



Fire Management Report for Development of ERF 3122 - Hartenbos

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1. Declaration of independence

- 1.1. The authors, do hereby declare that they are independent of the client and that all opinions expressed in this document are substantially their own.
- 1.2. The information contained in the report is presented based on information obtained in good faith and is accurate based on facts available at the time of writing. The Authors reserves the right to amend any part of the said report as new information becomes available.

2. About the authors

- 2.1. CF Pool has been involved in veldfires since 1989, has conducted numerous veldfire investigations and presented different courses in Fire Management (Including Fire Investigation and Fire Simulation courses).
- 2.2. He is a qualified Forester who grew up on a plantation and practised forestry for 17 years before taking up a lecturing position in 2000 at the Nelson Mandela Metropolitan University (NMMU). As fires are the biggest threat to forestry in SA and part of a forester's way of life, his involvement in veldfire management laid the foundation of his experience and knowledge of veldfires. He is also the editor of the "Fire Manager's Handbook on Veld and Forest Fires, Strategy, Tactics and Safety - South African Edition." He has served as expert witness in the High Court and is regularly consulted in his capacity as an expert fire investigator. He has also compiled fire management plans for landowners.
- 2.3. In addition, he has presented papers at international conferences on the topic of Fire Management, lectured abroad and is involved in the National Fire Management Workgroup of South Africa. He has written several articles on Fire Management related topics for different magazines. His highest qualification is a Master degree in Forestry (completed in 2012) with the focus on fire behaviour. Pool is acknowledged by the forestry and other industries for his knowledge of fire behaviour, firefighting, fire management, fire ecology and numerous other fire- related topics.
- 2.4. Pool has developed and registered the first Fire Management qualification in Africa and is serving as the Head of Department for Forestry at the Nelson Mandela University.
- 2.5. SJ van Zyl is a lecturer in Forestry and Veldfire Management at the NMU. He is

currently serving as the programme coordinator for veldfire management at the NMU. He has been involved in various veld and forest fire investigations and the compilation of fire protection plans for residential urban Interface developments since 2011.

- 2.6. He has completed a Fire Investigation course (Cum-Laude, NMMU), and is a certified user of the Carnegie Landsat Analysis System (CLASlite). He is skilled in interpreting satellite images and compiling electronic maps. His highest qualification is a Masters in Forestry (Cum-Laude, NMMU, 2015). He is currently pursuing a PhD in Nature Conservation (“How the science of fire behaviour can inform fire management in the South African context”).
- 2.7. He was an active category A police reservist from 2006 to 2015 and is, therefore, familiar with investigation and crime scene management procedures. Additionally, he completed an Incident Command System programme and served as a Section Chief on the incident management team of the 2017 Knysna/Plettenberg Bay Fire Complex.

3. Introduction

- 3.1. This document is an expansion of the following reports:
 - 3.1.1. “Fire Constraints for Development of ATKV ERF 3122 – Hartenbos” report 31 August 2017.
 - 3.1.2. Hartenbos Erf3122 fire scoping report 28_February_2018.
 - 3.1.3. Hartenbos Erf3122 fire scoping report 30_March_2021 revised
 - 3.1.3.1. New developer took over the project from this point on effecting a name change to “Hartenbos Garden Estate/Hartenbos Natuur-Landgoed”.
- 3.2. This updated report comments on the proposed layout of the development with reference to suggestions made by the authors during the constraints analysis and scoping phases of the development.
- 3.3. The developers of the project made several changes to the layout of the proposed development overtime and this report incorporates these changes without removing commentary on the previous design layouts to show whether the developer has remained within the safe build area as defined in our previous analyses.
- 3.4. The report aims to guide the developers and future owners of the property on avoiding

possible damage to structures in the event of veldfires.

- 3.5. The report provides basic guidance for safe burning practices to enhance biodiversity and to mitigate the risk of both fire damage and smoke pollution.
- 3.6. The recommendations in this report are based on the current environmental conditions that exist in the area and draw on the following expert reports relating directly or indirectly to the proposed development.

3.6.1. CapeNature: **Pre-application scoping report for the Hartenbos Garden Estate on erf 3122 Hartenbos Heuwels, Hartenbos, Mossel Bay Local Municipality, Western Cape.** Dated 08 March 2022.

3.6.1.1. Special note is taken of comment/recommendation 7 of the said report, all the aspects thereof are addressed in this fire management document:

3.6.1.1.1. Mentions the need for and their support for a “ecologically acceptable fire management plan” for the development.

3.6.1.1.2. Indicate that fire regime (burn interval of 12 – 15 years) proposed by Nick Helme (2016) for management of renosterveld is within the accepted range of 10 – 15 years. The Helme report referred to in 3.6.2. below does indicate the full 10 – 15 year return interval.

3.6.1.1.3. Indicate that firebreaks must be considered as part of the development footprint. Clear guidance on the required width and placement of fire breaks/buffers are given to the developers and have been considered for the final layout.

3.6.1.2. The need for ecological corridors is also noted and incorporated into the burning recommendations of this report.

3.6.2. Nick Helme Botanical surveys: **Conservation Management Plan for municipal land on Hartenbos Heuwels, Mossel Bay, Western Cape.** Dated 18 October 2017.

3.6.2.1. This report deals with management of the property (Remainder of Portion 59 of Farm 217, plus Erven 1852 and 1853, Mossel Bay) adjacent the development that is owned and managed by the Mossel Bay Municipality (MBM). See section 1 of the said report

for complete description of the affected area.

- 3.6.2.2. Section 7.3 of the said report discusses the fire management of the property.
 - 3.6.2.3. The properties are divided into 11 fire management units that are to be burned on a rotational basis ensuring a fire return interval of 11 years. Refer to Figure 9 of the said report.
 - 3.6.2.4. The rotational burning was meant to commence in 2018, there is however no indication that this has been implemented. Given the fact that the fire of 2019 affected the initial fire management units that should have been burned there is still opportunity for the MBM to catchup with the burning of the fire management units identified by Helme. The developers of Erf 3122 should actively engage with and encourage the MBM to implement the recommendations of the plan. If it is not done there will be a substantial increase in risk of fire to the development.
- 3.6.3. Dave Edge: **Hartenbos Garden Estate Fire Management Plan for the Butterfly Reserve**. Dated May 2021.
- 3.6.3.1. Indicates that proposed fire breaks in this report will enhance protection of the butterfly colony from unwanted fire.
 - 3.6.3.2. *Aloeides* butterfly larvae and pupae are relatively safe from fires in the nests of their host ants during the period from May to August.
 - 3.6.3.3. Refers to fire management plan proposed by Helme for adjacent property. Highlighting the recommendation that controlled burns carried out in July/August are best for the local vegetation. This overlaps ideally with the period of safe burning for *Aloeides* mentioned in 3.6.3.2.
- 3.6.4. David McDonald. Bergwind Botanical Surveys & Tours CC.: **Botanical Impact Assessment, Erf 3122 Mossel Bay (Hartenbos Hills Garden Estate), Mossel Bay Municipality Western Cape Province**. Dated January 2023.
- 3.6.4.1. Recommends keeping vegetation cut low but not eradicated along firebreaks.

- 3.6.4.2. Highlights the risk of the current absence of an implemented fire management plan.
- 3.6.5. David McDonald. Bergwind Botanical Surveys & Tours CC.: **Terrestrial Biodiversity Assessment, Erf 3122 Mossel Bay (Hartenbos Garden Estate), Mossel Bay Municipality Western Cape Province.** Dated January 2023.
 - 3.6.5.1. Comments similar to report mentioned in 3.6.4 above.
- 3.6.6. Jonathan Colville. Terrestrial Ecologist & Faunal Surveys and Callan Cohen. Birding Africa.: **Terrestrial Faunal Impact Assessment – Hartenbos Hills Garden Estate, Erf 3122, Mossel Bay.** Dated 31 October 2022.
 - 3.6.6.1. No specific mention of fire management need.
 - 3.6.6.2. Note taken of the importance of retaining ecological corridors for fauna.
- 3.6.7. Justine Ewart-Smith. Freshwater Consulting CC.: **Erf 3122, Hartenbos Heuwels residential development: Freshwater ecological impact report.** Dated January 2023.
 - 3.6.7.1. No specific mention is made of fire management requirements; however the details of wetland seeps and drainage areas are noted. The mention of appropriate wetland vegetation that should be planted in swales or unlined channels is noted (section 10.3.1.2. of the said report).
 - 3.6.7.2. It is also mentioned that swales serve a function as ecological corridors.
- 3.7. Future developments such as further residential developments adjacent to the area might have an influence on the recommendations within this document.
 - 3.7.1. The property at the bottom of the drainage east of Erf 3122 is apparently slated to be developed as a school.
 - 3.7.2. The properties mentioned in 3.6.2.1. are set aside for conservation land and will not be developed for residential purposes.
- 3.8. Erf No. 3122 (Hereafter referred to as “the property”) was previously utilised as agricultural land. The property is situated on the western edge of the Hartenbos

Heuwels residential area. Hartenbos Heuwels forms part of the Mossel Bay Municipal area, which in turn is part of the Garden Route District Municipality in the Southern Cape.

