LOCAL SPATIAL DEVELOPMENT FRAMEWORK

FOR

VAAL AEROTROPOLIS

DEVELOPED BY

VAAL AEROZONE

PREPARED IN TERMS OF SECTIONS 20 & 21 OF SPLUMA

Revision 2 – 30-JULY-2025

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PAPE*funds*

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GAUTENG
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ATC	Air Traffic Control
ATM	Air Transport Movement
BHS	Baggage Handling System
CAPEX	Capital Expenditure
CAT	Category
CBA	Critical Biodiversity Area
CBR	Cost-Benefit Ratio
DFP	Development Framework Plan
DDM	District Development Model
ECBA	Economic Cost-Benefit Analysis
ECC	Economic Cost of Capital
EIA	Environmental Impact Assessment
ENPV	Economic Net Present Value
ERR	Economic Rate of Return
ESA	Ecological Support Area
EMPr	Environmental Management Programme
ELM	Emfuleni Local Municipality
ELUS	Emfuleni Land Use Scheme of 2023
EMP	Environmental Management Plan
FDI	Foreign Direct Investment
GAPA	Gauteng Agricultural Potential Atlas
GDP	Gross Domestic Product

GFA	Gross Floor Area
GPEMF	Gauteng Province Environmental Management Framework
GSE	Ground Support Equipment
GVA	Gross Value Added
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IDP	Integrated Development Plan
ILS	Instrument Landing System
KZN	KwaZulu-Natal
LSDF	Local Spatial Development Framework
LTDF	Long Term Development Framework
MARS	Multiple Apron Ramp System
MERR	Modified Economic Rate of Return
MSCP	Multi Storey Car Park (“Parkades”)
mppa	million passengers per annum
NBE	Narrow Body Equivalent
MRO	Maintenance, Repair, and Overhaul (hangars)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NPV	Net Present Value
NSDP	Northern Spatial Development Framework

NWA	National Water Act, 1999 (Act No. 36 of 1998)
OLS	Obstacle Limitation Surfaces
OPEX	Operational Expenditure
Pax	Passenger
PV	Present Value
RESA	Runway End Safety Areas
RET	Rapid Exit Taxiway
RFFS	Rescue and Fire-Fighting Services
SANRAL	South African National Roads Agency
SAF	Sustainable Aviation Fuel
SDF	Spatial Development Framework
SDP	Site Development Plan
SDM	Sedibeng District Municipality
SEM	Socio-Economic Monitor
SSC	Species Survival Commission
SEZ	Special Economic Zone
sqm	square metre
VA	Vaal Aerotropolis
VAZ	Vaal Aero Zone
VRRSDF	Vaal-River Regional Spatial Development Framework
WBE	Wide Body Equivalent
WWTP	Waste Water Treatment Plant

LIST OF APPENDICES

1. INTRODUCTION

1.1. Purpose of the Report

This Local Spatial Development Framework (LSDF) report has been prepared on behalf of the Emfuleni Local Municipality by the professional team of Vaal Aerozone (Pty) Ltd., being the developer and owner of the proposed Vaal Aerotropolis.in terms of the Emfuleni Municipality Spatial Planning and Land Use Management By-Laws,2018 read with Sections 20 and 21 of the Spatial Planning and Land Use Management Act (SPLUMA).

This LSDF is prepared for the relevant local authorities (Sedibeng and Emfuleni) in order to be incorporated into their respective Spatial Development Frameworks (SDF). This will allow them to plan and budget, in order to obtain approval and proceed with the project. This will also create certainty for all the future relevant rights and zonings that will be granted through township establishment and other land use procedures and that engineering services can be provided as outlined in the LSDF.

This report will show that the proposed project as it is planned, complies with all current legislation and policies, be it local, provincial or national, and that it is in line with current policies including Land Uses Schemes, Spatial Development Frameworks, etc.

This document will also show that all necessary due diligence and background research have been done in relation to the environmental impact, transport and road networks and the provision of engineering and bulk services infrastructure to the site.

It is also intended that the Vaal Aerotropolis will be part of a Special Economic Zone (SEZ) to attract investment and stimulate growth and to manage and regulate the overall development, as this report will elude to.

1.2. Background to the VA Development

The development of an international airport in South Africa is guided by the National Ministry of Transport. Its Revised Strategic Plan 2020-2025 defines the manner in which future international airports within South Africa are to be developed. In terms of the principles of aerotropolis development, Economic hubs and SEZ are also not only supported by the National Department of Transport, but they are encouraged and even promoted. The report states under Aviation Infrastructure "*An integrated airport network system has the potential to support the NDP's objective by contributing to growing the economy of the country and ensure that potential investments are utilised effectively and efficiently through economic initiatives such as the aerotropolis concept, airport cities, Special Economic Zones (SEZ's) linked to international airports aimed at promoting economic growth, trade and tourism and job creation. It could further facilitate the expansion of tourism, including sport and adventure tourism. However, such initiatives must be sustainable to ensure economic growth within the country*."

The "Growing Gauteng Together Through Smart Mobility 2030" transport policy that was approved by the Gauteng Province under World Class Air Transport section states the following:

- A dedicated cargo airport in Gauteng is required
- More airports must be designated with international status
- An additional international airport i.e. a third one, needs to be designated in Gauteng as a port of entry point into South Africa.

These two policies are applicable to the proposed Vaal Aerotropolis, and support the vision of this proposed development.

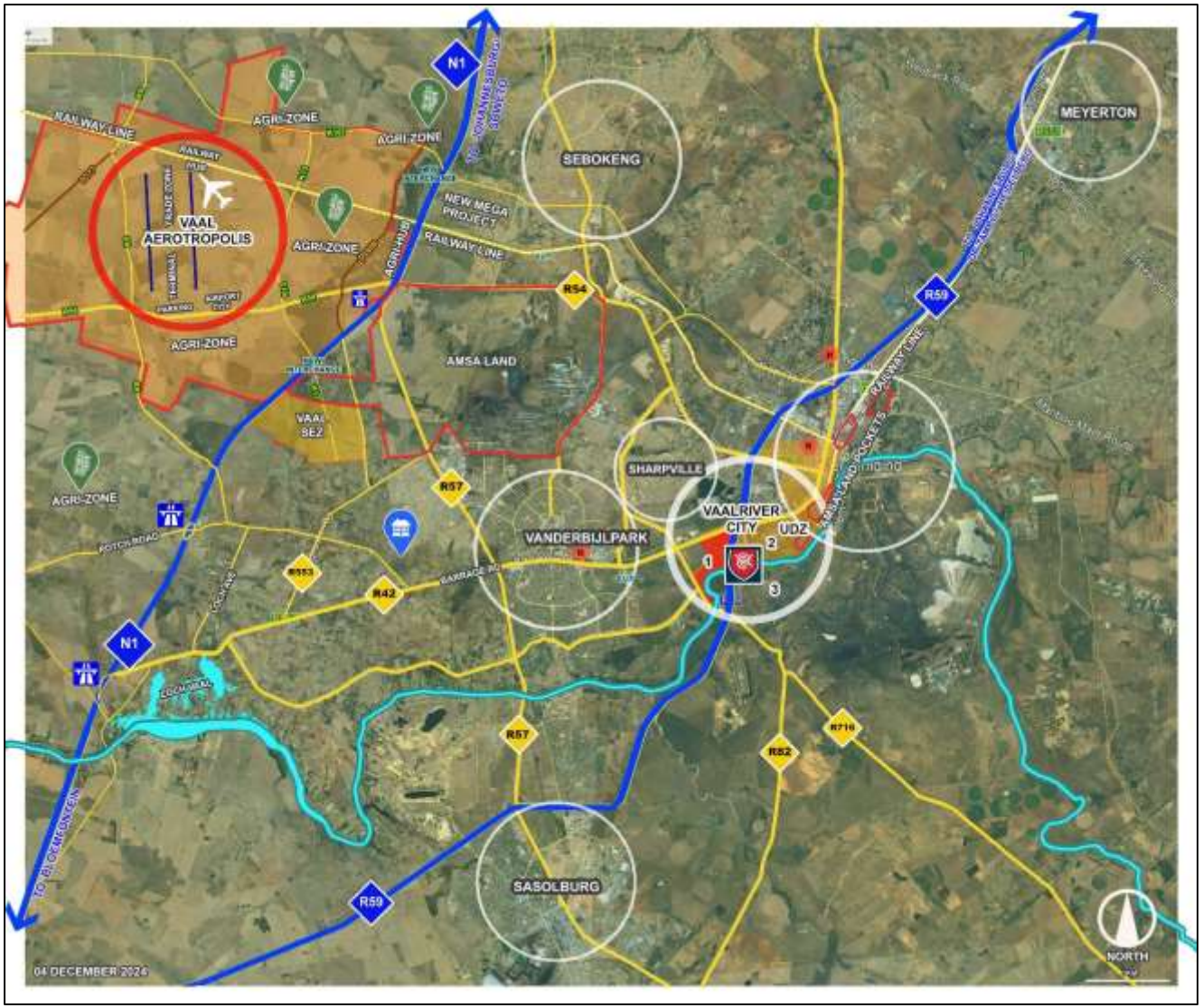

Figure 1-1. Macro Locality Plan.

The development of the Vaal Aerotropolis is an initiative which promotes economic development within the Emfuleni and Sedibeng municipal areas. It is intended to help generate employment opportunities in Emfuleni and to reduce the need for Emfuleni residents to migrate or to commute over long distances in order to access economic opportunities in other parts of Gauteng. The Emfuleni Local Municipality envisages an aerotropolis that will encompass the International Airport, the Logistical Hub and the Agricultural Hub. Typical of any other aerotropolis, the Emfuleni Vaal Aerotropolis will have the proposed International Airport as the multimodal commercial central core, with rings of other developments permeating outwards. By nature, an airport is a powerful engine for local economic growth which attracts many aviation-linked businesses. The Vaal Aerotropolis will, in time, develop to form clusters and corridors of airport linked commercial, high-tech, and advanced manufacturing or industrial clusters as well as logistics facilities complemented by retail, entertainment, hotels, conferences, and exhibition centres. The aim of the proposed airport as part of the Aerotropolis is to supplement the proposed Logistics Hub and to relieve the OR Tambo and Lanseria International airports and Rand Airport from the growth constraints they are currently experiencing. Estimates show that the OR Tambo International and Lanseria Airports and Rand Airport are experiencing cargo and passenger growth rates that are unlikely to be satisfied by the future expansion plans of these airports. These expansion plans cannot be amended due to land and infrastructural constraints surrounding these airports. These constraints present an opportunity for the development of an international airport in Emfuleni to capture some of the growth potential experienced by the abovementioned airports.

The location of the proposed airport in Emfuleni is critical. The existing airstrips in Emfuleni (such as the existing airstrips near Roshnee and Bophelong) are not suitably located to be converted into an international airport. These airports are not located near major transport infrastructure, existing industrial hubs, or the logistical needs of the Vaal region. In this locality, the proposed international airport can serve the proposed Logistical Hub, the Arcelor Mittal industrial hub, and have direct access to the N1 freeway linking the airport to the larger Gauteng region.

The proposed airport in Emfuleni is expected to provide infrastructural support and enhance business viability to the proposed Logistical Hub, which will be established immediately south of the proposed airport. In addition, the airport will impact on the land use pattern of the areas immediately surrounding the airport. These will include the Arcelor Mittal industrial Hub, Bophelong and Sebokeng residential area, and the Vanderbijlpark CBD. In particular, the strip of land along the P155 will benefit from the regional airport and the proposed logistical Hub. The newly proposed logistics hub location is within the 5 km radius from the proposed airport site, west of the N1 Freeway.

The repositioning of the logistical hub within the aforesaid parameters is directly motivated by numerous local and offshore findings gleaned from various feasibility studies randomly carried out, which demonstrated a proportionally high success rates of aerotropolis economies where logistical hubs are in close proximity to airport sites. A recent study on aerotropolis carried out by the national government arrived at similar findings pointing to much optimised economic success potential of aerotropolis regions where airport sites, logistic hubs and special economic zones (SEZs) are closely located to each other as opposed to haphazardly spread out and far from each other. It is therefore on the strength of the outcomes of studies that ELM proposed the re-location of the logistical hub to the west of the N1 Freeway to ensure turbocharged public and private sector investments incentivised by unleashed economies of scale, infrastructure practicability, enhanced high potential returns on investment, and general regional economic growth. Emfuleni local Municipality has reached an agreement with a few other role players, such as Transnet, Arcelor Mittal and the Gauteng Department of Economic Development, that a logistical hub in Emfuleni be considered as an important flagship project within the Vaal region. The Government will need to designate the Vaal Aerotropolis (VA) as a Special Economic Zones (SEZ) or part of an existing SEZ to increase the potential of this development being realized.

The potential components of the VA include Airport, Agri-zone, Cargo Terminal and Trade Zone. The proposed Vaal Logistical Hub is expected to provide O.R. Tambo with a suitable regional logistic facility to the mutual benefit of both Emfuleni and Ekurhuleni

Municipalities. In addition, the logistical hub will contribute to improving burdening transport costs and traffic congestions, make Emfuleni more attractive to local and foreign investments, and create employment opportunities which may have otherwise not been realized. The last component of the Aerotropolis is the Agri-zone. Sedibeng District Municipality in consultation with the Gauteng Department of Agriculture and Rural Development and the Department of Rural Development Land Reform has taken the initiative to develop an Agri-park on Rietkuil Farm. Rietkuil Farm is situated within the Emfuleni Local Municipality area, about 66km south of Johannesburg and located in close proximity to the N1 Highway and K178 Road. The site therefore enjoys good visibility along the N1 highway, regionally and beyond. It is approximately 435 hectares in extent.

The term Agri-park has often been referred to as a networked innovation system of agri-production, processing, logistics, marketing, training and extension services within a district municipality. In 2015 the national government launched the Agri-parks programme as one of the cornerstones of rural economic transformation. Agri-parks have been identified as the vehicle that will kick-start rural economic transformation and encourage growth of the smallholder farming sector, thus, in areas that had seen slow growth due to a lack of resources, including markets for the sale of produce, livestock, skills and infrastructure. The creation of Agri-parks will therefore breathe new life into South Africa's rural areas, revitalise small towns, increase employment and contribute to food security and broader economic opportunities. This initiative can create up to 300 000 new small-scale producers as well as 145 000 new jobs in agro-processing in the next five years.

Prior to the refinement and consolidation of the Agri-hub concept by Department of Rural Development and Land Reform (DRDLR) and the Gauteng Department of Agriculture and Rural Development (GDARD), various parcels of land situated west and south-west outside the determined Emfuleni Local Municipality's Urban Development Boundary (UDB) were earmarked collectively as the Agri-hub. However, successive refinements did not only define an Agri-hub but configured the concept within the broader contextual scheme of the overall agricultural programmes. According to DRDLR, an Agri-hub is one of the three primary components constituting

an Agri-Park in addition to Farmer Production Support Units (FPSU) and Rural Urban Marketing Centre (RUMC). “An Agri-park is a farmer-controlled entity that serves as catalyst around which rural industrialisation is planned to take place, according to a statement.

The aim is for the park to provide a network of contacts between producers, markets and processors, as well as infrastructure to process agricultural products, as defined by the DRDLR (2017). The DRDLR elaborates that “Agri- hubs” (AH) are located in central places in a district, preferably places with sufficient physical and social infrastructure to accommodate storage/warehousing facilities; Agri-processing facilities; packaging facilities; logistics hubs; agricultural technology demonstration parks; accommodation for extension support training; housing and recreational facilities for labourers. AH receive primary inputs from FPSUs for processing, value adding and packaging, which is through-put into the Rural Urban Market Centres or exported directly to markets”. Concepts on Agri-park, Agri- hubs and FPSUs will be comprehensively detailed in the relevant precinct plan being formulated and to be approved by the end of the year. Potential Benefits of the Vaal Aerotropolis are:

- It will attract new investment and have a positive impact on the socio-economic development of the Vaal region.
- It will diversify and grow the Vaal economy.
- It will create job opportunities that will address unemployment in the Vaal region.
- It will afford local people the opportunity to participate in the economy through business partnering, business establishment, training, and skills development.
- It will create a greater demand for Arcelor Mittal’s manufacturing output.
- The location of the Logistics Hub at Arcelor Mittal will help minimize transport cost of materials.
- It will create various opportunities for BBBEEE and SMME’s within the Vaal region; and
- Kick-start downstream manufacturing in Emfuleni.
- Reduce transport costs of goods from areas surrounding the airport and enhance tourism opportunities within the Vaal region.

SEZ are geographically designated areas set aside for specifically targeted economic activities, supported through special arrangements (that may include laws) & systems that are often different from those that apply in the rest of the country.

The purpose of the SEZ programme therefore is to:

- Expand the strategic industrialisation focus to cover diverse regional development needs and context.
- Provide a clear, predictable, and systemic planning framework for the development of a wider array of SEZs to support industrial policy objectives.
- Clarify and strengthen governance arrangements, expand the range and quality of support measure beyond provision of infrastructure; and
- Provide a framework for a predictable financing framework to enable long term planning. Several incentives will be available to ensure SEZs growth, revenue generation, and creation of jobs & attraction of Foreign Direct Investment (FDI).

The project known as ‘Vaal Aerotropolis’ will ultimately comprise of many different components, including:

- Road network with direct access to and from the N1 and linking with the proposed new PWV5;
- International Airport with a 4,2km runway length to accommodate any size of aircraft and second runway added in the future with central apron link;
- Passenger and Cargo terminals and all supporting facilities;
- Trade port with logistics and distribution facilities and general and cold warehousing and other commercial and industrial opportunities;
- Agri-zones and holding areas for produce being air freighted across the world;
- Airport City with Offices, Hotel, Conference, Retail and Medical facilities.

The estimated costs of the project for phase 1 are approximately R29 630 000 000 excluding V.A.T. and is made of the following components:

- Bulk infrastructure : R 3 300 000 000
- Airport : R12 200 000 000
- Trade zones : R 5 200 000 000
- Agri and support zones : R 3 600 000 000
- Other costs mainly financial : R 5 200 000 000
- Airport City Mixed Development : R 130 000 000

1.3. Structure of the DFP Report

The Local Spatial Development Framework (LSDF) Report includes the following sections:

- Section One (1) introduces the nature of the project and deals with the introductory structure, the statutory context, and the planning processes to date.
- Section Two (2) presents the ultimate indicative development concept for the Vaal Aerotropolis Framework Development Plan site, namely the New International Airport, Airport City, Agri-Zone, Trade-Zone and Special Economic Zone (SEZ).
- Section Three (3) locates the proposed development within a national, provincial, sub regional and local policy context.
- Section Four (4) sets out the on-and-off site informants and addresses how these considerations shape the development of the site.
- Section Five (5) presents the vision for the site and the principles that inform the development thereof.
- Section Six (6) outlines the spatial structure of the site in relation to the precincts, and further in terms of sub-precincts.

- Section Seven (7) presents a number of spatial planning frameworks for guiding the development of the site. The frameworks include an Environmental Services Framework, an Access and Circulation Framework, a Land Use Framework, a Landscape Framework
- Section Eight (8) Infrastructure Framework
- Section Nine (9) outlines the Phasing of the development and the anticipated draw down of development rights up until 2080 and beyond.
- Section Nine (10) Socio-Economic Assessment and Profiling for the proposed Vaal Aerotropolis Development.
- Section (11) broadly sets out the Institutional Framework
- Section Ten (12) concludes the Vaal Aerotropolis Development Framework Plan (DFP) Report.

1.4. Suite of Plans

- The following is a list of the plans included in this report:
- Sedibeng Spatial Development Framework
- Emfuleni Spatial Development Framework
- Vaal River Region Spatial Development Framework
- Locality Plan
- Vaal Aerotropolis LSDF (Masterplan)
- Vaal Aerotropolis Land Ownership Plan
- Proposed Zoning through the township layout plan
- Project Phasing Plan

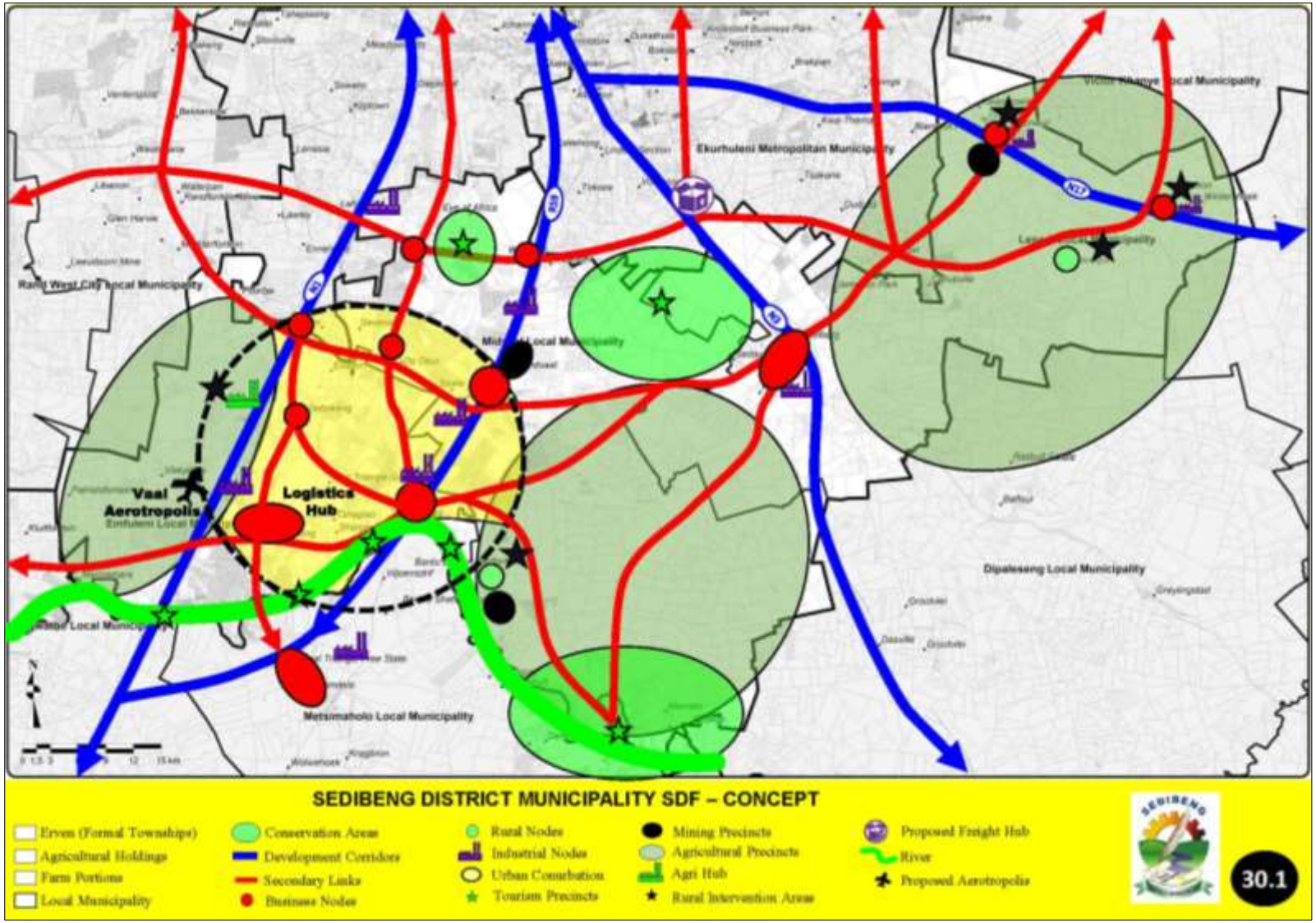

Figure 1-2a. Sedibeng SDF.

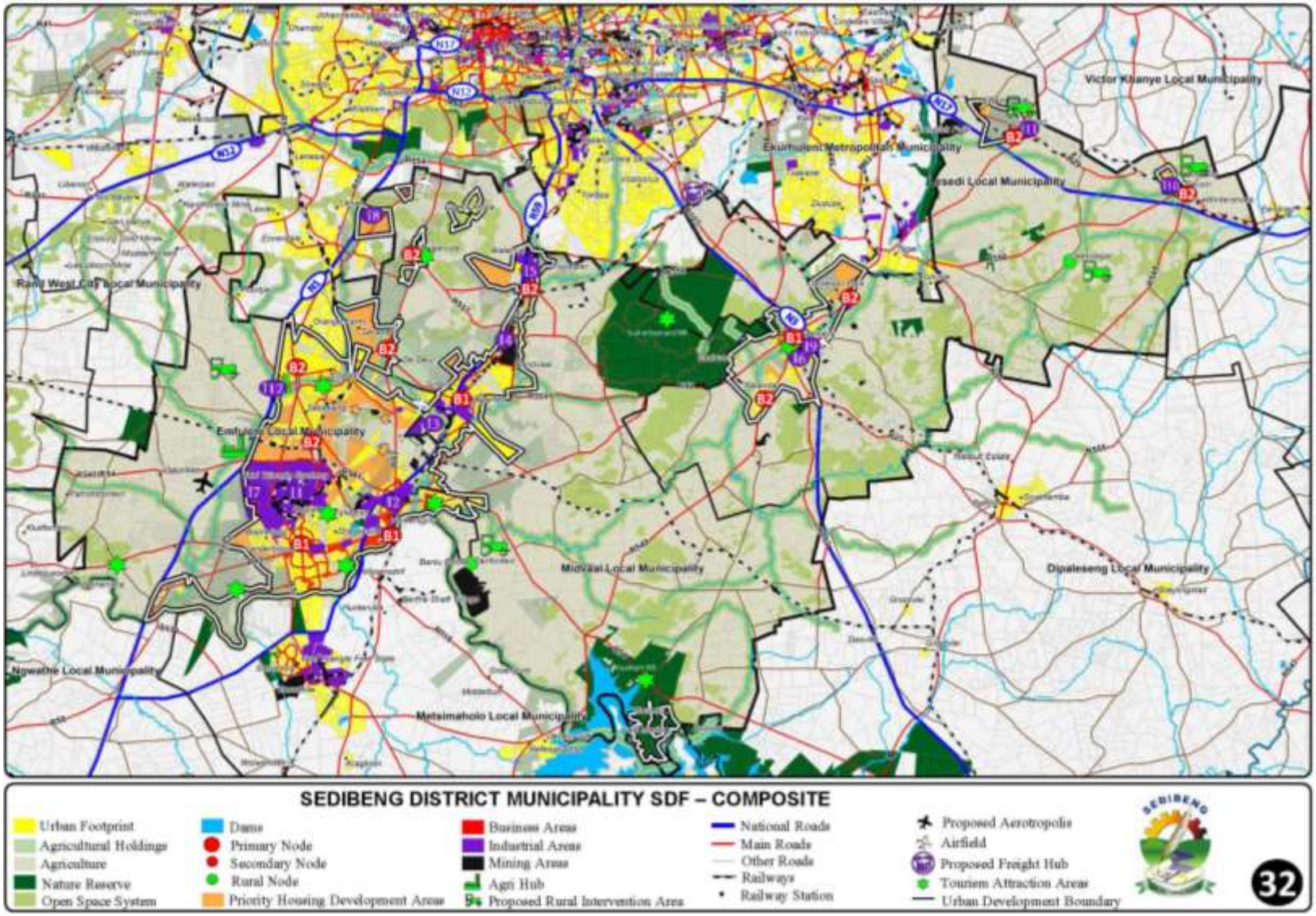

Figure 1-2b. Sedibeng SDF.

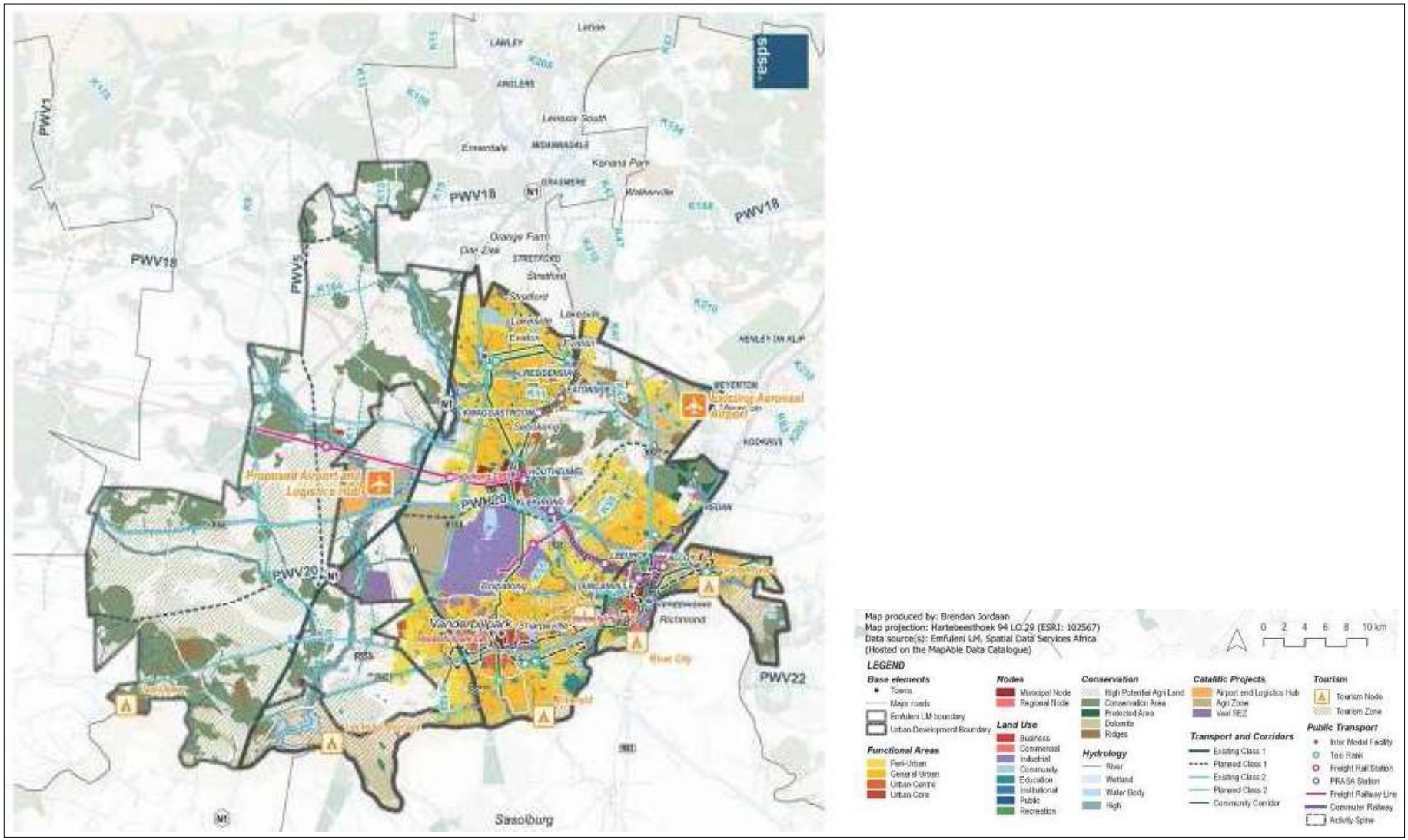

Figure 1-3. Emfuleni SDF.

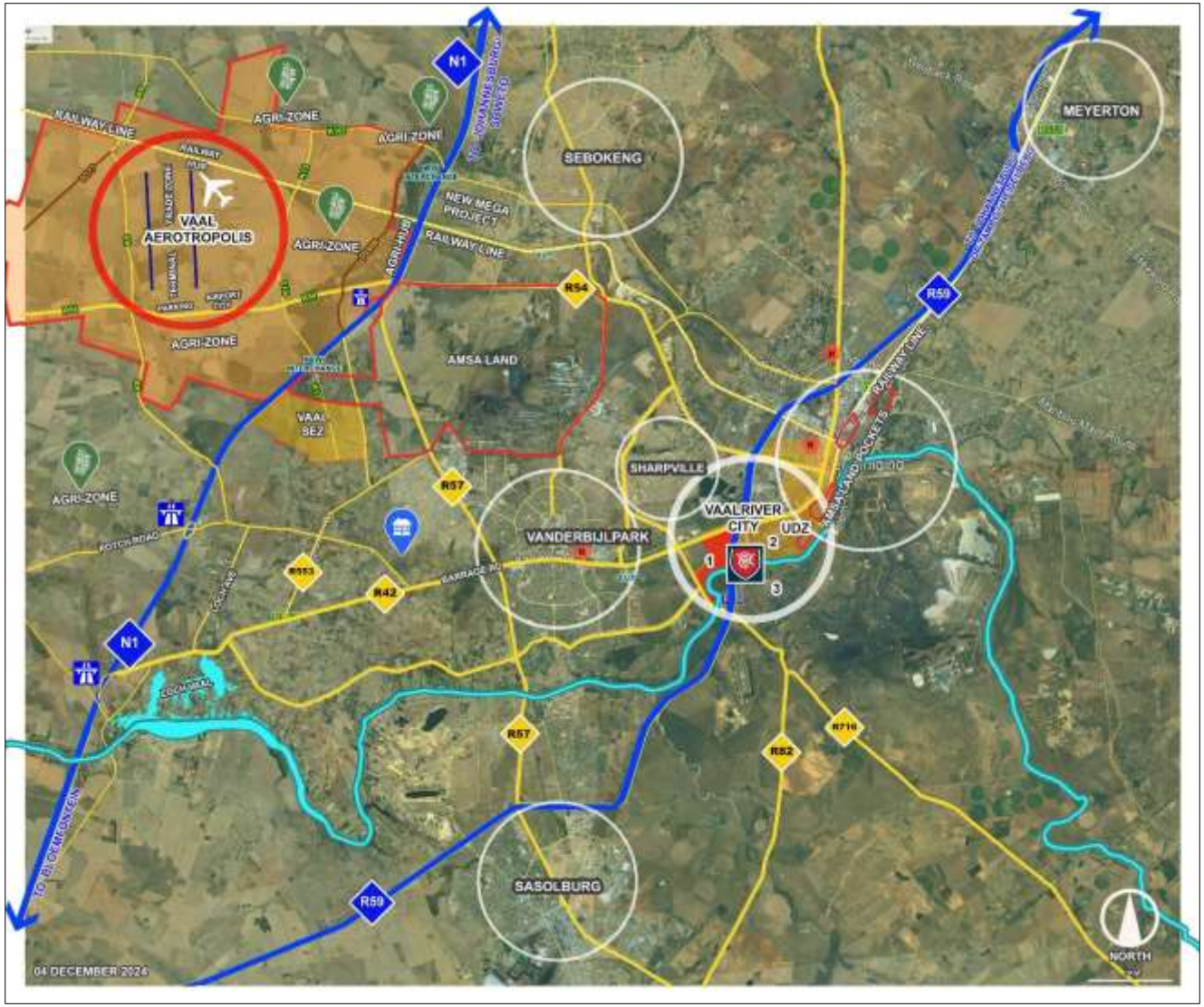

Figure 1-4. Locality Plan.

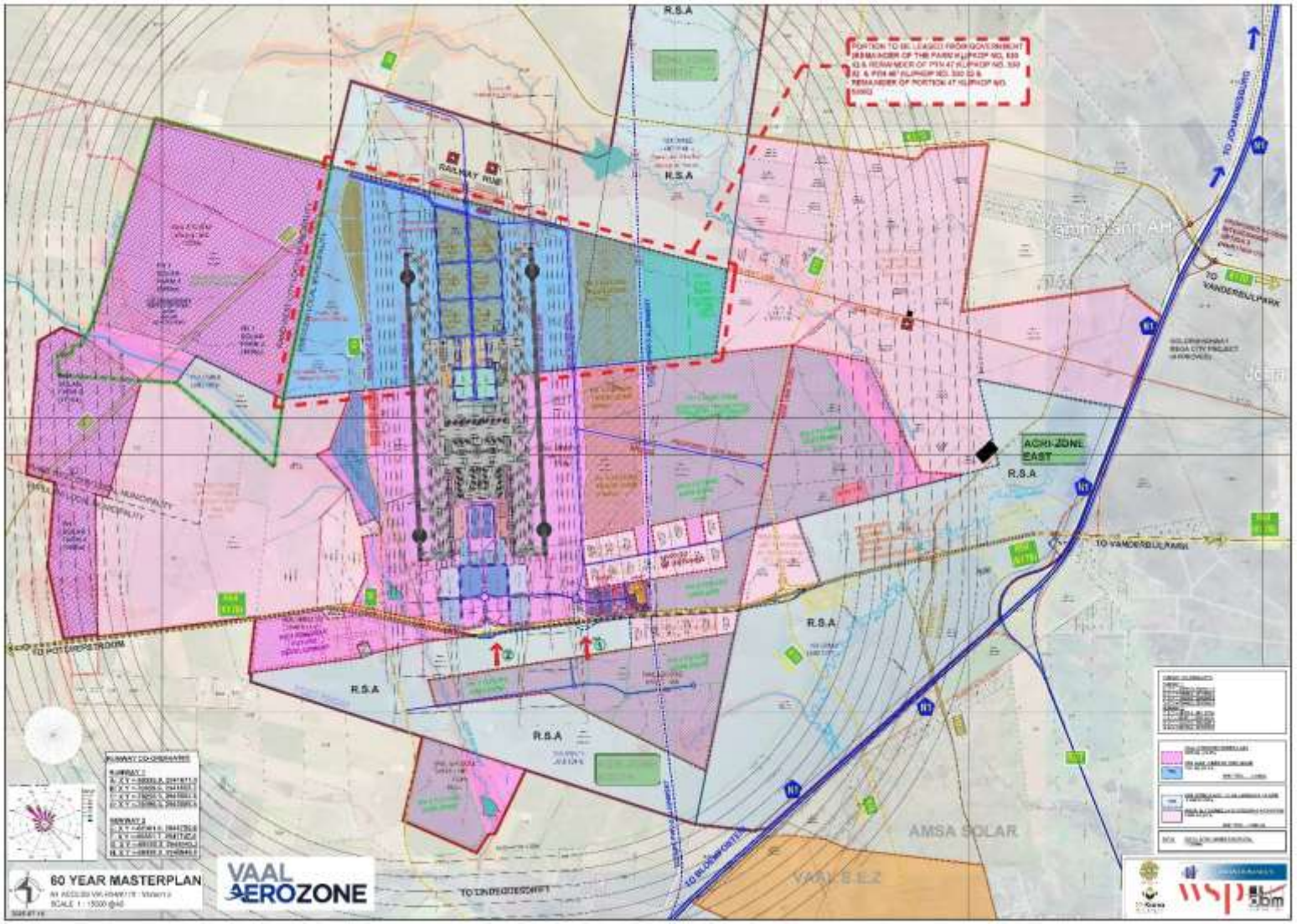

Figure 1-5. Vaal Aerotropolis LSDF (Masterplan).

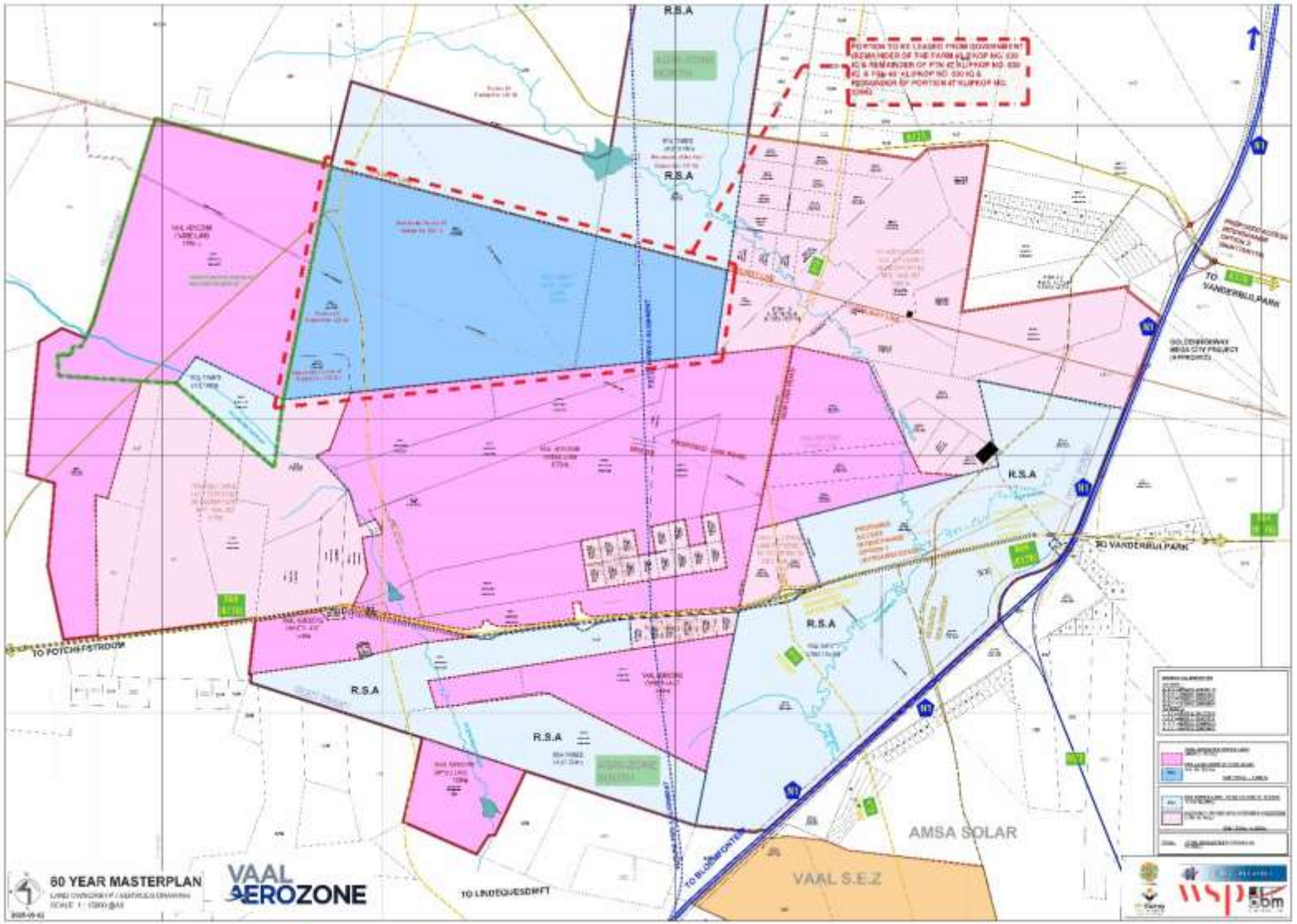

Figure 1-6. Vaal Aerotropolis - Land Ownership Plan.

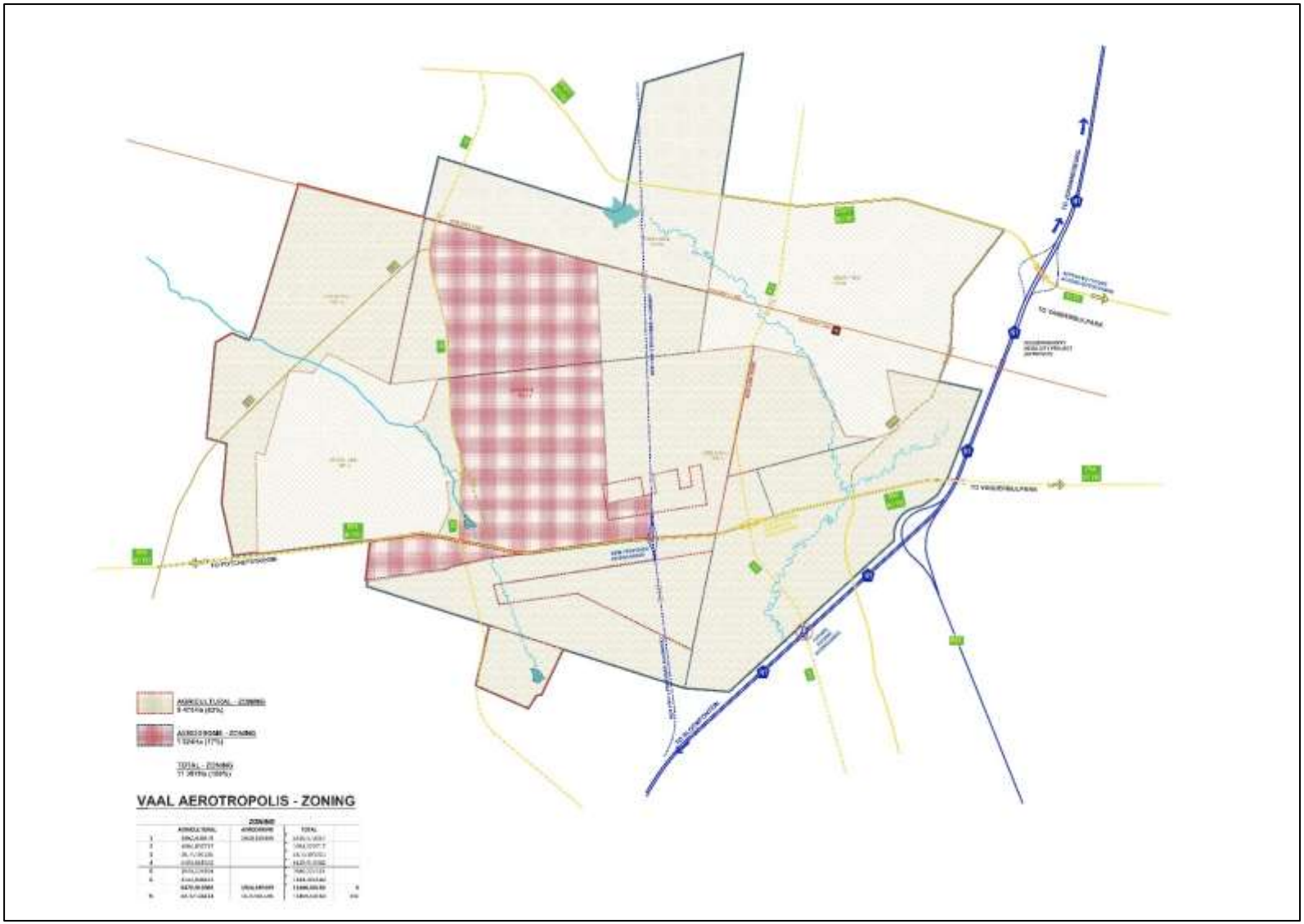

Figure 1-7. Zoning Plan.

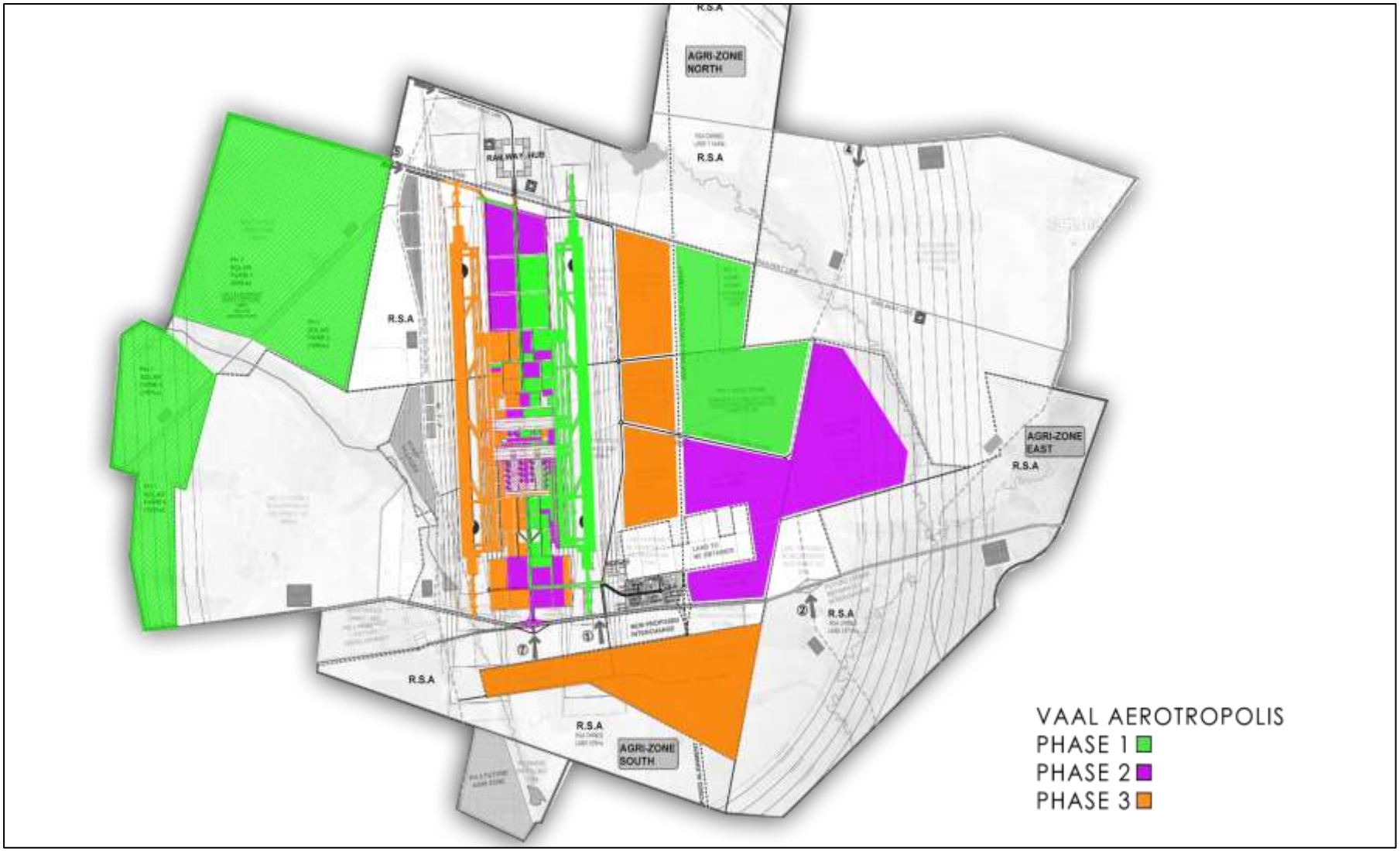

Figure 1-8. Phasing Plan.

