

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF RIVERSIDE VIEW
EXTENSION 84 ON PORTION 124 AND PORTION 185 OF THE
FARM DIEPSLOOT 388 JR

Final Submission

Proponent:



Project Reference:

21637 – Riverside View Ext 84

Report Date:

October 2020




Report Reference:

21637-EIR-2

DOCUMENT CONTROL

Project Name	Proposed development of Riverside View Extension 84
Report Title	Environmental Impact Assessment Report
Authority Reference Number	GAUT 002/17-18/E2040
Report Status	Final

Applicant Name	Steyn City Properties (Pty) Ltd
-----------------------	--

	Name	Signature	Date
Document Compilation	Ms. V Stippel (MSc. Animal, Plant and Environmental Science). Reg. EAP Pr.Sci.Nat.		2020/08
Document Review	Mr. D. Botha (M.A. Env.Man.) (PHED) Wetland Specialist Reg. EAP Pr.Sci.Nat.		2020/09
Document Signoff	Mr. D. Botha (M.A. Env.Man.) (PHED) Wetland Specialist Reg. EAP Pr.Sci.Nat.		2020/09

DOCUMENT PROGRESS

Distribution List

Date	Report Reference Number	Document Distribution	Number of Copies
24/08/2020	21637-EIR-0	Internal	Internal Review
11/09/2020	21637-EIR-1	GDARD	Online System
11/09/2020	21637-EIR-1	Department of Human Settlements, Water And Sanitation	Pdf
11/09/2020	21637-EIR-1	City of Johannesburg	Pdf
11/09/2020	21637-EIR-1	I&APs	Pdf
19/10/2020	21637-EIR-02	Internal	Internal Review
20/10/2020	21637-EIR-2	GDARD	Online System

Amendments on Document

Date	Report Reference Number		Description of Amendment
08/09/2020	21637-EIR-0	21637-EIR-1	Minor amendments; Finalise report
19/10/2020	21637-EIR-1	21637-EIR-02	Minor Amendments based on Public Review
20/10/2020	21637-EIR-02	21637-EIR-2	Minor amendments; Finalise report

INDEMNITY AND CONDITIONS RELATING TO THIS REPORT

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and Prism Environmental Management Services and its staff reserve the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

Although Prism Environmental Management Services exercises due care and diligence in rendering services and preparing documents, Prism Environmental Management Services accepts no liability, and the client, by receiving this document, indemnifies Prism Environmental Management Services and its directors, managers, agents and employees against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by Prism Environmental Management Services and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

COPYRIGHT

Copyright on all documents, drawings and records, whether manually or electronically produced, which form part of the submission and any subsequent report or project document, shall vest in Prism Environmental Management Services.

The client, on acceptance of any submission by Prism Environmental Management Services and on condition that the client pays to Prism Environmental Management Services the full price for the work as agreed, shall be entitled to use for its own benefit:

- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Should the Proponent wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from Prism Environmental Management Services to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	PROCESS TO DATE	3
1.2	EIA REPORT REQUIREMENTS AND OUTLINE.....	5
1.3	PUBLIC PARTICIPATION AS PART OF THE EIA PHASE.....	14
1.4	AUTHORITIES.....	15
1.5	APPLICANT.....	15
2	ENVIRONMENTAL ASSESSMENT PRACTITIONER	1
3	LEGISLATIVE FRAMEWORK	3
3.1	CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA.....	3
3.2	NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA), 1998 (ACT NO. 107 OF 1998)	4
3.3	NATIONAL WATER ACT (NWA) (ACT NO. 36 OF 1998)	8
3.4	NATIONAL HERITAGE RESOURCE ACT (NHRA), 1999 (ACT NO. 25 OF 1999)	9
3.5	NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (NEM:BA), 2004 (ACT NO. 10 OF 2004)	10
3.6	NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT (NEMPA) (ACT 57 OF 2003)	11
3.7	NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE MANAGEMENT ACT (NEM:WA), 2008 (ACT NO. 59 OF 2008).....	11
3.8	NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NEM:AQA), 2004 (ACT NO. 39 OF 2004)	11
3.9	OTHER LEGISLATION AND GUIDELINES	12
4	PROJECT DESCRIPTION.....	14
4.1	ENVIRONMENTAL AUTHORISATION	14
4.2	LISTED ACTIVITIES.....	14
4.3	PROJECT LOCATION.....	20
4.4	DESCRIPTION OF PROJECT ACTIVITIES	22
4.5	PROJECT LIFECYCLE	36
5	DESCRIPTION OF THE RECEIVING ENVIRONMENT	38
5.1	LOCAL CLIMATE	38
5.2	TOPOGRAPHY	40
5.3	GEOLOGY AND SOILS.....	41
5.4	LAND USE	42
5.5	AGRICULTURAL POTENTIAL.....	43
5.6	EXISTING AND AVAILABLE SERVICES.....	43
5.7	EXISTING AND AVAILABLE SERVICES.....	43
5.8	ROADS	46
5.9	SOCIO-ECONOMIC ENVIRONMENT	46

5.10	BIODIVERSITY	51
5.11	SURFACE WATER.....	55
5.12	ARCHAEOLOGY AND CULTURAL HERITAGE	56
6	NEED AND DESIRABILITY	58
6.1	OVERVIEW	58
6.2	NEED AND DESIRABILITY TABLE	59
7	ALTERNATIVES	77
7.1	LAYOUT ALTERNATIVES.....	77
7.2	ATTENUATION ALTERNATIVES	79
7.3	NO-GO ALTERNATIVE	82
8	PUBLIC PARTICIPATION	83
8.1	OBJECTIVES AND PURPOSE OF PUBLIC PARTICIPATION	83
8.2	NOTIFICATION PHASE OF PUBLIC PARTICIPATION	83
8.3	SCOPING PHASE COMMENT PERIOD.....	84
8.4	EIA PHASE PUBLIC PARTICIPATION	86
8.5	UPDATED EIA REPORT AND GDARD DECISION.....	87
8.6	OUTCOME OF THE DECISION.....	87
8.7	TIMEFRAMES	87
9	SUMMARY OF SPECIALIST STUDIES	89
9.1	BIODIVERSITY BASELINE AND IMPACT ASSESSMENT	90
9.2	WETLAND ASSESSMENT.....	99
9.3	HERITAGE IMPACT ASSESSMENT	107
9.4	AQUATIC RESOURCES MONITORING PROGRAM AND AUDITING PLAN (MONITORING PLAN)	112
9.5	AQUATIC RESOURCES REHABILITATION PLAN (REHAB PLAN).....	116
9.6	OUTLINE SCHEME REPORT	121
9.7	PHASE 1 GEOTECHNICAL ASSESSMENT	130
9.8	TRAFFIC IMPACT ASSESSMENT	136
9.9	STORMWATER MANAGEMENT PLAN	140
9.10	ASSUMPTIONS AND LIMITATIONS IDENTIFIED BY SPECIALISTS.....	144
10	IMPACT ASSESSMENT	146
10.1	OVERALL IMPACT ASSESSMENT	146
10.2	QUALITATIVE DISCUSSION OF IMPACTS	149
10.3	QUANTITATIVE IMPACT ASSESSMENT	156
10.4	DESCRIPTION OF IMPACTS.....	177
10.5	MITIGATION.....	191

10.6	ASSESSMENT OF ALTERNATIVES.....	192
10.7	MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT/BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO).....	198
11	ENVIRONMENTAL IMPACT STATEMENT	201
11.1	SENSITIVE ENVIRONMENTAL FEATURES.....	202
11.2	SUMMARY OF IMPACTS	205
11.3	RECOMMENDATIONS FROM SPECIALIST REPORTS.....	208
11.4	IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES.....	210
11.5	ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.....	212
11.6	REASONED OPINION OF EAP	212
12	EAP UNDERTAKING	222
13	REFERENCES.....	223
14	APPENDICES.....	225
14.1	CURRICULUM VITAE OF EAP.....	226
14.2	ALTERNATIVES	227
14.3	DRAFT SITE PLAN AND DESIGNS	228
14.4	A3 MAPS AND DRAWINGS.....	229
14.5	PUBLIC PARTICIPATION.....	230
14.6	SPECIALIST AND TECHNICAL STUDIES	256
14.7	IMPACT ASSESSMENT	266
14.8	ENVIRONMENTAL MANAGEMENT PROGRAMME.....	267
14.9	WATER USE LICENCE APPLICATION WULA TECHNICAL REPORT.....	268

LIST OF FIGURES

FIGURE 3-1: SOUTH AFRICAN ENVIRONMENTAL LEGISLATION HIERARCHY.....	3
FIGURE 4-1: PROPOSED ENVIRONMENTAL AUTHORISATION PROCESS.....	19
FIGURE 4-2: LOCALITY MAP OF THE SITE.....	21
FIGURE 4-3: LAYOUT.....	23
FIGURE 4-4: PRELIMINARY SITE DEVELOPMENT PLAN.....	25
FIGURE 4-5: WATER LAYOUT PLAN.....	27
FIGURE 4-6: SEWER SERVICES.....	29
FIGURE 4-7: TYPICAL MANHOLE DETAILS.....	30
FIGURE 4-8: STORMWATER.....	31
FIGURE 4-9: STORMWATER MANAGEMENT SYSTEM SHOWING MULTIPLE RELEASES.....	32
FIGURE 4-10: ROAD LAYOUT PLAN.....	33
FIGURE 4-11: CULVERT BRIDGE.....	34
FIGURE 4-12: TYPICAL CROSS-SECTION DESIGN PRINCIPLES.....	35
FIGURE 5-1: MINIMUM, MAXIMUM AND AVERAGE TEMPERATURES FOR CHARTWELL, GAUTENG (WWW.WORLDWEATHERONLINE.CO.ZA).	38
FIGURE 5-2: AVERAGE RAINFALL AMOUNT (MM) AND RAINY DAYS (WORLD WEATHER ONLINE).....	39
FIGURE 5-3: AVERAGE AND MAXIMUM WIND SPEEDS AND GUSTS (WORLD WEATHER ONLINE).....	40
FIGURE 5-4: 5M CONTOURS.....	41
FIGURE 5-5: GEOLOGY.....	42
FIGURE 5-6: AGRICULTURAL POTENTIAL.....	43
FIGURE 5-7: DIEPSLOOT NORTH DRAINAGE ZONE.....	44
FIGURE 5-8: CATCHMENTS.....	45
FIGURE 5-9: FUTURE AND EXISTING ROADS.....	46
FIGURE 5-10: HIGHEST EDUCATION LEVEL (ALL AGES) (STATS SA, 2017).....	47
FIGURE 5-11: EMPLOYMENT FOR THOSE AGED 15-64 (STATS SA, 2017).....	48
FIGURE 5-12: COJ SDF 2040.....	50
FIGURE 5-13: DESKTOP SENSITIVITY MAP.....	51
FIGURE 5-14: SOME OF THE IMPACTS OBSERVED: A) ESKOM POWERLINES, B) DUMPING OF BUILDING RUBBLE, C) INVASIVE PLANT SPECIES, AND D) FENCING (THE BIODIVERSITY COMPANY, 2019).....	53
FIGURE 5-15: GPEMF.....	54
FIGURE 5-16: PROTECTED AREAS (SOUTH AFRICAN PROTECTED AREAS DATABASE, 2019 QUARTER 4).....	55
FIGURE 5-17: SURFACE WATER.....	56
FIGURE 5-18: PALAEOLOGICAL (FOSSIL) SENSITIVITY MAP (OBTAINED FROM SOUTH AFRICAN HERITAGE RESOURCES INFORMATION SYSTEM (SAHRIS) - HTTPS://SAHRIS.SAHRA.ORG.ZA/MAP/PALAEO).....	57
FIGURE 7-1: PROPOSAL.....	78
FIGURE 7-2: ALTERNATIVE LAYOUT.....	79

FIGURE 7-3: PROPOSAL – ATTENUATION POND ALONG WETLAND	80
FIGURE 7-4: UPDATED PROPOSAL – ATTENUATION ALONG THE WETLAND.....	81
FIGURE 7-5: ALTERNATIVE - ATTENUATION POND TO THE NORTH OF THE SITE.....	82
FIGURE 9-1: HABITAT TYPES IDENTIFIED DURING THE FIELDWORK (THE BIODIVERSITY COMPANY, 2019)	95
FIGURE 9-2: SENSITIVITY MAP.....	97
FIGURE 9-3: NATIONAL WETLAND MAP VERSION 5 (NWM5) (VAN DEVENTER ET AL., 2019).....	101
FIGURE 9-4: WETLAND DELINEATION AND 32M BUFFER	103
FIGURE 9-5: TRACK LOGS	110
FIGURE 9-6: WATER SUPPLY ZONES (BIGEN AFRICA SERVICES (PTY) LTD, 2019)	122
FIGURE 9-7: WATER SERVICES (BIGEN AFRICA SERVICES (PTY) LTD, 2019)	125
FIGURE 9-8: DIEPSLOOT NORTH DRAINAGE ZONE (BIGEN AFRICA SERVICES (PTY) LTD, 2019).....	126
FIGURE 9-9: SEWER SERVICES (BIGEN AFRICA SERVICES (PTY) LTD, 2019)	127
FIGURE 9-10: TEST PIT LOCATIONS AND GEOTECHNICAL ZONING.....	134
FIGURE 9-11: TEST PIT LOCATIONS AND GEOTECHNICAL ZONING (VAN ROOY, 2010)	135
FIGURE 9-12: CATCHMENT AREA AND STORMWATER LAYOUT PLAN	142
FIGURE 9-13: CULVERT BRIDGE	143
FIGURE 10-1: ARTIFICIAL SOURCE	180
FIGURE 10-2: STORMWATER MANAGEMENT SYSTEM SHOWING MULTIPLE RELEASES	181
FIGURE 10-3: DEGRADED GRASSLAND AREA TO BE CONSERVED	186
FIGURE 10-4: MITIGATION HIERARCHY	192
FIGURE 10-5: PROPOSED LAYOUT.....	199
FIGURE 10-6: UPDATED PROPOSAL – ATTENUATION ALONG THE WETLAND (MULTIPLE ATTENUATION PONDS WITH MULTIPLE RELEASES)	200
FIGURE 11-1: SENSITIVITY MAP.....	203
FIGURE 11-2: SENSITIVITY MAP OVERLAID WITH PRELIMINARY SITE PLAN AND STORMWATER AND SERVICES.....	204

LIST OF TABLES

TABLE 1-1: REQUIRED CONTENTS OF THE EIA REPORT.....	6
TABLE 1-2: ALIGNMENT WITH PLAN OF STUDY.....	11
TABLE 1-3: GDARD REQUIREMENTS FOR THE EIA REPORT	12
TABLE 1-4.: DETAILS OF THE APPLICANT.....	15
TABLE 2-1.: DETAILS OF THE EAP.	1
TABLE 4-1.: DESCRIPTION OF THE LISTED ACTIVITIES.....	15
TABLE 4-2.: CORNER POINT COORDINATES	20
TABLE 4-3.: SURVEYOR GENERAL DIAGRAM NUMBERS.....	20
TABLE 4-4: PROPOSED ZONING	23
TABLE 4-5: WATER DESIGN STANDARDS	28
TABLE 4-6: SEWER DESIGN STANDARDS	29
TABLE 4-7: SUMMARY OF ATTENUATION PONDS AND COMPARISON TO PRE DEVELOPMENT RUN OFF.....	31
TABLE 4-8: OPERATIONAL HOURS FOR CONSTRUCTION PHASES.	35
TABLE 4-9: OPERATIONAL HOURS FOR OPERATIONAL PHASES.	36
TABLE 6-1: NEED AND DESIRABILITY	59
TABLE 8-1: PROPOSED TIMEFRAMES FOR THE EIA PROCESS.	87
TABLE 9-1: RECOMMENDED MONITORING REQUIREMENTS FOR THE DEVELOPMENT.	113
TABLE 9-2: WATER DESIGN STANDARDS (BIGEN AFRICA SERVICES (PTY) LTD, 2019)	123
TABLE 9-3: SEWER DESIGN STANDARDS (BIGEN AFRICA SERVICES (PTY) LTD, 2019).....	126
TABLE 9-4: SEWER DESIGN DEMANDS (BIGEN AFRICA SERVICES (PTY) LTD, 2019).....	128
TABLE 9-5: ROAD DESIGN CRITERIA (BIGEN AFRICA SERVICES (PTY) LTD, 2019)	129
TABLE 9-6: SUMMARY OF ATTENUATION PONDS AND COMPARISON TO PRE DEVELOPMENT RUN OFF.....	142
TABLE 10-1: NATURE AND TYPE OF IMPACT.....	146
TABLE 10-2: CONSEQUENCE OF THE IMPACT OCCURRING.....	147
TABLE 10-3: PROBABILITY AND CONFIDENCE OF IMPACT PREDICTION.....	147
TABLE 10-4: SIGNIFICANCE RATING OF THE IMPACT.	148
TABLE 10-5: LEVEL OF CONFIDENCE OF THE IMPACT PREDICTION	148
TABLE 10-6: MITIGATION EFFICIENCY.....	149
TABLE 10-7: DEGREE OF REVERSIBILITY AND LOSS OF RESOURCES.....	149
TABLE 10-8: POTENTIAL IMPACTS ASSOCIATED WITH LISTED ACTIVITIES.....	150
TABLE 10-9: PROJECT ACTIVITIES.....	154
TABLE 10-10: ENVIRONMENTAL ASPECTS.....	155
TABLE 10-11: SUMMARY OF IMPACT ASSESSMENT FOR THE CONSTRUCTION PHASES.....	158
TABLE 10-12: SUMMARY OF IMPACT ASSESSMENT FOR THE OPERATION PHASE.....	168
TABLE 10-13: COMPARATIVE ANALYSIS BETWEEN LAYOUT ALTERNATIVES (BLACK SHADED BLOCKS SHOW PREFERENCE, IF ANY).....	193

TABLE 10-14: COMPARATIVE ANALYSIS BETWEEN STORMWATER LAYOUT ALTERNATIVES (BLACK SHADED BLOCKS SHOW PREFERENCE, IF ANY) 194

TABLE 10-15: COMPARATIVE ANALYSIS BETWEEN ALTERNATIVES TAKING INTO ACCOUNT SPECIALIST REQUIREMENTS (BLACK SHADED BLOCKS SHOW PREFERENCE, IF ANY) 196

TABLE 11-1: SUMMARY OF IMPACTS 205

TABLE 11-2: SPECIALIST RECOMMENDATIONS 208

1 INTRODUCTION

Steyn City Properties (Pty) Ltd. plans to develop Riverside View Ext 84 on portions 124 and 185 of the farm Diepsloot 388 JR. The proposed zoning of the development will be *Special for: Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops* and aims to provide a school, offices and residential buildings. Private Open space will also be incorporated into the development which form parts of the Steyn City Parkland Residence which has been designed to be a modern, mixed land use and mixed income development.

Steyn City supplies residential units at various densities and at various residential typologies, sport and recreational facilities including a golf course, equestrian uses, educational facilities, community facilities, supportive retail and office development as well as large tracts of active and passive recreation open space. The entire Steyn City Lifestyle Estate contains a number of higher density villages together with low density uses and open space elements such as the Jukskei River and other environmental sensitive areas. Riverside View Extension 84 will be developed in line with this concept. Riverside View Extension 84 will; be incorporated into the Steyn City Development.

It should be noted that due to the extensive size of the Steyn City Development, a number of schools are required to cater for the residents (in general one works on a ratio of 1 school per 1000 residential erven /households). Steyn City currently has an approved and operational school which is located on Erf 1676 Riverside View Ext 46 (11.59ha) is situated close to the southern boundary of Steyn City Estate. This school which opened in 2018, is accessible from inside Steyn City Estate as well as from outside the main access gate to this estate (Cedar Road). This means that the school is accessible to residents of Steyn City as well as people who live outside the estate.

However, in addition to this School, another site is required. In order to deal with this, Riverside View Extension 84 has been identified as an ideal site to provide the necessary school as well as a number of different uses.

The principle intent of the proposed development is to allow for the development of an additional Steyn City School. The development will also provide Residential, Storage and Offices with ancillary Shops and Restaurants uses. In regard to the latter, the aim is to provide these uses in in the event that the market does not allow for the use of the (entire) site for purposes of an all-phase school (e.g. only one phase is developed), provision is also made for the development of the site (or a section therefore) for purposes of residential use, storage and offices, which include shops and restaurants.

A number of services will be required in support of the development and include:

- Water:

- There is an existing 160mm water pipe just south of the development within the existing Steyn City Boundary.
- A short connection pipe to this pipe will be made (160 mm diameter Class 16 MVPC Pipe).
- Sewer
 - As part of the development of Riverglen Erf 23 a 200mm diameter sewer line was constructed within the road reserve of View Road. Provision has been made for a future connection from Riverside View Ext 84 onto this sewer pipeline. This connection point is just outside the 32m buffer area of the wetland.
 - A new sewer manhole will be required.
- Stormwater
 - Due to the layout and topography of the site, and the constraints caused by the wetland area, as well as an Eskom Servitude running through the northern portion of the site, the stormwater management plan proposes that the site be split into six(6) separate catchments and create six (6) separate attenuation ponds to manage the flow from each section.
 - All run-off from the site will be routed to the attenuation ponds of each respective catchment. Each catchment area drains into an attenuation pond whereby the run-off from the area is throttled to release into the wetland and buffer zone at the 1:5 year pre-developed flow. Energy dissipating structures will be constructed at each outlet to limit any erosion and encourage sheet flow into the wetland area.
 - In general, stormwater attenuation will make use of the following:
 - Grass lined attenuation ponds;
 - Use of the soccer field to attenuate stormwater and allow for ground water recharge;
 - Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
 - Throttled outlet structures; and
 - Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.
- Access
 - Three access points will be provided for.
 - Access off View Road
 - The access is situated on the western boundary of the property, approximately 150m south of the intersection of Porcupine Park Avenue and View Road directly opposite the Eskom substation site access.
 - Second access off View Road
 - The access is situated on the western boundary of the property, approximately 300m south of the intersection of Porcupine Park Avenue and View Road directly opposite the existing Eskom substation site access.
 - Southern access

- This access will be an internal link road from the existing Steyn City. This is considered the main access to the township as a large number of trip generated by the proposed development are expected to originate from within Steyn City and will make use of this access.
- Roads and Wetland Crossing
 - No road upgrades are required.
 - An internal road will allow access through the site and to Erf 2. A Wetland Crossing is required for the latter.
 - This crossing will involve the development of a road-bridge which will allow for the 1:100-year flow of 8.7 m³/s to pass under the road. The bridge is to be constructed of pre-cast portal culverts and will extend the full width of the flood line. To cater for animal crossings, smaller culverts will be placed above the flood line to allow for migration

Steyn City Properties (Pty) Ltd has appointed **Prism Environmental Management Services** (Prism EMS) as the independent Environmental Assessment Practitioner (EAP) to undertake the required environmental authorisation processes required by a host of environmental legislation. Such process referred to as an **Environmental Authorisation process** and the details of which are discussed and described in the contents of this report.

1.1 Process to Date

1.1.1 Public Participation | Initial Registration

In order to provide an opportunity to all potential Interested and Affected Parties (I&APs), and I&AP database was compiled and included adjacent landowners, businesses, and authorities. A Background Information Document (BID) as well as Advert and Site Notice were also developed and included information on the proposed development.

I&APs were provided with a copy of the BID via email and were provided with 30 days to register as an I&AP (from 19 October 2018 to 19 November 2018). An advert was also placed in the Star Newspaper on 19 October 2018. In addition, site notices were placed at two locations around the site. All comments received were added to the Comments and Response Report.

1.1.2 Application

An application for the Environmental Authorisation was lodged with the competent authority on the 7 February 2020, under the following reference number:

- GAUT 002/17-18/E2040

1.1.3 Scoping Report

A Scoping Report was compiled in line with the requirements contained in Appendix 2 of the EIA Regulations, 2014 promulgated under the National Environmental Management Act, 1998 (Act No. 107 of

1998), as amended. The Scoping Report was available for public review between **7 February 2020 and 9 March 2020**.

Due to the fact the review of the Scoping Report took place more than a year after the initial notification, re-notification of all I&APs was undertaken to ensure a fair public participation process. As part of this, I&APs were provided with a copy of the BID via email and were provided with 30 days to register as an I&AP and to review/provide comment on the Scoping Report. An advert was also placed in the Star Newspaper on 7 February 2020. In addition, site notices were placed at two locations around the site.

All comments received were included in the Final Scoping Report which was submitted to the Gauteng Department of Agriculture and Rural Development (GDARD) on 19 March 2020. The Scoping Report (including the Plan of Study for the Environmental Impact Assessment (EIA) Report was subsequently approved by the Department on 5 August 2020¹.

1.1.4 Environmental Impact Assessment Report (EIR)

An Environmental Impact Assessment Report (EIR) was compiled and made available for public review between 11 September 2020 and 12 October 2020. Please refer to Section 1.3. and Section 8 for more information on the public review.

1.1.5 Comments on the EIR

The following comments were received as part of the review of the EIR:

- Requests for information
 - Traffic Impact Assessment and Stormwater Management Plan
 - Information on William Nicol Drive Upgrade Timeframes
 - Information on whether there has been a change in the proposed development since Scoping.
- Support of the Development
 - From the Ward Councilor of the area.
- Comments from SAHRA
 - Support the development
 - Mitigation to include Chance Find Procedure.
- Comments from City of Johannesburg Impact Assessment and Compliance Monitoring
 - Concerns regarding the artificial source of water indicated by Wetland and Biodiversity specialists.
 - Concern regarding the conservation of the degraded grassland area.
 - Comments on Geotechnical Assessment.
 - Requirements for recreational open space.
 - Concern regarding stormwater.

¹ Please note that the Scoping Report was submitted prior to the national lockdown instituted by the National Government in response to the Covid-9 outbreak. The timeframes related to the review of the document by the Department were therefore extended.

Comments were also received from GDARD on 26 October 2020.

Please refer to Appendix 14.5.5. for a copy of the Comments and Responses Report as well as Appendix 14.5.6.4 for a copy of the comments received during the EIR public review. Please note that in order to provide a detailed response to the City of Johannesburg, an addendum to the Comments and Responses Report has been compiled and should be read in conjunction with the Comments and Responses Report. A separate Addendum is also provided as a response to the GDARD Comments.

The comments received have not resulted in any material changes to the EIR. All however changes between the EIR that was made available for review and the final submission to the Department is underlined. This is to aid the review of the final submission.

1.2 EIA Report Requirements and Outline

According to Section 2 of Appendix 3 of the 2014 EIA Regulations, the objective of the EIA process is to, through a consultative process-

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;*
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;*
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;*
- (d) determine the--
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and*
 - (ii) degree to which these impacts-
 - (aa) can be reversed;*
 - (bb) may cause irreplaceable loss of resources, and*
 - (cc) can be avoided, managed or mitigated;***
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;*
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;*
- (g) identify suitable measures to avoid, manage or mitigate identified impacts; and*
- (h) identify residual risks that need to be managed and monitored.*

The EIA process for the proposed Riverside View Extension 84 aims to ensure that the objectives described above are met. In line with this, an outline of the EIA Report (and its relationship to the requirements to Appendix 3 of 2014 EIA Regulations) is provided in Table 1-1 below.

Table 1-1: Required contents of the EIA Report.

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
1.	Introduction	3(u) an indication of any deviation from the approved scoping report, including the plan of study, including- <ul style="list-style-type: none"> (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.
2.	Environmental Assessment Practitioner	3(a) details of- <ul style="list-style-type: none"> (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae
3.	Legislative Framework	3(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context
4.	Project Description	3 (b) the location of the activity, including: <ul style="list-style-type: none"> (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; 3 (c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is- <ul style="list-style-type: none"> (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken; 3 (d) a description of the scope of the proposed activity, including- <ul style="list-style-type: none"> (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development.

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
5.	Description of the Receiving Environment	<p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <p>(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.</p>
6.	Need and Desirability	<p>3 (f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;</p>
7.	Alternatives	<p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <p>(i) details of the development footprint alternatives considered</p> <p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <p>(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.</p>
8.	Public Participation	<p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <p>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</p> <p>(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.</p>
9.	Summary of Specialist Studies	<p>3(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.</p>

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
10.	Impact Assessment	<p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <ul style="list-style-type: none"> (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- <ul style="list-style-type: none"> (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and <p>3(l) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-</p> <ul style="list-style-type: none"> (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
		<p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.</p> <p>3(j) an assessment of each identified potentially significant impact and risk, including-</p> <ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.
11.	Environmental Impact Statement	<p>3(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:</p> <ul style="list-style-type: none"> (x) a concluding statement indicating the preferred alternative development location within the approved site. <p>3(g) a motivation for the preferred development footprint within the approved site.</p> <p>3(l) an environmental impact statement which contains-</p> <ul style="list-style-type: none"> (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives. <p>3(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of</p>

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
		<p>proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorization.</p> <p>3 (n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;</p> <p>3(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.</p> <p>3(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;</p> <p>3(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;</p> <p>3(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;</p> <p>3(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;</p> <p>3(v) any specific information that may be required by the competent authority; and</p> <p>3(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.</p>
12.	EAP Undertaking	<p>3(s) an undertaking under oath or affirmation by the EAP in relation to:</p> <ul style="list-style-type: none"> (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to

Chapter Number	Chapter Name	Requirements included in Appendix 3 of 2014 EIA Regulations
		comments or inputs made by interested or affected parties.
13.	References	-
14.	Appendices	3(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.

In addition to the above, the Regulations also note that the EIA process must be undertaken in line with the approved plan of study for environmental impact assessment that was included in the Scoping Report. To this end, a summary of how the EIA Process is in line with the Approved Plan of Study is provided in Table 1-2.

Table 1-2: Alignment with Plan of Study

Item	Plan of Study Requirement	Reference in Report
1.	Specialist Studies – <ul style="list-style-type: none"> • Ecological habitat Assessment; • Wetland Delineation and Assessment; and • Phase 1 Heritage Impact Assessment. Technical Reports/Input <ul style="list-style-type: none"> • Outline Scheme Report; • Traffic Impact Assessment; and • Geotechnical Assessment. . 	Chapter 9 Chapter 15
2.	Impact Assessment Methodology	Chapter 10
3.	Public Participation	Chapter 8

Section 3(u) of Appendix 3 of the 2014 EIA Regulations notes that the EIA Report should provide an indication of any deviation from the approved scoping report. **No deviation from the Plan of Study for the EIA however has been undertaken.**

In addition to the above, the EIA Report aims to ensure that GDARD's comments on the Scoping Report (as part of the acceptance of the Scoping Report) are addressed. The table below provide a summary of these comments, as well as where they have been addressed in the report.

Table 1-3: GDARD requirements for the EIA Report

Item	GDARD Comment – 5 August 2020	Reference in the Report	Comment
1.	<p>The above-mentioned matter received by the Department on 20 July 2020 has reference. The proposal development of Portions 124 and 185 of the farm Diepsloot 388-JR will involve mixed use township establishment to cater for a place of 'Instructions', 'Residential' use and 'Commercial' including ancillary uses such as restaurants and shops. One Erf will be set aside as a 'Private Open Space'. The subject site measures 29.30 hectares with the proposed development occupying an extent of 24.10 hectares. The applicant applied for Activity 19 of Listing Notice 1, Activity 15 of Listing Notice 2 and Activities 4, 12 and 14 of Listing Notice 3 of the Environmental Impact Assessment Regulations, 2014. The Scoping Report and plan of study submitted is noted and the Department would like to comment as follows:</p>	N/A	<p>Please note that the Scoping Report was submitted to the Department on 19 March 2020.</p> <p>The listed activities and project description is correct.</p>
2.	<p>Since the proposed site has a sizeable elevation difference, a comprehensive stormwater management system must be designed for implementation. The stormwater system must comply with the Sustainable Urban Drainage System Guideline of the Department</p>	<p>Section 4.4.4 Section 7.2.1. Section 9.1. Appendix 14.6.9</p>	<p>A comprehensive Stormwater Management Plan has been compiled. It is described in a number of places throughout the report.</p> <p>In general, stormwater attenuation will make use of the following:</p> <ul style="list-style-type: none"> • Grass lined attenuation ponds; • Use of the soccer field to attenuate stormwater and allow for ground water recharge; • Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet

Item	GDARD Comment – 5 August 2020	Reference in the Report	Comment
			<p>flow and absorption into the underlying soil;</p> <ul style="list-style-type: none"> • Throttled outlet structures; and • Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.
3.	A Waste Management Plan that seeks to achieve high levels of separation of waste at source to reduce volumes disposed of at the landfill sites must be compiled.	Appendix 14.8	A Waste Management Plan has been compiled and included as part of the Environmental Management Programme (EMPr).
4.	The stormwater management must be design in such a way that it will not dispense directly to the watercourse and its buffer zone and it must be submitted to the Johannesburg Roads Agency for consideration.	Section 4.4.4 Section 7.2.1. Section 9.1. Appendix 14.6.9	<p>A comprehensive Stormwater Management Plan has been compiled. It is described in a number of places throughout the report.</p> <p>Stormwater will be discharged over dry land and mitigation measures have been included in the design to ensure minimal impacts to the wetland and wetland buffer.</p>
5.	Additionally, adequate slip/shoulder lanes must be incorporated into the road infrastructure design to accommodate public transport services. This must include shaded area in instances where its raining or to hot.	Section 9.8 Appendix 14.6.8	A Traffic Impact Assessment has been compiled and notes that as part of previous developments in the area (Steyn City and Valumax), pedestrian walkways have been built along View Road. Public transport lay-bys along Porcupine Park Road at its intersection with Yellowwood Boulevard were also built as part of the Valumax Development. These lay-bys are within walking distance from the development and will serve the development well.
6.	The locality map and sketch layout plan has been included in the Final Scoping. However, a legible, A2 Layout Plan overlain	Section 11.1	A composite sensitivity map has been compiled and is included in Section 11.1.

Item	GDARD Comment – 5 August 2020	Reference in the Report	Comment
	by a composite sensitivity map on site with a legend easily linked to activity components must be included in the Draft EIAR after the acceptance of the Final Scoping.	Appendix 14.3 and Appendix 14.4.	
7.	This layout must be informed by sensitivities located on site, especially a Wetland Delineation Assessment which must be undertaken and form part of the EIR.	Section 9.2. Appendix 14.6.2	A number of specialist studies have been undertaken to better understand site sensitivity including a Wetland Assessment. The delineated wetland and associated 32m buffer have been taken into account in the development layout and will not be developed.
8.	The preliminary Site Development Plan indicates that there will be no crossing of the wetland. In view of this, the final Site Development Plan can involve minor alterations but not any crossings of the wetland.	Section 4.4.6 Appendix 14.3	This is not correct. As noted in our previous response to the Department's comments on the Scoping Report which was made available for public review, a wetland crossing is shown on the preliminary Site Development Plan. Please refer to Section 4.4.6. which provides more detail on the proposed wetland crossing.

Comments were also received from GDARD on 26 October 2020. Please refer to the Comments and Response Report in Appendix 14.5.5.

1.3 Public Participation as part of the EIA Phase

In order to ensure that all I&APs have an opportunity to review and comment on the EIA Report (EIR) and Water Use Licence Application (WULA) Technical Report, all registered I&APs (as identified as part of the process described in Section 1.1. above) were notified by email or SMS of the review of the EIA Report and WULA Technical Report which took place between **11 September 2020 and 12 October 2020**.

It should be noted that subsequent to the submission of the Scoping Report for approval, the President of the Republic of South Africa called a National State of Emergency related to the Global COVID-19 Pandemic. In light of this, the Minister published Directions regarding permitting processes (GN 650 Of 5 June 2020). These directions have been taken into account and a Public Participation Plan was submitted. Subsequently, GDARD has informed the EAP that the Directions have been repealed compliance is required with Disaster Management Act guidelines. Please refer to Appendix 14.5.8.

The public participation plan for the review of the EIR was drawn up to ensure fair and safe consultation and includes:

- All commenting authorities were contacted telephonically to confirm how they would prefer to receive a copy of the report (electronic download or hard copy/USB).
- Hard copies and/or electronic copies (sanitized flash drives) of the EIR were submitted to the necessary Authorities (including the City of Johannesburg, Department of Human Settlements, Water and Sanitation, GDARD and took into account their preferences as indicated during telephonic discussions. Where possible electronic means of communication were utilized. The exception to this will be Authorities and I&APs who cannot access documents electronically.
- For the public review of the EIR, emails or whatsapps/SMSes were sent to registered I&APs and included a link to download the EIR and included details of the 30-day review of the document.
- The EIR was uploaded to Prism EMS's website(<https://www.prismems.co.za/index.php/projects/pages>) to enable download and review. Sanitized flash drives will also be made available on request.

1.4 Authorities

The following competent authority are involved in the decision-making process:

- GDARD with reference to activities under the:
 - EIA Regulations and Listing Notices, 2014 (NEMA)
- The DHWS in reference to Section 21 Activities in terms of the National Water Act (NWA) (Act No 36 of 1998). A copy of the WULA Technical Report is appended in Section 14.9.

It should be noted that an integrated process is being undertaken and as such public participation will be undertaken together for both the EIA and WULA process.

1.5 Applicant

The applicant is the entity that will assume responsibilities as the holder of the environmental authorisation if granted. Details of the applicant and landowner are contained in Table 1-4.

Table 1-4.: Details of the Applicant.

Applicant:	Steyn City Properties (Pty) Ltd
Landowner:	Steyn City Properties (Pty) Ltd
Contact Person:	Christo de Wet
Address:	P.O. Box 1623 Honeydew 2040

2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Prism EMS have been appointed to undertake the required Environmental Authorisation and WULA process in terms of the required Environmental Impact Assessment (EIA) Regulations and National Water Act, 1998, respectively. Details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the EIA Report and WULA is provided in Table 2-1 and Curriculum Vitae is appended in Section 14.1.

Table 2-1.: Details of the EAP.

