitude acquisition assumed at 10% of the total line cost;
- 88kV overhead transmission lines are based on self-supporting lattice towers and are inclusive of foundations, line hardware, conductors, etc.
- 11, 22 and 33kV overhead transmission lines assumes the use of single circuit wooden pole structures;
- All proposed switching stations are assumed to have 2x1250A incoming feeders and 6x800A outgoing feeders.

A detailed costing sheet was developed to take into consideration the details of each substation or transmission line. Therefore, the costs discussed in this section are indicative for the purpose of planning and forecasting. Cost that is more detailed should be produced at detailed design stage.

6.5.2 LIST AND COST OF PROPOSED PROJECTS

Each proposed project has associated cost; category and time horizon based on the estimated completion year. All details related to the costing of each item can be found below.

Table 18: List of projects and costing

#	Major Upgrade to the Network	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	11/0.4kV +/-2x2.5%, 500 kVA Miniature substations	7,5m	7,95m	8,5m	8,9m	9,5m	10m	10,6m	11,3m	11,9m	12,7m
2	Riversdale 88/11kV +/-8x1.25%, 2x10 MVA substations. See note (1)						217m				
3	Golf Park 88/11kV +/-8x1.25%, 2x10 MVA substations. See note (2)									260m	
4	Smart Metering		0,25m	0,25m	0,25m	0,25m	0,25m	0,25m	0,25m	0,25m	
5	Entreprise Resource Planning System				3,0m						

SECTION 7: FUNDING AND IMPLEMENTATION ARRANGEMENTS

The Division of Revenue Act (DORA) makes provision for assisting municipal (and provincial) governments by transferring funds to them from the National Fiscus for specific purposes. This can include funding for construction, maintenance or rehabilitation of municipal infrastructure, and for developing and improving municipal systems and the capacity of municipalities to perform the functions assigned to them (including compliance with terms of the Municipal Finance Management Act).

MIG funding is allocated on a formula approach (based on census data). Performance of the municipality in implementation is monitored and penalised in future fund allocations where considered necessary. Municipalities need to be able to demonstrate to Treasury the ability to sustain the new/rehabilitated infrastructure by providing the following:

- Projections on future maintenance and operating costs for new or upgraded infrastructure;
- Operational budgets for maintenance and operating costs on existing infrastructure; and
- How the municipality's operational budget takes account of future commitments.

Summary: Key themes that are evident in legislation and are central to the government's vision of municipal infrastructure management are as follows:

- long-term sustainability and risk management;
- service delivery efficiency and improvement;
- performance monitoring and accountability;
- community interaction and transparent processes;
- priority development of minimum basic services for all; and
- financial support from central government.

Underpinning this vision is the need to drive the transformation process in the municipal sphere of government by placing strong emphasis on building capacity.

SECTION 8: RISK MANAGEMENT

Electricity Distribution infrastructure is complex by nature and requires robust management practices. Sound knowledge of the location, characteristics, estimated useful life, capacity and utilisation, cost characteristics, risk exposure and safety requirements of assets is required to best manage them and make sustainable improvements in service delivery. Risk management is inherent in the asset management process when dealing with matters of safety, environmental compliance and the delivery of the required level of service.

The purpose of the Risk Management Plan, outlined in this document, is to:

1. Present a risk management strategy in line with MLM's risk management framework;
2. Provide an introduction to risk management standards for electricity asset management;
3. Outline the risk management approach;
4. Identify critical electricity infrastructure assets and the risk exposure within the networks;
5. Describe the impact of risk on service delivery; and
6. Propose appropriate mitigation actions.

8.1 RISK MANAGEMENT FRAMEWORK

The National Treasury has revised and updated the Public Sector Risk Management Framework that was originally published in 2004. Various guidelines, guidebooks and templates support the revised framework (published 1 April 2010). The Framework encourages all public sector institutions (National Departments, Provincial Departments, Constitutional Institutions, Public Entities, Provincial Public Entities, Municipalities and Municipal Entities) to treat risk management as an integral part of their existence. The Framework aims to ensure that public sector institutions share a

common approach to risk management whilst providing sufficient scope for institutions to adapt certain aspects to suit their own institutional requirements.

The Framework was developed in response to the requirements of the Public Finance Management Act and Municipal Finance Management Act for Institutions to implement and maintain effective, efficient and transparent systems of risk management and control. It also incorporates the requirements of the Batho-Pele principles and King III concerning risk management.

The process framework describes the creation of an enabling environment for the management of risks. The Accounting Officer / Authority is responsible for ensuring that the institutional environment supports the effective functioning of risk management. The Institution should operate within the terms of a risk management policy that is approved by the Accounting Officer / Authority. The implementation of this policy should be guided by a strategy that is also approved by the Accounting Officer / Authority. Risk identification, assessment and control are important foundations for proactive asset management.

The overall purpose is to understand the cause, effect and likelihood of adverse events occurring, to manage such risks optimally to an acceptable level, and to provide an audit trail for the management of risks. These are achieved through:

- identifying potential risks associated with the assets, and making an estimate of the associated risk levels, on the basis of existing or proposed risk controls;
- determining whether these risks are tolerable; or
- Determining whether further analysis is required to establish whether the risks are or not tolerable; and
- Devising improved risk controls where these are found to be necessary or desirable.

Risk assessments can also be used for a systematic comparison of different risk control or reduction options. Assessments aid the organisation in prioritising any resulting actions to reduce risk. It may also be appropriate to have a generic risk assessment for a number of common risks. Some organisations develop generic risk assessments

for typical asset types or asset management activities. The precise details of these can vary for example between different locations or sites.

Generic risk assessments can be used as the starting point for more specific assessments, by identifying and assessing any differences between the conditions assumed in the generic assessment, and those pertaining in the specific situations being addressed. This approach can help to both increase the speed and efficiency of the risk assessment process and to improve the consistency of risk assessments for similar tasks.

The risk assessment process should form the basis for identifying the situations and scenarios that require emergency and evacuation plans as well as identifying the emergencies that require equipment or assistance. Before changes are made to assets or to the way in which they are managed, risk assessments should be carried out and control measures implemented whenever possible.

The municipality should also address overall business risk management in line with good corporate governance. In considering the asset and asset management related risks, consideration should be given to the interface with this corporate, top down risk management activity in order to ensure that organisational risk management is complete and consistent.

8.2 RISK MANAGEMENT STANDARDS FOR ELECTRICAL NETWORKS

Unless risk is managed effectively, MLM cannot maximise opportunities and minimise threats. Risk is concerned with the effect of uncertainty on the achievement of the municipality's objectives. The risk management standards applicable to electricity asset management are ISO 31000, PAS 55 and NRS 093-1.

12.2.1 ISO 31000

The International Standards Organisation introduced a new risk management standard (ISO 31000) in 2009. This standard is not certifiable but emphasises the achievement of goals (objectives) and highlights the importance of communication

regarding risk management. It sets out principles, a framework and a process for the management of all forms of risk (including safety and environment) in organisations of all sizes. It does not mandate a one-size-fits-all approach, but emphasises tailoring the principles and guidelines to the specific needs and structure of the organisation to be implemented creatively.