1.5. Proposed Phasing of the Development

The development of the Vaal Aerotropolis will include four main components, namely: the Airport itself, the Trade Zones, a commercial hub and the surrounding Agricultural activities. The rate of development will be guided by the growth of the economy, however, it is envisaged that it could take up to 60 years to fully develop the Vaal Aerotropolis as outlined in this LSDF document.

1.6. Statutory context of the Report

Government Support and Regulations:

- The Vaal Aerotropolis development has been declared as a Mega/Catalytic Project by the Gauteng Government, the Emfuleni Local Municipality and the Sedibeng District Municipality
- The location of the Vaal Aerotropolis is one of the areas that is to be declared as an SEZ (Special Economic Zone) or part of, by the DTIC & Provincial Government .
- The development is part of both the Emfuleni and the Sedibeng Municipalities Integrated Development Plans, as well as Spatial Development Frameworks
- Resolutions supporting the development have been received from Mayoral Committees of both Sedibeng and Emfuleni Municipalities

The following land uses have all been included in the Spatial Development Frameworks and Integrated Development Plans of both Sedibeng District Municipality and Emfuleni Local Municipality: Airport; Logistics Hub; Aerotropolis & Agri-zones.

1.7. Planning processes to date

The Project Implementation Milestones for the Vaal Aerotropolis are shown in Table below:

ACTIVITY	DESCRIPTION	TIMEFRAME
Site Identified	West of N1 Highway. No suitable land available on the Eastern Site.	2015
	4050ha of private land purchased. Approximately ± 1250ha of Government Land secured (99-Year lease)	2023 2025
Feasibility Study	Feasibility Study for Vaal International Airport Complete Due diligence on the feasibility study conducted by USTDA (FAA)	2019 Q1 2023
Inclusion of Vaal Aerotropolis in the SDF's Government support for Designation of SEZ	Municipal Approval New Municipal SDF	2019 2024
	Regional Official letters received from Director of Vaal Special Economic Zone	2024 2022
Citibank Acquisition of 50% shareholding in Vaal Aerozone (Pty) Ltd	Approval from the Minister of DTIC Subscription	Q12023 Q3 2023
EIA (Noise studies, LADAR, Drone /aircraft surveys and mapping). Township establishment of the land from agricultural to industrial (Draft LSDF for Vaal Aerotropolis, Conceptual Master Plan -Short, Medium, Long Term)	In progress	Initiated in 2024

Table 1-1. Project Implementation Milestones.

2. DEVELOPMENT CONCEPT

2.1. Overview of the Section

Section Two outlines the proposed concept for the full development of the site to the Year 2085. The concept will also deal with the development of the site, as currently contemplated, for the Airport, Trade-zone and Support precinct operational areas and Agri-zones.

2.2. Proposed Development of the VA Site

The main components of the aerotropolis are as follows:

2.2.1. Airport City

Premium office, retail, hospitality, medical uses including specialist clinics/hospital and leisure spaces in an urban green precinct.

2.2.2. Agri-Zone

A high-tech cluster of agricultural functions including climate-controlled greenhouses, packhouses, a tissue culture lab, and the first air platform in Africa for the export of live animals.

An integrated perishable supply chain.

The Agri-Zone will be developed as follows:

- The Agri-Zone is an IT-integrated high-tech agricultural cluster featuring 48 Ha of climate-controlled growing area operational in phase 1 -the largest on the continent.
- An integrated perishable supply chain, where produce enters the cold chain within minutes of processing, thereby minimizing handling time between harvest to transit-ready.
- Provides a state-of-the-art tissue culture facility to develop new plant breeds and produce existing plant breeds under license.
- The first live animal holding area for transport by air in South Africa.

2.2.3. Cargo Terminal

The most secure and state-of-the-art cargo terminal in Africa. This facility will be expanded over time as the airport grows and will have the most up-to-date cargo handling technologies available. Handling of goods will be automated and robotised ensuring that any additional contact points where tampering could occur are eliminated. Containers will be conveyed via bridge links to freight forwarding companies.

The Trade Zone Cargo Terminal will be capable of handling 100,000 to 150,000 tons of cargo per annum after opening of Phase 1. The available land and airport layout will have to capacity to expand facility to handle several times more if the demands require.

2.2.4. Trade Zone

Directly linked to the cargo terminal, with airside access to manufacturers, assemblers, and distributors.

The Vaal International Airport will be developed, operated, and managed by Vaal Aerozone (Pty) Ltd. It will be the only airport in Gauteng where integrated air cargo services are designed and planned as a priority. It will have four flexible freighter stands, accommodating either two wide-body or four narrow-body aircraft.

It will be planned initially with a capacity of:

- Cargo Terminal: 150 000 tons per annum.
- Passenger Terminal: 7.2 million passengers per annum.
- Planned final capacity of 45 million passengers per annum.

The Cargo Terminal will have competitive advantages:

- Dedicated freight handling environment / cargo village.
- Improved market access supported by air services strategy.
- Lowered logistics costs.
- Better landed product quality.
- Reduced delivery times.
- Reduced inventory costs / minimal dwell time.
- Increased security of consignments -infrastructure design.
- Messaging platform / electronic data interchange.
- Valuable cargo facility for gold, diamonds, and currency.

2.3. New International Airport

The site selected for the development of the Vaal Aerotropolis including Airport Precinct was identified by the investor in an earlier feasibility study. Originally, it was assumed that the location, orientation and dimensions of the two runways were fixed by the findings of that earlier feasibility study, however during the process of developing the Aerotropolis and Airport Precinct layout plans the requirements have changed and therefore the runway locations and orientation have been optimised within the site area available to

better accommodate the latest prevailing wind information. A master plan development process has then been undertaken to identify the most appropriate Airport Precinct layout to accommodate the facility requirements defined in the previous report section.

2.4. Agri-Zone

An Agri-zone is a managed unit that provides production, equipment hired, processing, packaging, logistics and training. An agro industrial zone is a complex of integrated industries (animal husbandry, crop production, food processing, agricultural machinery, organic farming) and supportive facilities (storage, insurance, transportation, distribution of food and agricultural products).

The Agri-zone can be located on both public and private land. They often serve as transition zones between urban and agricultural uses.

Agricultural zone is where multiple tenants and owners operate under a common management structure. An Agri-zone provides networks of contact between producers, markets and processors, but also provide the physical infrastructure required for the transforming industries. The focus of the Agri-zone is primarily the processing of" agricultural products". Of prime importance will be linkages between the zone and surrounding agricultural land for production.

2.5. Trade-Zone

A Trade-zone, also referred to as a logistics hub, is a central point for logistics operations in the area in which it is located.

A hub such as this brings together several different companies that perform tasks related to the flow of goods, all which mutually benefit from being in the same place.

Trade-zones have a large number of operators, workers, services, goods and data flowing in and out every day. They are also centres for manufacturing, assembling, labelling, organising, coordinating, and transporting goods for national and international transit. They often contain offices, storage facilities, warehouses, distribution centres, trucking and shipping services. Some even offer custom clearance points, dangerous goods zones and transport services parks.

The infrastructure of logistics hubs depends on the needs of the companies that use them, and location is an important characteristic. Large hubs tend to be located close to air and sea ports, factories, motorways, etc. because logistics centres need access to all types of transport. Hubs look like huge warehouses, but in reality, a logistic centre is a whole city of warehouses, where companies can perform all the operations necessary to process their cargo.

The fact that all these services are available from a single source has several advantages:

- The strategic location of logistic hubs allows them to connect with different freight types.
- Costs are reduced because sharing facilities between businesses save energy.
- Logistics hubs can invest in the latest logistic technology, facilitating operations.
- Different hub providers can collaborate with each other, which means they can offer value-added services since they can share assets.

Logistics Complexes are often built away from cities. This helps to consolidate transport flows in one place. They can relieve road infrastructure, share the workload among all members of the supply chain, reduce the cost of customs duties and improve import and export operations.

The infrastructure of each logistics centre depends mainly on the needs of the companies that will make use of the facilities. For example, depending on the goods being handled, it may be necessary to have several storage facilities with different temperatures, for food stuffs or medical supplies, or a dangerous goods storage area or, a customs clearance service.

The output of a logistic centre is measured by the number of 20-foot intermodal containers (TEUs) that it handles daily. Some logistics centres have an output of over 1 million TEUs per day.

In most cases logistic hubs have several owners as only very large companies can maintain logistics centres independently. The facilities are then leased to the different companies that want to use the hub.

2.6. Special Economic Zone (SEZ)

A Special Economic Zone (SEZ) is defined in the Act No. 16 of 2014 as “designated areas to promote targeted economic activities, supported through special arrangements and support systems including incentives, business support services, streamlined approval processes and infrastructure”.

An application for a specified area to be designated as a SEZ or an extension of boundaries of an existing SEZ or obtaining an Operator Permit can be made to the Minister in the form and manner as prescribed in the act. The Sedibeng District Municipality has taken the decision on 25th March 2025 to include the Vaal Aerotropolis development into the Vaal SEZ which is still in the process of obtaining an Operator Permit.

3. BROADER POLICY CONTEXT

3.1. Overview of the Section

This section provides an overview of the legal framework for the formulation of this development framework as well as providing the existing planning and policy documents available today and their potential impact on the development of the aerotropolis.

3.2. Sedibeng District and Emfuleni local municipalities Locations

The Sedibeng District Municipality is located in the southern part of the Gauteng Province. It is composed of 3 local municipalities namely:

- The Lesedi Local municipality to the east
- The Midvaal Local Municipality in the centre of the district, and
- The Emfuleni Local Municipality to the west.

The Aerotropolis will be situated in the Emfuleni local municipality approximately 9.0 km west of the N1 highway.

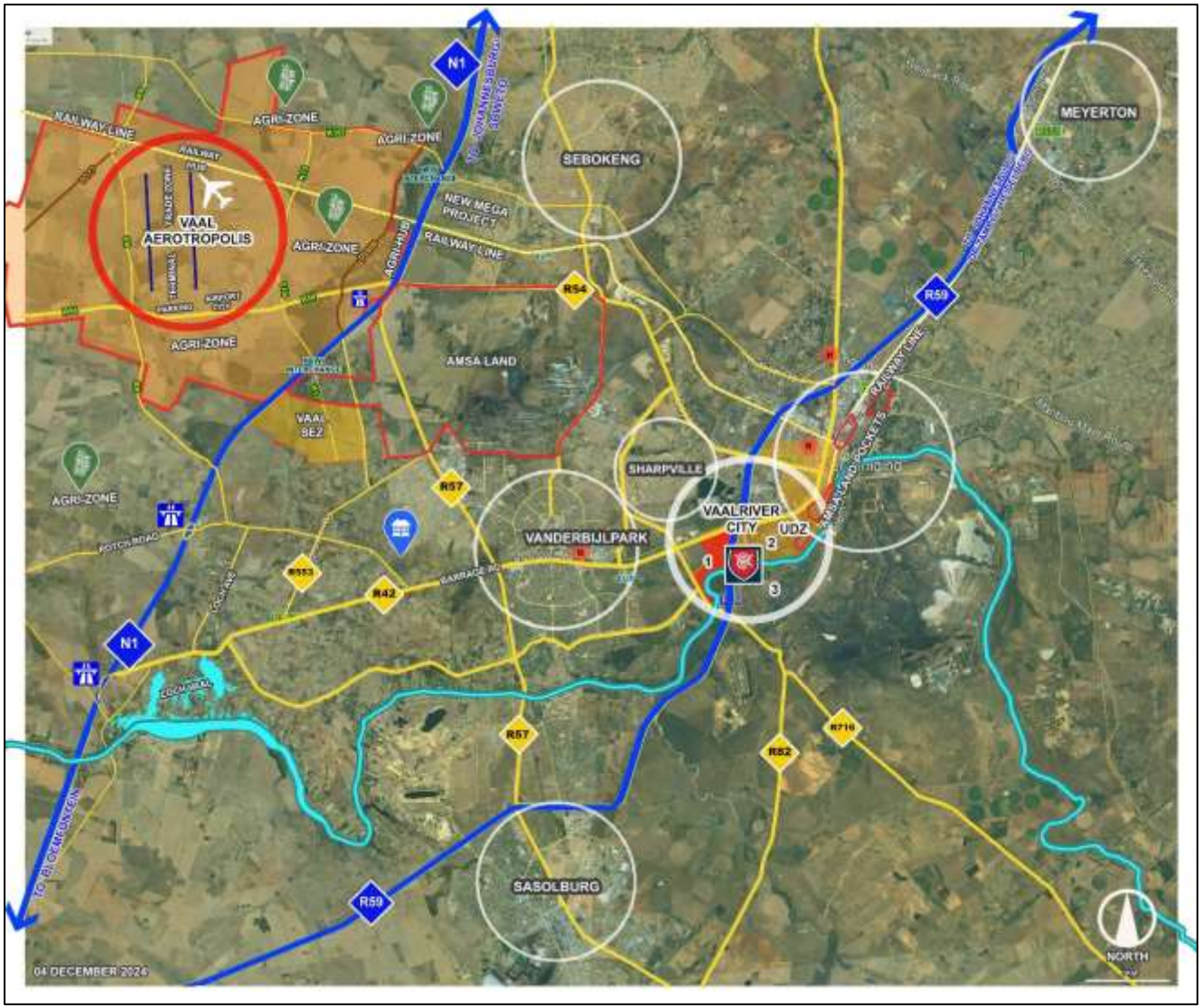

Figure 3-1. Macro Locality Plan.

3.3. Spatial Planning and Land Uses Management Act requirements

3.3.1. Spatial Planning Policy Context

The Spatial Planning and Land Use Management Act 16 of 2013 ('SPLUMA') was signed into law by the President on 2 August 2013 but only came into operation on 1 July 2015

It should be noted that the intention of SPLUMA is that municipal planning is done at municipal level and not at Regional, Provincial or National levels of government. This is why the content of a municipal SDF is much more detailed and extensive than the Regional, Provincial or National SDF's, as it has a priority of how municipal areas must be developed. It is also emphasized in the Constitution of South Africa.

The contents of **Municipal Spatial Development Frameworks** are prescribed as follows:

- To give effect to the development principles and applicable norms and standards set out in Chapter 2 of SPLUMA.
- Include a written and spatial representation of a five-year spatial development plan for the spatial form of the municipality.
- Include a longer-term spatial development vision statement for the municipal area which indicates a desired spatial growth and development pattern for the next 10 to 20 years.
- Identify current and future significant structuring and restructuring elements of the spatial form of the municipality, including development corridors, activity spines and economic nodes where public and private investment will be prioritized and facilitated.
- Include population growth estimates for the next 5 years.
- Include estimates of the demand for housing units across different socio-economic categories and the planned location and density of future housing developments.

- Include estimates of economic activity and employment trends and locations in the municipal area for the next 5 years.
- Identify, quantify and provide location requirements of engineering infrastructure and services provision for existing and future development needs for the next five years.
- Identify the designated areas where a national and provincial inclusionary housing policy may be applicable. Include a strategic assessment of the environmental pressures and opportunities within the municipal area, including the spatial location of environmental sensitivities, high potential agricultural land and coastal access strips, where applicable.
- Identify the designation of areas in the municipality where incremental upgrading approaches to development and regulation will be applicable.
- Identify the designation of areas in which:
    - More detailed local plans must be developed, and
    - Shortened land use development procedures may be applicable and land use schemes may be so amended.
- Provide the spatial expression of the coordination, alignment and integration of sectoral policies of all municipal departments.
- Determine a capital expenditure framework for the municipality's development programme, depicted spatially.
- Determine the purpose, desired impact and structure of the land use management scheme to apply in that municipal area.
- Include an implementation plan comprising of:
    - Sectorial requirements, including budgets and resources for implementation
    - Necessary amendments to a land use scheme,
    - Specification of institutional arrangements necessary for implementation
    - Specification of implementation targets, including dates and monitoring indicators, and
    - Specification, where necessary, of any arrangements for partnerships in the implementation process

Conversely, the contents of **Regional Spatial Development Frameworks** are prescribed as follows:

- Give effect to the development principles and applicable norms and standards set out in Chapter 2.
- Give effect to national and provincial policies, priorities, plans and planning legislation.
- Reflect the current state of affairs in that area from a spatial and land use perspective of the region.
- Indicate desired patterns of land use in that area.
- Provide basic guidelines for spatial planning, land development and land use management in that area.
- Propose how the framework is to be implemented and funded, and
- Comply with environmental legislation.

3.3.2. Gauteng Spatial Development Framework and Provincial Growth and Development Strategy

This provincial SDF also supports the SEZ approach for economic growth as a tool on page 37. It has identified a new SEZ for Emfuleni (Vaal Region). The SDF has also highlighted that Gauteng is a “freight and logistics hub”. The SDF on page 172 and 184 also provides guidelines for accelerating development of SEZ, especially where there is sufficient private sector interest.
On page 134 the support of the SEZ, green economy and Vaal River Smart City will consolidate the potential of urban critical mass in the Vanderbijlpark/Vereeniging area.

3.3.3. Growing Gauteng Together 2030 (GERT)

The goal for Sedibeng (referred to the as the Southern Corridor) which has suffered significant de-industrialization due to the collapse of the steel industry, is to revitalize the economy. The vision and plans for the Southern Corridor of the GCR, the aerotropolis is the main pillar of future economic growth for the southern corridor with agriculture and agri-processing and logistics.

The Vaal Aerotropolis is indicated as a GCR Apex infrastructure project. The introduction of an SEZ is also a priority of Gauteng City Regional policy where feasible as a mechanism for economic growth.

3.3.4. Sedibeng Spatial Development Framework

This Sedibeng SDF has been amended on the 25th March 2025 by formally including the Vaal Aerotropolis into its SDF. It also supports the development of Special Economic Zones and also on the same date included the Vaal Aerotropolis into the Vaal SEZ process. The map on page 133 indicates two areas along the N1 development corridor where one is where the aerotropolis will be located west of the N1 and along the existing railway line. The Sedibeng SDF on page 131 is “embedded on principles” where two of them are relevant:

- Support and align the SDF’s of municipalities in the Sedibeng District.
- Support appropriate major current and new development initiatives.

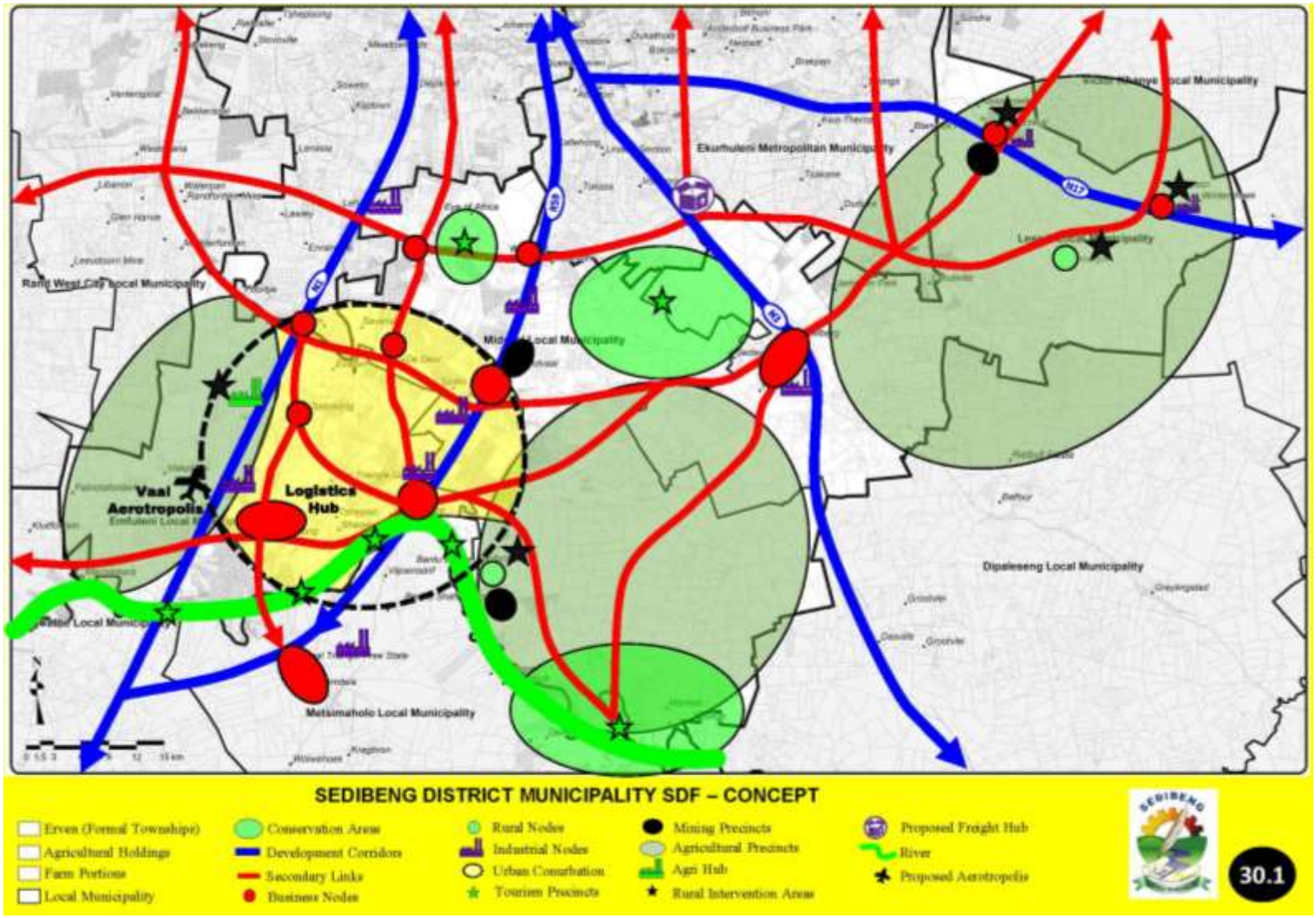

Figure 3-2a. Sedibeng SDF – Concept.

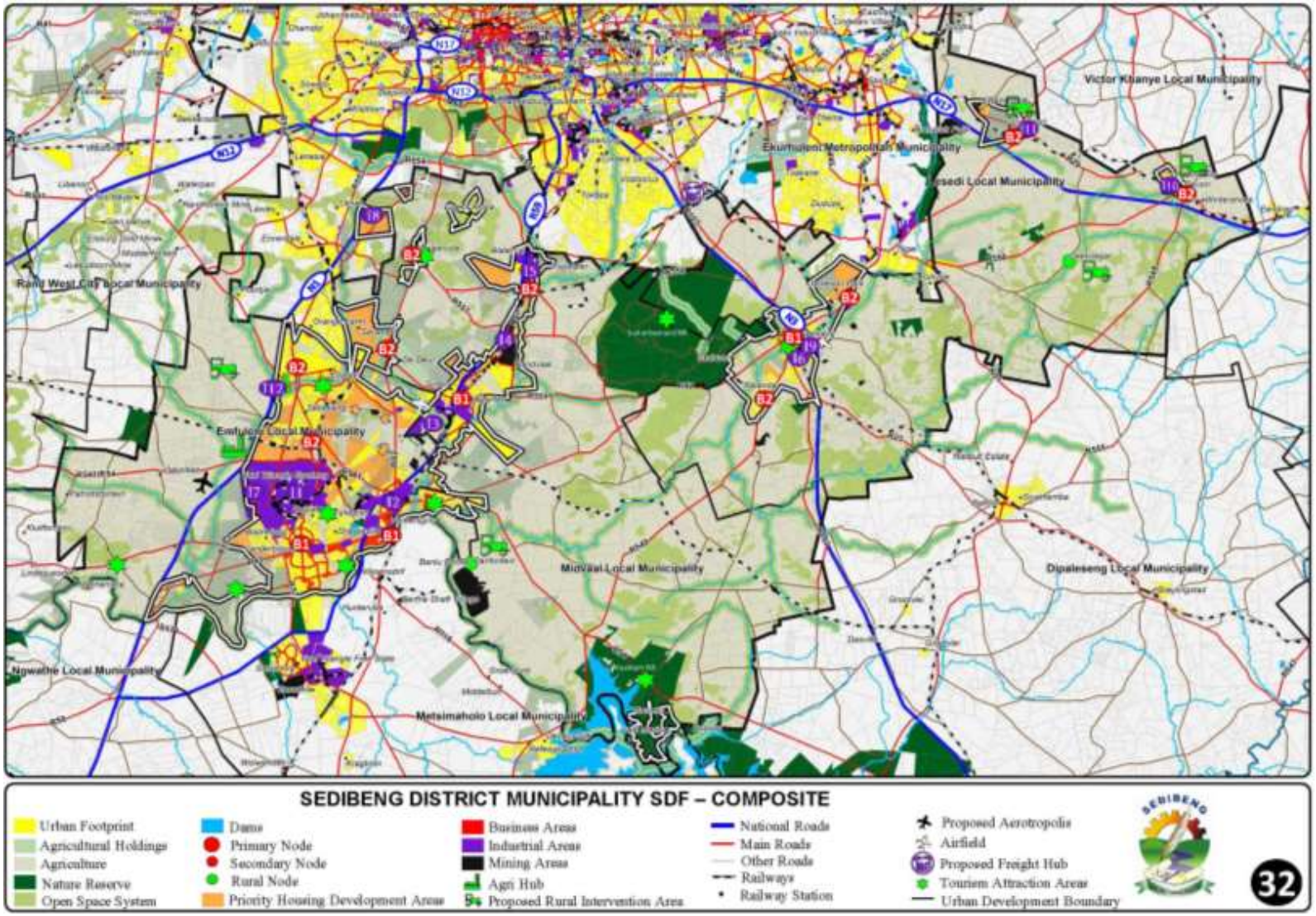

Figure 3-2b. Sedibeng SDF – Composite.

3.3.5. The previous Emfuleni approved Spatial Development Framework

The approved 2021-2022 EMFULENI SDF is in full support of the Vaal Aerotropolis project. The Spatial Development Framework on page 7 of the executive summary and on page 72 of the SDF clearly describe the location of the Vaal Aerotropolis to the west of the N1 corridor and its linkages to the agri-zone, agri-park and logistical hub. Its location is also demarcated as being inside the Urban Development Boundary (UDB).

Page 92 of the SDF document also emphasizes the logistical hub including the airport. The Emfuleni SDF has also identified various “special projects” including the Vaal Aerotropolis as being essential for catalytic to the economic growth of the municipality. These are detailed on Section 5.9, in particular, in 5.9.2 “the Emfuleni Aerotropolis”, pages 241 to 244.

This SDF is approved and binding on all levels of government. This has also been confirmed in an Emfuleni Local Municipality letter dated 10 April 2024.

3.3.6. The newly approved Emfuleni Spatial Development Framework

This SDF has been advertised by the municipality for public comment and it is now an approved SDF. It provides clear policy direction of where Emfuleni Local Council intends to steer economic development in the Emfuleni municipal area. This SDF also confirms the location of the Vaal Aerotropolis to the west of the N1, and inside the Urban Development Boundary (See Map below). The Emfuleni SDF provides several proposed interventions such as: Project 8 requires an “Urban Development Plan for the proposed Airport and Logistic Hub”. This has also been confirmed in a letter of support from Emfuleni Local Municipality dated 10 April 2024.

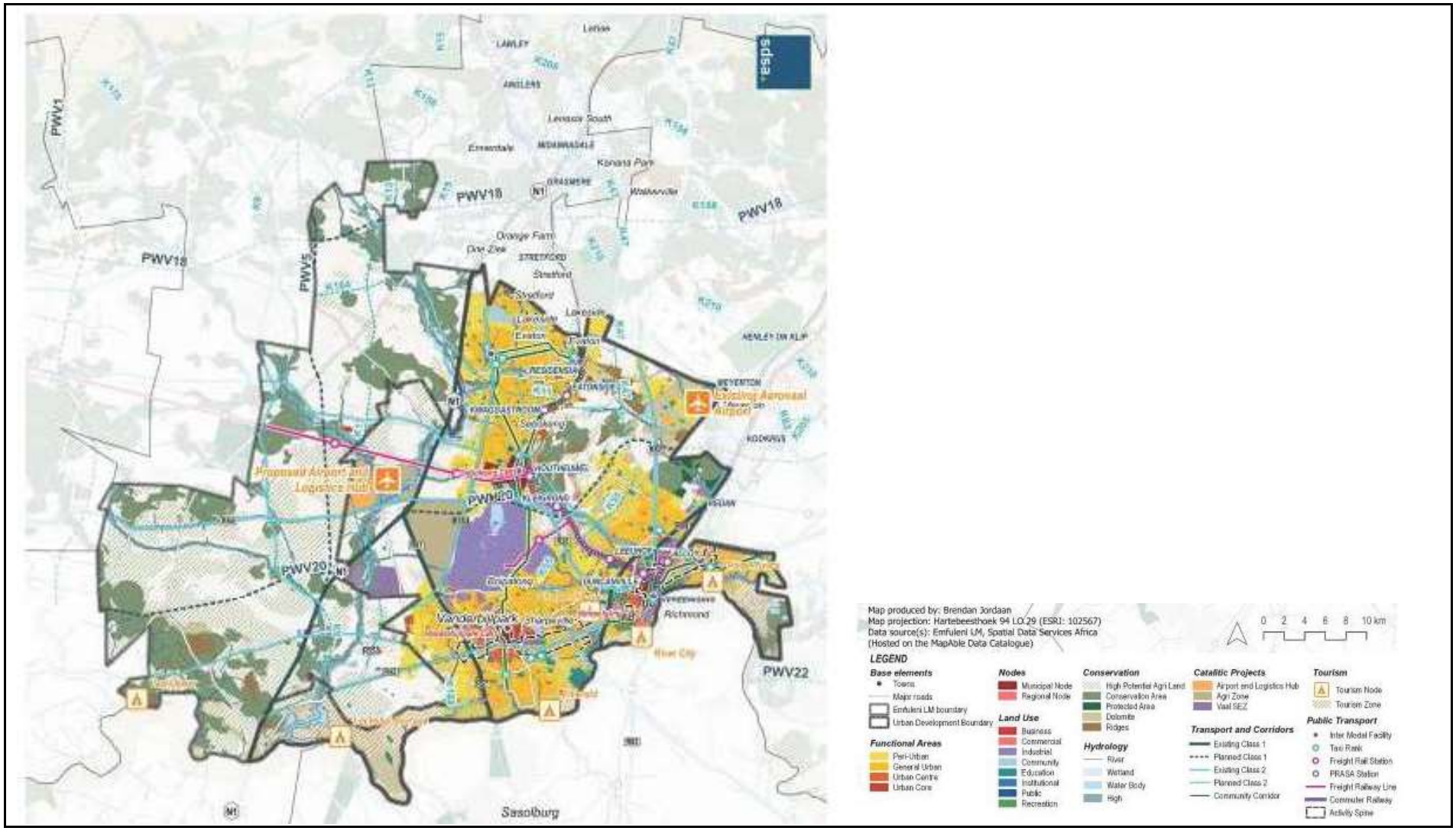

Figure 3-3. Emfuleni SDF.

3.3.7. Draft Vaal-River Regional Spatial Development Framework

The draft VRRSDF has clearly defined spatial planning and economic development objectives contained on page 14. These objectives support the establishment of an aerotropolis in the Vaal River region. A new airport is mentioned to be located within the Emfuleni Local Municipality, more specifically to the west of the N1 Highway. One of the key regional development constraints identified is that the existing logistic infrastructure will prohibit economic growth.

The key influencing economic factors are as follows:

- Economic diversification
- Growth in sectors with competitive advantage
- Regional infrastructure and connectivity.

In the draft VRRSDF, the Rietkuil Agri-Hub is mentioned as a proposed agricultural development in Emfuleni to the east of the Vaal Aerotropolis. Inter land sub-regional described the land west of the N1 in Emfuleni as part of the Central Urban Conurbation Subregion.

Concept Connectivity indicates the N1 as national corridors and also the location of the proposed aerotropolis west of the N1. The Spatial Development concept for the VRRSDF on four development principles are as follows:

- Growth focus
- Connectivity
- Concentration
- Conservation

Besides the last principle, all other 3 principles are met by developing an aerotropolis along an existing railway and a national road corridor. The Spatial Development concept again supports the location of the aerotropolis to the west of the N1 as it is linked to urban and industrial development focus areas.

The proposed Agri-hub also requires an airport to have an economic advantage in order to export agriculture product and produce from the region worldwide The Emfuleni SDF is fully in support of the Vaal Aerotropolis to be located to the west of the N1. The Vaal Aerotropolis supports diversified economic growth for the region and cannot be used as an infill project due to its requirements but needs to be close to corridors and agricultural products. For obvious reasons, an international airport cannot be an infill development next to existing residential developments.

The approved Emfuleni SDF have purposely supported the location of the Vaal Aerotropolis for the abovementioned reasons. The SPLUMA dictates that a Regional SDF must support and align to a municipal SDF and not the contrary. Proposed Development and critical linkage corridors indicate the proposed aerotropolis along development corridors and critical linkages to the west of the N1 and adjacent to the existing railway line. The draft VRRSDF indicates the location of the Vaal Aerotropolis to the west of the N1. It also adjoins the proposed Vaal SEZ to the east of the N1. The draft VRRSDF supports “the establishment of a SEZ which comprises of a Transnet container depot, an industrial development zone, an airport, warehouses and storage facilities, and intelligence information infrastructure to form a Logistic Hub”. This is an important flagship project within the Vaal River region.

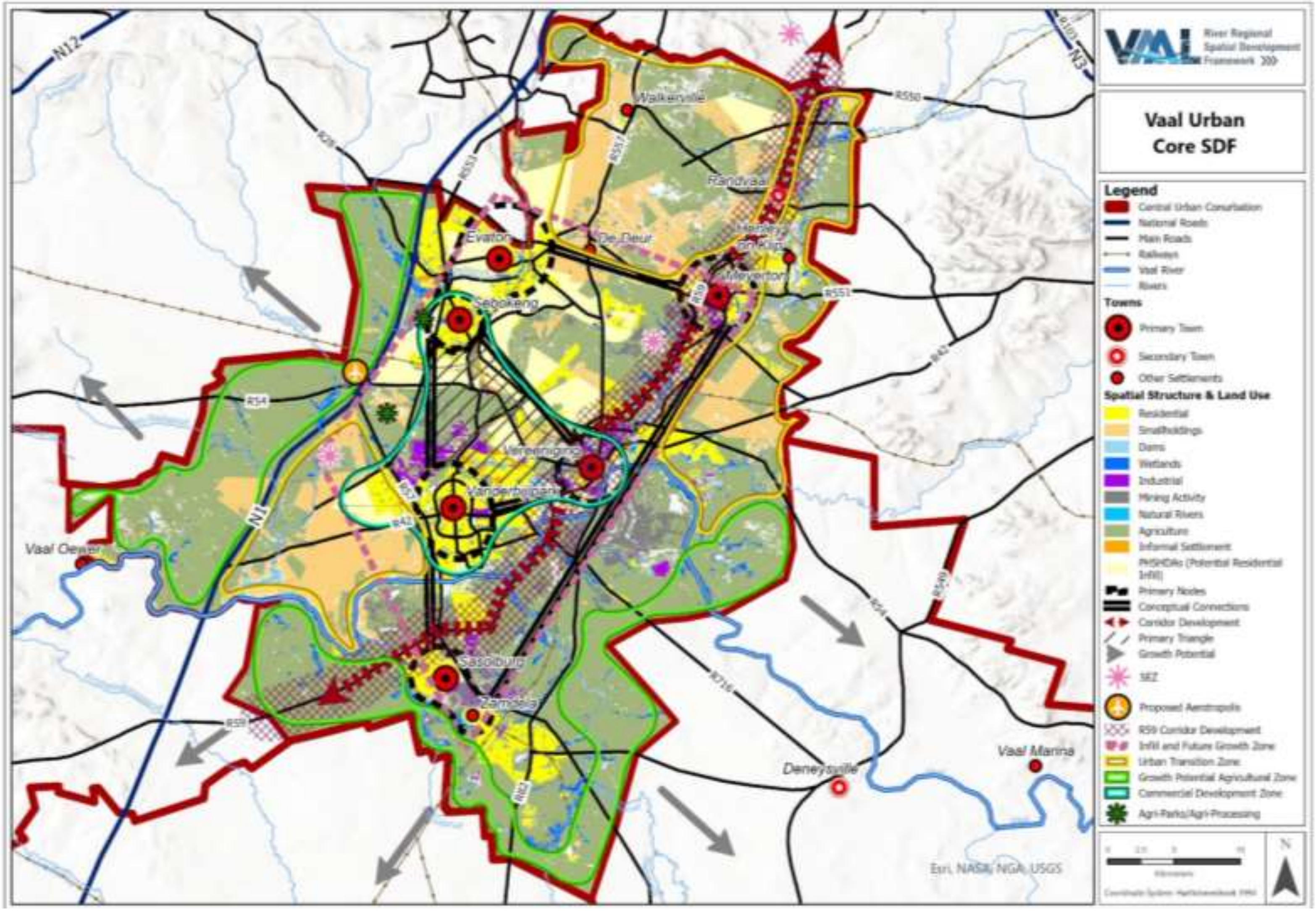

Figure 3-4. Vaal Aerotropolis SDF.

3.3.8. Rietkuil Agri-Hub Precinct Plan 2021

The Rietkuil Agri-Hub Precinct Plan 2021 (RAPP) is a conceptual framework for the proposed Rietkuil Agri-Hub, Vaal Aerotropolis and the logistics hub has been formulated. This RAPP proposal has proven feasible, especially the need of the Vaal Aerotropolis and its essential linkages with the Agri-Hub and logistics hub. It is proposed that a Local Spatial Development Framework be compiled and included in the Emfuleni SDF. Many interactions have been taking place between all relevant actors and the proposal has been supported at all levels of government.

The final Rietkuil Precinct Plan was completed on 13 May 2021 for a SEZ designation to be approved by the department of Trade, Industry and Competition, the applicant must have suitable land parcels and preferably public owned land

The figure below shows a summary of planned investment to be made on the proposed land parcels. Potential investors have conducted feasibility studies and developed business case that shown great potential for the parcels of land falling within this area. The proposed Vaal international airport, which has favourably received approval by CITI Bank for potential funding and development, will planned to locate on parcels of land that are being requested from DALRRD and forms part of the Greater Vaal Aerotropolis Development.

This is required for the construction of two required runways for their Vaal International Airport project. Thus far, an Equity Equivalent Investment Programme application has been granted by the DTIC to the tune of **R1,4 billion** which is earmarked for some of the phases for the development of the Vaal International Airport. It is in this programme that black industrialist participation will be sourced upon the creation of Special Purpose Vehicle as well as governance and funding management structure that will govern the disbursements of this funding.

Once all regulatory and statutory compliance matters have been met, the Vaal International Airport may be incorporated into the Vaal SEZ as an extension of the designation licence for the SEZ or will apply for its own SEZ designation. A similar approach to an integrated airport with industrial activities has been achieved in the DUBE Trade Port SEZ, where agglomeration of airport and industrial activity has shown great potential and economic development.

A pipeline of investment proposals for the different land parcels within this precinct which comprises amongst others, the following :

- An aerotropolis - a city developed around an airport;
- An aviation solution entity – Vaal International Airport;
- Trade Zone directly linked to cargo terminal, with airside access to manufacturers, assemblers and distributors;
- Airport City – Premium offices, retail, hospitality and leisure space in an urban green precinct;
- Agri Zone – Integrated perishable supply chain, high tech agricultural sector including a 200 ha of climate controlled green houses, pack houses, tissue lab, providing the first air platform in Africa for export of live animals.

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3.3.9. District Development Model One Plan

The District Development Model (DDM) puts a focus on the implementation of longer-term priority projects, stabilisation of local government and long-term institutionalisation of integrated planning, budgeting and delivery through the development and implementation of the “One Plan”. It is guided by the long-term objectives of the National Development Plan 2030 (NDP) and provides South Africa with long-term perspective through providing broad objectives to eliminate poverty and reduce the levels of inequality and unemployment. The success of the NDP is supported through the implementation of long-term sector strategies which are implemented through short, medium and long-term plans.

The DDM was officially endorsed and supported at various levels of government. After the President's announcement, it gained backing from the Local Government Ministerial and Members of the Executive Council (MINMEC), received approval from the President's Co-ordinating Council (PCC), and was ultimately approved by Cabinet in August 2019. In the context of the Gauteng Provincial Government the Premier's Co-ordinating Forum (PCF) endorsed the DDM approach in December 2019, and the Gauteng Provincial Government EXCO granted approval for its implementation in June 2020.

In line with Section 47 of the Intergovernmental Relations (IGR) Framework Act (Act No. 13 of 2005 that:

a. Strives the objects of local government set out in section 152 of the Constitution.

b. Gives effect to its departmental duties as required by section 153 of the Constitution.

c. Must ensure that National and Provincial government support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and to perform their functions as required by section 154 of the Constitution.

The Sedibeng Draft Second Generation (DDM) One Plan of the Sedibeng District Municipality served before the Municipal Council on Wednesday 27th March 2024 and was subsequently endorsed and adopted by Council.

The Sedibeng One Plan (SOP) document' s emphasis was towards the encouragement of international (grant) funding and the implementation of SEZ to address economic growth and job creation. It was also further highlighted the “need to invest in infrastructure in the district”.

Two projects were identified out of four projects, are related to the Aerotropolis project:

• Sedibeng Catalytic Investments.

• SEZ and Financing.

Collaboration with SEZ's, strategic financing and organizational restructuring are crucial components for successful implementation.

The main competitive advantages of the Sedibeng municipality are linked to agriculture and logistics. These sectors have the potential to grow the regional economy. The SEZ process is the mechanism to implement those economic opportunities. The Vaal Aerotropolis is a perfect example of a catalytic project as described in the Sedibeng IDP 2023-2024 to realize those economic opportunities. The recommendations below as contained in page 54 of the document are fully supported. "The Vaal SEZ will re-vitalise the economy by focusing high-growth sectors: agro-processing, agribusiness, food and beverage, cannabis farming, renewable energy, transport and logistics, and tourism and hospitality. Increase agricultural activities through efficient use of arable land (agro-processing) which take into consideration development corridors and the associated competitive advantage of transport and distribution opportunities. Diversify the economy to be less reliant on single industries such as the manufacturing industry. This would involve examining the following criteria when selecting an industry to diversify:

- Economic potential of the industry
- Complementary industries
- Skill and labour availability for the industry
- Resource availability
- Technological readiness
- Market demand and export potential
- Environmental sustainability in alignment with the Sedibeng Growth and Development Strategy
- Resilience to economic fluctuations

- Competitive advantage
- Risks and challenges
- Promote labour-intensive industries specifically those that can grow by drawing on unskilled and semiskilled workers with strong backward and forward linkages.

This could include the following industries:

- Agriculture and agribusiness: planting, harvesting, food processing.
- Construction industry: site prep, material handling, basic construction.
- Tourism and hospitality: food service, housekeeping
- Healthcare industry: administrative personnel, maintenance workers, aids requiring varying levels of training

- Promote rapidly growing industries with a comparative advantage (e.g. agriculture, agro-processing, logistics)
- The stimulation of investor interest through place marketing which involves the promotion and advertising of the region in an effort to improve the desirability to visit, live and work there. In order to realize these recommendations, the establishment of aerotropolis catalytic project is critical to its success."

The One Plan Vision is "Fostering Sedibeng as an accessible economic development region". In order to implement the vision, key catalytic projects must not only be seen to be supported but be supported by inclusion in approved public documents in order to provide comfort and confidence for the private sector to invest in these catalytic projects.

The DDM pillars is in full support of the Vaal Aerotropolis which will ensure that the SDM will realize its vision.

The document on page 70 states: “The process of identifying programs and projects involves a careful consideration of the unique characteristics and needs of the Sedibeng region, ensuring that each initiative contributes meaningfully to the overall vision.

From infrastructure development to social and economic programs, the selected projects are aimed at fostering sustainable growth, improving the quality of life for residents, and positioning Sedibeng as an accessible economic development region. The programs and projects flow from the strategies to ensure a cohesive and targeted approach towards achieving the envisioned future for the Sedibeng study area. The catalytic project is defined as “projects that kick start economic development and stimulate investment in a particular area”. Catalytic projects are intended to generate development momentum and attract further investment. The Vaal Aerotropolis fits perfectly in this category as it meets the “2 key questions to consider” perfectly. It will also measure very high on “success matric” as it will increase GDP, create sustainable jobs after construction and attract private sector investment.

The Vaal Aerotropolis meets also the next 3 categories to a lesser extent. The process of identifying programs and projects involves a careful consideration of the unique characteristics and needs of the Sedibeng region, ensuring that each initiative contributes meaningfully to the overall vision.

The Vaal Aerotropolis is now described as a catalytic project in all the documents mentioned earlier on.

This catalytic project supports the Vision and the Strategies of the One Plan document and has now been identified as a project in the document to be implemented.

3.3.10. Local Spatial Development Framework

In terms of sections 20 and 21 of SPLUMA only a local municipality can identify the designation of areas in which more detailed local plans must be developed. **This is the ultimate purpose of this document**.

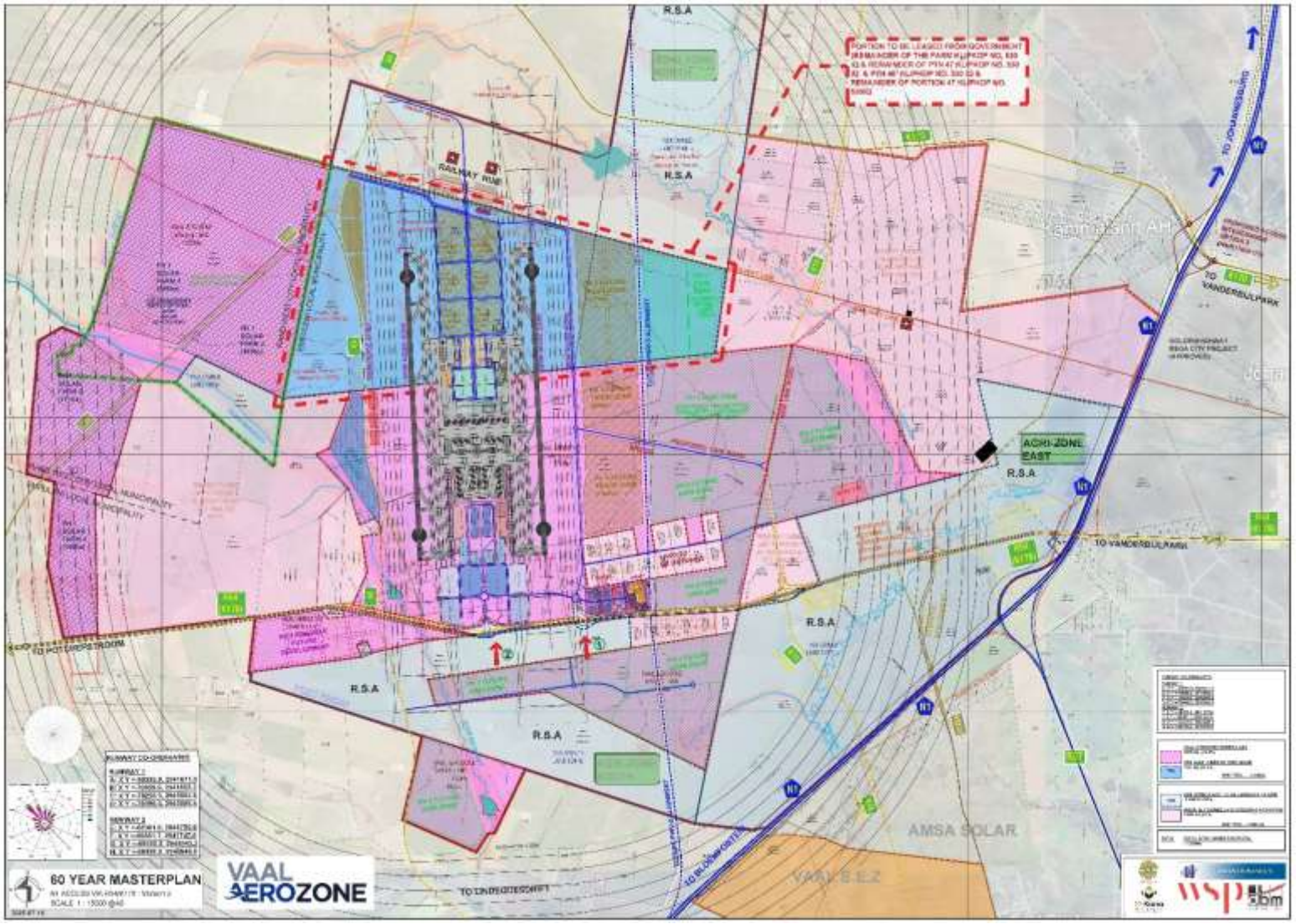

Figure 3-5. Vaal Aerotropolis LSDF.

3.3.11. Emfuleni Local Municipal - Township Establishment Process

- Background:

  The Emfuleni Municipality Spatial Planning and Land Use Management By-Laws, 2018 was published in the gazette on 31 January 2018 after much delay. The implementation thereof was further extended to 1 June 2019. Presently, all land use applications including applications for township establishment, is submitted and processed under this By-Law.

- Town Planning Process:
  - An application for township establishment will be prepared and submitted to the Emfuleni Local Municipality in terms of Section 44(1) of the Emfuleni Municipality Spatial Planning and Land Use Management By-Laws, 2018.
  - If the municipality considers and accepts the application as complete, it allows the applicant to initiate public participation by publishing notices in the prescribed format. The public and any other party has 28 days to object or comment.

    This includes:

    - Notices in the Gazette and 2 newspapers in English and 1 other official language
    - Notices to adjoining land owners
    - The application will be circulated by the applicant on behalf of the Emfuleni Local Municipality both internally and externally for a period of 60 days for comments. Thereafter, the local authority should be in a position to comment on the application.
    - The application will not be approved until such time as all the Technical Departments provide positive comments.
    - An application for township establishment would normally be approved within a 10-to-12-month period depending on the current backlog. In this case, it is our view that we should be able to achieve town planning approval in an 8 - 9-month period.