- 3.9. The property rests on a plateau in the hilly landscape west of the N2 Freeway that passes through the Hartenbos area. Although the property itself is relatively flat, the area bordering it forms a gentle downward slope with a network of valleys draining away from the plateau. To the east and south, there are shallow valleys that become deeper as it progresses into the adjoining area.
- 3.10. The primary vegetation type within the property is Brandwag Fynbos Renoster Thicket (Helme, 2016). Renosterveld forms part of the Fynbos biome and it is an endangered vegetation type, however the Renosterveld vegetation on the site is disturbed and therefore not of pristine conservation value. Renosterveld is a fire driven ecosystem. This implies that the vegetation relies on a natural fire cycle for rejuvenation and continued survival and as it grows to maturity, it becomes highly flammable.

4. Fire occurrence

- 4.1. Fire occurrence on the property was evident through remnants of previous fires when the site was first visited in 2011. Although most destructive fires in the region are driven by strong, dry and hot north-westerly berg winds, it was reported that a fire that occurred on 26 December 2009 entered the property from a South-westerly direction and may likely have been started by a campfire.
- 4.2. On 21 January 2019, a large veldfire damaged two houses in the area adjacent the proposed development. The fire also burnt a large portion of the Erf 3122.
- 4.3. Where hazardous fuels exist on the boundaries of the property there is a threat to residential units. This is true for any urban interface development. The authors are however confident that the layouts proposed by the developers adequately take this threat into account and adhered to our mitigating recommendations.

5. Regional weather

- 5.1. According to the Koppen classification (Thwaites, 1987), the climate of the Southern Cape region is classified as moderate humid. By implication this indicates that

temperatures in this area are below -3 °C (night) and 18°C (day) during the coldest months, while during the warmest months the average temperature is below 22°C. There is not a distinct wet season and rain can be expected throughout the year. Autumn and spring months are associated with the highest rainfall during the year. The weather is largely controlled by the passage of cold fronts (Tyson 1971).

- 5.2. Based on weather data from 2014-2017, the mean annual precipitation for the area was 652 millimetres, the average temperature 17°C, with a maximum of 37°C and a minimum of 2°C (Weatherunderground, 2017).
- 5.3. Bergwinds are north-westerly winds and mainly occur in the winter months from the middle of June to late August. Bergwinds, however, are not only limited to winter months and increasingly occur throughout the year. In Annexure 1 the average wind direction and speeds can be observed. These strong winds substantially increase the fire risk by lowering the moisture content of both living and dead fuel material, create high air temperatures and decrease the relative humidity, which increases the likelihood of fires igniting and spreading. Bergwinds provide favourable conditions for extreme fire events (Tyson, 1973; Pool & de Ronde, 2002).

6. Localised winds

- 6.1. Because of the topographical location of the property, it is constantly exposed to wind. This is due to the absence of tall trees and structures to break the force of the wind. The valleys towards the north-western end of the property will channel and accelerate the warm and dry NW bergwinds and residences facing these valleys will be exposed to a higher threat from fire than others. These valley winds can cause fires to spot and become uncontrollable.
- 6.2. The average wind speed in the area is \pm 11km/h but during periods of strong wind, gusts exceeding 150km/h have been measured.

7. Topographical and vegetative concerns

- 7.1. The land adjacent to the property is sloping terrain with valleys. Should a fire start in these areas it will likely burn with a fast uphill spread since fuel on slopes is preheated by rising hot air. This increases the risk associated with the warm and dry western front of the property. As mentioned, the valleys also pose a high fire risk as it will funnel and accelerate wind.

- 7.2. Alien invader vegetation in the area will lead to a higher fire hazard on the property. Encroaching invaders in the area increases the fuel load, supplementing it with more woody material and creating a deeper fuel bed for fire to burn in. An added disadvantage in this regard is that exotic woody species burn more intensely than fires in the indigenous flora species. Therefore, alien vegetation in and next to the property should be managed to ensure that the flammable fuel load is kept to a minimum. Weed control in this area should ideally be done before development of the areas starts, to allow burning out of dry dead woody material that has been cleared.

8. Fire hazard and risk zones.

- 8.1. The north-western front of the property has been identified as the highest hazard area for possible future wildfire threat. In South Africa, the north-westerly aspect of a site is usually its most dangerous area because it receives the greatest amount of solar radiation during the day -making it warm and dry - and it is exposed to maximum radiation during the warmest part of the day. Not only is this area exposed to the NW berg winds, but a community centre and an industrial area to the north-western side of the property may be a likely source of fire.
- 8.2. This is also the direction from which the 2019 fire (paragraph 4.2) entered the property.
- 8.3. If the areas indicated as Portion 59 of farm 217 and Erf 1852 (Sonskynvallei Housing Extension Phase 3) are developed as residential areas, it should reduce the threat of fire from this area.
- 8.4. Erf 1853 bordering the property from the west stretching all along the border of the property to the north-east, has been identified as a conservation area. This implies that alien vegetation will be removed and prescribed burning will take place as prescribed in the environmental plan (Helme report mentioned in 3.6.2.). If this management plan is properly implemented there will be a significant reduction in fire risk to Erf 3122.
- 8.5. The valleys to the east of the property also pose a moderate risk due to alien weed infestation that adds to the fuel load.
- 8.6. Bordering the southern boundary of the property are valleys that are invested with

woody aliens and evidence of human activity and dumping is evident. Although this area faces away from the dominant berg winds, it also poses a marginal threat to residential units close to this area and it is not recommended that development should take place in this area or directly bordering the area.

- 8.7. To summarise: the north-westerly boundary of the area carries the highest risk from fires and it is recommended that a strip of at least 20m be kept clear from developments. The areas directly in front of the valleys in this area should be kept free of development for at least 30m. The rest of the property should have a strip of at least 10m kept free of development. It is further recommended that units bordering the boundary area of the property, be developed in such a way that lawns and gardens face outwards towards the boundaries of the property. The areas where development is not recommended should be utilised to establish buffer zones that can act as a defensible area in case of fire. Annexure 2 shows a map that reflects the hazards and resultant risks to the property. These buffer areas must be mowed or planted with succulent vegetation that is fire resistant such as “vygies”, if they are not used for road infrastructure.

9. Suitability of proposed development layouts from a veldfire risk perspective

- 9.1. The authors are satisfied that their fire risk constraint recommendations have been adequately considered by the developers.
- 9.2. During a constraints meeting held on 31 October 2017 the developer discussed various proposed layouts. The developer presented a preferred layout that would enhance the viability and the sustainability of the development. The preferred layout however infringed slightly into the constraint zones of various experts. Each of these zones of infringement were discussed during the meeting. Since an extra safety margin was included in the original fire constraint analysis the attending fire expert (SJ van Zyl) provisionally accepted the proposed changes subject to further scrutiny of an electronic version of the layout and infringement zones.
- 9.3. The maps of the preferred layout were supplied (Annexure 3), and upon careful consideration the authors conditionally accepted the proposed changes with additional suggestions (Annexure 3). Thereafter the developers submitted a revised layout (Annexure 4).

- 9.4. The authors are fully satisfied that the developers addressed their concerns in the revised layout. The revised layout (dated 30 January 2018) (Annexure 4) is considered safe for development from a fire management perspective.
- 9.5. On 28 February a new proposed layout dated 27 February 2018 (Annexure 5) was received. The main changes were highlighted as follow:
- 9.5.1. Erven 1 – 4 in the far north have been moved closer to the reservoir (the space used to be open). There is no additional fire risk associated with this change;
 - 9.5.2. Erven 102, 103, 106 & 107 have been introduced at the southern exit (the space used to be open) There is no additional fire risk associated with this change;
 - 9.5.3. There are some minor changes to some ‘internal erven’ that were of the larger type (500-700sq/m) that are now of the smaller type 200sq/m. There is no additional fire risk associated with this change.
 - 9.5.4. There are additional open space linkages built into the revised plan that can be seen with the red lines. These changes are beneficial from a fire management perspective since it provides access and additional area that can be used for defensible space.
- 9.6. The authors are satisfied that the revised layout dated 27 February 2018 (Annexure 5) is safe for development from a fire management perspective. This layout adequately addresses all of the fire management concerns previously raised.
- 9.7. On 5 March 2020 the authors were advised that a new layout was being proposed by the developer (Annexure 6). Subsequently this layout was revised again and presented for consideration on 3 March 2021 (Annexure 7 & 8).
- 9.8. Likewise, two more alternative entitled “alternative 2” and “alternative 3” (Annexure 9 & 10) dated November 2021 and October 2022 respectively have been submitted for consideration.
- 9.8.1. Notably in “alternative 3” the fence line of the property is moved effectively joining the area to the adjacent conservation area of the municipality.
 - 9.8.2. The fire buffer on the actual property boundary must remain as indicated in the original fire constraints report. This serves as a

strategic point from where controlled burns can be anchored or alternatively from where counter fires can be started to protect from external threats (by qualified, adequately equipped fire managers only).

9.8.3. "Alternative 3" is the final layout.

9.9. After careful consideration, the authors are satisfied that the revised layouts (Annexure 6, 7, 8, 9 & 10) do not exceed any of the constraints set from a fire management perspective. The proposed layouts therefore meet the approval of the authors.

10. Fire management on the development

10.1. Erf 3122 has three main sections of land that needs to be burned:

10.1.1. The area surrounding the municipal reservoir including the butterfly reserve indicated as plot 262 on the final layout (Annexure 11).