The ISO 31000 process for managing risk is displayed below

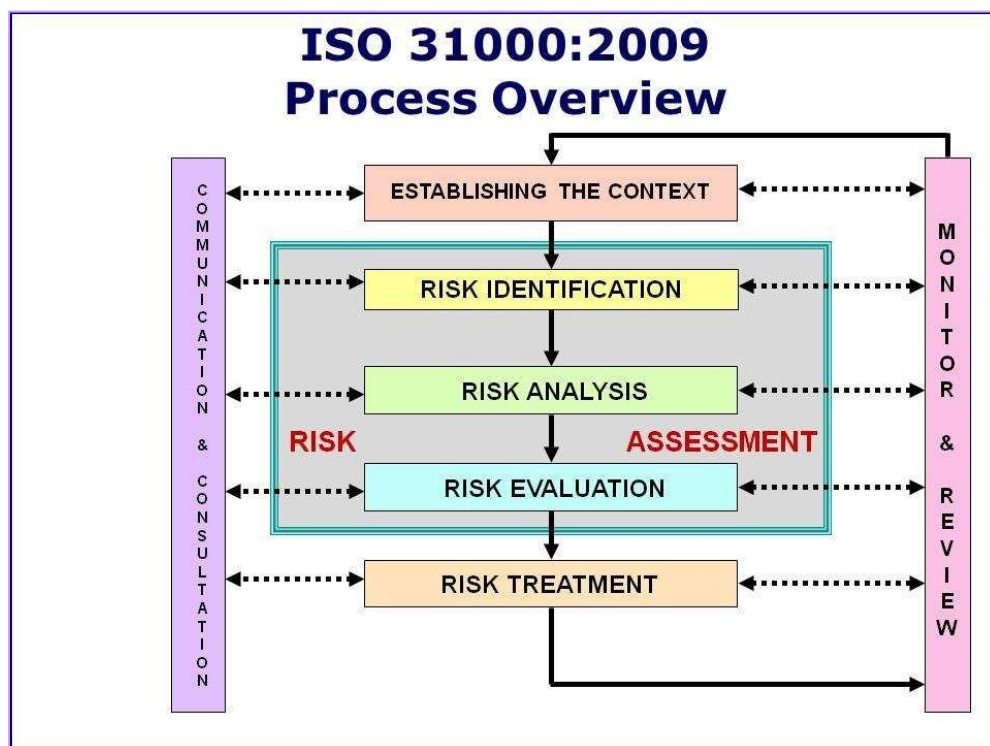


Figure 27: Risk Process

12.2.2 NRS 093-1

The Electricity Suppliers Liaison Committee (ESLC) approved and released the minimum requirements for asset management in the South African Electricity Distribution Industry (NRS 093-1) during October 2009. The standards for risk management are the following.

Risk management must be implemented and integrated into existing risk management systems for assets. It must be the prime basis for prioritising all asset activities including engineering, projects and investment (par. 4.3.9.1).

Potential and realised asset risks must be scientifically determined, understood and quantified through a risk assessment methodology that is consistent and repeatable (par. 4.3.9.2).

- Asset risks must be formally captured, reported on, coordinated and managed by the utility (par. 4.3.9.3).
- Asset risk must provide input into tactical and operational plans and decision-making related to asset maintenance, refurbishment and replacement (par. 4.3.9.4).
- Risk mitigation plans as well as contingency plans must be developed for asset failure.
- Risk management must provide input to financial and human resource planning. The utility's insurer must be informed accordingly (par. 4.3.9.5).

The NRS 093-1 highlights that the management of asset risks comprises the following main activities:

- **risk identification:** asset risks are identified per individual asset, per class of asset, at a system or network level and also at portfolio level;
- **risk assessment:** the identified asset risks are quantified and ranked in terms of likelihood of occurrence and consequence of incident;
- **risk control:** the necessary steps are identified and implemented to control the identified risks according to the utility's risk tolerance; and
- **risk monitoring:** the effectiveness of risk control measures is monitored by means of inspection and audits (new or previously undetected risks are also identified).

The ESLC expressed the wish that all electricity supply authorities would adopt the requirements of the NRS 093-1 in so far as their particular conditions permit. Any differences between the requirements of this part of NRS 093 and the corresponding authority's requirements should, as far as possible, be clearly indicated in schedules and (where appropriate) be submitted for consideration in future revisions of NRS 093-

8.3 MLM MAJOR RISK REGISTER

Four key electricity risks are listed as indicated below. Red and yellow indicating high, and moderate risk exposures respectively.

Risk score	Category
1 - 3	Low risk (green)
4 - 6	Moderate risk (yellow)
8 - 12	High risk (orange)
15 - 25	Extreme risk (red)

Table 19: Risk Register

Risk Description	Inherent Risk Exposure rating	Existing Controls	Residual Risk Exposure Rating	Action Plan
Electricity demand, growth exceeding electricity supply capacity.	20.00	- Capacity allocation management - Capacity upgrading programme - Development contribution policy - Upgrading of network - Long term tariff structure plan, linked to Eskom supply and own generation capacity	9.00	- Ongoing Implementation of distribution capacity upgrading projects - Ring-fencing of bulk contribution collected for electricity upgrading programmes. Funding and costs of these programmes need to be determined.
Quality of electricity supply drops below legislated requirement.	20.00	- Management of the capacity allocation programme. - Implemented the quality supply monitoring system.		- Continuous implementation demand side management programme. - Energy Efficiency Programmes
Quality of electricity supply drops below legislated requirement.	20.00	- Management of the capacity allocation programme. - Implemented the quality supply monitoring system.	4.00	Continuous implementation demand side management programme.
Vandalism of electricity infrastructure.	25.00	Limited security patrols and guards at key installations	9.00	Conduct awareness to National and provincial Government for the implementation of appropriate legislation and control.

SECTION 9: CONCLUSIONS

9.1 LOAD FORECAST

The load forecast for MLM was carried out using two assumptions. The first assumption assumed the worst-case scenario whereby there is not much investment in the economy. In this scenario, the existing load growth is linked to the GDP of 0.5% per annum for a period from 2021 to 2041.

The second assumption assumes a better economic performance whereby MLM lives its vision of a prosperous municipality for all. This can be achieved only through strong economic growth that create employment. Such economic growth will lead to growth in electricity demand, thereby affecting the existing network. All catalytic projects planned are assumed to take place under this scenario.

Combining the growth of existing loads and the new load planned for MLM, a more realistic load forecast was created with the only uncertainty being the lack of information for the execution date for some of the projects. For this reason, these projects are assumed to fall in the long-term bracket (from 2041).

9.3 DEMAND-SUPPLY BALANCE

MLM has no generating capacity at present and its entire load is supplied by ESKOM and other municipalities, therefore leaving it vulnerable to price changes. Its supply reliability is also strongly linked to the performance of Eskom's network. Instance the loss of Verudun's substation could black out the entire Midvaal network portion of MLM.

One way of reducing the amount of energy imported from Eskom is to consider alternative sources such as solar, biomass, waste to energy and thermal. The merit of each alternative source needs further consideration by taking into account the cost of capital and operational expenditures.

9.4 NETWORK PERFORMANCE AND RELIABILITY

As far as the design is concerned, the network reliability in MLM network is adequate. Each substation or switching station supply redundancy. Each of the new projects identified also uses the same philosophy for the design. Therefore, it is expected for outage durations to be short.

9.5 IDENTIFIED PROJECTS

For the network to be able to satisfy the forecast load demand, several projects need to be undertaken at the appropriate time. Overall, 3 projects have been identified. They are classified into categories as follows:

- **Based on priority:**
 - Short-Term: 8;
 - Medium-Term: 16;
 - Long-Term: 33.
- **Based on Type:**
 - Expansion: 51;
 - Reliability: 5;
 - Strategic: 1;

SECTION 10:RECOMMENDATIONS

10.1 LOAD FORECAST AND NETWORK EXPANSION

In this network masterplan, the load forecast forms a crucial part that is essential for all analysis carried out. Given its speculative nature, it is recommended that MLM use each of the proposed solutions only when necessary, preferably, when the projects are confirmed. In order to achieve this, the existing network load and application for connection must be closely monitored and a proper record kept all the time. To achieve this, MLM needs to implement the following changes:

- Install loggers with network capability or a SCADA system;
- Maintain a record of electrical connection applications.
- Have the entire electrical system mapped out on the GIS

Monitoring the network and application for connection will ensure that MLM approaches the network expansion in a cost effective manner.