The following may be reasonable time frames:

	Action Necessary	**Number of Days**	**Time Frame**
Preparation	Consultation & Preparation of Application	21 days	1 month
	Submission of Application for amendment of a pending application	-	
Evaluation: Submission	Council Evaluates application for compliance	14 days	½ month
Circulation	Internal & External Circulation	60 days	2 ½ months
	Respond to objections, comments, etc	14 days	
Approval	Allocation to Planner at Council	14 days	3½ months
	Preparation of Approval (Report)	60 days	
	Approval	30 days	
	Final erf numbers & Conditions of Establishment	30 days	1 month
Post Approval	General Plan – survey, submission & approval	2 months	
	Clearance Certificates for Services	Depending on engineering services	
	Opening of Township Register	3 weeks	
	Proclamation	1 month	

Table 3-1. Time frames.

- Applications for township establishment are submitted parallel with an application for environmental authorization (EA). The municipality will not approve an application for township establishment until such time as a positive EA has been achieved.

- A township establishment application requires reports and coordinated input from various other consultants, including the following studies / reports:
  - Civil Engineering (Roads & Stormwater and Water & Sanitation)
  - Electrical Engineering
  - Traffic Impact Assessment
  - Geotechnical Studies
  - Environmental Impact Assessment including specialist studies related to wetlands, ecology, hydrology, noise impacts, etc
  - Conveyancers Certificate
  - Land Surveyors Certificate
  - Layout Plan & phasing

3.3.12. Land use Plans

After the township has been established and proclaimed for the Vaal Aerotropolis area and it has been serviced with engineering infrastructure, site development plans can be submitted and building construction can be initiated.

The land use rights approved through the township establishment process will be entrenched but flexible as the final total development will take around 60 years to be completed.

It is envisaged the development will be phased through the drafting of various precinct plans. The zoning rights will be entrenched only for the first phase of the development. The other phases of the development will have their zoning rights approved but only implementable through the approval of Site Development plans (SDP) and/ or consent of the municipality. This will allow and enable the payment of development contributions only on zoning rights usable and only rates and taxes on zoning rights used.

The zoning will be split between Aerodrome and Agriculture zonings with specific conditions related to land uses required by VA.

STATEMENT OF INTENT: To provide, preserve, use land or buildings for Agricultural productivity, Industrial development and uses ancillary to agricultural activity and industrial accommodation are permitted at the discretion of the Municipality.		
USE OF LAND AND BUILDINGS: AGRICULTURE		
Column 1: PRIMARY RIGHTS	**Column 2: CONSENT USES**	**Column 3: PROHIBITED USES**
• Agricultural buildings • Agricultural land • Dwelling houses • Second dwelling house and out-buildings in connection therewith. • Staff accommodation.	• Agricultural Industry • Communication facility • Places of instruction • Places of public worship • Social halls • Warehouses • Special buildings and special uses	• Building and land uses not included in columns 1 and 2

Table 3-2. Use of Land and Buildings: Agriculture.

STATEMENT OF INTENT: This zone makes provision for the landing and take-off of aircrafts, facilities for refuelling and repair, and various accommodation facilities for passengers.			
USE OF LAND AND BUILDINGS: AERODROME			
Column 1: PRIMARY RIGHTS	**Column 2: CONSENT USES**	**Column 3: PROHIBITED USES**	**ADDITIONAL CONTROLS**
• Aerodrome • Buildings necessary for and in connection with an Aerodrome	• Commercial uses, business purposes and special uses which are subservient and related to the uses mentioned in column (1) • Communication facility	• Buildings and other uses not included in columns (1) to (2)	• Land uses specified in this table are permitted in the Airport Zone at Municipality's sole discretion and must be specifically related to the functioning of the airport, as well as other works ancillary to the function of an airfield and subject to agreement being reached on the permissible floor area ratio,

	• Dwelling units for key personnel • Places of refreshment • Shops • Special building and special uses • Filling stations • Conference facilities and ancillary uses		coverage and height restrictions, the placing of buildings on the site, on-site parking requirements and/or any other related matters by way of a site development plan in terms of this Scheme. Such site development plan shall have due consideration for any relevant regulations on airports and any related legislation as may be laid down from time to time by the Minister of Transport or any other responsible authority.

Table 3-3. Use of Land and Buildings: Aerodrome.

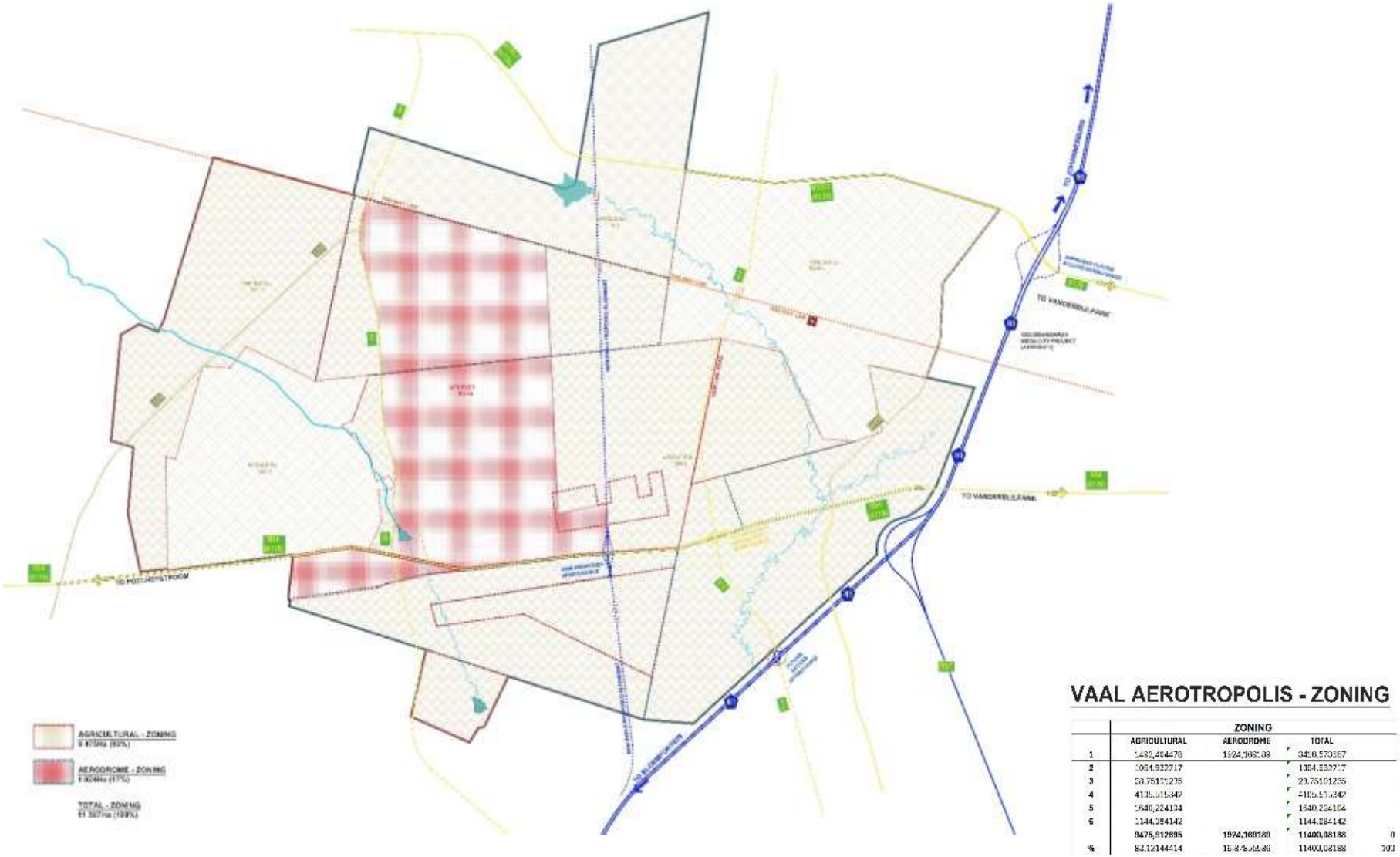

Figure 3-6. Vaal Aerotropolis – Zoning.

For the purpose of clarity, the following definitions are included as contained in the ELUS:

Agricultural Building

Means a building designed for use in connection with, and which is ordinarily incidental to, or reasonably necessary in connection with the use of the land on which the building is situated as agricultural land, and may include staff accommodation and not more than two dwelling houses.

Agricultural Industry

Means a building on agricultural land used for the intensive production in any form whatsoever, of poultry, game birds, livestock and allied products, and includes any final processing of these commodities and the processing of cultivated produce.

Agricultural Land (Uses)

Means arable, meadow and/or pasture land used for bona fide farming activities, such as crop or grain farming, grazing, land used for bee-keeping, bird and animal breeding and keeping, livestock farming, dairy farming, game farming, aquaculture, nursery gardens, plantations, orchards, market gardens and such other ancillary uses and buildings, normally regarded as incidental thereto.

Business Purposes

Means land or buildings used for offices, banks, hair and beauty salons, and any other business activity not elsewhere defined or listed in the Scheme, but excludes a Shop, Warehouse, Industry and Filling station.

Commercial Use

Means land or buildings used for purposes such as assembling and packaging, distribution centres, wholesale trade, storage, mini storage units, warehouses, cartage and transport services, laboratories and computer centres, and may include a canteen, offices and ancillary retailing of their products.

Warehouse

Means buildings used for the storage of products or materials for distribution or collection, in relation to any wholesale trade, or in relation to any manufacturing industry. A building or use of land for the exclusive purpose of storage of goods, which in the opinion of the Municipality are not dangerous, noxious or unsightly and includes wholesales trade, and may also include ancillary office accommodation which is subsidiary to the main use, but excludes any retail trade on the property of such building, unless the special consent of the municipality has been obtained.

The following floor areas for various land uses are indicated for Phase 1 and for the total project in the following table

AIRPORT BUILDING AREAS										
	Airport Terminal	**Multi Storey Office Park**	**Cargo Terminal**	**Freight Forwarding**	**RFFS**	**Airport Maint-enance GSE**	**Hangars**	**Catering**	**Total Building area**	**Site area**
PHASE 1	47635	120000	15000	40000	10000	23000	29000	10000	**294635**	12133904.63
FINAL PHASE	207934	480000	51000	180000	20000	110000	96000	98000	**1242934**	12133904.63

TRADE ZONE		
	Trade Zone Building Area	**Site Area**
PHASE 1	176000	352000
FINAL PHASE	1217650	2435300

AERO CITY		
	Aero City Building Area	**Site Area**
PHASE 1	4000	346544
FINAL PHASE	371409	742819

Table 3-4. Airport Building Areas.

4. SITE PLANNING INFORMANTS

4.1. Overview of the Section

The main purposes of this section are to understand what has guided the proposed development of the aerotropolis; the on-site and off-site opportunities and constraints.

4.2. Sub Metropolitan Context

A study conducted by Genesis Analytics in August 2018, commissioned by the CEOs Initiative called Vaal Region Regeneration Action Plan, recommended that:

- Existing industries in the region have declined as a result of meta-level forces like the drop in the global demand in mining, construction and infrastructure
- A big part of rejuvenating the region rests on rejuvenating mining, construction and infrastructure but must be based on market demand and market trends
- Another key recommendation is the introduction of sunrise industries like agriculture and agro-processing in the region to stimulate growth and employment
- Government support should be positioned to encourage new industries i.e., fuel cluster such as Hydrogen and Original Equipment Manufacturers (OEMs), revitalize the steel industry and existing companies to transition into new industries or new markets

- Government should also provide a clearer line of sight to planned infrastructure spend so that the private sector can either plan accordingly or make alternative financing arrangements to accelerate bulk infrastructure development in partnership with government
- Stimulation from government in the form of incentives for private sector participation and the right stimulus needs to be revised in order to attract the right private sector partners.

4.3. The Site

The site is located approximately 9 km west of the N1 motorway within the municipal boundary of the Emfuleni Local municipality. The site is owned mainly by the developer of the aerotropolis, either through direct ownership or through lease of public owned land. The area owned by Aerozone totals ±4000 ha and the area to be leased is around ±1200 ha. A small portion of the land is privately owned by neighbours for the moment. The site is in a rural type of environment and the land is mainly developed for farming activities with streams bisecting them. The total envisaged site area is approximately 12125 ha in extent. The airport takes up approximately 1924 ha and the agricultural uses take up 9475 ha. The site extent and Land Ownership details are illustrated in the following Land Ownership Plan (plan to be updated to show municipal boundaries etc).

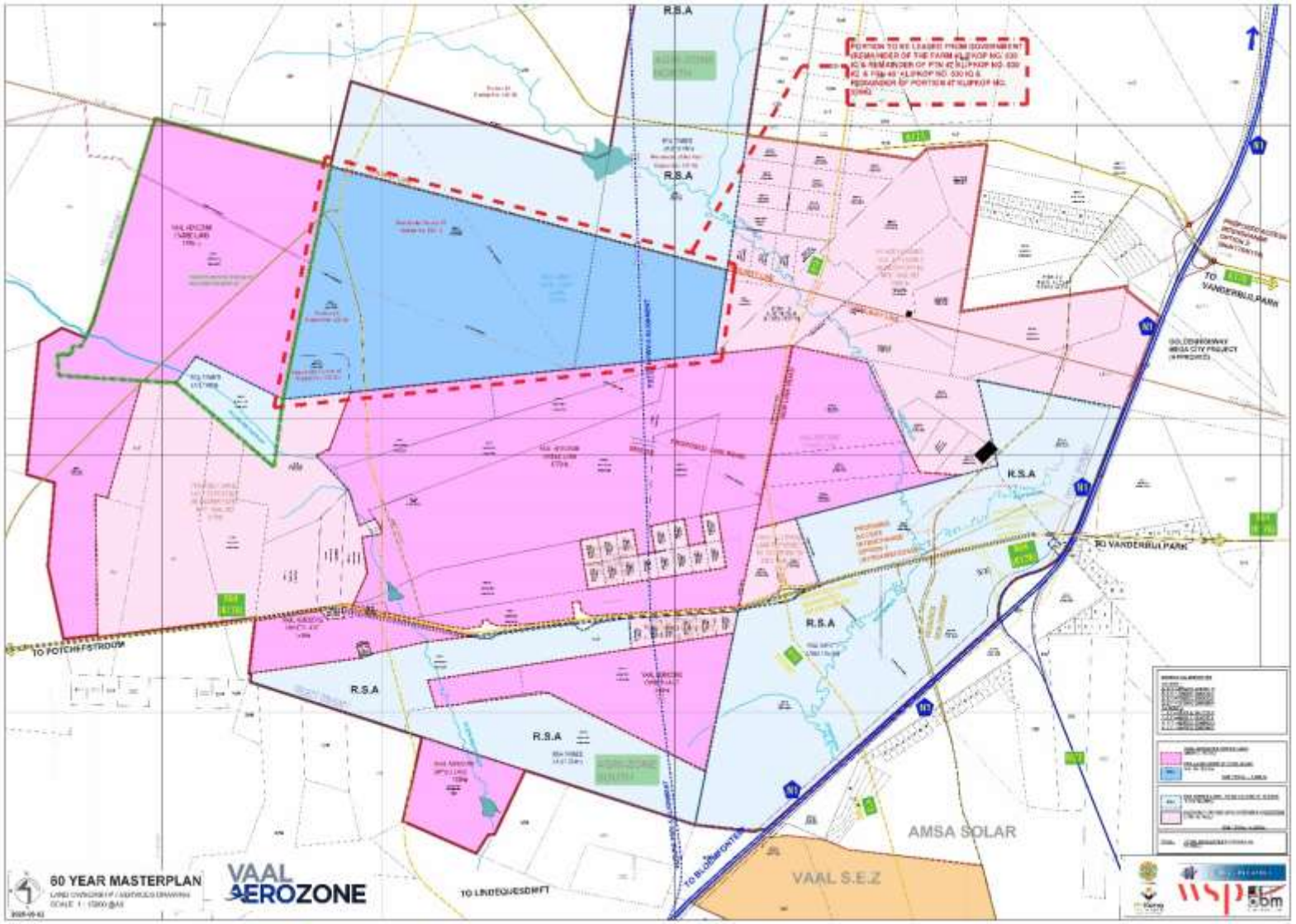

Figure 4-1. Vaal Aerotropolis – Land Ownership.

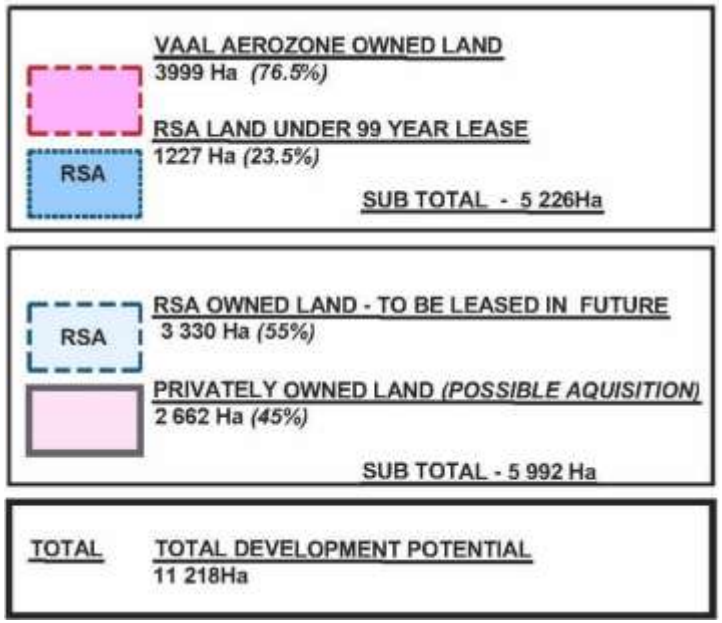

Table 4-1. Vaal Aerotropolis – Land Ownership.

4.4. Implications of the Air Platform for the Spatial Organisation of the Site

A high-level study of the Obstacle Limitation Surfaces (OLS) has been undertaken to provide a preliminary assessment of the safeguarding requirements and therefore potential constraints for Aerotropolis developments surrounding the Airport Precinct. The objectives of the definition of the OLS are to define the airspace around the Airport precinct to be maintained free from obstacles as to permit the intended aircraft operations to be conducted safely. The OLS define the limits to which objects may project into the airspace.

The definition of the OLS undertaken for Vaal Aerotropolis has been aligned to the ICAO Annex 14 international regulation. The image overleaf shows an example (source ICAO) of the OLS defined for a precision approach runway category III:

- conical surface;
- inner horizontal surface;
- approach surface and inner approach surface;
- transitional surfaces;
- inner transitional surfaces; and
- balked landing surface.

The description and characteristics of each of the OLS are contained in the ICAO Annex 14 Chapter 4 and ICAO Airport Services Manual Part 6.

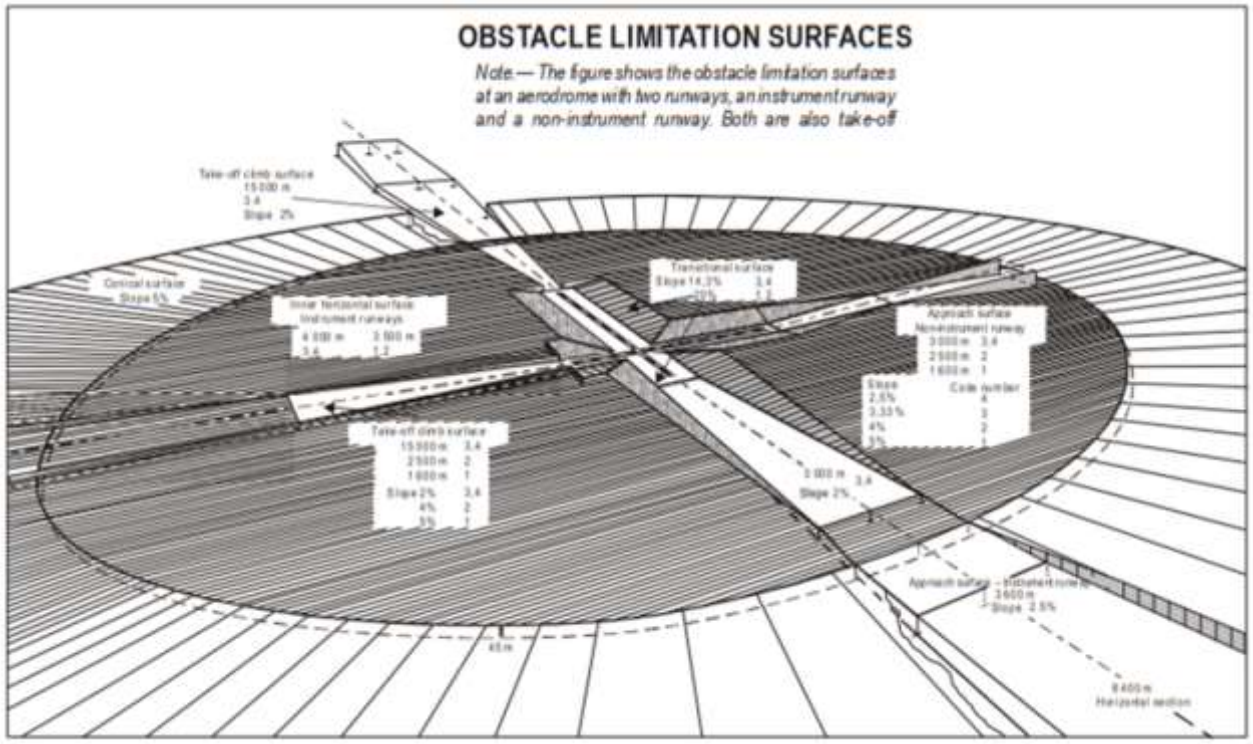

Figure 4-2. ICAO Obstacle Limitation Surfaces (Source: ICAO).

The next image shows the Runway Approach surfaces and Transitional surfaces based on the airport layout plan assuming a 1700m runway spacing. The Approach surface is a combination of inclined planes preceding each threshold; starting from the runway strip, the two sides of the Approach surface diverge uniformly at a specified rate from the extended centre line of the runway; the two sides meet the Transitional surface which develops from the side of the runway strip at the level of the runway platform and slopes upwards and outwards to the inner horizontal surface located at 45m above the runway level; the image below shows the Approach and

Transitional surfaces levels (every 10m) from the runway level to 45m where they join the Inner horizontal surface which represents a horizontal plane above the aerodrome.

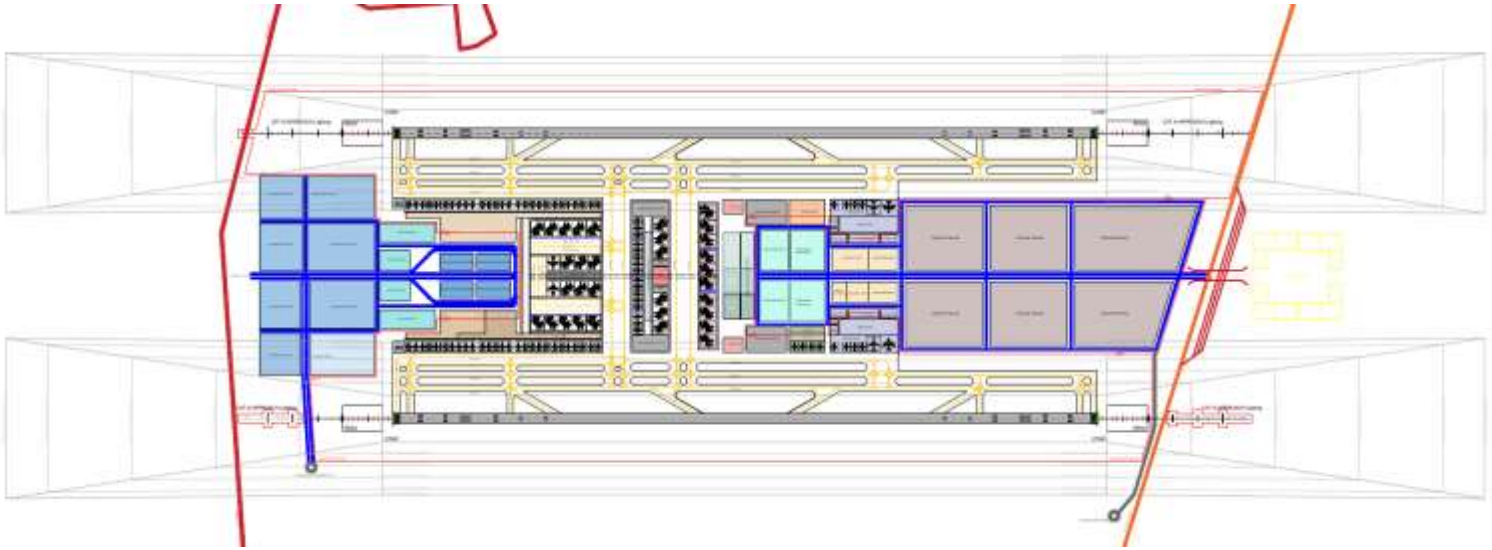

Figure 4-3. Airport Precinct Layout Plan for 45mppa with basic OLS.

The entire extension of the OLS for the two runways is shown in the next image.

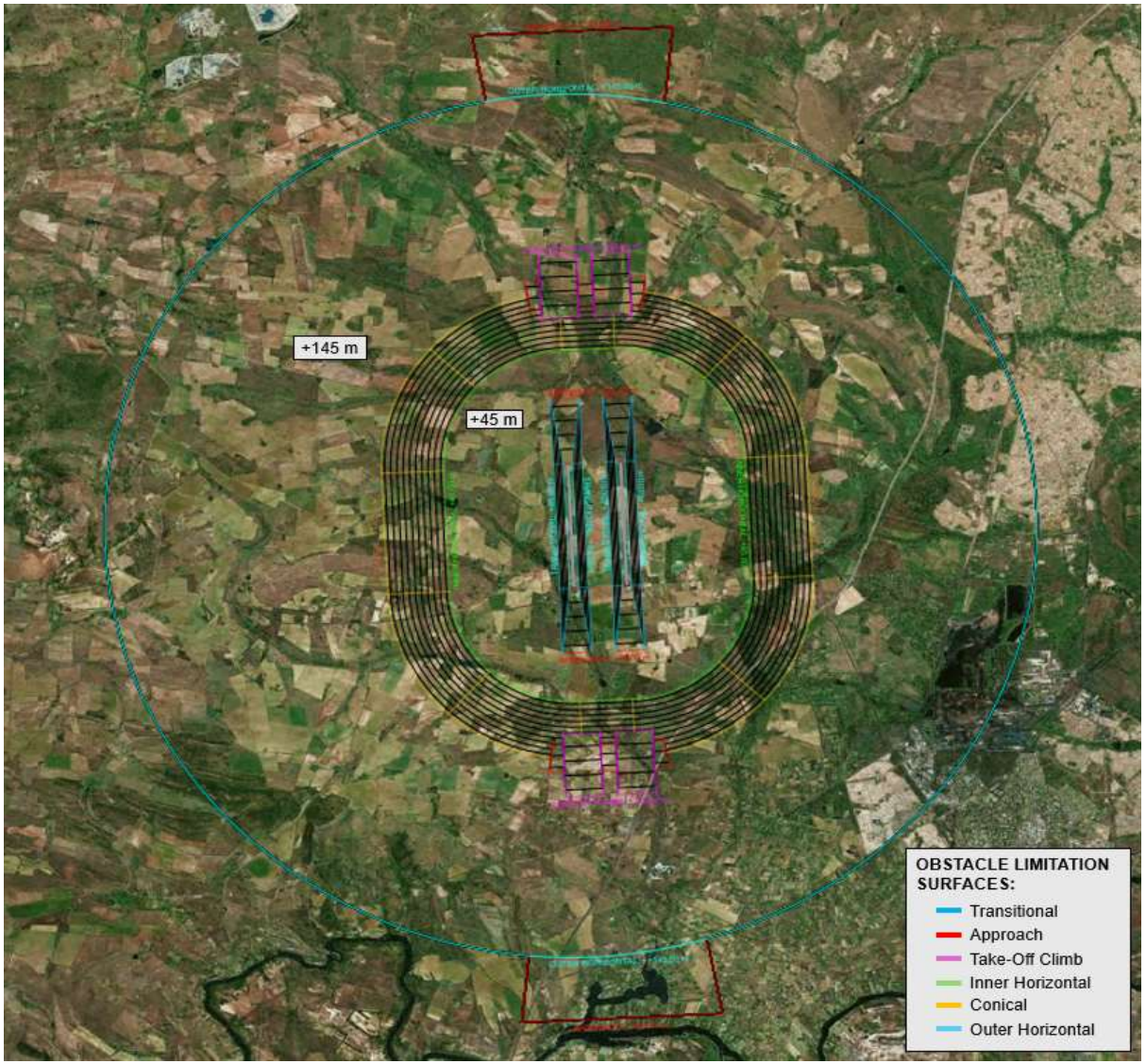

Figure 4-4. Obstacle limitation surfaces for the Airport Precinct (45mppa).

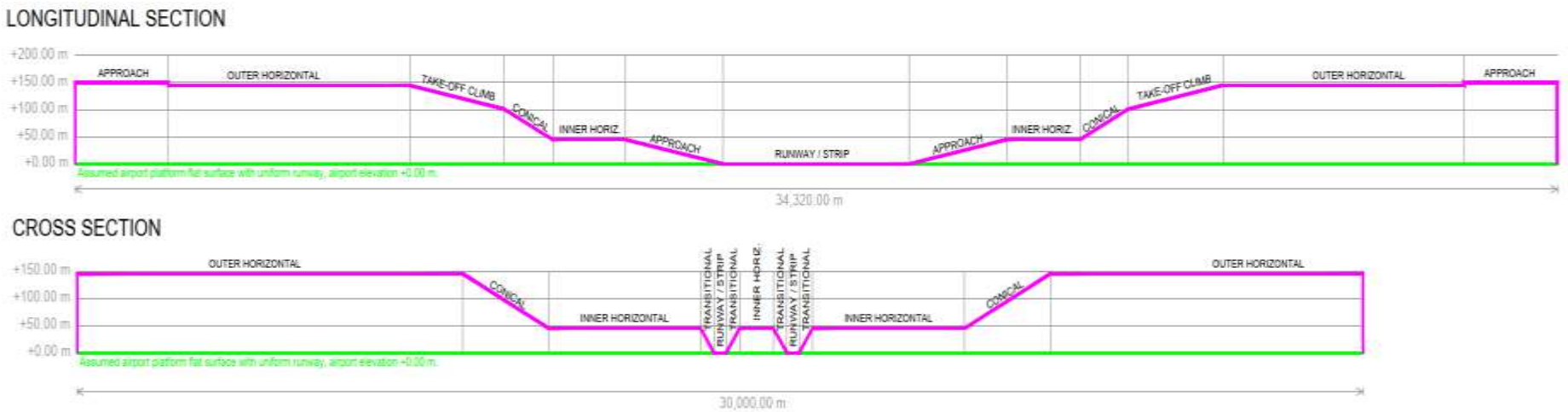

Figure 4-5. Obstacle limitation surfaces for the Airport Precinct (45mppa), longitudinal section and cross section.

The Inner horizontal surface develops at a height of 45m over the runway level from the Transitional surface and Approach surface to the Conical surface (highlighted in green in the previous figure). The Conical surface slopes upwards and outwards from the periphery of the Inner horizontal surface to the Outer horizontal surface (in orange) at 145m over the runway level. In correspondence to the extended centre line of the runways the Conical surface joins the Approach surface (in red) and Take-off climb surface (in magenta). The contours of the Conical surface are provided with 10m intervals from 45m to 145m above the runway level.

It should be noted that no assessment has been undertaken to determine the optimum airport platform elevation based on three-dimensional balanced cut and fill earthwork calculations. Therefore, the working assumption is that the airport platform will be a flat surface with a uniform runway and airport elevation. The obstacle limitation surface heights represented on the plans are therefore considered in relation to the height in metres above the assumed runway level. Further studies are required in the next design phases in order to establish the optimum airport platform elevation and any slopes permitted. This will then enable a subsequent assessment of the existing terrain to identify if there are any obstacles that could potentially infringe the runways' obstacle limitation surfaces.

4.4.1. Runways and Aircraft Approach / Take-Off Zones

The Obstacle Limitation Surfaces (OLS) associated with the proposed Airport are described in section 2.3. The OLS protects aircraft operations in the airspace closest to the airport and these impose some planning restrictions on neighbouring land uses. The Aircraft Approach and Take Off surfaces extend beyond the end of each runway or runway threshold and are required to provide maximum safety for the operations of the aircraft during landing or taking off. Development of buildings and structures in these zones are limited for safety reasons, however some low occupancy land uses are sometimes permitted in these areas, e.g. car parking, provided that there is no impact on aviation safety.

The runways and the associated OLS largely define the available space for airport development. The area between the two runways will be developed for the key Airport Precinct facilities such as car parking, passenger terminal building, apron, cargo terminal building, and trade zones. Buildings outside of the airport precinct located close to the airport must also be compliant with the OLS requirements so to avoid any infringement of the obstacle surfaces and endanger aircraft flight operations.

4.4.2. Building Height Restrictions

Building height restrictions for developments adjacent to the airport to the east and west of the airport are determined by OLS, specifically the Transitional Surfaces and Inner Horizontal Surfaces, defined in section 2.3. The Transitional Surface restrictions on building height decrease the further the distance is from the edge of the runway strips and form a building height restriction “envelope” which extends from the runway ground elevation outwards until it connects with the Inner Horizontal Surface that surrounds the airport, which limits development to below 45m above the runway elevation. Currently no buildings within the Vaal Aerotropolis master plan are proposed to infringe the transitional surface slope or exceed the 45m height restriction imposed by the Inner Horizontal Surface.

4.4.3. Noise Zones

The determination of noise zones is dependent on the flight tracks, characteristics of different aircraft types as well as the development layout and is important as the zones will place restrictions on developments immediately adjacent to the airport platform. Various noise zones have been identified, mapped and incorporated into the planning and design of each development precincts. The preliminary noise zones based on the expected ATMs and aircraft types for the different phases of the development have been modelled at high level and can be seen below. The modelling of these zones will be refined during the EIA process.

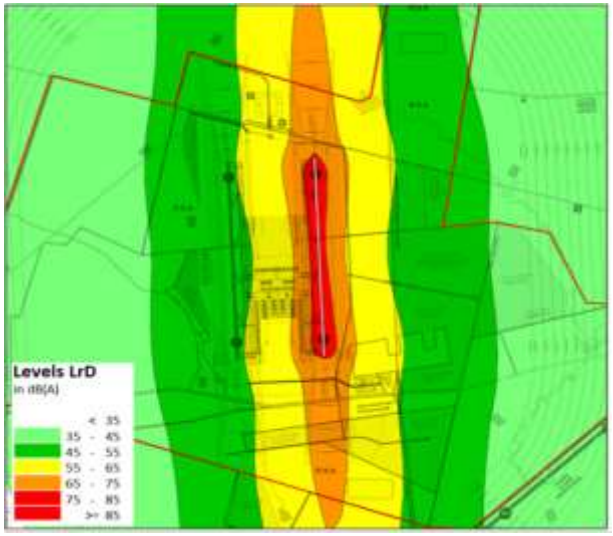

Figure 4-6. Preliminary Noise Zones for phase 1 (with 23 ATM's per hour)

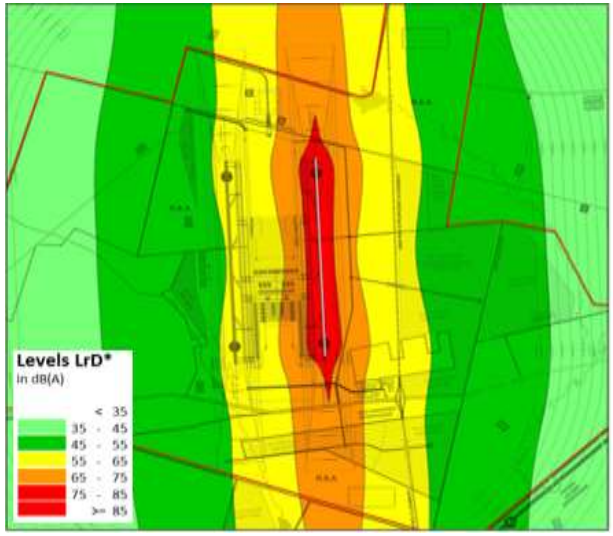

Figure 4-7. Preliminary Noise Zones for phase 2 (with 55 ATMs per hour).

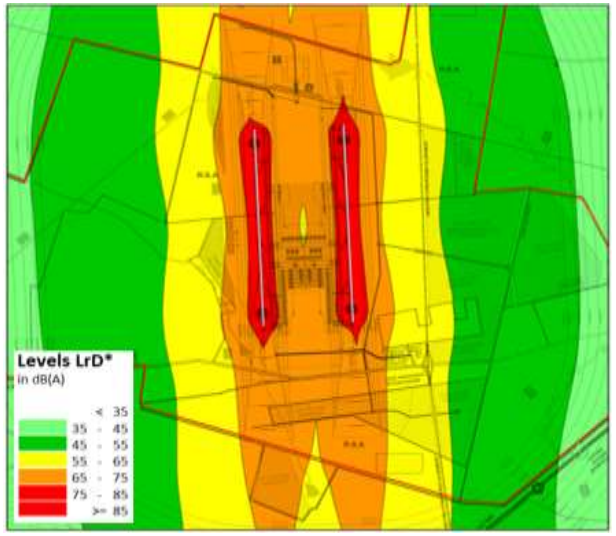

Figure 4-8. Preliminary Noise Zones for phase 3 (with 84 ATMs per hour).

4.5. Geophysical Conditions

4.5.1. Topography and Landform

The site is located within the Vaal Catchment with two perennial water courses namely the Leeuspruit, located along the north-eastern portion, and the Klein Rietspruit, a tributary to the Rietspruit River, along the southwestern portion of the study area. The confluence of the Leeuspruit and the Rietspruit is located east of the study area.

The topography of the study is undulating with the heights above sea level ranging from 1500 masl. in the northwest to 1450 masl. The predominant slope of the study area is between 2% to 6%.

In the southeast (Figure 4-9). The undulating terrain of the study area provides for the development of an interconnected airport platform which easily connects to the Airport city and Agri zones.

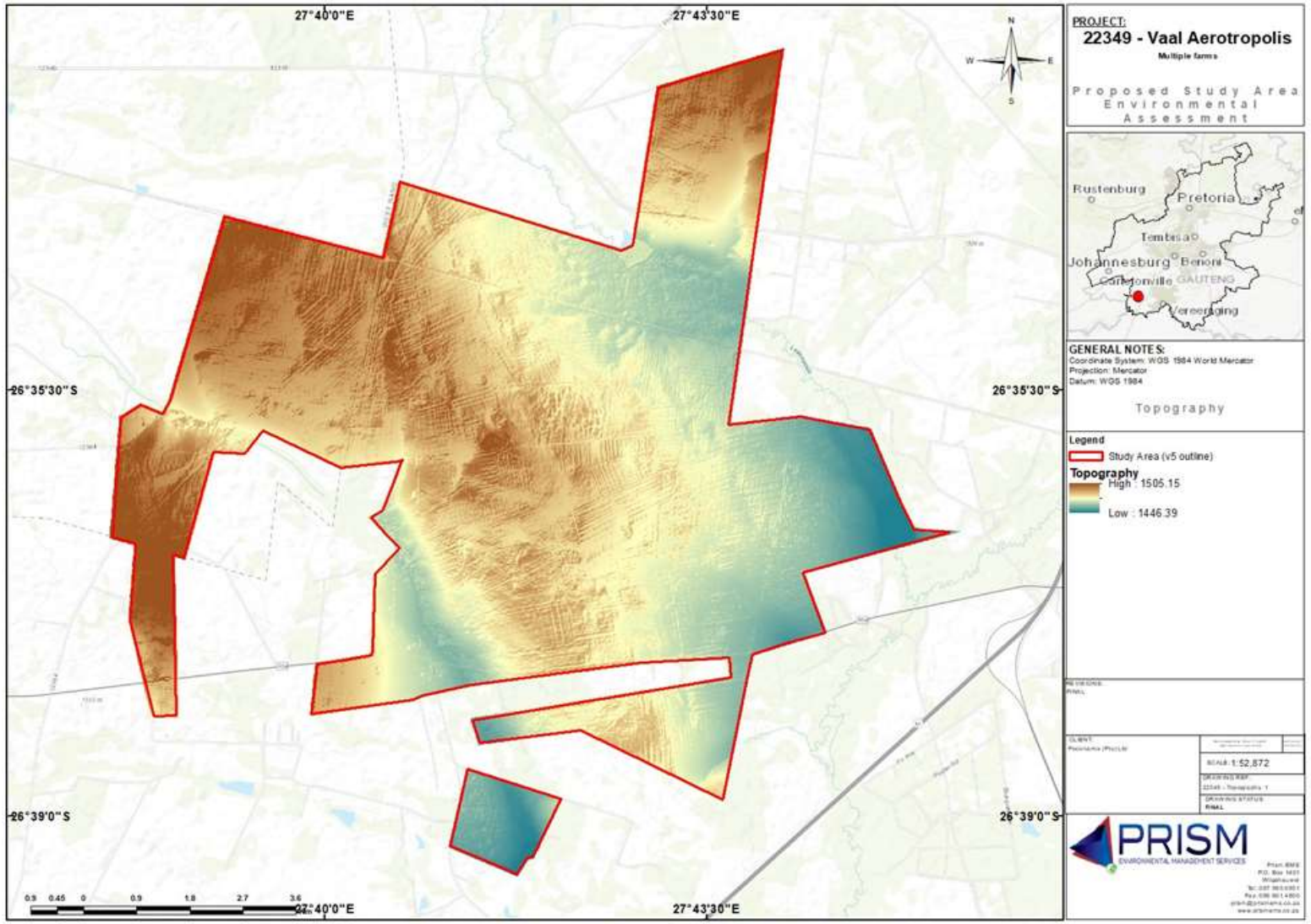

Figure 4-9. Topography of the study area.

4.5.2. Ecology

The landscape of the study area consists mostly of cultivated fields with a few patches of open grassland vegetation in between and intersected by natural freshwater systems. Initial screening and site verification assessments have been undertaken in order to identify environmental sensitivities. Studies undertaken as part of the Environmental Impact Assessment (EIA) for the aerotropolis have identified various sensitivities in terms of fauna, flora, aquatics and wetland systems.

The study area is situated within the Soweto Highveld Grassland vegetation type which forms part of the Mesic Highveld Grassland Bioregion and Grassland Biome (Mucina and Rutherford, 2006) (Figure 4-10). The Soweto Highveld Grassland is endemic to South Africa and consists of undulating landscapes on the Highveld plateau supporting short to medium-high, dense, tufted grassland. The grassland is dominated with *Themeda triandra* and a variety of other species such as *Elionurus muticus*, *Eragrostis racemosa, Heteropogon contortus*, and *Tristachya leucothrix*. Small wetlands, narrow streams, pans and occasional ridges or rocky outcrops occur in the continuous grassland cover (Mucina and Rutherford, 2006). The Soweto Highveld Grassland vegetation type is classified as vulnerable with approximately 61% transformed by agriculture, urban development and mining (Mucina and Rutherford, 2006; SANBI, 2021; DFFE, 2022). The study area occurs within an extensive agricultural landscape where farming has taken place since the early 1900's and very little of the natural vegetation type is still present on the site.

The Gauteng Biodiversity Conservation Plan, also known as the C-Plan (version 3.3, 2011 & version 4, 2024), indicates that Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs) and Irreplaceable Areas are located within the study area (Figure 4-10 & Figure 4-11). These conservation areas are mostly associated with the natural freshwater systems of the Leeuspruit (north-eastern section of site), Rietspruit (southeast of site) and Klein Rietspruit (western and southern portions of site) as well as tracts of natural grassland surrounding them.

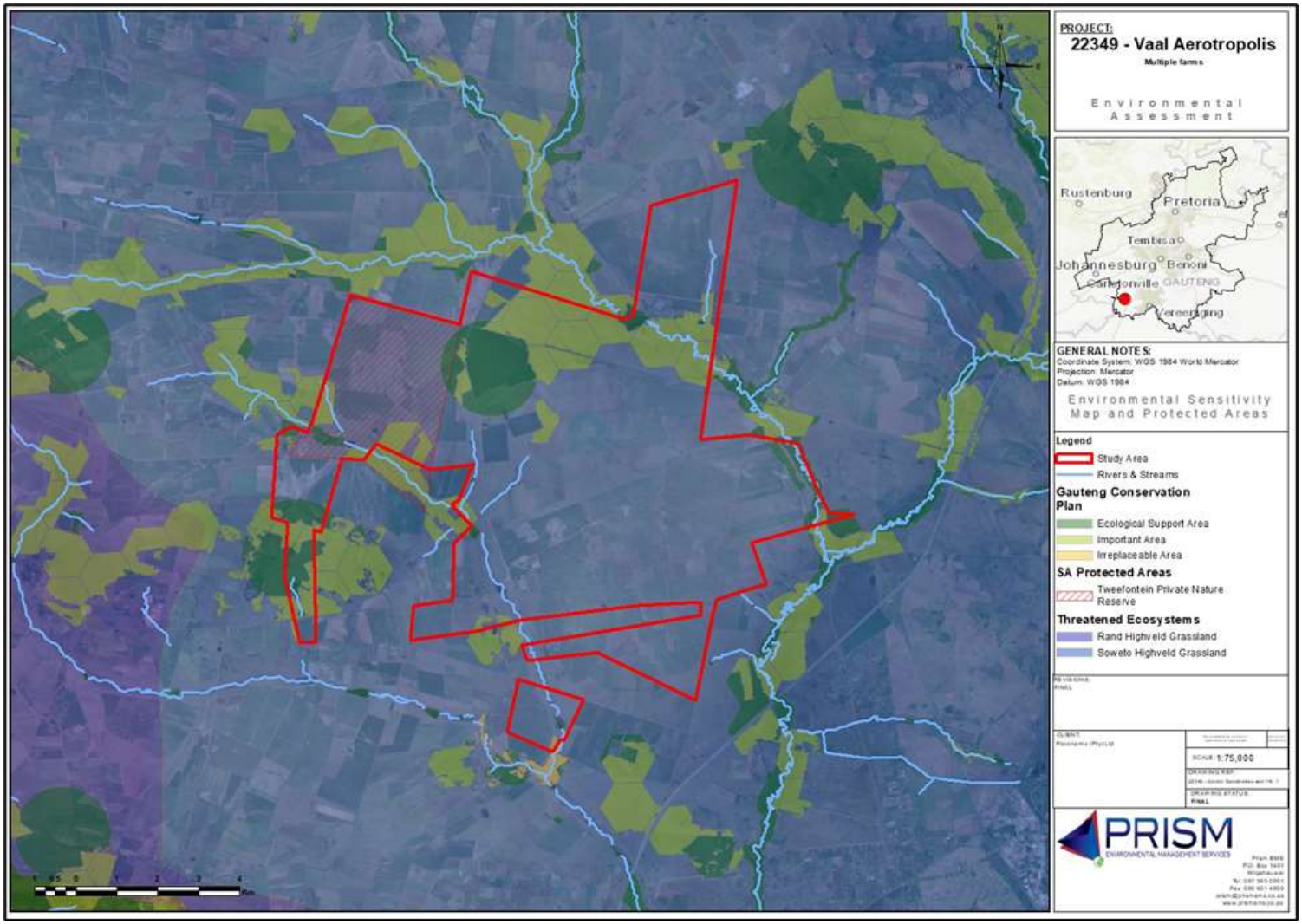

Figure 4-10. Environmental sensitivities in terms of the Gauteng Biodiversity Conservation Plan (v3.3) as well as Threatened Ecosystems.

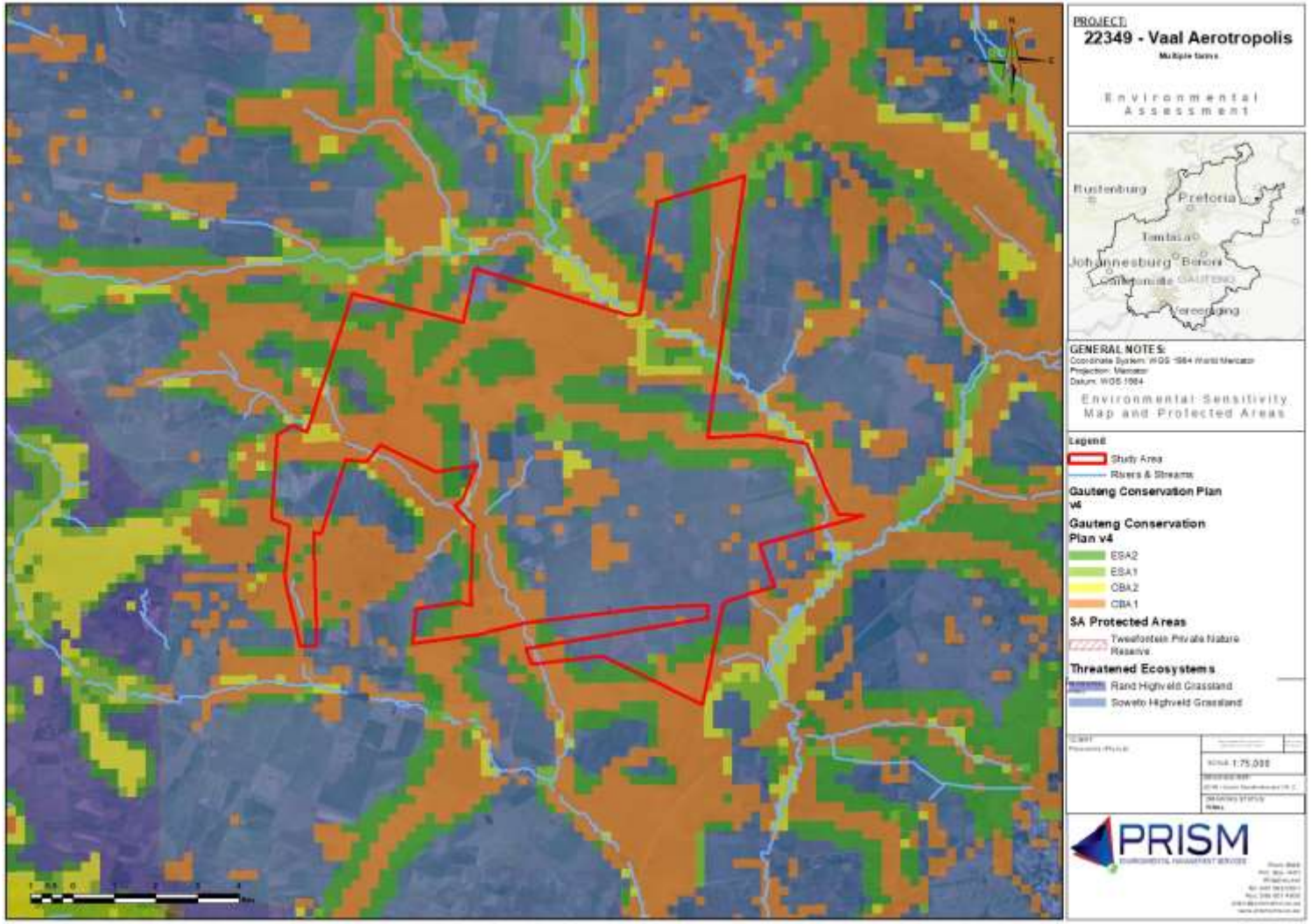

Figure 4-11. Environmental sensitivities in terms of the Gauteng Biodiversity Conservation Plan (v4) as well as Threatened Ecosystems.