EAP:	Vanessa Stippel
Company:	Prism Environmental Management Services
Qualifications:	MSc. Ecology, Environment and Conservation
Experience:	10 years
Affiliation/ Registration	Professional Member of Southern African Institute of Ecologists and Environmental Scientists Member of IAIAAsa (6020) SACNASP: Pr.Sci.Nat. (116221) EAPASA: Registered EAP in terms of Section 24H of NEMA, 1998 (as amended) (2019/175)
Address:	PO Box 1401, Wilgeheuwel, 1736
Tel:	087 985 0951
Fax:	086 601 4800
Email:	vanessa@prismems.co.za

Designation	Name	Qualification	Professional Registration	Specialist Assessment
Prism EMS Team				
Contact Details	Post: PO Box 1401, Wilgeheuwel, Johannesburg, 1736		Tel: 087 985 0951 Fax: 086 601 4800 Email: prism@prismems.co.za www.prismems.co.za	
Project Director	De Wet Botha	MA. Environmental Management PHED	SACNASP Registered Scientist – Pr.Sci.Nat. (119979) EAPASA: Registered EAP (2019/1209) Member of the International Association for	Project Management and Quality Control and Review

			Impact Assessors (IAIAsa) (1653) Member of the Gauteng Wetland Forum Member of the South African Wetland Society	
--	--	--	--	--

3 LEGISLATIVE FRAMEWORK

Section 3(e) of Appendix 3 of the 2014 EIA Regulations requires that the EIA Report includes a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context. In line with this, this section aims to provide an overview of key policy, legislation, plans, guidelines, and municipal development planning frameworks triggered by the proposed project. The requirements set out in these Act's and Regulations will be adhered to through the scoping and impact assessment phases of the project.

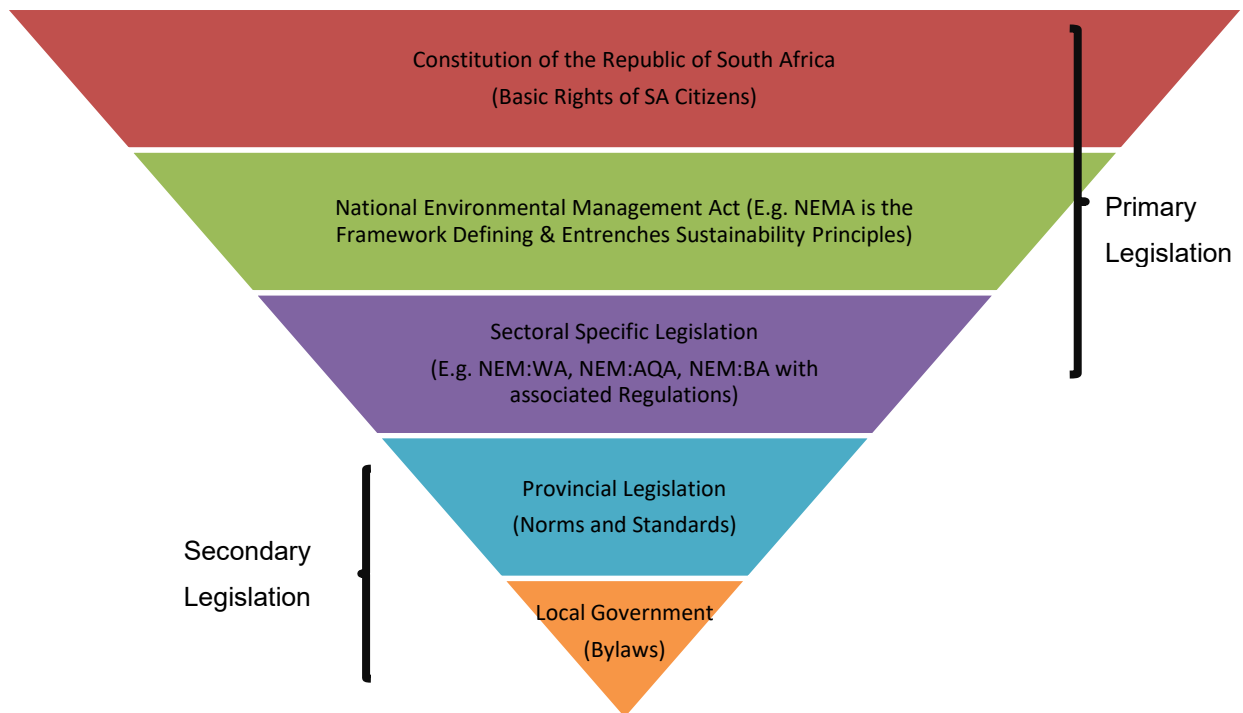


Figure 3-1: South African Environmental Legislation Hierarchy.

The following Acts, Regulations, By-Laws and Guidelines are applicable to the proposed development.

3.1 Constitution of the Republic of South Africa

Section 24 of the Constitution states that –

“Everyone has the right to -

- a) an environment that is not harmful to their health or well-being; and*
- b) have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*
 - (i) Prevent pollution and ecological degradation;*
 - (ii) Promote conservation; and*
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

3.2 National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)

The NEMA is the umbrella framework for all environmental legislation primarily to assist with implementing the environmental rights of the Constitution (refer to Section 3.1). The NEMA provides fundamental principles required for environmental decision making and to achieve sustainable development. It also makes provision for duty of care to prevent, control and rehabilitate the effects of significant pollution and environmental degradation, and prosecute environmental crimes. These principles must be adhered to, and taken into consideration during the impact assessment phase.

NEMA defines “environment” as –

“the surroundings within which humans exist and that are made up of –

- (i) the land, water and atmosphere of the earth;*
- (ii) micro-organisms, plants and animal life;*
- (iii) any part or combination of (i) or (ii) and the interrelationship among and between them; and*
- (iv) the physical, chemical, aesthetic and cultural, properties and conditions of the foregoing that influence human health and well-being.”*

Section 24D and 24(2) of the NEMA makes provision for the publication of list and associated regulations containing activities identified that may not commence without obtaining prior environmental authorisation from the competent authority. These regulations are referred to as the EIA Regulations and are interpreted hand in hand with the various listed activities discussed further below.

3.2.1 Environmental Impact Assessment Regulations, 2014 (GN R 982 of 4 December 2014)

The EIA regulations were promulgated in terms of Section 24 of the NEMA, for the purpose of providing methodologies and specific requirements for the undertaking of an EIA. The Regulations stipulate that any proposed activity listed in the associated notices must undertake either a Basic Assessment (BA) or Scoping & Environmental Impact Report (S&EIR) in order to obtain an environmental authorisation (if granted by the competent authority) before the commencement of the specified listed activity. The EIA Regulations provide the minimum requirements for appointing an EAP and for undertaking the relevant Public Participation Process (PPP) as required. They also detail the contents of the impact assessment reports and all other aspects associated with BA and/or EIAs.

The following listed activities have been identified and are discussed further in the sections that follow:

3.2.1.1 Listing Notice 1: GN R 983 of 4 December 2014 (as amended)

Activities listed under this process require a Basic Assessment process to be undertaken. **Due to the fact that a bridge will be put in place over the wetland, Activity 19 is triggered:**

The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-

- (i) a watercourse;*
 - (ii) the seashore; or*
 - (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving-*
- (a) will occur behind a development setback;*
- (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or*
- (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.*

Please note that whilst infrastructure (in the form of the road/bridge) will be placed within 32m if a watercourse, Activity 12 of Listing Notice 1 is not triggered. This is due to the fact that Activity 14 of Listing Notice 3 is triggered and thus the exclusion applies. It should also be noted that whilst water and sewer pipelines will be put in place, these are below the thresholds indicated in Activity 9 and 10 of Listing Notice 1 and as such these activities are not triggered. In addition, whilst a 450mm diameter stormwater pipeline will be put in place, this occurs within Zone 1 of the Urban Development Boundary and thus does not trigger Activity 9 of Listing Notice 1.

3.2.1.2 Listing Notice 2: GN R 984 of 4 December 2014

Activities listed under this process require Scoping and EIA to be undertaken. Due to the fact that more than 20 hectares of land will be developed and cleared, Activity 15 of Listing Notice 2 is triggered:

The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.

As such a Scoping and EIA process is applicable.

3.2.1.3 Listing Notice 3: GN R 985 of 4 December 2014

Activities listed under this process require a Basic Assessment process to be undertaken but only in specified geographic areas. Due to the fact that part of the site falls within a C-Plan area as well as historical Egoli Granite Grassland, a number of activities within Listing Notice 3 are triggered:

Activity 4 of Listing Notice 3, as amended:

The development of a road wider than 4 metres with a reserve less than 13,5 metres.

c. Gauteng

- i. A protected area identified in terms of NEMPAA, excluding conservancies;*
- ii. National Protected Area Expansion Strategy Focus Areas;*
- iii. Gauteng Protected Area Expansion Priority Areas;*
- iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;*

- v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);
- vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;
- vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas;
- viii. Important Bird and Biodiversity Area (IBA);
- ix. Sites or areas identified in terms of an international convention;
- x. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;
- xi. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or
- xii. Sites zoned for conservation use or public open space or equivalent zoning

Activity 12 of Listing Notice 3 (as amended):

The clearance of an area of 300m² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

C. Gauteng

- i. *Within any critically endangered or endangered ecosystem listed in terms of Section 52 of NEMBA or prior to the publication of such list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004.*
- ii. *Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;*
- iii. *On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.*

Activity 14 of Listing Notice 3 (as amended):

The development of-

- (i) *dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or*
- (ii) *infrastructure or structures with a physical footprint of 10 square metres or more*

where such development occurs-

- a) *within a watercourse;*
- (b) *in front of a development setback; or*
- (c) *if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -*

excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

c. Gauteng

- i. A protected area identified in terms of NEMPAA, excluding conservancies;*
- ii. National Protected Area Expansion Strategy Focus Areas;*
- iii. Gauteng Protected Area Expansion Priority Areas;*
- iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;*
- v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);*
- vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;*
- vii. Sites or areas identified in terms of an international convention;*
- viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;*
- ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or*
- x. Sites zoned for conservation use or public open space or equivalent zoning.*

3.2.2 GN 960 of 5 July 2019 | Notice of the requirements to submit a report generated by the National Web Based Environmental Screening Tool in terms of Section 24(5)(h) of the National Environmental Management Act, 1998 and Regulation 18(1)(b)(v) of the EIA Regulations, 2014 (as amended)

As per the requirements of GN 960 of 5 July 2019, a report was generated on the National Screening tool and is submitted to the Department as part of the application form. Further, a copy was included in the Scoping Report which was made available for public review. It is therefore not included again.

3.2.3 G.N. 164 of 2 March 2018 | Adoption of the Gauteng Provincial Environmental Framework Standard and Exclusion of Associated Activities from the requirement to obtain environmental authorisation in terms of Section 24(2)(d) and 24(10)(a) Read in conjunction with Section 24(1)(d) of NEMA, 1998 for the implementation of the Gauteng Provincial Environmental Management Framework

The Gauteng Provincial Environmental Management Framework (GPEMF) was consulted, whilst most of the development footprint does fall within Zone 1 – Urban Development Boundary, the site has a number of sensitivities and as such a Registration in terms of the GPEMF Standard, 2018 is not applicable.

3.2.4 Directions Regarding Measures To Address, Prevent And Combat The Spread Of COVID -19 Relating To National Environmental Management Permits And Licences (GN 650 Of 5 June 2020)

The purpose of the Directions is to curtail the threat posed by the COVID -19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster, and in particular to provide directions to ensure fair licensing processes and public participation processes. The requirements in terms of public

participation have been taken into account for the EIA process. A Public Participation Plan was submitted to the Department on 13 August 2020 and subsequently approved.

3.3 National Water Act (NWA) (Act No. 36 of 1998)

The NWA is the primary regulatory legislation; controlling and managing the use of water resources as well as the pollution thereof and is implemented and enforced by the Department of Human Settlements, Water and Sanitation (DHSWS²). Section 21 of the NWA lists water uses that must be licensed unless it is listed in the schedule (existing lawful use) and/or is permissible under a general authorisation, or if a responsible authority waives the need for a Water Use Licence. Section 21 water uses include:

- Section 21(a): taking water from a water resource
- Section 21(b): storing water
- Section 21(c): impeding or diverting the flow of water in a watercourse
- Section 21(d): engaging in a stream flow reduction activity contemplated in section 36
- Section 21(e): engaging in a controlled activity as identified in Section 37 (1) or declared under Section 38 (1).
- Section 21(f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall, or other conduit.
- Section 21(g): disposal of waste (i.e. effluent from sewage works) in a manner which may detrimentally impact on a water resource;
- Section 21 (h): disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.
- Section 21 (j): removing, discharging, or disposing of water found underground if it necessary for the efficient continuation of an activity or for the safety of people.
- Section 21(k): using water for recreational purposes.

Applicable definitions included in the NWA include watercourse which is defined as “(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse (and a reference to a watercourse includes, where relevant, its bed and banks). The Act also defines a wetland as “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”.

The recently published General Authorisation in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or section 21(i) (GN 509 of 2016) also defines the regulated area of a watercourse as meaning: (a) *The outer edge of the 1 in 100 year flood line and /or delineated riparian habitat, whichever is*

² Previously referred to as the Department of Water Affairs and later the Department of Water and Sanitation

the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; (b) In the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or (c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

Due to the crossing over the wetland, stormwater releases as well as activities within 500m of a wetland, the following Section 21 uses are triggered and required licencing:

- Section 21(c): impeding or diverting the flow of water in a watercourse
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.

Due to activities within the wetland and the fact that the development includes sewer connections and internal sewer reticulation, the GA for Section 21(c) and (i) is not applicable and a full WULA is required.

A WULA Technical Report has been compiled and is appended in Section 14.9 as public participation is combined with that of the EIA Report. The following reference number is applicable:

- WU17506

3.3.1 R. 267 of 24 March 2017 | Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals

It should be noted that on the 24 March 2017, the Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals (R. 267 of 24 March 2017) were published and came into effect. These Regulations provide the requirements for the WULA process. The WULA for Riverside View Extension 84 has been undertaken in line with these requirements.

3.4 National Heritage Resource Act (NHRA), 1999 (Act No. 25 of 1999)

The NHRA provides for the protection and management of South Africa's heritage resources. The South African National Heritage Resources Agency (SAHRA) is the administering authority in regards to all matters relating to heritage resources. A heritage resource refers to any historically important feature such as graves, trees, archaeology, culturally significant symbols, spaces, landscapes and fossil beds as protected heritage resources. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment (HIA)(also known as an Archaeological Impact Assessment or AIA) for certain categories of development. The NHRA also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required.

Section 38 (1) of the NHRA notes that the relevant heritage authority should be notified provided with details such as location, nature and extent of the following developments:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;

- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

A Heritage Impact Assessment (HIA) has been undertaken and is appended in Section 14.6.3. Further, a summary of the HIA is included in Section 9.3.

3.5 National Environmental Management: Biodiversity Act (NEM:BA), 2004 (Act No. 10 of 2004)

The NEM:BA aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. The purpose of the NEM:BA is to protect ecosystems and the species within as well as the promoting of sustainable use of indigenous biodiversity. During any environmental authorisation process the following regulations are considered and researched if at any stage the following regulations are applicable:

- Alien and Invasive Species Regulations;
- Alien and Invasive Species List;
- Lists of Critically Endangered, Endangered, Vulnerable and Protected Species; and
- Threatened or Protected Species Regulations.

A Biodiversity Baseline and Impact Assessment was undertaken and is summarised in Section 9.1. It is also appended to Section 14.6.1. In particular, it noted that Eight (8) Category 1b invasive species were recorded within the project area and must therefore be removed by implementing an alien invasive plant management programme in compliance of the Alien and Invasive Species Regulations and associated list. This has been included in the EMPr.

In addition, the study noted that the site is used for foraging of Grass Owls (*Tyto capensis*). The species is listed as vulnerable in terms of regional assessment by SANBI and Least concern in terms of IUCN assessment. Further in terms of the Lists of Critically Endangered, Endangered, Vulnerable and Protected Species (GN 151 of 23 February 2007), it is listed as Vulnerable. However, the biodiversity specialist has assessed the impact of the development in terms of the species and after mitigation, these are low. Specific mitigation measures are included in the EMPr.

Lastly, the proposed site falls within Egoli Granite Grassland which is classified as an endangered ecosystem. The site however is highly degraded. The impacts related to loss of the habitat type have been assessed and the necessary mitigation measures included in the EMP.

3.6 National Environmental Management: Protected Areas Act (NEMPA) (Act 57 of 2003)

The aim of NEMPA is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscape. It also provides for the establishment of a national register of national, provincial and local protected areas and for the management of those areas in accordance with national norms and standards.

In line with the Minister has established a **Register of Protected Areas** which was utilized to determine whether the proposed development was affected by Protected areas.

According to the Protected Area Database for Quarter 4 of 2019, the proposed development is located near the Diepsloot Nature Reserve. It should however be noted that whilst still on the DEFF Protected Area Database, the Diepsloot Nature Reserve is no longer functioning and is the site of the Johannesburg Water Northern Wastewater Treatment Works.

3.7 National Environmental Management: Waste Management Act (NEM:WA), 2008 (Act No. 59 of 2008)

The NEM:WA aims to regulate waste management in South Africa in order to protect health and the environment through the provision of reasonable measures for the prevent pollution and ecological degradation.

The Act includes regulations which provide a list of waste management activities that require a waste management licence terms of NEM:WA (GN 921 of 29 November 2013). Activities related to treatment of effluent, wastewater or sewage are however excluded and do not require a waste management licence.

Based on the above, no waste management licence is required for the proposed development. Waste will be collected by municipal waste collectors and disposed of at the municipal landfill.

Storage Facilities in excess of 100m³ (general waste) or 80m³ (hazardous) (if required) will comply with the Norms and Standards for the Storage of Waste.

3.8 National Environmental Management: Air Quality Act (NEM:AQA), 2004 (Act No. 39 of 2004)

The aim of NEM:AQA is to regulate air quality in order to protect the environment from pollution and ecological degradation.

The proposed development does not trigger any activities that require an Air Emissions Licence. Dust produced during the construction phase will be managed through the implementation of mitigation measures has been included in the Environmental Management Programme (EMPr).

3.9 Other Legislation and Guidelines

The following By-laws have been published under the City of Johannesburg (CoJ) Municipality to provide a framework for its operation and management and must be adopted by the public of Johannesburg and adhere to its specific regulations.

3.9.1 City of Johannesburg Bylaws

The following By-laws have been published by the City of Johannesburg to provide a framework for its operation and management and must be adhered to by the proposed development.

3.9.1.1 City of Johannesburg Metropolitan Municipality: Water Services By-laws

This bylaw prescribes and elaborates on the use and related activities of water in the CoJ and must therefore be considered during any EIA process in the Johannesburg metropolitan area.

- *No person or company may consume, abstract or be supplied with water from the water system, or utilise the sewage disposal system or any other sanitation service, unless he/she has been granted authorisation by the council for the proscribed water service.*
 - *If an EIA is required to be carried out before the provision of the water services can be approved or commenced, the applicant for such services shall be responsible for the carrying out of such EIA, and for the expenses connected therewith;*
 - *After environmental approval has been granted and the provision of water services has been approved by the Council, it is the responsibility of the proposed consumer or any entity established under any law to represent the property interests of any consumer or group of consumers to ensure that all laws and conditions affected by the provisions of water services and relating to environmental management and control are complied with.*

This bylaw also elaborates on the limits and maximum concentration of certain substances allowed to enter the water system (Schedule D).

3.9.1.2 City of Johannesburg Metropolitan Municipality: Waste Management By-Laws

This bylaw prescribes and elaborates on the use, disposal and related activities of waste in the CoJ and must therefore be considered during any EIA or waste management application process in the Johannesburg area.

- *When any site development plan is submitted to the Council for its approval, the person making the submission must simultaneously submit:*

- *A building waste management plan setting out the manner in which all building waste and other waste to be generated in the course of construction will be managed, treated, collected, transported and disposed of; and*
- *Proof that all necessary waste management services for the construction activities will be provided by an accredited service provider.*
- *No site development plan may be approved before the building waste management plan has been approved by the council*
- *All building waste must be disposed of at an appropriately licensed waste disposal facility, unless:*
- *the council has given written consent for the building waste to be used for the purpose of land reclamation and all other authorisations required for this have been obtained; or*
- *the building waste will be re-used or recycled by an accredited service provider.*

The Waste Management bylaws provide procedures for the minimisation of waste production and disposal in a best practice principle with related duty of care and allowed activities in the Johannesburg metropolitan area.

3.9.1.3 City of Johannesburg Metropolitan Municipality: Municipal Planning Draft By-Laws

This bylaw applies to all land and land development applications within the jurisdiction of the City of Johannesburg and must therefore be considered during any EIA process in the Johannesburg metropolitan area to align with the set of requirements set out in the by-law.

3.9.2 Guidelines

The following guidelines have been adopted by the applicant in the pursuit of best practice and sustainable development and are considered in the management measures and mitigation of impacts identified.

- Guidelines on Need and Desirability (DEA&DP, 2010);
- Guidelines on Alternatives (DEA&DP, 2010);
- Guidelines on Public Participation (DEA&DP, 2011);
- IEMS Guidelines series (DEA&DP, 2014);
- Gauteng Spatial Development Framework (SDF);
- Gauteng Provincial Environmental Management Framework (EMF); and
- National Development Plan 2030.

4 PROJECT DESCRIPTION

The Appendix 3 of the 2014 EIA Regulations requires that the following information is provided in the EIA Report:

3 (b) the location of the activity, including:

- (i) the 21-digit Surveyor General code of each cadastral land parcel;*
- (ii) where available, the physical address and farm name; and*
- (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;*

3 (c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-

- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken;*
- (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;*

3 (d) a description of the scope of the proposed activity, including-

- (i) all listed and specified activities triggered and being applied for; and*
- (ii) a description of the associated structures and infrastructure related to the development.*

In line with this, Section 4.2. provides information on the listed activities triggered, Section 4.3., provides information on the project location and Section 0., provides information on the proposed development (including associated infrastructure).

Please note that A3 copies of maps and drawings are appended in Section 14.4.

4.1 Environmental Authorisation

An “*Environmental Authorisation*” means an authorisation granted by the competent authority of a listed activity in terms of Section 24 of the National Environmental Management Amendment Act, (Act No. 107 of 1998).

An application for Environmental Authorisation (EA) has been submitted to GDARD and the following reference number has been issued: **GAUT 002/17-18/E2040**

4.2 Listed Activities

In terms of the EIA Regulations and Listed Activities, 2014 (introduced in Section 3.2.1), the activities that are triggered under the Listing Notices for this proposed development are provided in Table 4-1.

Table 4-1.: Description of the Listed Activities.

Listing Notice	Activity	Description of Listed Activity	Interpretation
<i>NEMA: Listing Notice 1 (require Basic Assessment)</i>			
GN R 983 4 December 2014	19 (i)	<p><i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-</i></p> <p><i>(i) a watercourse;</i> <i>(ii) the seashore; or</i> <i>(iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving-</i></p> <p><i>(a) will occur behind a development setback;</i> <i>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</i> <i>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</i></p>	<p>The proposed development involves construction within a watercourse (for infrastructure such as a bridge and sewer connection point) and will thus involve excavation of more than 10 cubic metres from the watercourse as well as the infilling of more than 10 cubic metres of material into the watercourse.</p>
<i>NEMA: Listing Notice 2 (require Scoping and EIR)</i>			
GN R 984 4 December 2014	15	<p><i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>	<p>The proposed development involves the development of approximately 24 hectares of land.</p>
<i>NEMA: Listing Notice 3 (require Basic Assessment)</i>			
GN R 985 4 December 2014	4 (c)(iv)(v)(vi)	<p><i>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i></p> <p><i>(c) Gauteng</i></p> <p><i>i. A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>ii. National Protected Area Expansion Strategy Focus Areas;</i></p>	<p>The proposed development includes the development of a number of internal roads within the development. These occur within areas indicated as Ecological Support Area (ESA) and Critical Biodiversity Area (CBA): Important Area in GDARD's C-Plan and within Egoli Granite Grassland which is a threatened ecosystem type. A very small section of</p>

Listing Notice	Activity	Description of Listed Activity	Interpretation
		<p><i>iii. Gauteng Protected Area Expansion Priority Areas;</i> <i>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</i> <i>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);</i> <i>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;</i> <i>vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas;</i> <i>viii. Important Bird and Biodiversity Area (IBA);</i> <i>ix. Sites or areas identified in terms of an international convention;</i> <i>x. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;</i> <i>xi. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks;</i> <i>or</i> <i>xii. Sites zoned for conservation use or public open space or equivalent zoning</i></p>	<p>the road/crossing also falls within Zone 2 of the GDARD EMF.</p>
	<p>12 (c)(i)(ii)</p>	<p><i>The clearance of an area of 300m² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p>C. Gauteng <i>i. Within any critically endangered or endangered ecosystem listed in terms of Section 52 of NEMBA or prior to the publication of such list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004.</i></p>	<p>The proposed development involves the development of approximately 24 hectares of land. Part of the site falls within an ESA and CBA: Important Area as well as Egoli Granite Grassland which is a threatened ecosystem.</p>

Listing Notice	Activity	Description of Listed Activity	Interpretation
		<p>ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	
	14 (c)(iv)(v)(vi)	<p>The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more</p> <p>where such development occurs- a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>c. Gauteng i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus Areas; iii. Gauteng Protected Area Expansion Priority Areas; iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; vii. Sites or areas identified in terms of an international convention;</p>	<p>The proposed development involves the development of infrastructure, crossings and stormwater outlet structures within 32m of a watercourse that falls within an ESA area, CBA: Important Area and Threatened Ecosystem (Egoli Granite Grassland). A very small section of the road/crossing also falls within Zone 2 of the GDARD EMF.</p>

Listing Notice	Activity	Description of Listed Activity	Interpretation
		<p><i>viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;</i></p> <p><i>ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks;</i></p> <p><i>or</i></p> <p><i>x. Sites zoned for conservation use or public open space or equivalent zoning.</i></p>	

The activities in Table 4-1 trigger both a basic assessment **and** scoping and impact assessment reporting processes, therefore a consolidated assessment process is required to be undertaken where the more detailed/thorough impact assessment process is to be followed i.e. **Scoping and EIR** (detailed in Figure 4-1 below).



Figure 4-1: Proposed environmental authorisation process.

4.3 Project Location

The site is collectively situated on Portion 124 and 185 of the farm Diepsloot 388 JR which is situated in Region A of the City of Johannesburg and is located to the north of Fourways and South of Diepsloot. The site is situated to the east of William Nicol Drive (R511) and the to the north of Zeven Street. The corner point coordinates of the site are indicated in Table 4-2.

Table 4-2.: Corner Point Coordinates

Corner	Coordinates
1	25°57'47.54"S; 28° 0'50.29"E
2	25°57'50.35"S; 28° 1'8.71"E
3	25°58'5.27"S; 28° 0'46.66"E
4	25°58'10.09"S; 28° 1'2.94"E

The Surveyor General 21-digit diagram numbers for the affected properties are provided in Table 4-3 below.

Table 4-3.: Surveyor General Diagram Numbers.

Portion	Surveyor General Diagram number
124	T0JR00000000038800124
185	T0JR00000000038800185

Refer to Figure 4-2 below for a visual indication of the site location. Please note that A3 maps are also provided in Appendix 14.4

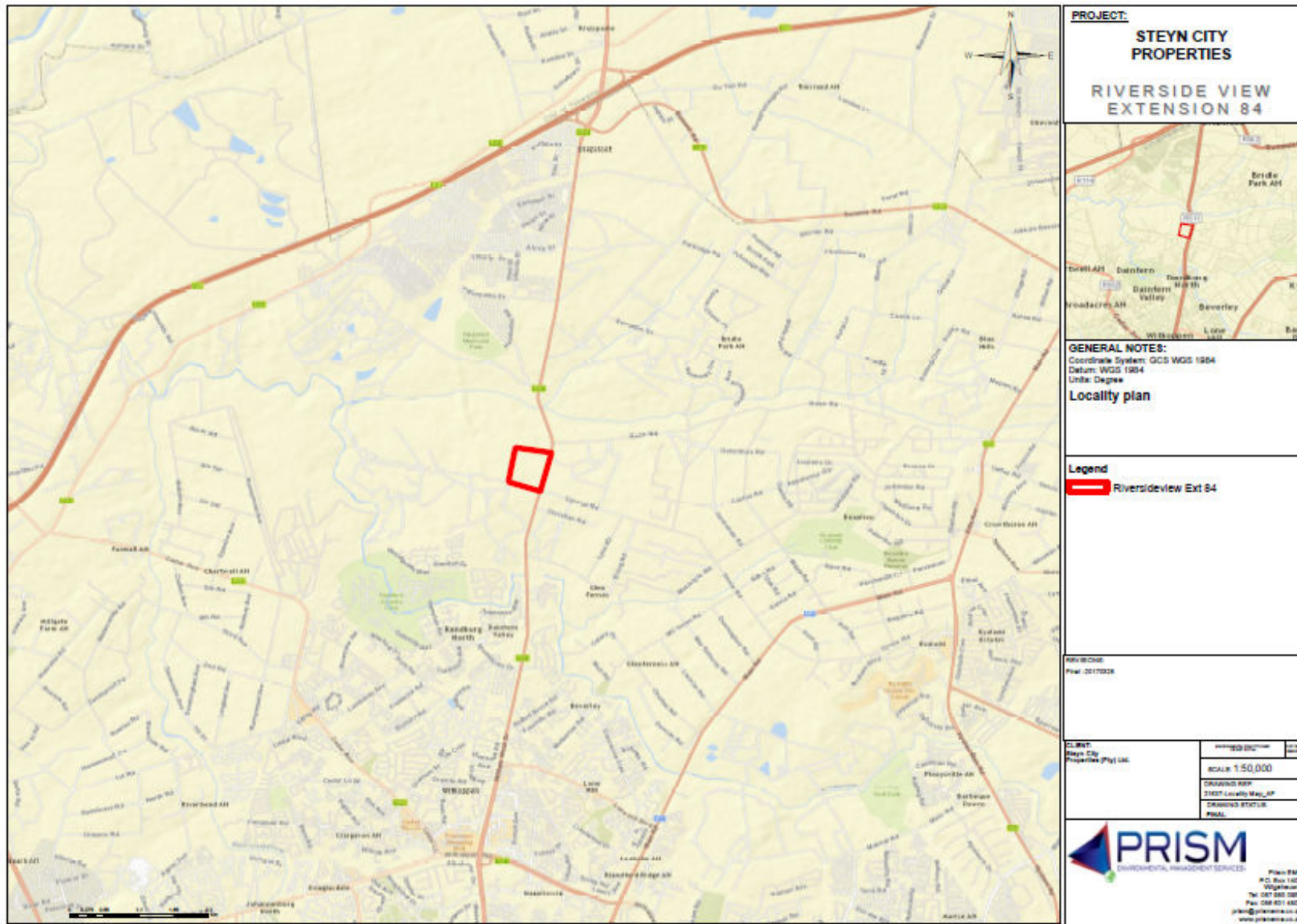


Figure 4-2: Locality map of the site.

4.4 Description of Project Activities

4.4.1 Zoning

The proposed project involves the development of Riverside View Extension 84 on portion 124 and 185 of the Farm Diepsloot 388 JR in the City of Johannesburg, Gauteng. The development will form part of the Steyn City Lifestyle Estate which provides residential units at various densities and at various residential typologies, sport and recreational facilities including a golf course, equestrian uses, educational facilities, community facilities, supportive retail and office development as well as large tracts of active and passive recreation open space.

It should be noted that due to the extensive size of the Steyn City Development, a number of schools are required to cater for the residents (in general one works on a ratio of 1 school per 1000 residential erven /households). Steyn City currently one operational school. The school, which is located on Erf 1676 Riverside View Ext 46 (11.59ha) is situated close to the southern boundary of Steyn City Estate. This school which opened in 2018, is accessible from inside Steyn City Estate as well as from outside the main access gate to this estate (Cedar Road). This means that the school is accessible to residents of Steyn City as well as people who live outside the estate.

However, an additional school is also required. Therefore, it should be noted that the principle intent of the proposed development is to allow for the development of an additional school. The development will also provide Residential, Storage and Offices with ancillary Shops and Restaurants uses. In regard to the latter, the aim is to provide these uses in in the event that the market does not allow for the use of the (entire) site for purposes of an all-phase school (e.g. only one phase is developed), provision is also made for the development of the site (or a section therefore) for purposes of residential use, storage and offices, which include shops and restaurants.

The layout of the proposed development is provided in Figure 4-3. Please note that 1:100 year and 1:50 year floodlines are indicated on this layout and are signed by the relevant engineer.



Figure 4-3: Layout

The site is 29.27 hectares in size and will be developed into three separate erven. The proposed use zones of these erven are described below (Table 4-4).

Table 4-4: Proposed Zoning

Erf 1 and 2	
Zoning	Special: Place of Instruction, Residential dwelling units, Residential buildings, Storage, Offices, including ancillary uses such as restaurants and shop
FAR	0.6
Height	As per Scheme. 5 Storeys excluding basements and architectural features
Coverage	As per Scheme. The coverage shall be determined in terms of an approved Site Development Plan
Density	20 dwelling units / hectare
Parking	As per Scheme and may be relaxed by the local authority
Building Line	16m building line along its boundary with William Nicol Drive (K46). 5m along all other street boundaries, provided that all building lines may be relaxed upon evaluation of the Site Development Plan. 0 metres along the shared erf boundary between Erven 1 and 3, as well as Erven 2 and 3 Riverside View Ext 84.

General	<ol style="list-style-type: none"> 1. A general Right of Way Servitude to be registered over Erven 1 and 3 in favour of Erf 2 until the water use licence is obtained and access is determined to Erf 2. 2. Access shall be to the satisfaction of the local authority 3. A Site Development Plan compiled to a scale of 1:200, or such other scale as approved by the local authority shall be submitted to the local authority for approval prior to the submission of any building plans. No building may be erected prior to the approval of such development plan by the local authority and the entire development shall be in accordance with this plan: provided that the plan may from time to time be amended with the written approval of the local authority. Such Site Development Plan shall show all the environmental sensitivity areas and the location and extent of the wetlands as determined in terms of the wetland assessment and delineation to be done
Erf 3	
Zoning	Private Open Space
FAR	As per scheme (0.01)
Height	As per Scheme. 1 Storey, excluding architectural features
Coverage	As per scheme
Density	Not Applicable
Parking	As per Scheme and may be relaxed by the local authority
Building Line	<p>As per Scheme</p> <p>16m along William Nicol Drive (K46)</p> <p>2m on all boundaries</p>
General	<ol style="list-style-type: none"> 1. A general Right of Way Servitude to be registered over Erven 1 and 3 in favour of Erf 2 until the water use licence is obtained and access is determined to Erf 2. 2. Access shall be to the satisfaction of the local authority 3. A Site Development Plan compiled to a scale of 1:200, or such other scale as approved by the local authority shall be submitted to the local authority for approval prior to the submission of any building plans. No building may be erected prior to the approval of such development plan by the local authority and the entire development shall be in accordance with this plan: provided that the plan may from time to time be amended with the written approval of the local authority. Such Site Development Plan shall show all the environmental sensitivity areas and the location and extent of the wetlands as determined in terms of the wetland assessment and delineation to be done 4. The ROD (Environmental Authorisation) received from GDARD shall be complied with as well as compliance with the Ecological Management Plan.

A preliminary site development plan (SDP) has been developed and is indicated in Figure 4-4. It should however be noted that this SDP can only be finalized during the townplanning approval process. A copy of the final SDP will then be submitted to GDARD.

The main uses indicated in the Preliminary SDP are as follows:

- School buildings and associated fields and parking areas;
- Residential areas; and
- Offices.

Necessary roads and services are also included.

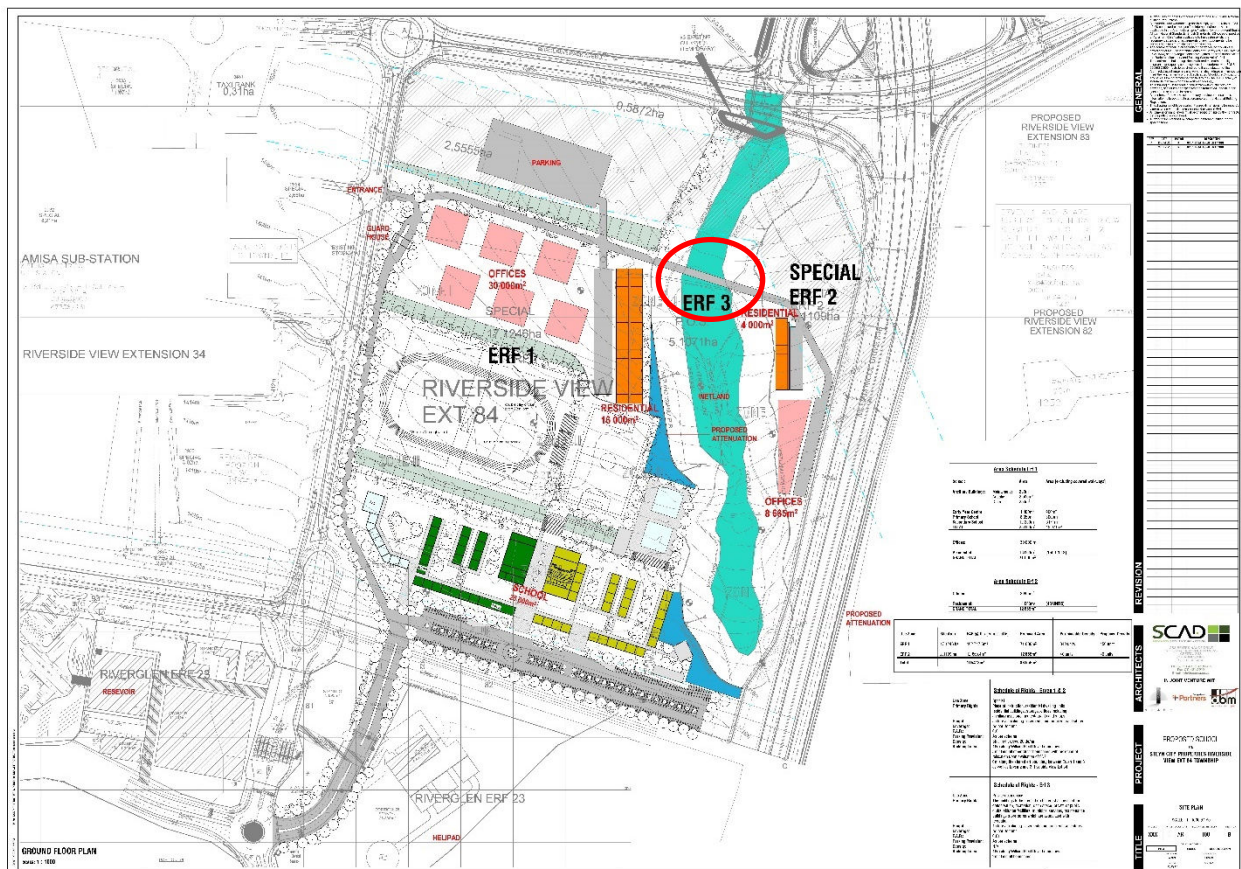


Figure 4-4: Preliminary Site Development Plan

Please note that the wetland crossing required to access Erf 2 is indicated by a red circle in the SDP above. Please also see Section 4.4.6. and Figure 4-10 which also discussed the need for a bridge over the wetland.