It is equally important for MLM to plan and reserve sites and line servitudes as part of its strategic planning. As the town grows, there will be a necessity to build substations and lines. Therefore acquiring the site and servitude at this stage is secure, cheaper and prone to less legal challenges and land claims.

ANNEXURE A: LIST OF UNFUNDED PROJECTS

ANNEXURE A1: PROJECT PRIORITISATION PER WARD

Table 19: Project Prioritization list

Ward	Prioritised Project 1	Prioritised Project 2	Prioritised Project 3	Prioritised Project 4	Prioritised Project 5
Ward 3	Gravel to tar on CM van den Heerver, Peit Retief & Theo Wassenaar. Resurfacing, resealing, tarring & speed humps on various roads. 800m track in Windsor Circle to be paved. Curb stones on Fitzpatrick Street.	Relocating Street lamp on the driveway of Johanna van der Merwe. Streetlights on Eben Donges, Kookrus Cemetery and Gustav Preller Street.	Maintenance of Traffic signs and signs prohibiting illegal dumping on Dani Bezuidenhout Street	Mobile Library at least once a week	Request for a park in Kookrus
Ward 4	Water borne sewer in Daleside (Second Phase)	Gravel to tar Road No4, Boltonwold	Additional Street lights, Daleside	Gravel to tar on Malan Street, Buyscelia	Community Hall Daleside
Ward 5	Gravel to Tar - Takbok Street, Meyerton Farms & Bloubok Street, Highbury.	Upgrade and widening Malcolm Road, Valley Settlements & South Road, Walkers Fruit Farms.	High mast lights/streetlight in Ophir AH.	Number plate recognition CCTV cameras at cnr Joan and Irene, Drumblade. Cnr Joan & Randvaal Road, Drumblade. Cnr Tintinkie & Springbok Road, Meyerton Farms. Cnr Kwevoel & Springbok Road, Meyerton Farms.	Outdoor Gym, soccer and netball posts - Cnr Springbok and Meyer Street, Meyerton Park

Ward 7	Multipurpose centre: Library, sports ground, ECD and media centre	Streetlights/ Security cameras masts throughout the ward starting in Tedderfield West	Traffic /speed calming methods on Nettleton road - Provincial road - high accident spot	Satellite Police station in Walkerville /Tedderfield area	Renewed street signage and naming of unnamed streets
Ward 8	Land for human settlement.	Electricity in the informal settlements.	Rehabilitation of roads/storm water management.	Rehabilitation of illegal dumping.	Pedestrian bridge along station Road (R59 freeway)
Ward 10	Tarring of all roads and speed humps on longer length roads.	Serviced stands/land for houses, place of worship & Clinic.	Address illegal dumping and ensure regular grass cutting on vacant stands.	Sewage pipes in Papegaa Street	Apollo lights and fencing for Erf 78 flats. All streetlights to be repaired.
Ward 11	High mast lights in De Deur	Tarring of Arthur, Boulder, Kraal, Road No. 6, Road No 8 & East Road	Parks & speed humps for all extensions of Savanna City	Sewer upgrade in Ohenimuri. Grass cutting, tree maintenance & Speed humps in Ohenimuri	Multi-purpose centre in De Deur

Ward 12	Land/Housing for residents living on Private Properties	Upgrade of Sewer pumps. Sewerage flows onto Cnr Klip and River Road. The repair of the damaged pipeline at Heineken Station - Joan Rd.	Rehabilitation and Installing proper drainage of all the Roads. Gravel to Tar: Marlborough, Honiball, Edge, End of Nelson & Napoleon Road in Gardenvale. Klip Road in Klipwater. Malcolm Road in Klipview. Rehabilitation of Roads: Rietspruit Rd - Rietspruit, Santa Fe Rd - Blue Saddles Gate to Nooitgedacht Rd, Nooitgedacht Rd - Nooitgedacht, Eisenhower Rd - Gardenvale. Repairs to all Roads and stormwater ducts - Klipriver Business Park	4. Install Number plate recognition security cameras at: Cnr M61 and R550 Intersection in Kliprivier, Cnr R550 and Drift Rd & Cnr R550 and Garthview Rd.	Upgrade/Replace the Eisenhower Bridge
Ward 13	Upgrade/tarring of Steynberg/Riversdale Road. All gravel roads to be tarred or grading cycles to be more frequent. Maintenance of all roads.	Social facilities such as community hall, Clinic with access to water and ablution facilities. Equipment and gym for park	Address illegal structures	The park, pavements and the cemetery require attention such as, weed removal, grass cutting and tree maintenance. Refuse removal must be collected on time and spillages cleaned up.	Increase/upgrade to electrical capacity. Address poor water pressure and sewer spillages.

Ward 14	Resin speed humps (as on Pierneef & Mimosa Rd) at every stop sign in Ward 14.	Play park equipment have been removed in Vlei Park. To be replaced with recycled plastic equipment.	Meyerton Sports Complex. Entrance road needs kerbstones and trees - beautified. Name board erected at entrance. Grass to be cut on the whole property up to surrounding houses. Parking to be paved or at least scraped. Fences and walls fixed or replaced. Ablution block to be built for public. Dilapidated dangerous cricket nets replaced or removed.	New clear view fence for the golf course.	Footpath in Pierneef Blvd from the Midvaal Sports Complex to the Vlei as per the proposal submitted
Ward 15	Extension of street lights especially high mast lighting around the train station	Community Hall and Recreational Facilities	Extension of Sewer lines to residents across the river	Curb stones to be installed on pavements to prevent erosion of the road	Traffic control measure like roundabouts and speed bumps

ANNEXURE A: LIST OF UNFUNDED PROJECTS

ANNEXURE A2: PROVINCIAL DEPARTMENT'S PROJECTS

Table 20: Project Prioritization list

ID/Ref Nr.	Key Focus Area (KFA)	Description of Capital Projects, Programmes and Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Department	Delivery: Internal / External	Funding Source	Ward
2/9/PI/ES/275	KPA 2 KFA 5	Traffic Lights at Walkerville and Eikenhof intersections	CP	O	GAUTRANS	External	CRR	7
3/10/CP/D/395	KPA 3 KFA 10	General Housing Project	CP	O	Dept. of Human Settlement			4,7,8 ,10 & 12
4/27/CP/E/497	KPA 6 KFA 21	Primary & Secondary Schools	CP		Dept of Educ.			1, 4 , 6, 7, 8, 10 &12
4/27/CP/E/498	KPA 6 KFA 21	Clinic	CP		Dept of Health			1,4, 6, 7,8,10, 12, 13 & 15
4/27/CP/E/502	KPA 6 KFA 21	Disability Centre	CP		GDSD			6, 11 & 12
4/27/CP/E/503	KPA 6 KFA 21	Formal Taxi Rank in De Deur	CP		SDM			11
4/27/CP/E/504	KPA 6 KFA 21	Ohenimuri Multipurpose Centre	CP		SRAC			11