In terms of faunal sensitivity, various species have been identified as vulnerable and endangered especially with reference to avi-faunal species. A total of 117 bird species were recorded on site which includes grassland species, generalist species adapted to farmland, raptors and species typically found around freshwater ecosystems. Five Species Survival Commission (SSC) listed bird species were recorded in the study area which includes the Greater Flamingo (*Phoenicopterus roseus*), Yellow-billed Stork (*Mycteria ibis*), Black-winged Pratincole (*Glareola nordmanni)*, Red-footed Falcon (*Falco vespertinus)*, and Maccoa Duck (*Oxyura maccoa*). Furthermore, the endangered butterfly species, *Insecta-Aloeides dentatis dentatis*, has been found on the site, north of the railway. The faunal sensitivities are mostly associated with the freshwater resource in the study area as seen in Figure 4-12. All sensitivities were taken into consideration during the planning phase of the development and all reasonable measures were taken to minimise the impact on these sensitive species.

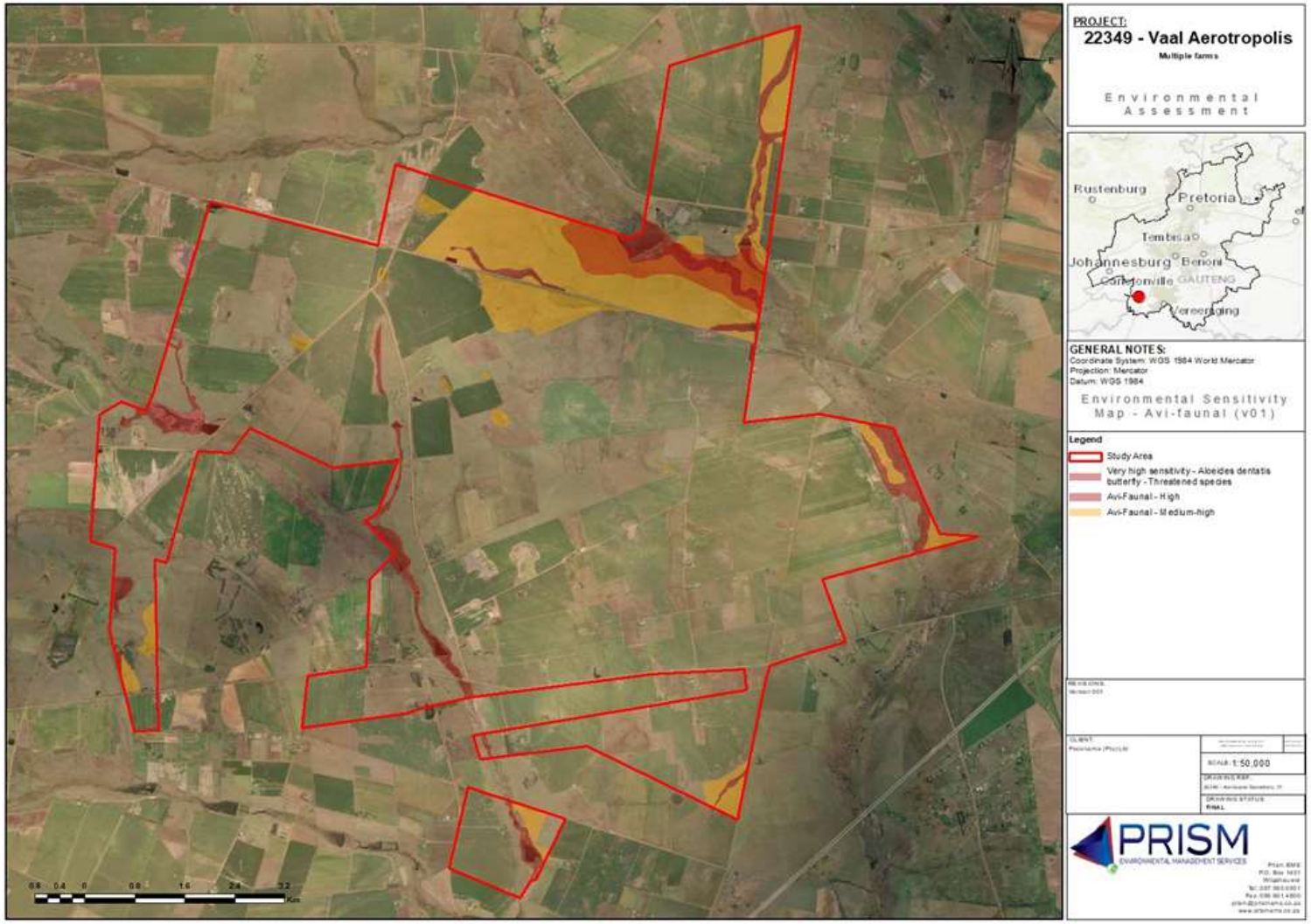

Figure 4-12. Faunal sensitivity with specific reference to Avi-faunal sensitivities and areas identified with threatened species.

The proposed development is located within the quaternary catchment C22J of the Vaal Water Management Area. Along with the Leeuspruit and Klein Rietspruit four (4) wetland groups were identified by the Wetland Assessment undertaken for the EIA as indicated below and in Figure 4-13:

- Channelled valley-bottom wetland;
- Unchanneled valley-bottom wetland;
- Artificial wetlands; and
- Seepage wetland.

All the wetlands identified are encapsulated within a system of natural, transformed, and agricultural vegetation/land cover units that exist on the site.

The valley systems and associated vegetation and wetland groups are an opportunity to link the ecological assets of the site to the main ecological corridors of the Rietspruit, Klein-Rietspruit and Leeuspruit rivers which ultimately discharge into the Vaal River. This will enable the possible establishment of an amalgamated and strong on-site open space system that will add value to the proposed development. As mentioned previously, all sensitivities have been taken into consideration during the planning phase to inform the location and orientation of the proposed development (Figure 4-14).

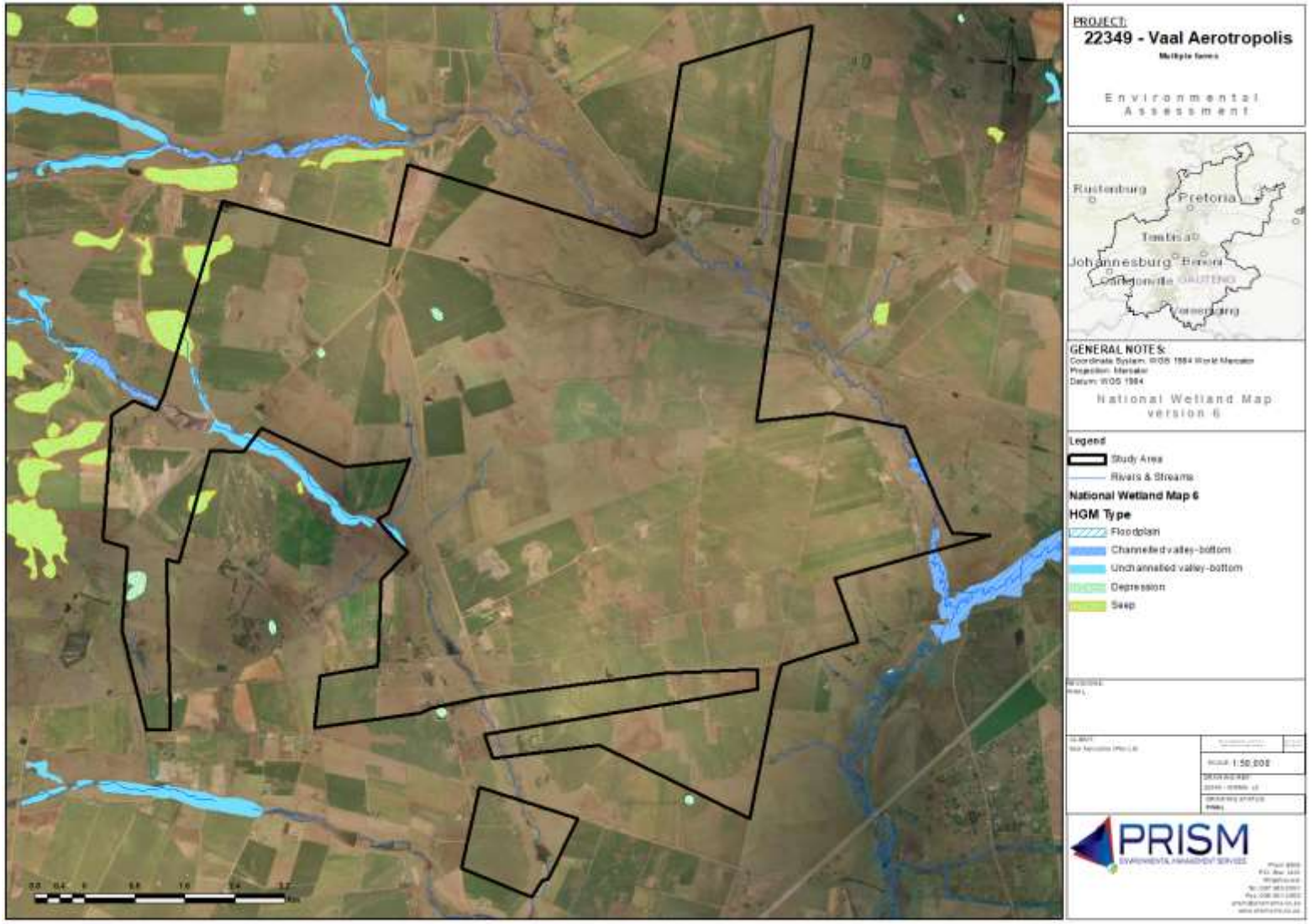

Figure 4-13. National Wetland Map Version 6 Map.

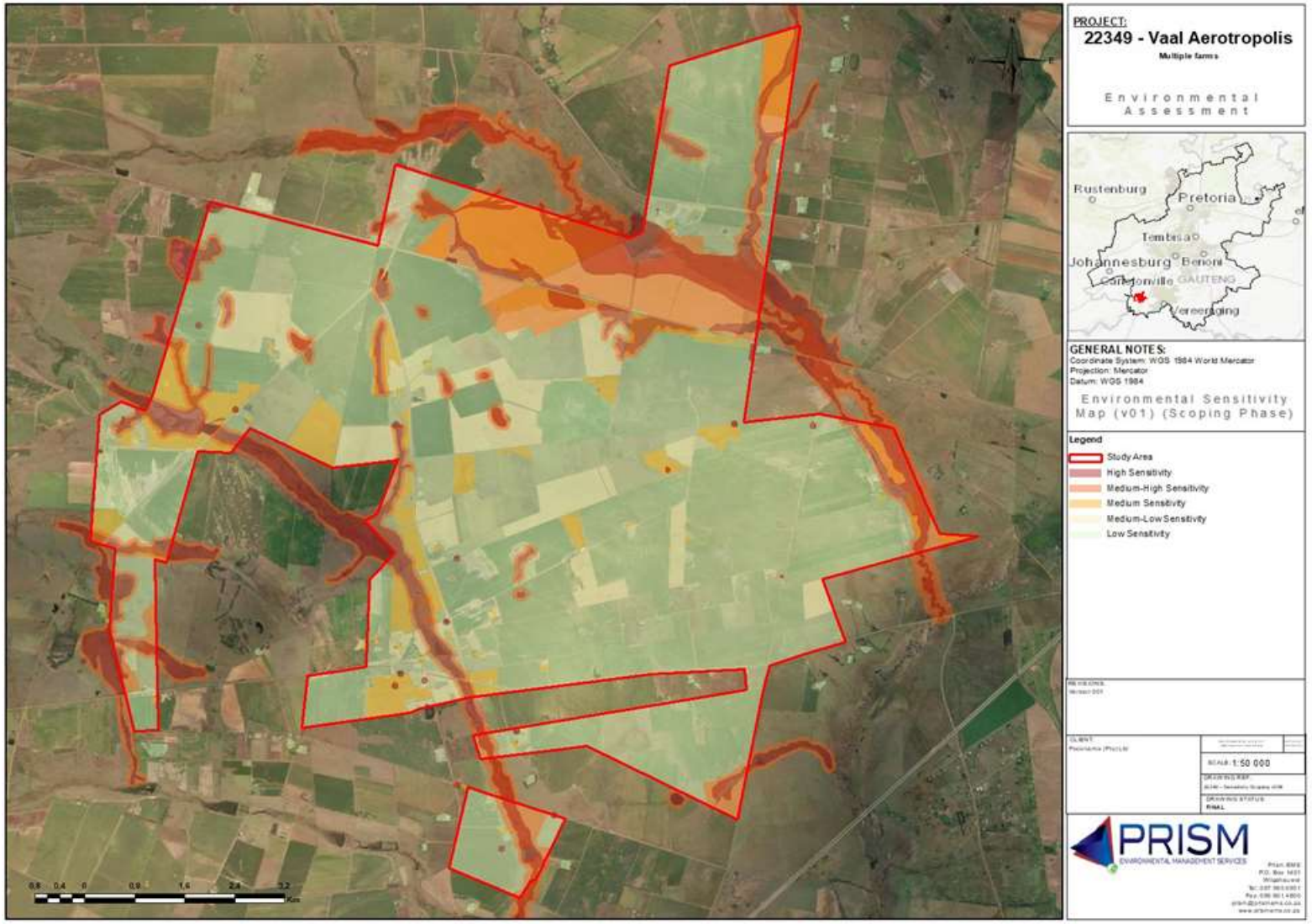

Figure 4-14. Combined Environmental Sensitivity Map.

4.5.3. Geological (Geotechnical)

4.5.3.1 Introduction

The geotechnical desktop report aims to identify constraints that may impact development, focusing on geological conditions, material performance, and site suitability. It includes a desk study, site visit drive-over survey and readily available resources to assess geotechnical aspects. The report outlines expected constraints, material utilization, and recommendations for further investigations to guide the development framework.

The evaluation is intended only to meet the requirements of a high-level assessment suited to the preliminary planning stage of the project. It cannot reveal the detailed conditions that will become evident during subsequent investigations stages. Conditions at variance with those described in this report may be encountered.

4.5.3.2 Site Characterisation

The majority of the site is generally undeveloped and covered with natural grass, agricultural crops and localised small to large sized trees and shrubs.

Based on the drive-over survey and historic aerial imagery, localised single to double storey farm dwellings with outbuildings are scattered across the area of interest. Areas of domestic waste, organic material, old foundations, French/soak away systems and construction rubble can be expected at, but not limited to, the existing farm dwellings and outbuildings.

Numerous shallow small diggings or borrow areas are situated next to the road infrastructure across the area of interest. Small termite mounds and animal burrows are present across the area of interest. Grave sites have also been encountered during the drive-over survey.

The current slope angles/directions vary across the site due to the nature of the geomorphological setting. These are low relief with slope forms varying between concave and convex shapes. The general site-specific slope directions are towards the drainage features situated across the site. The slope angles across the site, have gentle slope angles with average gradients of <2 degrees. The unchanneled drainage features and valley bottom traverses have relative flat-lying to slightly steeper slopes with gradients of <6 degrees.

Numerous minor and major drainage features are present across the site. The Leeuspruit bisects the northern site portion and drains in a south-eastern direction towards the Rietspruit. The majority of the drainage features across the site drain in a southerly to south-easterly direction towards the Klein-Rietspruit. The Klein-Rietspruit drains in an easterly to south-easterly direction towards the Rietspruit. The regional slope direction is towards the south-east in the direction of the Rietspruit, draining in a southerly direction towards the Vaal River.

The drainage on the site will occur in the form of overland flow and shallow, subsurface, flow towards tributaries as shown in Figure 4-15.

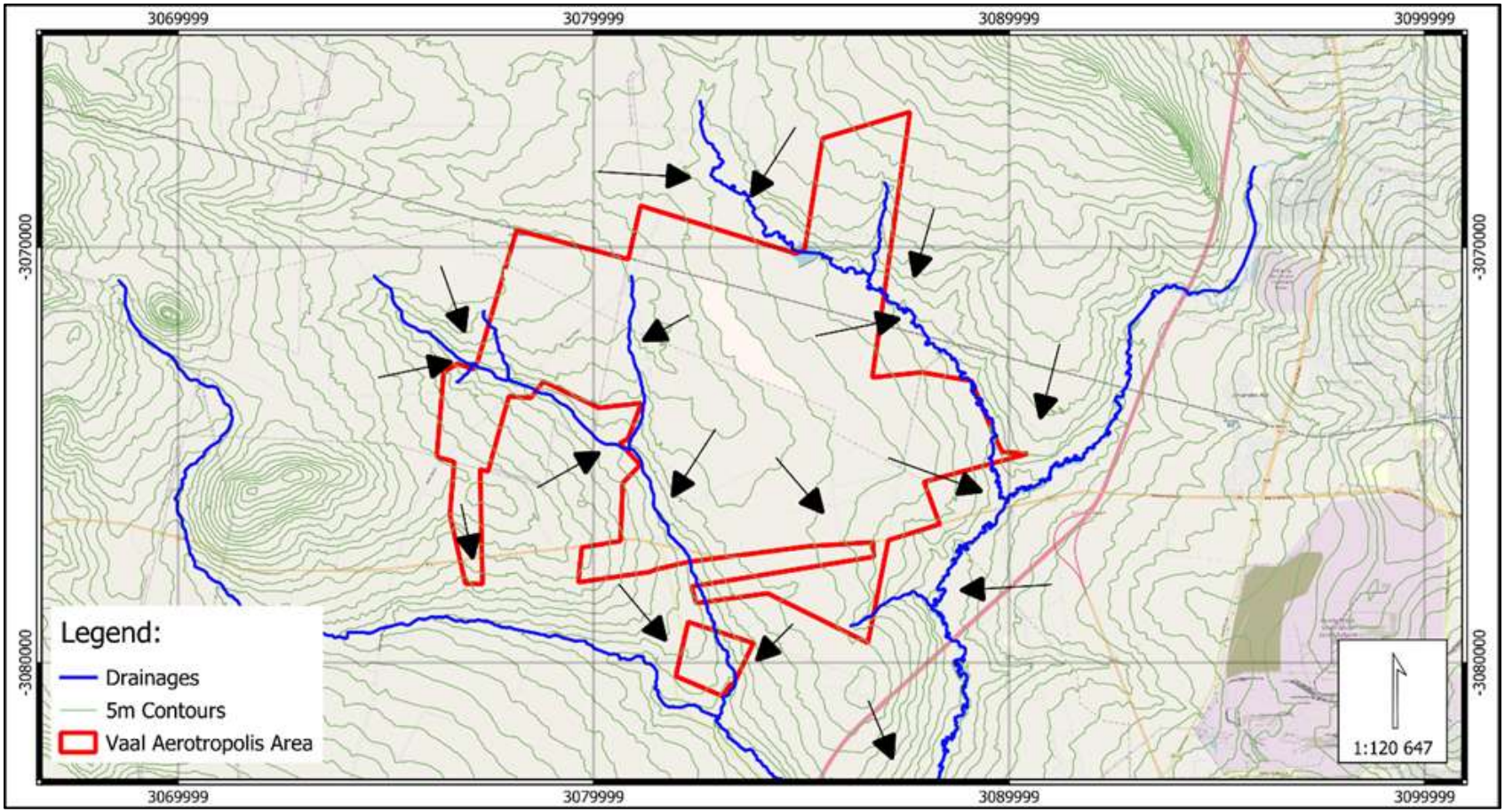

Figure 4-15. Expected drainage directions across the area of interest.

During the site drive-over prominent standing and/or surface seepage water was encountered across the site immediately after heavy and continuous downpours. Wetlands are associated with drainage lines and other low-lying areas and poor drainage conditions were noted on site and in the aerial photography review.

Climate determines the mode of weathering as well as the rate of weathering, with the effect of climate on the weathering process (i.e., soil formation) determined the climatic N-value defined by Weinert (1964), illustrated in Figure 4-16. The stratigraphy in the regional region is subjected to both mechanical disintegration and chemical decomposition, where the N-Value is between 2 and 5.

The site Weinert N-value is between 2 and 5, which is considered a “Moderate region”. Relatively deep soil profiles are expected, considering the moisture index and geomorphological setting.

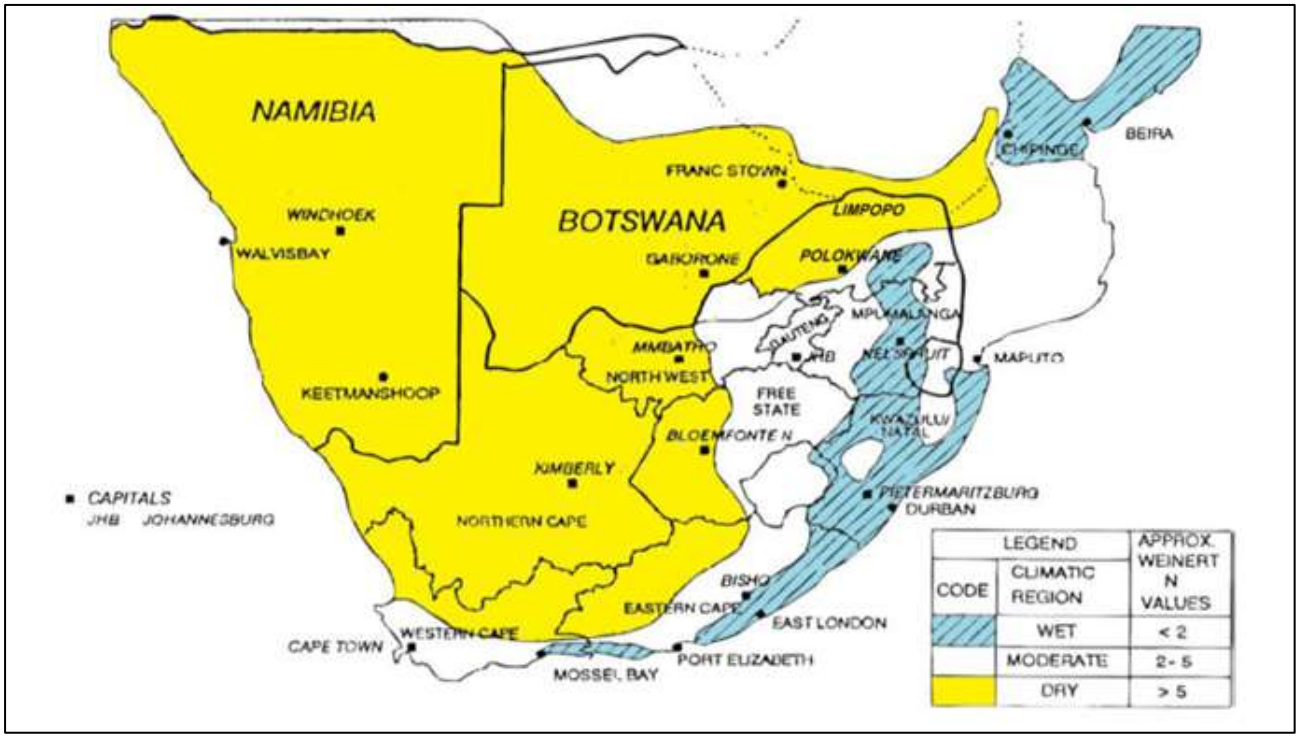

Figure 4.16. Macro-Climatic Regions of Southern Africa (Adapted from Weinert, 1980).

4.5.3.3 Regional Geology

Based on the 1:250 000-scale 2626 Wes Rand geological sheet, the site is underlain by “Qs”, “Qg”, “Vm”, “Vsi” and “Vdi” with “Vd” and “Vs” potentially at depth, of which the symbol indicates the following geological formations:

- Qs: Quaternary aged soil cover.
- Qg: Quaternary aged transported gravel in a sandy matrix.
- Vdi: Diabase.
- Vm: Quartzite of the Magalies Formation, Pretoria Group, Transvaal Supergroup.
- Vsi: Shale with interbedded quartzite, hornfels and limestone of the Silverton Formation, Pretoria Group, Transvaal Supergroup.
- Vd: Quartzites and shales, locally ferruginous of the Daspoort Formation, Pretoria Group, Transvaal Supergroup.
- Vs: Ferruginous shale and quartzites of the Strubenkop Formation, Pretoria Group, Transvaal Supergroup.

A cropped section of the regional geology is depicted in Figure 4-17.

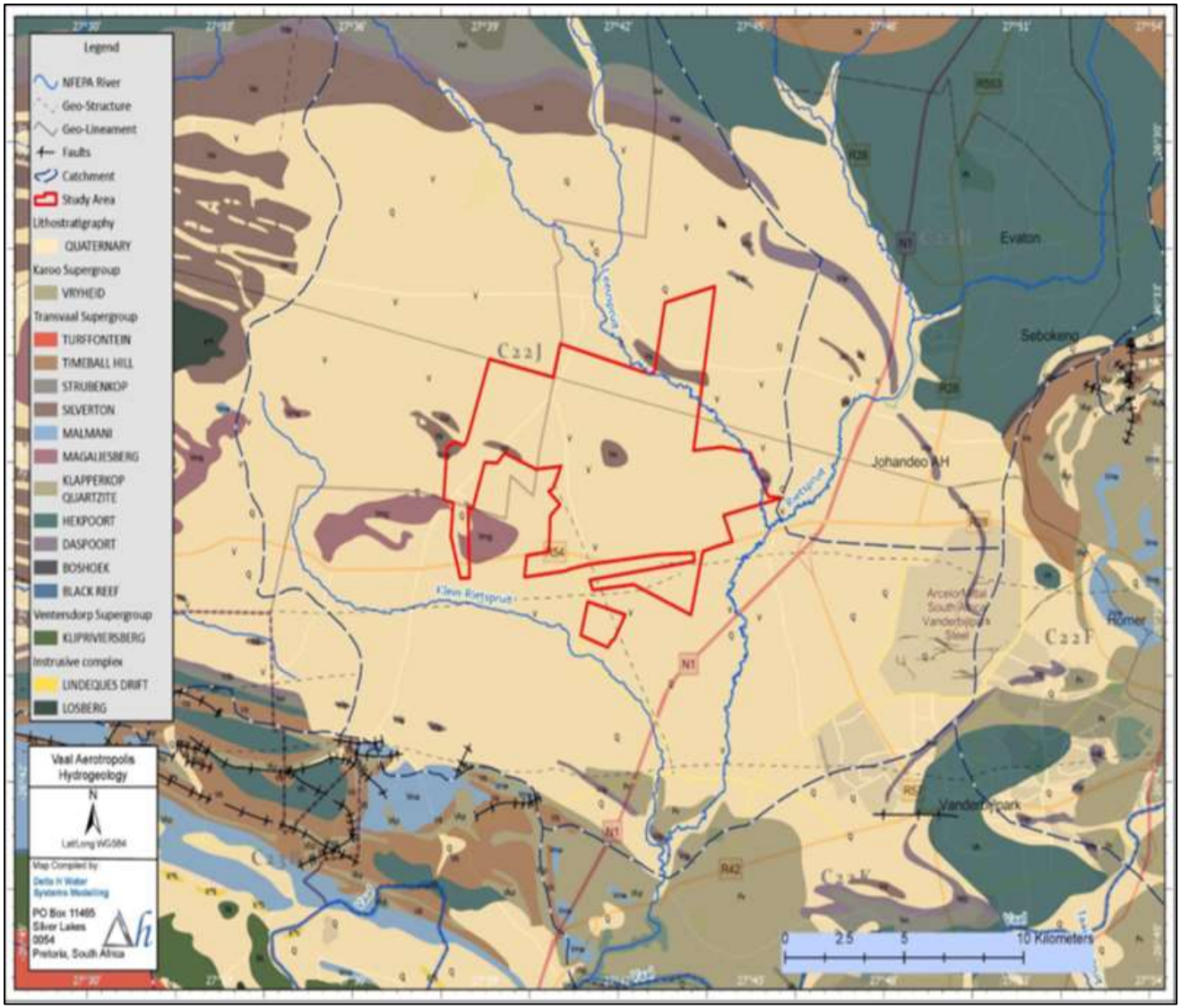

Figure 4-17. Regional Geological Map (DeltaH; 2024).

Based on the geological sheets, a prominent undefined W-E striking structure (potentially a diabase dykes) is situated in close on the southern portion of the site. The region is bestrewed with diabase dykes as indicated by the geological sheets. No other prominent linear structures such as faults or shears are depicted on/or in close proximity of the site. The site is not underlain by potentially soluble rock formations such as dolomite and limestone.

4.5.3.4 Expected Site-Specific Geology

Based on limited exposed cuts, borrow pits and readily available information, the region is generally covered with an upper topsoil or localised fill material towards existing infrastructure.

The fill or topsoil horizons are generally underlain by a colluvium or alluvium transported horizons with the alluvium materials situated towards the low-lying drainage areas. A pebble marker horizon or pedogenic formation underlies the aforementioned transported horizons while at the same time overlying either residual shale, residual quartzite, or localised residual diabase. The residual horizons are expected to generally transition to their respective rock type's weathered state which may be gradual or sudden transitions.

Pedogenic formations (well developed nodular to honeycomb to hardpan ferricrete) were recorded in shallow open cuts across the area of interest.

The depth to bedrock is expected to vary significantly, generally somewhere in the region of between roughly 1.00 to 3.00 m below ground level with undulating conditions and localised areas of very shallow hard rock to the western portion of the site.

No outcrops were encountered during the drive-over survey; however, surficial quartzite and diabase rock boulders were encountered towards the western portions of the area of interest. The intrusive diabase within this geological setting is well known for its spheroidal weathering resulting in small to large sized corestones. Based on aerial imagery the quartzites of the Magalies Formation is locally seemingly outcropping in the western limb of the area of interest.

4.5.3.5 Expected Geotechnical Constraints

The following major constraints are expected for the site:

- Open structured topsoil, colluvium and residuum horizons with a collapse potential in the in-situ state (uncompacted state);
- Expected shallow seasonal seepage water conditions and/or saturated soil profiles (during and immediately after heavy and/or continuous downpours) based on the presence of the prominent pedogenic formation present in the upper soil horizons;
- Upper transported (alluvium) and lower residuum (diabase and potentially Silverton shales) soils with an expected low to moderate expansive potential;
- Open soil structure with a medium percentage of fines (silt and clay) within the upper transported and lower residuum (shales and diabase) that is expected to result in a medium compressibility potential in the uncompacted and compacted state;
- Upper soils with an intermediate to high susceptibility to erosion if exposed and subject to concentrated water flow due to the sand content within the upper topsoil;
- Localised well cemented ferricrete, shallow bedrock and/or large size boulders or corestones that may result in severe excavation difficulty and possible use of pneumatic equipment and/or blasting for service installations and/or cut-to-fill-to-level preparation;
- Situated within a mining-induced and natural seismic activity region; and
- Areas within and adjacent to a known drainage channel or floodplain with slope less than 1 %.

Other constraints identified for this site include:

- Site slope that is expected to require minor cut-to-fill-to-level platform preparation for small to large structures and potential major cut-to-fill-to-level preparation for the runway;

- Expected localised large size boulders or corestones that may result in composite founding conditions where foundations span incompressible competent material and compressible soil;
- Soils with an expected unfavourable aggressiveness rating towards ferrous metals/services;
- Presence of localised trees with root systems and historic soak away/French drain systems that may affect the soils negatively if removed that will require rehabilitation or foundation modifications;
- Foundations and/or underground services that may result in composite founding conditions; and
- Localised areas of surficial uncontrolled fill/rubble that are expected to result in composite founding conditions that will require minor site preparation in these affected areas.

The site is divided into simplified expected FACET areas that are expected to have similar geotechnical conditions and constraints. The expected FACET areas are shown in Figure 4-18. The expected conditions for each zone are summarised in Table 4-2.

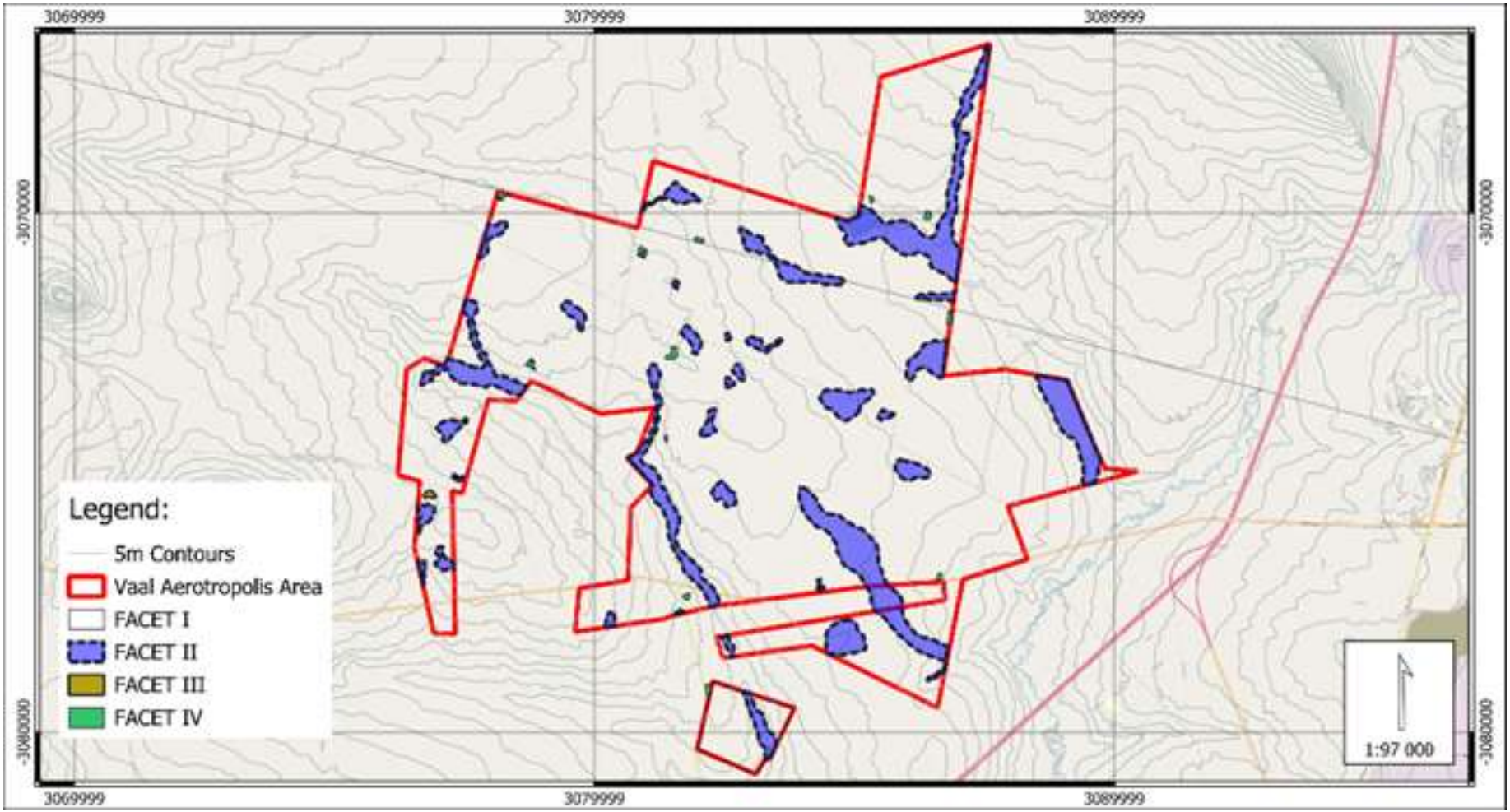

Figure 4-18. Simplified FACET areas of similar geotechnical constraints.

FACET	Major Geotechnical Constraints
I	• Expected compressible and potentially collapsible soils • Expected localised potentially expansive soils • Expected localised well cemented pedogenic formations, shallow bedrock and/or large size boulders or corestones that may cause severe excavation difficulty • Shallow seasonal groundwater seepage and localised ponding water that will necessitate mitigation such as subsoil drainage and pioneer layer construction • Erodibility of upper soils • Areas situated adjacent to known drainage channel or floodplain with slope less than 1 % • Localised fill material with existing structures and foundations
II	• Expected prominent severe waterlogged to shallow water seepage conditions • Expected compressible soils • Expected potentially expansive soils • Expected shallow well cemented pedogenic formations that may cause severe excavation difficulty
III	• Excavation difficulties on localised outcropping to shallow bedrock • Expected thin potentially collapsible soils • Erodibility of upper soils • Shallow seasonal seepage and ponding water
IV	• Areas previously borrowed with ditches and trenches that may need to be rehabilitated • Water ponding in holes and depressions • Uncontrolled fill of varying composition • Erosion of induced steep angles of the borrow sidewalls

Table 4-2. Expected major geotechnical constraints for the FACET areas.

4.5.3.6 Conclusion

The following can be concluded:

- The site is not underlain by potential soluble dolomitic formations and a dolomite stability investigation is not required.
- No potential economic deposits are indicated on site and expected to affect the developability of this site.
- No undermining is present that may affect the developability of the site as from a subsurface instability point of view.
- Soils with low bearing capacity, collapsible fabric, compressibility and expansiveness potential could be encountered.
- Localised shallow rock and/or corestones are expected across the site, which may cause excavation difficulties.
- Prominent shallow strongly cemented pedogenic formations such as honeycomb to hardpan ferricrete are expected across the site and are an indicator of the presence of shallow seasonal seepage water conditions.
- Severe seasonal standing and/or seepage water are expected during and immediately after heavy and/or continuous downpours, as evident from the vegetational cover across the site and towards lower-lying areas.
- The study did not identify any geotechnical fatal flaws that would preclude the proposed development. Notwithstanding, there will be geotechnical constraints, as mentioned above, which needs to be considered during the development planning.
- The constraints listed are the major expected geotechnical constraints that may affect the proposed development and should only be used for guideline purposes. The constraints should however be identified, confirmed and zoned in the detailed intrusive investigation to come as per standard practice.
- This desktop study is for informational and basic planning purposes only.

4.5.4. Geo-hydrology

Based on the conceptual hydrogeological understanding of the site, the following hydro-stratigraphic zones are

differentiated within the model area:

- Intergranular aquifer system (sedimentary deposits and weathered aquifer)
- Fractured hard rock aquifer.

(DeltaH; 2024)

Intergranular aquifer system

The intergranular and weathered zone consists the unconfined or semi-confined shallow weathered aquifer. Due to direct rainfall recharge and dynamic groundwater flow through the unconfined aquifer in weathered rock, the water quality is generally good, but in the absence of an overlying confining layer also vulnerable to pollution. Localised perched aquifers, formed from secondary mineralised clay layers and ferricrete layers, may occur. Water intersections in the intergranular and weathered aquifer are mostly above or at the interface to fresh bedrock, where less permeable layers of weathering products and capillary forces limit the vertical percolation of water and promote lateral water movement.

The shallow unconfined, phreatic (or water table) aquifer comprises saprolite (that formed as a result of intensive and in-situ weathering processes) and saprock (differentially weathered and fractured upper bedrock underlying the saprolite) zones. The soil and saprolite are collectively termed the regolith. The saprolite and saprock (classified as part of the bedrock) are generally treated as a single weathered aquifer unit, referred to as the weathered overburden, which varies in thickness and is derived from the in-situ decomposition of the underlying noritic rocks. (DeltaH;2024)

Fractured hard rock aquifer

The fractured hard rock aquifer consists of mostly sandstone, shale and mudstones. Groundwater flow is governed by secondary porosities like faults, fractures, joints, bedding planes or other geological contacts, while the rock matrix itself is considered less permeable. Geological structures are generally better developed in competent rocks like sandstone. Not all secondary structures are water bearing due to e.g. compressional forces by the neo-tectonic stress field overburden closing the apertures. The fractured aquifer is considered a confined aquifer. Fractured aquifers have typically a low hydraulic conductivity but are known to be highly heterogeneous with yields ranging from 0.5L/s to 2L/s.

Higher yields are typically associated with higher hydraulic conductivities along fracture zones associated with faults and shear zones and at contact zones with intrusive rocks. Depending on the residence time of the water in the aquifer, groundwater quality can be poor. The groundwater yield potential is classified as poor since most boreholes produce less than 2 litres per second (L/s).

The aquifer system underlying the project area is described as an intergranular and fractured aquifer with borehole yields varying between 0.5 to 2 l/s. (DeltaH;2024)

4.5.5. Hydrology

The Aerotropolis site is located within the Vaal River catchment. The greater extent of this catchment is made up of a number of head water basins and associated wetland systems that are tributaries to the Vaal River. The streams for this catchment are shown in figure 4-18. The Aerotropolis is downstream of the sub-catchment identified in figure 4-19.

Flood lines along the site were determined by hydrological and hydraulic analyses. For the hydrological assessment, the synthetic unit hydrograph method was used to calculate the flood peaks for the 50- and 100-year return period were calculated as 928 m3/s and 1 091 m3/s, respectively. These design values include a 10 % buffer to account for extremes and variability.

Since the design values are similar, a 2-year return period was added as a baseline reference. The flood line determination was completed in HECRAS using 1-dimensional, steady flow analysis. The resulting flood lines are presented on the left in Figure 4.20 for the catchment extent;

and on the right, zooms into the Vaal Aerotropolis development extent. There is some flood risk over the site, however, this is for non-perennial streams that are likely to have flow in extreme events and remain dry for most parts of the year. Adequate drainage accommodations should be made over these areas. The 1:50 and 1:100-year flood lines are also very similar and 1:100 flood lines would be adequate for the design phase.

Figure 4-19. Upstream Vaal River Catchment.

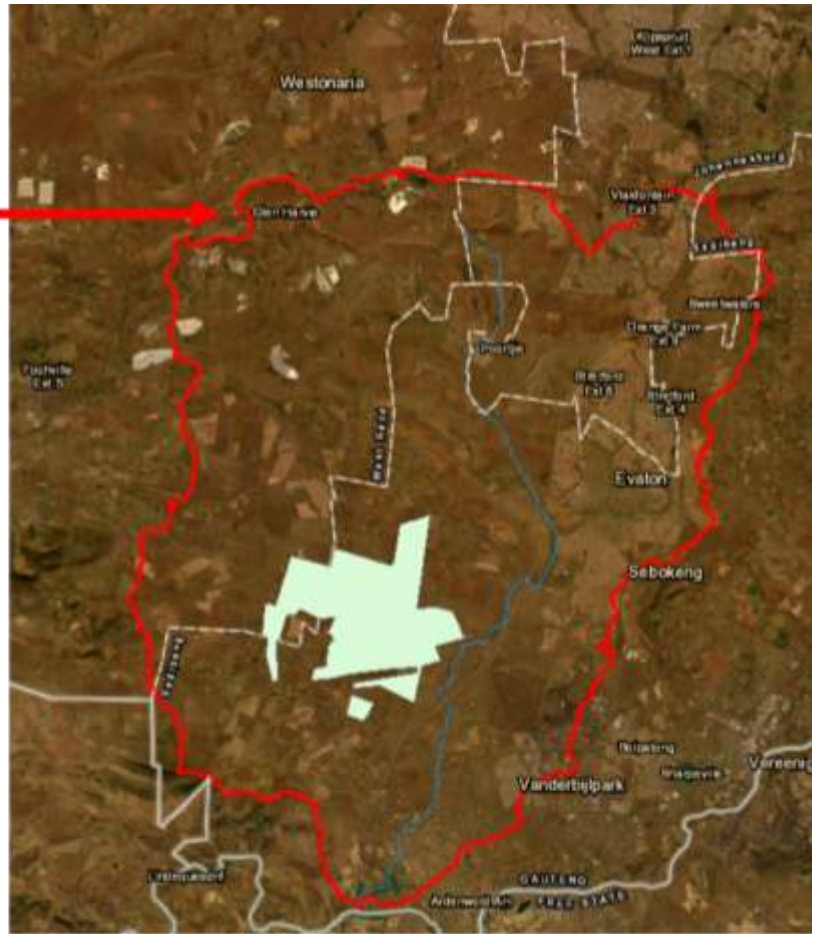

Figure 4-20. Vaal Aerotropolis site downstream sub-catchment.

The sub-catchment where the Aerotropolis is proposed includes multiple streams which contribute to the main river line. These secondary and tertiary streams are indicated on figure 4-21. The floodplains for the 1:50-year and 1:100-year return periods are indicated for the sub-catchment on figure 4-22.

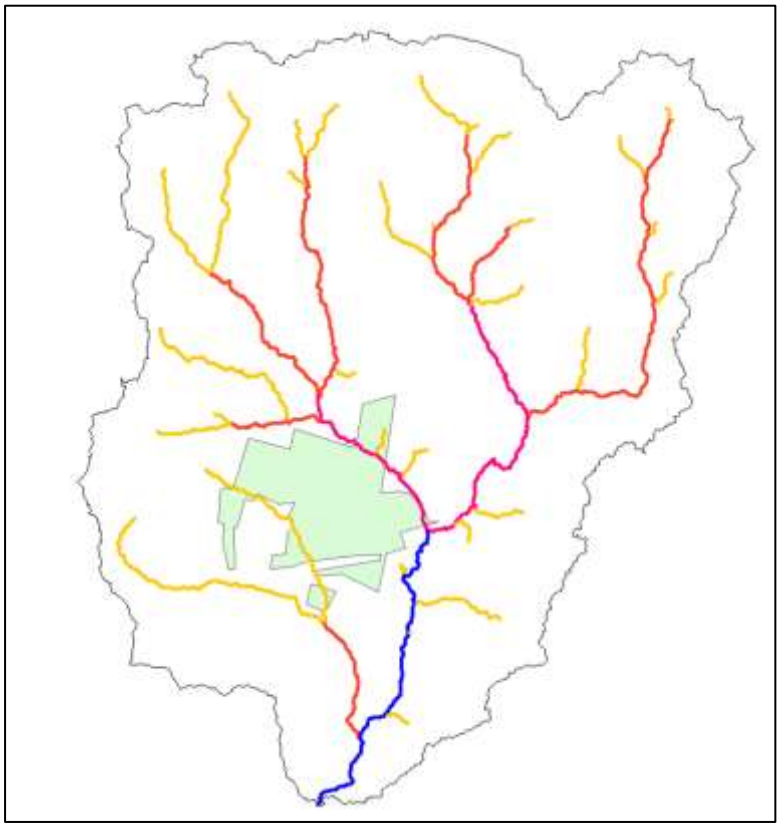

Figure 4-21. Sub-catchment contributing streams.

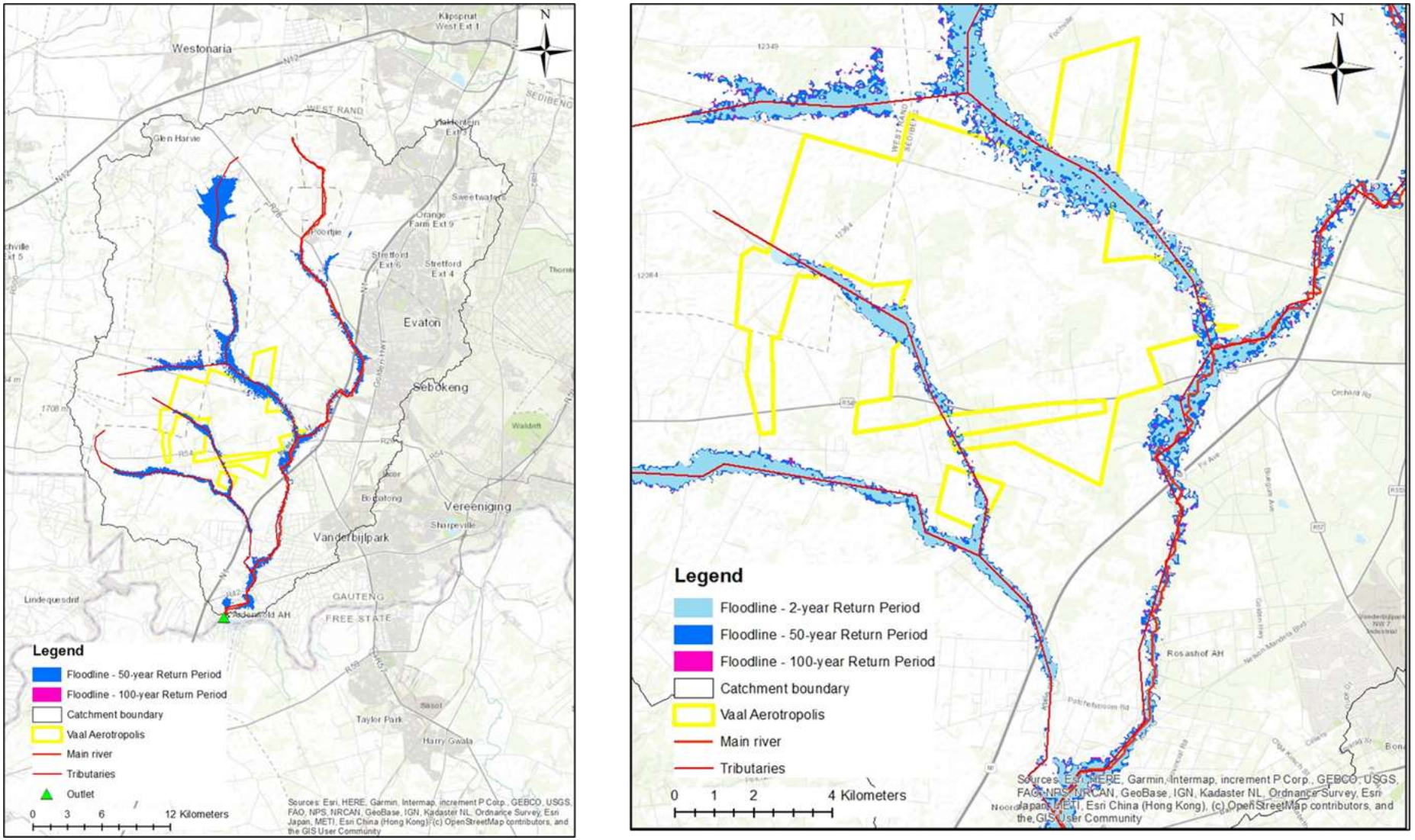

Figure 4-22. Flood lines representing 1:50 and 1:100-year return periods.