10.1.1.1. Plot 262 needs to be burned as soon as possible to rejuvenate the host vegetation critical to the survival of the *Aloeides* butterflies (see recommendation of Dave Edge as referred to in paragraph 2.6.3 of this report). A concerted effort must be made to conduct the burn in 2023.

10.1.1.2. Plot 262 may only be burned from May to August when the *Aloeides* larvae are safe underground.

10.1.1.3. Because plot 262 will be adjacent a frail care facility it would be best to burn it under slightly unstable atmospheric conditions that will facilitate the dispersal of smoke from the site. Dave Edge advises that the larvae and their ant host can survive the slightly more intense fire that will occur if burnt under these conditions.

10.1.1.4. There must be an adequate firebreak/buffer between the Butterfly reserve and the frail care facility as per the

10.1.2. The area east of the residential development that extends down into the drainage lines marked as plot 270 on the final layout (Annexure 12).

10.1.2.1. The simplest solution would be to regard this section as a single fire management unit. The total area of the section is approximately

20 ha.

- 10.1.2.2. Alternatively, the area can be divided into two or three smaller units using the drainage lines as logical dividing lines. For example, making a north / south separation through the drainage line north of sewer pumpstation 3 (Annexure 13). This would result in two roughly equal sized sections with an approximate area of 9 and 11 ha respectively.
- 10.1.2.3. When a burn is conducted it must be ensured that at least 70% of the intended area is burnt.
- 10.1.2.4. Most of this are burnt during the 2011 fire making the vegetation, which means the vegetation will be 12 years old in 2013. This is in the recommended burning window of 10 – 15 years.
- 10.1.2.5. In accordance with the recommendation in the Helme management plan for the MBM properties, it is best for the vegetation to have the burn in July and August.
- 10.1.2.6. It is recommended that this area be burned before the property is developed. This will be a simpler more cost-effective option as compared to having the initial burn after infrastructure is installed.
- 10.1.2.7. In future burns once the property is fully developed care should be taken to consider that fauna will have two main escape routes. They are the ecological corridors next to plot 252 and between plots 177 & 178. Fire should be put in in the areas furthest away from these areas to allow for adequate escape opportunities.
- 10.1.2.8. On steep areas care should be taken to mitigate against possible erosion from rain events following burns. Were judged necessary after the burns, biological degradable silt catchment barriers must be installed. This will prevent donga formation and limit siltation of wetland areas as identified in the aquatic assessment referred to in paragraph 3.6.7.
- 10.1.2.9. Care should be taken that control lines do not cause erosion. It should not be necessary to have lines cleared to mineral earth adjacent to the wetland areas. Short brush cut lines are adequate

if personnel ensure that fire does not creep across the lines.

10.1.3. The small panhandle marked as 270 near sewer pumpstation 4.

10.1.3.1. Due to the small area occupied by the panhandle section of plot 270 it would be best to burn it at the same time as the main area of plot 270.

- 10.2. In general, it is recommended that the sections are burnt with an interval of 11 years to conform with the regime proposed by Helme for the fire management units adjacent Erf 3122. The burns must be conducted in a window of between 10 – 15 years. This range gives ample room to ensure safe burning should very dry and hot years prevent the development from obtaining a burn permit in year 11.
- 10.3. Burning before the vegetation reaches 10 years of age may result in diversity loss. Exceeding the 15-year upper limit will result in excessive fuel build-up which increases fire risk.
- 10.4. The MBM should be approached to discuss the possibility of sharing the cost of burning by burning at the same time they implement the burns as prescribed by Helme in their management plan.
- 10.5. Burning permits should be obtained for all prescribed burns.
- 10.6. Only qualified and adequately equipped persons may conduct burns.
- 10.7. Well in advance any burn to be conducted the surrounding residents and especially the management of the frail care facility should be notified of the burn to enable mitigation measures against the resulting smoke.
- 10.8. It is recommended that the owners of Erf 3122 join the Southern Cape fire Protection Association (SCFPA). This gives them access to expert advice, reduced burning and suppression costs, and importantly removes the assumption of negligence in terms of the National Veld and Forest Fire Act (Act 101 of 1998).
- 10.9. The firebreaks/buffers around the property and between natural vegetation and residential plots as indicated in the fire constraints report may be mowed instead of being burned in line with McDonald's recommendation in paragraph 3.6.4.
- 10.10. The owners of the development must appoint a responsible person that must inform neighbours, the local Fire Protection Officer and the SCFPA of any fire that is detected on the property.
- 10.11. It is recommended that caretakers of the property be trained and equipped to perform

initial fire suppression. The SCFPA can assist with this.

10.12. It is recommended that the property have at least one mobile firefighting unit (bakkie sakkie) this is a +- 500l water tank with a pump and hose that can easily be loaded onto a bakkie or tractor-trailer.

10.13. It is also good practice on an estate to have hoses that can be connected to fire hydrants for localised fire suppression and refilling of firefighting units.

10.14. Residents and employees of the development should be provided with a guide explaining:

10.14.1. The need for ecological burning.

10.14.2. Where to report a wildfire.

10.14.3. Evacuation procedures.

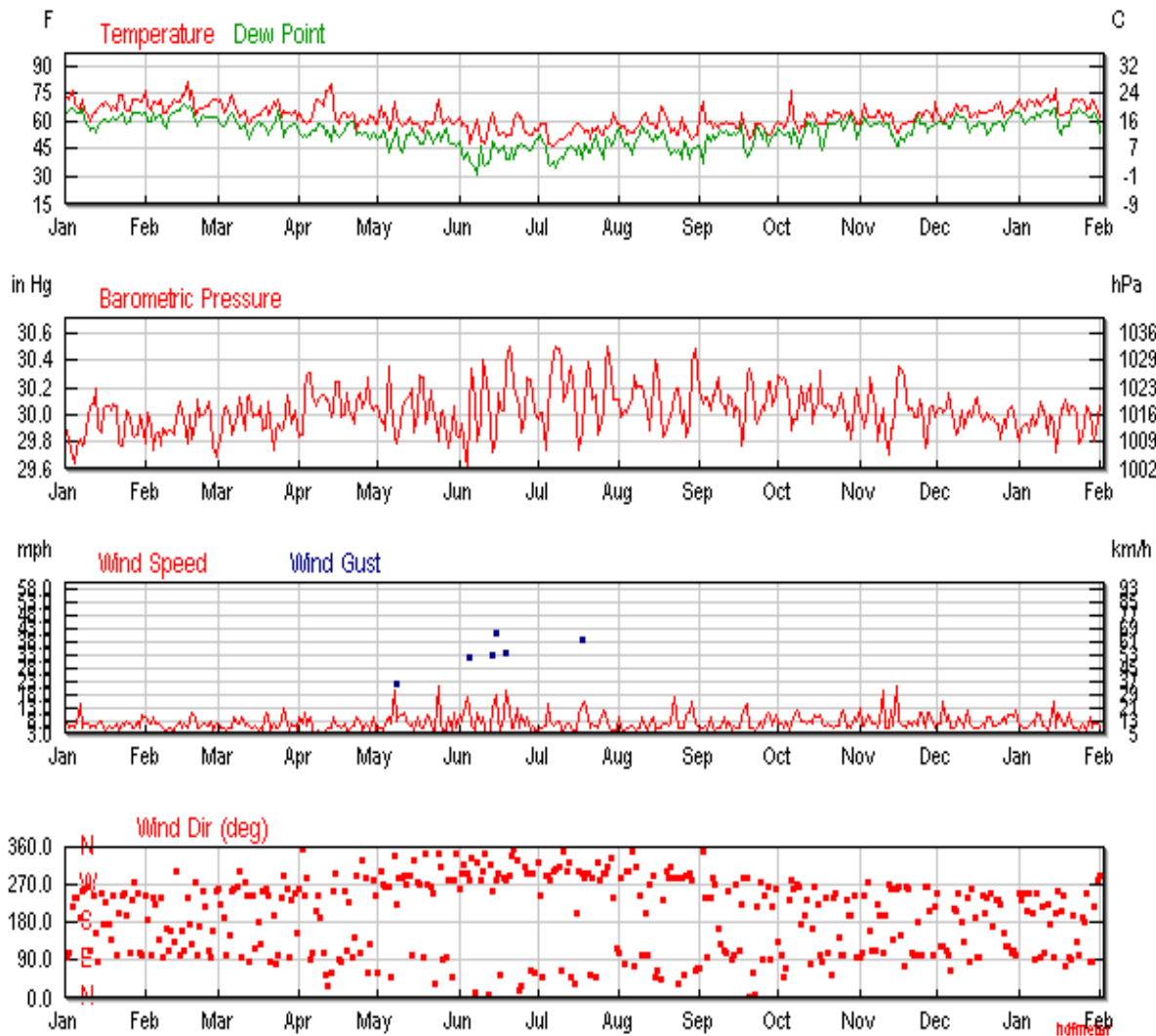
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Annexure 1: Weather in the region