ID/Ref Nr.	Key Focus Area (KFA)	Description of Capital Projects, Programmes and Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Department	Delivery: Internal / External	Funding Source	Ward
6/21/CP/1053	KPA 6 KFA 21	MPC and Health facility hub on Municipal owned stands in Savanna City	CP		Dept of Health			11
6/21/CP/1054	KPA 6 KFA 21	Health facilities on Municipal/Developer owned stands in Savanna City	CP		Dept of Health			11
6/21/CP/1055	KPA 6 KFA 21	Local SAPS satellite stations or permanent on Savanna City	CP		SAPS			11
8/26/CP/1056	KPA 8 KFA 26	Need for affordable Housing for aged and young families	CP		Dept. of Human Settlement	External		7
6/21/CP/1059	KPA 6 KFA 21	Kookrus Clinic too small to accommodate all the patients from other wards e.g. Ward 1. An additional clinic with a dental department and maternity facility for emergencies will benefit the different communities	CP		Dept of Health	External		3
6/21/CP/CS/1202	KPA 6 KFA 21	Land for Clinic	CP		Dept of Health			6
2/8/CP/P/397	KPA 2 KFA 6	Savanna City Fire Station	CP				11	Funding to be requested
2/8/A/P/280	KPA 2 KFA 6	Vaal Marina Fire Station Water Use License	A	O	External DWA		1	

ANNEXURE B: LIST OF UNFUNDED PROJECTS

ANNEXURE A3: MIDVAAL LOCAL MUNICIPALITY PROJECTS

Table 21: Project Prioritization list

IDP Project Reference No.	Key Focus Area (KFA)	Description of Capital Projects, Programmes or Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Delivery: Internal / External	Funding Source	Ward	Comment
3/10/CP/D/394	KPA 8 KFA 26	Land for development	CP	O			7	
3/14/CP/CS/1004	KPA 3 KFA 8	Mobile Library for Mamello	CP			UNFUNDED	1	Ongoing outreach programme
3/14/CP/CS/1005	KPA 3 KFA 8	New ECD	CP				6	
3/14/CP/CS/1006	KPA 3 KFA 7	Health and Recreational Facilities	CP				7	No funds allocated
3/14/CP/CS/1007	KPA 3 KFA 7	Indoor Gym for Ward 10	CP				10	No funds allocated
6/23/CP/E/308	KPA 6 KFA 17	Mamello Township Electrical supply	CP	O	External	DoE Grant	1	Pending Eskom Decision

IDP Project Reference No.	Key Focus Area (KFA)	Description of Capital Projects, Programmes or Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Delivery: Internal / External	Funding Source	Ward	Comment
6/23/CP/E/309	KPA 6 KFA 17	Sicelo Main sub and 88kV Line	CP	O	External		8 & 10	In Progress
6/23/CP/E/310	KPA 6 KFA 17	Vaal Marina Substation upgrade	CP	O	External	CRR	1	Complete
6/23/CP/E/312	KPA 6 KFA 17	Upgrade Martiens Oosthuizen Network	CP	O	Internal	CRR	3	
6/23/CP/E/314	KPA 6 KFA 17	Sectionalises for overhead lines	CP	O	Internal	CRR	All	Complete
6/23/CP/E/318	KPA 6 KFA 17	Upgrade O5 Substation Ophir	CP	O	External	CRR	5 & 11	Complete
6/23/CP/E/319	KPA 6 KFA 17	Replace Rothdene LV overhead line to underground	CP	O	Internal	CRR	3	Pending Availability of funds
6/23/CP/E/322	KPA 6 KFA 17	Feeder Supply to S16	CP	O	Internal	CRR	8 & 10	Pending Availability of funds
6/23/CP/E/323	KPA 6 KFA 17	Replace LV Line to underground in Oranje Rivier Street and upgrade area voltage	CP	O	Internal	CRR	13	Pending Availability of funds
6/23/CP/E/325	KPA 6 KFA 17	Feeder Supply to Rothdene	CP	O	Internal	CRR	3	Pending Availability of funds

6/23/CP/E/326	KPA 6 KFA 17	Feeder line to Riversdale	CP	O	Internal	CRR	13	Pending Availability of funds
6/23/CP/E/327	KPA 6 KFA 17	Smart Metering in Industrial area	CP	OC	External	CRR	9	In Progress
6/23/CP/E/328	KPA 6 KFA 17	Upgrade Overhead Lines in Chrissiesfontein	CP	O	Internal	CRR	13	Pending Availability of funds
6/38/CP/E/331	KPA 6 KFA 17	High Mast Lights in Sicelo	CP	O	Internal	Grant	8 & 10	Scheduled for Q3 2021
6/23/CP/E/332	KPA 6 KFA 17	High Mast Lights along Johan Le Roux and Noldick	CP	O	External	CRR	9	Complete
6/23/CP/E/337	KPA 6 KFA 17	Upgrade HT & LT Overhead Lines in Ophir Estates	CP	O	Internal	CRR	5 & 11	Pending Availability of funds
6/23/CP/E/338	KPA 6 KFA 17	Ohenimuri - Upgrade of Network	CP	O	Internal	CRR	11	Completed
6/23/CP/E/341	KPA 6 KFA 17	Sicelo reticulation Network Erf 78 (Dept of Energy)	CP	O	External	Grant	10	In Progress
6/23/CP/E/342	KPA 6 KFA 17	Replace 11 kV overhead line Springbok Road	CP	O	Internal	CRR	5	Pending Availability of funds

IDP Project Reference No.	Key Focus Area (KFA)	Description of Capital Projects, Programmes or Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Delivery: Internal / External	Funding Source	Ward	Comment
6/23/CP/E/343	KPA 6 KFA 17	New Streetlights on all Major roads and Gravel roads	CP	O	Internal	CRR	All	
6/23/CP/E/344	KPA 6 KFA 17	Festive Decorating Lights	P	O	Internal	CRR	9	
6/23/CP/E/348	KPA 6 KFA 17	Feeder to Glen Donald	CP	O	Internal		2, &13	Pending Availability of funds
6/23/CP/E/352	KPA 6 KFA 17	Bronk Lane Lighting	CP	O	Internal	CRR	7	Pending Availability of funds
6/23/CP/E/354	KPA 6 KFA 17	Electrical network to be upgraded in Walkers fruit farms	CP	O	External	Eskom	7	
6/23/CP/E/356	KPA 6 KFA 17	Electricity to settlements in Alewynspoort and Elandsfontein	CP	O			7	Pending Availability of funds
6/23/CP/E/358	KPA 6 KFA 17	Ophir Estates - Upgrade HT & LT Overhead Lights + Street Lights	CP	O			5 & 11	Pending Availability of funds
6/23/CP/E/362	KPA 6 KFA 17	Upgrade HT & LT Overhead Line - Chrissiesfontein	CP	O			13	Pending Availability of funds
6/38/CP/E/334	KPA 6 KFA 17	High Mast Lights Bantu Bonke	CP	O	External	Grant	1	Scheduled for 2021/2022
6/38/CP/E/340	KPA 6 KFA 17	Duncanville Streetlight upgrade	CP	O	Internal	CRR	2	Pending Availability of funds
6/38/CP/E/349	KPA 6 KFA 17	Vaal Marina upgrade of HT and LV over headlines	CP	O	Internal	CRR	1	
6/38/CP/E/351	KPA 6 KFA 17	Rissiville Ext 6 Electrification: Network strengthening	CP	O	Internal	CRR	2	
6/23/CP/ES/1032	KPA 6 KFA 17	Electricity Upgrades	CP				1	Pending Availability of funds
6/23/A/ES/1039	KPA 6 KFA 23	High Mast Lighting at Daleside Train Station	A				4	Scheduled 2021/2022
6/23/A/ES/1040	KPA 6 KFA 17	High Mast light between Bosduif and Kingfischer in Meyerton Park	A				5 & 9	Scheduled 2021/2022