Comments from the City of Johannesburg Impact Management and Compliance Monitoring were received on 12 October 2020 and noted that the private open space indicated on the layout plan must be conservation open space and that recreational open space is also required.

It should however be noted that the standard zoning rights for Open Space in the City of Johannesburg Land Use Scheme 2018 do not distinguish between 'recreational' and 'conservation' open space - only between Public and Private Open Space. The difference lies in the ownership and therefore the maintenance of the open space area. These 2 kinds of Open Space are defined in the Johannesburg Land Use Scheme 2018 as follows:

- “Public open space:
 - Use of building/s and/or land which is under the ownership of the Council or other authority, ...”
- “Private Open space:
 - Use of building/s and/or land, with or without access control and which can be used as a private ground for sports, play, rest and recreation, or as an ornamental garden; pleasure ground; golf course; or for buildings reasonably required in connection with such uses.”

The proposed Erf 2 is zoned Private Open Space, since it is the area affected by Wetlands. It could therefore be categorised as “conservation open space”. The Town planner has indicated that they will add the words “conservation open space” to their submission.

In addition to the above, the preliminary Site Development Plan indicates the sports fields for the school, which are “recreational open space”, as required for the learners.

In addition, the subject township is located adjacent to and directly north of the existing Steyn City Lifestyle estate, which is a private lifestyle estate, which makes provision for non—residential support uses within the estate. These include a golf course, retirement village, shopping centre, offices, filling station with convenience shop, gymnasium, heliport and school. Due to the extent of the residential component of this estate another school is required. The application site was identified for this use. The land was purchased after the original development of Steyn City Estate and therefore an extension to this estate which comprises the proposed township of Riverside View Ext 84. Initially the school will be open to people living outside the Steyn City, but eventually the residents of Steyn City will have first choice and therefore it will be a private school – similar to the existing Steyn City School in the southern section of the estate.

The existing estate boundary wall will be extended to enclose the application site in order to be included in the Steyn City Estate boundaries. Since Steyn City Estate is a private estate all roads in the estate are private roads and all open spaces are private. Therefore, the open space areas in the application site can only be zoned Private Open Space. However, like all other private schools, the sports fields are used for matches, which implies that the active open space areas will be utilized by more than only the Steyn City school.

Planned services will be put in place and are described in the sections that follow:

4.4.2 Water

In order to supply water to Riverside Extension 84 a connection to the Diepsloot Reservoir Supply zone will be required. This connection should be located downstream of the Dainfern PRV. This link water line, the proposed connection point to the Diepsloot Supply Zone and the proposed supply point for the development are indicated Figure 4-5 below. A copy of the water layout plan is included in Appendix 14.3.

The design and positioning of valves, fire hydrants, PRV valves, chambers and other fittings will be dealt with in the detail design phase. From the connection point a formal water reticulation system will then be constructed within the development, where water connections to individual stands forming the township will be made.

Water pipes construed within the Council Road Reserve will be constructed to Johannesburg Water Design Guidelines and Standards and will be handed over to the Council upon completion. The water reticulation within each stand of the development will remain private and maintained by the registered Body Corporate.

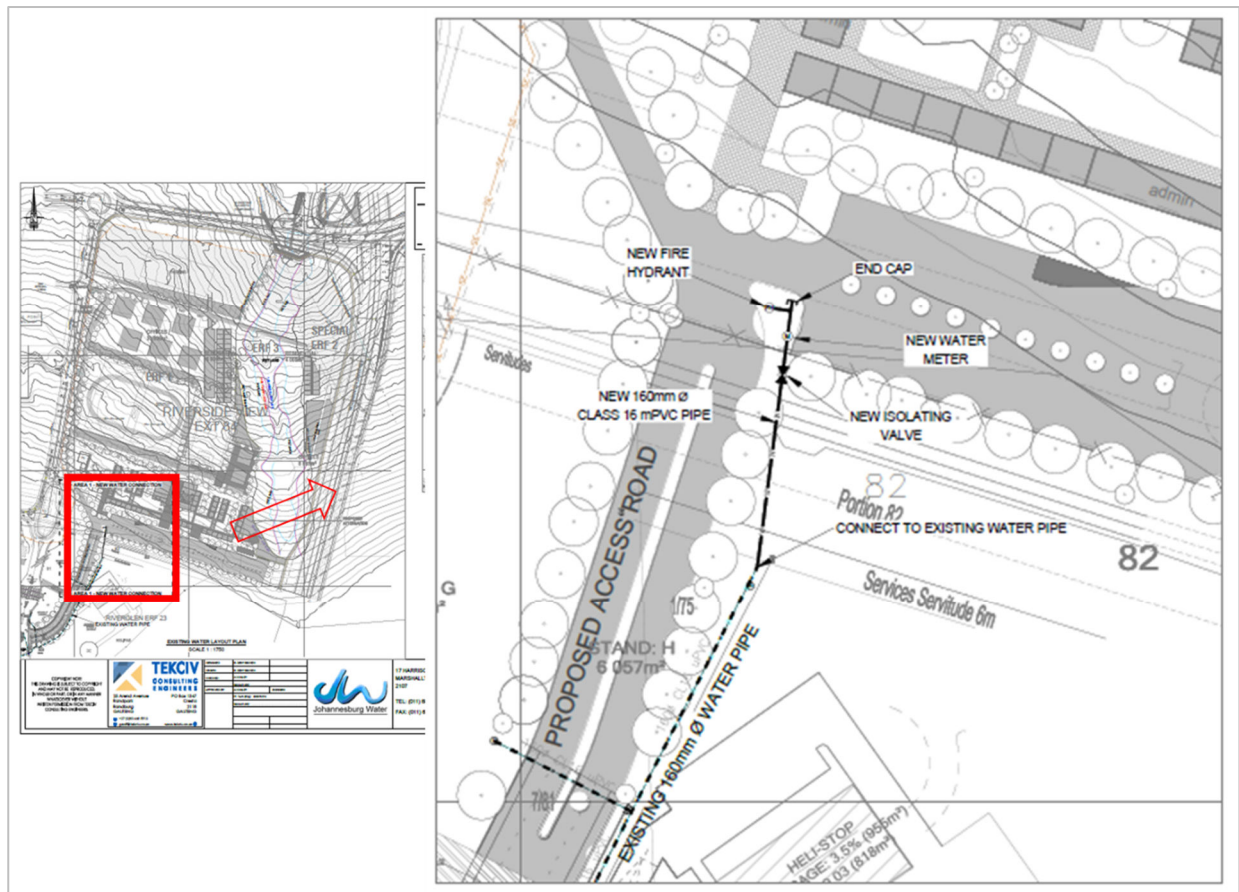


Figure 4-5: Water Layout Plan

The design of the water reticulation required for the development will accommodate the ultimate demands anticipated. The total average annual daily demand for Riverside View Ext 84 amounts to 0.48 Ml/day, with a peak hour demand total 24.99l/s. Relevant water design standards for the development are summarized in Table 4-5.

Table 4-5: Water Design Standards

	Parameter	Element	Guideline
1	Level of service (High)	Water connection per unit	-
2	Pressure	Maximum (Static) Minimum (at peak flow)	9.0 bar 2.0 bar
3	Maximum flow velocities	Diameter ≤150 mm Diameter ≥ 200 mm	1,0 m/s – 3,5 m/s 1,5 m/s – 2,5 m/s
4	Pipe Materials	Erf Connections Distribution main ≤ 200mm	HDPE Class 12 uPVC Class 12 with spigot and socketed couplings
5	Pipe size	Network Pipes Adjacent house connections House connections across street	110 mm minimum 25mm minimum 32mm minimum 25mm minimum 2-4 stands 32mm minimum

4.4.3 Sanitation

The proposed Riverside View Extension 84 falls within the Diepsloot North Drainage Zone as described in the JW Masterplan for the Diepsloot Corridor Developments. The site drains towards the existing Bruma Outfall which is located to the north of the site. The Bruma Outfall Sewer drains towards the Northern Outfall Sewer eventually terminating at the Northern Waste Water Treatment Works.

As part of the development of Riverglen Erf 23 a 200mm diameter sewer line was constructed within the road reserve of View Road. Provision has been made for a future connection from Riverside View Ext 84 onto this sewer pipeline (Figure 4-6). This connection point is just outside the 32m buffer area of the wetland. A copy of the sewer layout plan is included in Appendix 14.3.

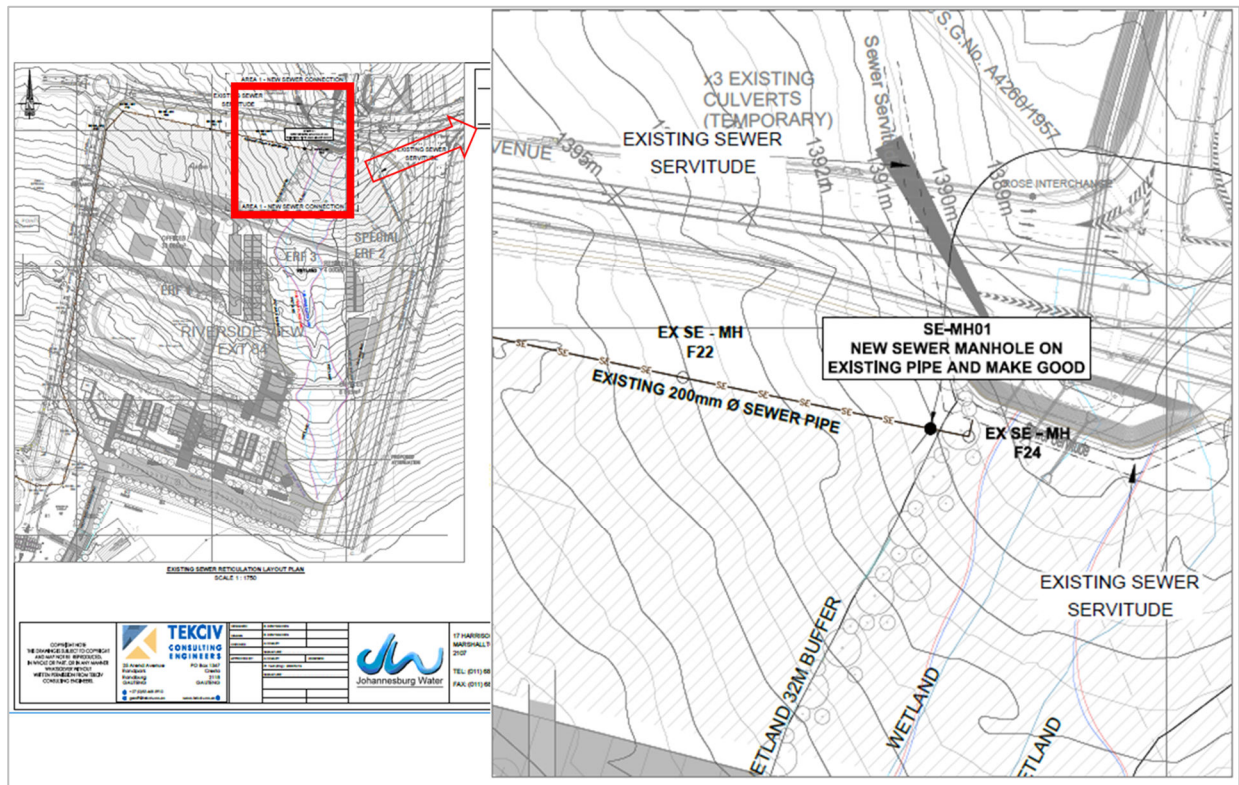


Figure 4-6: Sewer Services

The relevant sewage design standards which have been taken into account in the design of the services are indicated in Table 4-6.

Table 4-6: Sewer Design Standards

	Parameter	Element	Guideline
1	Minimum pipe diameter	Gravity sewers Connections	160mm 110mm
2	Minimum Velocity at full flow	Gravity sewers Rising mains	0,7 m/s 0,7 m/s
3	Pipe capacity	Flow level in pipe as percentage of diameter	67% at design flow
4	Minimum Gradients for Pipes	100 mm ø 150 mm ø 200 mm ø 300 mm ø and bigger	1 : 60 1 : 140 1 : 200 1 : 350
5	Pipe Materials	All pipes	uPVC Class 34
6	Connections	For Stands	110 mm uPVC with slip on couplings

Figure 4-7 below shows the typical manhole details.

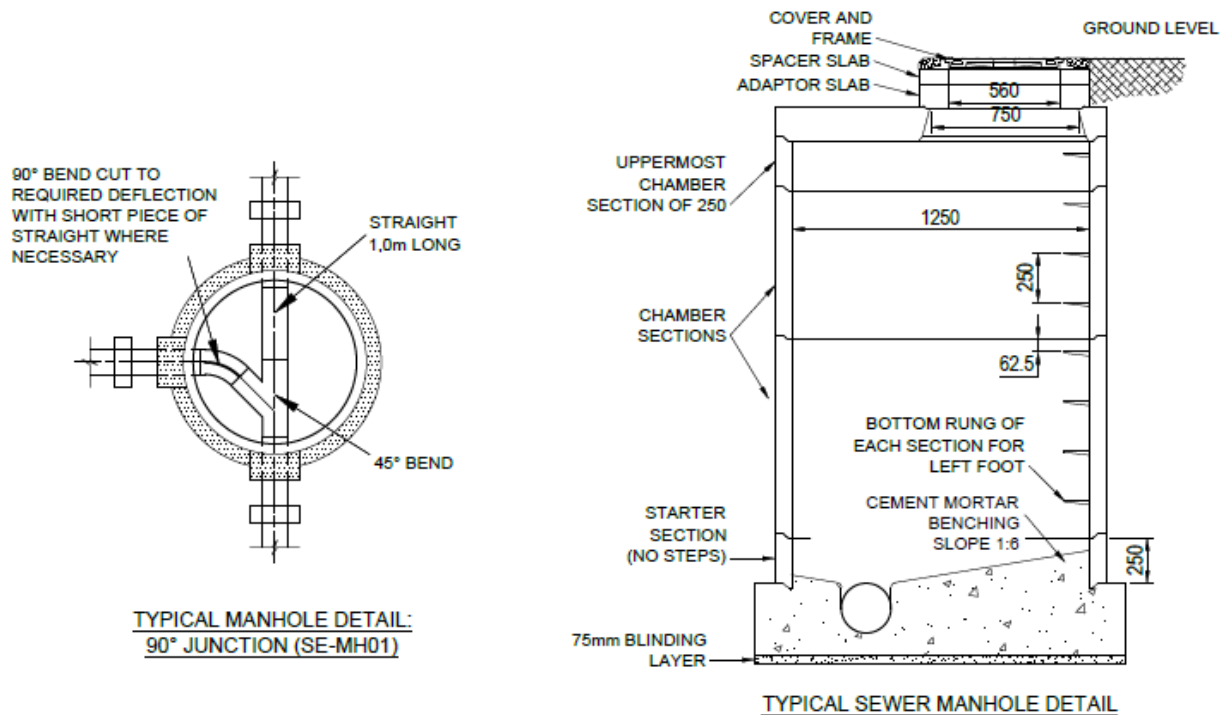


Figure 4-7: Typical Manhole Details

4.4.4 Stormwater

A Stormwater Management Plan has been compiled to properly manage stormwater in line with the requirements of the City of Johannesburg and is included in Appendix 14.6.9.

Due to the layout and topography of the site, and the constraints caused by the wetland area, as well as an Eskom Servitude running through the northern portion of the site, this plan proposes that the site be split into separate catchments and create separate attenuation ponds to manage the flow from each section.

All run-off from the site will be routed to the attenuation ponds of each respective catchment. Each catchment area drains into an attenuation pond whereby the run-off from the area is throttled to release into the wetland and buffer zone at the 1:5 year pre-developed flow. Energy dissipating structures will be constructed at each outlet to limit any erosion and encourage sheet flow into the wetland area.

In general, stormwater attenuation will make use of the following:

- Grass lined attenuation ponds;
- Use of the soccer field to attenuate stormwater and allow for ground water recharge;
- Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
- Throttled outlet structures; and
- Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.

Table 4-7: Summary of Attenuation Ponds and Comparison to pre development run off

	Attenuation Ponds						Sum	Total Site – 1:5 Year Pre- development
	1	2	3	4	5	6		
Area (m ²)	14 200	71 000	60 150	16 050	21 600	15 450	198 450	199 860
Flow out (m ³ /s)	0.082	0.070	0.309	0.079	0.096	0.059	0.695	0.71
Stored Volume (m ³)	457	1210	1185	366	290	200	3708	3574

A 450mm diameter concrete pipeline will also be put in place. This pipeline occurs within Zone 1 of the Urban Development Boundary and is thus excluded and Activity 9 of Listing Notice 1.

The proposed catchment and attenuation plan is provided in Figure 4-8. Please also see Appendix 14.3 for the A3 copies of drawings.

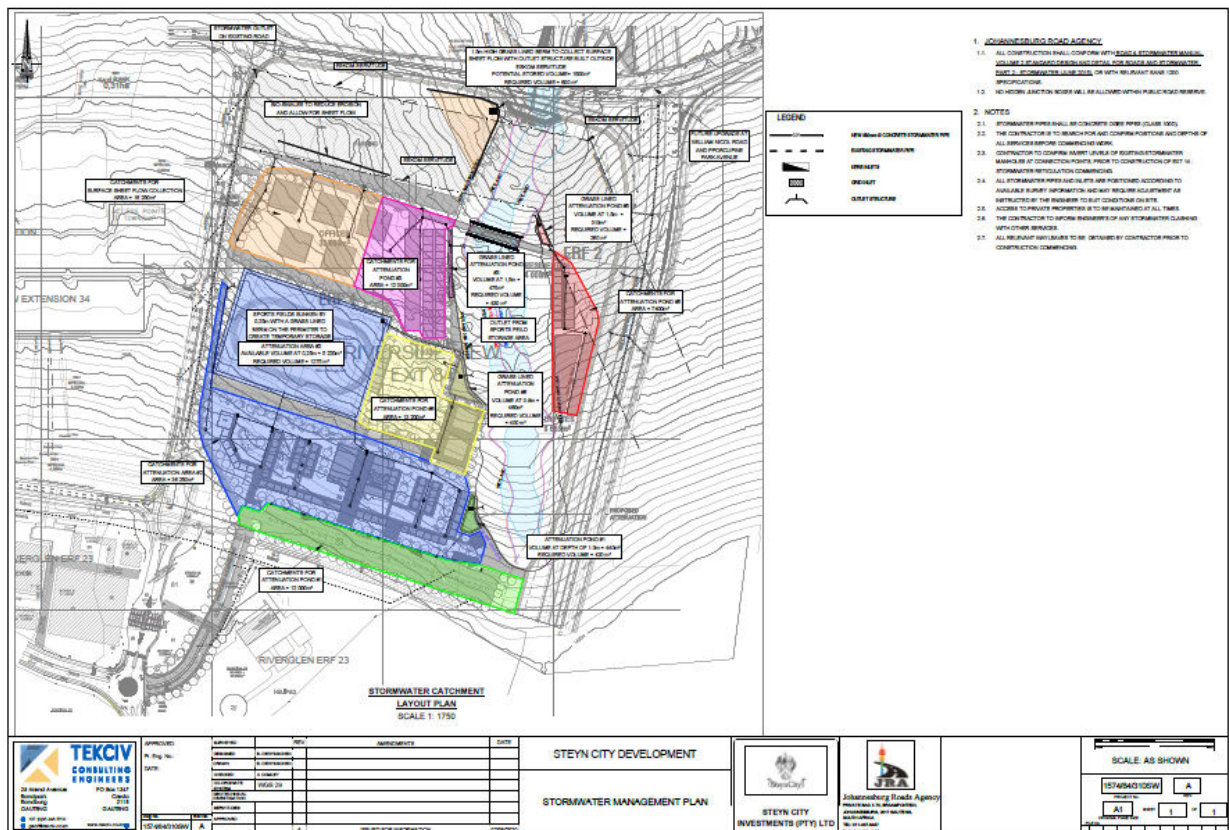


Figure 4-8: Stormwater

Comments from the City of Johannesburg Impact Management and Compliance Monitoring were received on 12 October 2020 and raised concern that attenuation only included single release points. However, it should be noted that the design was done in consultation with the wetland specialist and specifically catered

for multiple releases. Instead of creating one large attenuation pond with multiple releases, the engineers based their design on having multiple catchments within the development and each of these catchments having a specific attenuation pond and release. There are therefore six (6) separate release points along the full length of the watercourse. This mimics natural flow regimes and minimises impacts to the wetland area. Figure 4-9 has been compiled to indicate the release points and stormwater system.

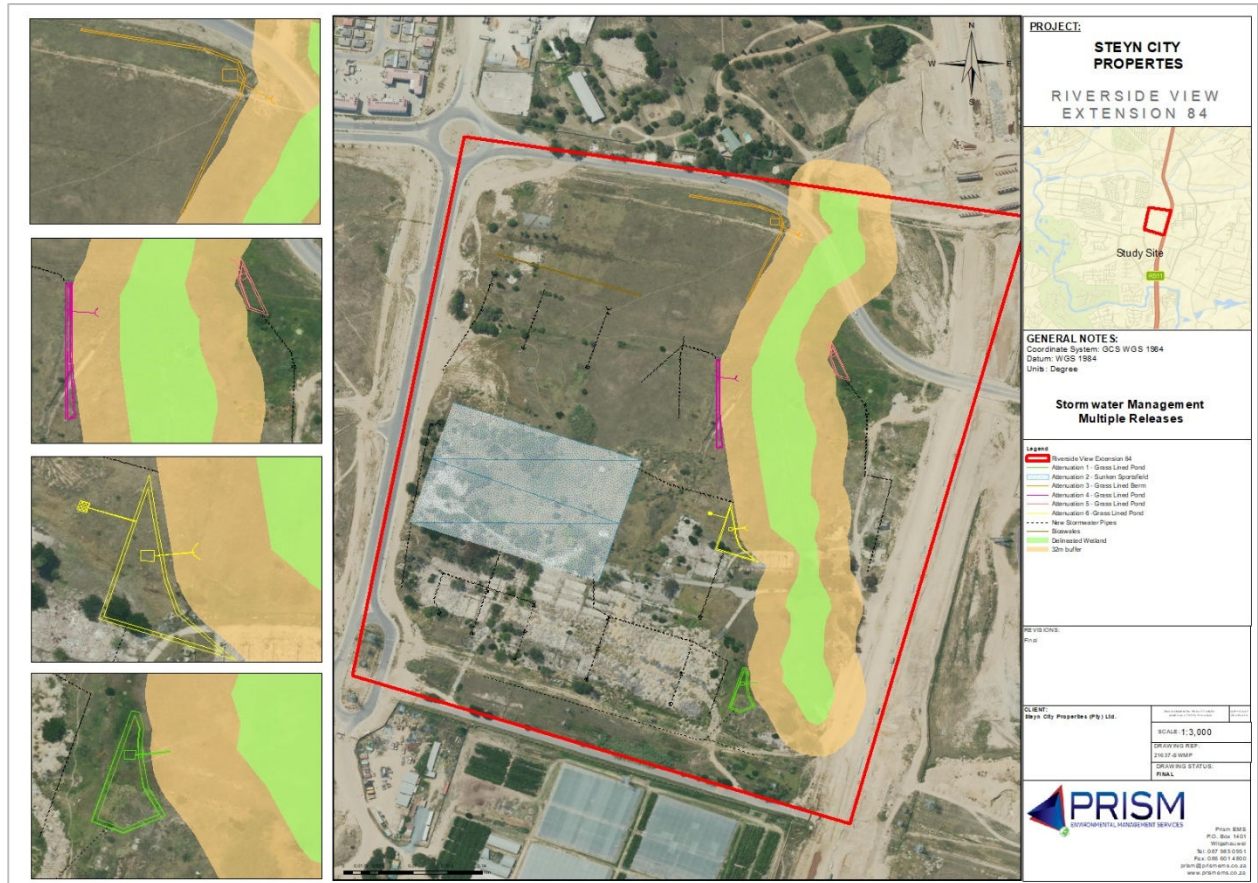


Figure 4-9: Stormwater Management System showing Multiple Releases

4.4.5 Roads and Access

Regional access to the proposed development site will be from the future Rose Road/William Nicol Interchange. The future extension of Rose Road will continue and eventually merge with the east-west road, Porcupine Park Avenue. View Road serves as the north-south link to the development. There will be 3 accesses to the development. These are as follows:

- Access off View Road
 - The access is situated on the western boundary of the property, approximately 150m south of the intersection of Porcupine Park Avenue and View Road directly opposite the Eskom substation site access.
- Second access off View Road
 - The access is situated on the western boundary of the property, approximately 300m south of the intersection of Porcupine Park Avenue and View Road directly opposite the existing Eskom substation site access.

- Southern access
 - This access will be an internal link road from the existing Steyn City. This is considered the main access to the township as a large number of trip generated by the proposed development are expected to originate from within Steyn City and will make use of this access.

The main access to the proposed development will be off View Road as indicated in Figure 4-10 whilst secondary access will be from Steyn City (to the south).

A number of internal roads will be put in place. Internal roads will not be taken over by the Local Authority and will be maintained by the Body Corporate set up as part of the development management.

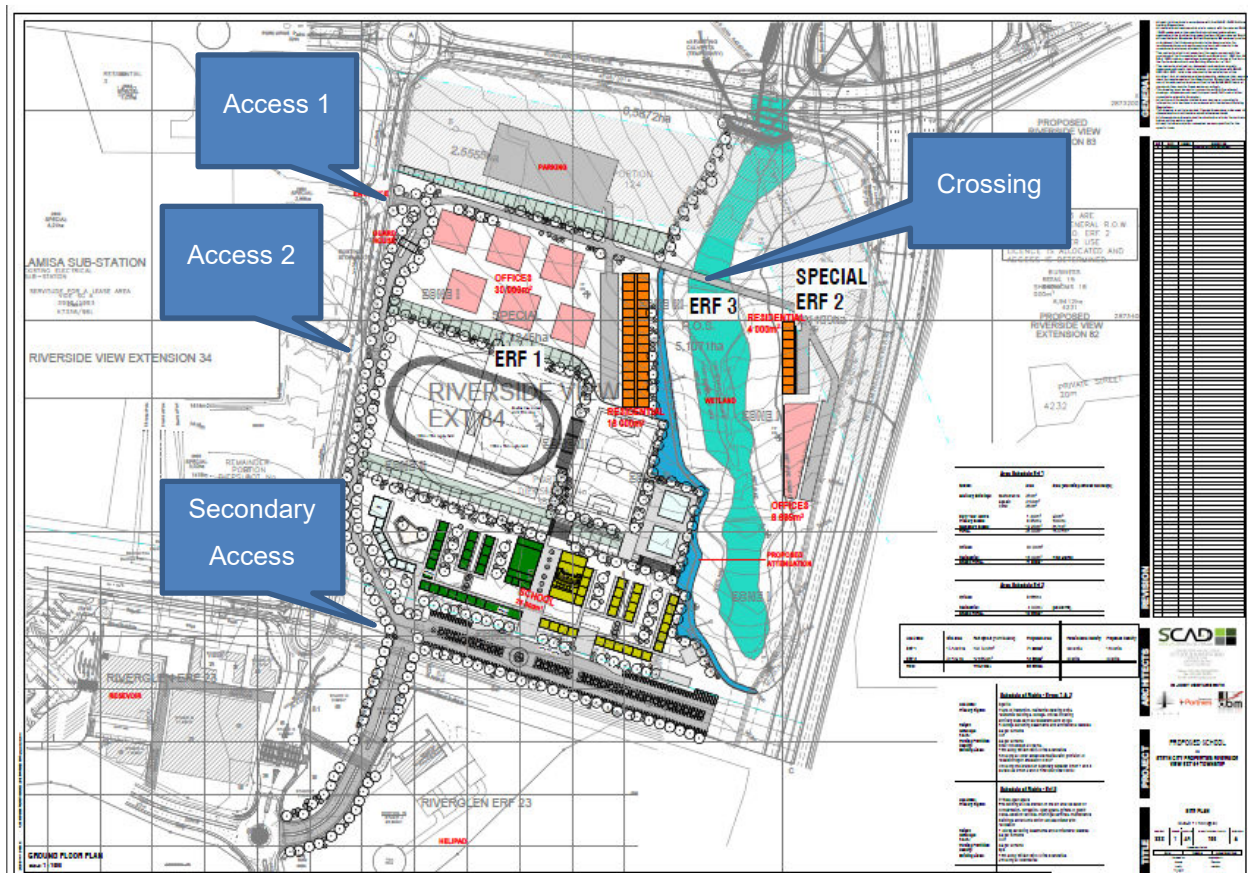


Figure 4-10: Road layout plan

4.4.6 Bridge across wetland

In order to allow access to the small erf to the east of the site, a crossing over the wetland is required. The proposed location of the crossing is also shown in Figure 4-10 above.

The proposed design of the crossing is provided in Figure 4-11 below and is also included in Appendix 14.3. This crossing will involve the development of a road-bridge which will allow for the 1:100-year flow of 8.7 m³/s to pass under the road. The bridge is to be constructed of pre-cast portal culverts and will extend

the full width of the flood line. To cater for animal crossings, smaller culverts will be placed above the flood line to all for migration.

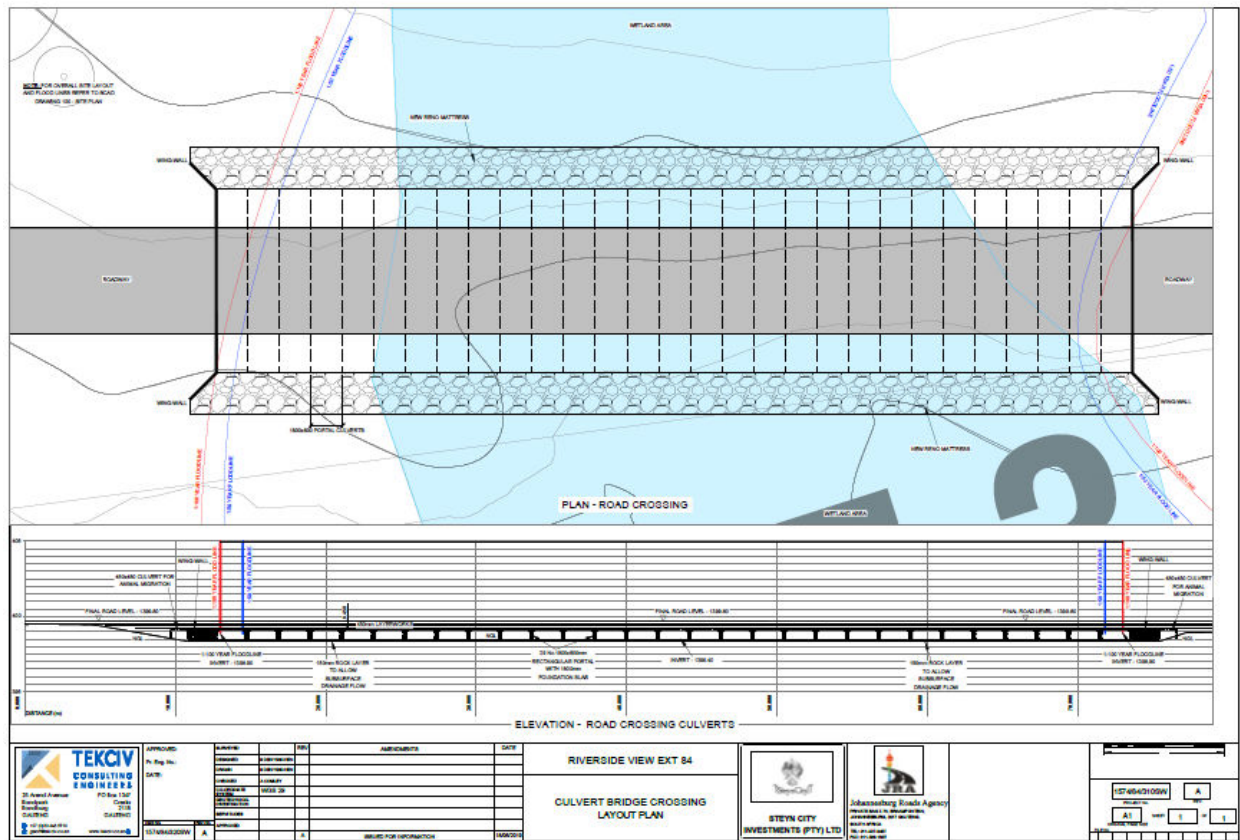


Figure 4-11: Culvert Bridge

The City of Johannesburg Impact Management and Compliance Monitoring raised concerns regarding the impact of the road crossing and recommended a span bridge. However, it should be noted that whilst conceptually a span bridge appears to reduce the impact, this is more in relation to riparian areas. From discussions with the Wetland Specialist and Engineers, it should be noted that due to the nature of the wetland and surface flows, the pillars would need to be sunk to a level were a greater impact would be experienced. Instead, the engineers (in consultation with the specialist) have recommended a culvert which rests on a “raft” of stone which will allow for continued subsurface flow and avoid intersection with the lateral interflow. This reduces the impact to the wetland and wetland habitat. **A span bridge is therefore not recommended from a wetland perspective.**

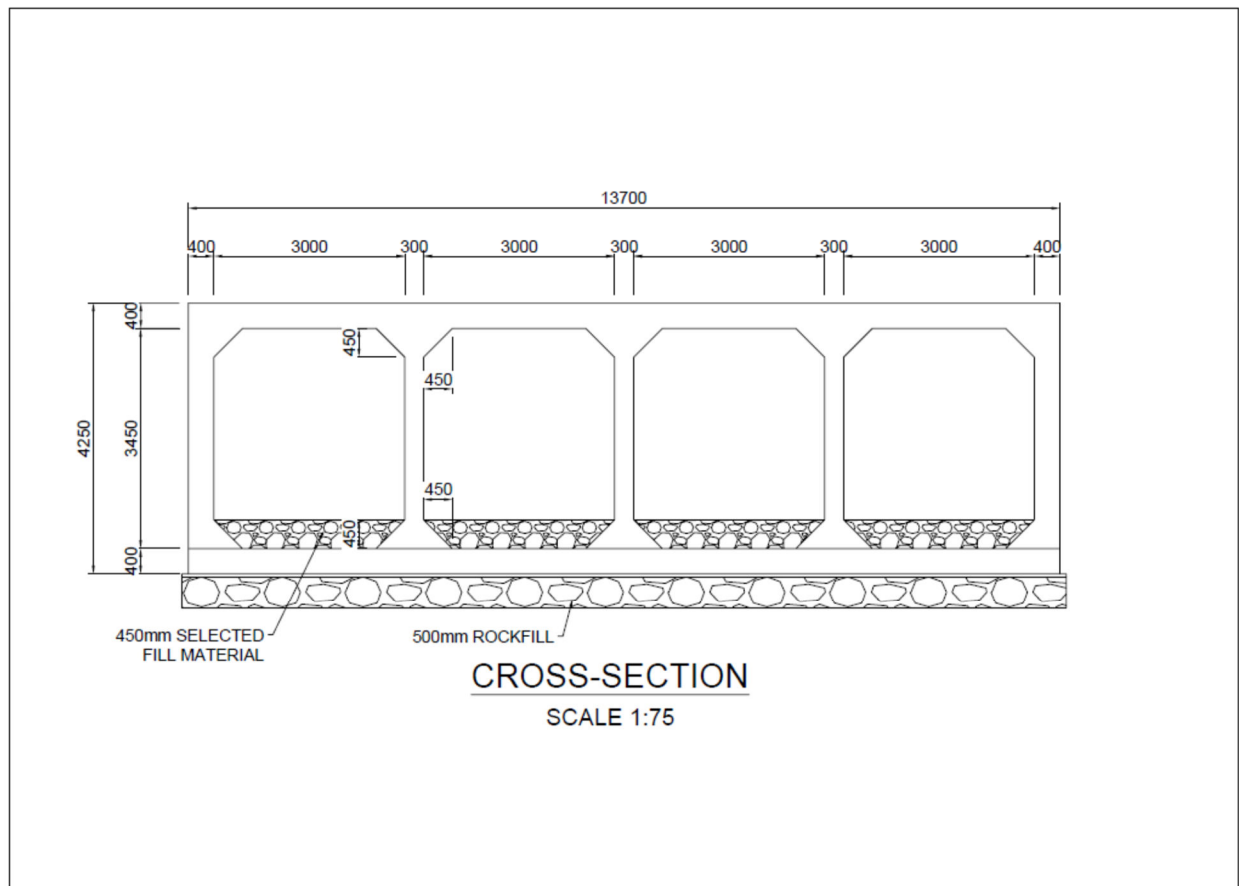


Figure 4-12: Typical Cross-Section Design Principles

4.4.7 Electrical Capacity

The proposed development will require approximately 6 MVA capacity. Eskom has confirmed that capacity is available. Eskom Transmission has also confirmed that the site is affected by the proposed Kyalami-Lulamisa 400 kV powerline servitude which is 110m wide. The servitude has been taken into account in the development layout. Eskom’s requirements will also be incorporated into the EMPr.

4.4.8 Timeframes

The proposed development will be constructed according to the following preliminary timeframes, see Table 4-8:.

Table 4-8: Operational hours for construction phases.

Period	Open	Close
Weekdays	07:00	18:00
Saturdays	07:00	15:00
Sunday	Only when required	
Public holidays	Only when required	

4.4.9 Ancillary Infrastructure Required for Construction

No major infrastructure is required on site for the construction of the development. The required ancillary infrastructure for the purposes of supporting services is discussed below.

4.4.9.1 Security

A construction camp will be erected on site for the duration of the construction. This camp will be fenced for security purposes. A security guard will also be posted on site during non-operational times. A wall will be erected around the property boundary as part of the development project.

4.4.9.2 Sanitation

During the construction phase of the project, chemical toilets will be placed on site for the duration of the construction phase.

4.4.9.3 Construction Camp and Laydown Areas

Designated areas will be established during the construction phase for construction equipment and vehicles. This area will be outside all sensitive areas (delineated wetlands etc.).

4.4.10 Operational Timeframes

The proposed development involves the development of a school. Operational hours of the school will vary during different times of the year and for special occasions (sporting events, school plays etc). In general, however, operational activities will be as follows:

Table 4-9: Operational hours for operational phases.