4.6. Transportation

The aerotropolis site is surrounded by various high, medium and low order roads. These roads are either existing, built to full or partial ultimate standard (cross-section), or unsurfaced or unbuilt (planned). The high-order roads, the N1 Freeway and Provincial Arterial roads, will provide vehicle and public transport access to the aerotropolis. Refer to Figure 4-23 for the regional road network, to Figure 4-24 for the local road layout and to Figure 4-25 for the Gauteng Strategic Major Road Network plan.

The South Africa National Road Agency (SANRAL) owned National freeway N1 is located approximately 9.0 km to the east of the site on a north-south alignment. It is the main freeway connecting the Western Cape to the Free State, Gauteng and Limpopo provinces. The K178 (R54) is a Provincial Road, located directly adjacent and south of the site. It is east-west aligned and connects Vanderbijlpark, Vereeniging and SANRAL's National Freeway N3 to the east, with Potchefstroom and the N12 freeway to the west. It has a grade-separated crossing over the N1, with no current or planned access allowed to the N1. The D1017 (the future K176) is located north of the site. It is east-west aligned and connects Sebokeng to the east and the future K213 to the west. It has a grade-separated crossing over the N1, with no current access to the N1. However, when it is upgraded it will include an access interchange with the N1. An unsurfaced, unnumbered road is located directly west of the site, it is partially located on the alignment of the future K9, and will connect the K178 to the south with the K176 to the north of the site. The K13 will be located east of the site, and will connect the K176 to the north to the K178 and over National Road N1 to the south. The Gauteng Strategic Major Road Network plan shows a future access interchange of the K13 and National Freeway N1, however SANRAL has confirmed this interchange will not be allowed due to interchange spacing standards.

The N1, R54, and possibly the R57, D2459 and the future K13 will provide access to the site, as well as serving the long-distance mobility needs to and from the site. The local roads that will provide the accessibility is dependent on the final interchange option with the N1 that will be implemented. Refer to Section 8.6 for the access assessment.

A railway line is located directly north of the site, and can provide direct access to a planned railway hub to support the aerotropolis. The line is east –west aligned, and connects to Vanderbijlpark and Vereeniging to the east, and Potchefstroom in the North-West Province to the west. It is a dual electrified line. This railway line can provide direct access to the railway hub to support the rail freight transport to the Aerotropolis, and may in future be extended with an additional link to provide a commuter rail service to link the terminal buildings with Metrorail's Gauteng services.

The current and future surrounding road and rail network and their associated class and levels of service will inform and influence the future land use distribution within the aerotropolis as they will determine the accessibility to, the visibility of, and lastly the land-use activities located

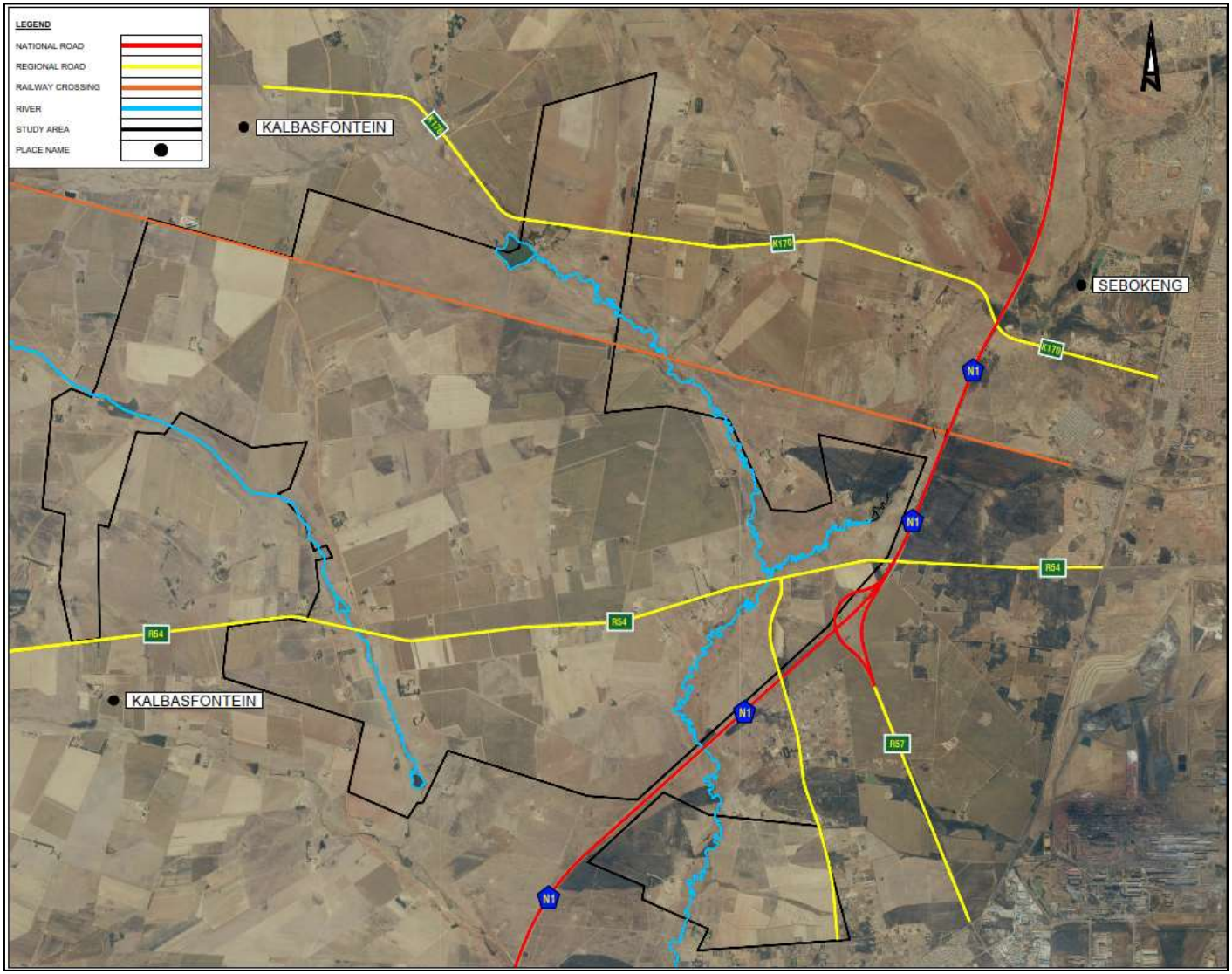

Figure 4-23. Site location & local road network (current).

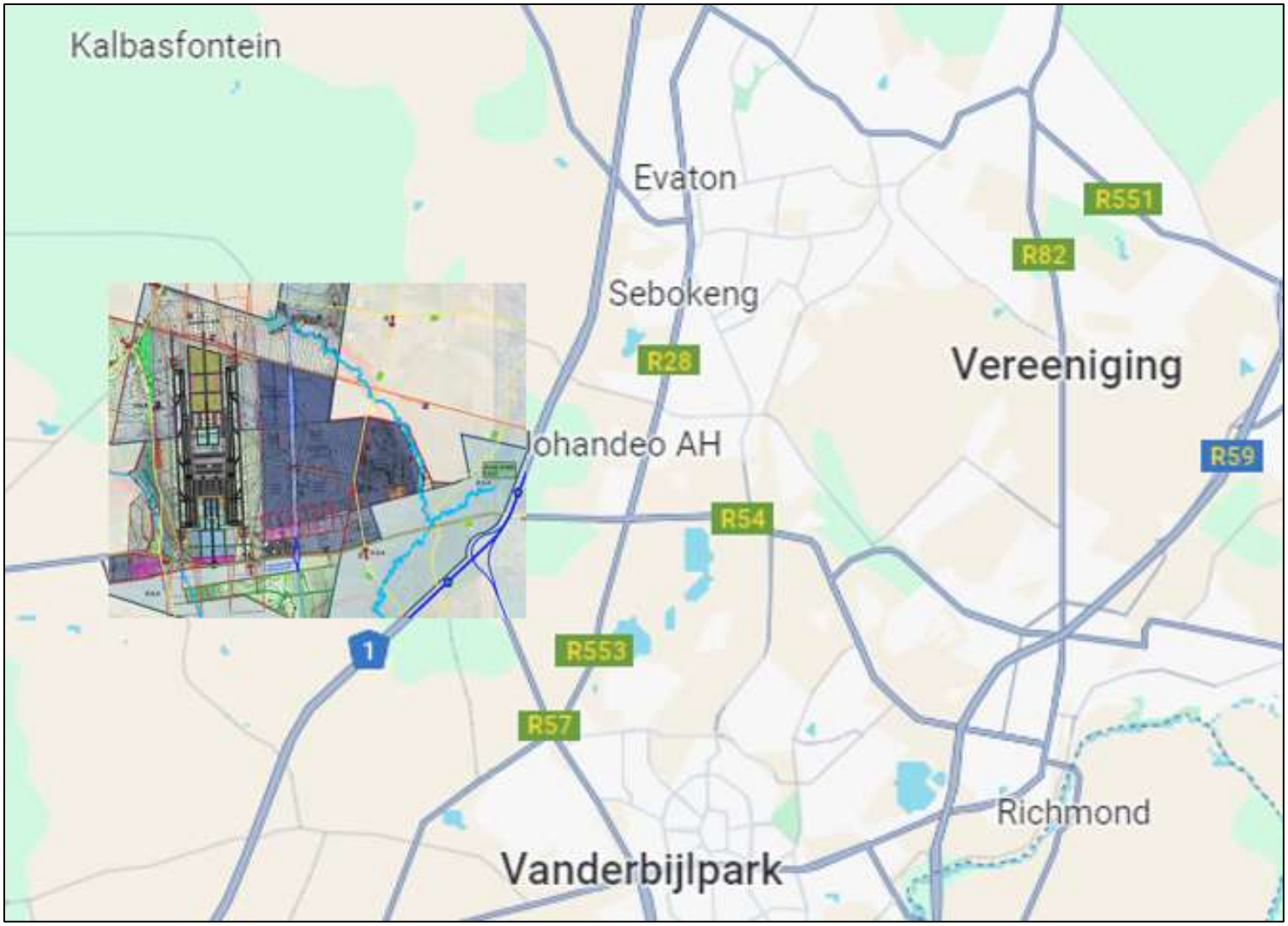

Figure 4-24. Site location & regional road network (current).

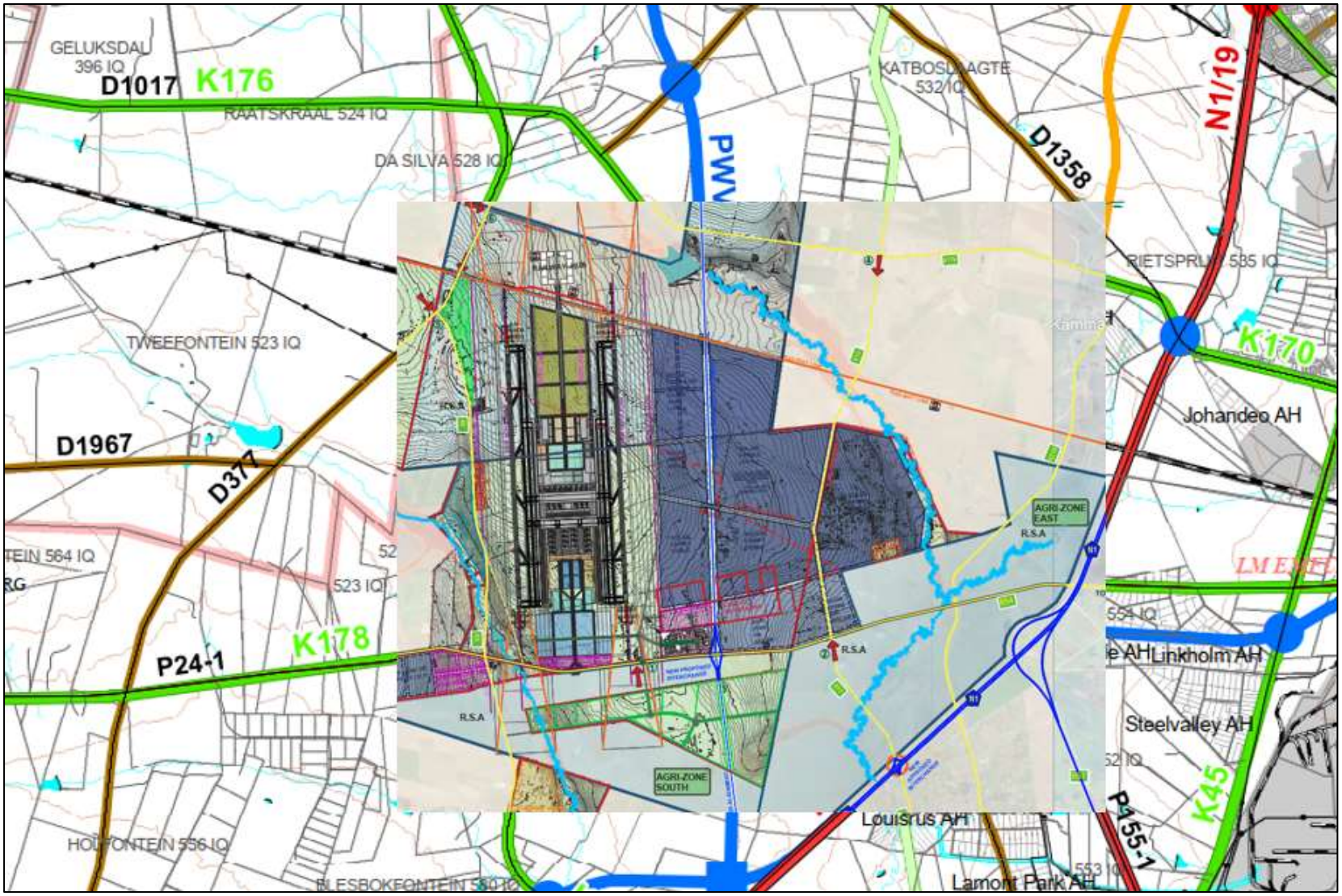

Figure 4-25. Site location & Gauteng Strategic Road Network (current & future).

4.7. Landscape

4.7.1. Sub-Regional Landscape Informants

The surrounding regional landscape provides a series of indicators that should inform the future landscape of the site in order to achieve an optimum level of integration with existing environment. These include the following:

- Natural elements consist of the natural highveld grassland vegetation type which include small wetlands, narrow streams, and occasional ridges or rocky outcrops in an undulating landscape.
- Agricultural elements in the form of annual maize and soya bean fields, homesteads and clearly defines property boundaries.
- The surrounding landscape to the north, west and south is rural with mainly agricultural uses. To the east of the site is the industrial complex including Arcelor Mittal and the town Vanderbijlpark.

4.7.2. On-Site Landscape Informants

The proposed airport buildings and airport platform design in conjunction with the current state of the vegetation and landform of the site provides additional direction with regard to the landscape approach for the site and its various precincts. These include:

- Freshwater systems, including wetlands and watercourses, which contain established vegetation corridors and which should be used to provide a green structure to the landscape
- Separate areas of degraded landscape which could be rehabilitated within a green space structure.
- Watercourses could provide visual interest as well as provide regional legibility and identity.
- Different site character profiles for different areas of the site relating to current site edge conditions will be set up across the site as a result of the land use character of the primary development elements i.e. airport and the trade port.
- The influences of the landform character on built form footprints and thus development density and massing.

5. CLIENT'S VISION AND DEVELOPMENT PRINCIPLES – VAAL AEROTROPOLIS

5.1. Overview of the Section

The purpose of this section is to explain the vision and principles that will underpin the success of this project.

The Client/Developer of Vaal Aerotropolis, Vaal Aerozone (Pty) Ltd. is highly experienced in the development and management of International Airports and is uniquely positioned and capable to take on a landmark project such as this.

5.2. Developer's Vision

- To be a driving force for economic and trade growth through the Vaal Aerotropolis in catalysing global trade in Southern Africa.
- To be a benefit to local businesses and community while serving our customers and our country.
- To be a premier hub for trade in South Africa, offering a gateway to the continent, creating employment opportunities, empowerment opportunities and significant economic growth.
- Aspiring to be the first port of call for international logistics in Southern Africa, while building a prosperous community in the Vaal Aerotropolis SEZ.
- Envisioning a region filled with growth and opportunity, with strong community engagement and support based on the opportunities that will be provided.

5.3. Development Principles

The project known as 'Vaal Aerotropolis' will ultimately comprise of many different components, including:

- International Airport with a 4,2km runway length to accommodate any size of aircraft and second runway added in the future with central apron link;
- Passenger and Cargo terminals and all supporting facilities;
- Trade port with logistics and distribution facilities and general and cold warehousing and other commercial and industrial opportunities;
- Agri-zones and holding areas for produce being air freighted across the world;
- Commercial opportunities with landmark Offices, Hotel, Conference, Retail and Medical facilities.
- Road network with direct access to and from the N1 and linking with the proposed new PWV5

The development will be managed as an SEZ entity in accordance with the SEZ act ,16 of 2014 and its regulations.
A SEZ is a tool for economic growth to promote economic development to attract foreign and domestic investments. Its development principles are:

- Facilitating the creation of an industrial complex
- Developing infrastructure to support the targeted industries
- Provide the location for the establishment of the investment
- Enabling the beneficiation of natural resources
- Promoting regional development and local and social benefits to local communities
- The generation of new and innovative economic activities.

6. SPATIAL STRUCTURING OF THE VAAL AEROTROPOLIS SITE

6.1. Overview of the Section

The purposes of this section are to provide direction for the development of an aerotropolis on a large undeveloped tract of land that is located in a rural environment. The principles of sustainable development are guided by the environmental opportunities and constraints of the site on one hand and on the physical and technical requirements of an international airport on the other.

6.2. Suite of Plans

The site being in 12 125 ha is very large and cannot be developed in one complete phase.

Implementation of the development will require a phasing approach that responds to the economic situation in RSA and in the world. It is also important to entrench the development zoning rights as early as possible in order to create a zone of comfort for investors.

The LSDF will create this comfort and at the same time provide flexibility in the use of the development rights through time.

The following plans will be utilised:

- Local Spatial Development Framework
- Township plan
- Phasing plans
- Site development Plans
- Building Plans

6.3. Vaal Aerotropolis Planning Areas

Given the high-level nature of the development framework plan, the Airport Precinct master plan or LSDF process has focused on safeguarding the right amount of space for each facility within an overall layout that is functional and operationally efficient, rather than defining the detailed configurations and design of each component within the airport facility. The overall Aerotropolis Master Plan layout is largely shaped by the location and layout of the Airport Precinct, and particularly by the location, length and orientation of the proposed two parallel runways to serve an ultimate planning phase of 45mppa. The spacing between the two runway centrelines was initially set at 1500m. However, during the recent airport layout development process it has been determined that a runway separation of 1700m would be more appropriate to accommodate the requirements for the airport operations and the safeguard space for the 'midfield' trade zones to the north.

The concept layout for the Airport Precinct based on the 1700m runway spacing is provided below.

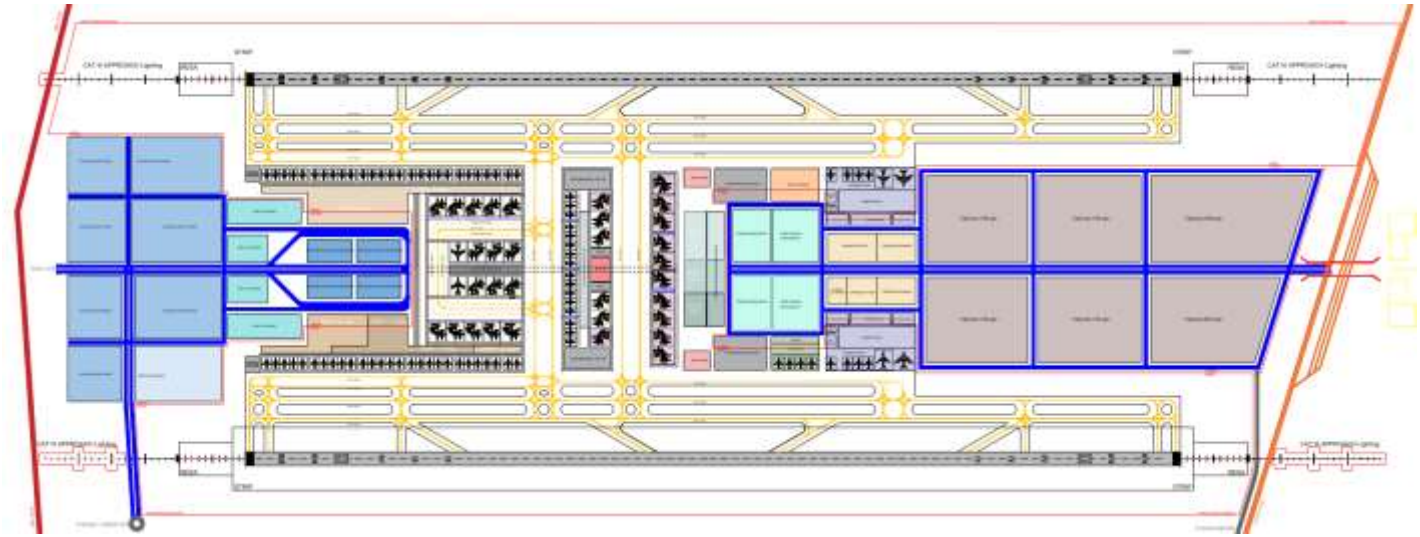

Figure 6-1. Airport Precinct Layout Plan for 45mppa.

The definition of the airport layout for the 45 mppa ultimate development phase started with the alignment of the runway and parallel taxiway system. For each runway a dual full length taxiway system has been planned, with one taxiway for Code F operations and one for code E operations, in order to accommodate the circulation of the largest aircraft types, but without oversizing the facilities to cater for the infrequent but larger Code F aircraft across the whole airfield system. Both runways would be supported by standard entry and exit taxiways and rapid exit taxiways (RETs) to maximize the capacity and efficiency of the runway operations. The RET layout assumed in this phase is indicative only, with exact positions to be determined during the next stage of planning and design based on the number and mix of aircraft movements.

The required clearance between runway centreline and taxiway centreline is 180m for Code F operations, while the clearance between the Code F and Code E parallel taxiways has been calculated as 83.5m, allowing for independent operation of the taxiways when the larger Code F aircraft is using the parallel taxiway (which is expected to be quite infrequent given the low level of Code F operations assumed – ca. 1% of the total annual aircraft movements). A dual Code C parallel aircraft stand taxilane system has been planned to provide efficient direct access to contact stands, safeguard for aircraft push-backs whilst simultaneously providing a by-pass taxiing capability to minimise apron congestion and delays. In between the terminal piers within the centre of the apron area a cul-de-sac taxi-lane system is provided to serve Code F taxi-lane operations or alternatively dual Code C taxi-lane operations.

The layout of the apron stands has been defined based on the passenger and cargo aircraft stand requirements defined in the previous paragraph, split by contact and remote as well as aircraft type (e.g. ICAO code). In order to provide greater operational flexibility, the layout where possible has been developed to provide MARS stands, which can accommodate either one Code E/F or two Code C aircraft. Code D aircraft demand, if required, would be accommodated on the proposed Code E stands.

For the ultimate 45mppa development phase two ‘mirrored’ terminals are proposed. Each terminal provides pier buildings aligned with the runway system to provide contact stands close to the terminal processing facilities.

The number of the contact stands is in line with the aircraft stand requirements defined in the earlier report section. Separate aprons are provided for remote aircraft stands for bussing operations or long-ground times. The central remote apron layout safeguards space for a potential future satellite building to cater for development beyond 45 mppa or if the demand characteristics or requirements should change over time. In the centre of this midfield apron an indicative location has been identified for the ATC tower, which is relatively central to the runway system to provide a good line of sight to all airside operational areas, however the exact location should be defined at a later stage of planning/design.

Given the need to accommodate demand from 7.2 mppa to 45mppa over the planning period, the terminal system has been planned based on a two-terminal system with the first terminal built with an opening day capacity of 7.2mppa but with the capability to be expanded to provide a 25mppa capacity in the medium term. A second 'mirror image' terminal would then be developed in the longer term to provide the required capacity of 45mppa.

The choice of terminal concept has been driven by the range of demand levels to be served from opening day to ultimate phase as well as considering the space available between the runways, which limits the development area for the terminal kerbside and access road system. The drop-off/pick-up kerb operations have been developed based on two separate access road loops, one for each terminal rather than a single loop serving both terminals, in order to facilitate the development in the phases, minimise congestion and allow independent operations for greater flexibility and resilience.

The advantages of the proposed two-terminal concept can be summarised as follows:

- Cost effective development phasing to meet specified demand levels of 7.2mppa, 25mppa and 45mppa;
- Efficient terminal layout provided at each phase;
- More logical expansion of passenger processing facilities within each terminal building;
- Each terminal offers a good pax experience, intuitive wayfinding, short walk distances and efficient operations;

- Flexibility to ultimately develop separate full-service and low-cost terminals or adapt concept over time to meet changing demands; and
- Separate terminal kerbs to spread traffic and construction cost.

To the south of the terminal area are the car parking areas including multi-storey short-stay car parks, long-stay at-grade parking, staff car parking and rental car facilities located near the passenger terminal system. The layout does not currently show a rail station; however, this should be considered in the longer term given the scale of the airport in the ultimate phase. Given the lack of space available it is likely that any rail station and rail link to the terminal area would need to be located underground and centrally between the terminals. It is assumed that bus services will use public transport interchange facilities located on the ground floor of the multi-storey car parks adjacent to the terminals.

The proposed air cargo facilities are located in the midfield of the airport to the north of the remote apron for passenger aircraft stands and the ATC tower area. This facility comprises the cargo aircraft stands planned for MARS Code E and F operations and a cargo terminal building that can be easily expanded as demand increases. Adjacent to the cargo facilities are two areas which have been allocated for the freight forwarding and logistics operations to support the cargo activities. Two rescue and fire-fighting stations have been located centrally along each runway to provide adequate recuse response times covering the entire airfield. Also located within this midfield support facility area would be aviation facilities relating to catering, ground handler GSE equipment and vehicle facilities, airport maintenance facilities, fuel farm, MRO operations and a Business Terminal and apron. To the north of the airport support facilities a large trade zone has been safeguarded, the exact sizing of this is still to be determined as part of the wider Aerotropolis master planning work. The next image shows the draft concept layout of the Airport Precinct with the revised runway orientation and separation (1700m) in the context of the wider Master Plan.

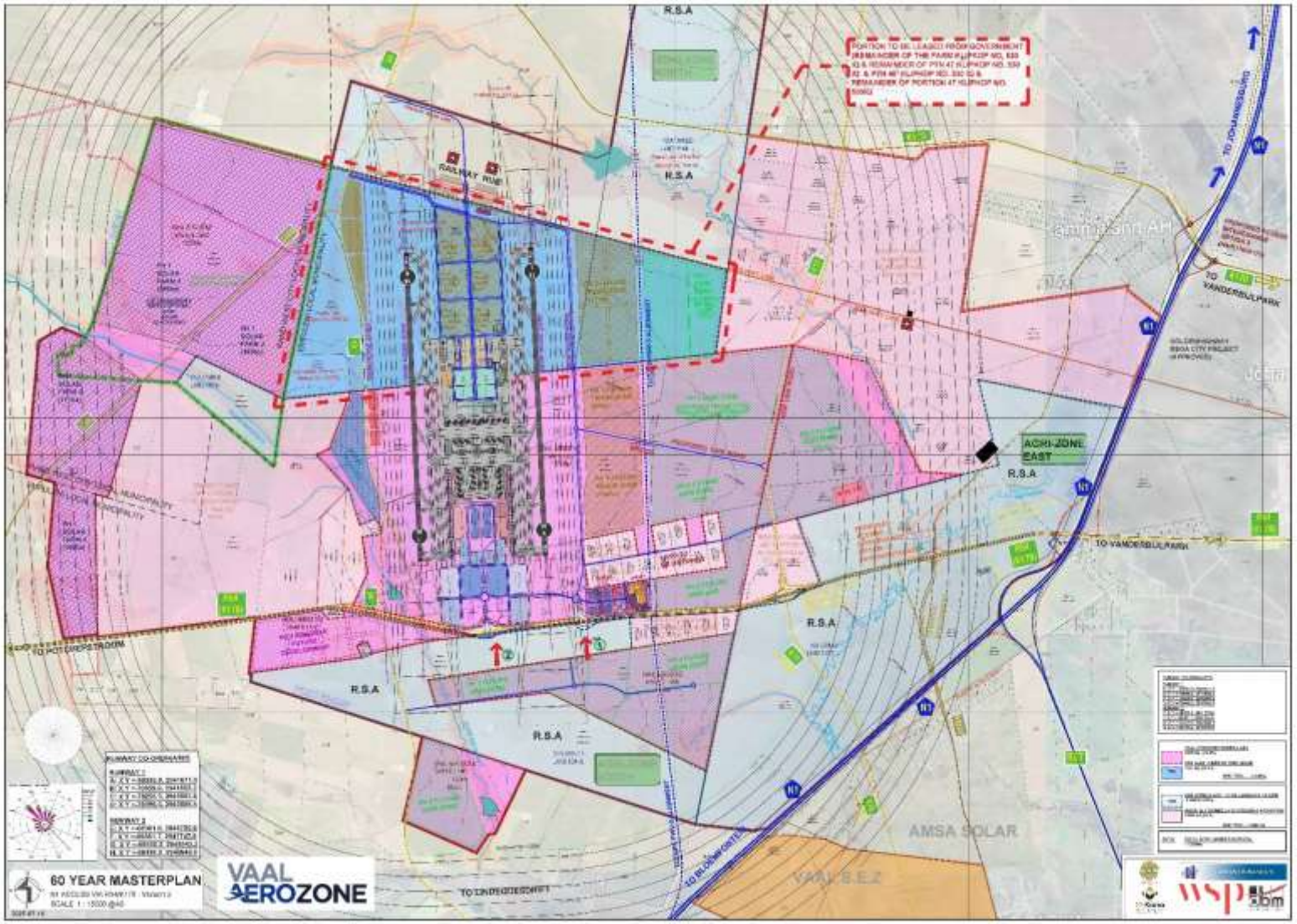

Figure 6-2. Airport Precinct Layout Plan for 45mppa (1700m separation and new runway orientation) within the overall Aerotropolis Master Plan context.

Consideration has been given as to whether there is scope to stagger the revised runway positions in order to make better use of the available site area and thereby minimise impacts on adjacent facilities. However, the new location and orientation with the two parallel runways is recommended as there is little impact on the railway line in the north and the R54 road in the south; moreover, the western runway would be away from the sloping terrain down to the river and the eastern runway should not be staggered to the south in order to avoid negative impacts to the Airport City.

7. SPATIAL FRAMEWORKS

7.1. Overview of the Section

This section of the report will deal with the various spatial framework components making the LSDF.

7.2. Environmental Services Framework

7.2.1. Environmental Services Objectives

Environmental Services Objectives include the following:

- Compliance with all applicable environmental laws which includes but is not limited to the National Environmental Management Act (NEMA) of 1998 (Act No. 107 of 1998)(as amended) and associated legislation, the National Water Act (NWA) of 1998 (Act No. 36 of 1998) as well as the National Heritage Resources Act (NHRA) of 1999 (Act No. 25 of 1999).
- Ensure sustainable development by establishing a sustainable green landscape in which development can take place.
- Contribute to the establishment and development of the Municipal Metropolitan Open Space system and the delivery of environmental services.
- Control and prevent the effects of pollution and environmental degradation on the receiving environment.
- Promote conservation of sensitive areas and species identified within the area through the establishment of an integrated and ecologically functional Open Space System network for the Vaal Aerotropolis.

- Ensure the integration of ecologically restored areas within the Vaal Aerotropolis framework. The principles and specifications for ecological restoration are outlined in the Environmental Impact Assessment (EIA). A framework and plan for ecological restoration will inform this process.
- Ensure that all impacts are mitigated according to the mitigation measures provided by the specialists as included in the EMPr.

7.2.2. Open Space Network

The open space network will also be assessed during the EIA process. This will include input from all the specialist disciplines and will inform the development layout and planning phases. Inter connectivity of open space and corridor interaction will be of key importance in the development.

7.2.3. Environmental Cores (Conservation Areas)

The aerotropolis site is surrounded by Ecological Support Areas (ESA's) and Important Areas as indicated in the Gauteng Conservation Plan (Figure 7-1). Part of the site is also located in the Tweefontein Private Nature Reserve which is classified as a South African Protected Area. The aerotropolis site falls within the threatened grassland ecosystems namely, the Soweto Highveld Grassland as well as an area with a moderate to high agricultural sensitivity as indicated by the Gauteng Agricultural Potential Atlas (GAPA) (Figure 7-2). In terms of the Gauteng Province Environmental Management Framework (GPEMF), the aerotropolis site falls within Zone 3: High control zones (outside the urban development zone) and Zone 4: Normal control zone as indicated in (Figure 7-3).

The areas identified above are considered to be environmental core conservation areas and has been considered and included in the design and layout op the Vaal Aerotropolis.

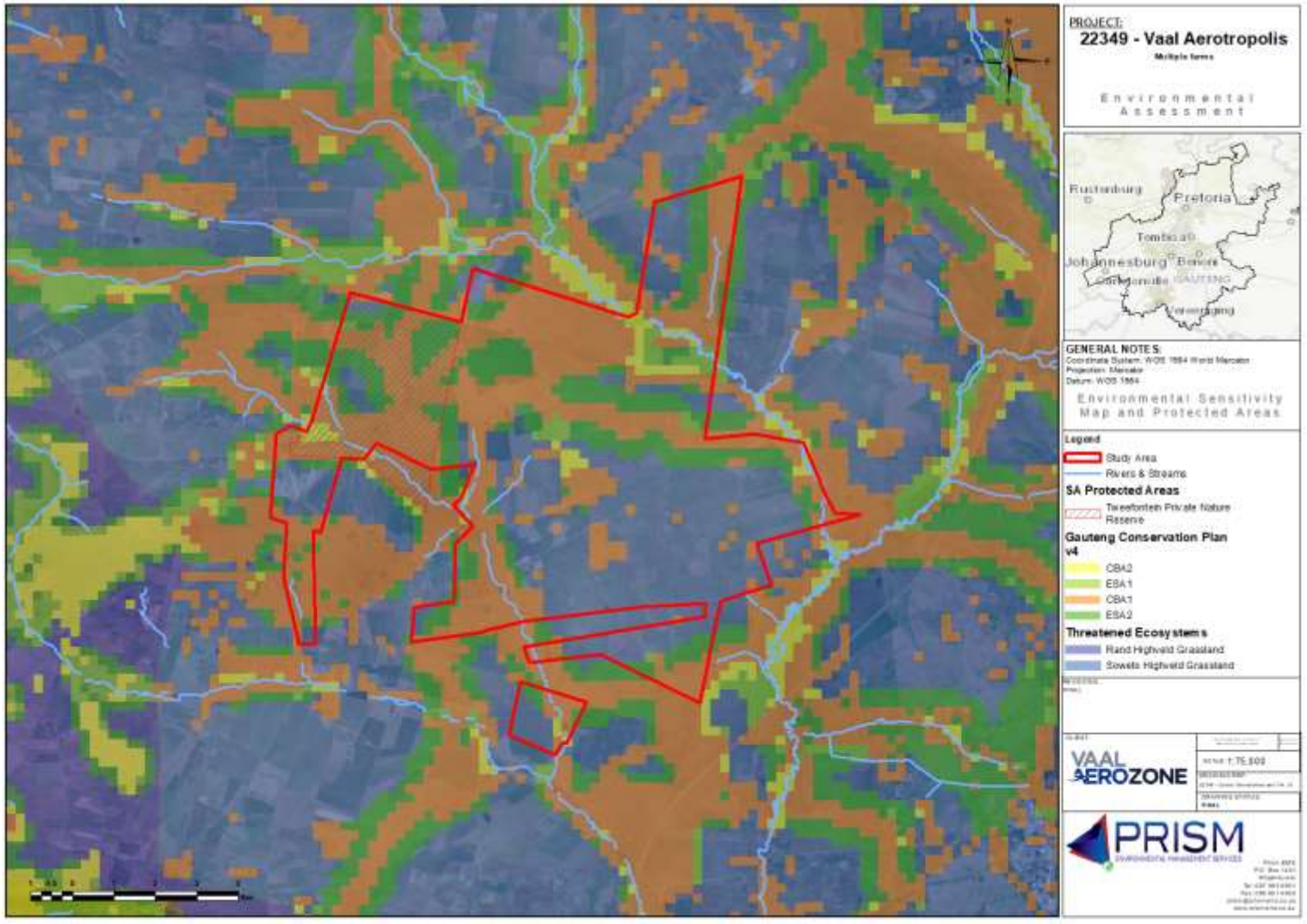

Figure 7-1. Environmental sensitivities in terms of the Gauteng Biodiversity Conservation Plan, Threatened Ecosystems and Protected Areas.

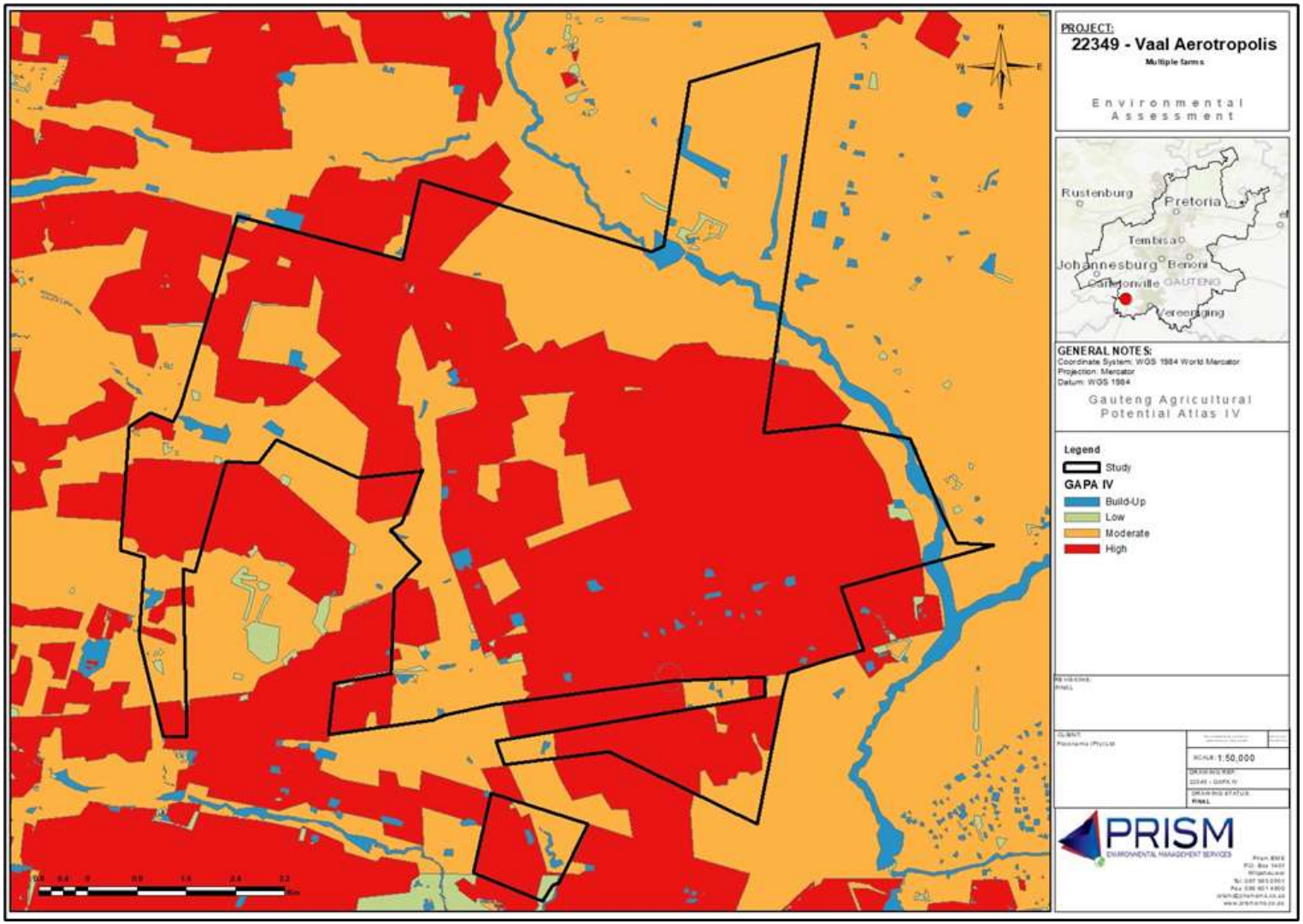

Figure 7-2. Agricultural Sensitivity as per the Gauteng Agricultural Potential Atlas (GAPA)(IV).

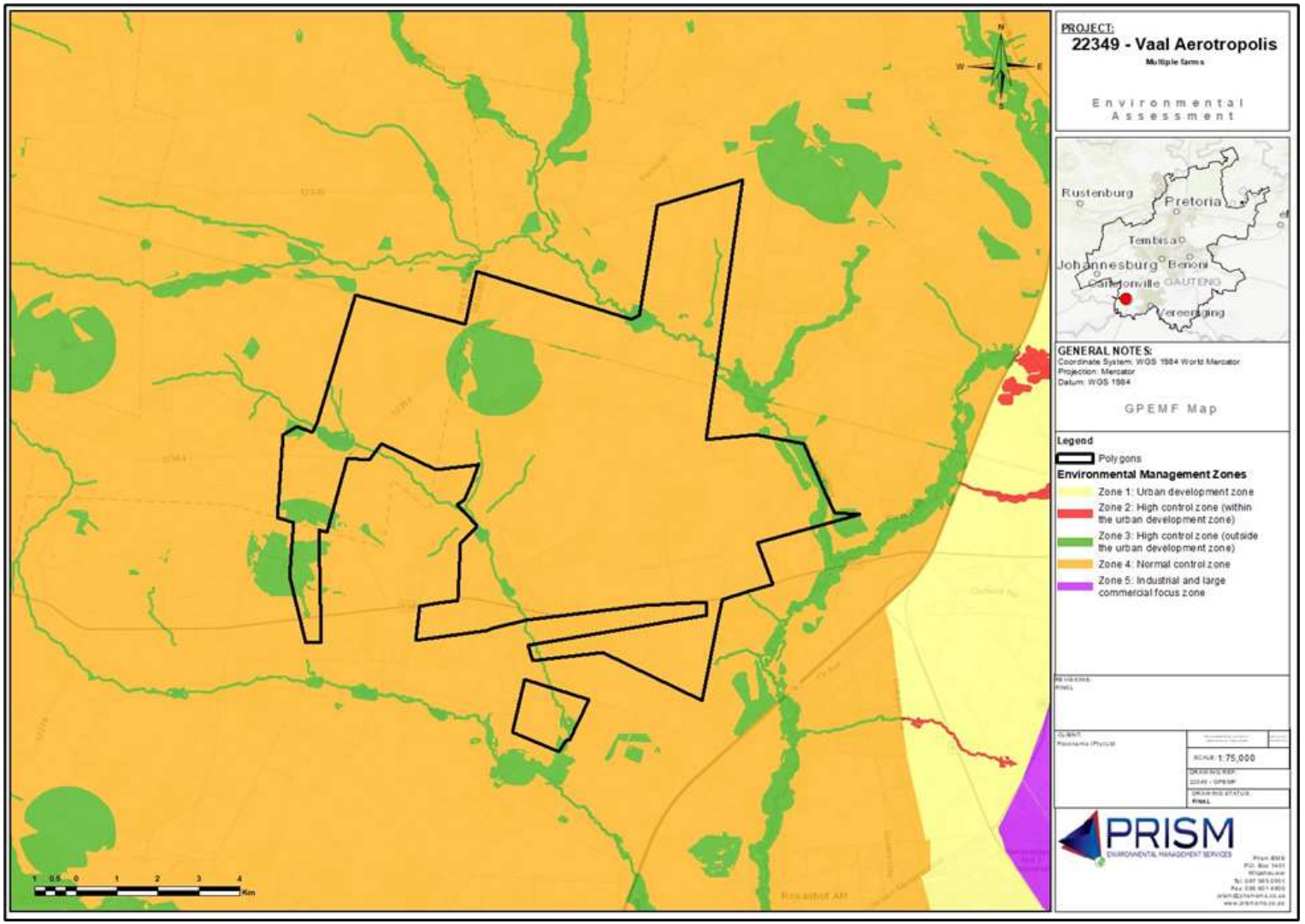

Figure 7-3. Gauteng Province Environmental Management Framework (GPEMF).

7.2.4. Environmental Corridors

Environmental corridors are essential for the conservation of ecological systems and habitats within and around the development. These corridors include the buffers and pathways connecting the sensitive core areas in order to ensure the supply of significant environmental services. Furthermore, these buffers ensure that no development is located adjacent to a sensitive core area therefore minimising the impact of the development on environmental services.

The corridors include:

- All streamlines within the Wetland Systems as identified in the EIA studies.
- Sensitive ecological areas where endangered species were observed.
- Grassed areas surrounding the runways.
- Major Road Reserves including N1, R54, Airport Access Roads as well as the planned GAUTRANS future PWV5 and K routes.

7.3. Access and Circulation Framework

- To ensure appropriate regional and metropolitan access to the Aerotropolis and all future surrounding land-uses.
- Ensure direct and efficient road access to and linkage between the various sub-zones of the greater aerotropolis and its precincts.
- To establish a suitable, economical and hierarchical movement network for all vehicles, for passengers, staff, freight and non-motorised transport.
- Enable the establishment of effective and efficient public transportation access, road based and potentially rail based.
- Promote integrated and safe vehicle and non-motorised access and circulation to site, on site, for an efficiently connected site.
- Promote a multi-modal approach to transport provision.

7.3.1. Regional Access and Circulation System

7.3.1.1 Regional Road access locations

The Aerotropolis will have access to the primary regional road network from three potential locations:

Short-term

- A new split diamond interchange on the N1 with the R54 and road D2459 (Roots Road) in the vicinity of the R57 partial interchange and the R54 overpass.

  OR

- A narrow diamond access interchange of the N1 Freeway with the K176/K170 located approximately 10.0 km to the north-east of the site. This interchange is contained in the Provincial Strategic Road Network Plan, and the Basic Planning of the interchange has been undertaken.

  OR

- A future access interchange of the N1 with the R54 (K178), located at the current N1/R57 interchange.

The future phases of the airport will require additional access capacity from the N1, which can be provide by either upgrading the interchange that will be implemented in Phase 1, or an additional interchange/s, or a combination of upgrade and additional interchange/s.

Refer to Figure 7-4 to 7-6 for the three interchange options. The final interchange that will be implemented for Phase 1 is subject to statutory approval by SANRAL, the Gauteng Department of Roads and Transport and the Emfuleni municipality.