IDP Project Reference No.	Key Focus Area (KFA)	Description of Capital Projects, Programmes or Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Delivery: Internal / External	Funding Source	Ward	Comment
3/10/CP/D/1055	KPA 6 KFA 21	Procurement of Private Land for Housing and Community Facilities	CP				8	
3/11/CP/CS/1056	KPA 3 KFA 7	Shelter for the community gym	CP			Outdoor gym provided. No shelter needed	10	Outdoor gym provided. No shelter needed
6/24/CP/ES/1057	KPA 6 KFA 19	Nyala Street storm water system	CP				10	Not started.
3/11/CP/CS/1058	KPA 3 KFA 7	Swings and play equipment for the Siculo Multipurpose centre	CP			UNFUNDED	10	Pending Availability of funds
8/33/CP/D/1059	KPA 8 KFA 26	Inclusion to the Urban Development Boundary	CP				5 & 12	UDB is extended depending on need and desirability
6/25/CP/ES/1060	KPA 6 KFA 19	Upgrade the sewer and water line	CP				13	
6/24/CP/ES/1061	KPA 6 KFA 18	Upgrade the stormwater drainage network	CP				13	Not started.
6/24/CP/ES/1062	KPA 6 KFA 18	Water use licence for Upgrade of Eisenhower Bridge	CP				12	Not started.
6/24/CP/ES/1063	KPA 6 KFA 18	Upgrade Eisenhower Bridge	CP				12	Not started.
6/25/CP/E/1064	KPA 6 KFA 19	Extension of waterborne sewer	CP	O			All	
6/25/CP/E/1065	KPA 6 KFA 19	Additional reservoir to service Eye of Africa and surrounds	CP	O			7 & 12	
6/25/CP/E/1066	KPA 6 KFA 19	Water Treatment Works for the Northern Portion of Midvaal (including all bulk and link services)	CP	O			4,5,7 & 12	
6/25/CP/E/1067	KPA 6 KFA 19	Bulk water supply	CP	O			4,5,7 & 12	
5/22/CP/CS/1068	KPA 7 KFA 24	Wheelie Bins	cp	o			4	
6/25/CP/E/1069	KPA 6 KFA 18	Access Roads	CP	O			4,5,7 & 12	Not started.
6/25/CP/E/1070	KPA 6 KFA 18	Broadening of View Avenue-Rothdene	CP	O			3	Not started.
3/8/CP/CS/1071	KPA3 KFA 7	Sport Centre/ Facilities on stand locations also owned by the Municipality in Savanna City	CP				11	Pending Availability of funds

IDP Project Reference No.	Key Focus Area (KFA)	Description of Capital Projects, Programmes or Activities	Capital Projects (CP), Programmes (P) and Activities (A)	Type of Indicator (Input (I), Output (O), Outcome (OC), Impact (IM))	Delivery: Internal / External	Funding Source	Ward	Comment
6/17/CP/ES/1076	KPA 6 KFA 17	Street light/area lights for FSH in Savanna City	CP				11	Pending Availability of MIG funds
6/17/CP/ES/1079	KPA 6 KFA 17	Bulk Electricity for subsidised housing in Savanna City	CP				11	In progress, 6 MVA additional MVA sought
6/17/CP/ES/1080	KPA 6 KFA 17	Electrification of FSH in Savanna City	CP				11	In Progress
6/17/CP/ES/1087	KPA 6 KFA 17	Apollo lights required in informal settlements	CP				1	
7/23/CP/ES/1090	KPA 7 KFA 23	Curb electricity outages and install prepaid metres in Glen Donald	CP				2	In Progress
6/17/CP/ES/1095	KPA 6 KFA 17	Street Light required in Kookrus Cemetery, Gustav Preller Street 100 and Eben Donges 23, Kookrus	CP				3	Pending availability of funding
6/21/CP/CS/1096	KPA 7 KFA 21	Need for a Multipurpose centre, Library and Park. Upgrades and maintenance to Danie, McLean Park, Rothdene Town Hall and Windsor Circle.	CP				3	Pending Availability of funds however maintenance of facilities ongoing
6/17/CP/ES/1099	KPA 6 KFA 17	High mast lights requested for the Industrial area. More street lights and maintenance on existing street lights.	CP				4	Pending availability of funding
6/17/CP/ES/1111	KPA 6 KFA 17	Solar Geysers for houses. Fix high mast lights	CP				6	Pending availability of funding
6/17/CP/ES/1114	KPA 6 KFA 17	Street lights required at all major intersections. Mainly Cnr 4th and Old Main Road (Spar 4-way)	CP				7	Pending availability of funding
6/17/CP/ES/1117	KPA 6 KFA 17	Electrification of the informal Settlements. High Mast Lights	CP				8	
6/17/CP/ES/1126	KPA 6 KFA 17	Upgrade electrical transformer	CP				10	
6/17/CP/ES/1137	KPA 6 KFA 17	High mast lights for Peil's Farms and Khayelitsha. Solar lighting to be explored	CP				12	Pending Availability of funds
6/17/CP/ES/1149	KPA 6 KFA 17	Street Lights	CP				15	Pending Availability of funds

6/17/CP/ES/1166	KPA 6 KFA 17	Street light at Kookrus cemetery, 100 Gustav Preller, 23 Eben Donges.	CP				3	Ongoing and in progress
6/17/CP/ES/1183	KPA 6 KFA 17	Increase voltage capacity in all electrical infrastructure.	CP				10	Unclear Description
6/17/CP/ES/1192	KPA 6 KFA 17	Street Lights required	CP				13	Ongoing and in progress
6/17/CP/ES/1197	KPA 6 KFA 17	High mast lights at entrances to Henley on Klip.	CP				15	Pending Availability of funds

Electricity

Majority (79%) of the households within Midvaal have access to electricity whilst approximately 21% of households (5598 households) do not have access. These households are mostly informal settlements and farm workers who use of either paraffin or candles due to the lack of such services. All informal settlements within Midvaal have no access to electricity, with a few having access to high mast lights. Illegal electrical connections are therefore a challenge especially in informal settlements like Sicelo and Mamello. These areas will only be reticulated once they are formalised. In the meantime, the alternative methods may cause an increase in shack fires.

Table 22: Midvaal Informal Settlements & Engineering Services available

No.	Informal Settlement	No. of structures	Engineering Services			
			Water	Sanitation	Electricity	Refuse
1	Badfontein Plot 4	8	Yes	No	No	Yes
2	Kudung	22	Yes	No	No	Yes
3	Mamello	348	Yes	No	No	Yes
4	Modderfontein	20	No	No	No	Yes
5	Platkoppie	8	Yes	No	No	Yes
6	Uitvlucht	19	No	No	No	Yes
7	Boitumelo	301	Yes	Yes	No	Yes
8	Dustin	20	Yes	No	No	Yes
9	Koolfontein Plot 10	6	Yes	No	No	Yes
10	Mohlakeng	26	Yes	No	No	Yes
11	Skansdam Foundry	46	Yes	Yes	No	Yes
12	Sporong	21	Yes	No	No	Yes
13	Uitgevallen (Mokokeng)	34	Yes	No	No	Yes
14	Plot 45 Welverdiend	17	Yes	No	No	Yes
15	Bears Farm	13	Yes	Yes	No	Yes
16	Kwa Ben	6	Yes	No	No	Yes
17	Ophir Plot 145 - 147	9	Yes	No	No	Yes
18	Chicken Farm	19	No	No	No	Yes
19	Elandsfontein Plot 22	3	Yes	No	No	Yes
20	Harold's Farm	28	Yes	No	No	No
21	Kromdraai	52	Yes	No	No	Yes
22	Vlakfontein	4	No	No	No	Yes
23	Sicelo Ext 4	1,406	Yes	Yes	No	Yes
24	Sicelo Ext 5	1,645	Yes	Yes	No	Yes
25	Jonkers	4	No	No	No	No
26	Ophir Plot 92	6	No	No	No	Yes
27	Kwa Brown	103	Yes	No	No	Yes
28	Piel's Farm	469	Yes	Yes	No	Yes
29	Plot 146 Driefontein (Dikhotsaneng)	30	Yes	No	No	Yes
30	Put Put (Khayelitsha)	488	Yes	Yes	No	Yes

31	Nelsonia Plot 180 Abramskop	6	Yes	No	No	Yes
32	Plot 136 Nelsonia Difateng	29	Yes	No	No	Yes
33	Henley on Klip (Dump) Erf 1319	5	No	No	No	Yes
34	New Kentucky Plot 33	5	Yes	No	No	Yes
35	Sherman Park	23	No	No	No	Yes
36	Vogelfontein Plot 23	20	Yes	No	No	No
Total		5,269				

HOUSING DEMAND

Determination of Housing Need

The Municipality currently does not have accurate data on the housing demand of all the residents and income groups within the municipal jurisdiction. The Municipality relies mainly on the Census/Community survey statistics, Housing Subsidy System (HSS) Information, Informal Settlement Enumeration data and the National Housing Needs Register (NHNR). There are however limitations to these methods as the data could be outdated/inaccurate.