Period	Open	Close
Weekdays	06:00	18:00 except for special occasions
Saturdays	06:00	15:00 except for special occasions
Sunday	Only when required	
Public holidays	Only when required	

It should be noted that the development will also have a residential component as well as offices.

4.5 Project Lifecycle

To adequately consider the impacts associated with the proposed development, the major activities during each phase of the project life-cycle are listed below:

- Feasibility Studies
 - Technical, economic and environmental screening of alternatives;
 - Development of Outline Scheme Report;

- Geotechnical Assessment; and
- Environmental Authorization and WULA process.
- Pre-construction Phase
 - Detailed layouts and services designs;
 - Procurement process for Contractors; and
 - Procurement of other necessary materials.
- Construction Phase
 - Appointments and site camp set up:
 - Appoint Environmental Control Officer;
 - Set up site camp with temporary offices and administrative facilities;
 - Set up ablutions;
 - Set up access control, security; signage and lighting;
 - General materials storage and laydown areas
 - Construction employment;
 - Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility); and
 - Temporary waste storage areas; these shall be established and managed in accordance with EMPr requirements.
 - Sourcing of construction materials and equipment:
 - All bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources.
 - Excavation and earthworks
 - Removal of existing surfacing material where necessary (concrete, asphalt etc.) which could involve excavation below ground level;
 - Levelling and compaction using heavy machinery / earthmoving equipment.
 - Potential for excavations and trenching in order to lay of below ground level equipment (cables, pipes, sumps, drainage etc.);
 - Construction work within the existing dams;
 - Potential for excavation dewatering in the event of water-table interception;
 - Use of general mechanical equipment within construction areas (generators, cutting and welding equipment, compressors etc.).
- Operation Phase:
 - Operation of service facilities;
 - Maintenance of infrastructure;
 - School, residential and office uses and associated activities .
- Decommissioning Phase
 - Decommissioning of the development and associated services is not envisioned. However, should decommissioning be required the activity will need to comply with the appropriate environmental legislation and best practices at that time.

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Section 3(h) of Appendix 3 of the 2014 EIA Regulations, requires that the EIA Report includes information on the *environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects*. In line with this, and in order to understand how the environment will be affected by the proposed development, the following section provides an overview of the receiving environment. Where necessary, this section includes information obtained from the specialist studies on the baseline conditions.

5.1 Local Climate

The climatological data for the Chartwell area is provided below.

5.1.1.1 Temperature

The climatological data for the Chartwell area (which is approximately 4km east of the study site) is provided below. In terms of temperature, average temperatures for the period 2009 to 2020 ranged between 21°C and 29°C in summer and between 9°C and 18°C in winter (www.worldweatheronline.co.za) (Figure 5-1).

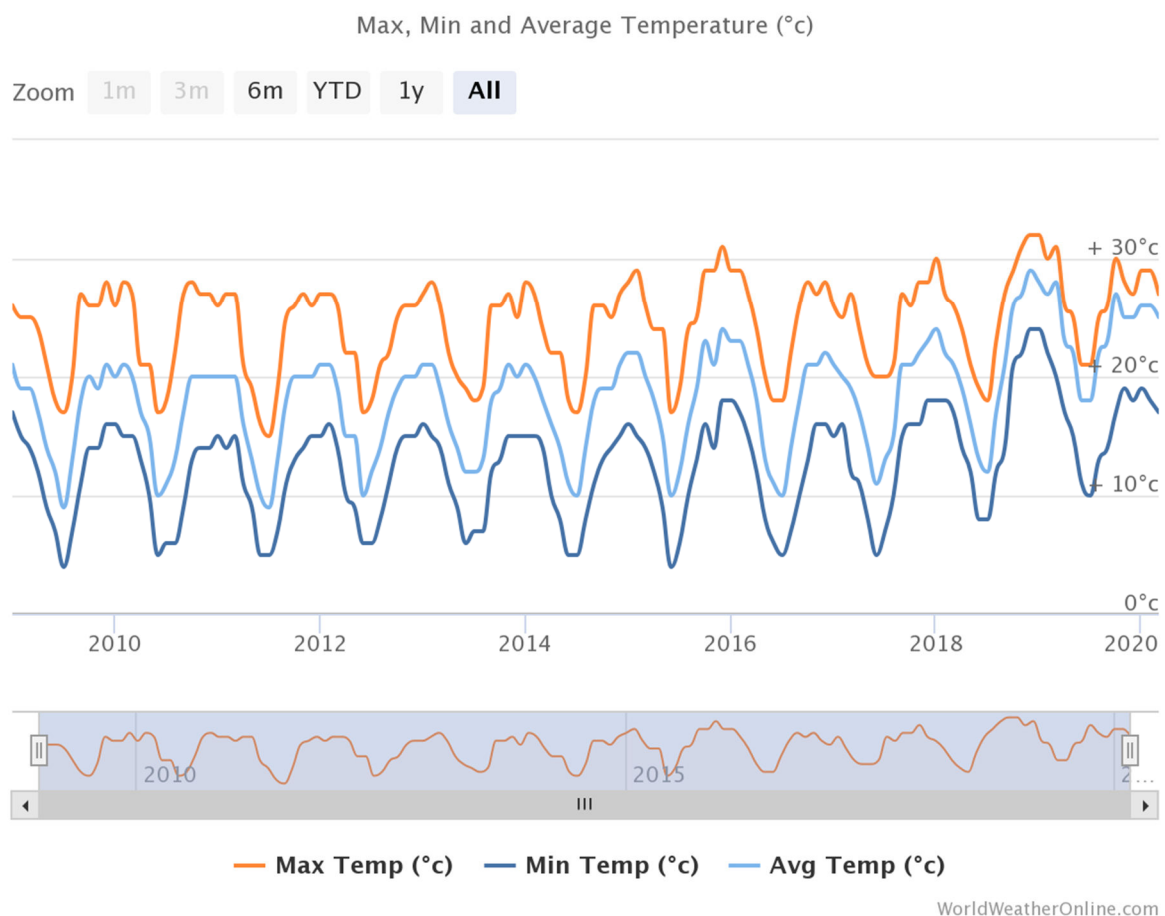


Figure 5-1: Minimum, Maximum and Average Temperatures for Chartwell, Gauteng (www.worldweatheronline.co.za).

5.1.1.2 Rainfall

The City of Johannesburg is located in a summer rainfall region and rainfall typically occurs in the form of late afternoon showers during October to April. The annual average rainfall is 713 millimetres, mostly concentrated in the summer months (City of Johannesburg, 2009). Figure 5-2 below shows the average rainfall in Chartwell, Gauteng for the period 2009 to 2020.

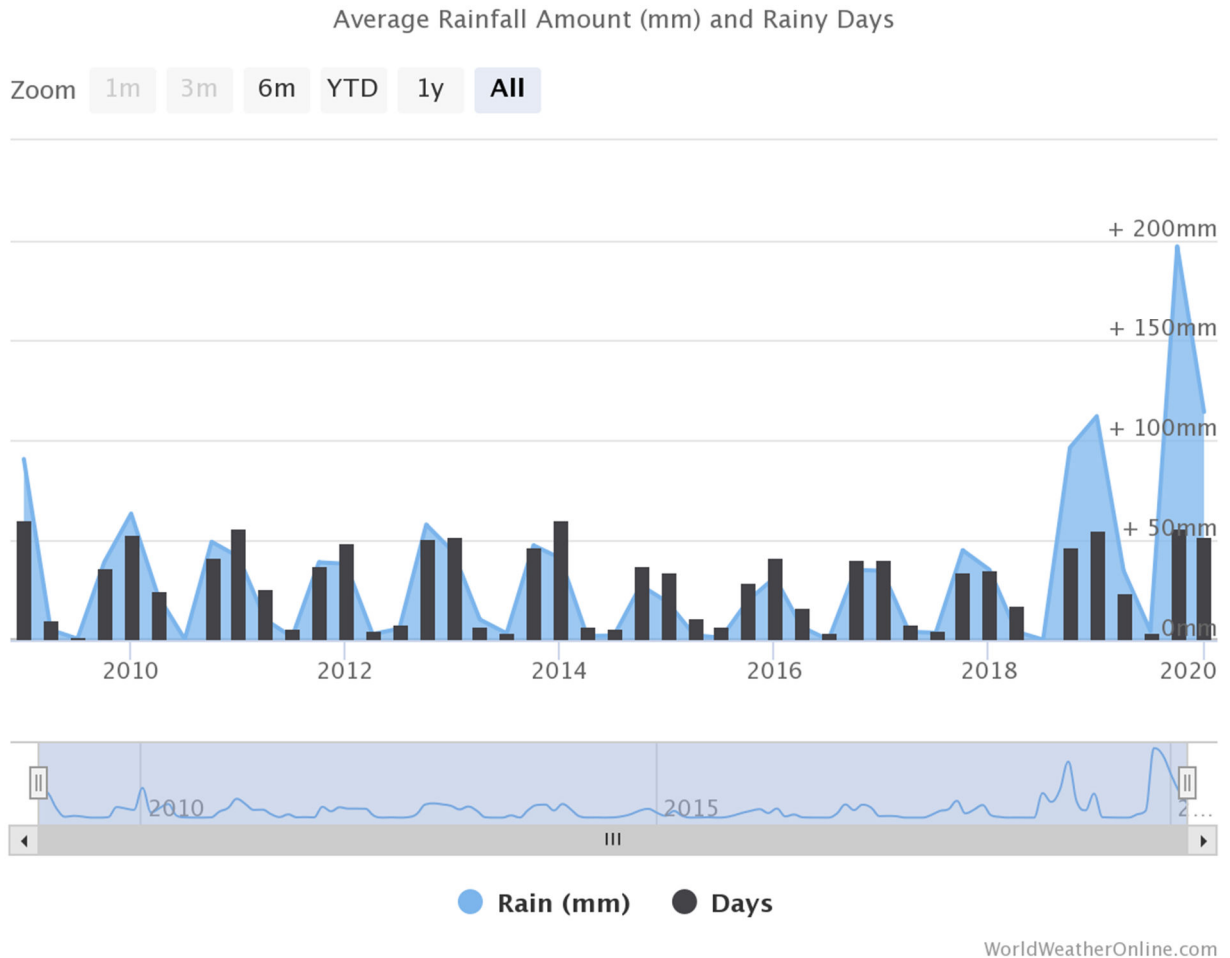


Figure 5-2: Average Rainfall Amount (mm) and Rainy Days (World Weather Online)

5.1.1.3 Wind

Data for average and maximum wind speeds in the area between 2009 and 2020 is between 5.5 kmph and 14 kmph (Figure 5-3).

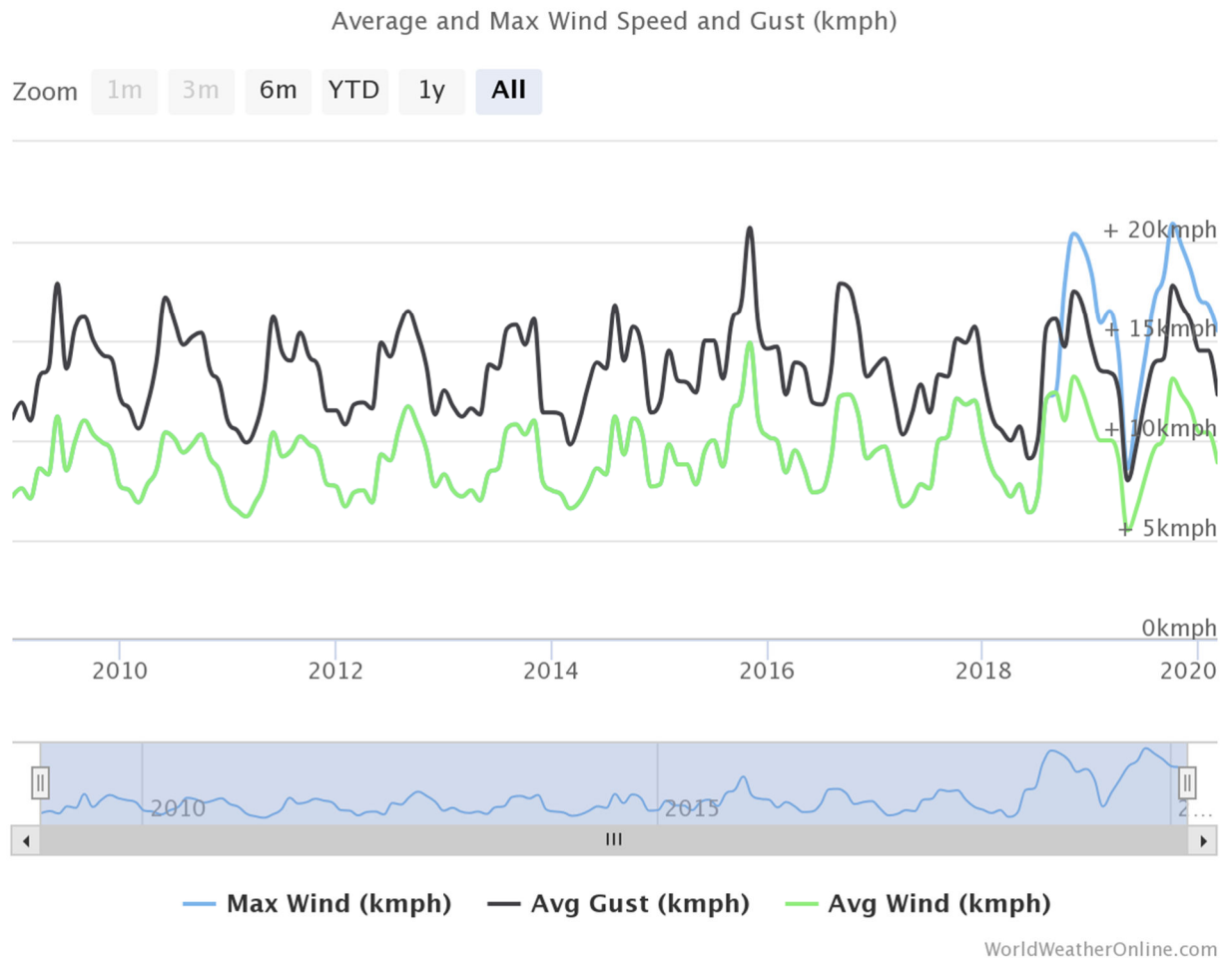


Figure 5-3: Average and maximum wind speeds and gusts (World Weather Online)

5.2 Topography

The Site is located between approximately 1422m and 1392m above sea level. The general slope direction is towards the north with an elevation difference of 30m with an average gradient of 1: 20 sloping towards a natural low point located to the north of the site.

The 5m contours of the site are provided in Figure 5-4.

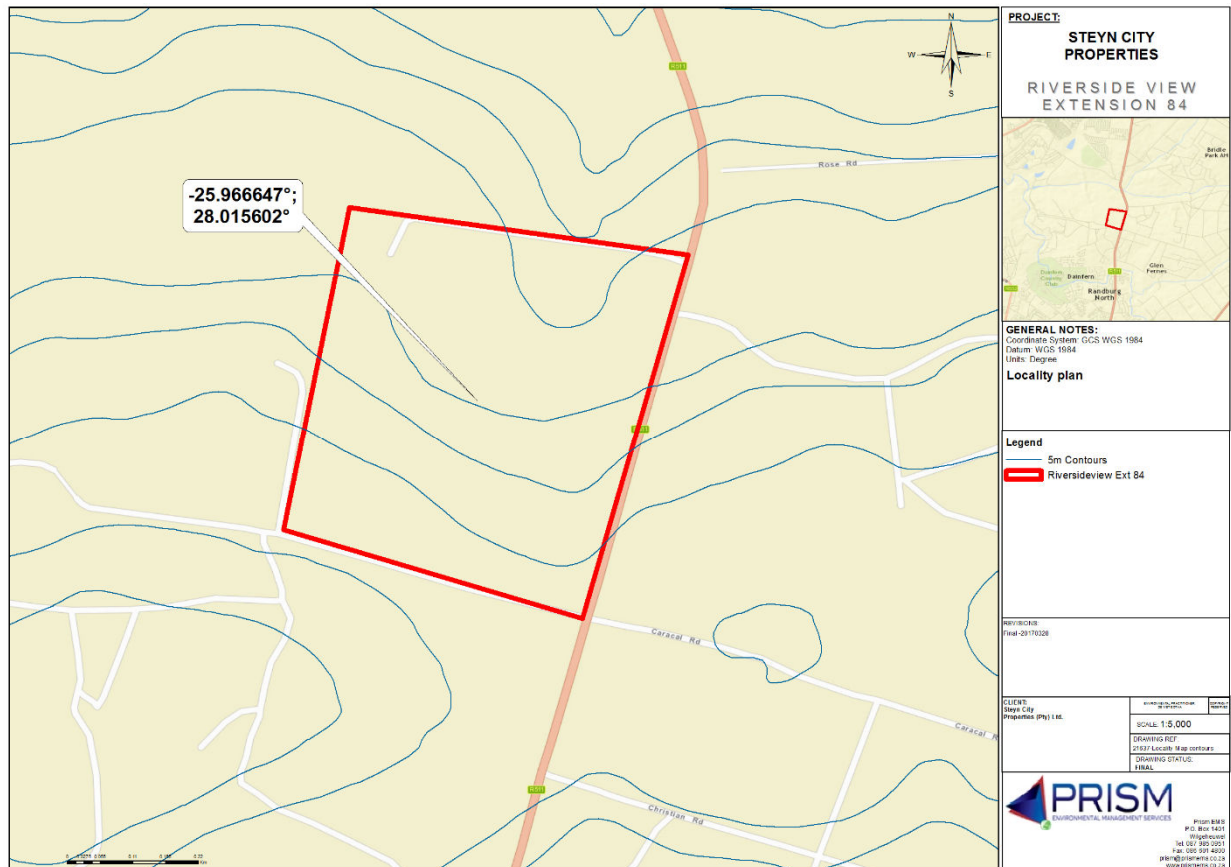


Figure 5-4: 5m Contours

5.3 Geology and Soils

Prism EMS utilized the Geology layers from the Council of Geosciences to produce maps showing the Chronostratigraphic layer. The proposed development is located on Pink-weathering granular or augen quartz-feldspar gneiss (Figure 5-5).

Furthermore, a Geotechnical Assessment for Portion 124 and 185 were undertaken separately (Van Rooy, 2010) (Van Rooy, Report of Phase 1 Geotechnical Site Investigations on Portion 124 of the Farm Diepsloot 388 JR, Johannesburg, Gauteng Province, 2011) and the following can be noted:

- Portion 124
 - The site is underlain by granite-gneiss and granite of the Johannesburg Granite Dome;
 - Due to historic site modifications, the natural soil profiles are somewhat disturbed. The areas that are less disturbed are generally covered by transported soils with an average thickness 0.3m;
 - The topsoil in the area is moist, dark brown, loose, intact clayey silty sand, with coarse quartz gravel.
 - The residual granite profile occurring from an average of 0.5m is slightly to very moist, grey to greyish brown mottled orange and black, medium dense intact clayey sand with Fe and Mn Nodules.
 - Groundwater seepage was only encountered on one test pit.

- Portion 185
 - The site is underlain by granite-gneiss and granite of the Johannesburg Granite Dome;
 - Due to historic site modifications, large areas are underlain by fill and some areas are cut platforms. Test pits could not be positioned in most of the modified areas and the nature of the cut platforms and fills are not known.
 - Thin unnatural material referred to as “fill” covers parts of the undeveloped areas on site. Average thickness is 0.16m and it varies from sand to ash clinker.
 - The natural profiles comprise of transported soils overlying residual granite or well developed ferricrete horizons.
 - The colluvium is generally dry, brown to grey, loose, intact, silty sand with quartz gravel and Fe and Mn nodules in some parts with abundant roots. The average thickness of this horizon is 0.28m.
 - The residual granite profile occurring from an average depth of 0.3m is dry, greyish, white with orange discolouration, dense, pinholed, silty sand.
 - Groundwater seepage was only encountered on one test pit.

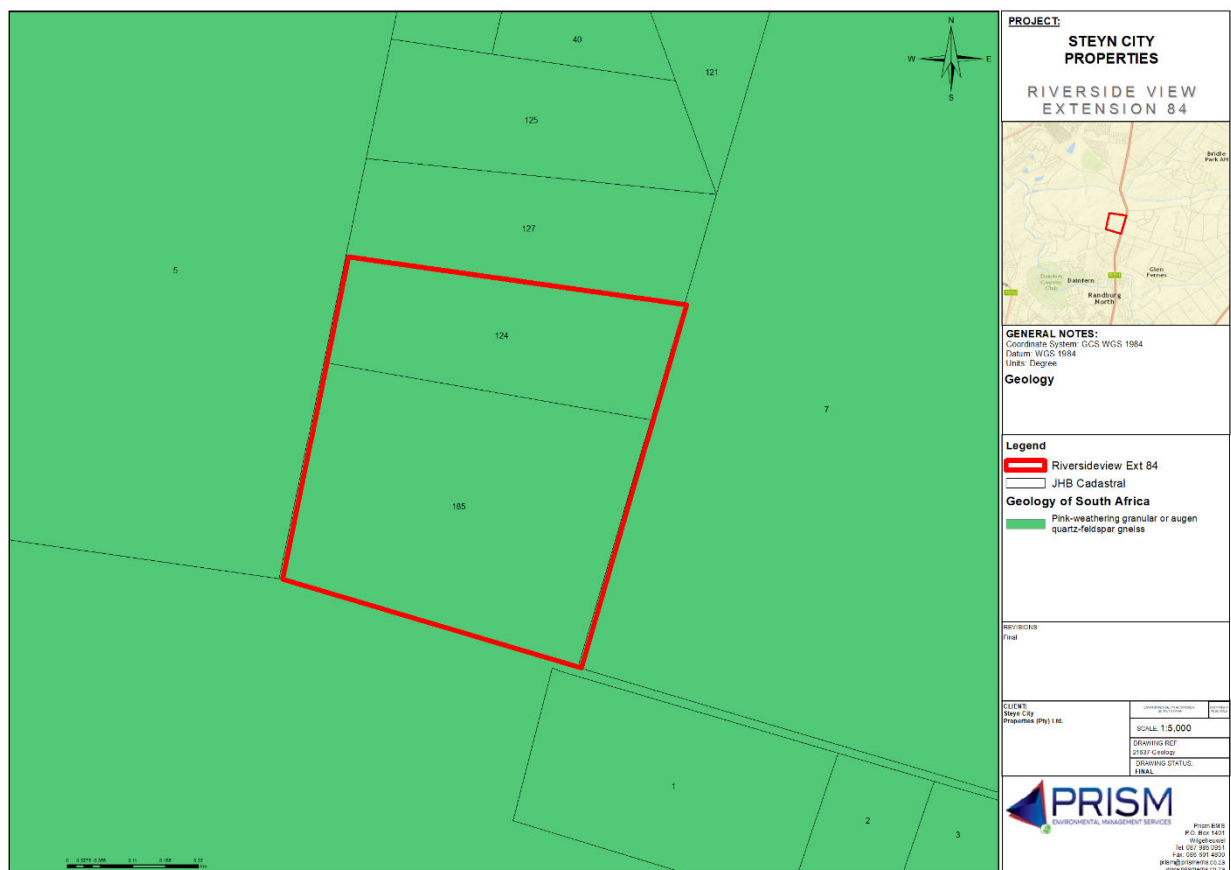


Figure 5-5: Geology

5.4 Land Use

The site is currently vacant. A school and builders' yard were previously operational but have since been demolished.

5.5 Agricultural Potential

According to the Gauteng Agricultural Potential Atlas IV, the site has low to moderate agricultural potential. No agricultural activities currently take place on site (Figure 5-6).

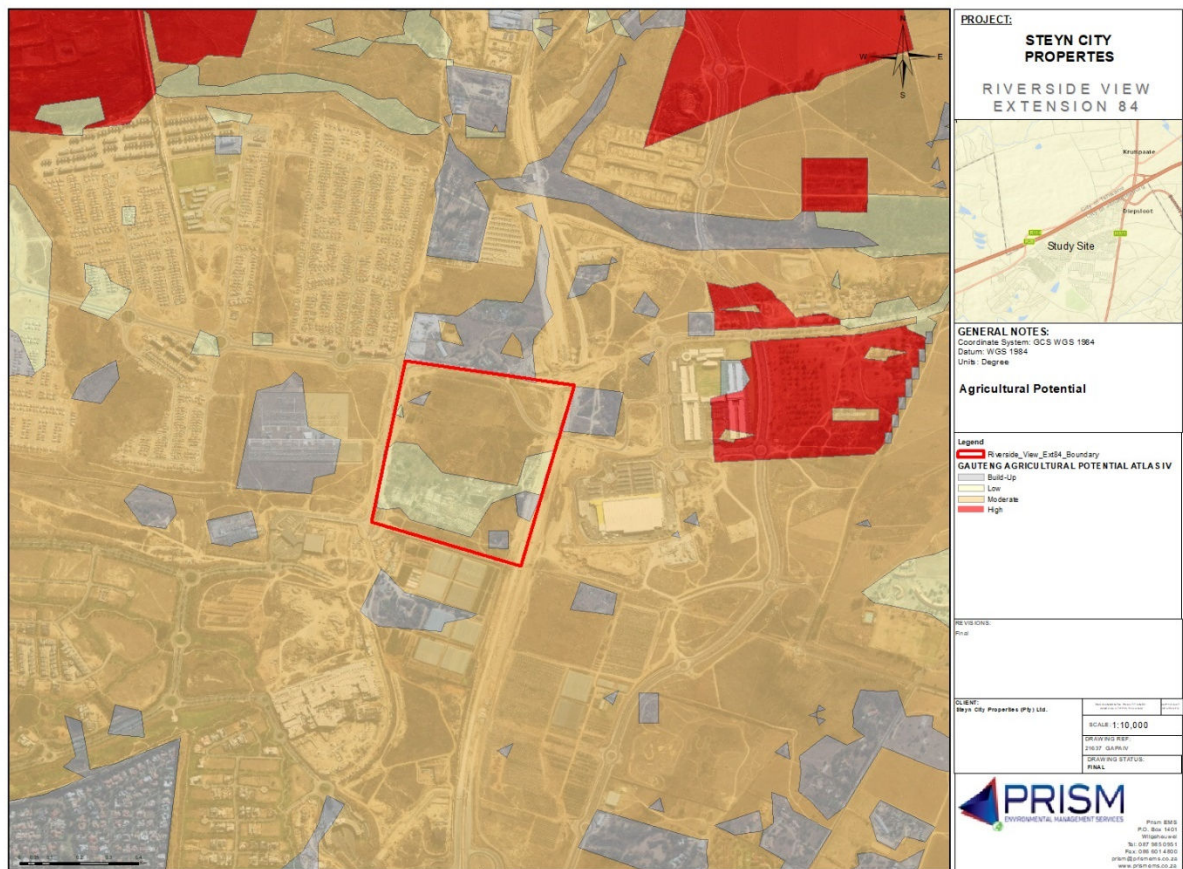


Figure 5-6: Agricultural Potential

5.6 Existing and Available Services

5.7 Existing and Available Services

5.7.1 Water

A water reticulation master plan was prepared for the Diepsloot Corridor Development by GLS for Johannesburg Water. Riverside View Ext 84 falls within the Diepsloot Reservoir Supply Zone. The Diepsloot Reservoir is supplied with a connection to the Rand Water supply line (RW33). The higher lying portion of Steyn City (Riverglen Extensions), portions of Riverside View Ext 34 and the proposed Riverside View Ext 84 are to be supplied from the Diepsloot Reservoir via the Dainfern PRV. A portion of the existing Dainfern, Diepsloot South and areas east of the R511 are also supplied from this PRV.

In order to supply water to Riverside Extension 84 a connection to the existing Diepsloot Reservoir Supply zone will be required. This connection should be located downstream of the Dainfern PRV.

5.7.2 Sewer

The proposed Riverside View Extension 84 falls within the Diepsloot North Drainage Zone as described in the JW Masterplan for the Diepsloot Corridor Developments. The site drains towards the existing Bruma Outfall which is located to the north of the site (Figure 5-7: Diepsloot North Drainage Zone Figure 5-7). The Bruma Outfall Sewer drains towards the Northern Outfall Sewer eventually terminating at the Northern Waste Water Treatment Works.

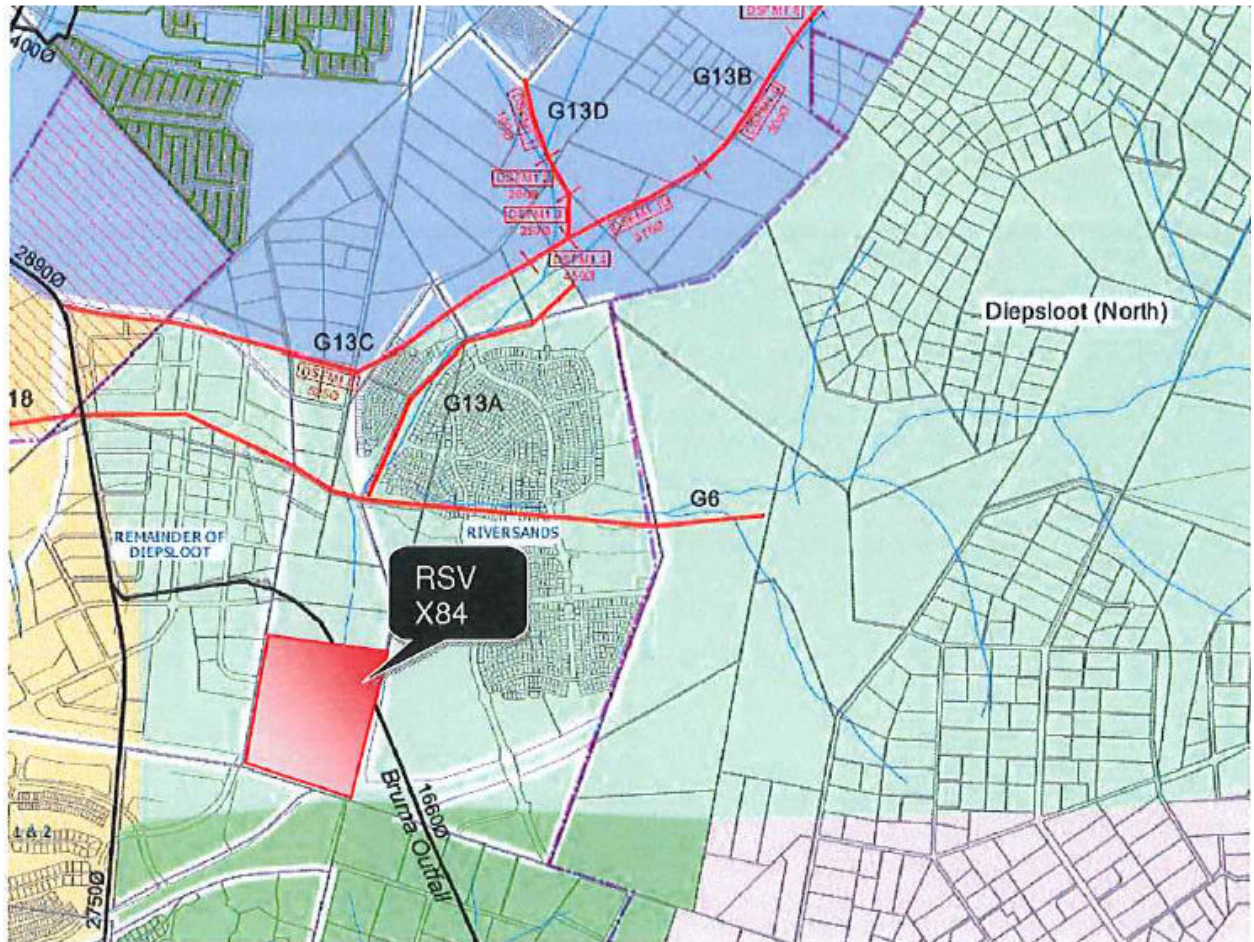


Figure 5-7: Diepsloot North Drainage Zone

As part of the development of Riverglen Erf 23, a 200mm diameter sewer line was constructed within the road reserve of View Road. This sewer pipeline connects to existing Bruma Outfall Sewer. Provision has been made for a future connection from Riverside View Ext 84 onto this sewer pipeline.

5.7.3 Stormwater

Existing stormwater systems are present within the areas surrounding the proposed development. The general catchment drains towards the perennial wetland area. View Road acts as a stormwater cut-off for stormwater from Catchment Area 4, with some external stormwater being discharged onto the site by means of an existing underground piped stormwater system. This pipe system daylight at the intersection of Porcupine Park Ave and View Road and discharges stormwater into a shaped earth channel towards the natural wetland.

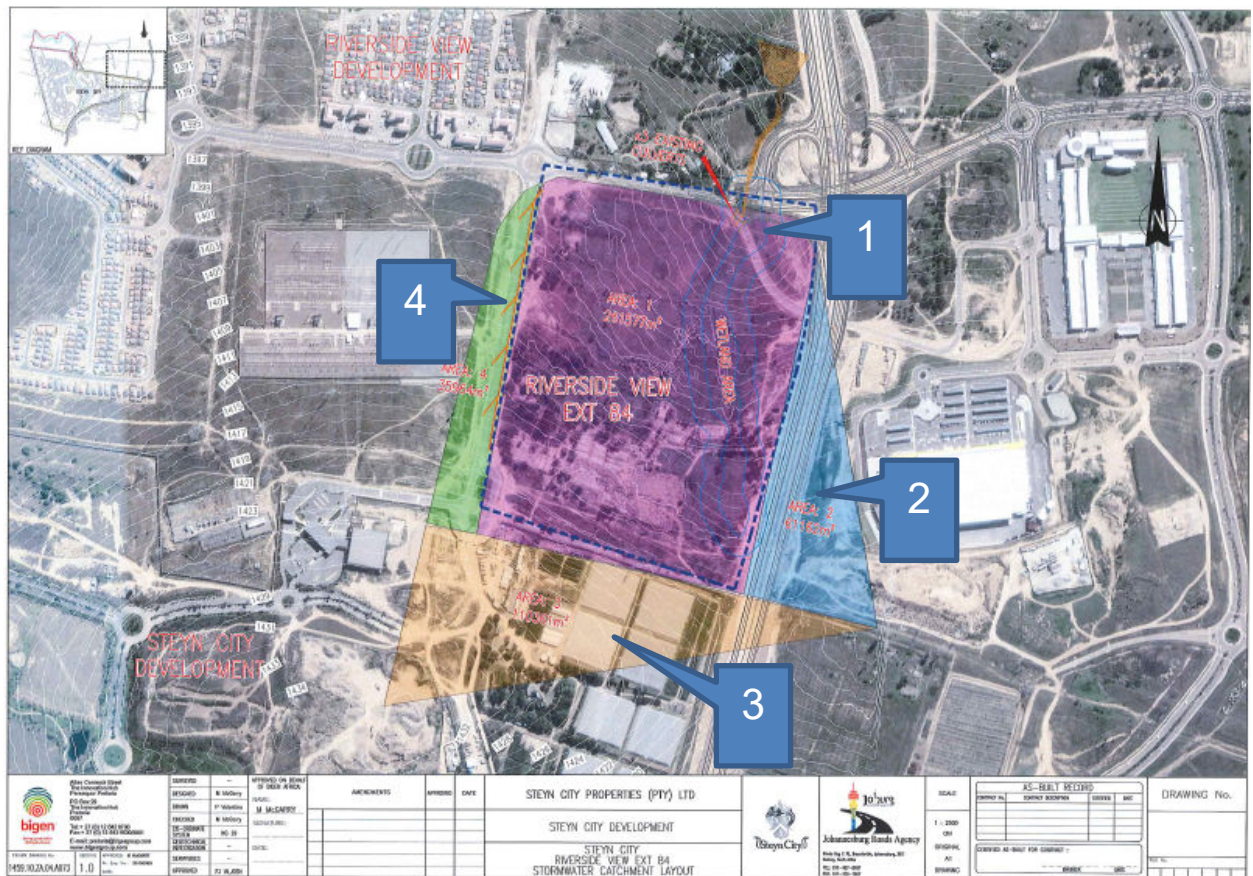


Figure 5-8: Catchments

External stormwater from Catchment Area 2 is cut-off by William Nicol Drive. Given that this road is a Provincial Road, the road will not serve as part of the Stormwater system and stormwater will be discharged onto adjoining properties. Provision should be made to during detail design to accommodate this additional run-off.

External stormwater from Catchment Area 3 originates from within the Steyn City Development. This catchment area drains towards Steyn City Boundary Wall and is discharged at the intersection of Zeven Road and William Nicol Dr into a pipe culvert and thereafter enters the proposed site as overland stormwater run-off.

Stormwater currently drains towards the natural low-point on the site. The temporary deviation of Porcupine Park Ave. acts as a stormwater cut-off and stormwater run-off is channelled through a series of 3 existing 600mm diameter pipe culverts which cross Porcupine Road and discharge stormwater into the area earmarked for the future Rose Road Interchange. Once the Interchange has been completed a new bulk stormwater system will be constructed to discharge stormwater from Riverside View Ext 84 and associated areas underneath the Interchange and eventually terminating in the Wetland area located north of the future Interchange.

5.8 Roads

Due to the fact that the study area as a whole is being developed, a number of future roads are planned as part of separate developments. These have been discussed below however, **it should be noted that these new roads do not form part of the proposed Riversideview Extension 84.** An overview of future and existing roads is provided in Figure 5-9.

The proposed Riversideview Extension 84 is adjacent to William Nicol Drive (R511) to the east. Zeven Street occurs to the south of the proposed site. An existing temporary road (part of Porcupine Park Avenue) crosses the north-east of the site. However, this is likely to be replaced by a new interchange that is currently being constructed to the north of the site (Rose Interchange).

To the east of the site is View Road. Two accesses to the site will be taken off View Road.