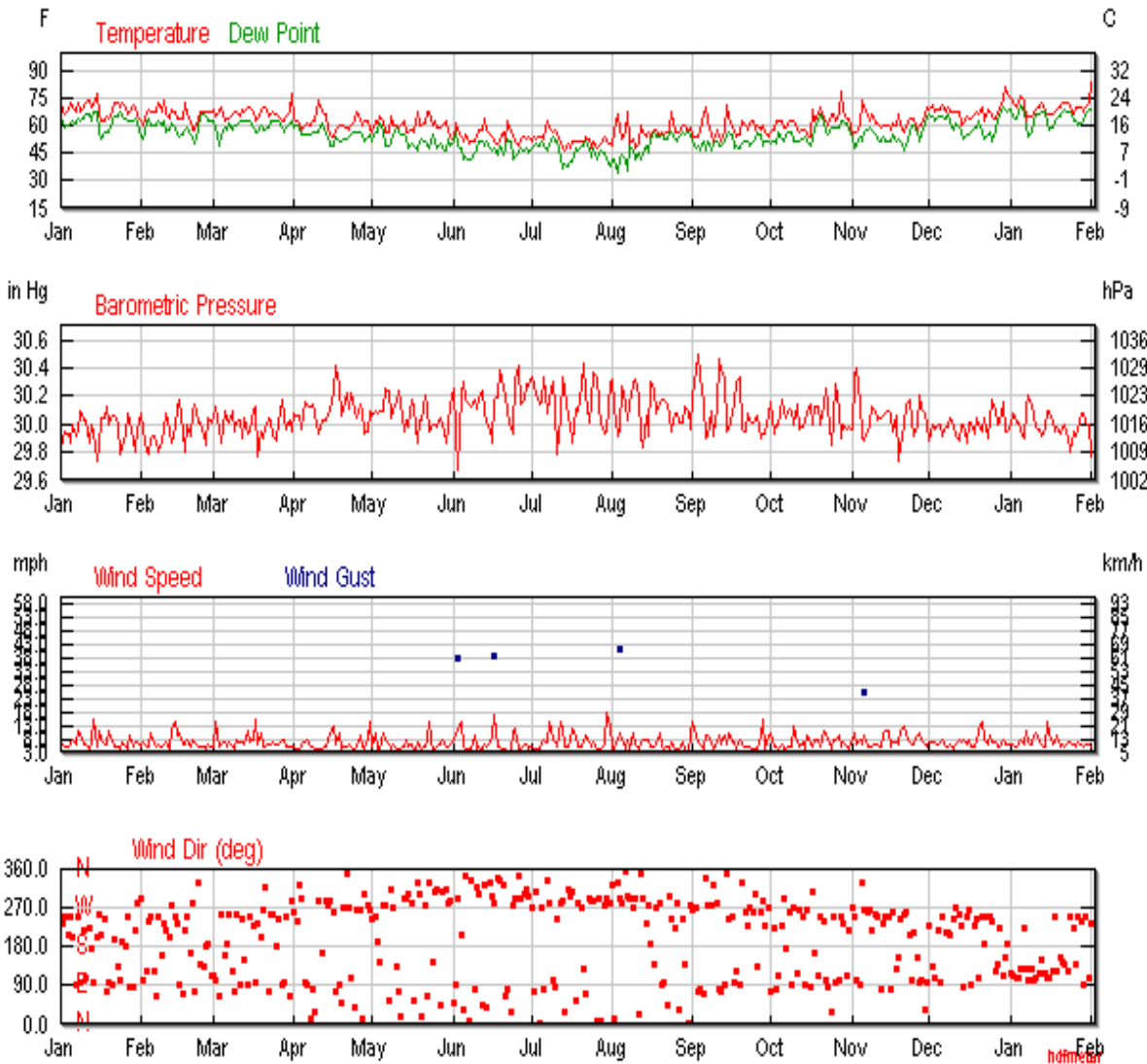
Weather History George Airport Jan 2014-2015

	Max	Avg	Min
Max Temperature	37 °C	22 °C	12 °C
Mean Temperature	27 °C	17 °C	8 °C
Min Temperature	21 °C	12 °C	2 °C
Wind	138 km/h	11 km/h	0 km/h
Gust Wind	87 km/h	54 km/h	26 km/h



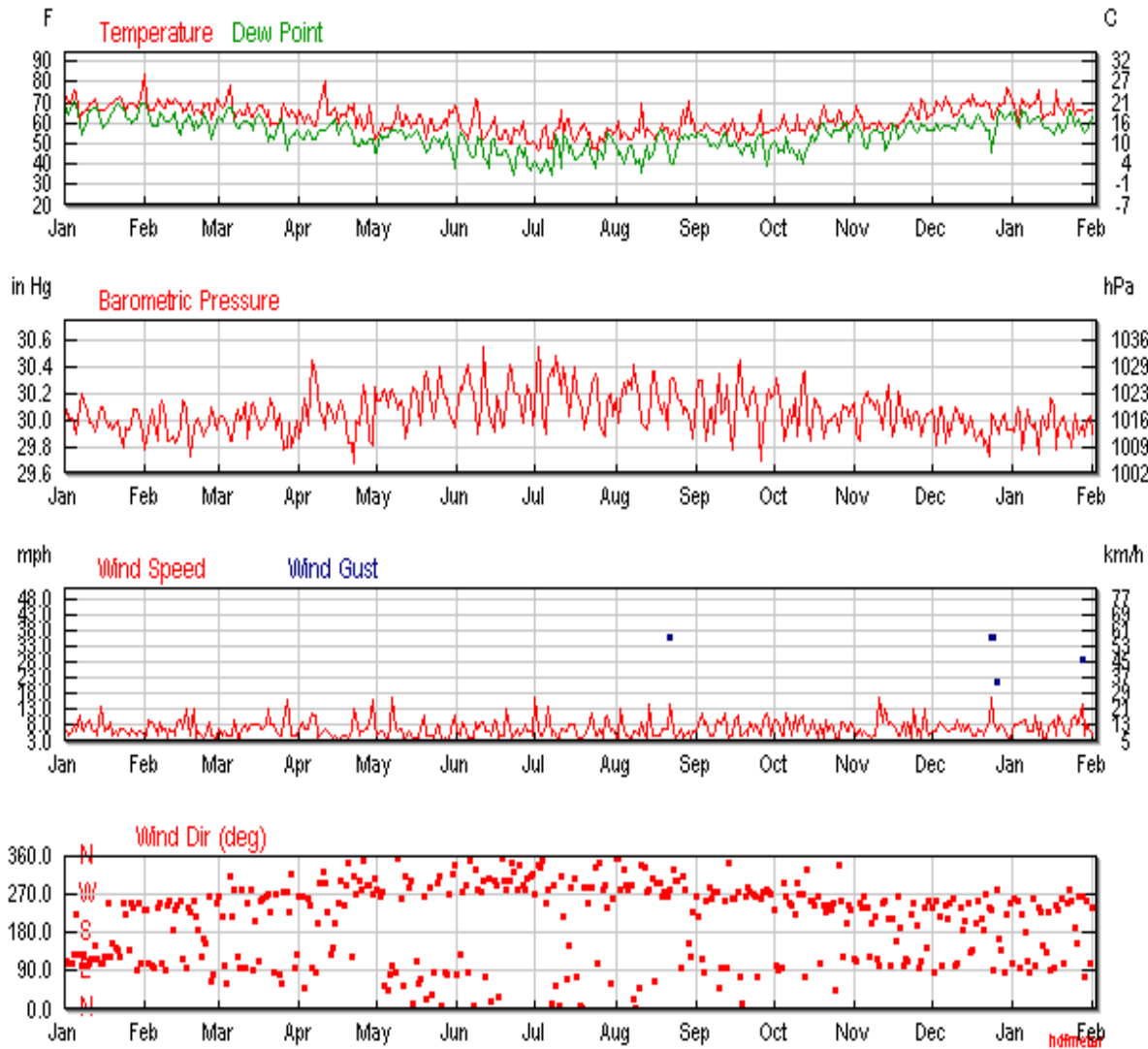
Weather History George Airport Jan 2015-2016

	Max	Avg	Min
Max Temperature	37 °C	21 °C	12 °C
Mean Temperature	29 °C	17 °C	8 °C
Min Temperature	22 °C	12 °C	3 °C
Wind	55 km/h	11 km/h	0 km/h
Gust Wind	80 km/h	53 km/h	29 km/h