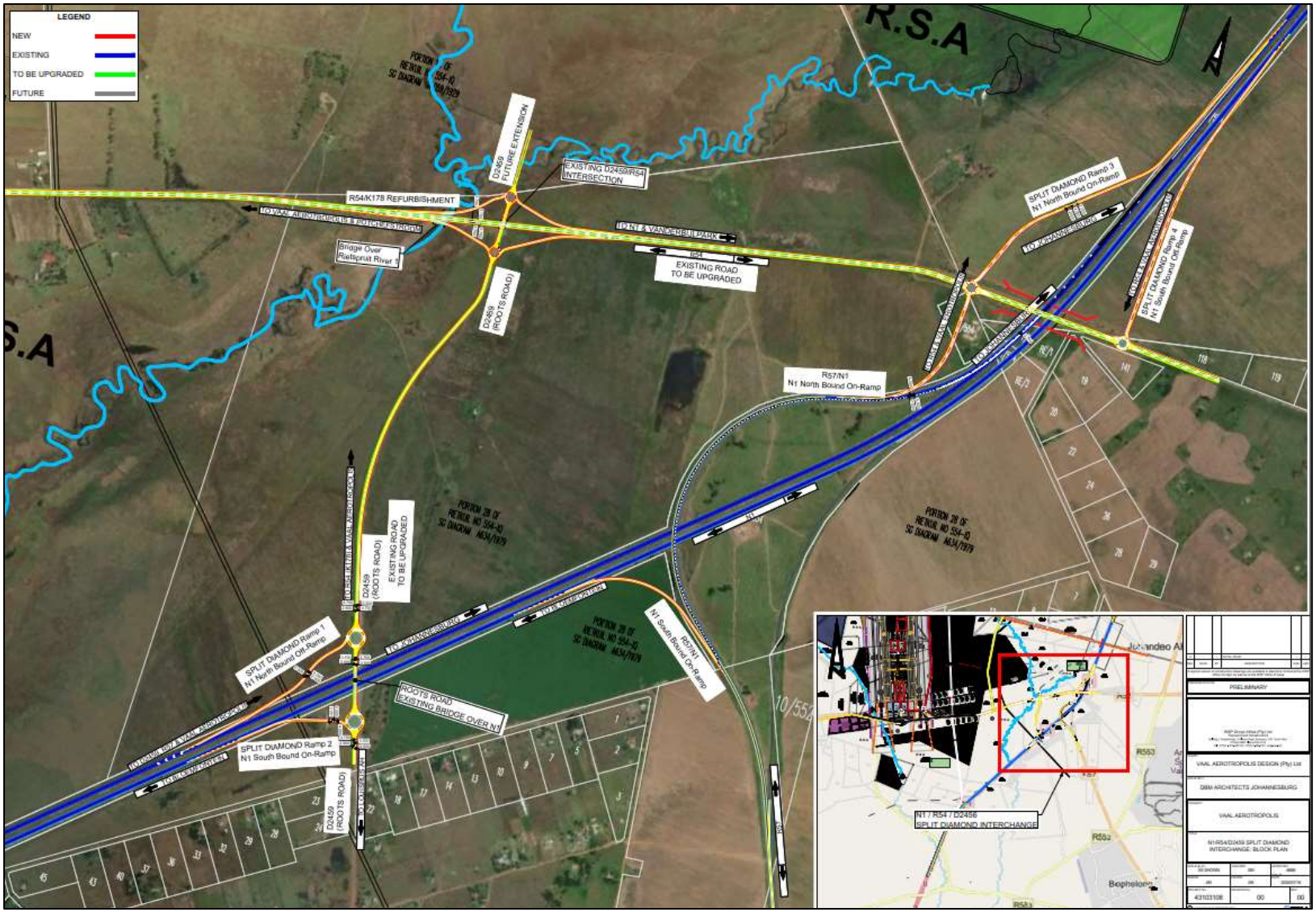

Figure 7-4. N1/R54/R57/D2459 interchange option.

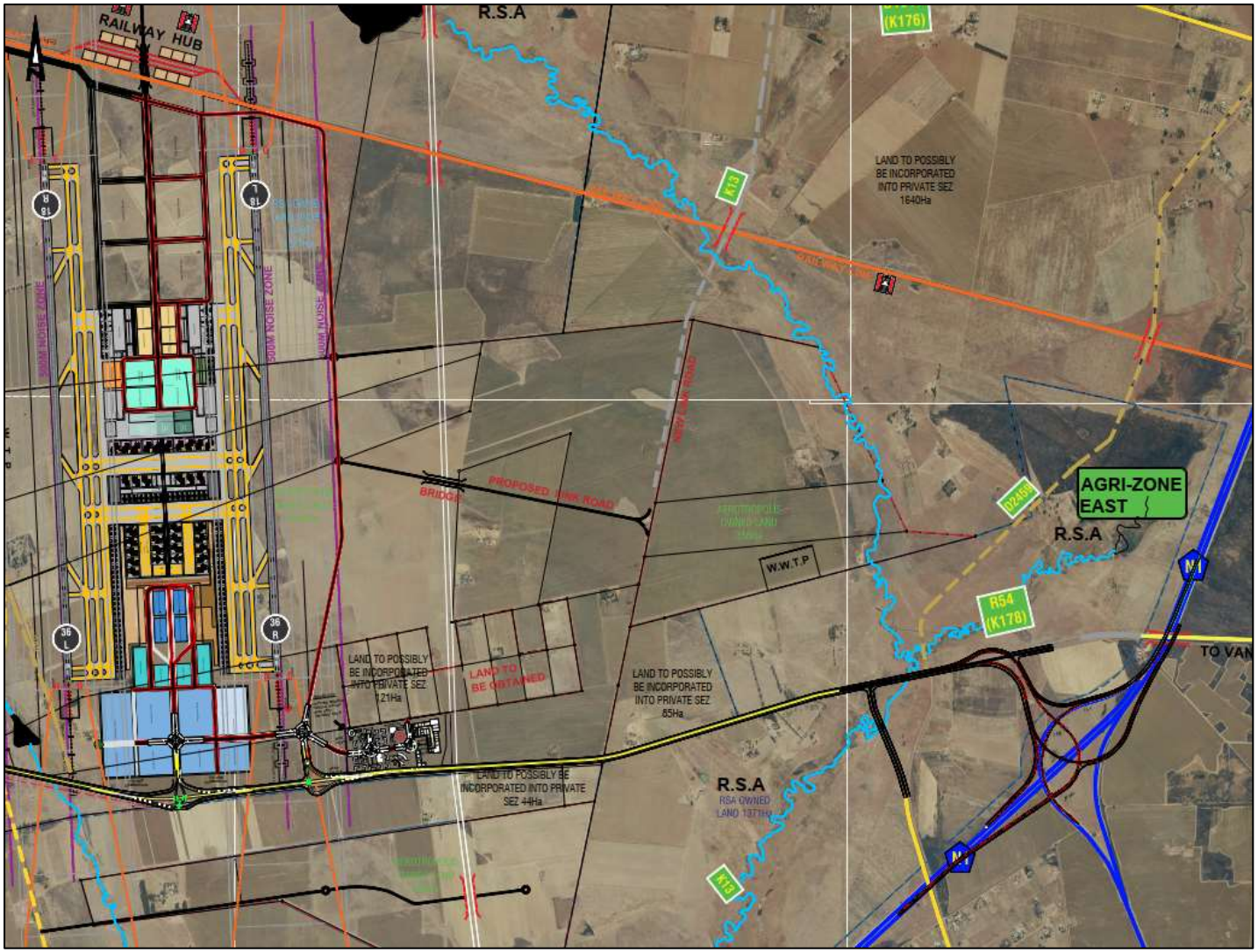

Figure 7-5. N1/R54 interchange option.

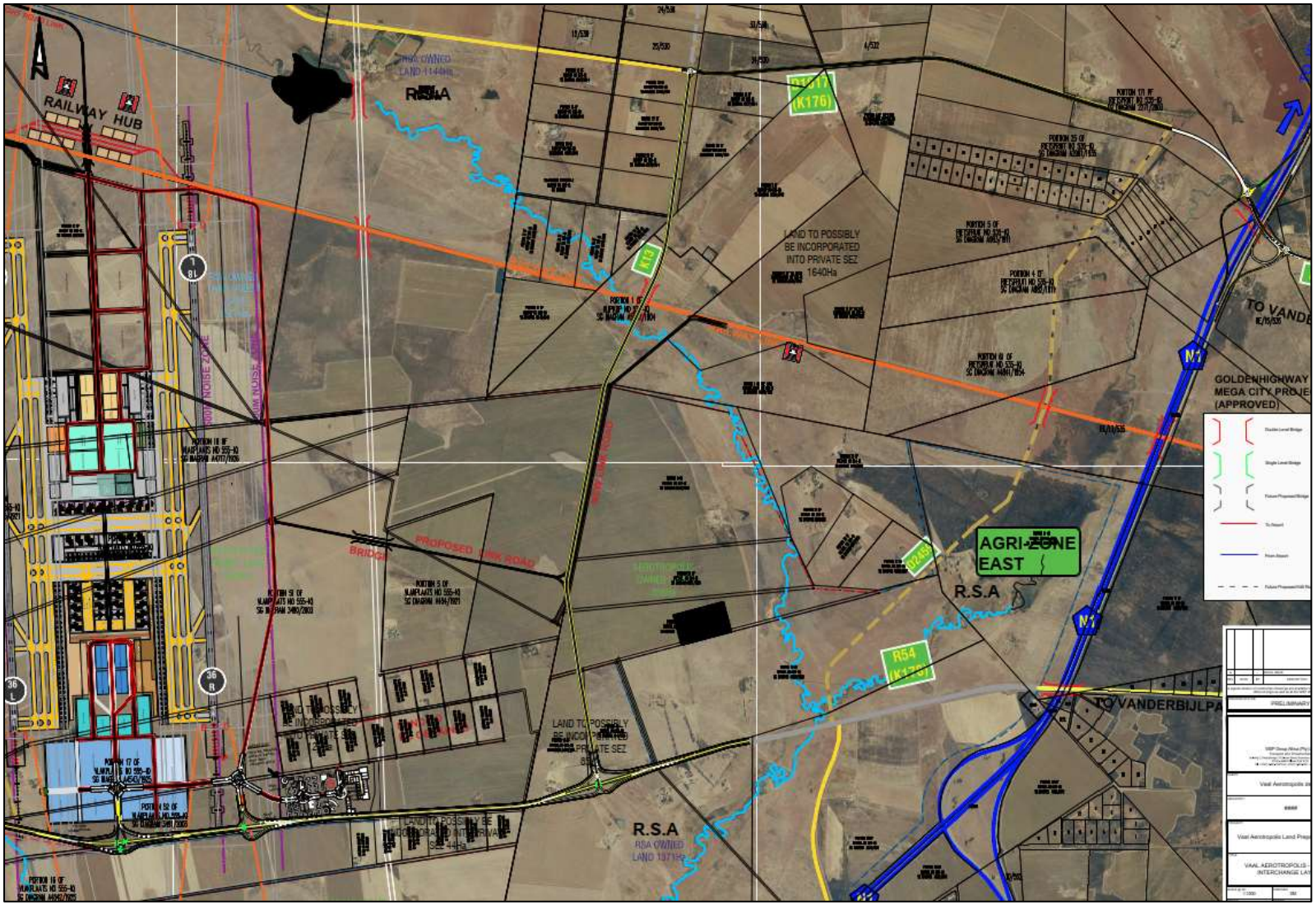

Figure 7-6. N1/K176/K170 interchange option.

Medium- to Long-term

- Should any of the short-term interchange proposals be approved in principle, one will be chosen for construction based on aspects such as environmental impact, etc. The alternate interchanges may then be considered for implementation in future, for additional capacity when the next phases of the airport are implemented.

  OR

- Should only one of the proposed interchanges be approved and implemented in the short-term, it will be assessed for capacity upgrades in future, if required, when the next phases of the airport are implemented.

7.3.1.2 Regional Road access network

The Vaal Aerotropolis will obtain access from the following Provincial roads, the K-Road network of the Gauteng Strategic Major Road Network. These roads are future Class 2 roads, with an ultimate 2 lane or more lanes per direction with a segregated dual carriageway cross-section.

Short-term

- Access via the upgraded R54 (from the west and east), and to the new N1/R54 partial interchange from the north on the N1.
- Access via the upgraded R54 to the R57 northbound link to the N1.
- Access via the upgraded R54 to the upgraded D2459 (Roots Road) and the new N1/D2459 partial interchange from the south on the N1, and from the D2459 from the south.

OR

- Access via the R54, a new section of the K13, a section of the K176 to the new N1 Freeway/ K176/K170 interchange
- Access from the west along the R54

OR

- Access via a section of the R54 to the new N1 Freeway/R54 interchange
- Access from the west along the R54

Medium-term

- To be determined based on the option of N1 interchange that will be implemented for Phase 1 of the Aerotropolis.

Long-term

- To be determined based on the option of N1 interchange that will be implemented for Phase 1 of the Aerotropolis in the short term, and Phase 2 of the Aerotropolis in the medium term.

7.3.2. Vaal Aerotropolis Road network

7.3.2.1 Secondary Road network

A secondary road network is planned to connect the regional high-order roads to the Aerotropolis precincts. The routes are described in terms of the precincts and the zones they will provide access to. These roads will be a combination of Class 3 to Class 5 links, with varying cross-sections to be determined by the land-uses and precincts they will serve.

Terminal building precinct, Airport City

- Access 1: This is a new proposed access to serve the development, the access will be constructed as a partial free flow interchange with access from and to the R54 east of the interchange. The interchange will not have an on or off-ramp serving the R54 to and from the west, this movement will be accommodated at Access 2.
- Access 2: This is a new proposed access 2 to serve the development, the access will be constructed as a grade-separated diamond interchange with full accessibility from the R54 (to and from the east and west). All ramps will be free-flowing.

Agri-zone south

- Access via the future K9 from the K178 (R54), a future north-south aligned route that will traverse the K178 at a an at-grade junction west of the site.

Trade zone 1 & 2, Railway Hub, and Agri-Zone North

- An east-west aligned road from the airport trade zone access road to the access road from the Airport City. This road will also provide access to the future Trade Zones 3 to 5.

Alternatively, or in addition:

- An east-west aligned road from the K9 to the trade zone access road.
- A link from the K9 to the Railway Hub, with a grade separated road over rail structure to Trade Zone 1 and 2 and the cargo precinct of the airport. *(Future link)*

Agri-zone East, Trade zone 3 - 5

- The north-south aligned route from the eastern access off the K178 to the Trade Zones 1 and 2 is required for Phase 1. This road will also provide access to Trade Zone 3, 4 and 5 and the land-uses east of the airport.

- An east-west road from the K13 to the Trade Zone access roads.
- An east-west road from the Trade Zone access road between northern Trade Zone.

Agri-zone west

- Access to Agri-zone West can be provided off the K9. It must be noted that direct access to properties is not allowed off Class 2 K-roads. Additional low order roads will be required to link the K9 to the Agri-zone and land-uses west of the airport.

7.3.2.2 Vaal Aerotropolis Tertiary Road Network

The tertiary road network will be the lowest order roads to connect the secondary road network to the various sub-precincts and erven. Seeing as the land-use details of the trade and Agri-zones (types, densities, etc.) has not been determined, additional analysis and geometric design will be required to inform the requirements of the tertiary roads.

7.3.3. Public Transport Provision

7.3.3.1 Road based

- Road based public transport provision to the Aerotropolis will be accommodated on the secondary road network. At all appropriate locations, lay-bys for kerbside stopping for buses and mini-buses will be provided.

7.3.3.2 Rail based

- Metrorail operates a commuter service from Vereeniging to Johannesburg Park Station via Sebokeng, Orange Farm, Lenasia, and Soweto. A future airport commuter rail service can be considered to link to the Vereeniging/Park Station service at Vereeniging Station.

- A rail siding can potentially be implemented from the main railway line north of the site, on a north-south alignment, which will terminate at a sub-surface station near the terminal buildings within the terminal surface parking area.
- A high-level desk-top assessment noted that the link is feasible from a horizontal alignment perspective. The vertical alignment requires further investigation to test the feasibility.

7.3.4. Non-motorised Transport Provision

- Non-motorised transport will be accommodated on all precinct access roads, where appropriate, by means of surfaced sidewalks and safe pedestrian crossings at intersections and public transport lay-bys.
- At the large public transport demand areas such as the terminal buildings and the high-density Airport City, public transport hubs such as a bus and taxi ranks will be incorporated in the site development planning.

7.3.5. Summary

The planned transport network will provide a hierarchical and clear network to serve the long-distance mobility access needs, regional access needs and the local and inter-zone zone transport needs of the Aerotropolis.

The network is more than sufficient to accommodate the land-use development as they are implemented over the course of the life of the Aerotropolis. The network is also robust and flexible to be adapted in future should land-uses within zones change and/or intensify that may require additional and accessibility.

Refer to Figure 7-7 for the planned road transport network, and to Section 8.8 for the phased road infrastructure requirements.

Figure 7-7. Aerotropolis planned external and internal road network.

7.4. Land Use Framework

This section defines the Airport's facility requirements and describes the proposed Airport layout plan based on the information received and agreed airport planning assumptions.

7.4.1. Land Use Objectives

The spatial requirements of the airport facilities are based on the air traffic demand forecasts and airport planning assumptions suited to the proposed airport operations. A detailed bottom-up analysis for the definition of the spatial requirements would be based on the peak hour volumes (passengers, ATMs and cargo); however, in most cases the requirements for the Airport Precinct facilities have been defined using a top-down high-level approach based on annual volumes, planning ratios, benchmarking and industry best practices, in the absence of detailed demand and operational information being available at this stage of the project.

7.4.2. Land Use Distribution within the VA Site

Planning horizons and demand forecast:

- The proposed opening year planning capacity has been identified as 7.2mppa for the passenger facilities, 150,000 tons/year for the cargo facilities, supported by a single runway with an estimated peak throughput demand of 23 ATMs/hr;
- The ultimate planning capacity for the passenger terminal and related facilities has been set to 45mppa;
- An interim phase has also been identified for a capacity of 25mppa, which could be the trigger point for the development of the second runway; however, the need for a second runway is dependent on several factors including demand and also airspace restrictions, which is not included in the scope of this work;
- Overall, the Airport Precinct has therefore been planned based on three main development phases at 20 years intervals for a total development period of 60 years.

7.4.3. Land Use Distribution within the Aerotropolis

7.4.3.1 Airport Precinct context:

- The new airport would provide a single runway on opening day with a second runway planned for the medium to long term development;
- The location and orientation of the runway system was defined with runway length set to 4200m for wide-body aircraft operations; however, the runway location and orientation has recently been changed ;
- The separation of the two runways was initially set to 1500m; however, following a review of the passenger terminal, cargo terminal, apron stand requirements and landside access requirements the spacing between runway centrelines has been extended to 1700m;
- The Dube Trade Port Development Framework Plan report has been assumed as a reference for the report and the King Shaka International Airport layout in La Mercy, KwaZulu-Natal has been assumed as the key reference for the development of the Airport Precinct at Vaal Aerotropolis.

7.4.3.2 Airfield facilities:

- Airfield planning standards are based on ICAO Annex 14 Volume 1 9th Edition 2022;
- The aerodrome reference code is ICAO Code 4F as the proposed runways exceed 1,800m and the design aircraft for planning purposes is Code F for both cargo and passenger facilities;
- Runway approach procedures have been assumed to be ICAO Precision Approach Category III for ILS, OLS, approach lighting and the runway strips;
- The design aircraft types are as follows: Code C = A321 Neo / B737-MAX, Code E = A350-1000, Code F = A380-800
- Runway End Safety Areas (RESA): Maximum RESAs defined by ICAO to be provided at each runway end;

- Airfield separations and clearances: Runway to taxiway, taxiway to taxiway, taxilane to taxilane and taxiway/taxilane to object clearances as per ICAO Annex 14.

7.4.3.3 Ancillary Facilities:

- Maintenance, Repair and Overhaul (MRO) facilities (including hangar, hardstand, offices and car parking) planned to accommodate based regional airlines with ultimate capacity to accommodate up to 8 code C, 2 code E and 2 code F aircraft in the 45 mppa planning horizon;
- Other airfield support facilities and car parking requirements have been based on international ratios and best practice.

Using a combination of the demand forecast data, international design standards and recommendations, rules of thumb based on experience, and benchmarking with other similar airports, the facility requirements for each component of the airport Master Plan have been defined.

7.4.4. Airfield Facility Requirements

The key planning assumptions adopted for the definition of the airfield facilities including runways, taxiways and apron stands have been defined as follows:

- Runway length = 4,200 m based on client requirements;
- Runway width = 60 m, plus 7.5m paved shoulders on either side for a total width of 75m for Code F operations;
- Runway End Safety Areas (RESA): Maximum RESAs to be provided at each runway end 240m long by 150m wide as per ICAO recommendations;
- Runway Approach Lighting provided has been based on CAT III requirements to safeguard space for the worst-case scenario;

- It has been assumed that a CAT III Instrument Landing System (ILS) would also be provided to maintain operations in low visibility conditions, and therefore space has been safeguarded for the provision of ILS glidepath and localiser facilities and surrounding protected areas;
- Distance between runway centre line and taxiway centre line = 180m, for code F operations;
- Two parallel taxiways are recommended for greater operational flexibility;
- Code F Taxiway centre line to Code E taxiway centre line = calculated as 83.5m using ICAO methodology;
- Code E Taxiway centre line to Code C taxiway centre line = calculated as 61.5m using ICAO methodology;
- Taxiway width: Code E/F taxiway width = 23m;
- Other airfield separations and clearances as per ICAO Annex 14;
- Airside Roads: 10m wide two-way 'Head of Stand' and 'Back of Stand Roads' plus inter-stand roads should be provided every 4-5 aircraft stands. 5m parking/kerb zone also provided between 'Head of Stand' road and terminal building;
- Code F MARS stand size: stand sizing for initial master plan layouts = 95m deep x 91m wide;
- Code E MARS stand size: stand sizing for initial master plan layouts = 91m deep x 85.5m wide;
- Code C stand size: stand sizing for initial master plan layouts = 60m deep x 45m wide;
- Cargo Stands: stand sizing as per passenger aircraft stands plus operational area between stand and cargo terminal building of approximately 50m to provide airside road and operational areas for cargo equipment storage.

7.4.5. Passenger Aircraft Stands Requirements

The aircraft stand requirements are typically calculated based on the analysis of aircraft on the ground derived from the design day flight schedule. However, this information is not available for this project, and therefore the stand requirements have been estimated at a high level using the annual volumes, planning ratios, and benchmarking.

The high-level approach adopted for defining the passenger aircraft stand requirements has been based on the expected ratio of annual passenger volumes per aircraft stand. This ratio typically varies based on the type of airport, airline mix, aircraft types and load factors; the ratio typically decreases for smaller, less busy airports, and it increases for larger busier international airports. For master planning purposes we would recommend not to assume the highest ratios of passengers per stand in order to safeguard sufficient space for aircraft stands and provide contingency to handle changes in demand. Based on this approach, the passenger aircraft stand requirements have been defined based on the following ratios for the three phases of development:

- 200,000-250,000 pax/ stand for 7.2mppa (opening year)
- 300,000-350,000 pax/stand for 25 mppa (interim phase)
- 400,000-450,000 pax/stand for 45 mppa (final phase)

For comparison, King Shaka International Airport has been built with 29 stands NBE (narrow body equivalent) for a declared capacity of 7.5mppa; this corresponds to a ratio of ca. 260,000 pax/stand.

The table below provides the total passenger aircraft stand requirements for the three phases of development. For each phase of development, a range of passenger aircraft stands is provided.

High-level passenger stand requirements	Annual pax / stand ratio	7.2 MPPA	25 MPPA	45 MPPA
Phase 1	200,000	36		
	250,000	29		
Phase 2	300,000		84	
	350,000		72	
Phase 3	400,000			113
	450,000			100

Table 7-1. Passenger stand requirements, top-down approach.

An alternative methodology has also been developed to define the mix of passenger aircraft stands; this methodology was based on

a bottom-up approach that defined the requirements based on the passenger Air Traffic Movement (ATM) peak volumes derived from the annual passenger demand provided by the Client. The peak movements were defined using annual to peak hour ratios because of the lack of detailed information provided in the Client's traffic forecast. The peak ATMs were then split by ICAO aircraft type. The estimated passenger ATM peak hour demand by type of aircraft is reported in the table below:

PAX ATM Aircraft Split	ATM demand		
	7.2 mppa	25 mppa	45 mppa
Aircraft Type A	0	0	0
Aircraft Type B	1	1	1
Aircraft Type C	18	47	73
Aircraft Type D	0	1	1
Aircraft Type E	2	5	8
Aircraft Type F	1	1	1
Total ATM peak - PAX	**22**	**55**	**84**

Table 7-2. Estimated passenger ATM peak hour demand by type of aircraft.

In absence of any specific information coming from the traffic forecast, the stand requirements were calculated by increasing the peak ATM demand by 20%. The total passenger aircraft stand requirement is reported in the table below:

Total PAX Stand requirements	Total		
	7.2 mppa	25 mppa	45 mppa
Aircraft Type A	0	0	0
Aircraft Type B	1	1	1
Aircraft Type C	22	56	88
Aircraft Type D	0	1	1
Aircraft Type E	2	6	10
Aircraft Type F	1	1	1
Total PAX Stand requirements	**26**	**65**	**101**
Total PAX Stand requirement - NBE	29	73	113
Total PAX Stand requirement - MARS*	15	37	57

* if all stands were MARS

Table 7-3. Passenger stand requirements, bottom-up approach.

The results coming from the bottom-up approach are within the ranges provided by the top-down approach. For space safeguarding purposes it has been assumed that the highest requirements between the two approaches should be adopted and the requirements by type have been calculated in proportion to the bottom-up approach.

The summary of the passenger aircraft stand requirements is presented in the table below. The split between contact and remote stands has been defined by assuming:

- Narrow-body aircraft: 60% contact – 40% remote
- Wide-body aircraft: 80% contact – 20% remote

Total PAX Stand requirements	Total			Contact			Remote		
	7.2 mppa	25 mppa	45 mppa	7.2 mppa	25 mppa	45 mppa	7.2 mppa	25 mppa	45 mppa
Aircraft Type A	0	0	0	0	0	0	0	0	0
Aircraft Type B	1	1	1	1	1	1	0	0	0
Aircraft Type C	22	56	88	14	34	53	8	22	35
Aircraft Type D	0	1	1	0	1	1	0	0	0
Aircraft Type E	2	6	10	2	5	8	0	1	2
Aircraft Type F	1	1	1	1	1	1	0	0	0
Total PAX Stand requirements	**26**	**65**	**101**	**18**	**42**	**64**	**8**	**23**	**37**
Total PAX Stand requirement - NBE	29	73	113	21	49	74	8	24	39
Total PAX Stand requirement - MARS*	15	37	57	11	25	37	4	12	20

*** if all stands were MARS**

Table 7-4. Passenger stand requirements, contact / remote split.

The definition of the concept Master Plan layout for the ultimate phase of 45mppa has been aligned to the passenger stand requirements defined with the bottom-up approach (i.e. 113 NBE passenger aircraft stands).

7.4.6. Passenger Terminal Facility requirements

Due to the absence of detailed passenger demand forecasts, it has not been possible at this early stage of planning to adopt a typical bottom-up analysis to calculate the terminal facility requirements based on IATA planning standards, busy hour information, and facility processing assumptions to define the requirements. Therefore, a top-down methodology has been used to size the terminal building based on industry recognised rules of thumb/ratios based on benchmarking the building area expected per million annual pax with other similar airports and other planning assumptions, which are presented below:

- Terminal Gross Floor Area (GFA) Sizing rule of thumb: 10,000sqm per MPPA for International operations.
- Terminal Gross Floor Area (GFA) Sizing rule of thumb: 8,000sqm per MPPA for Domestic operations.

The split of domestic and regional / international facilities has been derived from the traffic forecast information provided. The following splits have been assumed:

- 7.2 mppa: Dom = 65% and Reg/Int = 35%
- 25 mppa: Dom = 65% and Reg/Int = 35%
- 45 mppa: Dom = 70% and Reg/Int = 30%

Different assumptions have been used to convert the GFA figures into a terminal building footprint for planning purposes:

- International terminal area = Average of 2.5 levels e.g. BHS basement (half level)/Arrivals (half level)/Departures (one level)/Offices (half level).
- Domestic terminal area = Average of 2 levels e.g. BHS basement (half level)/Arrivals (half level)/Departures (one level).

These different sizing assumptions and GFA/footprint ratios by sector take into consideration that larger areas are needed for international passenger processing facilities compared to domestic operations.

The Passenger Terminal area requirements are presented in the following table.

		7.2 MPPA		25 MPPA		45 MPPA	
		Int	*Dom*	*Int*	*Dom*	*Int*	*Dom*
	sqm/mppa ratio	*35%*	*65%*	*35%*	*65%*	*30%*	*70%*
International Terminal GFA sqm	*10,000*	25,200		87,500		135,000	
Domestic Terminal GFA sqm	*8,000*		37,500		130,000		252,000
Total Terminal GFA sqm			**62,700**		**217,500**		**387,000**
	No. of levels						
International Terminal Footprint sqm	*2.5*	10,080		35,000		54,000	
Domestic Terminal Footprint sqm	*2*		18,750		65,000		126,000
Total Terminal Footprint sqm			**28,830**		**100,000**		**180,000**

Table 7-5. Passenger terminal requirements (GFA, sqm).

7.4.7. Cargo Terminal Facility requirements

The air cargo facilities have been planned to serve dedicated cargo freighter aircraft operations and therefore the cargo terminal has been planned with dedicated cargo aircraft stands.

The space requirements for the Air Cargo building have been calculated using a top-down approach based on benchmarking information due to the lack of detailed cargo demand forecasts available for the interim and final phases. A benchmarking study has been conducted to assess the cargo facilities provided at King Shaka and O. R. Tambo international airports. The study has provided a ratio of annual cargo tonnes per cargo terminal square metre to calculate the cargo building requirement. Also, guidelines provided by IATA have been considered to take into account the potential level of automation to be adopted in the new cargo terminal building and the assumption that over time the operations should become more efficient with increased levels of automation. The requirements have been then defined based on the following assumptions:

- Phase 1: 150,000 tons/yr: assuming 10 tons/sqm (as per King Shaka international airport)

- Phase 2: 362,000 tons/yr: assuming 13.5 tons/sqm (as per IATA's medium/high level of automation)
- Phase 3: 872,000 tons/yr: assuming 17 tons/sqm (as per IATA's high level of automation)

CARGO TERMINAL **Footprint requirement (sqm)**		**150k tonnes**	**360k tonnes**	**870k tonnes**
	tons/sqm ratio	Footprint	Footprint	Footprint
High level of automation	*17.0*	8,830	21,300	51,300
Medium/High level of automation	*13.5*	11,120	26,820	64,600
King Shaka benchmarking ratio	*10.0*	15,000	36,200	87,200
O.R. Tambo benchmarking ratio	*8.2*	18,370	44,340	106,790

Table 7-6. Cargo terminal requirements (GFA, sqm).

Between the cargo building and the cargo stands a buffer area of 50 m wide which would be provided to safeguard space for cargo operations (including airside road, storage and manoeuvring area). On the landside of the cargo building, a buffer area of 75 m wide would be provided to safeguard space for car parking, landside loading/unloading and vehicle manoeuvring areas.

To support the cargo terminal operations, freight forwarding facilities (buildings and yards) would be required, similar to the concept of operations found at King Shaka International Airport. In the absence of detailed requirements for this facility and operation, the space requirements for planning this function have been calculated based on the tonnes per year / sqm ratio found at King Shaka International Airport.

FREIGHT FORWARDING **Footprint requirement (sqm)** Including car parking		**150k tonnes**	**360k tonnes**	**870k tonnes**
	tons/sqm ratio	Footprint	Footprint	Footprint
King Shaka benchmarking ratio	*6.6*	22,700	54,790	131,970

Table 7-7. Freight forwarding facility requirements (GFA, sqm).

7.4.8. Cargo Aircraft Stands requirements

The requirements for the number of Cargo aircraft stands have been calculated with the same bottom-up methodology used to define the number of passenger aircraft stands. In the absence of any specific information contained in the traffic forecast, the stand requirements were calculated by increasing the peak demand by 20%. The total cargo aircraft stand requirement is reported in the table below:

Total CARGO Stand requirements	150k tonnes	360k tonnes	870k tonnes
Aircraft Type A	0	0	0
Aircraft Type B	0	0	0
Aircraft Type C	1	2	5
Aircraft Type D	2	4	6
Aircraft Type E	1	1	2
Aircraft Type F	1	1	1
Total CARGO Stand requirements	**5**	**8**	**14**
Total CARGO Stand requirement - WBE	5	7	12

Table 7-8. Cargo stand requirements, bottom-up approach.

7.4.9. Airside Ancillary Facility requirements

7.4.9.1 Air Traffic Control (ATC) tower

The footprint requirement for the ATC tower has been calculated by assessing the footprint provided at King Shaka and O. R. Tambo international airports:

- King Shaka international airport: 7,000 sqm footprint
- O. R. Tambo international airport: 25,000 sqm footprint

As a minimum requirement it is assumed an area of 10,000sqm dedicated to the ATC tower, car parking and related functions.

An indicative location for the ATC tower will be included in the concept airport master plan, however the exact position and height of the ATC Tower required to adequately view the operational areas will need to be determined during a later design stage through undertaking an ATC Tower line of sight study. However, a benchmarking study has been undertaken to identify the heights of ATC

towers at international airports with a similar runway configuration (two wide-spaced parallel runways). Based on this study, it is expected that the ATC tower should be ca. 70m in height; however, a more detailed line of sight study would need to be undertaken to determine the exact height.

7.4.9.2 Airport Rescue & Fire-Fighting Services RFFS

The footprint requirement for the RFFS facilities has been calculated by assessing the footprint provided at King Shaka and O. R. Tambo international airports:

- King Shaka international airport: 10,000 sqm footprint
- O. R. Tambo international airport: 35,000 sqm footprint

In this case it is assumed two stations (main and support), each with a total footprint for buildings and support areas of ca.10,000sqm, will be provided at Vaal International Airport, with one used to serve each runway in order to meet the response times to the end of the runways and to other airside facilities. The footprint requirements include space for the RFFS station buildings, car parking, internal roads and other RFFS related functions. Due to the lack of information related to the specific air traffic forecast and fleet mix, the highest Aircraft Category for Fire Fighting assumed has been based on the need to handle Code E/F aircraft (Category 10 - design aircraft with overall length > 76m).

7.4.9.3 GSE and Airport Maintenance Facilities

The definition of the requirements for the Airport and GSE maintenance facilities has been undertaken by assessing King Shaka and O. R. Tambo International airports as well as using rule of thumb ratio (footprint area per mppa) based on benchmarking with other international airports.

The footprint per mppa ratio calculated for O.R. Tambo airport is almost three times higher than King Shaka international airport due to the different type and scale of operations and historical development of O. R. Tambo to serve a wider range of commercial and general aviation activities. Given the uncertainty regarding the operational strategy for the long-term development of Vaal Aerotropolis, we therefore recommend using requirements based on the area per mppa ratio taken from benchmarking with other international airports.

GSE Maintenance Footprint requirement		**7.2 MPPA**	**25 MPPA**	**45 MPPA**
	Footprint/mppa	Footprint	Footprint	Footprint
International ratio	*3,000*	21,600	75,000	135,000
King Shaka ratio	*2,530*	18,216	63,250	113,850
O.R. Tambo ratio	*7,140*	51,408	178,500	321,300

Table 7-9. Airport maintenance and GSE requirements (GFA, sqm).

7.4.9.4 Maintenance, Repair and Overhaul (MRO) Facilities

Like the airport / GSE maintenance, the space requirements for the MRO facilities have been defined by a benchmarking exercise with other international airports, O. R. Tambo Airport and King Shaka Airports. Given the difference in the type of operations of the latter two airports, discussions have been undertaken with Vaal Aerotropolis's management team to understand the long-term strategy for the MRO development. Following these discussions, it has been agreed that Vaal Aerotropolis will not be a replacement for

O. R. Tambo operations in the ultimate 45mppa phase and therefore carriers like South African Airways would not be relocating their base of operations to the airport. However, the ambition is to attract regional commercial / business aviation

operators to be based at Vaal and therefore these airlines would need MRO and related facilities; furthermore, the airport management team requested to include third party MRO facilities capable of handling larger commercial aircraft, including code F, to increase the airport's commercial attractiveness.

Therefore, the requirements for the MRO facilities have been calculated as:

- Phase 1: 2 Code C and 1 Code F hangars;
- Phase 2: 4 Code C, 1 code E and 1 Code F hangars;
- Phase 3: 8 Code C, 2 code E and 2 Code F hangars.

The facilities supporting the MRO hangars, such as hardstand, workshop, warehouse, and car parking, have been defined using sqm/mppa ratios based on benchmarking with other international airports.

The overall requirements for the footprint required for the MRO facilities are summarised in the table below:

MRO Footprint requirement (including supporting areas)		**7.2 MPPA**	**25 MPPA**	**45 MPPA**
	Methodology	Footprint	Footprint	Footprint
2 Code C + 1 code F	*Bottom-up*	41,400		
4 Code C + 1 code E + 1 code F	*Bottom-up*		102,200	
8 Code C + 2 code E + 2 code F	*Bottom-up*			193,700

Table 7-10. MRO requirements (GFA, sqm).

7.4.9.5 Aviation Fuel Farm Facility

To calculate the aviation fuel storage requirements (JetA1/SAFs etc), the standard methodology would determine the fuel needed to service the flights operated on a peak day and then provide a defined number of days of fuel reserves in case of a break in regular supply.

However, due to the limited availability of data, the facilities have been sized based on benchmarking the size of the existing fuel farms at King Shaka and O. R. Tambo airports as well as other international airports with passenger demands up to 45mppa.

Based on these benchmarks, a space requirement of ca. 700 sqm/mppa has been defined for Vaal Aerotropolis. This requirement assumes that the distribution of fuel would be with a hydrant system with SAF / conventional jet A1 aviation fuel given this a new greenfield airport site. The assumed requirement is lower than King Shaka and O. R. Tambo airports where the refuelling process is based on bowser operations.

Fuel Farm Footprint requirement		**7.2 MPPA**	**25 MPPA**	**45 MPPA**
	Footprint/mppa	Footprint	Footprint	Footprint
International ratio	*700*	5,040	17,500	31,500
King Shaka ratio	*1,680*	12,100	42,000	75,600
O. R. Tambo ratio	*2,000*	14,400	50,000	90,000

Table 7-11. Fuel farm requirements (GFA, sqm).

Due to lack of information, no space requirements have been calculated for hydrogen refuelling operations; however, an area for a potential hydrogen fuel farm has been identified in the aerotropolis Master Plan layout.

7.4.9.6 Flight catering facilities

Bottom-up calculations based on number of meals per flight multiplied by number of flights per peak day are usually used to develop the size of flight catering facilities; however, due to lack of data it has been assumed that an area of 1,200sqm per MPPA is required for a catering facility and car parking based on international benchmarks.

Flight Catering Footprint requirement		7.2 MPPA	25 MPPA	45 MPPA
	Footprint/mppa	Footprint	Footprint	Footprint
International ratio	*1,200*	8,640	30,000	54,000
King Shaka	*n.a.*	n.a.	n.a.	n.a.
O.R. Tambo ratio	*n.a.*	n.a.	n.a.	n.a.

Table 7-12. Flight catering requirements (GFA, sqm).

7.4.9.7 Landside car parking

The requirements for the car parking facilities have been defined from international benchmarks and by assessing King Shaka and O. R. Tambo international airports. Discussions have been undertaken with Vaal Aerotropolis' management team to define the long-term commercial strategy to determine the car park requirements.

The proportion of car parking area by different products/facilities has been assumed to be as follows:

- Multi-storey car parks for short to medium stays (MSCP) "Parkades": 35%
- Long-stay car parks: 45%
- Car rental ('front of house' facilities): 10%
- Staff: 10%

Based on international benchmarks the MSCP requirement has assumed of 300 car parking spaces per mppa and 35 sqm per car parking space (including internal roads and landscaping). The long-stay requirement has assumed of 650 car parking spaces per mppa and 20 sqm per car parking space (including internal roads and landscaping).

Based on the assumption above, the space requirements for all types of car parking are approximately 29,000 sqm / mppa which is slightly higher than the ratio found at King Shaka International Airport (which is estimated to be approximately 27,700 sqm / mppa). The car parking facilities provided at O. R. Tambo international airport are assumed not to be representative of the requirements for a new airport like Vaal because of the airport's space constraints and therefore high proportion of MSCP.

The total requirements for the car parking facilities including passengers ("parkades" and long stay car parks), staff parking and rent a car are highlighted in green in the table below.

Car Parks space requirement		7.2 MPPA	25 MPPA	45 MPPA
	total space/mppa	Total space	Total space	Total space
International ratio	*29,000*	208,800	725,000	1,305,000
King Shaka	*27,740*	199,728	693,500	1,248,300
O.R. Tambo ratio	*16,750*	120,600	418,750	753,750

Table 7-13. Car parking total requirements (GFA, sqm).

The space requirement for the MSCP will be allocated on multiple levels depending on the space available near the terminal/s.

7.5. Landscape and Built Form Framework

7.5.1. Landscape and Built Form Objectives

- Ensure that the VA contributes to the protection of valuable features in the natural landscape, such as the natural watercourses on the site.
- Integrate the VA site visually with the surrounding landscape by considering the height, surface area, arrangement of the infrastructure, colours used and boundary of the infrastructure with the environment.
- Rehabilitate degraded landscape elements of the site.
- Create a new landscape through the establishment of a number of individual development precincts, namely the airport platform, aero city and Agri zones.
- Ensure the creation of sustainable and memorable places within the VA.
- Establish a distinctive gateway image for the metropolitan area, the Province and the Country.

7.5.2. Landscape and Built Form Strategies

The development zones identified in Section 2 will be designed in such a manner that the development aesthetically fits into the natural environment. This is achieved by considering the opportunities and constraints identified within the study area and combining it with the needs of the development in terms of development layout, building and infrastructure footprints, heights and forms of infrastructure.

Therefore, each precinct should be designed in such a way that it proactively responds to the informants by mitigating the negative impacts associated with the transformation of the site and enhancing the natural landscapes by creating a unique, sustainable and memorable environment. This will ensure the creation of an efficient as well as cohesive landscape.

Two key overriding principles underpin the landscape strategy (see Figure 7-5) described below.

- Ensure that the conservation areas identified in the natural environment are maintained and enhanced in a sustainable manner in order to ensure and protect the ecological integrity of the ecosystem. The identified conservation areas form part of an integrated open space system within which development areas have been identified.
- Ensure that the new assets that will be created during the development of the VA utilise the assets and characteristics of the existing natural environment and landforms. This will ensure the creation of environments with distinct character and identities which is sensitive to human needs as well as efficient with respect to their roles in the VA.

Both of the above principles will be combined to generate an environment with an agricultural, but contemporary image, “feel” and experience that will be an important part of the branding strategy for the VA as a gateway to South Africa and the Emfuleni Region as an investment location.

Table 7-14 identifies and describes the primary elements of the landscape and built form framework that will be established through the detailed design and construction of each element and precinct within the site.

Element	**Description**
Open Space System	This is the primary landscape element of the VA site which will contain existing and future core components of the highveld grassland vegetation, freshwater systems as well as agricultural assets. It will spatially structure development on the site and will provide a backdrop for the built environment components of the development. It will be retained and developed as a common visual character element to all development precincts and will be physically integrated with each precinct wherever possible.

Airport Platform	This includes the entire levelled platform containing primary airport infrastructure and facilities including the Passenger and Cargo Terminals and runway and taxi areas. Whilst this platform will be developed in terms of strict aviation regulations the design of its various built elements will wherever possible within operational imperatives incorporate and respond to the surrounding highveld grassland and agricultural landscape character by way of form, materials, colours and textures. Planting and landscaping within the platforms various precincts will also reflect the highveld grassland characteristics. Built form in the platform will set up a human scaled and legible environment at the local scale and will contribute to the establishment of an identifiable new regional landscape.
Precincts	The VA site will consist of a number of discrete but linked development precincts with varying, but identifiable layout footprints and built environmental characters. Layout and building footprints, associated massing in response to the land use functions and operational requirements, land form characteristics of each precinct and location within and adjacent to surrounding development will determine the landscape character, “grain” and scale of the built environment of each precinct.
Movement Corridors	The network of primary movement corridors providing access to the VA area (e.g. N1, R54 and future PWV 5) and providing access and circulation within the VA site itself (e.g. Airport Access Road and other internal roads) will each have a discernible character representative of its role and hierarchy in the wider regional setting and / or within the VA site itself. The character of each will be determined by landscaping reserves and planting and signage themes and by concomitant building controls relating to built form, architecture and signage of buildings and structures which abut each road corridor.
Landmark Features	Prominent natural features including skylines, grasslands, fresh water systems etc. will be acknowledged and celebrated either through their protection from development, or celebration through appropriate built form to form a system of landmarks that will assist in the structure of the landscape and with orientation within the VA site.
Gateways	A hierarchy of gateways and entrance points to the VA site and individual precincts will be established which will be created through the development of new intersections and interchanges and celebrated by the design and grouping of buildings and appropriate landscaping treatments.
Vistas and Views	A network of vistas and views will be identified that will contribute to the experiences within, and images of, the various components of the VA and its precincts.

Table 7-14. Description of VA Site Landscape Elements.

8. INFRASTRUCTURE FRAMEWORK

8.1. Overview of the Section

This section describes the Infrastructure Framework for Bulk Infrastructure for the Vaal Aerotropolis Development, and in particular the First Build. The DTP Bulk Infrastructure is described under the following headings:

- Bulk Infrastructure Water
- Bulk Infrastructure Sewer
- Bulk Infrastructure Electricity
- Bulk Infrastructure Drainage
- Bulk Infrastructure Roads

8.2. Bulk Infrastructure Water

The Emfuleni water supply system is currently restricted to the municipality. Rand water shall supply the development; however, the Aerotropolis will also utilise borehole water supply for non-potable and back up water supply. The Vaal Aerotropolis will include a water treatment plant, retrieving water from available aquifers in the area using boreholes. The Vaal Aerotropolis will include a fully operational Water Treatment Plant, including storage facilities, which will have capacity to accommodate potable demands for the first build and the plant capacity will be increased to suit the ultimate development. The Vaal Aerotropolis will connect a sewage outflow line to the Vaal SEZ site and ultimately link to the Rietspruit Water Treatment Works. Should Rand Water not be able to offer this solution, a water treatment plant will be constructed on the site.

Water abstracted from aquifers, including borehole systems, shall be treated on site to the appropriate DWAF and DWS standards.

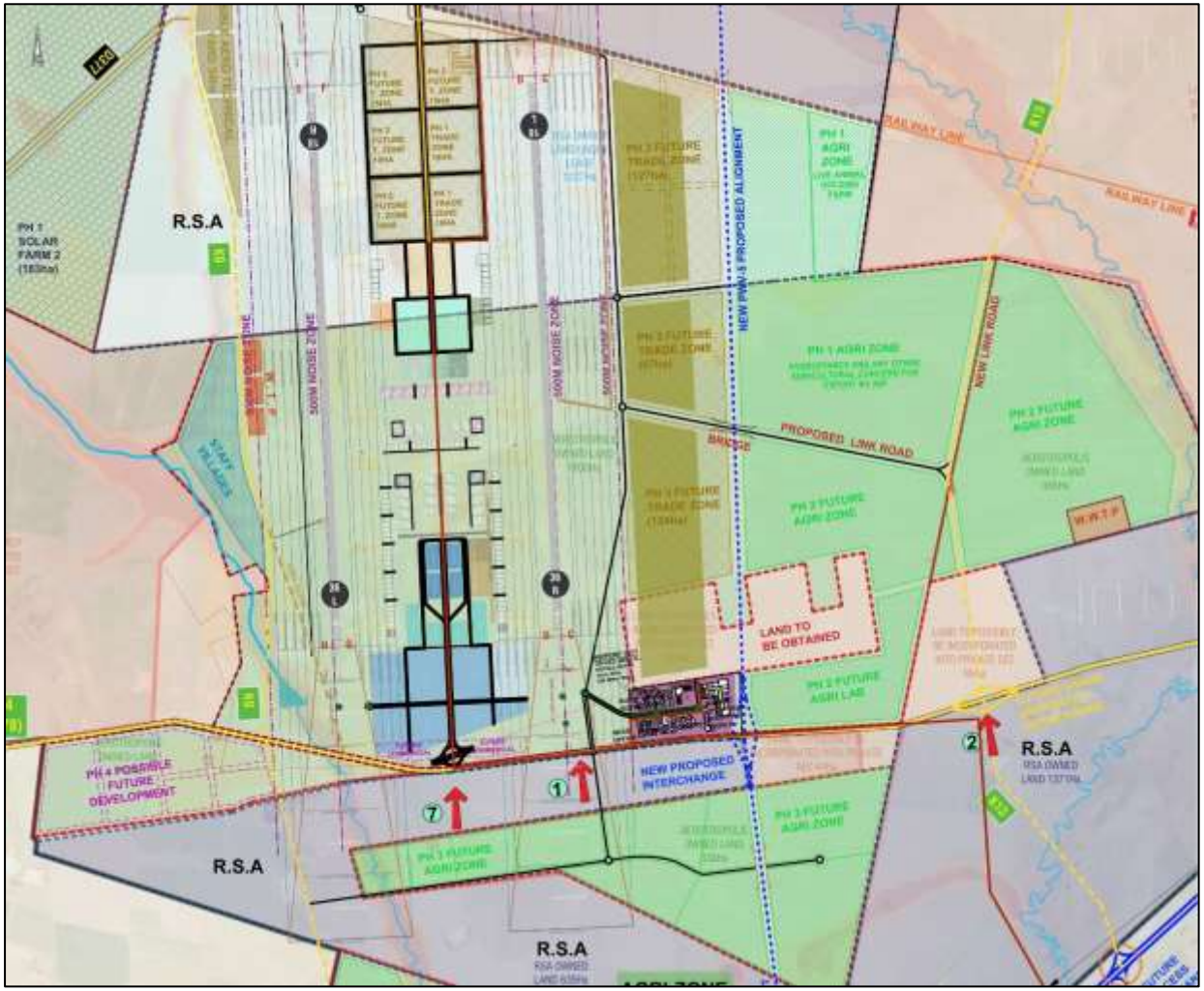

Figure 8-1. Connection to Bulk Sewer network of Vaal SEZ.

Table 8-1 shows the determined potable water demands for the 3 phases:

	Phase 1	Phase 2	Phase 3
Water Demand (Ml/day)	5.7	12	17.2
Required potable supply (Ml/day)	1.5	2.4	3.5
Required storage (Ml)	3	4.8	7

Table 8-1. Determined Potable Water demands.

The storage requirements allow provision for emergency storage based on 48 hours supply. The storage capacity also makes provision for fire storage allowance. Considering the risk as moderate, it is required that the fire water supply have a minimum of 15m pressure head. Table 8-2 shows the proposed storage options for the 3 phases. The proposed option makes use of the alternative, including construction of a reservoir for the phase 3 storage capacity, which increases the no. of days for emergency storage in phases 1 and 2:

	Phase 1	Phase 2	Phase 3
Proposed Storage (Ml)	3	4.8	7
Alternative (Ml)	8	8	8
Storage provision (days)	2	2	2
Storage provision alt. (days)	5.33	3.33	2.29

Table 8-2. Proposed storage options.