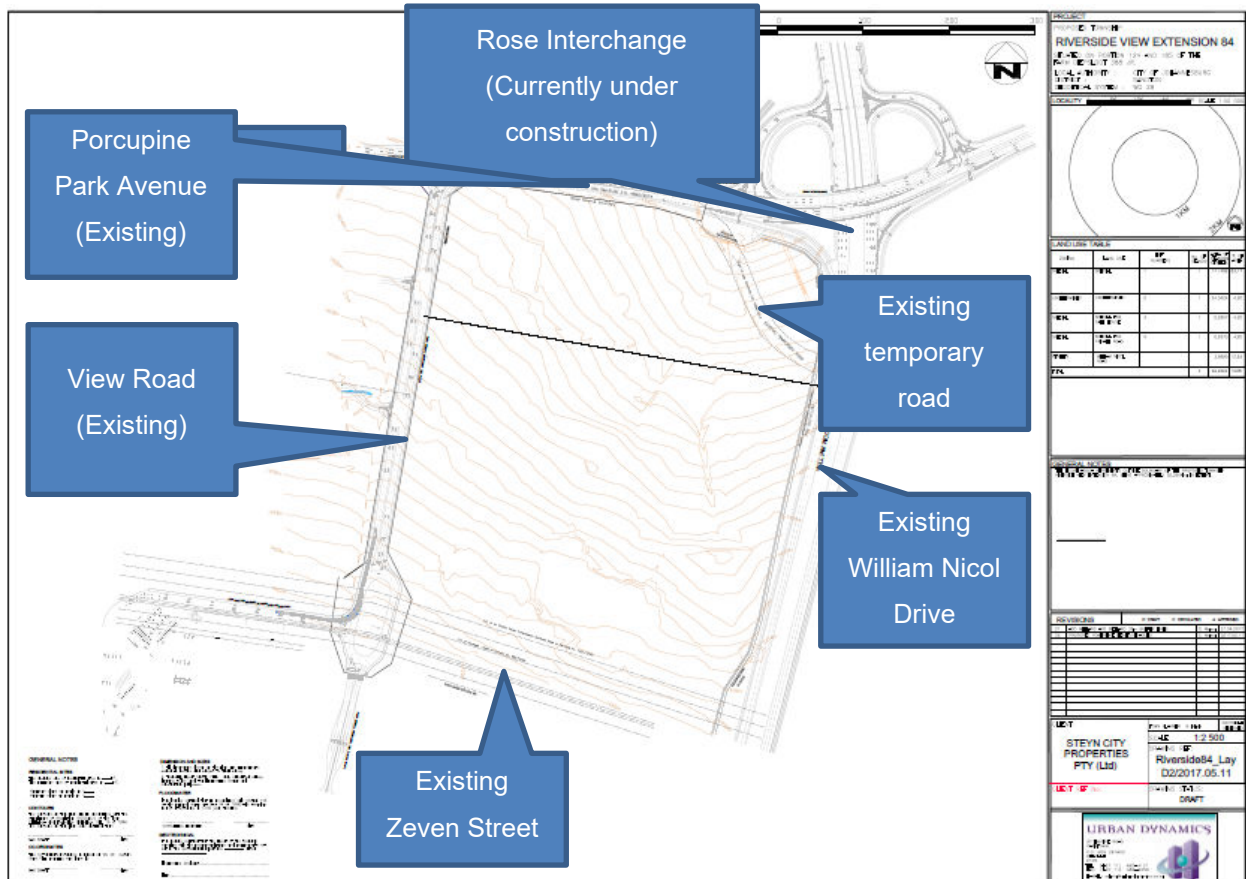


Figure 5-9: Future and existing roads

5.9 Socio-Economic Environment

5.9.1 City of Johannesburg Socio-Economic Environment

The proposed development occurs within the City of Johannesburg in Gauteng. A summary of the socio-economic environment for the City of Johannesburg (obtained from StatsSA) is included below.

The City of Johannesburg Local Municipality is situated in Gauteng province and covers an area of 1 645km². The City is the provincial capital of Gauteng, the wealthiest province in South Africa. According to Census 2011 information, the area has a total population of 4,4 million of which 76,4% are black African, 12,3% are white people, 5,6% are coloured people, and 4,9% are Indian/Asian.

Figure 5-10 below shows that the majority of people in the area have either some primary school education (33.6%) or secondary education (30%). Only 20.8% of the population has completed secondary school and an even smaller percentage (5.3%) have higher education (Stats SA, 2017).

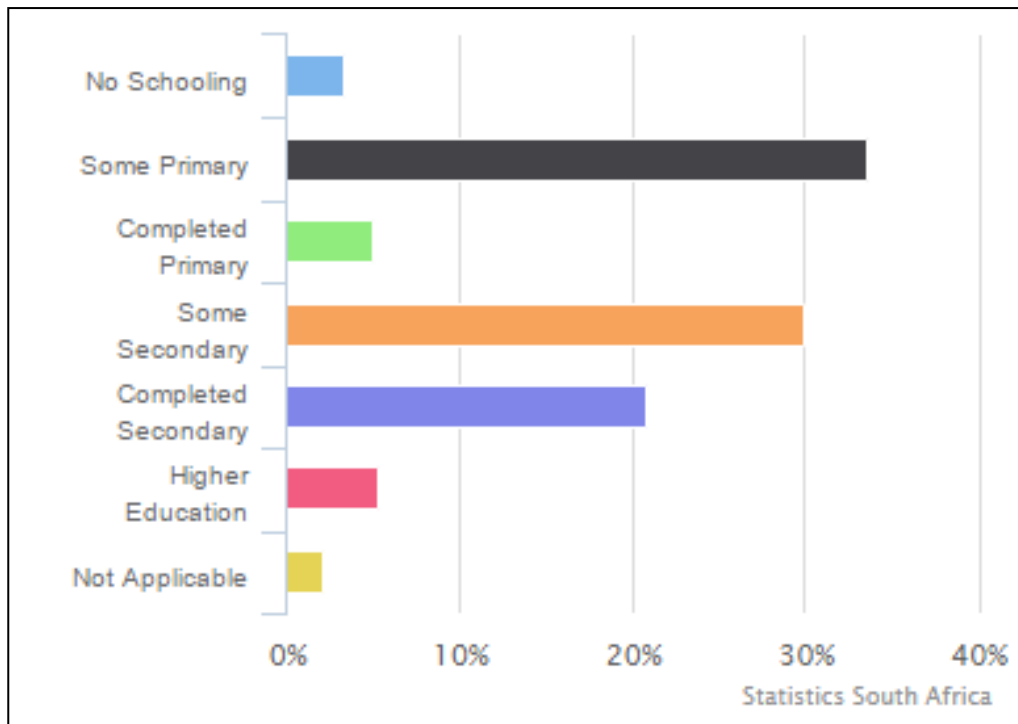


Figure 5-10: Highest Education Level (All Ages) (Stats SA, 2017).

Approximately 72.7% of the population are at a working age (15-64). Of those, approximately 52.6% (1 696 520 people) are employed (Figure 5-11). The unemployment rate for the area is 25%. Of the 1 228 666 economically active youth (15–35 years) in the area, 31,5% are unemployed. In terms of living conditions, there is 1 434 856 households in the municipality with an average household size of 2,8 persons per household. 64,7% of households have access to piped water, 26,9% have water in their yard and only 1,4% of households do not have access piped water (Stats SA, 2017).

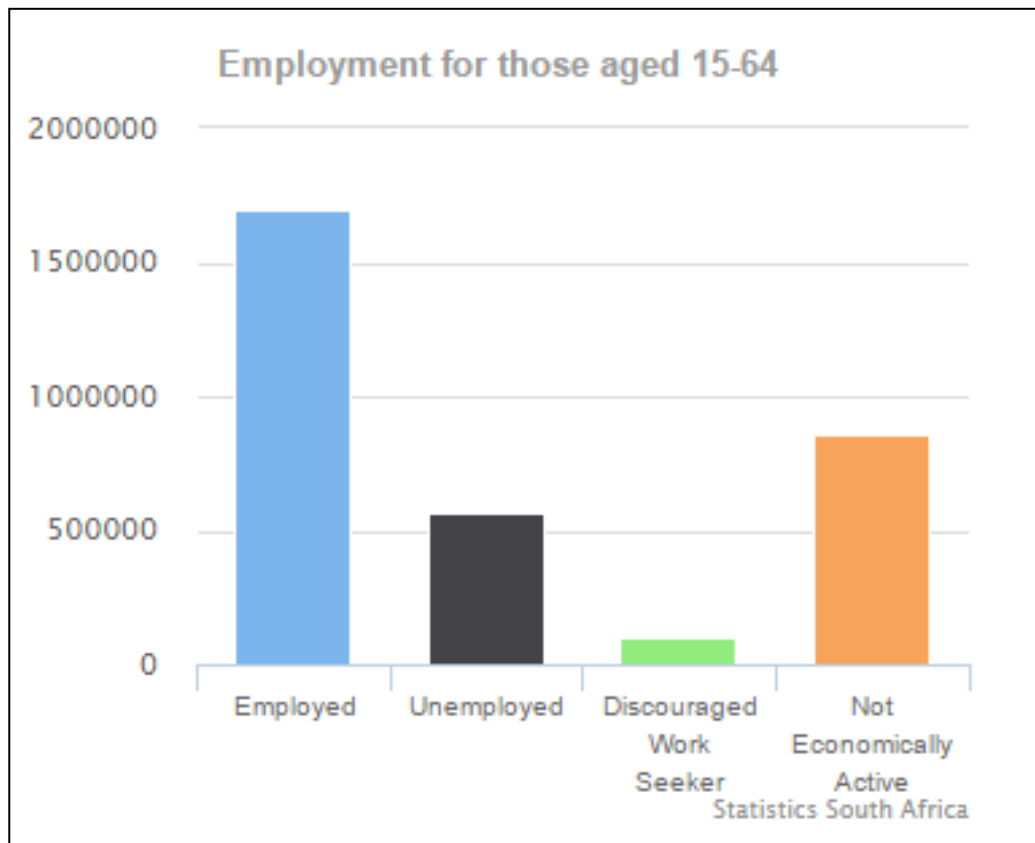


Figure 5-11: Employment for those aged 15-64 (Stats SA, 2017)

In addition to the above, the following planning documents and frameworks apply to the area and are discussed in more detail in the following subsections:

5.9.2 Regional Spatial Development Framework (RSDF), 2011: Administrative Region A:

The RSDF represents the prevailing spatial planning policy within the City of Johannesburg and is adopted in terms of the Municipal Systems Act, 2000 (Act No. 32 of 2000) as an integral component of the City's Integrated Development Plan (IDP).

The proposed development is situated within the City of Johannesburg Metropolitan Municipality in Region A. Region A, is one of seven administrative regions that make up the City of Johannesburg. It is located on the northern periphery of the City of Johannesburg Metropolitan area, bordered by Region C and Region E to the south, Mogale City Local Municipality to the west, City of Tshwane Municipality to the north and City of Ekurhuleni Municipality to the east. The Greater Diepsloot and Greater Ivory Park areas are classified as Marginalised areas and are among the most prioritised areas in terms of the Growth Management Strategy (GMS).

The proposed study site is situated in Sub-Area 3 of Region A according to the Regional Spatial Development Framework. Sub-Area 3 consists mainly of the Diepsloot Nature Reserve and the marginalized area of Diepsloot West and Extensions. The remainder of the sub area includes agricultural holdings and farm portions that fall within and outside the Urban Development Boundary (UDB).

The Site falls inside of the Urban Development Boundary according to the 2010/2011 Regional Development Framework for region A and has three high priority development Objectives:

- To ensure socio-economic integration, infrastructure upgrading, consolidation and long-term sustainability of Diepsloot and Extensions.
- Strengthen the economic growth and social development of Diepsloot
- To enable access to housing and security of tenure in the contained Diepsloot and Extensions.

5.9.3 COJ Spatial Development Framework 2040

The SDF is part of the executive authority of the provincial government and an integral component of the governance structure of the province as a whole, and as such has to assist in ensuring the realization of national, regional, provincial and local development objectives.

The SDF includes the following elements:

- An Integrated Natural Structure
- Transformation Zone
 - A strong, accessible and generative urban core
 - Corridors of Freedom
 - Unlocking Soweto as a true city district
 - Developing a Randburg – OR Tambo Corridor
 - Unlocking the Mining Belt
- The spatial economy
 - Priority Economic Zones
 - A hierarchy of nodes as a focus for growth, consolidation, and reinvestment
 - Public transport station nodes as a focus of growth (TOD)
- A Consolidation Zone
 - Deprivation areas
 - Established suburban, built up areas
- Reinforcing the Urban Development Boundary

Figure 5-12 below shows that the proposed Riverside View Ext 84 occurs within the Consolidation Zone. The focus of the Consolidation Zone is 1) to create liveable lower to medium density suburban areas that are well-connected to higher intensity areas through transit infrastructure and 2) address challenges in areas of deprivation.

As part of this, the city will therefore allow new developments that promote the goals and meet the requirements of the SDF, but do not require extensive bulk infrastructure upgrades. The proposed development is therefore in line with the SDF 2040.

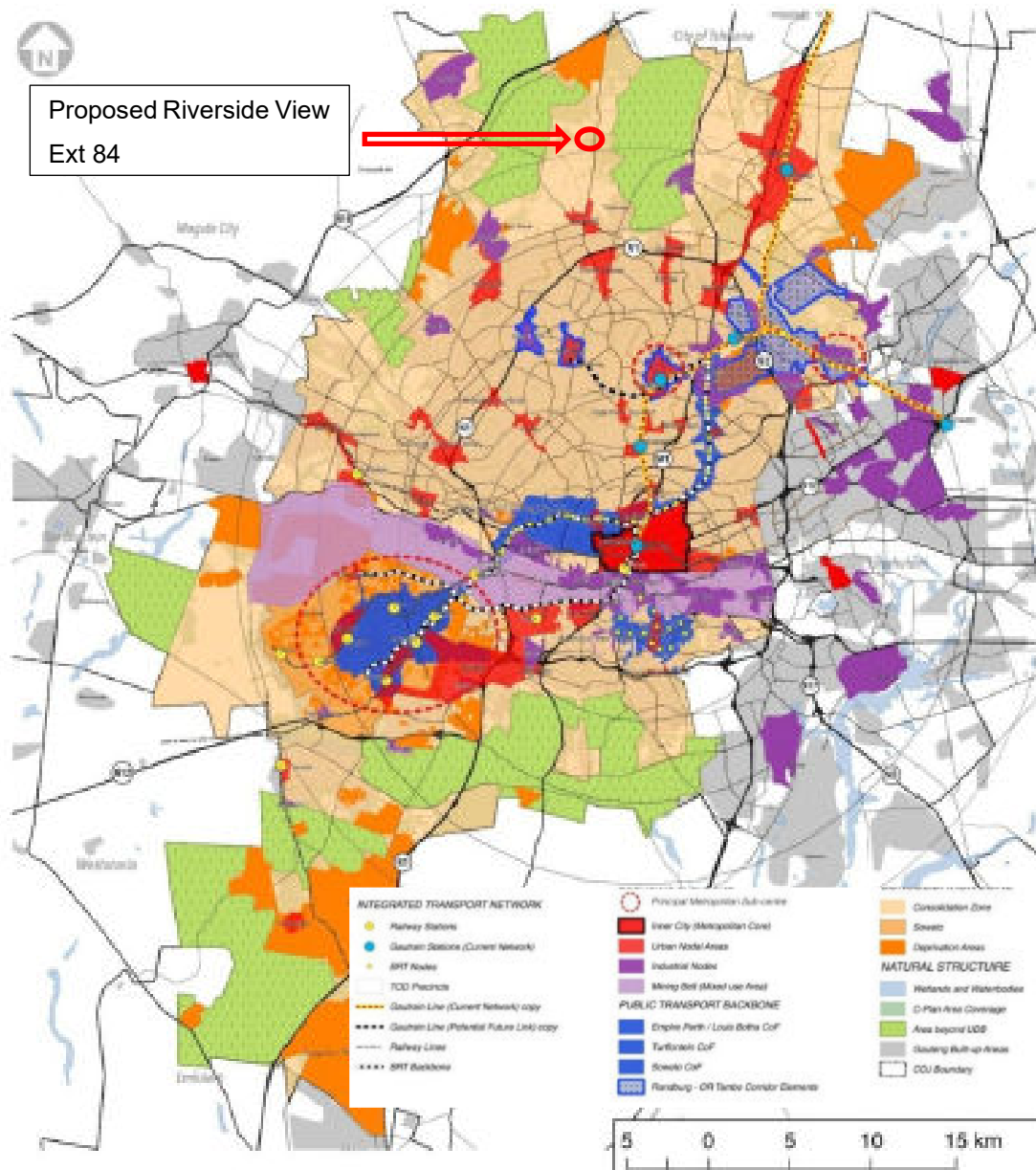


Figure 5-12: COJ SDF 2040

5.9.4 CoJ 2017/2018 Integrated Development Plan

The recent CoJ 2017/2018 IDP notes the following 5 pillars that are central in addressing the challenges faced by the City. These include:

- Grow the economy and create jobs;
- Enhance quality of life by improving services and taking care of the environment;
- Advance pro-poor development that provides meaningful redress;
- Build caring, safe and secure communities; and
- Institute an honest, responsive and productive government.

As part of “Enhance quality of life by improving services and taking care of the environment”, the City notes that there are 1 million people living in informal settlements in Johannesburg and there is a need for sustainable human settlements. Further, the IDP highlights the importance of the GSDF (discussed above).

5.9.5 Site Context

In the context of the site, the proposed development is in close proximity to the approved Steyn City development which is in the process of being constructed. It is also to the south east of the approved Riverside View Ext 28. William Nicol Drive runs along the eastern section of the site.

5.10 Biodiversity

An overall sensitivity map for the proposed site is indicated in Figure 5-13 below. More information is then provided on each biodiversity feature in the subsections that follow.

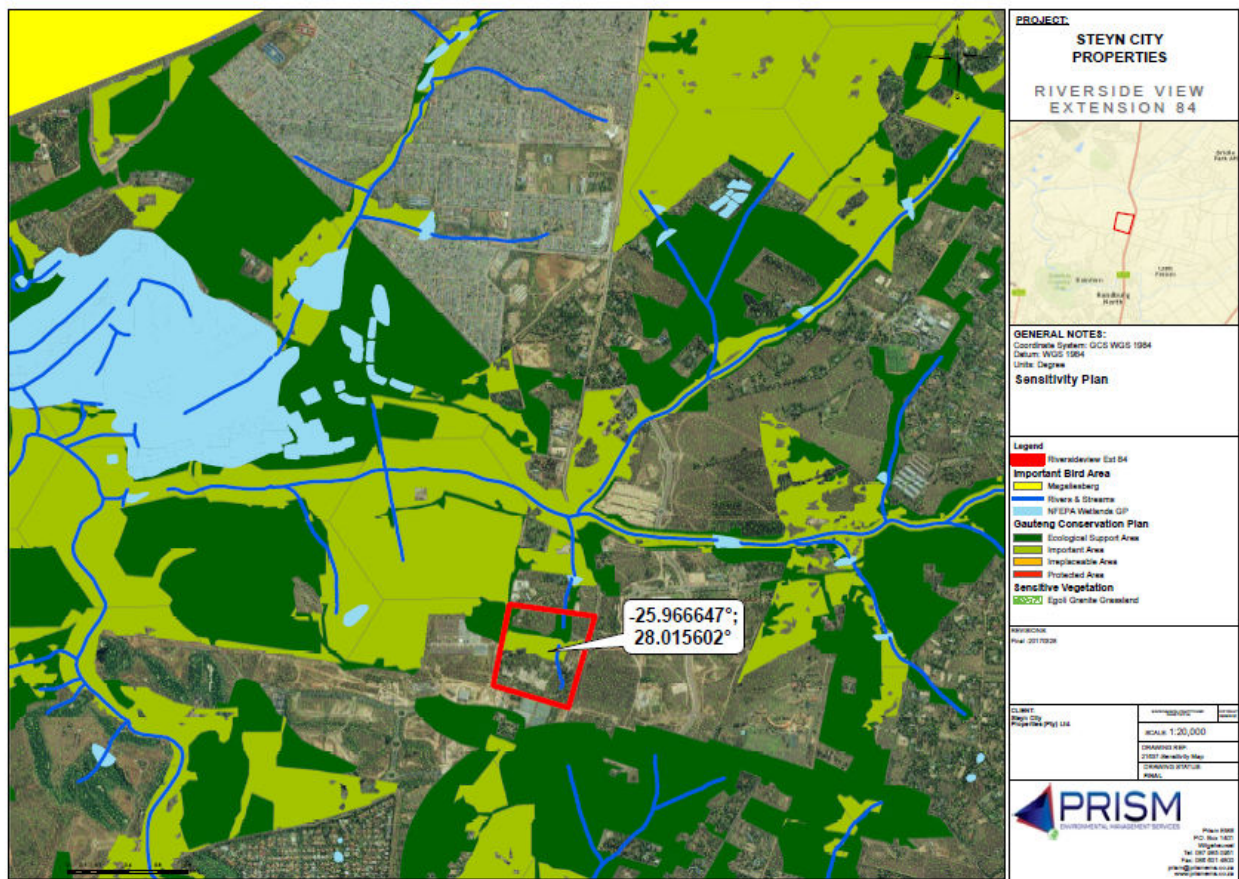


Figure 5-13: Desktop Sensitivity Map

5.10.1.1 Threatened Terrestrial Ecosystems

The first national list of threatened terrestrial ecosystems for South Africa was gazetted on 9 December 2011 (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GoN 1002), 9 December 2011). The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.

The proposed development occurs within the Egoli Granite Grassland which is classified as endangered. According to Mucina and Rutherford (2006), only about 3% of this unit is conserved in statutory reserves and a number of private conservation areas. More than two thirds of the unit have already undergone transformation mostly by urbanisation, cultivation or by building of roads. It should however be noted that the site is already disturbed by construction activities and by the previous school which occurred on site.

A Biodiversity Baseline and Impact Assessment (The Biodiversity Company, 2019) was also undertaken and noted that from the regional ecological overview, as well as the baseline data collected to date that the project area has been altered (historically and currently). The area was mainly transformed by large amounts of alien invasive plant species and dumping of large amounts of building rubble.

Two main types of habitat on site were identified:

- The **degraded grassland** area is an area where the habitat is considered to be predominantly intact with the vegetation and species composition in a semi-natural state. This habitat contained the highest diversity of indigenous plant species of the various habitats identified. This area has recovered somewhat from historic impacts and does function as a part of the natural ecosystem in the area. *Imperata cylindrica* was found within this habitat which is known to be directly correlated to *Tyto capensis* (Grass-Owl), which utilise dense stands of this plant species as breeding and foraging habitat. This habitat is however surrounded by transformed areas and is fragmented from any other nearby natural areas. Wet areas were also identified within this habitat; however, it is presumed that the source of the water in these areas is from an artificial source.
- The **transformed habitat** in the project area consisted mainly of dumps and impacts associated with edge effects in relation to the urban area. This habitat hosted a large number of the exotic alien plant species recorded within the project area and has been impacted upon and transformed to such an extent that it will need many years or recovery and active rehabilitation to recover to a near-natural state and therefore this area was given a low sensitivity rating.



Figure 5-14: Some of the impacts observed: A) Eskom powerlines, B) Dumping of building rubble, C) Invasive plant species, and D) Fencing (The Biodiversity Company, 2019)

5.10.1.2 Gauteng Conservation Plan

Gauteng Conservation Plan (C-Plan) 3.3. is based on the systematic conservation protocol developed by Margules & Pressey (2000) and is based on the principles of complementarity, efficiency, defensibility and flexibility, irreplaceability, retention, persistence and accountability.

The main purpose of C-Plan 3.3 is to serve as the primary decision support tool for the biodiversity component of the EIA process, to inform protected area expansion and biodiversity stewardship programmes in the province and to serve as a basis for development of Bioregional Plans in municipalities within the province.

According the Gauteng C-Plan, part of the proposed site falls within a Critical Biodiversity Area (CBA): Important Area and Ecological Support Area (ESA). CBAs and ESAs are an imperative part of C-Plan 3 to ensure sustainability in the long term.

5.10.1.3 The Gauteng Provincial Environmental Management Framework (GPEMF)

The GPEMF is a legal instrument in terms of the Environmental Management Framework Regulations, 2010. The purpose of the regulations is to assist environmental impact management including EIA processes, spatial planning and sustainable development.

Most of the proposed development site occurs in Zone 1: Urban development zone. The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.

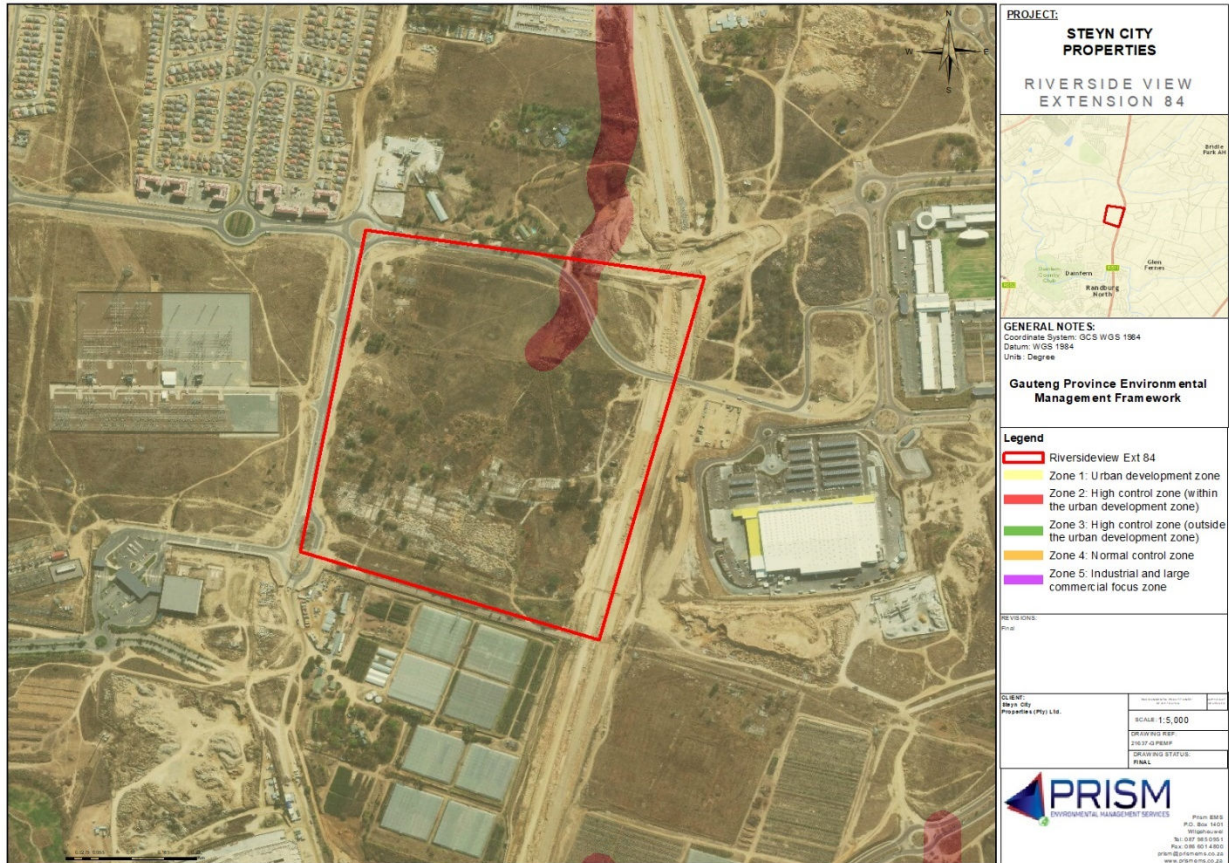


Figure 5-15: GPEMF

A very small section of the site, does fall within Zone 2 (High control zone within the urban development zone). This zone is sensitive to development activities. Only conservation should be allowed in this zone. Related tourism and recreation activities must be accommodated in areas surrounding this zone. It should be noted that the small section falling into Zone 2 is associated with the wetland section found on the site. This area will be protected with minimal development intrusion.

5.10.1.4 Important Bird Areas and Avifauna

The proposed development does not occur within any Important Bird Area (IBA). The closest IBA is the Magaliesburg IBA which is approximately 4.5 km to north-west of the site.

According to the Biodiversity Baseline and Impact Assessment, the site is known to have African Grass-owls (*Tyto capensis*), with the Kyalami African Grass Owl Project and EWT noting that the bird does not use the area as a nesting site but does forage in the area (<https://gekco.co.za/kyalami-african-grass-owl->

project/). Specific mitigation measures have been included to ensure impacts to African Grass Owls can be mitigated.

5.10.1.5 Protected Areas

According to the Protected Area Database for Quarter 4 of 2019, the proposed development is located near the Diepsloot Nature Reserve. It should however be noted that whilst still on the DEFF Protected Area Database, the Diepsloot Nature Reserve is no longer functioning and is the site of the Johannesburg Water Northern Wastewater Treatment Works.



Figure 5-16: Protected areas (South African Protected Areas Database, 2019 Quarter 4)

5.11 Surface Water

The site falls within Quaternary catchment area A21C, and is part of the new Limpopo Water Management Area (WMA) (previously Crocodile (West) and Marico WMA). According to desktop GIS information, a watercourse and wetland traverses part the site.

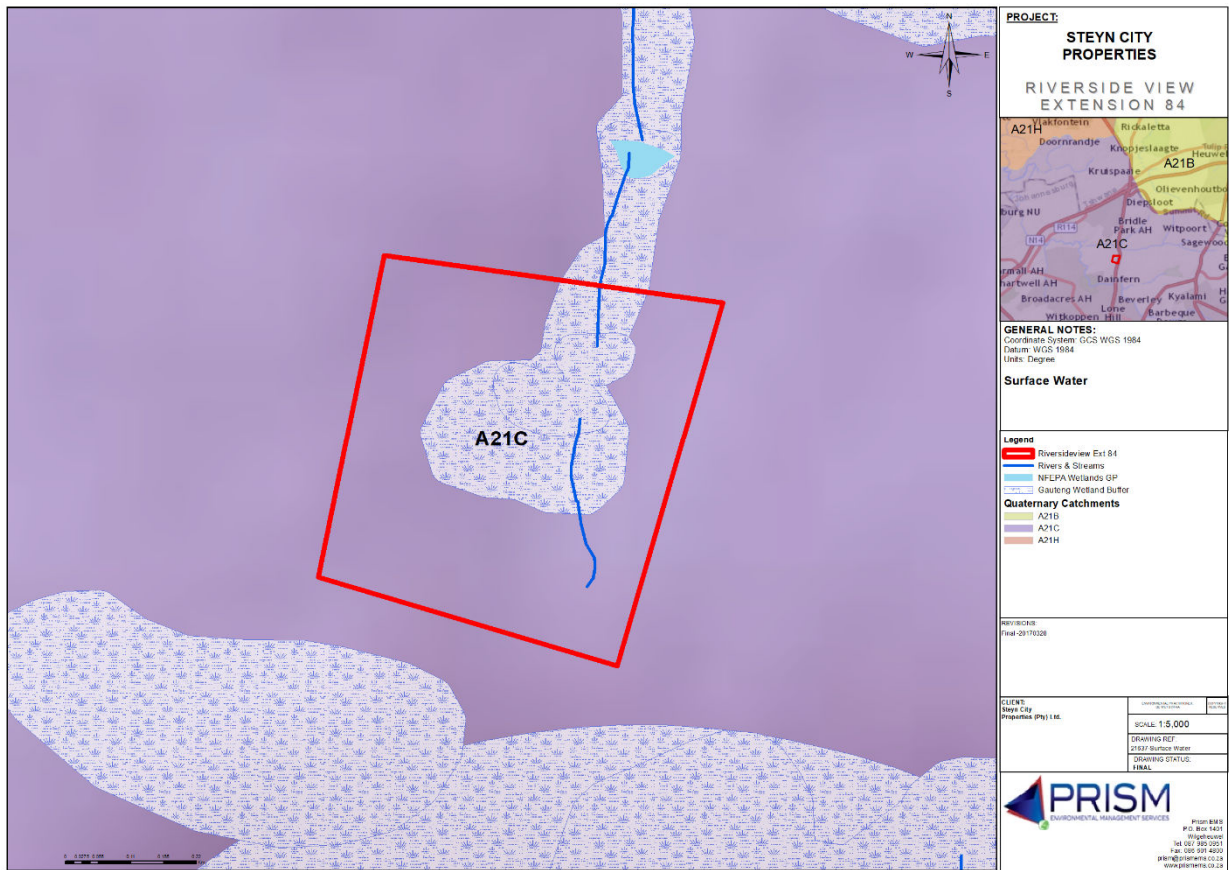


Figure 5-17: Surface Water

A Wetland Assessment (Prism EMS, 2020) has been undertaken and the delineated wetland and 32m wetland buffer excluded from the development footprint. Further, the report notes that the wetland was found to be highly modified. Rehabilitation measures have been recommended and are included in the EMP as well as the Aquatic Resources Rehabilitation Plan.

5.12 Archaeology and Cultural Heritage

5.12.1 Archaeology

There is no known heritage on site. Although the site is currently vacant, a school was previously in place but has since been demolished. A Heritage Impact Assessment (HCAC - Heritage Consultants, 2019) was undertaken and noted that the property is severely disturbed and has been cultivated from prior to 1957. From 1975 onwards, numerous industrial structures and a few residential dwellings with access roads were developed. All structures on site besides one has been destroyed from 2008 to 2015 based on Google Earth images. The remaining structure is not older than 60 years old.

In addition, the study also noted that the from an archaeological point of view no Iron Age sites are on record or expected for the study area. One open air Later Stone Age site is on record for the farm Zevenfontein (Wits archaeological database) but is not in close proximity to the proposed interchange.

Based on the extensive disturbance to the site it is also expected that no *in-situ* Stone Age sites occur in the study area

No archaeological sites or material of significance was recorded during the survey. In addition, no burial sites were recorded. There are no battlefields or related concentration camp sites located in the study area.

5.12.2 Palaeontology

The Palaeontological (Fossil) Sensitivity Map developed by SAHRA has been reviewed and shows that the proposed site does not fall within an area with high fossil sensitivity. Instead, the site falls within an area of insignificant or zero sensitivity and no palaeontological studies are required (Figure 5-18 below). The Heritage Impact Assessment (HCAC - Heritage Consultants, 2019) undertaken for the site confirms that no palaeontological sensitivity is expected.



1 in 250 000 geological formation layers are courtesy of the Council for GeoScience
For more information, go to [How to Use the Palaeontological \(fossil\) Sensitivity Map](#)

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 5-18: Palaeontological (Fossil) Sensitivity Map (obtained from South African Heritage Resources Information System (SAHRIS) - <https://sahriss.sahra.org.za/map/palaeo>)

6 NEED AND DESIRABILITY

In terms of Section 2 (f) of Appendix 2 of GN 921 of 4 December 2014, this section discusses the need and desirability of the project which has been assessed in terms of Notice 891 of 2014 which is the updated guideline available regarding need and desirability. In line with this, the consideration of "need and desirability" included consideration of the strategic context of the proposed development along with the broader societal needs and the public interest.

6.1 Overview

The consideration of "need and desirability" included consideration of the strategic context of the proposed development along with the broader societal needs and the public interest. In order to better understand the need and desirability, one needs to understand the proposed development. The proposed zoning of the development will be Special for: *Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops* and aims to provide a school, offices and residential buildings. Private Open space will also be incorporated into the development which forms part of the Steyn City Development.

Steyn City supplies residential units at various densities and at various residential typologies, sport and recreational facilities including a golf course, equestrian uses, educational facilities, community facilities, supportive retail and office development as well as large tracts of active and passive recreation open space. The entire Steyn City Lifestyle Estate contains a number of higher density villages together with low density uses and open space elements such as the Jukskei River and other environmental sensitive areas. Riverside View Extension 84 will be developed in line with this concept.

It should be noted that due to the extensive size of the Steyn City Development, a number of schools are required to cater for the residents (in general one works on a ratio of 1 school per 1000 residential erven /households). Whilst Steyn City has one existing School, another one is required due to the size of the development.

The proposed use of the site for the primary rights will fulfil a need for an all-phase school / residential use / storage / offices with ancillary shops and restaurants, to cater for the varying demands of the residents of Steyn City Estate. There is therefore a need for such a development especially in light of the fact that there is an increasing need for the provision of adequate schools in close proximity - or within the secure environment - of an upmarket estate, which is also located close to transport, employment and other urban opportunities. In particular, we note that the provision of adequate schooling and housing is a basic human right, which every South African is entitled to. In order to cater for a necessary sized school, a site that is big enough is required. The site is outside Steyn City but close enough to allow easy access from Steyn City as well as access from a point outside of the main access gate of Steyn City.

Furthermore, the proposed rights for the Riverside View Ext 84 Township includes provision for residential buildings and residential densities of up to 20 dwelling units per hectare. This will contribute towards the supply of residential land, by better utilization of the land.

The location of the proposed development along William Nicol Drive and the future interchange adjacent to and north-east of the site is also desirable, since it provides for easy access from William Nicol Drive (K46), via Porcupine Park Avenue to Riverside View Ext 84. The development is also close to existing engineering services and road network, which is presently being upgraded.

The residential land use is also complementary to the other proposed land uses of Riverside View Ext 84 as well as the land uses of the neighbouring Steyn City Lifestyle Estate, to which it will be linked.

In terms of the Gauteng Provincial Environmental Management Framework, the majority of the proposed development falls within Zone 1. A small section falls within Zone 2 however, the development footprint is excluded from this area. The proposed development is thus in line with the intention of the zone 1 which is to: "streamline urban development activities in it and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the COJ Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas." Further, as the development is within the urban development boundary, the proposed development will promote compact city development. A wetland area has been identified on site however has been delineated and the wetland and 32m buffer have been excluded from the development footprint.

6.2 Need and Desirability Table

In addition to the above, the following questions have also been addressed in line with the Guideline for Need and Desirability (Notice 891 of 2014) (Table 6-1).