Statistical Method

The statistical method utilizes information from the Census 2011 and the 2016 Community Survey. The information relating to individuals' incomes and those residing in traditional dwellings, informal dwelling/ shack in backyard and informal dwelling/ shack not in backyard can be used to estimate the demand for housing. As per the table below, the Census 2011 statistics estimates the housing backlog at 5546. The 2016 Community Survey on the other hand, which is more recent estimates the housing backlog at 5649. It should be noted that there isn't a significant difference between the 2 statistical methods. The Community Survey of 2016 shows an increase of 103 informal households from the 2011 Census.

Table 23: Estimated backlog - Census 2011 data vs Community Survey 2016

Type of Informal Dwelling	Number of Structures (Community Survey 2016)	Number of Structures (Census 2011)
Traditional dwelling/hut/structure made of traditional materials	151	150
Informal dwelling/shack in back yard	944	944
Informal dwelling/shack NOT in back yard; e.g. in an informal/squatter settlement or on farm	4436	4435
Caravan or tent	118	117
Total	5649	5546

5.1.2 National Housing Needs Register (NHNR) & Housing Subsidy System (HSS)

The NHNR is a central database that offers households the opportunity to register their needs for adequate shelter by providing information about their current living conditions, household composition and to indicate the type of housing assistance they require from Government.

Currently, households on the NHNR residing in Midvaal Municipality is estimated at 18278. Out of the registered people on the database, 5496 have completed housing subsidies and their applications are approved on the HSS (See table below)

Table 24: National Needs Register & HSS Approvals

 human settlements Department: Human Settlements REPUBLIC OF SOUTH AFRICA			
GAUTENG	NHNR and Approved on HSS	On NHNR Only	NHNR Total
Midvaal Municipality	2 748	9 139	11 887
Meyerton	2 103	8 244	10 347
Randvaal	101	267	368
Walkerville	544	628	1 172
TOTAL	5 496	18 278	23 774

Table 16: Completed housing projects

Project Name	Ward	Target market	Project Type	Completed & Allocated Houses
Sicelo Proper North and South	8 & 10	Low income earners	Fully subsidised	1089
Lakeside Estates Extension 1	6	Low income earners	Fully subsidised	1247
Lakeside Estates	6	Low income earners	Fully subsidised	1187
Sicelo Shiceka Ext 5 (Erf 206 Meyerton Farms)	8	Low income earners	Fully subsidised	290
Savanna City	11	Low income earners	Fully subsidised	2242
Sicelo Shiceka Ext 5 (Erf 78 Meyerton Farms (Phase 1))	10	Low income earners	Fully subsidised	180
Total				6235

Table 25: Number of houses yet to be transferred to Beneficiaries

Project Name	Ward	Completed & Allocated Houses	Number of Houses Not Yet Transferred to Beneficiaries
Sicelo Proper North and South	8 & 10	1089	41
Lakeside Estates Extension 1	6	1247	46
Lakeside Estates	6	1187	Information not available
Sicelo Shiceka Ext 5 (Erf 206 Meyerton Farms)	8	290	290
Savanna City	11	2242	417
Sicelo Shiceka Ext 5 (Erf 78 Meyerton Farms)	10	180	180
Total		6235	1154

Source: Finance Department, 2021

7.1.2 Current housing projects (Active short-medium term projects) The GDHS and the Municipality have commenced with projects that will eradicate the housing backlog through the delivery of housing units which are in wards 1, 8, 11 and 10.

The current housing projects are short-medium term projects and comprise of fully subsidised houses (IRDP), MKV houses, provision of serviced stands and walk-up units with full title deeds.

7.1.2.1 Low Income Housing

The following housing projects are currently ongoing;

- Sicelo Shiceka (Erf 78 Meyerton Farms Project Walk-up Units) – This project aims to assist in eradicating the Sicelo Informal Settlements (Ext 4&5) as well as backyard shacks in wards 8 & 10. Project is for the construction of 720 walk-up units and includes parking area, children's playground, landscaping, informal trading sites, etc. Dolomite Stability Investigation, Rezoning, Urban Development Framework (UDF), Site Development Plan (SDP), Precinct Plan, Layout Plans and other studies are completed. Contractor has completed Phase 1 of the project comprising of 180 walk-up units using Innovative Building Technology (IBT). The 180 completed houses have been allocated to housing beneficiaries. The GDHS is yet to commence with the title deed registration for the allocated 180 beneficiaries. Phase 2 of the project comprising of the remaining 540 walk-up units is ongoing and will be a Brick and Mortar project. Consultant has been appointed and is busy with the Architectural and Engineering Designs. The said designs are yet to be submitted to the Municipality for consideration
- Savanna City Development (Fully Subsidised IRDP) – This project is a Private Public Partnership (PPP) mega project comprising of 18399 opportunities. This project has a component of 5517 fully subsidised houses. To date, 2242 fully subsidised houses have been completed and allocated to beneficiaries from Midvaal as well as neighbouring Municipalities such as Emfuleni and the City of Johannesburg. The inclusion of the said Municipalities in the project, is due to a cross border agreement. According to the Municipality's records, 1825 houses have been transferred to beneficiaries. Title deed registration processes are still underway. A Local Labour Desk has been established for the purposes of ensuring the community, SMMEs, Businesses and local labourers benefit from the project. Database is managed by the Developer. Challenges relating to illegal occupation of fully subsidised houses exist, and the Developer is addressing the matter by following the legal processes of obtaining an Eviction Order
- Savanna City Development (MKV) – The Savanna development is providing 200 housing opportunities to Military Veterans in Midvaal and surrounding areas who

meet the stipulated criteria. To date, 85 houses have been allocated to MKV 47 beneficiaries. Challenges relating to the illegal occupation of the MKV houses exist and is being dealt with by the Developer, who is following the required legal processes by obtaining an Eviction Order.

- Mamello Ext 1 Project – The project aims to assist in the relocation of households living in the Mamello Informal Settlement and neighbouring farms/settlements such as Uitvlucht and Kudung to the said project. The project size for this development is 515 housing units with social amenities such as schools, creche, community facility, church sites, commercial sites, taxi rank, etc. The Environmental Authorisation, Layout plan, Engineering Services Design and so forth are completed. Conditions of Township Establishment are being adhered to by the GDHS. The installation of internal Engineering Services (water, sewer & roads) is completed, 515 stands are serviced and accepted by the Municipality. Bulk infrastructure is not available and as such, the project is at a standstill. The appointment of a Bulk and Top-Structure Contractor is yet to be concluded by the GDHS.