8.2.1. Infrastructure for Ultimate Development

The conceptual design of the Bulk water infrastructure shall make provision to eventually have a bulk supply pipeline around the Vaal Aerotropolis supplying water to a system of reservoirs distributed at different development nodes. This bulk supply feed shall be a minimum 600mm diameter pipe. The development will be designed to accommodate supply from the bulk water reservoir storage located on site, that will receive potable water from a bulk water supply pipeline connected to the Rand Water Langerand Reservoir site, as well as an on-site water treatment plant where groundwater is sourced using boreholes as back up water supply.

Figure 8-2. Water and Fire supply layout for phase 2.

Figure 8-3. Water and Fire supply layout for phase 3.

The implementation of phase 2 will include an additional 2Ml upgrade to the WTP, additional bulk water supply pipelines and bulk fire supply pipelines to the zones added to the airport areas. The additional bulk supply pipelines for both water and fire supply shall include additional take-offs to various areas of the airport and will be implemented during the additional phased upgrades. The final phase will include an additional runway east of the airport and additional fire hydrants are to be included along the length of the runway. Included in the bulk water supply shall be all pumps and reservoirs required to achieve the reticulation to the zones identified above.

8.2.2. Infrastructure for First Build

For the initial installation, a reticulation system will provide bulk water from the on-site reservoir to:

- The Airport, including the length of the runway
- The Airport City
- To and within the Agri-zones

Included in the bulk water supply shall be all pumps and reservoirs required to achieve the reticulation to the zones identified above. The reticulation design shall be dimensioned with sufficient capacity for future growth and expansion to meet the needs of the ultimate development layout. The next figure shows the layout for the water supply and fire water supply to be implemented as part of the first build.

Figure 8-4. Water and Fire supply layout for phase 1.

8.3. Bulk Infrastructure Sewer

The existing municipal wastewater infrastructure in the Emfuleni area lacks sufficient capacity to meet current demand and is therefore unable to support the projected requirements of the Vaal Aerotropolis development. However, a phased upgrade of the Emfuleni wastewater system is planned to increase capacity over time. The Vaal Aerotropolis will be connected to a bulk sewer pipeline conveying effluent from both the Aerotropolis and the Vaal SEZ to the Rietspruit Wastewater Treatment Works (WWTW). Where and if necessary, on-site wastewater treatment will be implemented in accordance with applicable DWAF and DWS standards.

Table 8-3 shows the sewer demands for the Wastewater Treatment plant in accordance with the phased implementation across the ultimate development:

	Phase 1	Phase 2	Phase 3
Demand (Ml/day)	1.9	4.2	5.7
Required Plant Capacity (Ml/day)	3.5	4.2	5.7
Proposed Plant Capacity (Ml)	3.5	3.5 + Rietspruit	3.5 + Rietspruit

Table 8-3. Sewer demands for Wastewater Treatment plant.

A wastewater treatment facility may be constructed to meet the demand requirements of the Vaal Aerotropolis and is proposed to be located east of the airport precinct. In the initial phase, bulk sewer pipelines will be constructed to convey wastewater from the Airport City, Airport Core, and Trade Zones towards the southern boundary of the development, where it will connect to the bulk sewer pipeline serving both the Vaal Aerotropolis and Vaal SEZ. This pipeline will ultimately discharge into the Rietspruit Wastewater Treatment Works (WWTW). If connection to the Vaal SEZ network cannot be rationalised, the Vaal Aerotropolis will include a wastewater treatment plant to treat the total demands of the full development.

The planned upgrade of the Rietspruit WWTW will increase its treatment capacity, enabling it to accommodate the additional load from the Vaal Aerotropolis. It is anticipated that the Rietspruit WWTW upgrades will be completed before the implementation of Phase 1. Subsequent phases (Phases 2 and 3) will include the upgrading of the existing pump station to handle increased flows, as well as the construction of additional pipelines to integrate new developments with the bulk sewer network, in line with the phased rollout of the project.

8.3.1. Infrastructure for Ultimate Development

As the phased upgrades to the municipal wastewater system in the Emfuleni area are still ongoing, definitive connection points to the municipal network cannot yet be confirmed. The wastewater infrastructure for the Vaal Aerotropolis has therefore been designed with flexibility to accommodate future integration with the municipal system. Figure 8-5 illustrates the complete extent of the proposed sewer network, including the potential location of the wastewater treatment plant (WWTP), if required, and the proposed connection point to the Rietspruit WWTW for the ultimate development scenario.

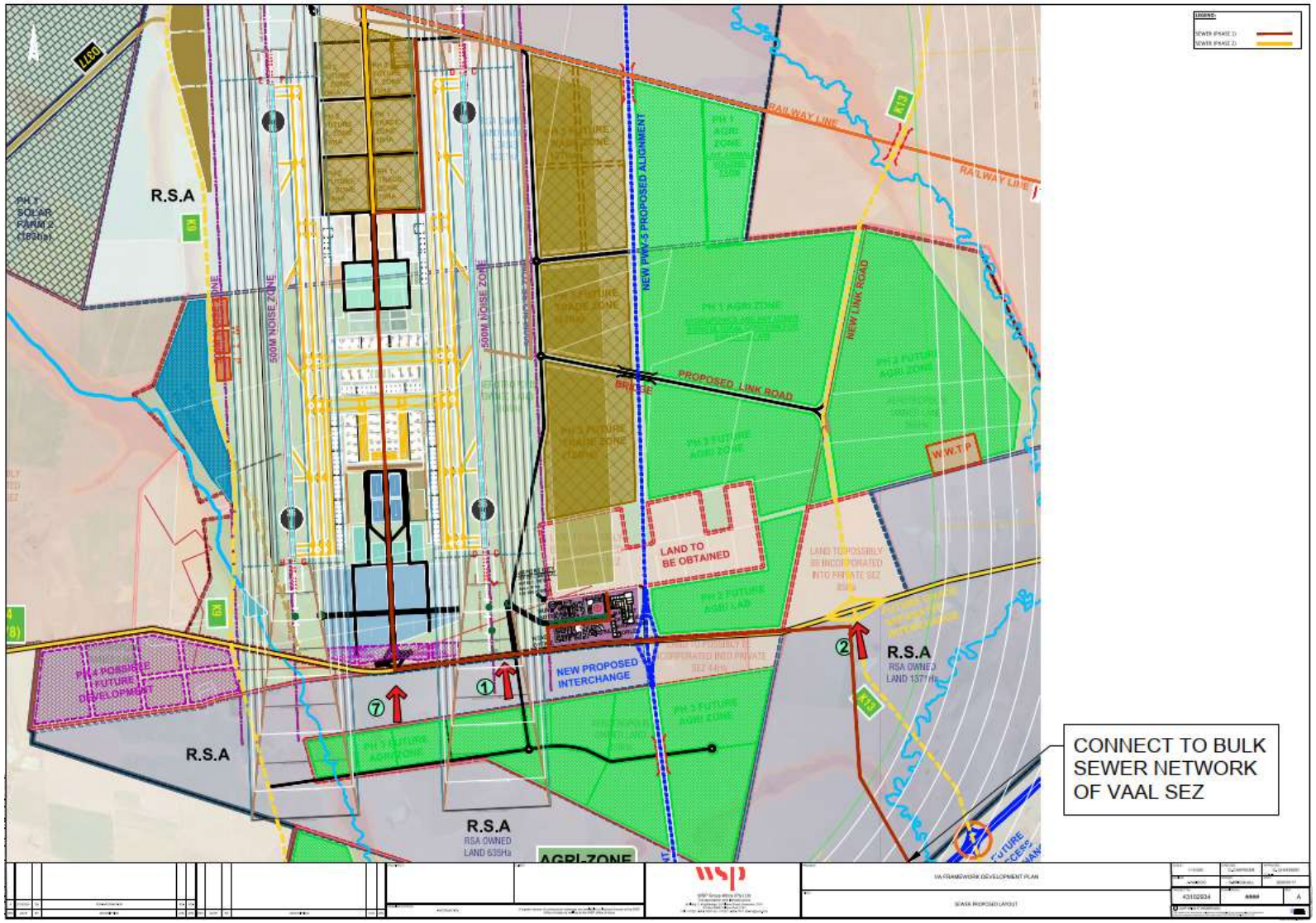

Figure 8-5. Bulk Sewer layout for the ultimate development.

8.3.2. Infrastructure for First Build

The first build will include a reticulation system that will provide for removal of wastewater from:

- The Airport
- The Airport City
- From and within the Agri-zones

Included in the bulk wastewater reticulation system shall be all pumps required to achieve the reticulation to the zones identified above. The reticulation design shall be dimensioned with sufficient capacity to meet the needs of future growth and expansion for the ultimate development layout. Figure 8-5 shows the first build layout for the sewer network.

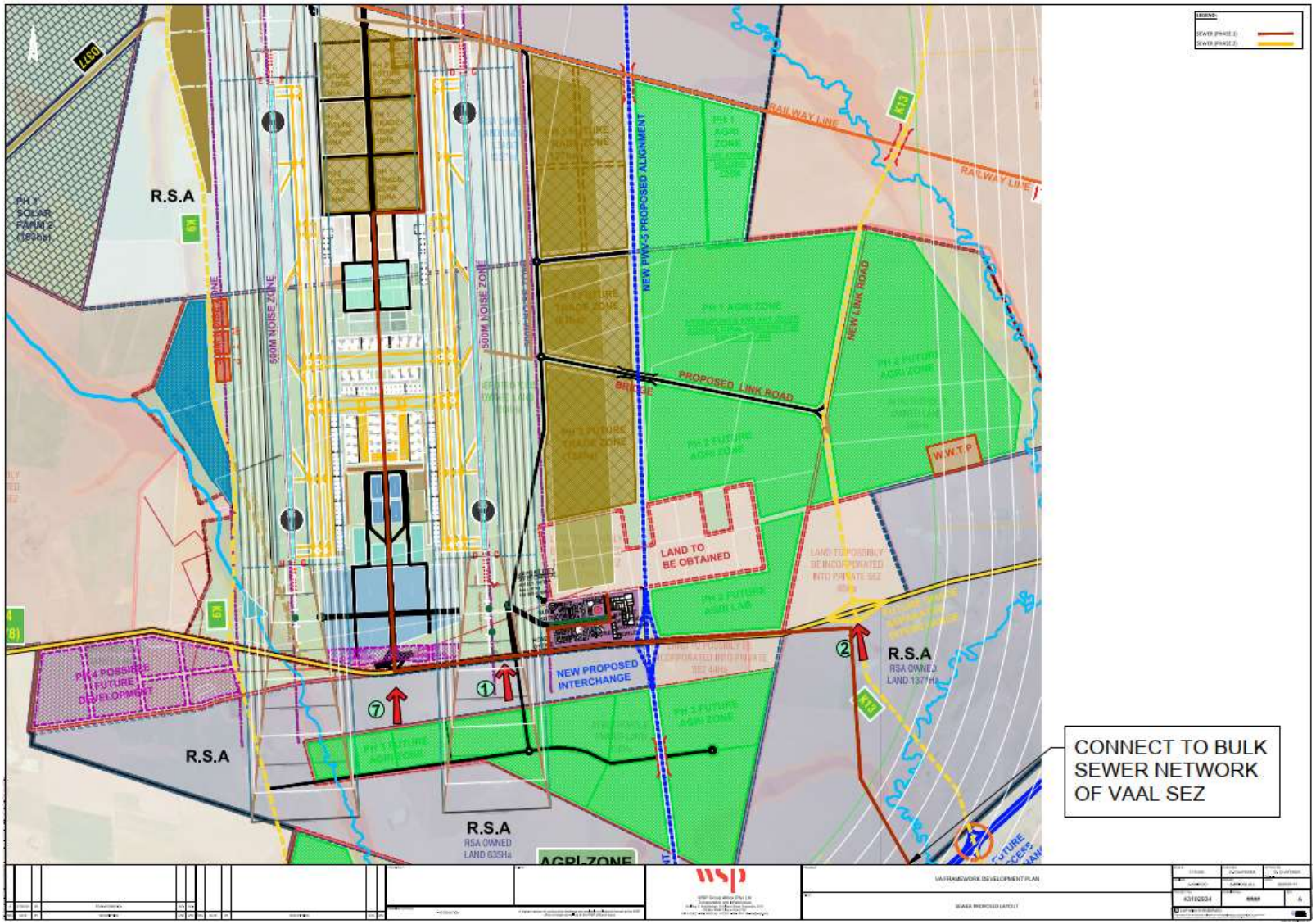

Figure 8-6. Bulk Sewer layout for the First Build.

8.4. Bulk Infrastructure Electricity

As part of the Vaal aerotropolis development framework, it shall be indicatively determined that the airport precinct shall approximately have a site total area of 570 000 sqm which shall accommodate the airport and parking space for freight.

The Planned areas shall include the new international airport which shall have a 4.2km runway, a Trade Zone which shall include a cargo terminal, cargo processing, warehousing, packaging, assembly, distribution facilities and lastly support zones that shall consist of several precincts.

To meet a maximum energy demand of 47MW, the primary source of power shall be supplied from two 11kV Eskom Supplies into the site boundary into the main intake MV substation (Energy Centre) then reticulated via a single metering ring main unit (MRMU) to satellite substations for the respective zones. The outgoing of each transformer will terminate to the main distribution boards located at the hospitals. The LV Distribution throughout the project will be at 400/230 V, 50 Hz, with separate neutral and protective earthing conductors.

The scope of work for the electrical systems includes the following:

- Medium Voltage “MV” utility power supply and distribution network including 132/88/11kV switchgears/RMUs and cables.
- Miniature Substations.
- Medium Voltage “MV” Emergency standby generators.
- Low Voltage “LV” normal network including main distribution boards.
- Uninterruptable power supply for offices and security equipment.
- Cables and wires.
- Containment, cable trays and all accessories.

- Indoor lighting installations and controls
- Illumination and marking of means of Egress,
- Wiring devices.
- Earthing systems.
- Lightning protection system.

Codes and Standards

All electrical installations are designed based upon the local Standards and Regulations requirements, complemented with International Standards and Regulations. The Standards and Regulations that are utilized include but not necessarily limited to the following:

- Local Power Authority regulations and practices for Power supply (ESKOM).
- The latest edition of the "SANS 10142-1, also known as the Code of Practice for the Wiring of Premises, Part 1: Low Voltage Installations, is listed in the Electrical Installation Regulations''
- Nominal characteristics of all materials and equipment forming part of the Electrical works are specified to conform to the International electrical Commission (IEC) Standards
- Standby power supply shall comply with ISO 8528 - “Reciprocating Internal Combustion Engine Driven Alternating Current Generating Sets”, ISO 3046 – “Reciprocating Internal Combustion Engines Performance”, IEC 60034 – “Rotating Electrical Machines” and IEC 60085 – “Electrical Insulation - Thermal Evaluation and Designation”.
- Lightning protection system shall comply with IEC 62305 - “Protection of Structures against Lightning”.
- Earthing system shall comply with SANS 10199.

Design Criteria

The design of the electrical installations was developed based on the main objectives summarized below:

- To comply with the applicable codes and standards,
- To achieve reliability and durability of systems and components,
- To implement safety and protection measures for people and equipment.

Power Supply Characteristics

Nominal characteristics of power supply and distribution will be as follows:

Medium Voltage : 132/88/11 kV, 3 phase, 3-wire.

Low Voltage (LV) : 400/230, 3-phase, 4-wire, with solidly earthed system (TN-S)

Frequency : 50 Hz

The table below indicates the total approximate VA for each zone based on floor area to determine the total electrical demand required.

Area	Floor Area (m^2)	Area Type	Design Criteria (W/m^2)	Maximum Load (kW)	Diversity	Total Diversified Load (kW)	Power Factor	Electrical Load (kVA)	Electrical Load (A)
NEW AIRPORT	120000.00	Offices - air conditioned	87	10440.00	0.80	8352.00	0.90	9280.00	13394.53
TRADEZONE	360000.00	Offices - non air conditioned	62	22320.00	0.80	17856.00	0.90	19840.00	28636.57
SUPPORT ZONE	60000.00	Restaurant	225	13500.00	0.80	10800.00	0.90	12000.00	17320.51
AGRIZONE	30000.00	Open area	35	1050.00	0.80	840.00	0.90	933.33	1347.15
Total (A)				**47310.00**		**37848.00**		**42053.33**	**60698.758**

Table 8-4. Indicative Electrical Load Demand Across Areas.

The energy centre shall consist of MV switchgear, step-down transformers, step-up generators as an alternative power source as well as UPS for critical equipment. The satellite substations shall be a combination of miniature substations and substation buildings for the Low Voltage Network.

Power Supply Categories

The electrical power supply shall be from three different sources to the within the Project are categorized as per the following:

- Normal Power Supply N-1 (Eskom).
- Emergency Power Supply (Generator).
- Photovoltaic Power Supply (PV) (Not covered by this report, outside SOW)

Normal Power Supply

Normal power supply will be provided by Eskom Power Utility Authority at medium voltage level (132/88/11 KV) N-1 topology and will terminate to dedicated MV Switchgear room located at the Eskom Main Intake Substation building. This scheme will be coordinated with Local Authorities.

Emergency Power Supply

Due to unreliability of the Utility power supply, a set of diesel generators with “N+1 configuration” will back up the entire project load to ensure business continuity.

Emergency generators will be of the indoor/outdoor, diesel type, rated for “prime” operation at 11000V, 3 phase, 50Hz, 1500 rpm, Class G2 to ISO 8528-1.

Generators are sized according to the demand load while considering the specific load characteristics (e.g. power factor and starting current). The generator sets shall operate in parallel via a synchronizing board to provide a reliable alternate source to all loads in accordance with a pre-scheduled priority order.

Preliminary ratings of generators are: Multiple generators in parallel i.e. 22 x 2.5 MVA units for a redundancy N+1 configuration

- Multiple generators in parallel (e.g., 22 × 2.5 MVA units) for redundancy (N+1 configuration).
- Voltage Output: 11kV directly synchronized to the MV bus.
- Synchronization Equipment: Synchronization panels, load sharing controls.

Uninterruptable Power Supply

Uninterruptible power supply (UPS) will be provided to supply a no-break power to critical equipment that may not tolerate power interruption, such as CCTV, data network, computers, emergency lighting and flight information, etc.

Earthing System

A complete system of electric service grounding of TN-S type shall be provided. Earthing system will comply with SANS 10313 – “Code of Practice for Protective Earthing of Electrical Installations”

The earthing system shall consist of earth rods buried in the ground around the building and interconnected by a ring copper earth conductor. Transformer neutrals will be connected to the main earth source. Earthing bars shall be provided in electrical room, near motor control centres and mechanical equipment and telecommunication rooms, all connected to the main earth loop via two separate insulated earth conductors sized to withstand the short circuit level. Protective earthing conductors shall run in each conduit for earthing of socket outlets and lighting fixtures. All non-current carrying metallic objects shall be bonded to the ground.

Lightning Protection System

A complete lightning protective system will be provided in accordance with IEC 62305, based on the risk assessment calculation. The system will mainly consist of a horizontal air termination network (mesh, rods, etc.) connected to through down conductors.

Down conductors may be one or combination of the following type:

The building's steel reinforcement bars by bonding steel bars to the roof conductors and to the earth electrodes.

Copper conductors, concealed behind the building façade and wall cladding in dedicated grooves and fixed to the building structure. PVC coloured tapes exposed across the building façade.

The lightning protection system will be bonded to all exposed metal structures and interconnected to the building earth electrode system as per code requirements.

Main Distribution Boards

The main distribution boards will be of the free-standing type, metal enclosed, Form 3b / Partition Class to IEC 62271, IEC 61439-1 and IEC 61439-2, protection code IP 31 for indoor installations, housing the copper busbars along with the incoming and outgoing circuit breakers.

Surge protective devices Class I+II will be provided on each MDB main incomer. Main Distribution Boards will include additional 20% of spare circuit breakers. Main distribution boards will be provided with all necessary elements such as relays, transducers, etc.

Power Factor Correction Capacitors

Power factor correction capacitors will be provided to ensure a power factor of 0.92 is achieved.

Low Voltage Cables

Low voltage feeders and sub-feeders will comply with IEC 60502. Low voltage feeders and sub-feeders will be copper conductor, XLPE insulated, and PVC sheathed except for cables passing through plenum areas which shall be LS0H (Low-Smoke Zero-Halogen) sheathed, armoured type was buried underground, single-core or multi-core cables as required for the application. In general, all feeders shall be installed on galvanized sheet steel cable trays/ ladders, in vertical shafts and/or pulled in conduits depending on location.

Current carrying capacities for feeders and wires will be determined in accordance with the Regulations and the expected installations conditions. Voltage-drop from the transformer up to the farthest end of a branch circuit shall not exceed the values indicated in SANS 10141-1.

Automatic Transfer Switches

Automatic transfer switches will be utilized where required to supply power to life safety and essential loads, where switching between the two sources is required.

Transfer switches will comply with IEC 60947-6, capable of frequently switching mixed motors and resistive loads.

Transfer switches will be provided with all necessary relays and auxiliaries required for the operation of the system, proper interface with BMS and will be located as close as possible to the loads being served. ATSs will be equipped with Class II surge protective device at the utility side.

Medium Voltage Cables

Medium voltage cables will be three-core for connection to medium voltage switchgears and single-core for connection to transformers, copper conductor, XLPE insulated, 132/88/11 kV, armoured for directly buried cables and unarmoured otherwise. Cables shall be designed, manufactured and tested in accordance with IEC 60502-2 and local regulations.

Containment

Heavy gauge PVC-U conduits will be used for embedded installations. Flexible metallic conduits will be used for terminating all connections to motors and vibrating equipment. Electrical Metal Tubing (EMT) will be used for exposed installations above false ceilings when the false ceiling is used as a return plenum and where conduits are exposed to mechanical damage such as in mechanical rooms.

All conduits for branch circuit wiring will be either embedded in concrete, concealed in walls and under floor tiles or exposed above false ceilings and in electromechanical rooms. Cable trays / ladders shall be of galvanized sheet steel, supported from ceilings/ walls.

Lighting – General Design Criteria Indoor

The lighting design will be based on achieving CIBSE recommended illumination levels taking into consideration occupants' comfort, safety and well-being, proper colour rendering and colour temperature for each task while considering End user requirements. Glare shall be kept to a minimum through the correct selection and positioning of luminaires.

The targeted illumination levels for basic indoor areas shall be as summarized in the below table.

The targeted maintained average illumination levels for basic indoor areas:

- Circulation/Corridors : 200 Lux (day) / 50 Lux (night)

- Lobbies : 200 Lux
- Toilets, Bath, Wash and Shower rooms : 100-200 Lux
- Changing Rooms : 150 Lux
- Storage : 200 Lux
- Mechanical/ Plumbing/Elect. Rooms : 200 Lux
- Reception : 300 Lux
- Pharmacy : 500 Lux
- Administration/ Office : 500 Lux
- Workshop : 500 Lux

Outside Lights

Outside lighting shall be added to cargo terminals airside canopy, covered walkways, covered carports, parking bays and covered patios. Outside lighting shall also be added to the side of the buildings or perimeter wall where needed. Outdoor lighting will be controlled by day/night sensors.

Emergency Lighting

Emergency and evacuation lighting will be supplied by dedicated UPS and Fire-retardant conductors will be used to supply emergency and evacuation lighting.

Emergency battery packs will be fitted to all lights at critical locations such as lights at emergency exit doors, exit passageways, change of direction or change of elevation, toilets, lights at stairs and lights close to emergency equipment.

Self-powered or self-maintained emergency lighting include all signage (luminaries) and lighting with dedicated batteries interior to the fitting. Each emergency light fitting shall operate as a normal light fitting when normal power is available. The light switch shall switch both normal and emergency lights together when normal power is available.

The emergency light shall only operate via its battery supply when the normal power source is not available at the breaker terminations. A separate cable shall be wired from a dedicated MCB and conduit at each distribution board to act as a trip wire to activate the emergency light when main supply has become unavailable and to keep the batteries charged during normal operating conditions (irrespective of the light switch operation).

The escape route lighting shall activate within 25s to 30s of the failure of the normal lighting and shall reach the required illuminance within 60s.

The dedicated MCB can be used to test the functionality of the emergency lights. When the breaker is operated, all connected emergency lights should come on and stay on for at least 60min via the self-contained batteries.

Power Points

The general socket and power outlet design includes the following:

- Power-skirting in open plan offices
- Single phase socket outlets for office equipment e.g. computers, printers etc.
- Power points in the offices will be fed off UPS supply
- Single phase socket outlets for general purpose fed off the normal supply
- All power points shall be manufactured per IEC standards
- Welding plugs shall be provided in the cargo terminal storages/warehouses

Reticulation Layout

The main reticulation layout below shall indicate the potential locations of the main intake substations, miniature substations and external and internal main reticulation routes as indicated.

Figure 8-7. Main Reticulation Layout.

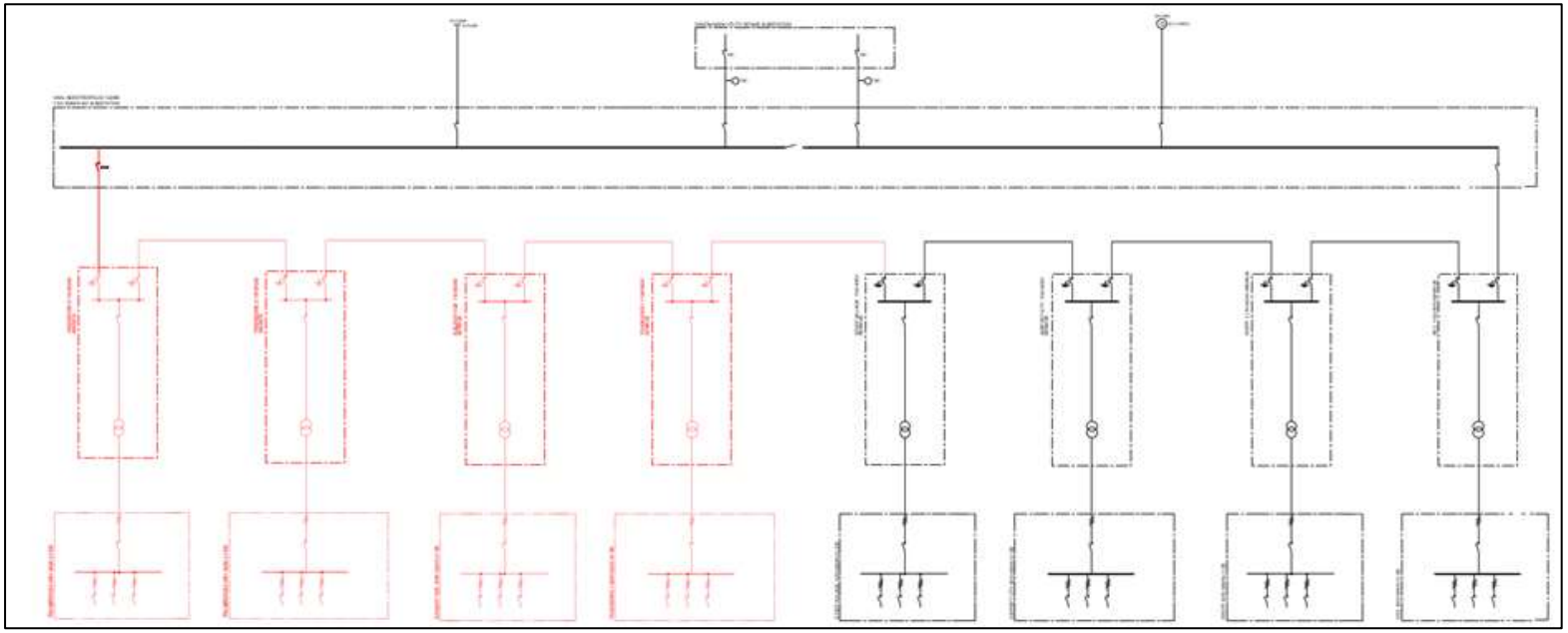

Figure 8-8. Main Reticulation Single Line Diagram. (Refer to Appendix XX for the actual drawing)

The proposed concept for Phase 1 reticulation will include four RMUs.

1. Staff Village 11kV/400V Minisub supply Staff Village 400V Main LV DB
2. Airport City 11kV/400V Minisub supply Airport City400V Main LV DB
3. WWTP 3 11kV/400V Minisub supply WWTP 400V Main LV DB
4. SEZ 11kV/400V Minisub supply SEZ 400V Main LV DB

Proposed Phase 2 (Future):

1. Tradezone 1 11kV/400V Minisub supply Tradezone 1 400V Main LV DB
2. Tradezone 2 11kV/400V Minisub supply Tradezone 2 400V Main LV DB
3. Tradezone 3 11kV/400V Minisub supply Tradezone 3 400V Main LV DB
4. Railway Hub 11kV/400V Minisub supply Railway Hub 400V Main LV DB

High level load calculations and a floor area-based distribution design were carried out to guarantee effective utilization of electrical infrastructure. By including fire-rated components, surge protection, and grounding systems, the new development phased approach design will prioritise the safety of passengers, employees, and equipment.

To guarantee regulatory alignment and operational reliability, electrical designs must adhere to and comply with national (SANS, SACAA) and international (ICAO, IEC) standards. The continuous operation of airport lights, ATC systems, and security infrastructure depends on redundant power sources, such as dual feeders, UPS systems, and backup generators.

Power distribution zoning and substation placement schemes shall be conducted to reduce downtime and enhance fault isolation. The detail design shall accommodate future growth through spare capacity in substations, distribution boards, and cable routing.

Modular, flexible system designs shall be incorporated to allow for easy upgrades and expansions to meet evolving Vaal airport demands. To enable real-time electrical system monitoring and control, centralized monitoring systems must be incorporated into the BMS.

The electrical system design criteria are based on typical requirements for an effective and efficient electrical system and shall further be refined at later stages during detail design. The coordination with other services shall be carried out to ensure all power requirements have been provided.

8.4.1 Existing Electrical Services & Infrastructure

Relocation Application Feedback

Eskom Land Development Team has provided feedback regarding the servitudes application submitted. As per the Layout Plans provided the following Portions / Farms would be directly affected by this Application. See below Largis Services Plan WS452/2025 & INSET 1 indicating the approximate position of the affected area.

As per the Layout Plans provided the following Eskom (Dx) Servitudes identified as possibly affected by this Application and compared with the listed Servitudes – note these Eskom (Dx) could either be Occupied or Vacant:

ITEM	PORTION	FARM NAME	REGISTRATION DIVISION.	SG NO.		ITEM	PORTION	FARM NAME	REGISTRATION DIVISION.	SG NO.
1	2	TWEEFONTEIN	523 – I.Q.	A4067/1911		10	18	VLAKPLAATS	555 – I.Q.	A4717/1926
2		KLIPFONTEIN	674 – I.Q.	1623/2003		11	51	VLAKPLAATS	555 – I.Q.	3490/2003
3	48	KLIPKOP	530 – I.Q.	11937/2007		12	5	VLAKPLAATS	555 – I.Q.	A454/1921
4	47	KLIPKOP	530 – I.Q.	6879/2002		13	9	RIETKUIL	554 – I.Q.	A1058/1929
5	20	VLAKPLAATS	555 – I.Q.	A13/1940		14	26	RIETKUIL	554 – I.Q.	A667/1956
6	52	VLAKPLAATS	555 – I.Q.	3491/2003		15	3	RIETKUIL	554 – I.Q.	A886/1921
7	17	VLAKPLAATS	555 – I.Q.	A4543/1925		16	46	KLIPKOP	530 – I.Q.	A1434/1980
8	7	VLAKPLAATS	555 – I.Q.	A456/1921		17	15	VLAKPLAATS	555 – I.Q.	A4541/1925
9	6	VLAKPLAATS	555 – I.Q.	A455/1921		18	19	VLAKPLAATS	555 – I.Q.	A4718/1926

Table 8-5. Servitudes.

ESKOM ITEM	LAYOUT ITEM	SG NO.	DEED NO.	FARM PTN
1	(1)	A227/1952	K268/1954S	530/48
2	(2 & 3)	A4928/1970	K396/1971S	530/48; 530/47
3	(4)	A215/1952	K443/1953S	555/19
4	(5)	A212/1952	K140/1953S	555/7
5	(6)	A219/1952	K216/1955S	555/13
6	(7)	A5781/1977	K1065/1978S	555/3
7	(8)	A4927/1970	K1481/1973S	523/2
8	(9)	A5778/1977	K1065/1978S	555/9
9	(10)	A4929/1970	K3169/1974S	555/18
10	(11)	A218/1952	K140/1953S	555/18; 555/7
11	(12)	A214/1952	K443/1953S	555 (REM.)
12	(13)	A226/1952	K1382/1958S	554/3
Note the below additional Servitudes identified: in and around the app. area				
13		A5780/1977	K1065/1978S	555/3
14		A216/1952	K129/1953S	554/10?
15		A225/1952	K123/1953S	554/2
16		A5775/1977	K973/1978S	530/1
17		A5776/1977	K972/1978S	532/1
18		A5779/1977	K1065/1978S	554/26

Table 8-6. Eskom servitudes.

Eskom findings and the Services / Servitudes that would be affected by the proposed Commercial Airport Project.

The following Eskom Distribution services are affected / in close proximity:

Item no:	Details
1	SAR TWEEFONTEIN 88kV Traction Substation; (west of the App. area.)
2	KLIPKOP / CARDOVILLE 1 11kV Feeder Overhead Lines;
3	KCA87/22/33/7 Pole Mounted Trfr Bay;
4	KLIPKOP / CARDOVILLE 1 11kV Feeder Underground Cables;
5	KCA87/22/32 Pole Mount Switching Bay;
6	KCA87/22/32/1 Pole Mount Switching Bay;
7	KCA87/22/25/3 Pole Mounted Trfr Bay;
8	KCA87/22/25/1 Pole Mounted Trfr Bay;
9	RIGI / SAR TWEEFONTEIN 1 88kV Feeder Overhead Lines; (Servitude.)
10	ELANDSFONTEIN RURAL / HOLFONTEIN 1 11kV Feeder Overhead Lines;
11	EH89/138/52 Pole Mounted Trfr Bay;
12	EH89/138/41/2 Pole Mounted Trfr Bay;
13	EH89/138/30/2 Pole Mounted Trfr Bay;
14	EH89/138/22 Pole Mount Switching Bay;
15	Vacant Servitude A227/1952 - K268/1954S; (ELECT. P/L x 2)
16	Vacant Servitude A4929/1970 - K3169/1974S;
17	Vacant Servitude A218/1952 - K140/1953S; (ELECT. P/L x 2)

Item no:	Details
21	Vacant Servitude A219/1952 - K 216/1955S; (ELECT. P/L x 2)
22	Vacant Servitude A226/1952 - K1382/1958S; (ELECT. P/L x 2)
23	RIG/SARTF/SARKBT/KKT165 Pole Mount Switching Bay;
24	RIG/TF153 Pole Mount Switching Bay;
25	EH89/237/16/4 Pole Mounted Trfr Bay;
26	EH89/237/8/9 Pole Mounted Trfr Bay;
27	EH89/237/9 Pole Mount Switching Bay;
28	EH89/194/5 Pole Mounted Trfr Bay;
29	EH89/189/5 Pole Mounted Trfr Bay;
30	EH89/189 Pole Mounted Trfr Bay;
31	EH89/186 Pole Mounted Trfr Bay;
32	EH89/184 Pole Mount Switching Bay;
33	EH89/181 Pole Mount Switching Bay;
34	EH89/179 Pole Mounted Trfr Bay;
35	EH89/178/2 Pole Mounted Trfr Bay;
36	EH89/180/4/1 Pole Mounted Trfr Bay;
37	EH89/180/11 Pole Mounted Trfr Bay;

18	Vacant Servitude A212/1952 - K140/1953S; (ELECT. P/L x 2)
19	Vacant Servitude A215/1952 - K443/1953S; (ELECT. P/L x 2)
20	Vacant Servitude A214/1952 - K443/1953S; (ELECT. P/L x 2)
41	EH89/207/12 Pole Mounted Trfr Bay;
42	EH89/207/14/1 Pole Mounted Trfr Bay;
43	EH89/207/23 Pole Mounted Trfr Bay;
44	EH89/175 Pole Mounted Trfr Bay;
45	EH89/172 Pole Mount Switching Bay;
46	EH89/170 Pole Mounted Trfr Bay;
47	EH89/159/5 Pole Mounted Trfr Bay;
48	EH89/131/14 Pole Mounted Trfr Bay;
49	EH89/145/2 Pole Mounted Trfr Bay;
50	EH89/130 Pole Mount Switching Bay;
51	EH89/125 Pole Mount Switching Bay;
52	EH89/124/1/1 Pole Mounted Trfr Bay;
53	EH89/124/2 Pole Mount Switching Bay;
54	EH89/119/3 Pole Mounted Trfr Bay;
55	EH89/111/12 Pole Mounted Trfr Bay;
56	EH89/111/11/4 Pole Mounted Trfr Bay;
57	EH89/102/11/1 Pole Mounted Trfr Bay;

38	EH89/207/1 Pole Mount Switching Bay;
39	EH89/207/4 Pole Mounted Trfr Bay;
40	EH89/207/10 Pole Mounted Trfr Bay;
58	EH89/97/2 Pole Mounted Trfr Bay;
59	EH89/102/1 Pole Mount Switching Bay;
60	EH89/119/3 Pole Mounted Trfr Bay;
61	EH89/125 Pole Mount Switching Bay;
62	EH89/124/1/1 Pole Mounted Trfr Bay;
63	EH89/124/2 Pole Mount Switching Bay;
64	EH89/139 Pole Mount Switching Bay;
65	EH89/138 Pole Mounted Trfr Bay;
66	EH89/138/9/2 Pole Mounted Trfr Bay;
67	EH89/138/13/1 Pole Mounted Trfr Bay;
68	EH89/124/11/2 Pole Mounted Trfr Bay;
69	EH89/25/25 Pole Mounted Trfr Bay;
70	EH89/25/26 Pole Mounted Trfr Bay;
71	KCA87/22/54/22/6/1 Pole Mounted Trfr Bay;
72	KCA87/22/59 Pole Mounted Trfr Bay;
73	Eskom (Dx) proposed Project along Servitudes as shown; (orange / blue / purple / pink areas.)

Table 8-6. Eskom Distribution services.

There is currently an existing 88kV High Voltage (HV) overhead line crossing the proposed development site. To accommodate the planned development, this power line will need to be relocated and rerouted along an alternative alignment outside the designated project area. WSP has formally applied to Eskom's Distribution and Transmission departments, requesting the relocation of the line to ensure compliance with airport clearance requirements.

The figure below shall indicatively detail the information pertaining to the overhead line running through portion 47 of Klipkop no 530-IQ SG diagram 68972002 details.

Figure 8-9. Existing 88kV Overhead powerline.

From the above figure and relocation application, Eskom engineering teams will assess the feasibility of relocating the line, impacts of the electrical load flow and availability of space for the new route.

Proposed relocation of the Overhead Line and Servitudes (represented by green lines) mentioned above is illustrated in the Figure 8-10 below.

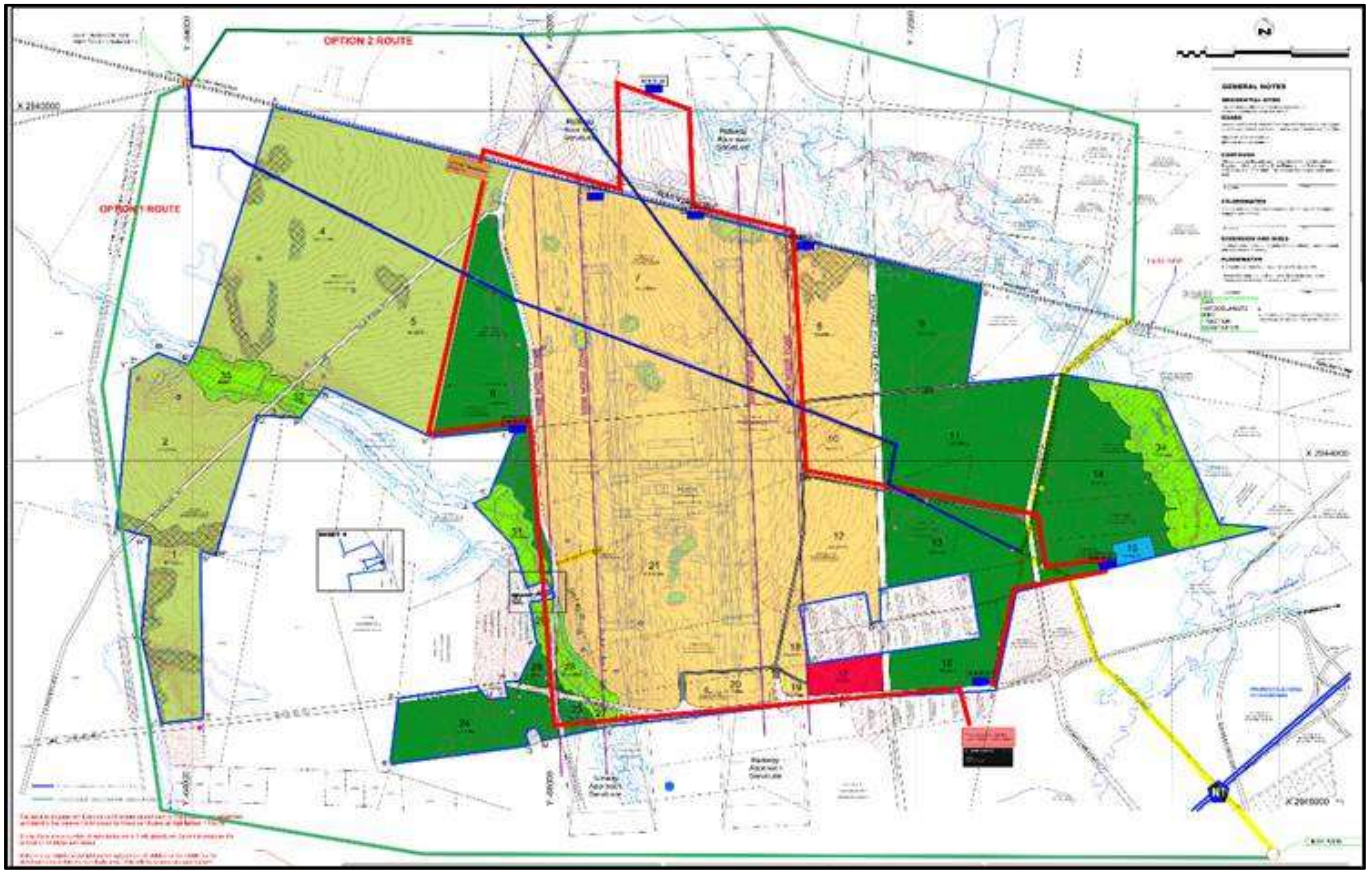

Figure 8-10. Proposed relocation of overhead line and servitude.

8.4.2 Report findings and progress

Site Visit Observations & Discussions

Following a meeting with Eskom Engineers, an on-site visit was arranged to discuss the electrical load requirements for the new development. Eskom outlined the necessary information required to proceed with full electrical planning and feasibility studies:

1. Site Load Forecast
2. Site Coordinates (including substation coordinates)
3. Site Development Plan & Electrical Master Plan
4. Confirmation on Substation Construction (Self-build or Eskom-built)

Upon submission of these requirements, Eskom will take approximately 120 days to conduct an assessment and provide a Cost Estimate Letter (CEL). This document will require our review to ensure the capacity analysis and scope of work align with project requirements. If approved, Eskom will issue the final Bill of Quantities (BQ).

Additional Considerations:

1. Engagement with Eskom's Land Development Plan/Customer Services Department to assess the rerouting or relocation of existing electrical infrastructure.
2. Environmental Impact Assessment (EIA) for the new development will be conducted, with detailed requirements following the issuance of the CEL
3. Ancillary/Temporary Power Connection applications for construction must be submitted within three months, to be addressed at a later stage.

Next Steps:

1. Submit the required documentation to Eskom to proceed with feasibility studies
2. Engage with Eskom's Land Development Plan/Customer Services Department for the existing electrical services/network assessment and infrastructure relocation.
3. Await the Cost Estimate Letter (CEL) to review financial and technical feasibility.
4. Plan for Environmental Impact Assessment (EIA) following the CEL issue.
5. Prepare for temporary power connection applications within three months required for construction (0.5MVA or 1MVA or 2MVA)

Eskom-Built Substation Process:

Elements	Eskom-Built Substation
Cost	Lower initial cost but Eskom charges for construction and operation
Timeline	Longer, as Eskom follows internal processes and prioritization i.e. 12 months – Design; 24 Months - Construction
Approval Process	Eskom manages approvals internally, but the process can be slow
Control & Ownership	Eskom retains ownership and operational control
Maintenance & Operation	Eskom handles maintenance and repairs, but response times may vary.

Table 8-8. Eskom-Built Substation process.

On-Site Existing Reticulation Layout Overview

A second site meeting was held with the Eskom engineers. The inspection was to assess the site's current electrical services and compare the results with the proposed network distribution. To supply the entire development, the primary input substation must have a capacity of about 50 MVA. The load profile studies were conducted using the area per square meter diversification calculation parameters, in accordance with electrical rules and regulations.

A sequential ramp-up strategy must be implemented in order to comply with Eskom's limitations on supplying 50 MVA at one go. This can be accomplished by designing a switchover panel to provide power incrementally, such as starting with 20 MVA and then ramping up to 50 MVA. This design study will be under Eskom's responsibility.

It was determined that the following three Main Transmission Stations (MTS) in the Sedibeng region might be able to supply the future Vaal Aerotropolis development:

1. Olympus MTS (132 kV/88 kV): Dedicated to AMSA, ArcelorMittal, is pending final allocation from Eskom.
2. Riggi MTS (132 kV/88 kV): Eskom planner to verify capacity and availability. The proposed Main Intake Substation location for the new construction is estimated to be 15 km away.
3. Lindequesdrif MTS (132 kV/88 kV): Eskom planner to verify capacity and availability. The proposed Main Intake Substation location for the new construction is estimated to be 20 km away.

Eskom will provide a Cost Estimate Letter (CEL) within 90 days of receiving the proof of payment of the Cost Estimate Fee and the application form where connection works are for Distribution only, and 120 days where initial studies indicate an upgrade of the Transmission network may be required to provide such a connection.

Upon engagements with the relative supply authority stakeholders, it has been determined that the development shall fall under the Eskom jurisdiction.

From the network distribution, there are various substations that could potentially provide two redundant electric supplies into the development. The identified substations are MTS (Main transmission Station) namely Olympus MTS and Riggi MTS. These substations shall require to be further investigated with Eskom in order to determine the most viable and feasible application.

It has been also brought to attention that the Tweefontein and Katboslaagte Substation cannot be utilized due to these being traction

Substations, i.e. for industrial purposes. Due to these constraints mentioned, it would be beneficial to construct a dedicated substation that shall tie into the 132/88kV/11kV electrical network with supplies being provided from Riggi and Olympus MTS as discussed above. This new substation shall essentially be a ‘’Eskom Built’’ which means Eskom will essentially design and construct the Main intake substation and shall directly be funded from the project.

There is however an extensive application process that shall be required to be undertaken through Eskom for this proposal where design intent of the requested substation shall be clearly illustrated.

Eskom Application Connection Process (Extract from Eskom IPP connection Process)

1. Proof of payment of the Cost Estimate Fee (CEF). Application form to be completed electronically and submitted. Payable upfront within 30 days, before the cost estimate letter (CEL) is produced.
2. Proof of land ownership/permission to use the land, right to develop on the proposed site. Letter from Landowner, etc.
3. Once the application has been submitted, Eskom will arrange a Site Meeting to discuss the following:
    - Where should the facility be connected
    - The requirements in terms of the supply
    - Grid configuration and voltages to use
    - Estimated costs of connection, based on proper network configuration and equipment boundaries and details
    - Grid capacity available at nearest network
    - Fault levels at nearest network
    - Define need to coordinate projects, determine requirements / risks for shared networks
    - Any potential Eskom plans that may impact on project proposals
    - Any impact (e.g., lead times) on requested timetable

4. Eskom to determine interdependent projects in public domain (as far as possible) (liaising with EIA consultants, DEA, NERSA, etc.)

If the required conditions are met to proceed with a budget quotation (Part 1), Eskom will request Part 2 of the application form to be completed for the detailed interconnection and power system studies.

Eskom Latest Feedback

WSP received the Cost Estimation Fee (CEF) from Eskom, under the Recoverable Works category (minimum charge applicable when a CEL is required). This fee covers all Eskom distribution services within the project area, including the existing 88kV distribution line, pole-mounted equipment, underground cables, and associated infrastructure.

Payment of the CEF initiates Eskom's detailed technical investigation. Upon completion, they will issue a Cost Estimate Letter (CEL) outlining the scope, cost, and timeline for the required relocations.

Secondly, the Substation CEL has been submitted to the PRC. Feedback indicates that there are still approval processes to be followed, which are expected to take approximately 40 working days.