Table 6-1: Need and Desirability

Question from the Need and Desirability Guideline	Response
Securing ecological sustainable development and use of natural resources	
How will this development (and its separate elements / aspects) on the ecological integrity of the area?	<p>An Ecological Habitat Assessment and Wetland Delineation Assessment were undertaken and are included in the EIA Report.</p> <p>In summary, it is not expected that the proposed development will negatively impact on the ecological integrity of the area as the site is not pristine and has been degraded by historical use. In addition, the wetland and associated wetland</p>

Question from the Need and Desirability Guideline	Response
	<p>buffer have been incorporated into the open space area and will not be developed. A number of mitigation measures have been recommended by the wetland specialist and incorporated into the Environmental Management Programme (EMPr). As such, impacts to the wetland are reduced and the specialist recommended that the proposed development can proceed.</p>
<p>How were the following ecological integrity considerations taken into account?</p> <ul style="list-style-type: none"> • Threatened Ecosystems • Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, • Critical Biodiversity Areas (“CBAs”) and Ecological Support Areas (“ESAs”) • Conservation targets, • Environmental Management Framework, • Spatial Development Framework, and • Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc. 	<p>The Scoping Report included a summary of the receiving environment which includes applicable information on:</p> <ul style="list-style-type: none"> • Threatened ecosystems; • CBAs and ESAs; • Sensitive features such as wetlands; and • Socio-Economic Information including information on the GSDF. <p>This was used to identify potential sensitivities which required further assessment by a specialist. Based on this, the following specialist studies were undertaken and are included in the EIR:</p> <ul style="list-style-type: none"> • Ecological Habitat Assessment; and • Wetland Delineation and Assessment. <p>In summary, it is not expected that the proposed development will negatively impact on the ecological integrity of the area as the site is not pristine and has been degraded by historical use. The sensitivity indicated by the specialist was low and low moderate. Based on the results and conclusions it was the opinion of the specialists that the proposed project can be favourably considered should the all the mitigations measures and recommendations be adhered to.</p> <p>In addition, the wetland and associated wetland buffer have been incorporated into the open space</p>

Question from the Need and Desirability Guideline	Response
	<p>area and will not be developed. The Present Ecological State (PES) of the wetland is low and the specialist noted that the system is highly degraded.</p> <p>A number of mitigation measures have been recommended by the wetland and biodiversity specialists and incorporated into the Environmental Management Programme (EMPr). As such, impacts to the wetland and biodiversity are reduced and the specialists recommended that the proposed development can proceed.</p>
<p>How will this development disturb or enhance ecosystems and / or result in the loss or protection of biological impacts that could not be avoided altogether, what measures were explored to minimize and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>An Ecological Habitat Assessment and Wetland Delineation and Assessment have been undertaken and noted that the currently the site is altered by historic use. The biodiversity specialist noted that the site has a low to low moderate sensitivity whilst the wetland specialist indicated that the PES of the wetland was highly degraded. In addition, the wetland and associated wetland buffer have been incorporated into the open space area and will not be developed. A Wetland Rehabilitation Plan has been compiled and will implemented to improve the current status of the wetland. Furthermore, a Stormwater Management Plan (SWMP) has been developed and will ensure the post development run off is not greater than the current run off. Sustainable Urban Drainage Systems (SUDs) has been included in the concept of this SWMP which incorporates the following:</p> <ul style="list-style-type: none"> • Grass lined attenuation ponds; • Use of the soccer field to attenuate stormwater and allow for ground water recharge; • Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;

Question from the Need and Desirability Guideline	Response
	<ul style="list-style-type: none"> • Throttled outlet structures; and • Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.
<p>How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimize and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>A detailed impact assessment has been undertaken and is included in Section 10. However, the proposed development involves a mixed-use development with uses including a school, offices, storage area and residential use. Significant pollution is therefore not expected.</p> <p>In terms of degradation of the biophysical environment, significant impacts are not expected. Firstly, the site is historically degraded. Secondly, the wetland and wetland buffer are excluded from the development footprint. Thirdly, a Wetland Rehabilitation Plan has been compiled and will be implemented. This should improve the PES of the wetland.</p>
<p>What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimize, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>During construction, construction waste will be produced whilst during operation, domestic waste related to the Riverside View Ext 84 will be produced.</p> <p>The EMPr included in Appendix 14.8. includes a waste management plan that aims to ensure measures to minimize, reuse and/or recycle the waste are incorporated into the development.</p>
<p>How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimize and remedy</p>	<p>The proposed development does not involve the mining of non-renewable resources. However, some natural resources will be required during construction. A detailed impact assessment has been undertaken and found the significance of impacts related to use of natural resources to be low.</p>

Question from the Need and Desirability Guideline	Response
(including offsetting) the impacts? What measures were explored to enhance positive impacts?	
<p>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardize the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimize the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</p> <ul style="list-style-type: none"> • Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. dematerialized growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life) • Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?). • Do the proposed location, type and scale of development promote a reduced dependency on resources? 	<p>An Ecological Habitat Assessment and Wetland Delineation and Assessment have been undertaken. The studies found that the impacts to biodiversity and the wetland could be satisfactorily mitigated and are expected to be low. These impacts have been incorporated into a detailed impact assessment.</p> <p>Based on this detailed impact assessment, it is not expected that the proposed development will negatively impact on the ecological integrity of the area.</p> <p>Energy saving measures will also be incorporated at the detailed design phase to minimise energy requirements. Steyn City aims to develop the site in line with its existing development which has a focus on open spaces and sustainability.</p>

Question from the Need and Desirability Guideline	Response
<p>How were a risk-averse and cautious approach applied in terms of ecological impacts?</p> <ul style="list-style-type: none"> • What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? • What is the level of risk associated with the limits of current knowledge? • Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development? 	<p>A risk-averse and cautious approach has been undertaken. The following has reference:</p> <ul style="list-style-type: none"> • The specialist studies undertaken have identified gaps which have been noted in both the specialist report and EIA. • The impact assessment which has been undertaken and included in the EIR deal with gaps identified by specialists and/or lack of information through the assessment of 'Level of Confidence'. In general the level of confidence in the assessment of impacts is high. • The EMPr also provides numerous mitigation measures to ensure that impacts identified to be a 'low' risk can be further mitigated.
<p>How will the ecological impacts resulting from this development impact on people's environmental right in terms following:</p> <ul style="list-style-type: none"> • Negative impacts e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimize, manage and remedy negative impacts? • Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts? 	<p>A detailed impact assessment was undertaken and did not identify any significant impacts to people's environmental rights. The site is disturbed and the wetland buffer which falls within the proposed development will not be developed.</p> <p>Furthermore, whilst some infrastructure (road crossing, attenuation outlets) will occur within the wetland/wetland buffer, the impact of this is reduced through the implementation of the necessary mitigation measures. This includes the implementation of a Wetland Rehabilitation Plan as well as ensuring stormwater is properly managed to pre-development run off levels.</p>
<p>Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?</p>	<p>A detailed impact assessment was undertaken and did not identify any significant impacts to ecosystem services, loss of livelihoods, heritage or significant opportunity costs.</p>

Question from the Need and Desirability Guideline	Response
	<p>The EMPr included in Appendix 14.8. includes a number of mitigation measures which specifically deal with management of potential impacts to heritage, biodiversity and wetland resources.</p>
<p>Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?</p>	<p>It is not expected that the development will negatively impact on the ecological integrity objectives of the area. Whilst part of the site does fall within an ESA and CBA Important area, the Biodiversity Baseline and Impact Assessment noted that the site is historically altered and therefore degraded. Further, the wetland has been delineated and excluded from the development footprint. Whilst some infrastructure (road crossing, attenuation outlets) does occur within the wetland/wetland buffer, it is not expected that this will have a significant negative impact. Suitable mitigation measures have been recommended and included in the EMPr.</p> <p>Further, it should be noted that the proposed development falls within Zone 1 which is the Urban Development Zone of the Gauteng Provincial Environmental Management Framework (GPEMF). The purpose of this zone is to promote densification and development and thus the proposed development is in line with the GPEMF. It also falls within the Consolidation Zone of the COJ SDF and is thus in line with that document.</p>
<p>Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the “best practicable environmental option” in terms of ecological considerations?</p>	<p>Two layout alternatives are being assessed as part of the Scoping and EIA process. These are:</p> <ul style="list-style-type: none"> • The proposal; and • Alternative 1. <p>In addition, based on discussions with the wetland specialist, two alternative placements of the attenuation pond are also being assessed:</p>

Question from the Need and Desirability Guideline	Response
	<ul style="list-style-type: none"> • The proposal - along the boundary of the wetland with multiple discharge points; • Alternative 1 – along the northern boundary of the site. <p>A detailed impact assessment has been undertaken for both sets of alternatives and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (Appendix 14.7). Based on the impact assessment, Layout Alternative 1 is <u>not preferred</u> for the following reason:</p> <ul style="list-style-type: none"> • Multiple accesses points to the various erven will be required; • Multiple service connections will be required; and • Multiple crossing points along the wetland would be required. <p>In terms of the attenuation alternatives, Attenuation Alternative 1 is also not preferred as it would provide only release point. Further, by having numerous attenuation along the wetland buffer area, it is possible to mimic the wetland conditions and allow for better distribution of surface run off.</p> <p>Both proposals have therefore been identified as the Best Practicable Environmental Options as they reduce the impact to the wetland interflows.</p>
Promoting justifiable economic and social development	
<p>What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?</p> <ul style="list-style-type: none"> • The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) 	<p>Please see Section 5.9 which provides an overview of the socio-economic context of the area and includes information on the existing Gauteng Spatial Development Framework, Regional Spatial Development Framework and the Integrated Development Plan.</p>

Question from the Need and Desirability Guideline	Response
<p>and any strategic plans, frameworks of policies applicable to the area,</p> <ul style="list-style-type: none"> • Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.). • Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and • Municipal Economic Development Strategy (“LED Strategy”). 	<p>In summary, the proposed development is in line with the GPMEF as it occurs within Zone 1 – Urban Development Boundary. Similarly, it falls within the Consolidation Zone of the SDP.</p>
<p>Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?</p> <ul style="list-style-type: none"> • Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs? 	<p>The proposed Riverside View Ext 84 aims to provide complimentary uses to the existing Steyn City Development. In addition, it will create approximately 150 temporary jobs during construction and the capital investment of approximately R15 million will have a local multiplier effect in the area. Local skills will be encouraged within the EMPr.</p>
<p>How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?</p>	<p>The proposed development aims to provide ancillary land uses associated with the larger Steyn City development. As such a zoning rights for the site include: <i>Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops</i></p> <p>In all cases, these proposed land uses will complement the existing Steyn City Land Use and provide a more holistic development which will address the needs of the existing and future community. In addition, through the construction of the development, local community members will be employed.</p>
<p>Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and</p>	<p>A detailed impact assessment has been undertaken and all identified impacts can be satisfactorily mitigated. Significant inequitable</p>

Question from the Need and Desirability Guideline	Response
economically sustainable in the short- and long-term?	(intra- and inter-generational) impacts are not expected.
<p>In terms of location, describe how the placement of the proposed development will:</p> <ul style="list-style-type: none"> • Result in the creation of residential and employment opportunities in close proximity to or integrated with each other • Reduce the need for transport of people and goods • Result in access to public transport or enable non-motorized and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport), • Compliment other uses in the area • Be in line with the planning for the area, • for urban related development, make use of underutilized land available with the urban edge • optimize the use of existing resources and infrastructure, • opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement), • discourage “urban sprawl” and contribute to compaction/densification, • contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs, • encourage environmentally sustainable land development practices and processes, • take into account special locational factors that might favour the specific location (e.g. the 	<p>The location of the proposed development considered a number of aspects including:</p> <ul style="list-style-type: none"> • Available land; and • Proximity to Steyn City (as the proposed development aims to form part of the existing Steyn City). <p>The following can also be noted:</p> <ul style="list-style-type: none"> • The proposed development aims to create ancillary land uses associated with the larger Steyn City development. • By creating these ancillary uses, it will reduce the need for transport of people from Steyn City and will create a holistic development. • The proposed development makes use of land adjacent to Steyn City which falls within the urban edge. • The development is therefore in line with the GPEMF as it mostly falls within Zone 1 – Urban Development Zone. • A Wetland assessment and Biodiversity Baseline and Impact Assessment have been undertaken. Both studies found that the status of the site was degraded due to historic use. The Wetland and 32m wetland buffer have however been incorporated into the development footprint and will not be developed. In addition, mitigation measures recommended by the specialists are included in the EMPr. Thus ensuring that the development is environmental sustainable. • A Heritage Impact Assessment was also undertaken to ensure the proposed development does not impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-

Question from the Need and Desirability Guideline	Response
<p>location of a strategic mineral resource, access to the port, access to rail, etc.),</p> <ul style="list-style-type: none"> the investment in the settlement or area in question will generate the highest socio-economic returns (i.e an area with high economic potential), impact on the sensitivities of the area, and in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement? 	<p>historic characteristics of the site. No sensitive heritage resources were identified. A Chance Find Procedure has however been compiled and is included in the EMPr.</p> <ul style="list-style-type: none"> The proposed development will create employment during construction and operation. It also compliments other land uses in the area and will create a more integrated settlement as it provides ancillary land uses to the existing Steyn City development.
<p>How were a risk-averse and cautious approach applied in terms of socio-economic impacts?</p> <ul style="list-style-type: none"> What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge? Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development? 	<p>Other than the Heritage Impact Assessment, no social or economic specialist studies have been triggered and are required. However, a risk-averse and cautious approach has been undertaken. The following has reference:</p> <ul style="list-style-type: none"> The Heritage Impact Assessment identifies gaps which are noted in both the specialist report and EIA. The impact assessment has been undertaken and specifically deal with gaps identified by specialists and/or lack of information through the assessment of 'Level of Confidence'. In general, confidence levels in the impact assessment is high. The EMPr which has been compiled and includes numerous mitigation measures to ensure that impacts identified to be a 'low' risk can be further mitigated.
<p>How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:</p> <ul style="list-style-type: none"> Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if 	<p>A detailed impact assessment was undertaken and includes an assessment of social and economic impacts (both positive and negative).</p> <p>Based on this assessment, it is not expected that there will be negative socio-economic impacts associated with the development. Instead, the CAPEX value of the project is about R15 million</p>

Question from the Need and Desirability Guideline	Response
<p>avoidance is not possible, to minimize, manage and remedy negative impacts?</p> <ul style="list-style-type: none"> • Positive impacts. What measures were taken to enhance positive impacts? 	<p>and will create numerous multiplier effects in the area. Further, approximately 150 construction-related and 150 operation-related jobs will be created.</p>
<p>Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilization of natural resources, etc.)?</p>	<p>A detailed impact assessment was undertaken and includes an assessment of social and economic impacts as well as ecological impacts. Based on the type of proposed development, it is not expected that the socio-economic impacts will result in ecological impacts.</p>
<p>What measures were taken to pursue the selection of the “best practicable environmental option” in terms of socio-economic considerations?</p>	<p>Two alternative layouts were assessed, namely:</p> <ul style="list-style-type: none"> • The proposal; and • Alternative 1. <p>In addition, based on discussions with the wetland specialist, two alternative placements of the attenuation pond are also being assessed:</p> <ul style="list-style-type: none"> • The proposal - along the boundary of the wetland with multiple discharge points; • Alternative 1 – along the northern boundary of the site. <p>A detailed assessment of alternatives has been undertaken and is included in Section 10.6. Alternatives are also included in the Impact Assessment itself. The assessment of alternatives takes into account the following:</p> <ul style="list-style-type: none"> • The findings of the specialist studies; • The results of the impact assessment; and • The need for the project. <p>Based on the impact assessment, Layout Alternative 1 is <u>not preferred</u> for the following reason:</p>

Question from the Need and Desirability Guideline	Response
	<ul style="list-style-type: none"> • Multiple accesses points to the various erven will be required; • Multiple service connections will be required; and • Multiple crossing points along the wetland would be required. <p>In terms of the attenuation alternatives, Attenuation Alternative 1 is also not preferred as it would provide only release point. Further, by having numerous attenuation along the wetland buffer area, it is possible to mimic the wetland conditions and allow for better distribution of surface run off.</p> <p>Both proposals have therefore been identified as the Best Practicable Environmental Options as they reduce the impact to the wetland interflows.</p>
<p>What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the “best practicable environmental option” to be selected, or is there a need for other alternatives to be considered?</p>	<p>A detailed Scoping and EIA process is currently being undertaken. This includes the assessment of alternatives, compilation of a detailed impact assessment and undertaking relevant specialist studies. Further, as noted above, the proposed development aims to complement the existing Steyn City development and thus the beneficiaries of the proposed development are located in close proximity to the development.</p> <p>A detailed assessment of alternatives has been undertaken and is included in Section 10.6. Alternatives are also included in the Impact Assessment itself. The assessment of alternatives takes into account the following:</p> <ul style="list-style-type: none"> • The findings of the specialist studies; • The results of the impact assessment; and • The need for the project.

Question from the Need and Desirability Guideline	Response
	<p>Based on the impact assessment, Layout Alternative 1 is <u>not preferred</u> for the following reason:</p> <ul style="list-style-type: none"> • Multiple accesses points to the various erven will be required; • Multiple service connections will be required; and • Multiple crossing points along the wetland would be required. <p>In terms of the attenuation alternatives, Attenuation Alternative 1 is also not preferred as it would provide only release point. Further, by having numerous attenuation along the wetland buffer area, it is possible to mimic the wetland conditions and allow for better distribution of surface run off.</p> <p>Both proposals have therefore been identified as the Best Practicable Environmental Options as they reduce the impact to the wetland interflows.</p>
<p>What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?</p>	<p>A number of specialist studies have been undertaken as part of the EIA Phase to ensure that the proposed development is sustainable and does not result any negative impacts to disadvantaged persons. These studies did not identify any “fatal flaws” and all identified impacts can be satisfactorily mitigated.</p>
<p>What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development’s life cycle?</p>	<p>In identifying the potential impacts associated with the development, the full lifecycle was assessed. In addition, a detailed impact assessment has been undertaken and identifies potential impacts as well as the main mitigation measures required to reduce this impact.</p> <p>These mitigation measures are then included in the EMPr which includes the roles and responsibilities</p>

Question from the Need and Desirability Guideline	Response
	for the development and ensures that the responsibility of the implementation of the EMPr falls to the developer.
<p>What measures were taken to:</p> <ul style="list-style-type: none"> • ensure the participation of all interested and affected parties, • provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation • ensure participation by vulnerable and disadvantaged persons, • promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, • ensure openness and transparency, and access to information in terms of the process, • ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and • ensure that the vital role of women and youth in environmental management and development were recognized and their full participation therein were promoted? 	<p>A detailed public participation process is being undertaken as part of the Scoping and EIA process.</p> <p>As part of this, a detailed Interested and Affected Party (I&AP) Database was compiled and included registered I&APs from previous Steyn City projects. The database also includes organs of state that have jurisdiction over the site such as City of Johannesburg, Johannesburg Roads Agency, Department of Water and Sanitation, Johannesburg Water and Gauteng Department of Agriculture and Rural Development (GDARD). In addition, the I&AP database included the affected ward councillor of the area as well applicable residential associations. These I&APs have been notified of the Scoping and EIA process and will be provided with an opportunity to comment on all reports (both the Scoping Report and EIA Report) and provided with an opportunity to comment.</p> <p>Numerous communication methods (including site notices, adverts, hand delivery of BIDs and emails) are being employed, and it is felt that public participation has been such to ensure participation by all potentially interested or affected people.</p>
<p>Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low- middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)</p>	<p>The proposed development aims to provide ancillary land uses associated with the larger Steyn City development. In all cases, these proposed land uses will complement the existing Steyn City Land Use and provide a more holistic development which will address the needs of the existing and future community. In addition, through the</p>

Question from the Need and Desirability Guideline	Response
	construction of the development, local community members will be employed.
What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	A site specific EMPr has been developed and includes an Environmental Awareness Plan. As part of this, workers will be informed of their rights to refuse work that might be harmful to human health or the environment.
Describe how the development will impact on job creation in terms of, amongst other aspects: <ul style="list-style-type: none"> • the number of temporary versus permanent jobs that will be created, • whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area), • the distance from where labourers will have to travel, • the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits); and • the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.) 	The following can be noted in regards to this: <ul style="list-style-type: none"> • The EMPr which has been compiled, notes that local employment should be encouraged to promote skills transfer and development. This will enhance the general area and provide job opportunities to potential job seekers and manage it in the best suitable way. • An assessment of the social environment of the area suggests that there is labour available in the area. • The proposed development occurs in close proximity to numerous residential developments and informal settlements and thus, the distance labourers will have to commute is not expected to be significant. • The proposed development will not result in any losses of any jobs and job-related opportunity costs are not expected.
What measures were taken to ensure: <ul style="list-style-type: none"> • That there were intergovernmental coordination and harmonization of policies, legislation and actions relating to the environment, and • That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures? 	National Legislation i.e. NEMA, NWA, NHRA, NEM:BA were consulted in the preparation of both the Scoping Report and EIR. Provincial guidelines also formed part of the literature review. Spatial development tools also aided the EAP to assess and provide information pertaining to the proposed development.

Question from the Need and Desirability Guideline	Response
	Any comments received from I&APs or organs of state are included in the comments and response register.
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The site specific EMPr which has been compiled includes realistic and achievable mitigation measures which aim to reduce any negative impacts as well as to enhance any positive benefits associated with the project.
What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The site specific EMPr which has been compiled includes detailed roles and responsibilities. In addition, a penalty system for contractors will be included.
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	<p>Two alternative layouts were assessed, namely:</p> <ul style="list-style-type: none"> • The proposal; and • Alternative 1. <p>In addition, based on discussions with the wetland specialist, two alternative placements of the attenuation pond are also being assessed:</p> <ul style="list-style-type: none"> • The proposal - along the boundary of the wetland with multiple discharge points; • Alternative 1 – along the northern boundary of the site. <p>A detailed assessment of alternatives has been undertaken and is included in Section 10.6. Alternatives are also included in the Impact Assessment itself. The assessment of alternatives takes into account the following:</p> <ul style="list-style-type: none"> • The findings of the specialist studies; • The results of the impact assessment; and • The need for the project.

Question from the Need and Desirability Guideline	Response
	<p>Based on the impact assessment, Layout Alternative 1 is <u>not preferred</u> for the following reason:</p> <ul style="list-style-type: none">• Multiple accesses points to the various erven will be required;• Multiple service connections will be required; and• Multiple crossing points along the wetland would be required. <p>In terms of the attenuation alternatives, Attenuation Alternative 1 is also not preferred as it would provide only release point. Further, by having numerous attenuation along the wetland buffer area, it is possible to mimic the wetland conditions and allow for better distribution of surface run off.</p> <p>Both proposals have therefore been identified as the Best Practicable Environmental Options as they reduce the impact to the wetland interflows.</p>

7 ALTERNATIVES

According to the 2014 EIA Regulations, alternatives are defined as:

“Different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

(a) property on which or location where the activity is proposed to be undertaken;

(b) type of activity to be undertaken;

(c) design or layout of the activity;

(d) technology to be used in the activity; or

(e) operational aspects of the activity;

and includes the option of not implementing the activity”

In line with the Regulations, a number of alternatives have been assessed for the proposed development.

These include:

- Layout alternatives;
- Attenuation alternatives; and
- The No -Go Option.

More information on each of these alternatives is provided below.

7.1 Layout Alternatives

Two layouts have been identified as feasible in regard to the development of Riverside View Extension 84.

These are:

- The proposal; and
- Alternative.

7.1.1 Proposal

The proposal involves the development of three separate erven as follows:

- Erf 1 and 2:
 - Special: Special for Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops.
- Erf 3:
 - Special for Private Open Space

As part of the proposal, access to the site will be obtained from three points (two off View Road and one from the Steyn City development to the south). Connections to existing services will also be to a single point on the Erf 1.

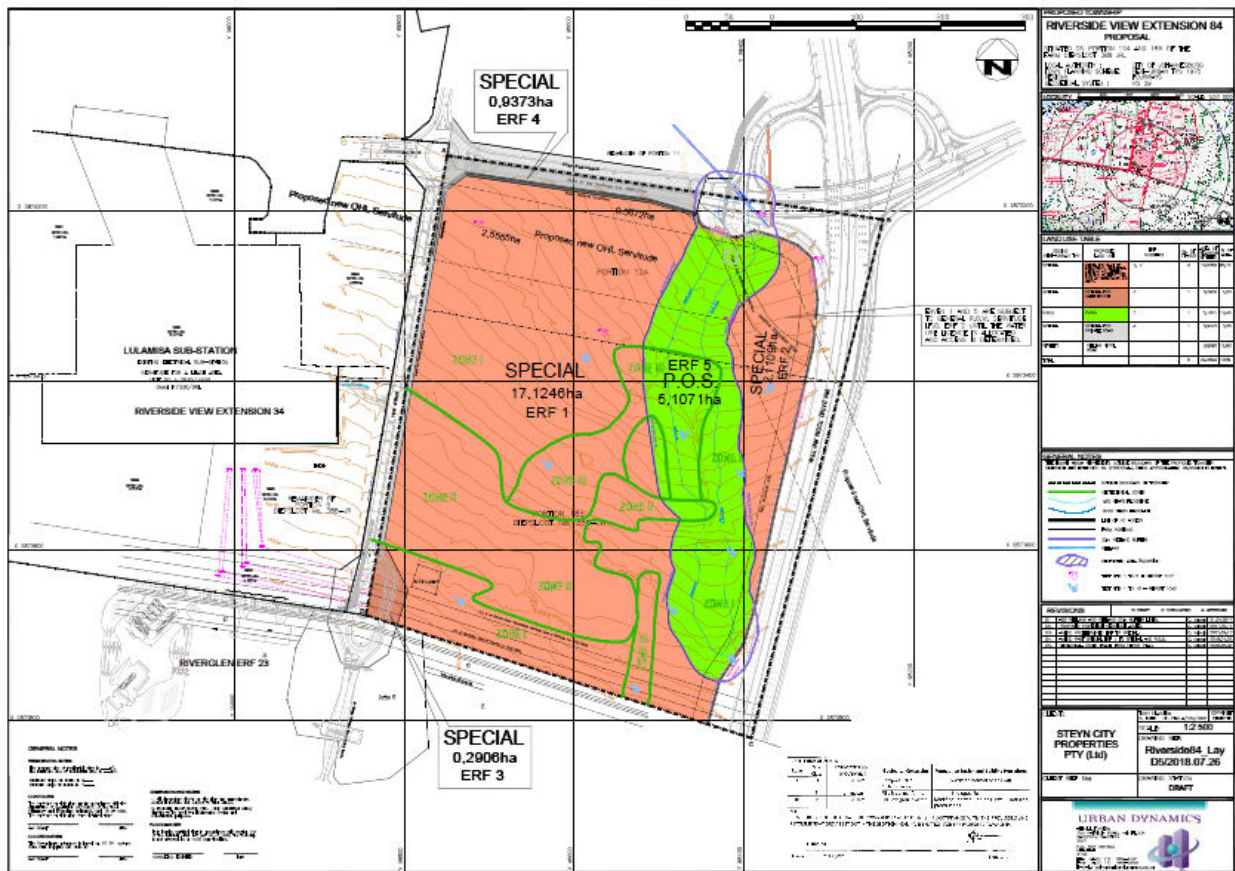


Figure 7-1: Proposal

7.1.2 Alternative

The alternative involves the development of seven separate erven as follows:

- Erf 1 – 4:
 - Special: Special for Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops
- Erf 5:
 - Special for Access Control
- Erf 6:
 - Special for Private Roads
- Erf 7:
 - Special for Private Open Space

The extent of Erf 1, 2, 3 and 4 will be smaller (between 2.1 and 6.7 hectares). Additional access points off View Road will be required. Further, multiple connections to the existing bulk services will be required.

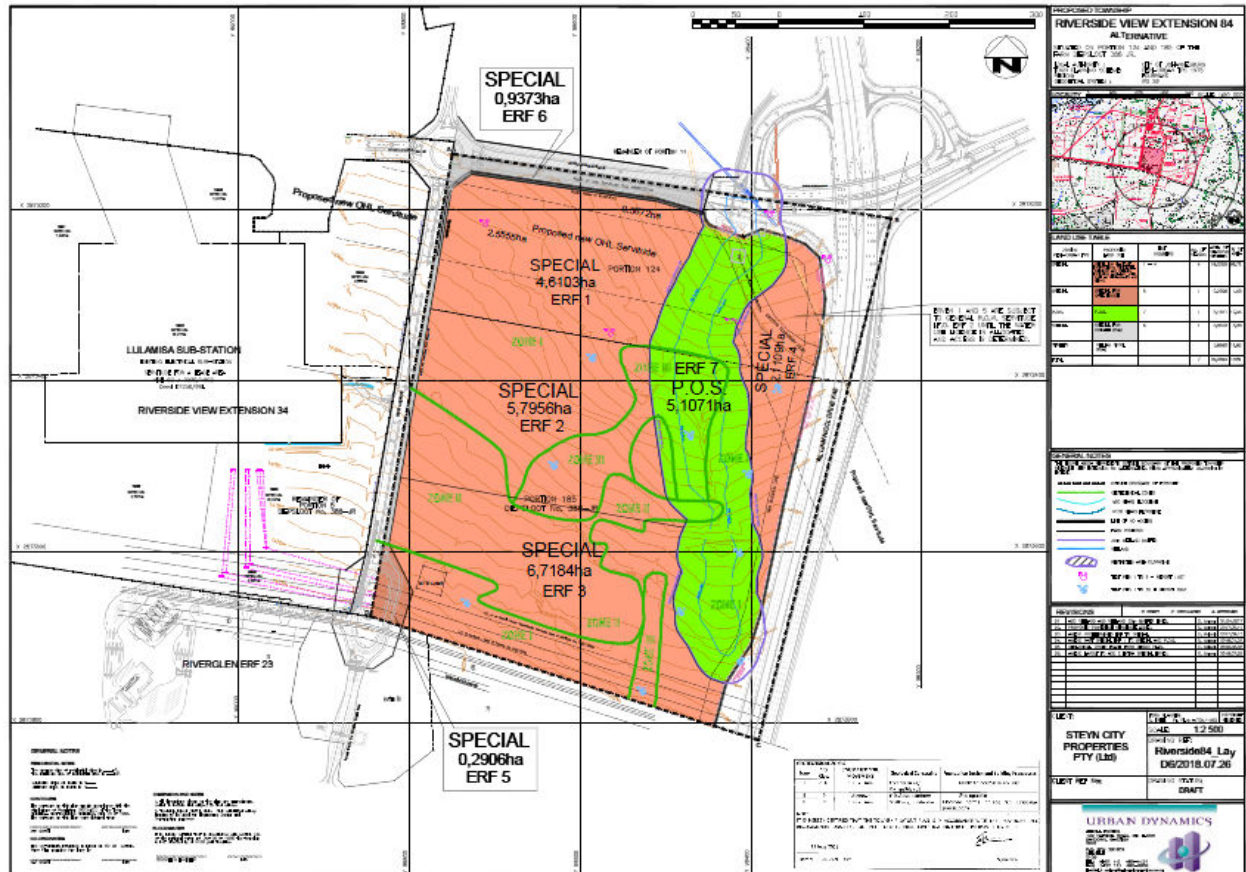


Figure 7-2: Alternative Layout

7.2 Attenuation Alternatives

In line with the requirements of the Johannesburg Roads Agency (JRA), stormwater attenuation will be provided to reduce the increased stormwater run-off resulting from the development to pre-development volumes through the incorporation of Stormwater attenuation ponds in the stormwater system.

Two options exist for the location of this attenuation pond:

- Proposal – Attenuation Pond along Wetland; and
- Alternative – Attenuation Pond to the north of the site.

7.2.1 Proposal – Attenuation Pond along Wetland

Preliminary discussions with the wetland specialist indicated that a long, thin attenuation pond which runs alongside the existing wetland and has multiple release points would be most environmentally sound and would mimic the wetland conditions existing on site.

In line with this, the engineers have designed a proposed attenuation pond alongside the wetland (Figure 7-3).

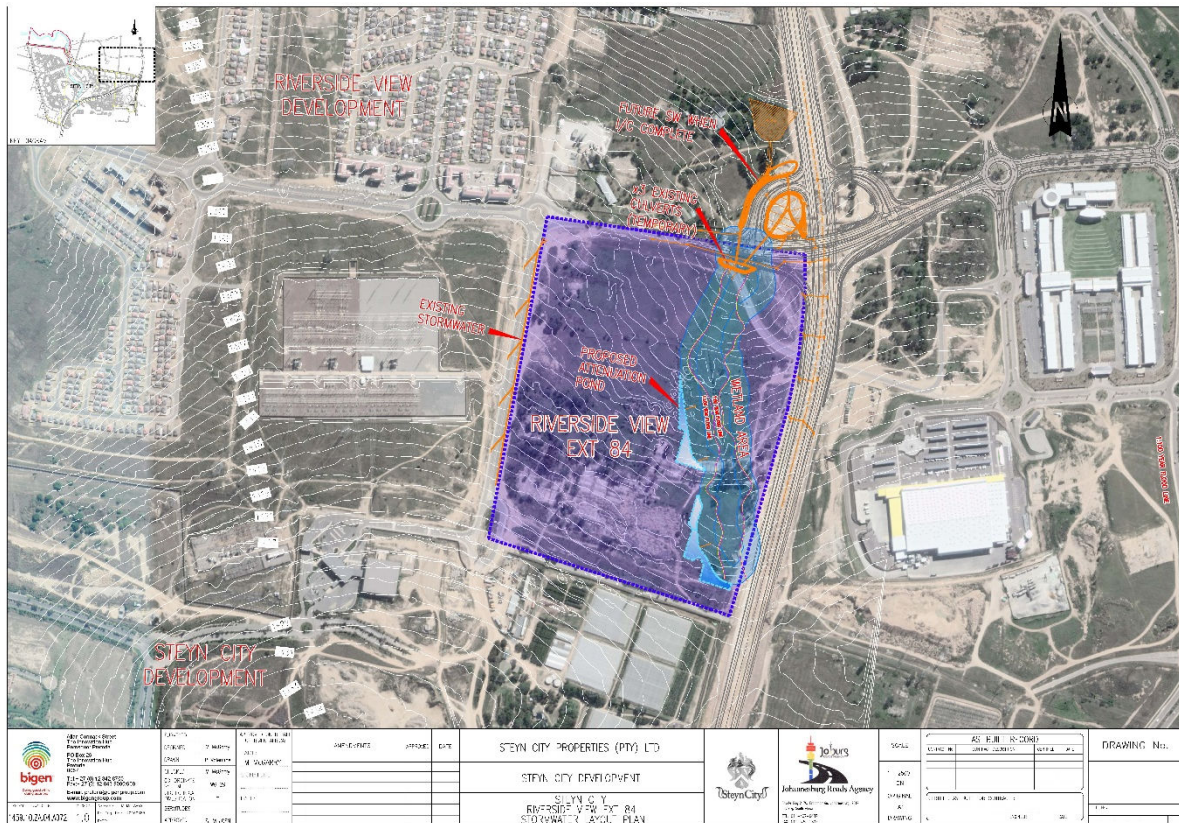


Figure 7-3: Proposal – Attenuation Pond along Wetland

As part of the development of the SWMP, the Proposal (Attenuation along the Wetland) has been further designed to ensure that it is practicable and will meet the requirements of the City of Johannesburg. To the end, additional attenuation is provided as part of the sports field, and on the eastern side of the wetland. The updated proposal is therefore indicated in Figure 7-4.

In general, stormwater attenuation will make use of the following:

- Grass lined attenuation ponds;
- Use of the soccer field to attenuate stormwater and allow for ground water recharge;
- Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
- Throttled outlet structures; and
- Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.

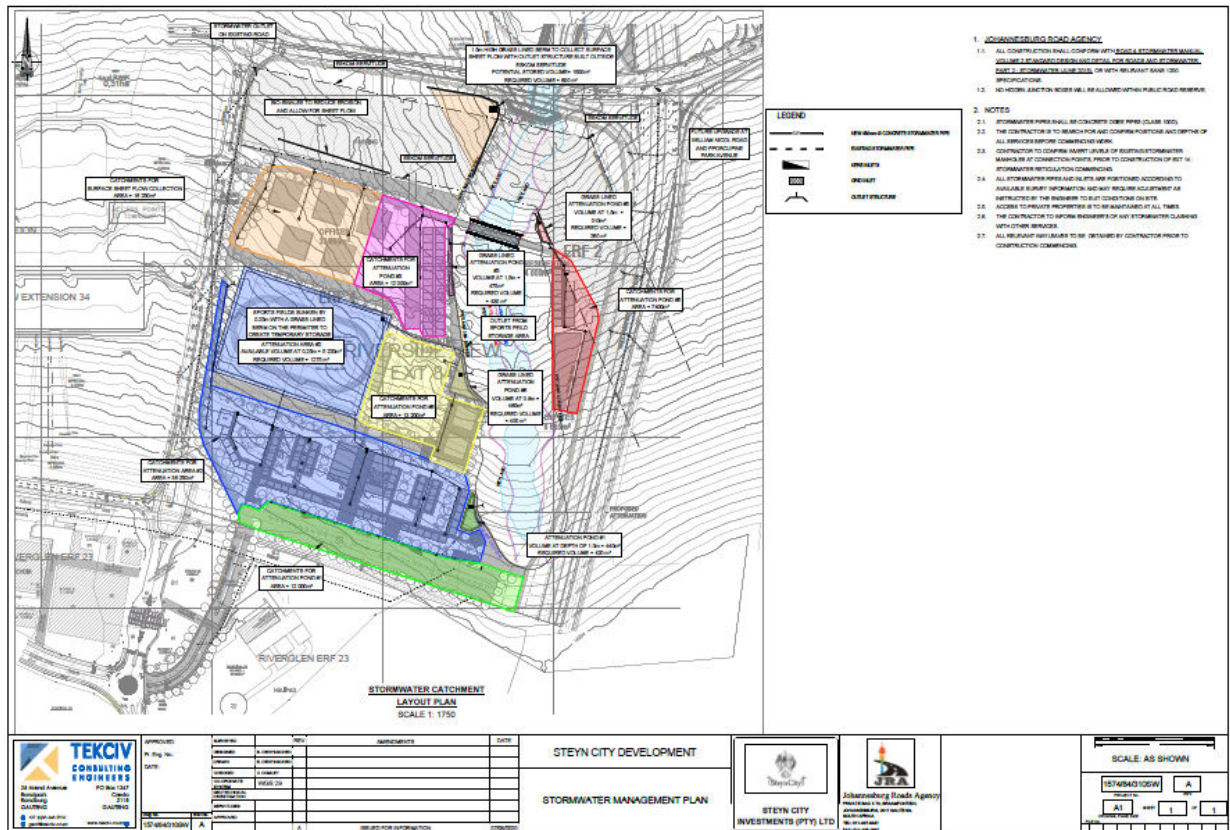


Figure 7-4: Updated Proposal – Attenuation along the Wetland

7.2.2 Alternative – Attenuation Pond to the north of the site

As part of the alternative, Stormwater would be attenuated to the north of the site. Only one release point would be provided (Figure 7-5.).