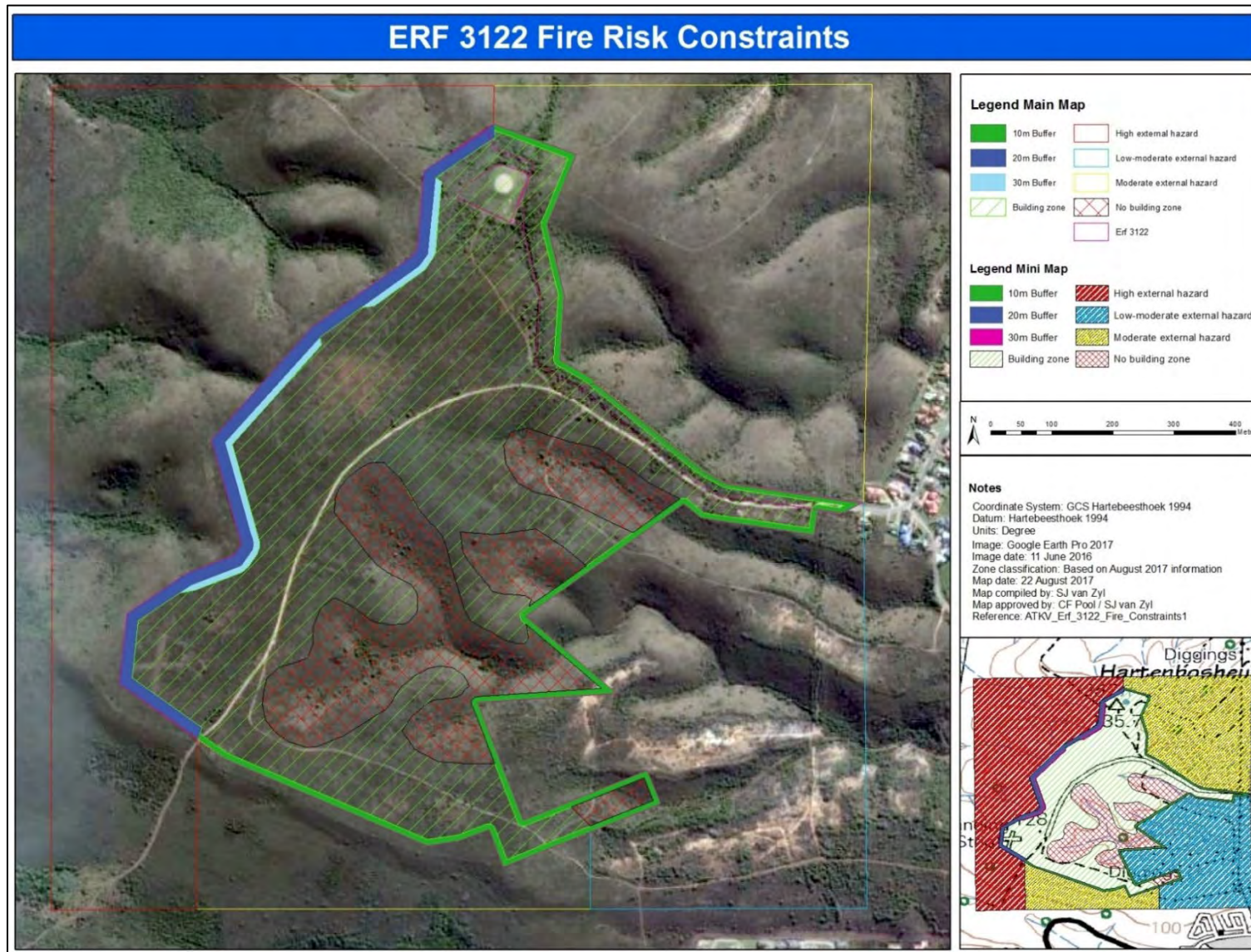
Weather History George Airport Jan 2016-2017

	Max	Avg	Min
Max Temperature	37 °C	22 °C	12 °C
Mean Temperature	29 °C	17 °C	8 °C
Min Temperature	22 °C	12 °C	2 °C
Wind	175 km/h	11 km/h	0 km/h
Gust Wind	80 km/h	53 km/h	35 km/h

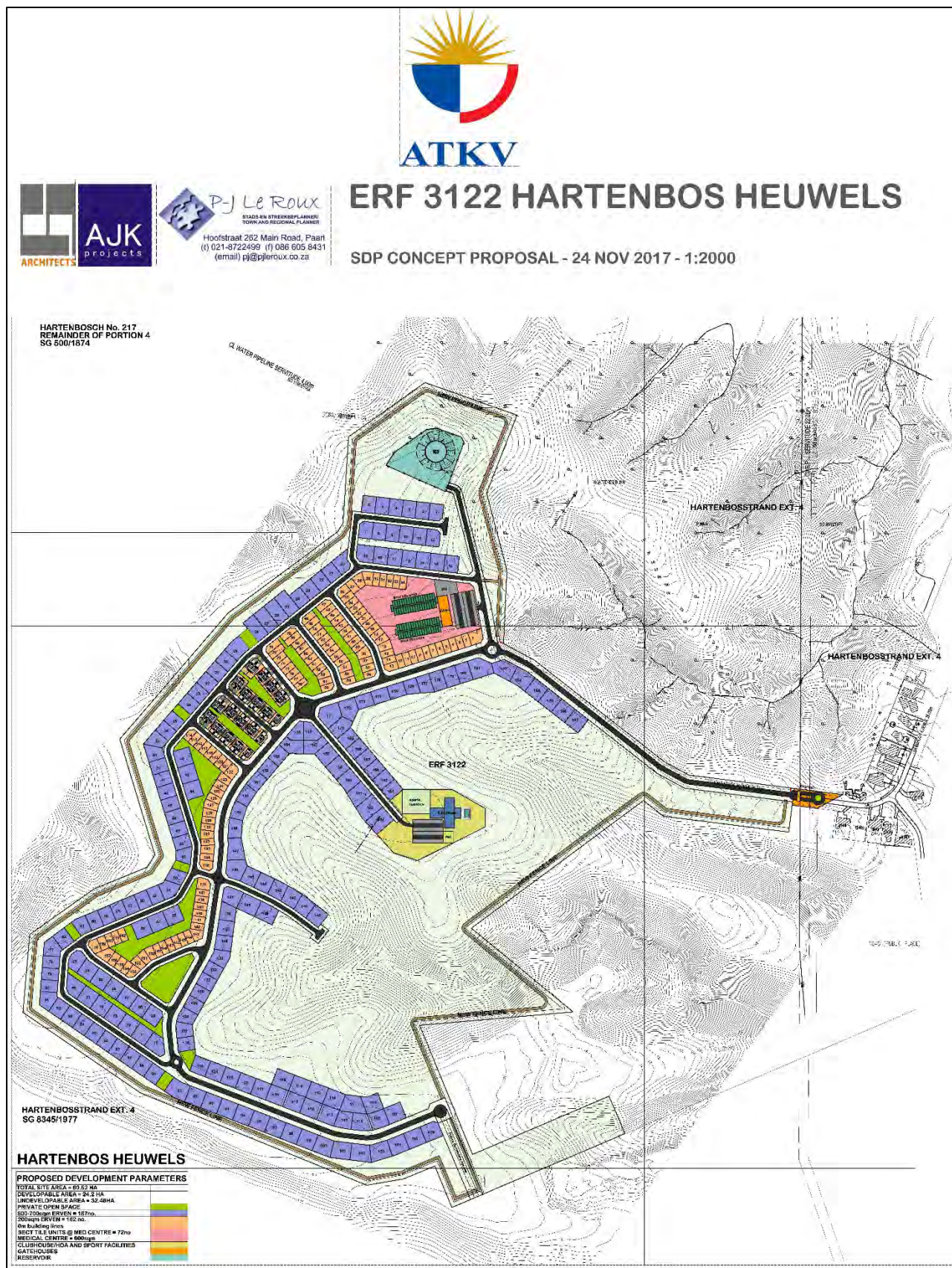


(Accessed 19/08/2017 @ <https://www.wunderground.com/history/>)