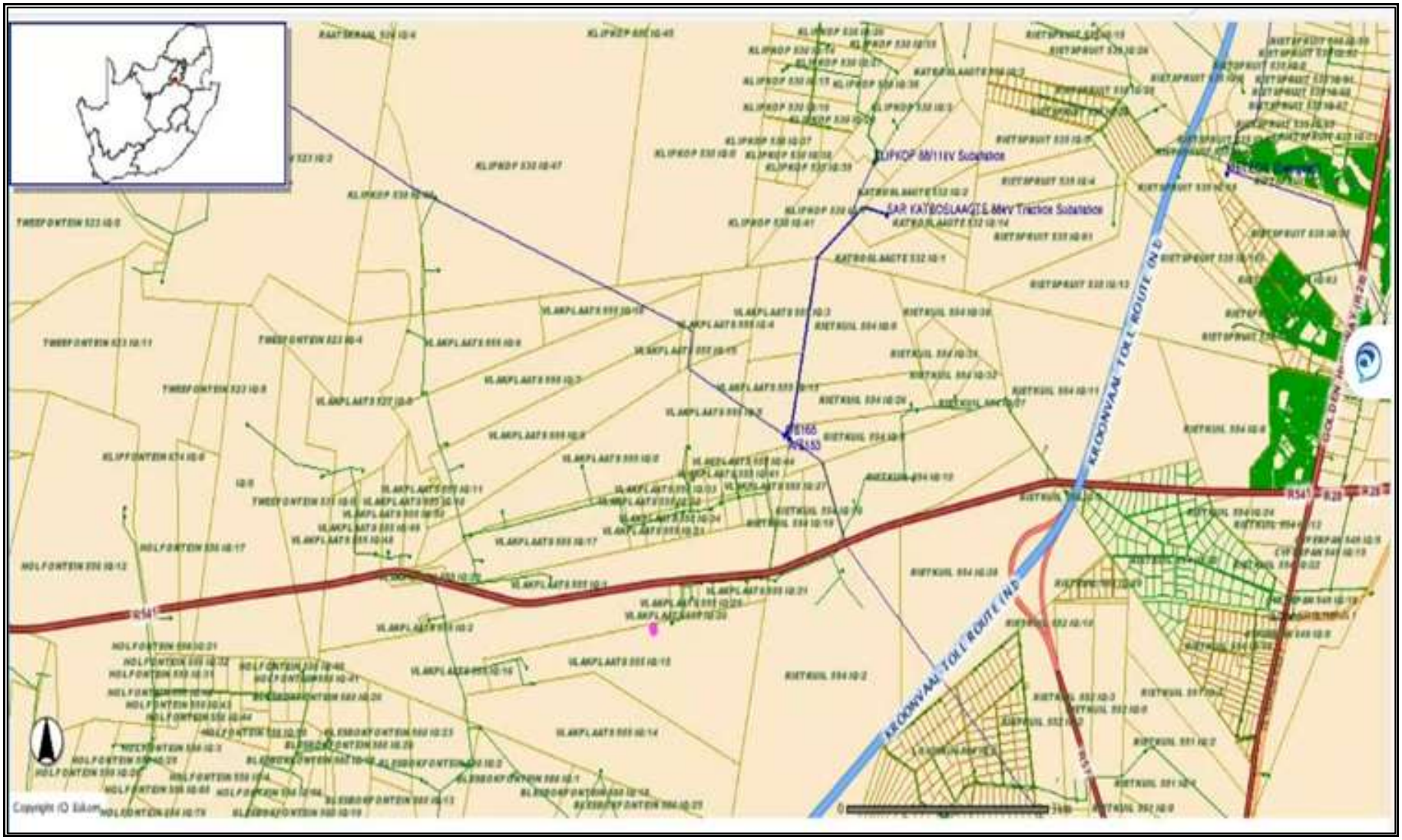

Figure 8.11. Existing Distribution Lines.

Following up on a meeting we had with Eskom (NTCSA). We noted that all our overhead lines are lower than 132KV which make them Distribution lines and not transmission lines. Therefore, no transmission line will be affected in the development Eskom will assist with relocation of the existing distribution lines.

Conclusion

WSP have gathered all the required information and have followed the necessary steps for the next phase of the project. WSP are currently waiting for the Cost Estimate Letters (CELs) from Eskom before proceeding further. Eskom has informed us that the application review process may take at least 30 days or up to 120 days if transmission components are included.

We have also finalized the decision to proceed with 50 MVA infrastructure and will issue a Notice of Demand for each project phase. This approach allows us to manage costs effectively and ensures that we mitigate the risk of limited power availability in the future.

WSP have been actively engaging with the Vaal SEZ to ensure smooth coordination on this project. In our previous meeting, Eskom confirmed the tap-off point for the new supply. Before the substation is fully constructed, we will arrange for ancillary power supply to allow the project to commence this will be coordinated and communicated with Eskom.

The construction and commissioning of the new Eskom Built substation is expected to take approximately 24 months, after which we will begin Phase 1 of the project. While we await Eskom’s CEL and feedback on the relocation application, we continue to engage with the client and other stakeholders and will keep updating the progress tracker and reporting accordingly.

The applications for relocation of the existing Eskom distribution services identified by the Land Development Team, surveyed relevant portions, farms layouts, 11kV / 88kV overhead lines etc, within the impacted area have been submitted to Eskom for their internal review and research related to the relocation.

8.5. Bulk Infrastructure Drainage

Adequate drainage shall be provided. The drainage system shall outfall east of the site to the Leeuwspruit watercourse and southwest of the site into the natural watercourse. All stormwater will be attenuated to 1:50 prior to discharging to natural watercourses and all drainage requires passing through an oil separator prior to discharging into the various waterbodies.

8.6. Bulk Infrastructure Roads

A new and upgraded road network will be provided to serve the access and mobility needs of the Vaal Aerotropolis site and surrounding land-uses. This network will be broadly in-line with the Gauteng Strategic Major Road Network located within the greater study area. A traffic impact assessment and potentially a local transport model may be required to determine the capacity, alignment and geometry of the road network to and within the site, site access, site circulation, parking, public transport and freight transport infrastructure needs.

The primary and secondary transport requirements for the phased development is briefly noted below, with indicative road network maps for each. Note that the final option of the interchange from the N1 has not been finalised.

Refer to Figure 8-12 for the internal road network of the Aerotropolis (full development), and Figure 8-13 for the terminal buildings, Airport City and Trade zone Phase 1 and 2 road networks.

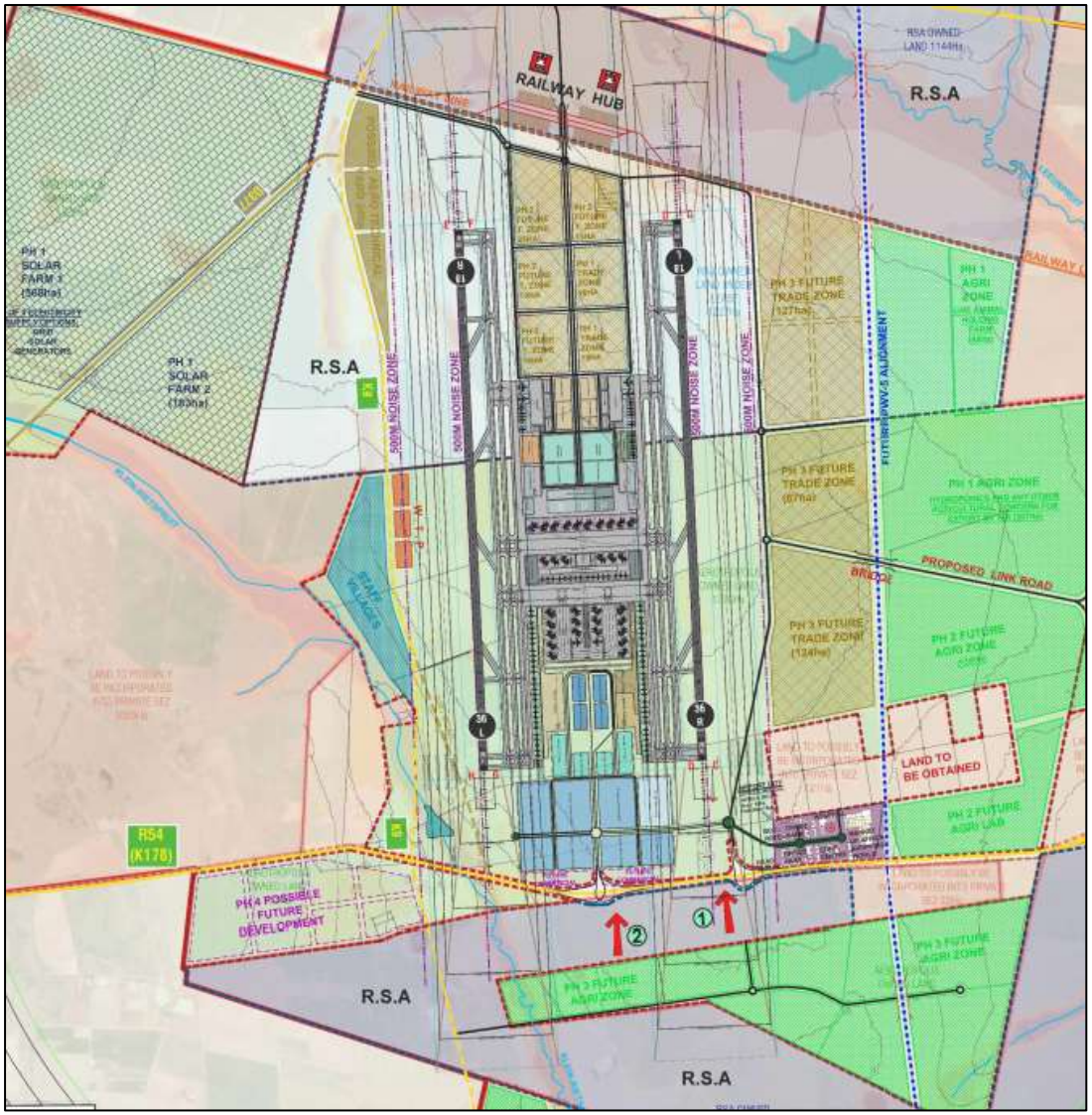

Figure 8-12. Internal Road Network and Access - Ultimate Development.

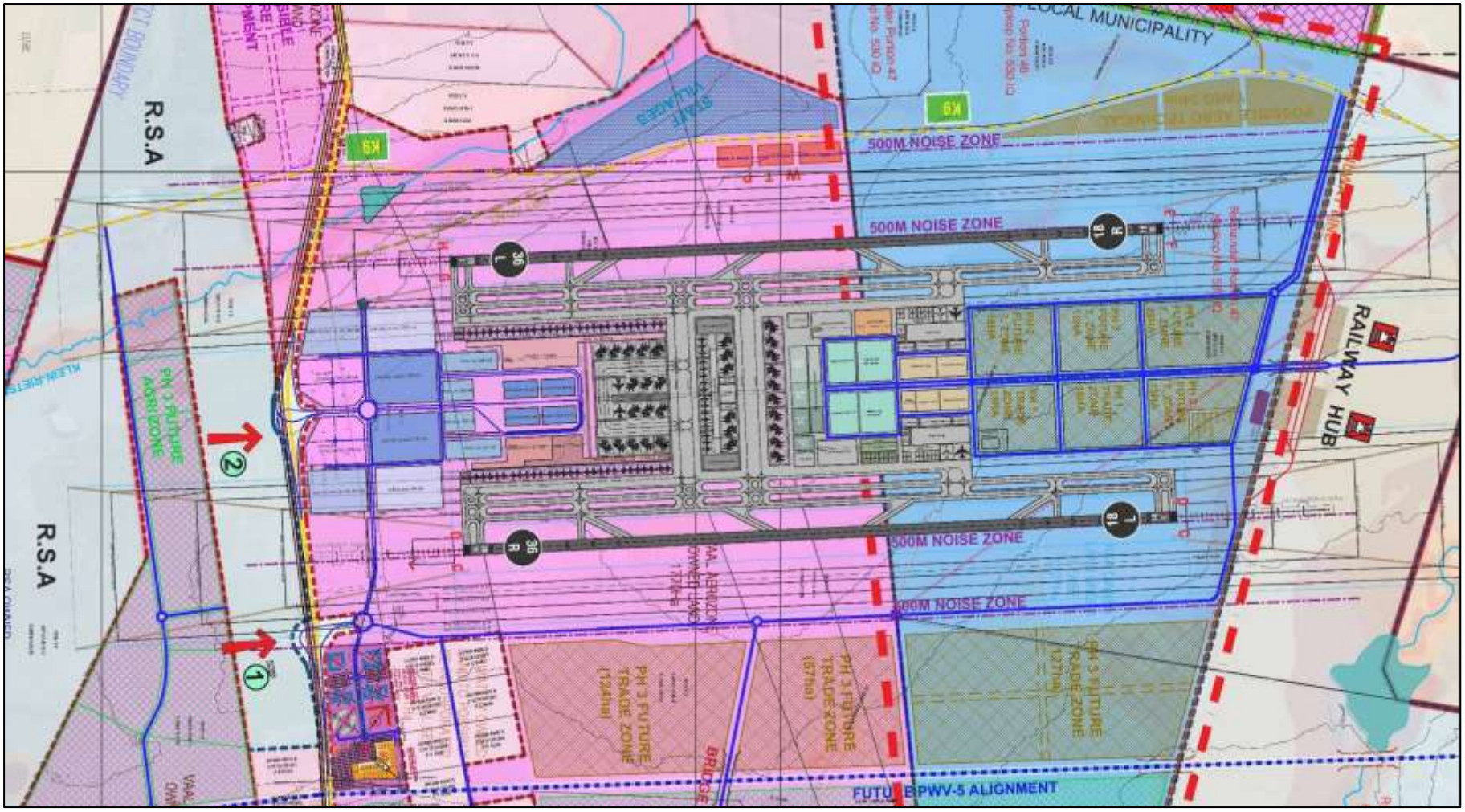

Figure 8-13. Internal Road Network and Access – Terminal and Trade Zone.

8.6.1. Phase 1: Airport Terminal, Airport City, Trade Zones , Agri-zones all phases

- Access from the east via either the N1/R54/R57, or N1/K176/K70 or the N1/R57 interchange (from the east)
- Access from the R54 (from the west)
- Direct access from the R54 via two grade separated interchanges

8.6.2. Phase 2 & 3: Airport Terminal expansion, Trade Zones, Agri-zones – all phases

- Access from either of the potential N1 interchanges that were not implemented in Phase 1.
- Access from the R54 (from the east & west)
- Direct access from the R54 via two grade separated interchanges
- Access link from the K13 to the internal north-south access road

8.6.3. Agri-zones South – Phase 3

- Access from the future K9 via the R54 (K178)

8.6.4. Railway hub - Phase 2 or 3

- Access from the future K9

9. DEVELOPMENT PHASING

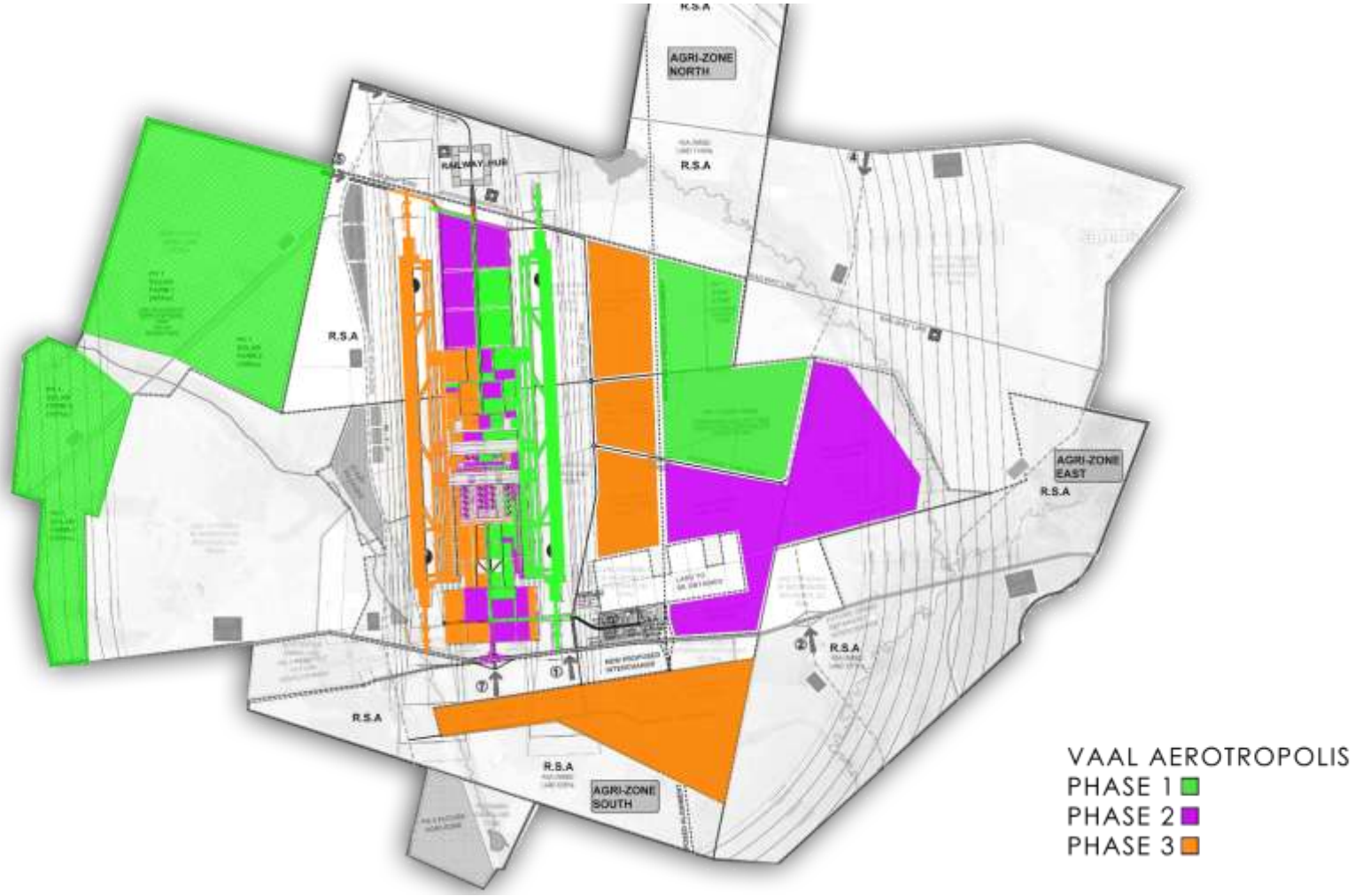

Figure 9-1. Development Phasing Plan.

Based on the agreed Airport Precinct layout plan for the ultimate 45mppa phase a draft Phase 1 concept layout representing the opening day airport layout plan with a target capacity of 7.2 mppa and the draft interim Phase 2 airport layout plan with a target capacity of 25mppa have been developed. The proposed draft phasing is based on the space requirements defined for the key facilities in the Airport Precincts and reported in the previous section of this report.

Phase 1 and Phase 2 have generally been defined based on a “do minimum” development approach where a range of potential facility requirements have been defined. However, the number of passenger aircraft stands are aligned to the maximum requirements to safeguard flexibility for aircraft operations.

The Phase 2 airport development has been planned to accommodate a passenger demand of up to 25 mppa. The airport development still focuses on the operation of a single runway way together with expanded terminal, apron, cargo, ancillary and landside facilities to the west of the runway. The initial terminal building would be expanded both in terms of the processing building and also the pier building. Additional Code E or F MARS passenger aircraft stands would be provided to the west of the terminal served by the cul-de-sac taxi-lane. The layout presented here is a do-minimum scenario and would provide a lower proportion of pier served stands than in Phase 1 or 3. However, if a higher pier-service level is required an additional pier/satellite building could be built together with the Airport People Mover system connecting to the two sides of the airport terminal area as shown in the ultimate airport plan. The landside facilities close to the terminal would be expanded with an additional multi-storey car park for short stay spaces, expanded rental car parking facility, and relocated and larger staff car park. Long-stay at-grade surface parking located further from the terminal along the southern access road would also be expanded to meet demand. To the north of the terminal, the remote aircraft parking aprons around the ATC Tower would be expanded to meet the growth in peak stand demand. Further north, in the midfield area the Air Cargo terminal and aircraft apron would be expanded to meet growth with additional levels of automation assumed for efficient air freight handling within the building. Freight forwarding, In-flight catering, General Aviation and Aircraft

Maintenance (MRO) Hangar facilities would all be expanded to meet demand growth. The airport fuel farm would also be expanded in its proposed location. The trade zone development would also continue to be expanded in line with demand towards the north of the Airport Precinct.

The image below shows the draft concept layout for Phase 1 (7.2mppa.).

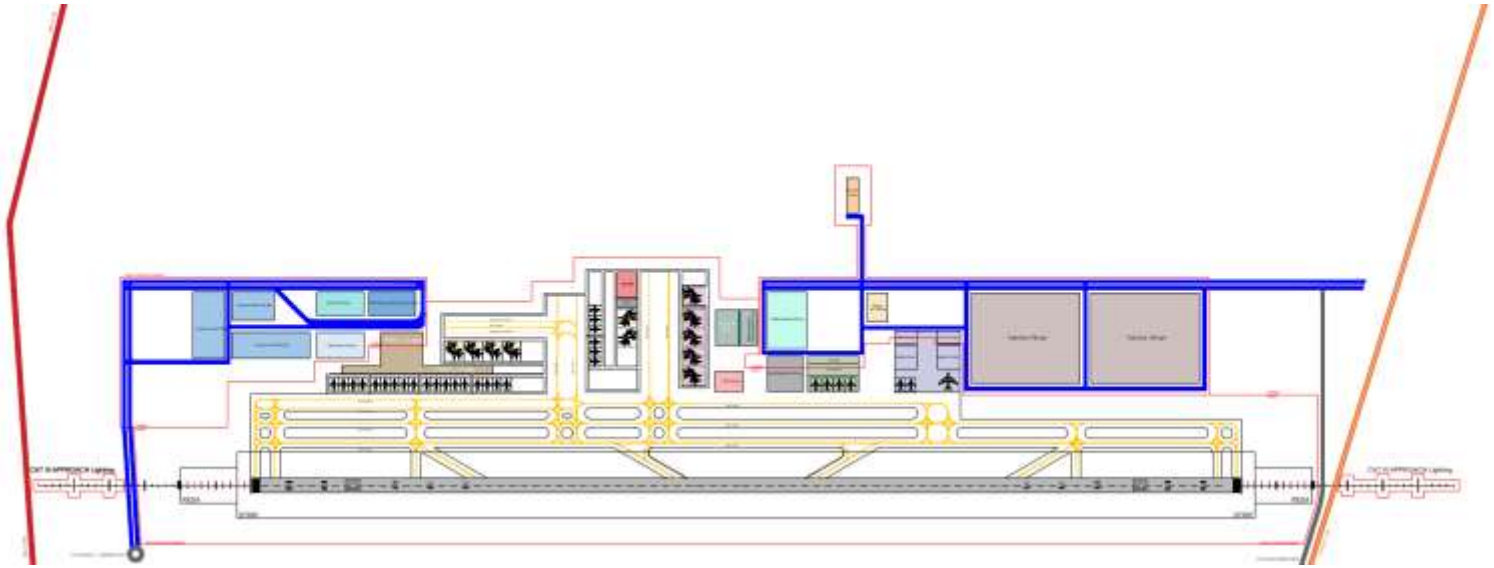

Figure 9-2. Airport Precinct Layout Plan for 7.2mppa.

The image below shows the draft concept layout for Phase 2 25mppa.

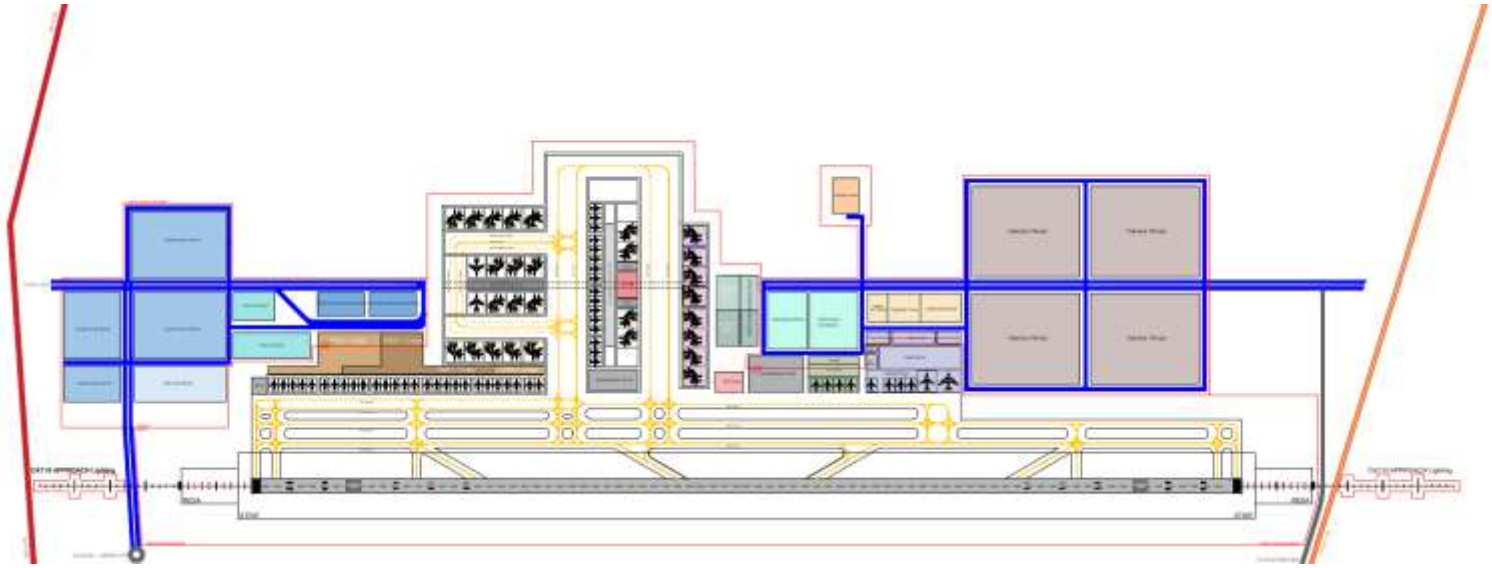

Figure 9-3. Airport Precinct Layout Plan for 25mppa.

10. SOCIO ECONOMIC ASSESSMENT AND PROFILING FOR THE PROPOSED VAAL AEROTROPOLIS DEVELOPMENT.

10.1. Demand Assessment for an Airport in the Vaal Region.

A high-level demand assessment for an airport development at the Vaal Aerotropolis site initial findings indicates that the airport could potentially generate demand upwards of 4.5 million annual passengers and 15 167 ton of cargo, 5+ years after becoming operational.

		OR Tambo International Airport	Cape Town International Airport	King Shaka International Airport	Vaal Aerotropolis Trade Area	
					Low Scenario	High Scenario
Socio-Economic Profile	Population 2024	11 034 194	5 211 503	4 115 006	4 090 852	
	Population growth rate	1.66%	2.17%	1.59%	1.8%	
	Households	4 128 907	1 619 666	1 111 825	1 346 059	
	Households growth rate	2.75%	2.85%	1.24%	2.0%	
	SEM 4-5	30.10%	34.2%	24.20%	19.9%	
	SEM 4-5 population	3 321 292	1 779 955	995 831	814 080	
Passengers	International	7 054 616	2 754 405	274 882	1 252 066	1 407 439
	Regional	707 178	169 961	2 514	109 222	122 776
	Domestic	10 005 667	7 093 292	4 706 511	2 707 473	3 043 451
	Unscheduled	85 108	16 694	3 754	13 106	14 733
	Total	**17 852 569**	**10 034 352**	**4 987 661**	**4 081 867**	**4 588 399**
	Ratio Passengers per SEM 4-5	**5.38**	**5.64**	**5.02**		
Cargo	Import (tonne)	3 072 697	14 882	2 995	11 331	3 035 725
	Export (tonne)	71 342	36 129	2 800	404	108 314
	Total (tonne)	3 144 039	51 011	5 795	11 735	3 144 039

Table 10-1. Airport Demand (Demacon,2025).

This would be subject to marketing, management and related considerations, as well as the ability to secure critical contracts. It is worthy to note that Lanseria (with 9.5 million people within a 50km radius) commenced with commercial flights in 2006. Following various restructurings of flights, destinations and service providers, the airport currently accommodates ±2.5 million passengers per annum. From the above, the proposed Vaal Airport would have a strong business case for cargo, provided key anchors could be procured.

10.1.1 Airport Land Use Profile

Traditionally, property in the immediate vicinity of airports accommodated aeronautic activities in direct support of aviation activities of the airport. As economies evolved, land around airport became increasingly vital locations for commercial and industrial activities. As economies and cities grew more complex and dynamic, so has the demand and land use profiles of property near airports. Land uses typically associated with airports in a modern-day context include:

- Industrial including light manufacturing, warehousing and logistics
- Commercial
- Hotels
- Entertainment
- Conferencing and convention centres.

The mentioned mix of activities is driven by the need for international and local businesses to be in an environment that offers convenience, accessible office space, and necessary complementary facilities and activities, including accommodation and entertainment. Airports are set to become the new centres of future development in the form of aerotropolis.

Aerotropolis is a new city layout in response to the needs of 21st century businesses. Generally, an aerotropolis refers to a fusion of airport and metropolitan where a city has at its centre, an airport development, just like the traditional CBD of cities. This layout encourages the moving of goods and people with minimum inconvenience and optimum efficiency. For businesses that rely on time-sensitive air freighting, operate as distribution centres, need warehousing or that have executives who travel frequently, having commercial premises close to an airport is a necessity.

10.1.2 Changing Demand

In recent years, industrial space around airports have transitioned from a selective and single function space to incorporate a greater variety of space options. In particular, the demand for larger warehousing space, often referred to as maxi-units, has emerged as a new driving force for industrial space demand around airports. This demand for large warehousing space is driven primarily by the needs of logistics companies, in turn supported by downstream retail and trade activities.

The South African economy has transformed in such a way that the moving of raw material is no longer the only driving force behind major logistic activities. There has been a greater demand for the distribution of manufactured goods (intermediate and final goods) which results in the increased demand for warehousing and logistics space.

In addition, imports have come to play a greater role in the South African economy, accounting for 30% of GDP from 2008 to 2017, from 24% in 1996 to 1997. This has contributed to a growing demand for logistics and warehousing which continues to expand.

The growth of imports to the country and demand for warehousing space are underpinned by the transportation of perishables (food and beverages, specialised agricultural produce, flowers etc) that requires warehousing space near airports and major transport routes. In addition, the popularity of online retailing also contributes significantly to the increased demand for warehousing space in strategic locations.

10.1.3 Warehousing and Distribution space

Key design considerations for warehousing and distribution space include:

- Ease of access to major road networks and airports
- Exposure / high frontage associated with major transportation routes
- Large warehouse space (maxi-units) especially for distribution and logistics use
- Modern space and finishing
- Energy efficient such as reduce water wastage, optimise the use of natural light, energy efficient lighting (Solar and LED installations)
- Hyper flat, hyper hard floors
- Internet connectivity, preferably fibre
- High ceilings to enable better cubic metre usage
- Covered loading areas
- Sprinkler systems
- Good security
- Larger yards with manoeuvring space for interlink
- Highway frontage allowing for outdoor marketing
- Small office component as part of the warehouse, typically a warehouse will accommodate an office component of 10% to 20% of total space
- High tech cold-storage facilities including frozen and super frozen storage offering long term and short-term storage.

10.1.4 Appeal of the Development Site for Industrial/Warehousing Development

The demands associated with the logistics sector has resulted in a high demand for well-located warehousing space with key influencing factors including the following:

- Proximity to major consumption centres
- Access to global and local trade
- Changing demographics and increasing levels of value-added services enhanced by the importance of proximity to all spheres of the labour market, skilled and unskilled.
- Transport infrastructure
- Total cost to value as investors and tenants is increasingly considering total supply chain costs.

10.1.5 Industrial Location Factors

Industrial location factors consider the location of industrial activity based on several factors that allow industrial activity to exist, operate and sustain itself. The industrial location factors are important in the sense that the proposed development will hinge on manufacturing. The environment enabling such a developmental activity should be conducive to industrial related manufacturing or logistics.

10.1.6 Agricultural Produce Cargo Export

Agricultural produce cargo exports from South Africa increased by 4.0% per annum over the last ten years, indicating high positive growth. Even though a seemingly negative long-term trend can be observed at airports, it is worthy to note that the post-2020 annual growth exceeded 15% (17.3%). This resonates with the international trend in terms of which exponential increase in e-commerce

post COVID 19 is being observed. O.R. Tambo Int Airport experienced a long-term growth rate of 4.5% in agricultural produce cargo, outperforming national trends over the corresponding period. Given the **above trends, agricultural produce cargo** is set to increase with approximately 454 129 ton per annum. Agricultural produce cargo export from O.R. Tambo is set to increase with approximately 1 654 ton per annum.

The potential VAAL Aerotropolis cargo volume will be a combination of new growth as well as a share of existing exports, resulting in potential exports of between 11 000 and 15 000 ton at 2032 (potential operational date), increasing to between 25 000 and 30 000 ton over the long term.

Vaal Aerotropolis Export Potential for Years 2032,2037,2042, are for Cargo Export 11 000 to 15 000 ton, 15 000 to 20 000 ton and 25 000 to 30 000 ton respectively. The Vaal Aerotropolis location is ideally suited to provide enough space for holding areas for various animals, adhering to veterinary and quarantine requirements and creating a more humane option.

10.2. Introduction to Airport Economics.

Airports are a valuable economic commodity that generates a variety of economic and social benefits. Airports cities develop over longer periods of time and require pro-active planning to ensure sustainable and optimal airport centric development. As such, it is vital to understand which land uses and economic clusters are deemed most suitable and beneficial given the role and function of an airport. The term airport economics essentially refers to the economic dynamics and benefits associated with the presence of an airport on its hosting economy and community. The objective of this chapter is to provide some insight into the key dynamics associated with airports to ultimately understand which land use activities are most compatible and contribute to the highest economic impact.

10.2.1. Airport Land Uses and Economics Clusters.

Airports and their immediate environs typically accommodate a mix of activities either directly related to aviation, activities reliant on the airport and activities that fulfil a complementary function to the aviation industry. To understand the land use profile and related dynamics associated with airports, they are typically divided into four functional areas:

- The core airport area includes runways, airside operations and passenger terminals
- The airport crossover area includes land still on airport property although not necessarily directly related to the operations of the aircraft and flights
- Areas adjacent to the airport referred to as the off-airport area which typically accommodates activities serving the airport or activities that are reliant to easy access to the airport.
- Airport surrounds include areas still within proximity to the airport but not on airport property and further from the core airport area itself.

Airports are typically associated with various economic clusters. The presence of these economic clusters is determined by the size, function and maturity of the airport and the combination of clusters may vary for different airports. Airports and their surrounds are typically integrated with a variety of economic clusters. The presence of these economic clusters will depend on the function of the airport, its location within the greater context, the size of the airports as well as its age and the maturity of the urban fabric. The land use profile of airports and their surrounds are mixed-use in nature and fulfil different functions.

Activities within the core airport area are usually dominated by uses that are directly related on aviation and the core function of the airport. This includes the runways, airside activities and passenger terminals.

Activities just beyond the core of the airport typically include uses that are reliant on the aviation industry and consist largely of

transportation related functions, food preparation and cargo handling. Areas adjacent to the core airport area and crossover area, typically boasts activities that still rely on access to the aviation industry although direct runway access is not essential. Surrounding environment typically accommodate activities that still benefit from being within proximity to an airport.

10.2.2. Benefits and Economic Impacts Associated with Airports.

Airports offer a great variety major economic and social impact to its hosting community and economy. The greater airport environment hosts a vibrant mix of land use activities which offer a multitude of opportunities. Airports and their operations have the ability to:

- Attract significant investment
- Enhance tourism
- Diversify the economy
- Creates employment opportunities direct, indirect and induced
- Creates a tax base
- Aviation boasts high occupancy rates, more than road and rail transport
- Improved efficiency of supply chains
- Catalyst for innovation
- Facilitates world trade
- Ability to serve a large market
- Encourages densification and intensification.

10.2.3. Airports and Logistics

Airports hold a direct benefit for distribution companies as it facilitates greater regional and global reach of products. A significant proportion of activity on airport grounds and its surrounds are dedicated to cargo and freight operations which includes logistics, transportation and warehousing. This sector has also experienced exceptional growth in recent years given the rise of e-commerce. Although the demand for air freight is limited by cost, which is typically 4 to 5 times that of road transport and 12 to 16 times that of sea transport, the commodities shipped by air are those that have high value per unit density. Air freight constitutes 35 per cent of world trade by value. Airports are valuable importers and exporters of goods, and the immediate influence area is therefore invaluable for the distribution and logistics sector Airports fulfil an invaluable role in the logistics field and offer strategic opportunities for warehousing and distribution companies.

Aviation's speed and reliability has contributed to the market for same-day and next day delivery services and transportation of urgent or time-sensitive goods, giving it an advantage over other modes of transport. Global e-commerce sales amounted to USD 25,3 trillion in 2015. Active e commerce development has a significant impact on air transport demand as e commerce transactions depend fundamentally on the speed of air transport which connects manufacturers and retailers to the world's cities and regions.

Around 90 per cent of business to consumer (B2C) e-commerce parcels are currently carried by air. Given the cost of air cargo services, this shipping method is typically reserved for higher value goods These include:

- Perishable goods, fresh produce, cut flowers, fresh fish, pharmaceuticals
- High-value goods, electronics, precision manufactured goods, pharmaceuticals (not sensitive to temperature), medical devices, jewellery, diamonds etc.
- Time sensitive goods, commodities involved in just-in-time manufacturing processes, replacement parts and other goods with urgent customer requirements.

Typical logistics sector activities found in airport environments include:

- Fast-cycle logistics
- Cargo handling
- Freight forwarding
- Courier companies
- Import and export agents
- Warehousing.

10.2.4. Socio- Economic Conclusion

The International Air Transport Association (IATA) has urged South Africa's new Government of National Unity to continue prioritizing the development of its aviation sector as a critical driver for economic growth and job creation. "South Africa's aviation industry is poised for significant growth over the next 20 years, adding 345 million additional passenger journeys by 2043. With aviation generating $6 in economic activity for every $1 spent, this expansion will inject billions into South Africa's GDP and create thousands of new jobs. It is important for the new government to keep this as a strategic focus. The economic and social benefits of aviation will be maximized with a sharp policy focus on keeping costs low, providing sufficient capacity to grow, monitoring the cost-effectiveness of regulations, and achieving net zero carbon emissions by 2050," said Kamil Alawadhi, IATA's Regional Vice President for Africa and the Middle East.

10.3. Financial Analysis and Sensitivity.

The Economic Costs Benefits Analysis (ECBA) undertaken, weighed the costs and benefits of two scenarios against each other:

- the **base case scenario (Scenario 1)** that considers the proposed development location within its current state (the property is primarily used for commercial agriculture)
- and **project implementation scenario (Scenario 2)** that considers the medium- to long-term development of Phase 1 of the Vaal Aerotropolis.

The implementation of Phase 1 of the Vaal Aerotropolis development is not without its costs. The development would require capital investment to unlock the potential of the development site as an integrated Aerotropolis development that supports logistics, industry, tourism, trade, service industry and agriculture.

As investors take up available land uses, operational expenses will be necessary to operate businesses and unlock the economic value of the Aerotropolis. Once the Aerotropolis is fully developed and has reached operational maturity (over the medium to long term), the full extent of its economic and social value will be realised.

Capital costs and operational expenditures are necessary to create value from the development and its operational components. However, aside from capital and operational expenses, additional costs will arise. The environmental attributes once provided by the commercial agricultural activities will be lost. Moreover, the creation of employment opportunities will likely attract job seekers to the area, imposing a cost burden on the community through increased labour pools, skills mismatches, and a higher potential for crime. Additionally, the establishment of logistics and warehousing operations will increase heavy vehicle activity in the area, consequently influencing travel patterns. Lastly, the Aerotropolis will generate additional carbon emissions from passenger and cargo travel facilitated by the airport.

Taking into consideration a range of identified, defined, and quantified costs and benefits per ECBA scenario, the following highlights the key results obtained from the analysis:

- A Positive NPV indicates an overall social benefit to the community affected ERR
- An ERR greater than the SDR (10%) offers a sizeable community benefit.
- An ERR equal to the SDR shows that the costs and benefits are in equilibrium with each other, whilst an ERR less than the SDR indicates a marginal social cost to the community.
- A BCR greater than 1 indicates that a positive relationship exists between the present value of costs and benefits. BCR's are effective tools in ranking and selecting the most socially advantageous project option for a community.

The ECBA analyses identify that the base case scenario (Scenario 1) represents an efficient use of community and economic resources. The current commercial agricultural (Scenario 1) use of the properties that make up the Vaal Aerotropolis development site provides economic value to society because of the inherent environmental value that the development site possesses as opposed to the operational costs associated with commercial agriculture and the increased crime activity associated with the theft of crops and livestock.

The project implementation scenario (Scenarios 2), in contrast, identify that the opportunity cost of implementing Phase 1 of the Vaal Aerotropolis project represents a benefit to society and the economy. The ECBA analysis reveals that utilising the development location for the establishment of an integrated Aerotropolis development would through the logistics-based development in support of national and regional economic growth initiatives, create considerable economic and social benefits. This efficient use of societal and economic resources would enhance the community and the economy. In essence, the introduction of productive land uses that can expand economic activity would compound the benefits derived from the proposed development location, creating long-term value in highly valued economic sectors such as logistics, industry and agriculture.

The project implementation scenario would, therefore, afford society (including those who find employment at the Aerotropolis), potential passengers and logistics operators the greatest benefit. These benefits include increased savings on travel costs, travel time, and travel safety, reduced carbon footprints, upskilling the labour force and economy and an overall lower impact on the environment for people employed at the proposed development and their households.

The comparative analysis of the outcomes of the ECBA for the base case and project implementation scenario shows that the base case scenario has an ERR of 0.0%, which is less than the 10% Economic Cost of Capital Rate (ECC) prescribed by National Treasury.

The ECC rate represents the minimum rate of return that National Treasury requires for a project or capital investment to be considered economically viable and beneficial to communities, as it will make use of scarce community resources.

The project implementation scenario, the preferred scenario, alternatively, has an ERR of 11.1% which is higher than the ECC rate of 10.0%. This indicates that the implementation of Phase 1 of the Vaal Aerotropolis over the medium- to long-term would provide an overall benefit to society and the economy because the project has the potential to generate economic returns. Therefore, the implementation of the project (Scenario 2) offers the potential to generate social and economic value beyond the expected rates of return over the medium- to long-term implementation and operational periods.

Furthermore, the base case scenario has a benefit to cost ratio (BCR) of 1.81, which is greater than the 1.07 BCR of the project implementation scenario. Even though the BCR suggests that the base case scenario is more beneficial to society, the BCR should be reviewed alongside the NPV and ERR to mitigate against bias. The NPV and ERR of the project implementation scenario exceed those of the base case scenario.

Moreover, the project implementation scenario’s ERR surpasses the National Treasury ECC rate of 10%, indicating its potential to drive economic and community resource development.

10.4. Market Analysis

10.4.1. Construction Phase

Impacts generated during the construction phase of the project are once-off and are sustained for as long as construction occurs. These impacts dwindle as construction activity comes to an end and the development becomes operational, then operational impacts which are created and sustained annually, are activated.

The total CAPEX (Capital Investment) of the project could temporarily add approximately:

- R82.18 billion in additional business sales,
- R36.07 billion in additional GDP (contributes +1.73% to the provincial economy)
- Approximately 118 498 once-off jobs (formal and informal) throughout the Gauteng provincial economy.

An estimated 347 additional formal small, medium and micro-enterprise opportunities could be created. Black-owned SMMEs would potentially represent 72.91% of new formal SMME opportunities, given the prevailing legislative environment.

Formal employment during the construction phase represents 92 746 jobs (total direct, indirect and induced).

Approximately 22.92% of formal employment opportunities are expected to be filled by skilled labourers compared to 58.53% semi-skilled labourers and 18.55% low-skilled labourers. Additional compensation paid to employees during the construction phase is estimated to be approximately R13.33 billion.

It is estimated that approximately R9.98 billion in additional taxes could be generated during the construction phase. The largest contributor to new taxes is because of personal income tax, contributing 33.45% to all taxes collected economy wide.

10.4.2. Operational Phase

Impacts are generated when the productive-land uses of the development commence with operations. Impacts created during the operational phase are "sustained" impacts. “Sustained impacts” are impacts that are continuously generated (i.e. created and then sustained annually) as soon as the full operation of the project commences (long-term impacts).

The total annualised OPEX (operational revenue) of the project could annually add approximately R19.68 billion in additional business sales, R9.28 billion in additional GDP (contributes +0.44% to the provincial economy). It will also create:

- Approximately 19 838 sustained jobs (formal and informal) throughout the Gauteng provincial economy.
- An estimated 91 additional formal small, medium and micro-enterprise opportunities could be created. Black-owned SMMEs would potentially represent 70.33% of new formal SMME opportunities, given the prevailing legislative environment.
- Formal employment opportunities created throughout the lifetime of the project represents 16 175 jobs (total direct, indirect and induced).
- Approximately 28.18% of formal employment opportunities are expected to be filled by skilled labourers compared to 49.03% semi-skilled labourers and 22.79% low-skilled labourers.
- Additional annual compensation paid to employees during the operational phase is estimated to be approximately R3.1 billion.

It is estimated that approximately R2.29 billion in additional taxes could be generated during the operational phase. The largest contributor to new taxes is because of personal income tax, contributing 37.34% to all taxes collected economywide.

10.5. Overall Economic Outcome

The construction and operational phase of the project would have a measurable positive effect on the Gauteng provincial economy, generating sizeable GDP over the short- to long-term, high additional business sales and new business formation and a considerable number of new employment opportunities across all skill levels Additional taxes can contribute to national and local treasuries and households across the province can increase their livelihoods. The increased demand for social amenities will influence the fiscus and operation of public sector entities. The increased pressure on the fiscus is offset by the addition of productive rateable assets through the envisaged capital investment in the project

Consequently, the analysis suggests that the project implementation scenario has the potential to offer the greatest social and economic benefits, considering the prudent allocation of limited community resources. Overall, the benefits associated with the implementation of Phase 1 of the Vaal Aerotropolis represent:

- On-site employment generated by the Vaal Aerotropolis, including businesses establishing operations within its Aerotropolis and SEZ, offers numerous societal benefits due to the proximity of job opportunities to communities in areas like greater Sebokeng and Vanderbijlpark
- Increased earnings compared to average household incomes of local communities
- Relative boost to employment upskilling in the Gauteng economy because of technology integrated employment opportunities provided by the Aerotropolis.
- Reduced travel time to Aerotropolis employment opportunities compared to the average travel time of persons employed in the local economy
- Reduced travel cost to Aerotropolis employment opportunities compared to the average travel cost of persons employed in the local economy

- Reduced carbon emissions from reduced travel time and distance
- Reduce propensity to be involved in a serious vehicle accident because of reduced travel time and distance
- Passengers closer to the Vaal Aerotropolis no longer must travel considerable distances to access air travel at ORTIA, LIA or WNA
- Reduced travel time because of passenger proximity to the Vaal Aerotropolis
- Reduced travel cost because of passenger proximity to the Vaal Aerotropolis
- Reduced carbon emissions from reduced travel time and distance
- Reduced propensity to be involved in a serious vehicle accident because of reduced travel time and distance
- The cargo and logistics function of the Vaal Aerotropolis, notably its dedicated live animal export capability, can provide dedicated export and import locations in Gauteng and neighbouring Provinces with a logistics (road freight orientated) efficiency benefit via shorter routes to an alternative air cargo hub than ORTIA:
  - Reduced accidents
  - Reduced congestion
  - Reduced emissions
  - Reduced land way
  - Reduced noise
  - Reduced policing
  - Improved Road freight efficiency
  - Reduced travel time for logistics operators

- Alternative uses such as health care (clinic/hospital) included as part of the Aerotropolis can assist with improving access to healthcare facilities in the Emfuleni region and assist with reducing the burden of disease of the district
- The implementation of Phase 1 of the Vaal Aerotropolis could assist with further diversifying the regional economy by introducing a variety of industries (e.g., logistics, retail, trade, agriculture, manufacturing, etc) over and above the established businesses in the region.
- The potential to development linkages with a variety of established industries which would enable greater collaboration and resource flow and logistical efficiency
- The potential to establish additional international resource flow connections could further enhance access to global markets and establish new industries
- The Vaal Aerotropolis offers an opportunity to attract additional foreign and domestic investment into the local economy
- The Aerotropolis can be used as a key informant to strategic planning in the Gauteng and regional strategic planning sphere
- The development of the Aerotropolis could lead to further investment into bulk services and infrastructure in surrounding communities and economic nodes.

11. INSTITUTIONAL FRAMEWORK FOR THE VAAL AEROTROPOLIS DEVELOPMENT.

The Sedibeng District Municipality Council has on 25th March 2025 resolved that the Vaal Aerotropolis development be integrated into the Vaal SEZ.process The Vaal SEZ Operator Permit has not been approved by the Minister yet, but it is expected that an approval will happen within the next 6 months.

The intention is to include the Vaal Aerotropolis development through an application for an Operator Permit in terms of Section 32(4) of the Special Economic Zones Act No. 16 of 2014.

The intention is to manage the Vaal Aerotropolis development by obtaining a Special Economic Zone Operator Permit.

An application will have to be made to the Minister after the Vaal SEZ Advisory Board has appointed Vaal Aerozone as an operator to develop, operate, and manage part of the Vaal SEZ related to the Vaal Aerotropolis Project.

The operator that will manage part of the SEZ related to the Vaal Aerotropolis will also be responsible for the implementation of the zoning development rights through the management, amendment and approval of the various plans.

12. CONCLUSION

This Local Spatial Development Framework is in essence a Masterplan which outlines the planned land usage and the phased roll-out of the development over the next 60-Years.

It aims to explain in broad but properly researched and considered terms how the Vaal Aerotropolis will be positioned in terms of Regional and Local Spatial Development frameworks and integrated into the existing and future infrastructure of the region so that all role players fully understand the project demands and can plan, programme and budget accordingly.

It should be seen as a ‘bankable’ development model outlining all infrastructure and services that will be required from local and regional government.

This LSDF will be developed into more detailed Precinct Plans for the Phase 1 build, which will delve more specifically into the main building typologies and support services of each of the 4 main precincts, being:

- Air Platform
- Trade Zone
- Agri-Zones
- Airport City

A detailed Development Manual containing all development design guidelines, specifications and other criteria will be compiled to guide the primary and secondary development of all parts of the Vaal Aerotropolis.

APPENDIX 1 : Artists Impression