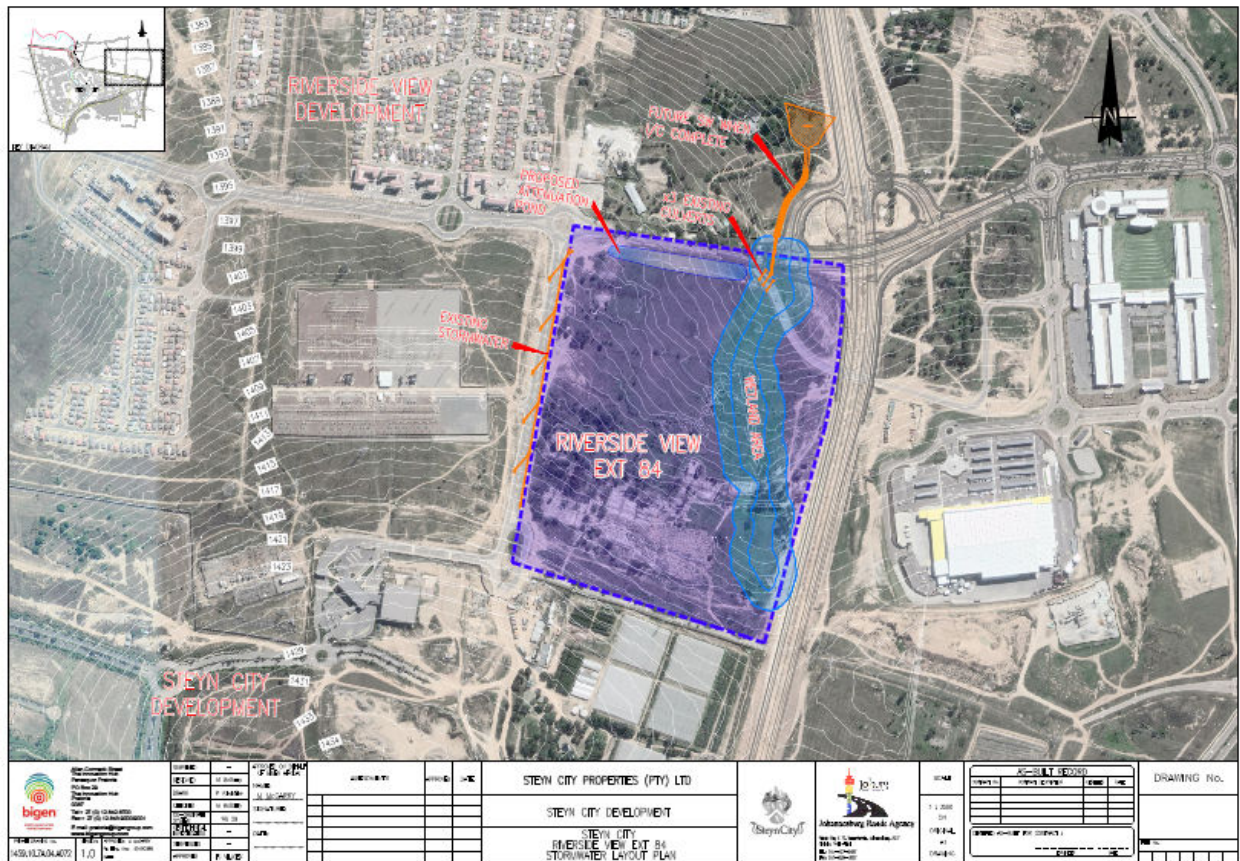


Figure 7-5: Alternative - Attenuation Pond to the north of the site

7.3 No-Go Alternative

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives.

The main implication of the No Go Option is that should the development not proceed, there will be a loss of the economic benefits of the investment of approximately R15 million in the area. There will also be a loss of the 150 construction related employment opportunities and 150 operation related employment opportunities.

Further, the site will remain vacant and will not provide the needed ancillary uses required by Steyn City. In particular, it is important to note that the proposed use of the site for the primary rights will fulfil a need for an all-phase school / residential use / storage / offices with ancillary shops and restaurants, to cater for the varying demands of the residents of Steyn City Estate. There is therefore a need for such a development especially in light of the fact that there is an increasing need for the provision of adequate schools in close proximity - or within the secure environment - of an upmarket estate, which is also located close to transport, employment and other urban opportunities. Therefore, should the no-go alternative proceed, there will be a lack of the needed uses. Of particular concern would be the loss of the school for the area.

8 PUBLIC PARTICIPATION

8.1 Objectives and Purpose of Public Participation

The purpose of the public participation process is to provide information regarding the proposed project to any potentially interested and/or affected person for use and consideration throughout the environmental assessment process. The information usually involves a combination of the technical project scope, environmental attributes and sensitives, cultural and heritage aspects as well as socio-economic factors that may be potentially beneficial or problematic to various role players.

The dissemination of such information is intended to assist the public with understanding how the proposed project and/or development may impact them and the environment in either a positive and/or negative manner, and especially where impacts are determined or perceived as significantly high, how such impacts may be influenced by project changes (layout or design aspects) or management measures may be implemented to reduce or minimise the significance of any identified impacts.

As a registered I&AP, members of the public of any affiliation are awarded the opportunity to remain informed of the steps, actions and decisions made within the environmental impact assessment process and are able to actively participate by reviewing all information provided by the EAP to the I&AP's in a reasonable period in order to provide comments, objections, suggestions or any other information that will assist the project to develop in a favourable for all manner or contribute to the competent authority's knowledge in order to make an informed decision on the application for environmental authorisation.

8.2 Notification Phase of Public Participation³

The public participation process commenced with identifying and notifying all potential Interested and Affected Parties (I&AP's). Background information documents and comment forms were provided as a basic source of information or notices were viewed and potential interested and/or affected members of the public were invited to register as I&AP's for the remainder of the Scoping and Environmental Impact Reporting phases of the process. All public participation was conducted in English as it is the first language of 50% of the surrounding communities according to Stats South Africa.

8.2.1 Identified I&AP's

The following potential I&AP's were identified:

- Gauteng Department of Agriculture and Rural Development (GDARD);
- Department of Human Settlements, Water and Sanitation (DHSWS);
- CoJ: Department of Environmental Planning and Management;
- Johannesburg Roads Agency;
- Eskom;
- Adjacent landowners;

³ Please note that as the initial notification took place in 2018, re-notification was undertaken as part of the review of the Scoping Report and is detailed in Section 7.3.

- Local businesses in the area; and the
- The relevant ward councillor.

Refer to Appendix 14.5.1. for a detailed list of the interested and/or affected members of the public that were notified and/or subsequently registered as an I&AP.

8.2.2 Newspaper Notice

A notice was published in the Star Newspaper on **19 October 2018**.

Refer to Appendix 14.5.2.1. for proof of the newspaper notices.

8.2.3 Site Notice

Two site notices were placed on the **19 October 2018** around the proposed development site at the following locations:

- On the corner of View Road and Porcupine Park Avenue (to the north of the site); and
- Along Porcupine Park Avenue (at William Nicol Drive, to the east of the site).

Refer to Appendix 14.5.2.2 for proof of the notices placed on site.

8.2.4 Written Notifications

The surrounding landowners and/or occupiers and organs of state (listed in Appendix 14.5.1) were notified in writing via email on **22 October 2018** and were issued with a copy of the Background Information Document (BID) to provide further information on the project. A copy of the BID is provided in Appendix 14.5.2.3

Refer to Appendix 14.5.2.4 for proof of the Written Notifications undertaken as part of the initial notification.

8.2.5 Comments Raised by I&AP's during the Initial Notification Period

The comments received during the initial notification period are summarised in the Comments and Responses Report attached in Appendix 14.5.5. Most comments received were requests to be registered. In addition, Eskom issued comments noting their powerlines would be affected. They did not raise any objections but instead provided a number of terms that must be adhered to. These have been incorporated into the EMPr included as an Annexure to this document.

8.3 Scoping Phase Comment Period

The Scoping Report was made available for review and comment to all registered interested and affected parties and relevant organs of state for a period of 30 days from **7 February 2020 to 9 March 2020**.

Due to the fact the review of the Scoping Report took place more than a year after the initial notification, re-notification of all I&APs was also undertaken at the same time to ensure a fair public participation process. The details of the re-notification are as follows:

8.3.1 Newspaper Notice

A notice was published in the Star Newspaper on **7 February 2020**. The advert provided information on the proposed development as well as the review of the Scoping Report.

Refer to Appendix 14.5.3.1 for a copy of the newspaper notice as well as proof of notification.

8.3.2 Site Notice

As before, two site notices were placed on the **6 February 2020** around the proposed development site at the following locations:

- On the corner of View Road and Porcupine Park Avenue (to the north of the site); and
- Along Porcupine Park Avenue (at William Nicol Drive, to the east of the site).

Refer to Appendix 14.5.3.2 for a copy of notice placed on site as well as proof of notification.

8.3.3 Written Notifications

The surrounding landowners and/or occupiers and organs of state were notified in writing via email on **7 February 2020** and were issued with a copy of the Background Information Document (BID) to provide further information on the project. The BID that was initially distributed was updated to include the details of the public review of the Scoping Report as well as the link to download the document. Please refer to Appendix 14.5.3.3 for copies of the updated BID.

All registered I&AP's were notified via email and provided with a downloadable link to the DSR. Proof of notification is included in Appendix 14.5.3.4.

8.3.4 Authority Review of the Scoping Report

In addition to the public review, hard and/or electronic copies of the Scoping Report were also provided to key commenting and/or decision-making authorities. These included:

- GDARD;
- DHSWS; and
- City of Johannesburg.

A copy of the Scoping Report was also uploaded onto the SAHRIS to provide the SAHRA an opportunity to comment on the EIA Report.

Proof of delivery to authorities is included in Section 14.5.3.5.

8.3.5 Comments Received during and after the Review of the Scoping Report

Comments were received from the City of Johannesburg, GDARD, Eskom and an adjacent landowner. All comments received have been included in the Comments and Responses Register which can be found in Appendix 14.5.5.

In addition, comments were also received from SAHRA as well as a community member from the area. These were submitted after the public review of the Scoping Report was completed and the final document submitted to GDARD. However, the comments have been taken into account and included in the Comments and Responses Report.

8.4 EIA Phase Public Participation

As required by the EIA Regulations, 2014 (as amended). The EIA Report (this document) has been subjected to public participation. The details of such is described in the subsections that follow:

8.4.1 Public Review of the EIA Report

Email notification was sent to all registered I&APs on the I&AP Database notifying them of the review of the EIA Report. A link to download a copy of the EIA Report was included in the notification email. A 30-day public review period was provided between **11 September 2020 to 12 October 2020**. Proof of notification of registered I&APs is included in Appendix 14.5.4.1.

8.4.2 Authority Review of the EIA Report

In addition to the public review, copies of the EIA Report were also provided to key commenting and/or decision-making authorities. These included:

- GDARD;
- DHSWS; and
- City of Johannesburg.

In addition, a copy of the EIA Report and HIA was uploaded onto the SAHRIS to provide the SAHRA an opportunity to comment on the EIA Report.

Proof of delivery to authorities is included in Appendix 14.5.4.2.

A 30-day review period was provided between **11 September 2020 to 12 October 2020**.

8.4.3 Comments Received

The following comments were received as part of the review of the EIR:

- Requests for information
 - Traffic Impact Assessment and Stormwater Management Plan
 - Information on William Nicol Drive Upgrade Timeframes
 - Information on whether there has been a change in the proposed development since Scoping.
- Support of the Development
 - From the Ward Councilor of the area.
- Comments from SAHRA
 - Support the development

- Mitigation to include Chance Find Procedure.
- Comments from City of Johannesburg Impact Assessment and Compliance Monitoring
 - Concerns regarding the artificial source of water indicated by Wetland and Biodiversity specialists.
 - Concern regarding the conservation of the degraded grassland area.
 - Comments on Geotechnical Assessment.
 - Requirements for recreational open space.
 - Concern regarding stormwater.

Please refer to Appendix 14.5.5. for a copy of the Comments and Responses Report as well as Appendix 14.5.6.4 for a copy of the comments received during the EIR public review. Please note that in order to provide a detailed response to the City of Johannesburg, an addendum to the Comments and Responses Report has been compiled and should be read in conjunction with the Comments and Responses Report.

8.5 Updated EIA Report and GDARD Decision

All comments received during the comment period discussed above have been considered and incorporated into the EIA Report and documented in the Comments and Response Report.

The EIA Report will now be submitted to GDARD for decision.

8.6 Outcome of the Decision

Registered I&AP's will be notified in writing of the outcome of the Department's decision within 12 days of the decision. The notification will include details of the process and timeframes in which to appeal the outcome of the decision made by the competent authority, GDARD.

8.7 Timeframes

An overview of the Scoping and EIA process undertaken to date is provided in Table 8-1.

Table 8-1: Proposed timeframes for the EIA process.

Responsible Role Player	Milestone Tasks	Required Time Period	Proposed Timeframes	Status
Application Phase				
PPP	Written, Newspaper, Site Notices & BID's	30 days	19 October 2018	✓
EAP	Submit Application for EA	N/A	28 January 2020	✓
GDARD	Accept/Acknowledge Application for EA	10 days	+/- 10 February 2020	✓
Scoping Phase				
EAP	Compile SR	N/A	2018/2019	✓
PPP	I&AP Comment Period on SR	30 days	7 February 2020 – 9 March 2020	✓
EAP	Review / Incorporate Comments	2 days	10 March 2020 – 18 March 2020 -	✓

GDARD	Review SR	43 days	19 March 2020 – 5 August 2020	✓
Impact Assessment Phase				
Specialists	Ecology, Wetland, HIA	N/A	During appropriate season	✓
EAP	Compile EIA Report	N/A	April 2020-September 2020	✓
PPP	I&AP Comment on EIA Report	30 days	September 2020 – October 2020	✓
EAP	Review / Incorporate Comments	2 days	October 2020	✓
GDARD	Review EIA Report and Provide Decision	106 days	September-November 2020	<u>In progress</u>
PPP	Notification of Decision / Appeal		November 2020	✗

9 SUMMARY OF SPECIALIST STUDIES

One of the most important aspects of the Scoping Phase was the identification of specialist studies required for the EIA Phase.

The Specialist Studies triggered (*a trigger is “a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input”*) included the following:

- Biodiversity Baseline and Impact Assessment;
- Wetland Assessment;
- Heritage Impact Assessment;
- Monitoring Plan; and
- Wetland Rehabilitation Plan.

In addition, the following technical studies were also undertaken and have also been used to inform the EIA Report:

- Outline Scheme Report;
- Geotechnical Assessment;
- Traffic Impact Assessment; and
- Stormwater Management Plan.

Although these are not specific environmental specialist studies, they are also summarised below.

The *Guideline for the review of specialist input in EIA processes (Keatimilwe & Ashton, 2005)* was used to ensure that specialist input was incorporated into the EIA Report comprehensively. This included the incorporation of the following information:

- The assumptions and limitations identified in each study are included in Section 9.10.;
- A summary of each specialist study is provided below and includes information on the key findings and conclusions drawn;
- The Specialists' impacts assessment, and the identified mitigation measures, were included in the overall project impact assessment contained in Section 10;
- Specialist information was used to assess alternatives and identify the BPEO (Section 10.6);
- Specialist input was obtained to address comments made by I&APs that related to specific environmental features; and
- Recommendations made by the specialists were taken forward to the EIA Conclusions and Recommendations and associated EMP (Section 11 and Section 14.8).

9.1 Biodiversity Baseline and Impact Assessment

The key issues and triggers identified during Scoping for the Ecological Assessment include:

- The presence of Threatened Terrestrial Vegetation within the proposed development footprint (Egoli Granite Grassland); and
- The presence of CBA: Important Area and ESA within the proposed development.

The details of the Ecological Specialists that were responsible for the compilation of the study are as follows:

- Martinus Erasmus
 - **Qualifications:** B-Tech degree in Nature Conservation
 - **Experience:** 5 years' experience.
 - Affiliations: Cand.Sci.Nat.
- Lindi Steyn
 - Qualifications: PhD
 - **Experience:** 7 Years' experience
- Andrew Husted
 - **Qualifications:** MSc. Aquatic Science
 - **Experience:** 12 years' experience.
 - **Affiliations:** Pr Sci Nat registered (400213/11) in the following fields of practice: Ecological Science, Environmental Science and Aquatic Science

The full Ecological Impact Assessment is appended in Section 14.6.1.

9.1.1 Key Findings

9.1.1.1 Terms of Reference

The Terms of Reference (ToR) for the proposed study included the following:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the study area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify 'significant' ecological, botanical and zoological features within the proposed development areas;
- Provide a map identifying sensitive receptors in the study area, based on available maps, database information & site visit verification.
- Site visit to verify desktop information; and
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application.

9.1.1.2 Method

The methods involved in the study included:

- Utilizing of Geographic Information Systems (GIS):
 - Existing data layers were incorporated into a GIS to establish how the proposed the mining operation interact with these important entities. Emphasis was placed around the following spatial datasets including Vegetation Map of South Africa, Lesotho and Swaziland (Mucina et al., 2007); Important Bird Areas 2015 – BirdLife South Africa (vector geospatial dataset); and Gauteng Conservation Plan (Version 3.3).
- Botanical Assessment:
 - The botanical study encompassed an assessment of all the vegetation units and habitat types within the project area. The focus was on an ecological habitat assessment of habitat types as well as identification for any red-data species within the known distribution of the Project area. The methodology included the following survey techniques:
 - Timed meanders;
 - Sensitivity analysis based on structural and species diversity; and
 - Identification of floral red-data species
 - A literature review was conducted as part of the desktop study to identify the potential habitats present within the project area. The SANBI provides an electronic database system, namely the Botanical Database of Southern Africa (BODATSA), to access distribution records on southern African plants. This is a new database which replaces the old Plants of Southern Africa (POSA) database. The POSA database provided distribution data of flora at the quarter degree square (QDS) resolution.
 - The Red List of South African Plants website (SANBI, 2016) was utilized to provide the most current account of the national status of flora. Relevant field guides and texts were consulted for identification purposes in the field during the surveys.
- Wet Season Fieldwork
 - The wet season fieldwork and sample sites were placed within targeted areas (i.e. target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork.
 - The focus of the fieldwork was to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological habitat assessment at each sample site. Emphasis was placed on sensitive habitats.
 - At each sample site notes were made regarding current impacts (e.g. invasive species, fencing etc.), subjective recording of dominant vegetation species and any sensitive features (e.g. wetlands, outcrops etc.). In addition, opportunistic observations were made while navigating through the project area. Effort was made to cover all the different habitat types within the limits of time and access.
- Faunal Assessment
 - The faunal desktop assessment included the following:
 - Compilation of identified species lists;

- Compilation of expected species lists;
- Identification of any Red Data or species of conservation concern (SCC) present or potentially occurring in the area; and
- Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance.
- The field survey component of the study utilised a variety of sampling techniques including, but not limited to, the following:
 - Visual observations;
 - Identification of tracks and signs; and
 - Utilization of local knowledge.
- Herpetology
 - A herpetofauna assessment of the project area was also conducted. The herpetological field survey comprised the following techniques
 - Diurnal hand searches - are used for reptile species that shelter in or under particular microhabitats (typically rocks, exfoliating rock outcrops, fallen timber, leaf litter, bark etc.);
 - Visual searches - typically undertaken for species whose behaviour involves surface activity or for species that are difficult to detect by hand-searches or pitfall trapping. May include walking transects or using binoculars to view species from a distance without them being disturbed;
 - Amphibians – many of the survey techniques listed above will be able to detect species of amphibians. Over and above these techniques, vocalisation sampling techniques are often the best to detect the presence of amphibians as each species has a distinct call; and
 - Opportunistic sampling - Reptiles, especially snakes, are incredibly illusive and difficult to observe. Consequently, all possible opportunities to observe reptiles are taken, in order to augment the standard sampling procedures described above. This will include talking to local people and staff at the site and reviewing photographs of reptiles and amphibians that the other biodiversity specialists may come across while on site.

9.1.1.3 Findings

9.1.1.3.1 Desktop Assessment

A summary of the findings of the desktop assessment undertaken as part of the Biodiversity Baseline and Impact Assessment is provided below.

- Vegetation Assessment
 - The Riverside View project area is situated within the grassland biome, specifically the Egoli Granite Grassland. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006).
 - Egoli Granite Grassland occurs only in the Gauteng province, and less than 32% of this vegetation type remains untransformed. The province has a target to conserve and protect 25% of the remaining vegetation type.

- Egoli Granite Grassland is characterised by a high species richness with a patchy dominance of various grass species, and a large variety of forbs (broad leafed herbaceous plant, other than grass), representing a climax or close to climax condition
- Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 543 plant species are expected to occur in the area. Of the 543-plant species, three (3) species are listed as being Species of Conservation Concern (SCC). These include: *Delosperma leendertziae*, *Melolobium subspicatum* and *Pearsonia bracteata*.
- Avifauna
 - Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 429 bird species are expected to occur in the vicinity of the project area.
 - Of the expected bird species, thirty (30) species (6.6%) are listed as SCC either on a regional (29) or global scale (13).
 - These include: *Alcedo semitorquata* (Half-collared Kingfisher), *Anthropoides paradiseus* (Blue Crane), *Aquila ayresii* (Ayres's Hawk-eagle), *Aquila verreauxii* (Verreaux's Eagle), *Calidris ferruginea* (Curlew Sandpiper), *Ciconia abdimii* (Abdim's Stork), *Ciconia nigra* (Black Stork), *Circus ranivorus* (African Marsh Harrier), *Coracias garrulous* (European Roller), *Ephippiorhynchus senegalensis* (Saddle-billed Stork), *Eupodotis senegalensis* (White-bellied Korhaan); *Falco biarmicus* (Lanner Falcon); *Falco vespertinus* (Red-footed Falcon); *Geronticus calvus* (Southern Bald Ibis); *Glareola nordmanni* (Black-winged Pratincole); *Gyps africanus* (White-backed Vulture); *Gyps coprotheres* (Cape Vulture); *Limosa lapponica* (Bar-tailed Godwit); *Mycteria ibis* (Yellow-billed Stork); *Oxyura maccoa* (Maccoa Duck); *Phoeniconaias minor* (Lesser Flamingo); *Podica senegalensis* (African Finfoot); *Polemaetus bellicosus* (Martial Eagle); *Pterocles gutturalis* (Yellow Throated Sandgrouse), *Rostratula benghalensis* (Greater Painted-snipe); *Sagittarius serpentarius* (Secretarybird); *Sterna caspia* (Caspian Tern) and *Tyto capensis* (African Grass-owl).
 - In particular, the African Grass Owl is rated as VU on a regional basis. This species has been observed in the area previously.
- Mammals:
 - The IUCN Red List Spatial Data (IUCN, 2017) lists 91 mammal species that could be expected to occur within the project area. Of these species, 10 are medium to large conservation dependent species, such *Ceratotherium simum* (Southern White Rhinoceros) and *Tragelaphus oryx* (Common Eland) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list.
 - Of the remaining 91 small to medium sized mammal species, sixteen (16) (17%) are listed as being of conservation concern on a regional or global basis.
 - The list of potential species includes: Two (2) that are listed as EN on a regional basis; Five (5) that are listed as VU on a regional basis; and Nine (9) that are listed as NT on a regional scale. On a global scale, 2 species are listed as EN, 5 are listed as VU and 9 as NT.

- These include: *Aonyx capensis* (Cape Clawless Otter), *Atelerix frontalis* (South African Hedgehog), *Crocidura maquassiensis* (Maquassie Musk Shrew), *Crocidura mariquensis* (Swamp Musk Shrew), *Dasymys incomtus* (African Marsh Rat), *Felis nigripes* (Black-footed Cat), *Hydrictis maculicollis* (Spotted-necked Otter), *Leptailurus serval* (Serval), *Mystromys albicaudatus* (White-tailed Rat), *Ourebia ourebi* (Oribi), *Panthera pardus* (Leopard), *Parahyaena brunnea* (Brown Hyaena), *Pelea capreolus* (Grey Rhebok)
- *Poecilogale albinucha* (African Striped Weasel), *Redunca fulvorufula* (Mountain Reedbuck), and *Rhinolophus blasii* (Blasius's Horsehoe Bat).
- Herpetofauna
 - Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2017) 81 reptile species are expected to occur in the project area. Three (3) reptile species of conservation concern could be present in the project area according to the above-mentioned sources.
 - These include: *Chamaesaura aenea* (Copper Grass Lizard), *Crocodylus niloticus*, *Homoroselaps dorsalis* (Striped Harlequin Snake).
 - Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2017) 30 amphibian species are expected to occur in the project area. One (1) amphibian species of conservation concern could be present in the project area according to the above-mentioned sources.
 - Giant Bull Frog (*Pyxicephalus adspersus*) is a species of conservation concern that will possibly occur in the project area. It should be noted that the likelihood of occurrence is rated as low because of the proximity to humans and the chance of persecution.

9.1.1.3.2 Field Survey

A summary of the findings of the field survey undertaken as part of the Biodiversity Baseline and Impact Assessment is provided below.

Vegetation Assessment

The vegetation assessment was conducted throughout the entire project area and the following habitats were identified in the project area:

- The **degraded grassland** area is an area where the habitat is considered to be predominantly intact with the vegetation and species composition in a semi-natural state. This habitat contained the highest diversity of indigenous plant species of the various habitats identified. This area has recovered somewhat from historic impacts and does function as a part of the natural ecosystem in the area. *Imperata cylindrica* was found within this habitat which is known to be directly correlated to *Tyto capensis* (Grass-Owl), which utilise dense stands of this plant species as breeding and foraging habitat. This habitat is however surrounded by transformed areas and is fragmented from any other nearby natural areas. Wet areas were also identified within this habitat; however, it is presumed that the source of the water in these areas is from an artificial source.

- The **transformed habitat** in the project area consisted mainly of dumps and impacts associated with edge effects in relation to the urban area. This habitat hosted a large number of the exotic alien plant species recorded within the project area and has been impacted upon and transformed to such an extent that it will need many years of recovery and active rehabilitation to recover to a near-natural state and therefore this area was given a low sensitivity rating.
- A total of 40 tree, shrub and herbaceous plant species were recorded in the project area during the January 2019 field assessment. No species of conservation concern were identified.
- Six (6) Category 1b invasive species were recorded within the project area and must therefore be removed by implementing an alien invasive plant management programme in compliance of section 75 of the Act as stated above.

Figure 9-1 below shows the extent of these two habitat types.

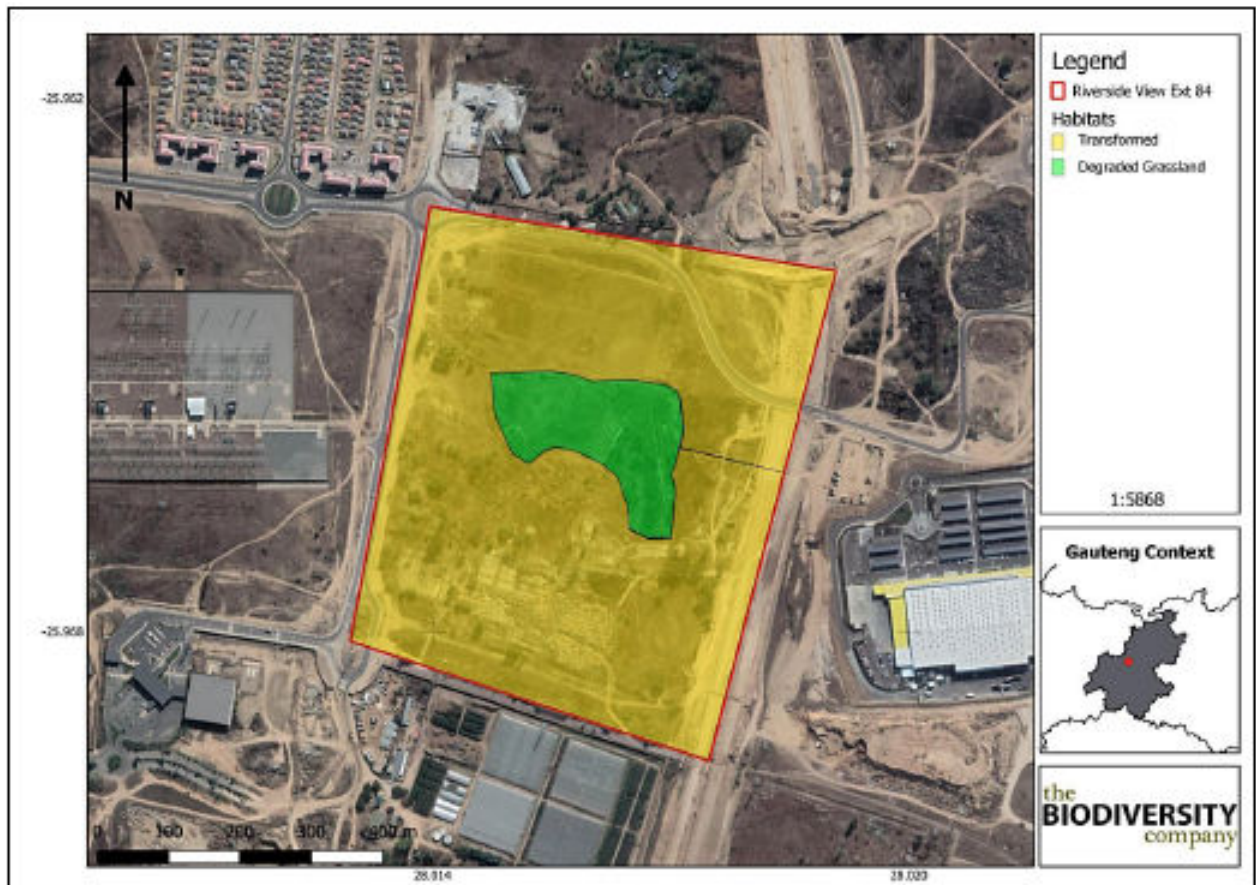


Figure 9-1: Habitat types identified during the fieldwork (The Biodiversity Company, 2019)

Avifauna

During the February 2019 survey nine species of birds were recorded. The site is known to have African Grass-owls (*Tyto capensis*). The Kyalami African Grass Owl Project and EWT noted that an individual of this species which is fitted with a telemetry device does forage within the project area (<https://gekco.co.za/kyalami-african-grass-owl-project/>). However, no currently-known breeding sites occur

here but further surveys may reveal the presence of possible nests. The fact that this species is known to occur in the project area is an important aspect to consider for the development and special mitigations may need to be followed for the protection of this species in this area.

Mammals

Overall, mammal diversity in the project area was considered low, with no mammals recorded during this February 2019 survey based on either direct observation, or the presence of visual tracks & signs.

Herpetofauna

The herpetofauna diversity was considered low as one reptile species and no amphibian species were recorded during the February 2019 survey. The only species identified during the site visit was *Trachylepis striata* (Striped Skink). It is considered likely that further surveys would reveal the presence of various common amphibian and reptile species, but the likelihood of occurrence of SCC is low.

9.1.1.3.3 Sensitivity Mapping

The Biodiversity Baseline and Impact Assessment compiled a sensitivity map for the study site. As part of this, a moderate sensitivity score was given to the middle portion of the project area. These areas were considered the most natural areas within the overall project area and were host to the highest diversity of species. This area was also a relatively wet area as indicated by the presence of *Imperata cylindrica* and other wetland plant species. It was also in this area that Marsh Owls were recorded and where the presence of Grass Owls has been previously recorded (EWT, 2019, *pers. comm.*).

The rest of the property was classified as having a low sensitivity. This means that these areas have already been disturbed or impacted upon by factors such as litter, dumping, previous anthropogenic impacts (such as housing) and/or the presence of various alien plant species

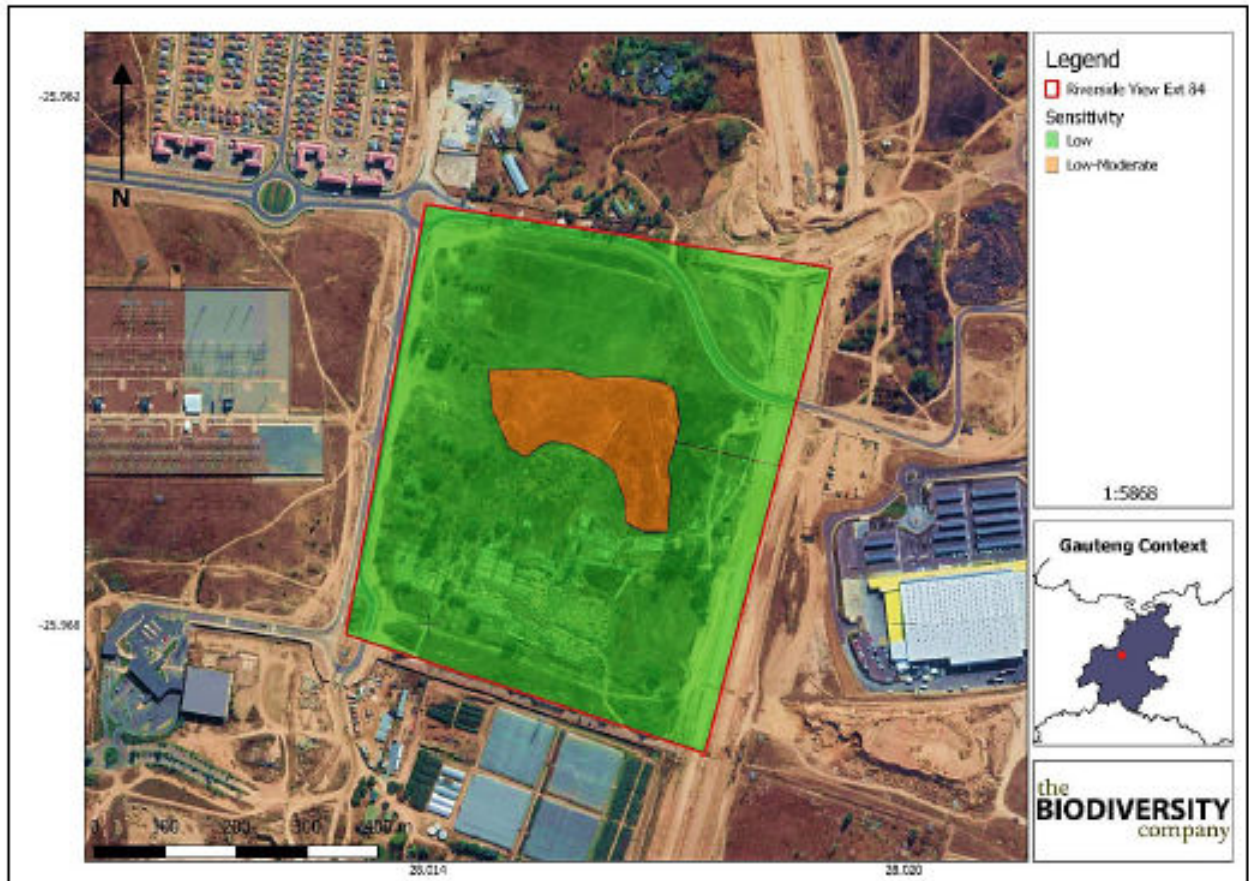


Figure 9-2: Sensitivity Map

9.1.1.3.4 Impact Assessment

A detailed impact assessment was undertaken and can be viewed in Appendix 14.6.1. In summary, the following potential impacts were considered for the construction phase.

- Potential impacts were considered on terrestrial vegetation communities
 - Destruction, further loss and fragmentation of the vegetation community (including an area classified as CBA and ESA as well as an EN vegetation type); and
 - Destruction of habitat for the African Grass Owl (especially the central portion of the project area).
- Potential impacts on faunal communities include:
 - Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).

In addition, the following impacts were considered as part of the Operational phase.

- Potential impacts were considered on terrestrial vegetation communities:
 - Continued encroachment and displacement of the vegetation community due to alien invasive plant species, particularly in previously disturbed areas.
- Potential impacts on faunal communities include:

- Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic and dust);
- Loss of faunal species (road mortalities and/or poaching);
- Habitat degradation (litter and alien vegetation encroachment); and
- Introduction of pest species (e.g. rats) due to the new habitats and food sources that are created by an increase in waste levels.

All impacts could be satisfactorily mitigated to a low or absent level will the implementation of necessary mitigation measures. These measures have been incorporated into the EMPr.

9.1.2 Conclusion

The completion of a comprehensive desktop study, in conjunction with the detailed results from the surveys mean that there is a high confidence in the information provided. The survey which was completed, and the corresponding studies resulted in good site coverage, assessing the major habitats and ecosystems, obtaining a general species (fauna and flora) overview and observing the major current impacts.

It is clear from the regional ecological overview, as well as the baseline data collected to date that the project area has been altered (historically and currently). The area was mainly transformed by large amounts of alien invasive plant species and dumping of large amounts of building rubble.

The following further conclusions were reached based on the results of this assessment (these conclusions are limited due to the unknown extent and type of development which is proposed for the project area):

- The project area falls in an area classified as an ESA and a CBA: Important area;
- The project area falls entirely within an ecosystem which is listed as EN;
- All of the terrestrial ecosystems associated with the development (entire project area and surrounds) are rated as poorly protected;
- The project area does overlap with any formally or informally protected area;
- The project area is situated in one vegetation type; the Egoli Granite Grassland (Gh 10), according to Mucina & Rutherford (2006). This vegetation type is classified as EN;
- Based on the Plants of Southern Africa database, 543 plant species are expected in the project and surrounding areas and three (3) of these species are listed as being Species of Conservation Concern (SCC);
- A total of 40 tree, shrub and herbaceous plant species were recorded in the project area during the January 2019 field assessment. No plant SCC were recorded during the survey;
- Eight (8) Category 1b invasive species were recorded within the project area and must therefore be removed by implementing an alien invasive plant management programme in compliance of section 75 of the Act as stated above; and
- The site is known to have African Grass-owls (*Tyto capensis*), the Kyalami African Grass Owl Project and EWT noted that the bird does not use the area as a nesting site but does forage in the area (<https://gekco.co.za/kyalami-african-grass-owl-project/>).

Based on the results and conclusions presented in this report, and the outcomes of the field survey, it is the opinion of the specialists that the proposed project can be favourably considered should the all the mitigations measures and recommendations be adhered to.

9.2 Wetland Assessment

The key issues and triggers identified during Scoping for the Wetland Delineation Assessment include:

- The presence of watercourses (including wetlands) along the eastern boundary of the site.

The details of the Specialist are as follows:

- D. Botha
 - **Qualifications:** M.A. Environmental Management; B.A. Hons. Geography & Environmental Management; Wetland and Riparian Delineation (DWA Accredited Short Course); Soil Classification and Wetland Delineation (Terrasoil Science Short Course) and Tools for Wetland Assessment (Cum Laude) (Rhodes University)
 - **Experience:** 17 years' experience.
 - **Affiliations:** SACNASP Registered Scientist – Pr.Sci.Nat. (119979), EAPASA: Registered EAP (2019/1209), Member of the International Association for Impact Assessors (IAIAsa) (1653), Member of the Gauteng Wetland Forum, Member of the South African Wetland Society.

The full Wetland Delineation Assessment is appended in Section 14.6.2.