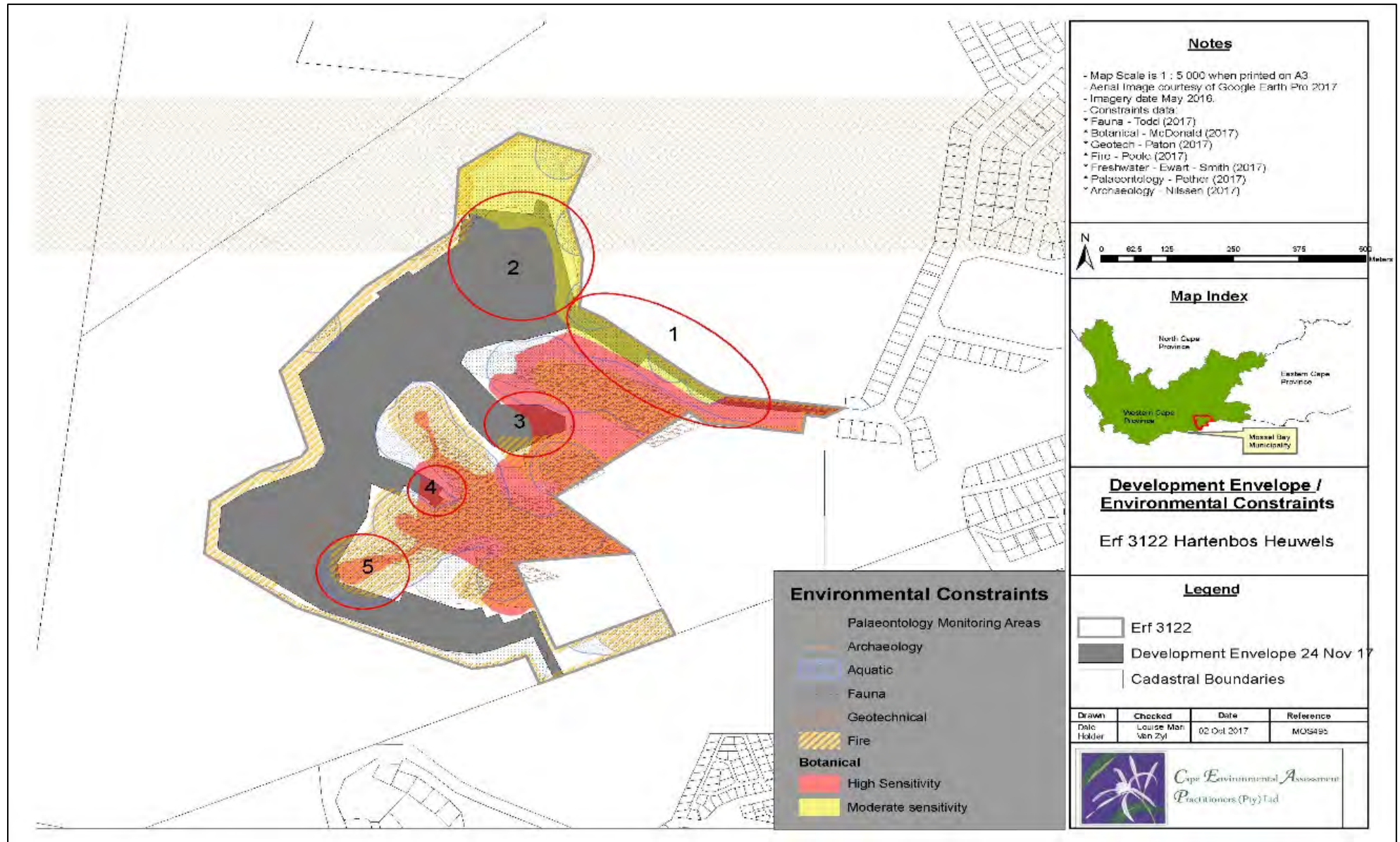
Annexure 2: Fire constraints map





Annexure 3: Development proposal and fire scoping comments



Annexure 3: Development proposal (2017) and fire scoping comments



Annexure 3: Development proposal (2017) and fire scoping comments

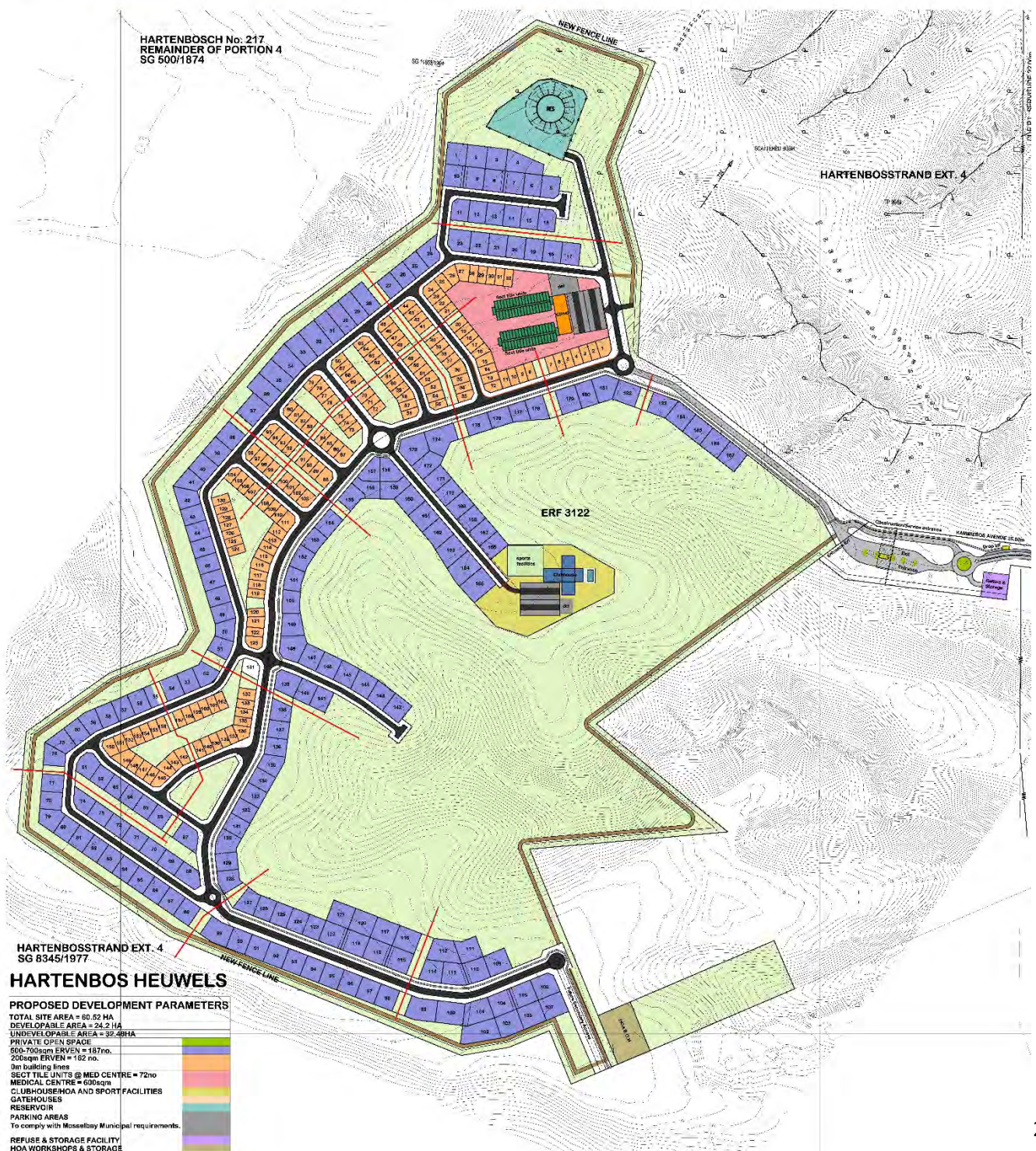
AREA	SPECIALIST	COMMENT
1	Fire	Changes acceptable.
2	Fire	<p>Changes acceptable. Not technically in zone 2 but... erfs 24, and 29 -32 can be safely enlarged to similar proportions as erfs 25 – 28.</p> 
3	Fire	Changes acceptable.
4	Fire	<p>Changes acceptable with the following additional mitigation measures: Erf 139 should be reduced to half its size as it is situated on a high risk area at the mouth of the drainage.</p>  <p>Structures on erfs 140 -143 should be placed on the side of the erf that is the furthest from the drainage to create defensible space should a fire burn into the drainage (This should be the general practice for all erfs bordering flammable material).</p>
5	Fire	Changes acceptable.

Annexure 5: Revised development proposal dated 27 February 2018



ERF 3122 HARTENBOS HEUWELS

SDP 23 CONCEPT PROPOSAL 23(3)- 27 FEB 2018 - 1:2000



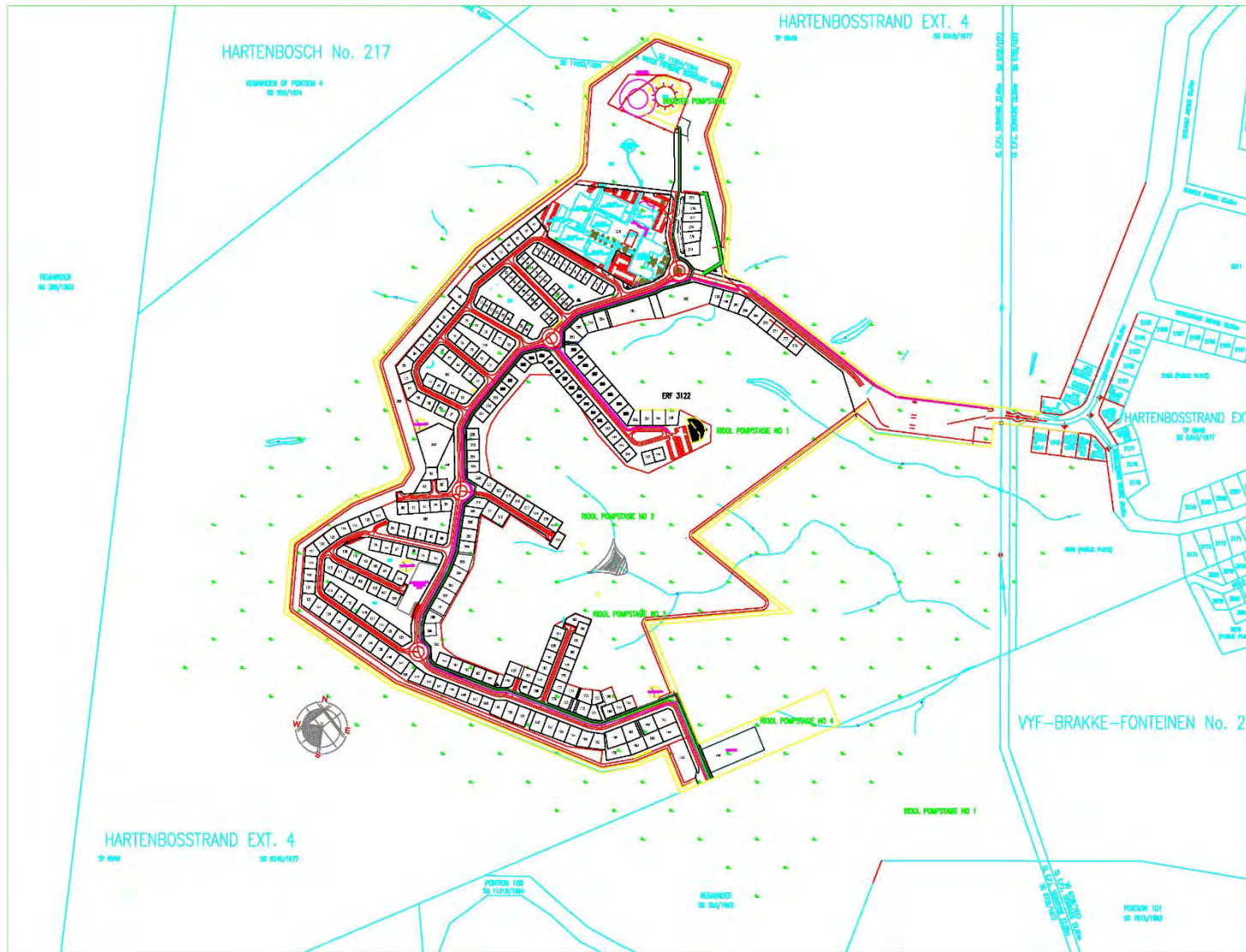
Annexure 6: Revised development proposal dated 03 March 2020