- Sicelo Shiceka De-densification & Relocation Project (Portion 47 of the farm Langkuil 373 IR) – Sicelo has the largest informal settlement in Midvaal with a total of over 3500 households. The informal settlement is densely populated and as such the UISP which was planned years ago for the area cannot take place until such time that households are relocated to enable space for the installation of engineering services. The Municipality has made 252 stands available for relocation on Portion 47 of the farm Langkuil 373 IR for the de-densification of Sicelo Ext 4 and 5. The Layout Plan, Traffic Impact Assessment, Dolomite Stability Investigation and Flood Line Study have been completed. Rezoning, Subdivision and Consolidation application is being evaluated by the Town Planning Section. Basic services have been installed by the Engineering Services Department. 9 EPWP participants have been appointed to assist with enumeration and relocation of households from the informal settlement to the identified site. To date, 160 households have successfully relocated to Portion 47 of the farm Langkuil 373 IR. Plans are underway for the remaining households to be relocated in the upcoming months.

- Sicelo Shiceka De-densification & Relocation Project (Portions of 188 Meyerton Farms) – This project is to further assist with the de-densification of the

Sicelo informal settlement. Project will enable the relocation of 162 households from the Sicelo informal settlement to the identified site. Dolomitic Stability Investigations and Layout Plan has been completed. Rezoning, Subdivision and Consolidation applications are being evaluated by the Town Planning Section. Engineering Designs, installation of internal engineering services and land surveying are yet to be completed. 9 EPWP participants have been appointed to assist with enumeration and relocation of households from the informal settlement 48 to the identified site. Relocation will be undertaken once all the required planning processes are completed.

Based on the above-mentioned current projects, 7366 housing opportunities are available to low-income households in Midvaal in the short-medium term. This is summarised in the table below;

Table 26: Summary of active low-income housing projects in Midvaal

Project Name	Ward	Targeted Informal Settlements	Project Type	Project Size	Allocations to Date
Savanna City	11	All informal settlements in Midvaal	Fully subsidised	5517	2242
Mamello Ext 1	1	Mamello, Kudung and surroundings	Fully subsidised	515	0
Sicelo Shiceka (Erf 78 Meyerton Farms walk up units)	10	Sicelo	Fully subsidised	720	180
Sicelo Shiceka (Langkuil De-densification & Relocation)	8	Sicelo	De-densification and Relocation (provision of serviced stands)	252	160
Sicelo Shiceka (Portions of 188 Meyerton Farms De-densification & Relocation)	8	Sicelo	De-densification and Relocation (provision of serviced stands)	162	0
Savanna City (MKV)	11	All areas within Midvaal and surroundings	Fully subsidised	200	85
Total				7366	2667

7.1.2.2 Middle Income/Credit Linked Housing

The middle-income housing programme aims to assist households in the 'gap' market, i.e. those who are too rich to qualify for the fully subsidised houses but too poor to afford a bond for a house.

FLISP is intended to assist these households to access housing, by providing a subsidy that can be used to pay the deposit on a house or to decrease the size of the home loan. The following project is ongoing to cater for this market. This project is partially funded by Government;

- **Savanna City Development (FLISP)** – This project is market driven and comprises of 5518 opportunities. The beneficiaries of this project need to meet

certain criteria stipulated by the NDHS as per the subsidy instrument. To date, 650 FLISP have been allocated to qualifying beneficiaries in the Savanna project.

Table19: Middle Income Housing in Midvaal

Project Name	Ward	Targeted Informal Settlements	Project Type	Project Size	Allocations to Date
Savanna City (FLISP)	11	All areas within Midvaal and surroundings	Partially subsidised	5518	650
Total				5518	650

It should be noted that the provision of the active low-medium income projects will yield and supply a total of 12884 housing opportunities, which is close to the entire estimated housing backlog of 14376.

Map 5: Current housing projects to eradicate informal settlements/backlog

City of Johannesburg Metropolitan Municipality

Ennerdale

Sebokeng

Emfuleni Local Municipality

Vereeniging

Three Rivers

Metsimholo Local Municipality

Thokoza

Ekurhuleni Metropolitan Municipality

Heidelberg

Lesedi Local Municipality

Dipaleseng Local Municipality

Vaal Dam

Major Roads (Existing)

Rivers

Extensive Agriculture

Nature Reserves

Vaal Dam

Informal Settlements

Current Housing Projects

Residential

Rural Residential

Cadastre

Ward	Name	Ownership	Number of Structures
1	Stellenbosch	Private	3
2	Stellenbosch	Private	22
3	Stellenbosch	Private	9
4	Stellenbosch	Private	5
5	Stellenbosch	Private	12
6	Stellenbosch	Private	1
7	Stellenbosch	Private	1
8	Stellenbosch	Private	1
9	Stellenbosch	Private	1
10	Stellenbosch	Private	1
11	Stellenbosch	Private	1
12	Stellenbosch	Private	1
13	Stellenbosch	Private	1
14	Stellenbosch	Private	1
15	Stellenbosch	Private	1
16	Stellenbosch	Private	1
17	Stellenbosch	Private	1
18	Stellenbosch	Private	1
19	Stellenbosch	Private	1
20	Stellenbosch	Private	1
21	Stellenbosch	Private	1
22	Stellenbosch	Private	1
23	Stellenbosch	Private	1
24	Stellenbosch	Private	1
25	Stellenbosch	Private	1
26	Stellenbosch	Private	1
27	Stellenbosch	Private	1
28	Stellenbosch	Private	1
29	Stellenbosch	Private	1
30	Stellenbosch	Private	1
31	Stellenbosch	Private	1
32	Stellenbosch	Private	1
33	Stellenbosch	Private	1
34	Stellenbosch	Private	1
35	Stellenbosch	Private	1
36	Stellenbosch	Private	1

There are projects within Midvaal currently in the planning phase. These projects are listed below and will contribute to the future housing needs and the eradication of the housing backlog. The projects will yield about 12142 housing opportunities. It should be mentioned that these projects could take between 3-5 years to be implemented.

Table 27: Future Housing Projects in Midvaal

Project	Ward	Project Type	Target Beneficiaries	Project size	Progress to date
Sicelo Erf 72 Meyerton Farms	8	Walk-up units with full title deeds	Sicelo informal settlement	700	Rezoning application has been approved by the Municipality. Awaiting the GDHS to appoint a Consultant for Engineering and Architectural Designs
Boitumelo Informal Settlement Upgrading	4	Rapid Land Release Program (Provision of serviced stands)	Boitumelo, Khayelitsha, Piel's Farms and neighboring informal settlements	4700	Feasibility Study is completed. Engagements are ongoing with the Ekurhuleni Metropolitan Municipality for the donation of land. Other Town Planning studies are yet to be conducted
Sicelo Erf 56 Meyerton Farms	8	Walk-up units with full title deeds	Sicelo informal settlement	700	Rezoning application has been approved by the Municipality Awaiting the GDHS to appoint a Consultant for Engineering and Architectural Designs
Sicelo Informal Settlement Upgrading	8	Res 1, 3 & others	Sicelo informal settlement	842	All planning processes completed. Area is densely populated, awaiting relocation of households. The Erf 47 Langkuil and Portions of 188 Meyerton Farms

					De-densification and Relocation projects will assist in this regard
Bantu Bonke Agri-Village	1	Agri Village	Bantu Bonke and surrounding informal settlements	500	Feasibility & Cost Benefit Analysis study completed. Awaiting the GDHS to include project in Business Plans
The Grace	12	Walk-up units with full title deeds	Boitumelo, Khayelitsha, Piel's Farms, Harold's Farm and neighboring informal settlements	700	Township application approved by the Municipality. Project to commence once bulk challenges are resolved
Portion 77 Langkuil development	5	Rapid Land Release Program (Provision of serviced stands)	Sicelo informal settlement	4000	Geotech study and land acquisition is completed. Awaiting GDHS to appoint a Consultant for the required Town Planning activities
Total				12142	

By taking the current and future housing priority projects into consideration, there will an oversupply of houses as indicated in the table below. About 25026 housing units will be available to Midvaal residents by 2022; this is over the housing demand of 14376.