WP BOSCH & ASSOCIATES
ARCHITECTS

0193 /102 - SITE DEVELOPMENT PLAN CONCEPT
 Proposed New Lifestyle Village
 Hartenbosstrand Ext. 4
 Erf 3122
 2020-03-03

Annexure 7: Revised development proposal dated November 2020



Annexure 8: Revised development proposal dated 20 December 2020



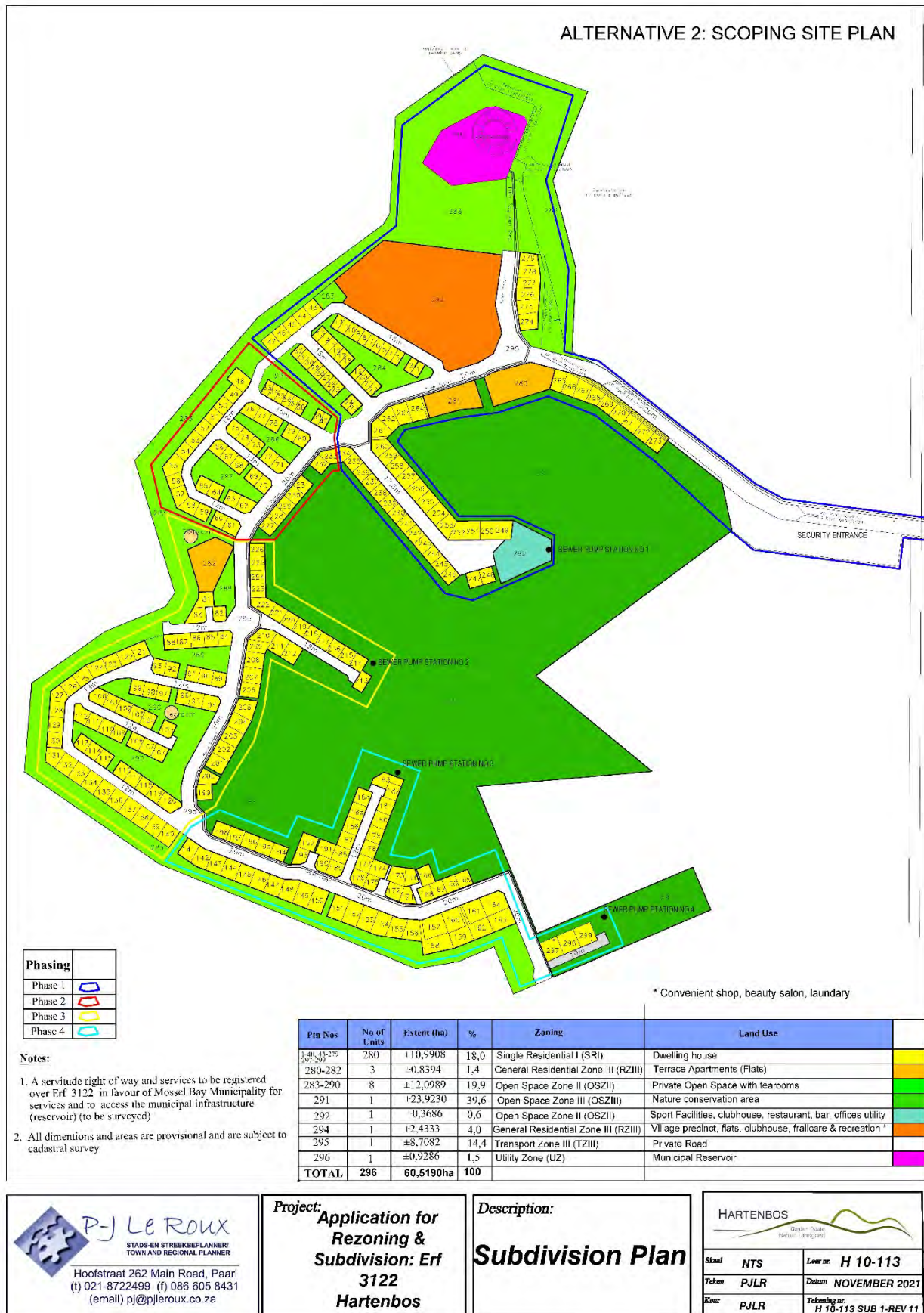
0193 /102 - SITE
DEVELOPMENT PLAN
CONCEPT - REV 6
Proposed New Lifestyle Village
Hartenbosstrand Ext. 4
Erf 3122
2020-12-20

HARTENBOS
Garden Estate
Natuur-Landgoed

Negester

WP BOSCH & ASSOCIATES
ARCHITECTS

Annexure 9: Revised development proposal dated November 2021



P-J Le Roux
STADS-EN STREEKBEPLANNERS
TOWN AND REGIONAL PLANNER

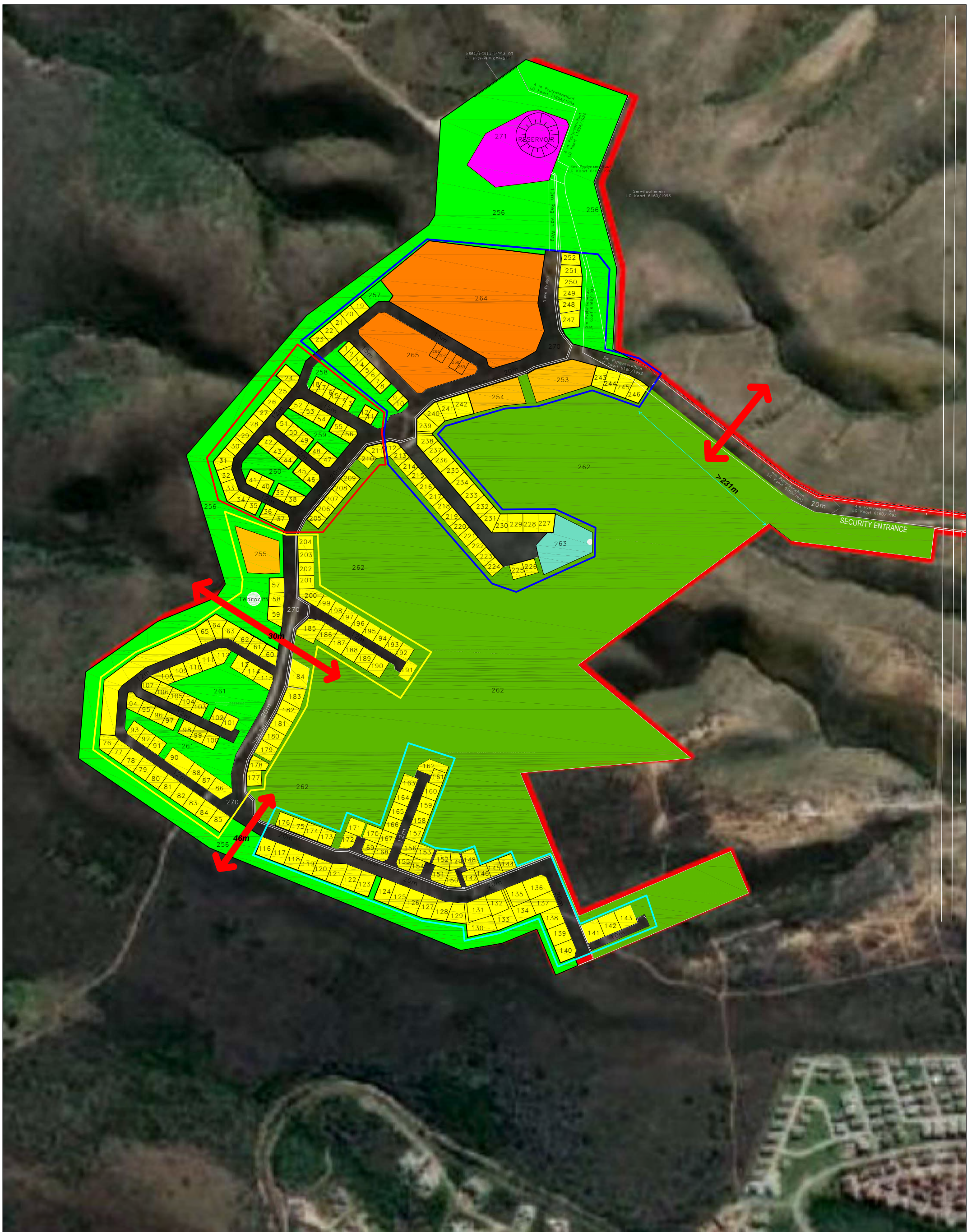
Hoofstraat 262 Main Road, Paarl
(t) 021-8722499 (f) 086 605 8431
(email) pj@pjleroux.co.za