Table 28: Estimated housing supply by 2022

Project Type	Project Name	Project Size	No of units
Low Income earners (Fully subsidized, MKVs, Walk-ups & provision of serviced stands)	Sicelo Siceka (Erf 56 Meyerton Farms)	700	
	Savanna City	5517	
	Sicelo Informal Settlement Upgrading	842	
	Bantu Bonke Agri Village	500	

	Sicelo (Erf 78 Meyerton Farms)	720	19508
	Sicelo (Erf 72 Meyerton Farms)	700	
	Sicelo (Erf 47 Langkuil De-densification & Relocation)	252	
	Mamello Ext 1	515	
	Savanna City (MKV)	200	
	Boitumelo Rapid Land Release Program	4700	
	The Grace	700	
	Sicelo (Portions of 188 Meyerton Farms De-densification & Relocation)	162	
	Portion 77 Langkuil	4000	
Middle Income earners (FLISP)	Savanna City	5518	5518
Total		25026	25026

7.1.4 Land for future development

The following land parcels have been acquired for future development to accommodate households in the Sicelo and Bantu Bonke area. Detailed studies are yet to be conducted on the portions of land.

Table 29: Land for Future Housing Development

Property Description	Ward	Ownership	Target Beneficiaries	Project size
Portion 77 Langkuil	8	Gauteng Provincial Government	Sicelo informal settlement	4000
Portion 7 of Panfontein 437 IR	1	Department of Rural Development and Land Reform	Bantu Bonke, Kudung, Uitvlucht and neighboring informal settlements	500
Total				4500

Besides the above mentioned, the Midvaal SDF highlights 16 Strategic Development Areas

(SDAs) where current and future residential development and densification is promoted. No housing developments will be considered outside the SDA's as indicated in the HSP and SDF.

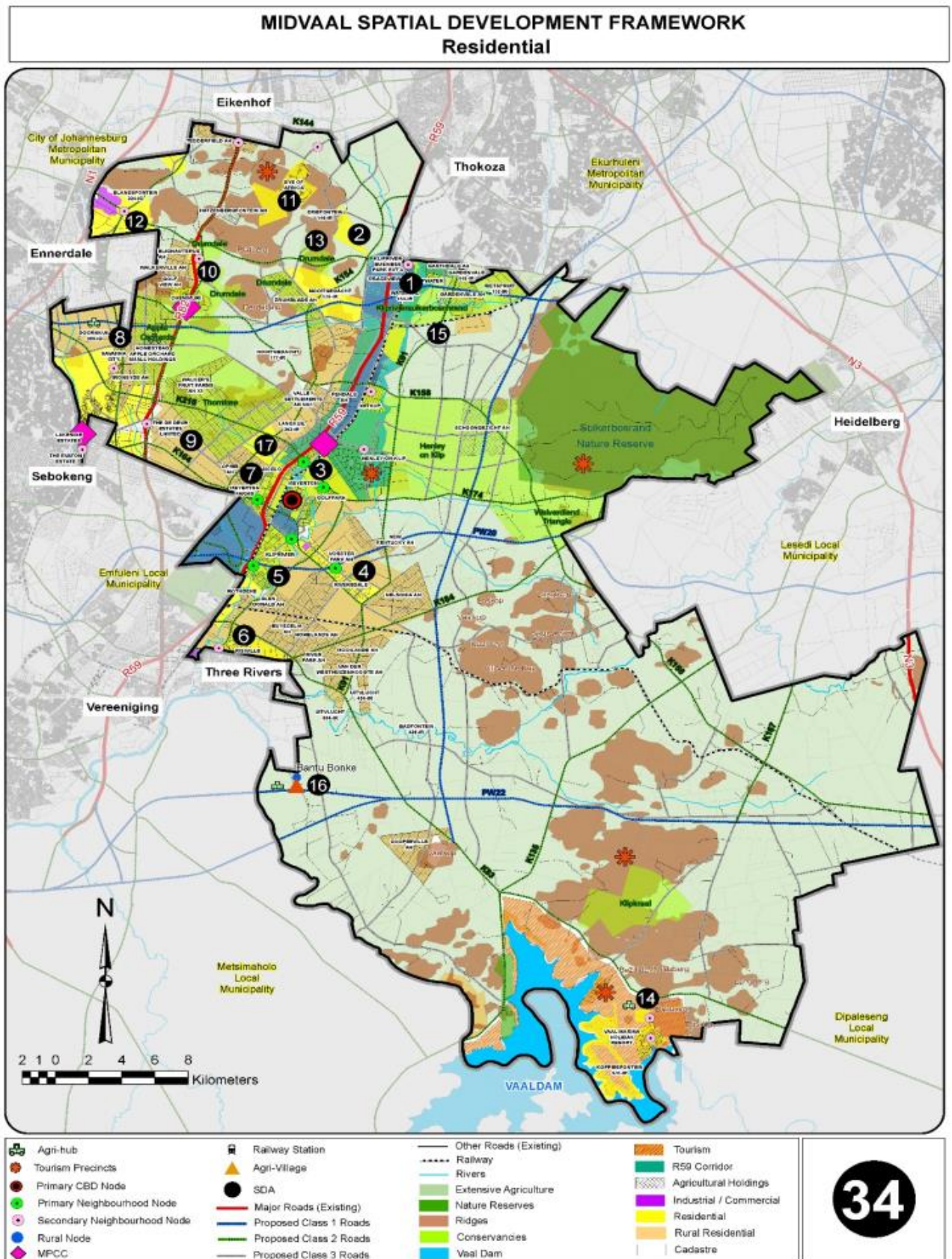
Table 30: Midvaal Strategic Development Area (SDA)

Strategic Development Area	Potential Capacity
SDA1: Waterval Node within UDB	550 Units
SDA2: Eco Estate	1532 Units
SDA3: Meyerton CBD Precinct *	1000 Units
SDA4: Riversdale	200 Units
SDA5: Rothdene-Kookrus	200 Units
SDA6: Risiville	100 Units
SDA7: Sicelo *	5476 Units
SDA8: Savanna City *	18 399 Units
SDA9: De Deur	20 028 Units
SDA10: Walkerville	2523 Units
SDA11: Eye of Africa	2599 Units
SDA12: Elandsfontein	16 182 Units
SDA13: The Grace	1414 Units
SDA14: Mamello *	1031 Units
SDA 15: Boitumelo (ERWAT Land) *	4700 Units
SDA 16: Panfontein	500 Units
SDA17: Langkuil*	4000 units
Total	80 434 Units

Source: Midvaal SDF 2021/22

*** Short to Medium Term Priority**

Map 6: Proposed SDAs (Future Housing Development Areas)



Source: Midvaal SDF 2021/22

7.2 PLANNED PRIVATE DEVELOPMENTS INITIATED IN MIDVAAL

The following table provides some details on housing developments pursued by the private sector. These projects are targeted at the middle to upper income earners.

Table 31: Planned Private Developments Initiated.

Project Name	Ownership	Project Type	Project Size	Status
Uitvlucht Project	Private	Medium to high residential	Res 1 – 1926 Res 2 – 2439 Res 2 – 210 (Retirement)	Township establishment in process
Gateway Eco Estate	Private	Medium to high residential	Res 1 – 1518 Res 2 – 453 Res 3 -2093	Township establishment approved
Savanna City (Bonded & Proposed Res 3)	Private	Middle-high residential	Bonded – 4729 Res 3 – 2635	Construction of the bonded houses is ongoing
The Grace	Private	Middle-high income	Res 1 – 1414	Township establishment approved
Total			17417	

SECTION 11: APPROVAL

CLIENT Local Municipality

Date

DBSA

Date