Project:
Application for Rezoning & Subdivision: Erf 3122 Hartenbos

Description:
Subdivision Plan

HARTENBOS
Garden Estate
Natuur-Landgoed

Staal	NTS	Loos nr.	H 10-113
Teken	PJLR	Datum	NOVEMBER 2021
Kleur	PJLR	Tekening nr.	H 10-113 SUB 1-REV 11





P-J le Roux
Stads-en Streekbeplanners/
Town and Regional Planners

Hoofstraat 262 Main Road Paarl
(Ph) 021-8722499 (Cell) 076 031 7607
(email) pj@pjleroux.co.za

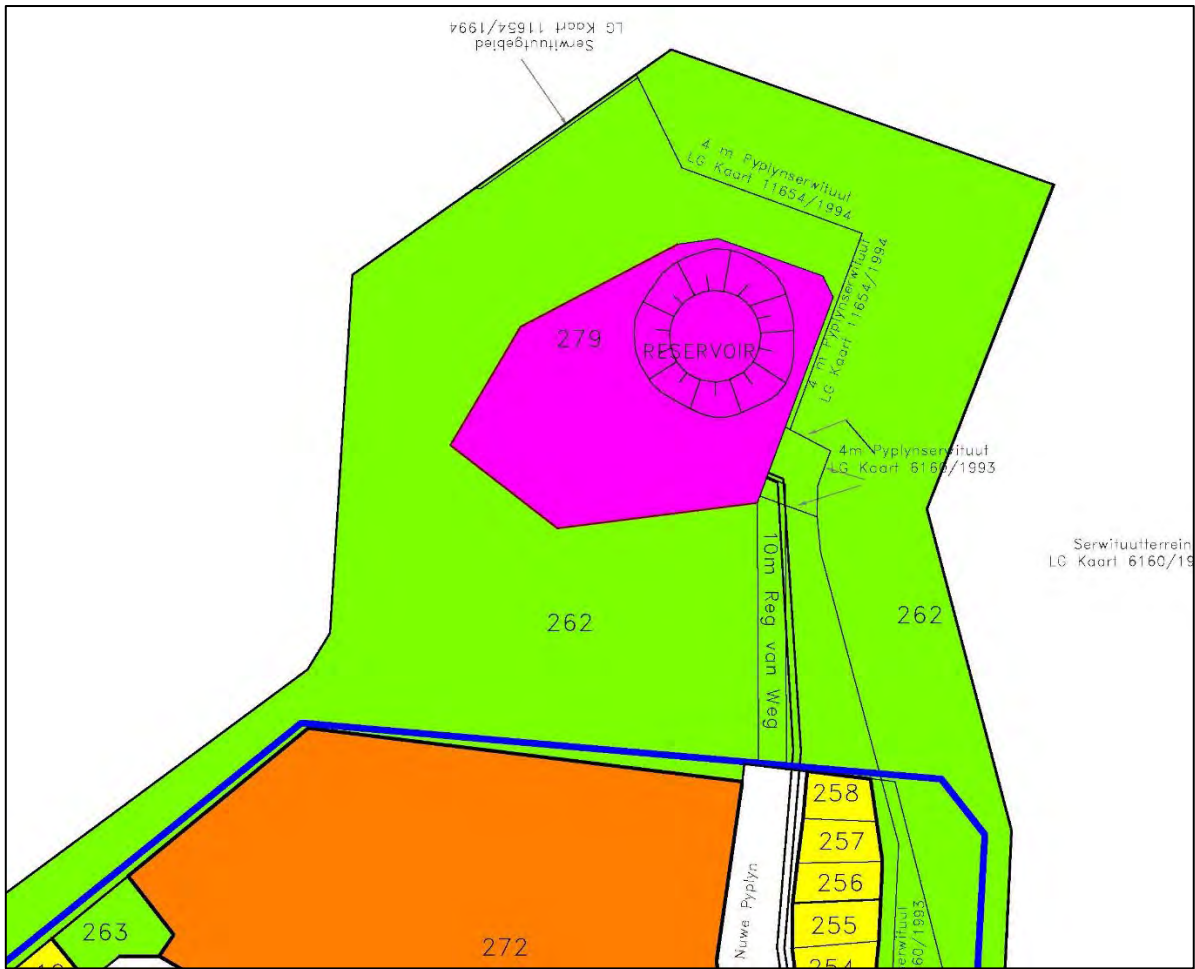
Project: Application for
**Rezoning &
Subdivision: Erf
3122
Hartenbos**

Description:
Subdivision Plan

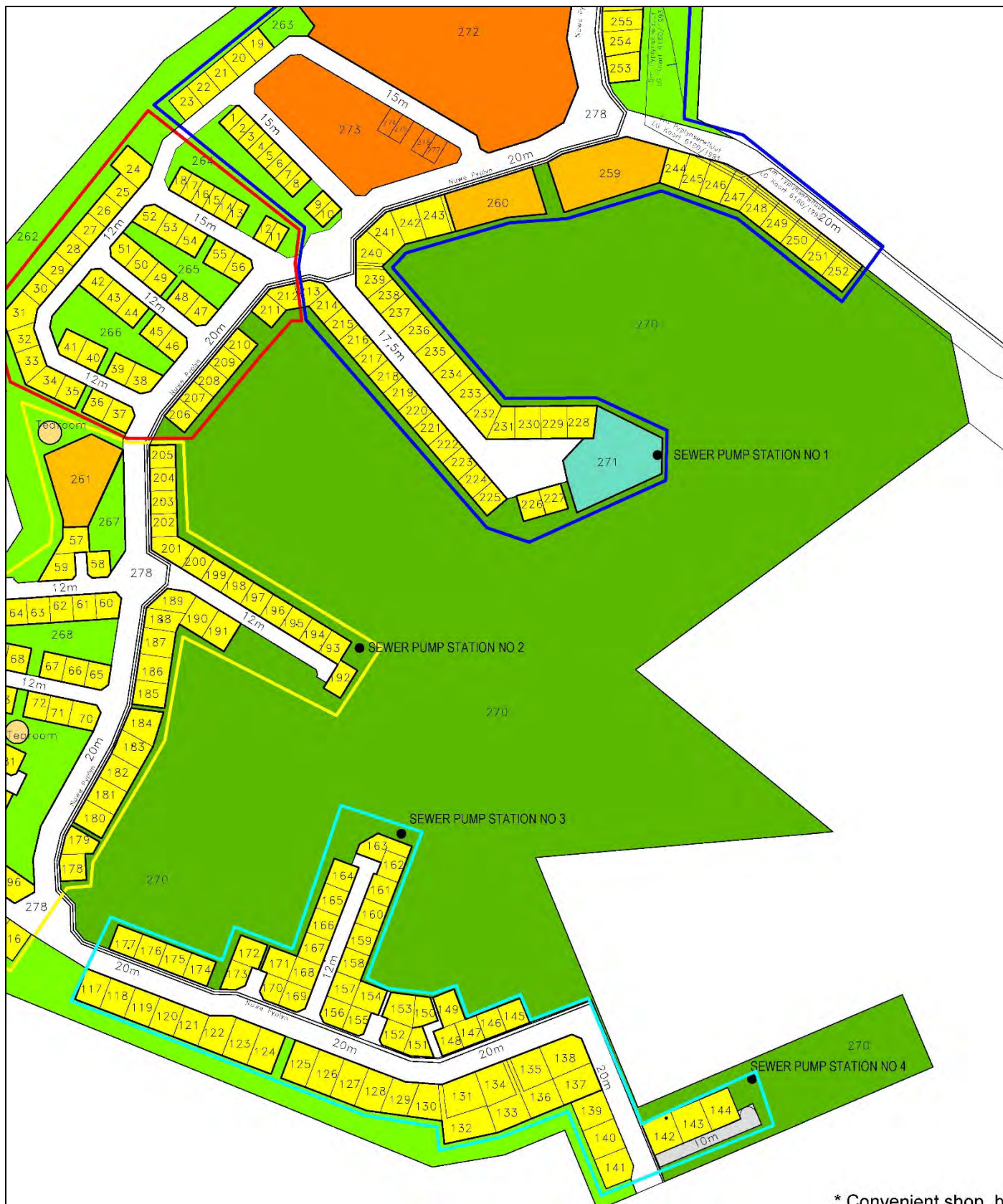


Skaal	NTS	Leer nr.	H 10-113
Teken	PJLR	Datum	MARCH 2023
Keur	PJLR	Tekening nr.	H 10-113 SUB 1-REV 13

Annexure 11: Butterfly reserve fire management unit (Plot 262)



Annexure 12: Plot 270 fire management unit



Annexure 13: Possible subdivision of plot 270 fire management unit