9.2.1 Key Findings

9.2.1.1 Scope and Purpose

The aim of this study was to undertake a wetland assessment to delineate the wetland and to determine the Present Ecological State (PES), the Ecological Importance and Sensitivity (EIS) and the Recommended Ecological Classification (REC) for the proposed development. This, specifically to inform the Environmental Impact Assessment (EIA) and Water Use License Application (WULA) for the said development.

9.2.1.2 Method

The methods involved in this study involved the following:

- Desktop Assessment
 - A preliminary delineation of the Wetland boundary was undertaken using aerial photograph interpretation.
 - Historical records and reports were consulted.

- The Department of Water and Sanitation (DWS) database was also consulted to obtain historical data for the study area. The National Wetland Map version 5 (NWM5) as presented by South African National Biodiversity Institute (SANBI) was also scrutinised (Van Deventer et al, 2019).
- Historical data and official approvals were also consulted during the assessment.
- Field Assessment
 - The field investigation was undertaken during January 2020 to assess and corroborate the delineated Wetland zones present on the survey area.
 - The field procedure for the wetland delineation was conducted according to the Guidelines for delineating the boundaries of a wetland set out by the Department of Water Affairs and Forestry (DWAF 2005/8). The following wetland indicators were considered (DWAF 2005/8):
 - Terrain unit indicator;
 - Soil wetness indicator; and
 - The vegetation indicator.
 - The following procedure was followed during the delineation of the wetland boundaries and zones:
 - A desktop delineation of the larger wetland area was undertaken using satellite imagery of the study site;
 - Areas for verification were identified; and
 - Identified areas were then assessed in the field with boundaries being recorded using a GPS.
- Mapping
 - Mapping of the wetland boundaries was done by computerised processing utilising GPS tools, mobile applications and GIS modelling.

9.2.1.3 Findings

The findings of the report are summarised below:

9.2.1.3.1 Desktop Assessment

During the desktop investigation, one (1) possible area where wetlands could occur was identified on or in close proximity to the study site that would be affected by the proposed development activities. The National Wetland Map version 5 (NWM5) as presented by SANBI was also scrutinised and one wetland area was identified on or in close proximity to the study site that could be affected by the proposed activities. The wetland as indicated by the NWM5 wetland layers were further investigated on site (Figure 9-3).

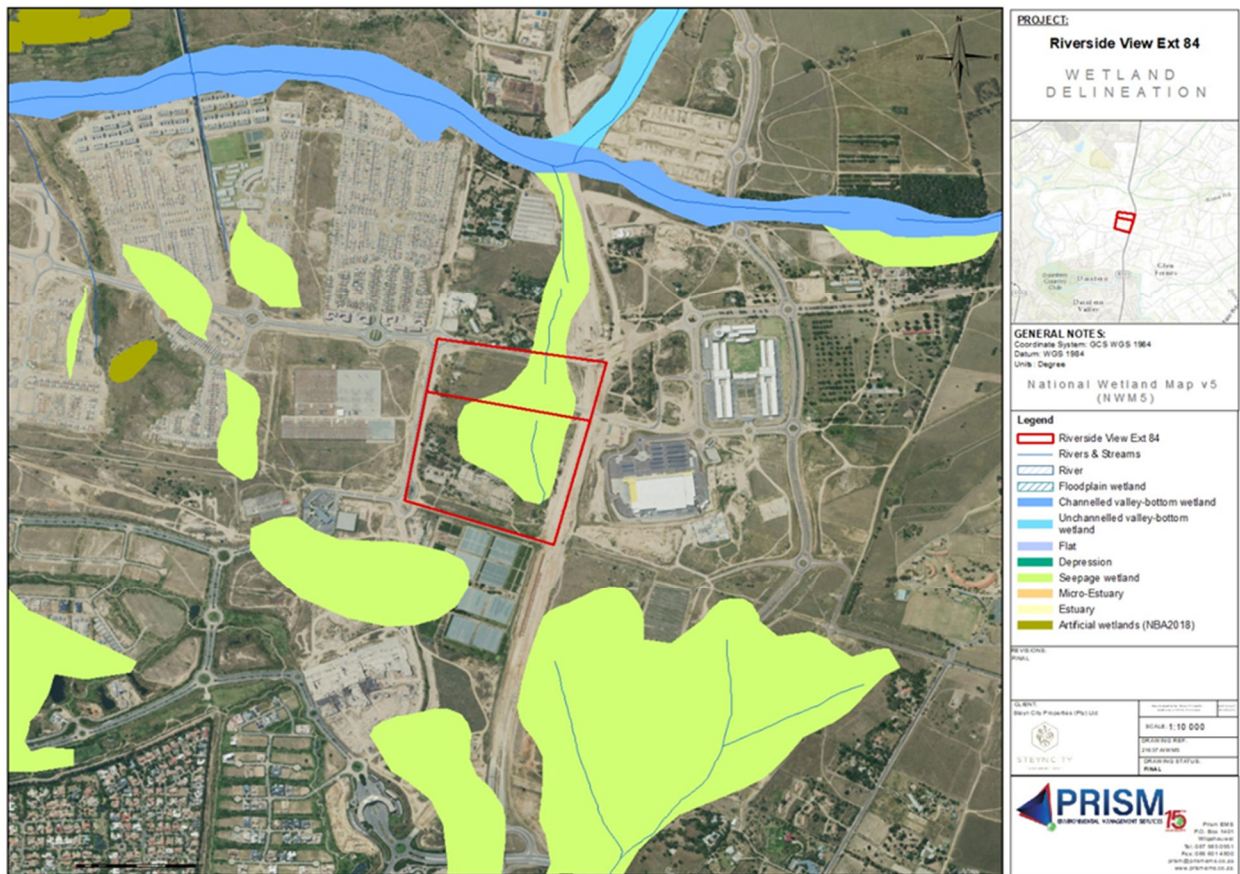


Figure 9-3: National Wetland Map version 5 (NWM5) (Van Deventer et al., 2019).

9.2.1.3.2 Field Assessment

9.2.1.3.2.1 Terrain Unit Indicator

Terrain unit indicator helps identify those parts of the landscape where wetlands are most likely to occur. The field assessment identified one (1) wetland on site. The wetland was assessed in respect to its location in the landscape:

- RSV84_UCVB was found on a plain at the head of the catchment, draining towards the North.

9.2.1.3.2.2 Soil Form and Soil Wetness Indicator

Soil erodibility in hydrologically transformed environments contributes to the difficulties to precisely determining wetland boundaries. This investigation focussed on the delineation of the wetland features based on soil hydro-morphology and landscape hydrology as observed in the catchment and on the site.

Soils were found to be of a low clay content in general. Mostly sandy soils were present especially in the top 250mm. The wetland seasonal and permanent zones reflected clayey soils. Typical halfway house granite geological formation and associated soils were observed.

9.2.1.3.2.3 Vegetation Indicator

Upon the assessment of the area, the various wetland vegetation components were assessed and recorded. Dominant species were characterised as either wetland species or terrestrial species. Hydrophytic vegetation species were observed. Predominantly grass, rushes and sedge species were recorded. This unit was predominantly utilised to delineate the wetland.

Main species identified include:

- *Pycreus* species;
- *Fuirena* Species;
- *Paspalum* species;
- *Imperata cylindrica*
- *Andropogan* species;
- *Cyperus* species;
- *Berkheya radula*; and
- *Leersia hexandra*.

9.2.1.3.2.4 Wetland Delineation

Figure 9-4 serves to conceptually present the location of the wetland that could be affected by the proposed development activities on the site.

A 32m buffer was applied to the wetland that is in line with the National Environmental Management Act (NEMA) listed activities and Gauteng biodiversity and mapping requirements. This wetland is largely disturbed due to historical impacts and is of low ecological importance. Rehabilitation of the wetland and buffer areas will be required. This conservation buffer should be utilised as the control area and will be adequate to assist with management and mitigation during the construction and operation phase.

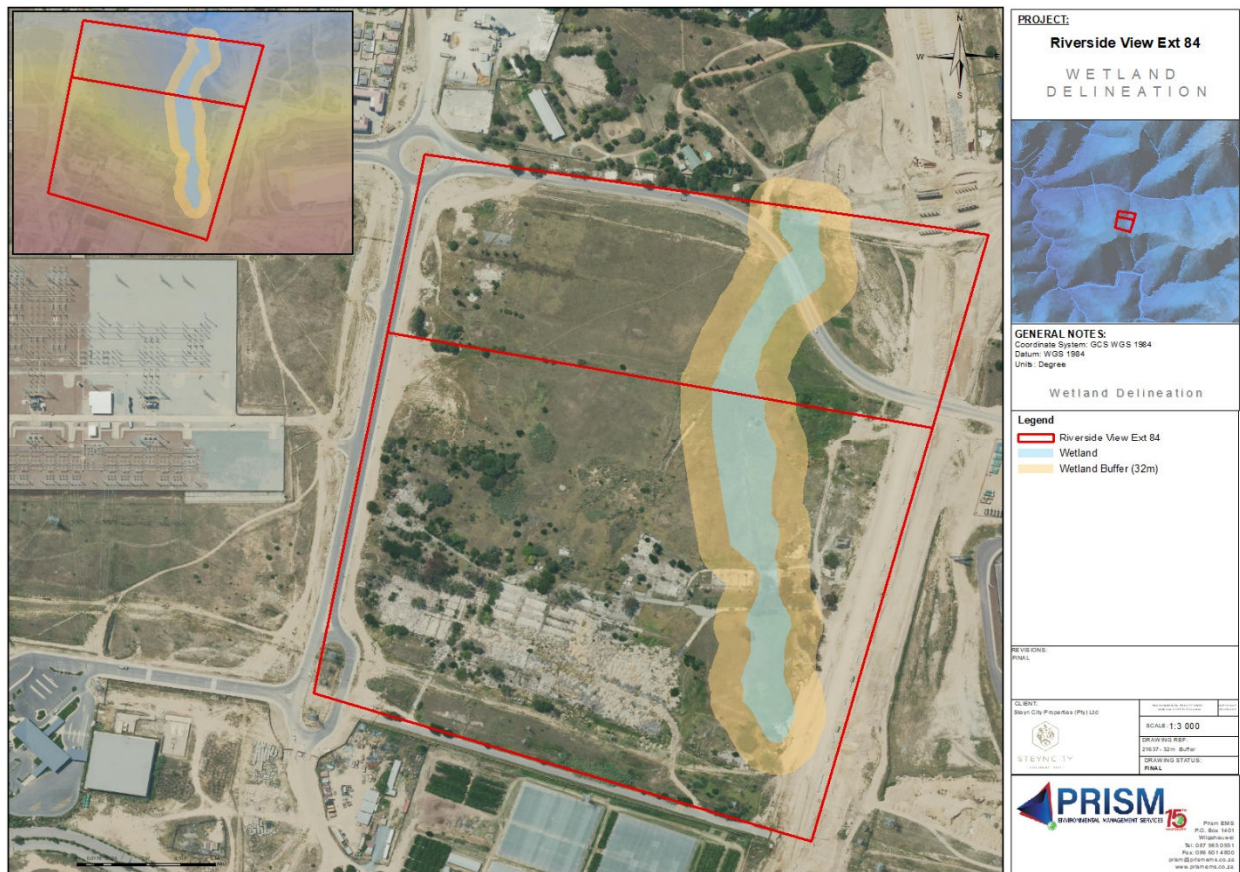


Figure 9-4: Wetland delineation and 32m buffer

The wetland recorded was assessed and the following results were attained:

- The wetland attained a low overall PES (Present Ecological State)
 - RSV84_UCVB was found to be highly modified. The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable. This wetland system is impacted by historical activities both in the catchment as well as directly on the wetland system where the impacts are continues. It forms part of a larger wetland system. The trajectory of change for the wetland ecological status is predicted that conditions are likely to deteriorate slightly over the next 5 years without major intervention.
- The wetland attained a Moderate Ecological Importance and Sensitivity (EIS) score.
 - The RSV84_UCVB, Unchanneled Valley Bottom Wetland is considered ecologically important and sensitive on a local scale. The biodiversity of this wetland is generally not sensitive to flow and habitat modifications. It plays a small role in moderating the quantity and quality of water of major rivers. The system drains into further downstream wetland and streams before reaching major rivers. The Ecological Importance and Sensitivity (EIS) for this system is thus considered to be Moderate.
- The wetland Recommended Ecological Classification (REC) classification was rated as:
 - The wetland will be impacted to some extent by the proposed development activities. This impact will be localised and at the transitional point leading from the development and

infrastructure installations into the wetland and buffer area. It will in all likelihood regress slightly in terms of its current Ecological Category if not managed in specific during the construction period. Stormwater management for the site is required in specific the construction phase. This will mitigate the impact on the wetlands. Rehabilitation of the impacts and maintenance of the system will further mitigate the impacts and could improve the sustainability of the system. It is thus rated that the Recommended Ecological Category (REC) should fall into:

- Category D for RSV84_UCVB

9.2.1.4 Impact Assessment

The specialist assessment includes an impact assessment. The following impacts were assessed and found to be of a low significance after mitigation for both the construction and operation phase:

- Water quality;
- Flow Regime;
- Habitat;
- Biota; and
- Geomorphology.

9.2.1.5 Monitoring and Mitigation Requirements

Monitoring programmes can measure the success of mitigation implementations, monitor unforeseen impacts, and can be used as a feedback system to adjust or correct management of the wetlands.

- The following are recommended:
 - It should be attempted to enhance the current wetland function.
 - Wetland drivers should be protected as far as possible.
 - Water quality preservation is key. Silt protection measure to be implemented in consultation with the wetland specialist (ECO).
 - Mitigation measures for the proposed development activities should be implemented, managed and monitored according to:
 - The following wetland ecosystem impact assessment conclusions, based on the results of the baseline survey:
 - Runoff from the construction areas may result in contamination of wetland and downstream aquatic habitat;
 - On site storm water management must be implemented.
 - The following impacts may result in changes to the soil structure:
 - Heavy construction vehicles moving within the wetland areas;
 - Ingress and Egress must be managed to minimise impacts in respect of compaction of the wetland soils.
 - Single entry and exit points must be established.

- These areas must be scarified as part of the rehabilitation plan.
- Stock piling;
 - Stock piling must be located outside the delineated wetland and buffer boundaries.
- Spills from machinery;
 - To be managed as per the Environmental Management Programme (EMPr).
- The mixing of concrete;
 - To be managed as per the Environmental Management Programme (EMPr) outside of the demarcated buffer areas with no flow into the control area.
- The following aspects may result in reduction of ecosystem habitat integrity:
 - Dust and sediment runoff from construction activities;
 - Diesel and oil spill from equipment and machinery; and
 - Higher and faster water flow from the site that could cause soil erosion.
- The following aspects may result in sedimentation of the associated aquatic systems:
 - Sedimentation due to increase runoff and dispensed soil particles and runoff from the affected areas; and
 - Increase in the velocity of the runoff from the exposed soil, due to construction.
- The proposed activities must be initiated and constructed in such a way to prevent the reduction of natural water flow into the wetland and downstream which, in essence, is the driving factor in terms of water provision.
 - An approved stormwater management plan must be implemented.
 - Velocity dissipation structures and sheet flow structures (such as reno mattresses) must also be installed to prevent water flowing through culverts to gain velocity and be released uncontrolled.
 - Dispersed flow must be attained post formal structures.
 - Sheet flow must be promoted to mimic natural flow patterns.
- The wetland integrity should be improved during the rehabilitation phase. This may entail the following:
 - Removal of alien and invasive plant species during the construction and operational phases.
 - Stabilisation of gullies and drainage lines to prevent erosion.
 - Implementation of topsoil management (stockpiling, topography shaping) and erosion control (berms, geotextiling, silt fences, hay bales and gabion structures).

- Re-vegetation with indigenous plant species.

9.2.2 Conclusion

Concluded from the results presented in this document, the construction activities will in all likelihood impact on the wetland system but can be mitigated to satisfactory standards if all mitigatory actions are implemented with due care. It is key to preserve water quality and supply to the downstream aquatic resources.

The rehabilitation of the wetland is vital to recover some ecological function. The wetland drivers must be enhanced as part of the rehabilitation of the affected areas. In respect of the construction phase, it is important to ensure that the required erosion protection measures linked to the wetland intersection sections be carefully designed and installed.

The project can be supported, should all the mitigation measures be implemented and monitored against to ensure compliance and protection of the aquatic resource.

9.3 Heritage Impact Assessment

The key issues and triggers identified during Scoping for the HIA include:

- The proposed development involves the re-zoning of a site exceeding 10 000 m² in extent and thus in line with the NHRA, a HIA is required.

The details of the Specialist are as follows:

- J. Van Der Walt
 - **Qualifications:** MA: Archaeology (PhD in progress)
 - **Experience:** 13 years' experience.
 - **Affiliations:** Professional Member of the Association of Southern African Professional Archaeologist (#159)

The full HIA is appended in Section 14.6.3.

9.3.1 Key Findings

9.3.1.1 Terms of Reference

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Specifically the following was to be undertaken:

- Field study
 - Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.
- Reporting
 - Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

- To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

9.3.1.2 Methodology

The following methodology was employed:

- Literature Review
 - A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).
- Genealogical Society and Google Earth Monuments
 - Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.
- Public Consultation and Stakeholder Engagement:
 - Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved was integrated with the S&EIA process.
- Site Investigation
 - Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.
- Site Significance and Field Rating
 - Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. A number of criteria were used to establish site significance with cognisance of Section 3 of the NHRA. In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report.
- Impact Assessment Methodology
 - In addition, a specific impact assessment methodology was utilized to assess potential impacts.

9.3.1.3 Findings

9.3.1.3.1 Literature Review

5 Previously recorded sites are on record for the 2528 CC 1: 50 000 sheet at the Wits database. These sites consist of Stone Age sites. None of these sites are located within or close to the project area but provide a background of the history of the area.

Several previous CRM projects were conducted in the general vicinity of the study area. Among these are studies by van Schalkwyk (2007, 2008 & 2013) who did not record any sites of significance but did record cemeteries during the 2008 study. Coetzee (2008) recorded graves and the remains of modern structures, but no other sites of heritage significance. Fourie (2001) conducted a survey for the township development of Cosmo City and recorded numerous graves (250), Ndebele initiation sites as well as possible Late Iron Age and Boer war sites. Van der Walt (2015) recorded no sites of significance.

9.3.1.3.2 Genealogical Society and Google Earth Monuments

No known grave sites are on record close to the study area.

9.3.1.3.3 Field Survey

Figure 9-5 below shows the extent of the field survey that was undertaken.

The property is severely disturbed and has been cultivated from prior to 1957. From 1975 onwards, numerous industrial structures and a few residential dwellings with access roads were developed. All structures on site besides one (Feature 1) has been destroyed from 2008 to 2015 based on Google Earth images.. Currently the site is fallow, highly overgrown with the building rubble from demolished structures scattered over the study area.

No archaeological sites or material of significance was recorded during the survey.

Based on the SAHRIS Paleontological Sensitivity Map. the area is of insignificant paleontological significance. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed.

In terms of Section 36 of the Act no burial sites were recorded. However, if any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

Long term impact on the cultural landscape is considered to be negligible as the surrounding area consists of a developed area that was developed from prior to 1957.. Visual impacts to scenic routes and sense of place are also considered to be low due to the extensive developments in the area.

There are no battlefields or related concentration camp sites located in the study area.

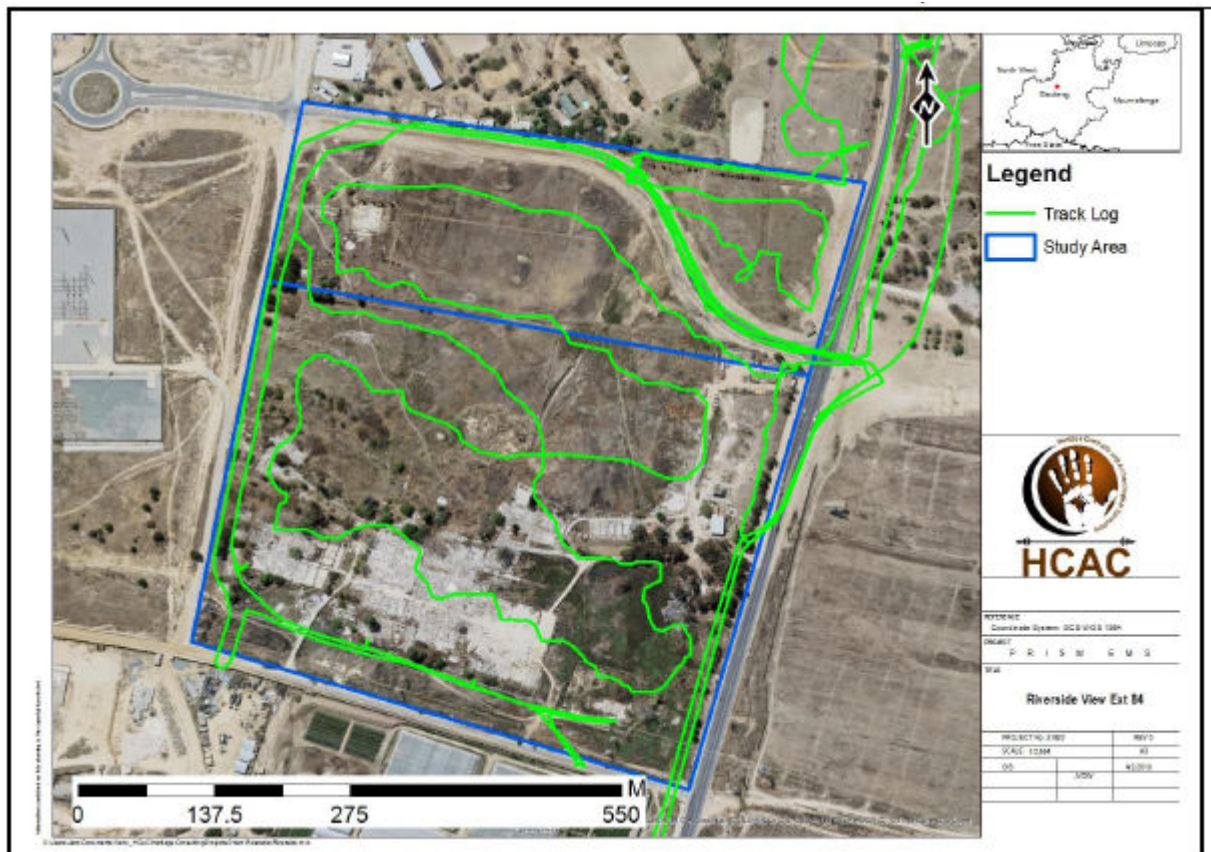


Figure 9-5: Track Logs

9.3.1.3.4 Potential Impact

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of very low significance unless unknown graves are exposed and would then be of high significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the heritage landscape. The lack of any heritage resources in the immediate area minimises additional impact on the landscape.

In particular the study noted the following possible impacts related to these following phases:

- Pre-Construction phase:
 - It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.
 - It is unclear whether the structures would be demolished or incorporated within the proposed development. However, the assessment assumes total demolition. It has very

low heritage significance which means that the extent of the impact can be regarded as site-specific. The impact significance is low but if the structure is retained and incorporated in the development then it would be very low.

- Construction Phase
 - During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.
- Operation Phase
 - No impact is envisaged for the recorded heritage resources during this phase.

9.3.2 Conclusion and Recommendations

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed project to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey over a period of 1 day.

The property is severely disturbed and has been cultivated from prior to 1957. From 1975 onwards numerous industrial structures and a few residential dwellings with access roads were developed. All structures on site besides one (Feature 1) has been destroyed from 2008 to 2015 based on Google Earth images. Currently the site is fallow, highly overgrown and building rubble from demolished structures are scattered over the study area. Several informal shelters of homeless people and loiterers were encountered during the survey that posed a security risk and together with the vegetation cover limited the extend of the field survey.

All structures on site besides one has been destroyed after 2008. The remaining structure (Feature 1) is not indicated on archival maps and is therefore assumed not older than 60 years. The structure is occupied and it was not possible to record the structure in detail due to hostile residents. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and is therefore of no heritage significance.

No significant archaeological sites or material was recorded during the survey and based on the SAHRIS Paleontological Sensitivity Map, the area is of insignificance paleontological sensitivity. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed.

In terms of Section 36 of the Act no burial sites were recorded. However, if any graves are identified they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. The study area is surrounded by industrial and residential developments and road infrastructure developments and the proposed residential development will not impact negatively on significant cultural landscapes or

viewscales. During the public participation process conducted for the project no heritage concerns were raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure as outlined below:

Chance find procedure

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

From a heritage perspective, the proposed project is acceptable. If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the development will not impact negatively on the heritage record of the area

9.4 Aquatic Resources Monitoring Program and Auditing Plan (Monitoring Plan)

The key issues and triggers identified during Scoping for the Monitoring Plan include:

- The proposed development includes a wetland and thus requires a Water Use Licence Application (WULA). A Monitoring Plan has been compiled in line with the requirements for the WULA.

Whilst the Monitoring Plan primarily is a tool for the WUL, as an integrated process is being undertaken for the WULA and EA, the details are also pertinent to the EA process and the monitoring requirements have also informed the development of the EMPr.

The details of the Specialist are as follows:

- P. Singh
 - **Qualifications:** MSc *Cum Laude*: Aquatic Health
 - **Experience:** 8 years' experience.
 - **Affiliations:** Professional registered scientist with SACNASP (116822).

The full Monitoring Plan is appended in Section 14.6.4.

9.4.1 Key Findings

9.4.1.1 Terms of Reference

Prism Environmental Management Services was requested by **Steyn City Properties (Pty) Ltd.** to develop an Aquatic Resources Monitoring Program and Auditing Plan. Monitoring programs can measure the success of mitigation implementations, monitor unforeseen impacts, and can be used as a feedback system to adjust or correct management of the aquatic resource.

The aquatic resource monitoring program was developed according to the requirements as per the Department of Water and Sanitation. The aquatic resource monitoring methods were based on previous experience on similar projects and developments.

9.4.1.2 Monitoring Plan

The monitoring requirements for this project are based on the findings of the specialist studies and site/project-specific information, at the discretion of the author(s) of this monitoring program. The aspects to be monitored, as well as frequencies and submissions are presented in the Table 9-1 below. This, to a) summarise the monitoring activities for the applicant, ensuring ease of compliance, and b) aid the Department Official in structuring the monitoring requirements of the water use license being applied for.

Table 9-1: Recommended Monitoring requirements for the development.

Monitoring Program		Monitoring Requirements and Deliverables
1.	Wetland Assessment	<p>Aspects: Present Ecological State, Ecological Importance and Sensitivity, Recommended Ecological Category. Photographic record</p> <p>Survey Point:</p> <ul style="list-style-type: none"> • Wetlands and buffer areas <p>Sampling Frequency:</p> <ul style="list-style-type: none"> • One (1) Post-construction/rehabilitation assessment. <p>Reporting Frequency:</p> <ul style="list-style-type: none"> • Once off <p>Submission to Client: 30 days after Site assessment.</p>

2.	ECO Site Inspections	<p>Aspects: Site condition of sensitive areas; litter and pollution; storage of building material and waste; condition and functioning of bridge; site photographs; non-compliances with Environmental Authorisation and Water Use License/General Authorisation; threats to sensitive areas. Conditions of the EMPr.</p> <p>Survey Point:</p> <ul style="list-style-type: none"> • Sensitive areas (wetland and buffer areas) • African Grass-owl foraging areas • Storage and laydown areas (waste, building materials, etc.) <p>Survey Frequency:</p> <ul style="list-style-type: none"> • Preconstruction Phase – Once • Construction Phase – Weekly • Post construction - Once <p>Reporting Frequency:</p> <ul style="list-style-type: none"> • Phase dependent. Monthly reporting for weekly inspections. <p>Submission to Client: 30 days after last survey.</p>
3.	Water Use License Compliance Audit	<p>Aspects: Dependent on Water Use License conditions.</p> <p>Survey Point (s):</p> <ul style="list-style-type: none"> • As required by the Water Use License. <p>Survey Frequency:</p> <ul style="list-style-type: none"> • As required by the Water Use License. • Recommended frequency – Annual Audit <p>Reporting Frequency:</p> <ul style="list-style-type: none"> • As required by the Water Use License. • Closure audit (within 6 months of construction completion) <p>Submission to Provincial Head: 30 days after Audit.</p>
4.	Rehabilitation Audit	<p>Aspects: Site condition of sensitive and rehabilitated areas. Effect of the Rehabilitation effort before, during and after rehabilitation comparisons.</p> <p>Survey Point (s):</p> <ul style="list-style-type: none"> • Sensitive areas (Wetland and Buffer Areas) • Rehabilitated areas <p>Survey Frequency:</p> <ul style="list-style-type: none"> • Preconstruction Phase – Once • Construction Phase – Once • Post construction - Once <p>Reporting Frequency:</p> <ul style="list-style-type: none"> • Phase dependent. • Closure audit (within 6 months of rehabilitation completion) <p>Submission to Client: 30 days after last survey.</p>

9.4.2 Conclusions

This Monitoring Program aims to highlight environmental aspects that require monitoring based on findings from the specialist studies, at the discretion of the aquatic specialist. This, to suggest the appropriate monitoring requirements in the Water Use License. The recommended monitoring requirements are summarised in the above. The aquatic resources to be monitored includes the unchanneled valley-bottom

wetland. Also to be included are the foraging areas used by the African Grass-owl. The relevant monitoring tools mentioned in this document will provide the necessary information regarding the impacts associated with the proposed construction and with this information, it will be possible to monitor the extent of the impacts on various aspects of the associated wetland/aquatic ecosystems. The final monitoring requirements is subject to the discretion of the Department of Water and Sanitation. The necessary mitigation measures can be developed according to the information that will be gathered using the monitoring tools discussed in this document. Monitoring programs can measure the success of mitigation implementations, monitor unforeseen impacts, and can be used as a feedback system to adjust or correct management of the aquatic resource.

Recommendations:

- Reference should be made to the Wetland Assessment Report (21637_WPES_1) (Botha, 2020) and the Biodiversity Baseline and Impact Assessment Report (Erasmus, Steyn, & Husted, 2020) detailed/further mitigation measures.
- It should be attempted to preserve current wetland function:
 - Wetland drivers should be protected.
 - Water quality preservation is key.
- It is recommended that a silt curtain be used where possible to contain increased turbidity and limit the extent of the impact during construction. Silt curtains can be used to contain re-suspended sediment to a smaller area;
 - Particular attention must be paid to controlling soil erosion as siltation will impact on sensitive aquatic habitats downstream of the site;
- Adequate storm-water management which won't aggravate the erosion of the banks/slopes must be provided;
- An Environmental Control Officer (ECO) should be present to facilitate aquatic resource habitat rehabilitation efforts;
- The ECO should be experienced and qualified in general rehabilitation measures and how to identify current, emerging and potential problems;
- The footprint of the development during the construction phase should be kept as small as possible by limiting construction vehicles to designated roadways;
- The unnecessary removal of wetland and terrestrial vegetation must be avoided;
- The dumping of any excess building material or refuse must be prohibited within the wetland and buffer zones;
- Adequate toilet facilities must be provided in order to prevent construction crews defecating in the wetland and buffer zones, and must be placed outside the delineated buffer area.
- No fires are permitted in the wetland and buffer zones, or the use of vegetation thereof being used to make fires;
- No trapping, killing or poisoning of any wildlife should be allowed on site;
- All exotic vegetation identified must be managed and removed routinely and appropriately, in attempts to reduce the impacts of exotic species.

- Prior to construction and clearing, walkabouts need to be done to chase up any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the specie to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested.
- During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT).
- Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.
- Adequate signage should be erected that raises awareness about possible fauna, protected areas and delineations in the area.
- Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited.

Follow-up surveys are recommended to potentially identify emerging impacts following post-construction within wetland areas. This is important to implement any further mitigatory measures required for emerging problems (e.g. soil erosion forming through poor storm-water management feature design, re-establishment and encroachment of exotic vegetation, impedances of wetland drivers, etc.). The appointed ECO should be well-versed in identifying potential emerging environmental concerns.

The relevant monitoring tools mentioned in this document will provide the necessary information regarding the associated impacts. The monitoring tools may be used to determine the baseline state of the different ecosystems. By doing this, the bio-monitoring data can be measured against the data obtained during the baseline state. Any changes can then be recorded. With this information it will be possible to monitor the extent of the impacts on various aspects of the associated aquatic ecosystems. The necessary mitigation measures can be developed according to the information that will be gathered using the monitoring tools discussed in this document.

9.5 Aquatic Resources Rehabilitation Plan (Rehab Plan)

The key issues and triggers identified during Scoping for the Rehabilitation Plan include:

- The proposed development includes a wetland and thus requires a Water Use Licence Application (WULA). A Rehab Plan has been compiled in line with the requirements for the WULA.

Whilst the Rehab Plan primarily is a tool for the WUL, as an integrated process is being undertaken for the WULA and EA, the details are also pertinent to the EA process and the monitoring requirements have also informed the development of the EMP.

The details of the Specialist are as follows:

- P. Singh
 - **Qualifications:** MSc *Cum Laude*: Aquatic Health
 - **Experience:** 8 years' experience.
 - **Affiliations:** Professional registered scientist with SACNASP (116822).

The full Rehab Plan is appended in Section 14.6.5.

9.5.1 Key Findings

9.5.1.1 Terms of Reference

Prism Environmental Management Services was appointed by Steyn City Properties (Pty) Ltd. to develop an Aquatic Resources Rehabilitation and Plant Species Plan. These programs form the basis for mitigation implementations for the correct management of the aquatic resource.

The aquatic resource Rehabilitation Plan was developed according to the requirements as per the Department of Water and Sanitation. The aquatic rehabilitation methods were based on previous experience on similar projects and developments

9.5.1.2 Initial Rehabilitation Measures

Before the construction and rehabilitation activities commence, a number of initial rehabilitation activities need to take place:

- Construction workers must all undergo environmental training to be aware of the correct environmental principles;
- The wetland and/or riparian area needs to be demarcated and / or fenced off based on specialist consultation;
- The construction and regulated areas should be clearly marked;
- The construction area may be cleared of fauna and flora prior to construction if authorised by the competent authority and only under consultation with the relevant ecologist, wetland and/or aquatic scientist. Adequate signage should be erected that raises awareness about possible flora, fauna, protected areas and delineations in the area.
 - Flora:
 - Where cleared plants (terrestrial and riparian) can be reused later for rehabilitation, these plants must be relocated elsewhere on site with their root systems and some soil intact;
 - All cleared wetland plants must be relocated to temporary non-stagnant storage impoundments with their root systems and some soil intact;

- If the water is stagnant, the roots will rot. Therefore, the water needs to be circulated.
- These plants must be kept in similar conditions to where they were originally from and wet to avoid desiccation of the plants;
 - Monitoring of the plants should take place regularly to prevent root rot, desiccation and loss of the plants.
- These plants will be used later on in the project for rehabilitation and when available from nurseries, are expensive.
- All exotic vegetation identified must be managed and removed routinely and appropriately, in attempts to reduce the impacts of exotic species
- Fauna:
 - If any fauna is encountered on site before construction, these should be removed (unharmful) from the construction site and relocated elsewhere on site / nearby open fields:
 - No trapping, killing or poisoning of any wildlife should be allowed on site
 - If any amphibians, snakes and other reptiles, baboon spiders, small mammals or fauna with a threatened status are to be relocated then the relevant specialist should be consulted for the removal thereof.
 - Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited.
 - Prior to construction and clearing, walkabouts need to be done to chase up any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the species to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested.
 - During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the Endangered Wildlife Trust).

9.5.1.3 Rehabilitation Measures and Management Objectives

The management objectives that are listed in the report were compiled by using previous experience obtained with similar projects. This rehabilitation plan encompasses mitigation measures for soil, vegetation, impacts on surface water quality, impacts related to erosion, sedimentation and increased turbidity, and impacts on instream aquatic biota. For the proposed and current development of the study site a number of site-specific rehabilitation measures need to be implemented in order to achieve the

management objectives. The management objectives that are listed below were compiled by using previous experience obtained with similar projects.

Before these objectives can be implemented, it is imperative that **STRICT DEMARCATION** of the wetland, wetland buffer and construction area must be **MAINTAINED and ENFORCED**, ensuring that no construction activities exceed the construction boundaries. This will ensure that no degradation of the wetland and/or riparian area occurs outside of the allocated construction area. Further, construction workers may not set traps, hunt, poach, kill, harm or consume any fauna from the study area.

The following mitigation measures should be implemented during the construction and rehabilitation phases.

9.5.1.3.1 Impacts on surface water and soil quality.

- Changing of oil, refuelling and lubricating of equipment should not be carried out within proximity of the Aquatic Resources (Wetland and Riparian areas) to minimize the potential for water and soil pollution.
- Construction equipment and machinery should not be serviced or refuelled near watercourses. A suitable area should be designated outside the buffer area.
- Oil storage and workshop areas should be surrounded by a bund wall to contain spillages. In the case where soil becomes contaminated with oil, it must be removed for proper disposal or treatment (e.g. bioremediation).
- Construction workers should not use watercourses for sanitation purposes.
- Contaminated water needs to be isolated. Water with a chemical signature different to that of the receiving aquatic environment should be considered contaminated and should be isolated.
- Solid waste (plastics, polystyrene, etc.) is expected to build up post-construction. This should be considered and managed accordingly.
- All litter and wastes generated from the construction activities and construction workers must be disposed of correctly.

9.5.1.3.2 Impacts related to erosion, sedimentation and increased turbidity.

- It is recommended that construction activities should make use of the dry seasonal construction window. This will further reduce the risk associated with erosion/siltation.
- Dredging activities should be kept to the minimum practicable timescales and should comply with conditions as granted by the Responsible Authority.
- Removed sediment should not be placed on the shoreline prior to disposal. Same must be removed from site and / or stockpiled 32m wayward from the delineated riparian/wetland zones.
- It is recommended that a silt curtain be used where possible to contain increased turbidity and limit the extent of the impact during construction. Silt curtains can be used to contain re-suspended sediment to a smaller area.

- The selection of an appropriate construction method to maximize the capture of sediment and minimize the re-suspension of silt / sediment.
- The design consideration for the construction of the proposed activity should be based on environmental best practises.
- Access roads need to be inspected on a regular basis for signs of erosion and sedimentation as it is anticipated that large vehicles and heavy machinery will be utilised for the construction.
- Stormwater should not discharge perpendicularly to the aquatic resources, but rather as parallel as possible to reduce impacts to the stream flow and the opposite bank.
- Additionally, breakers should be incorporated at the discharge points to reduce the velocity of stormwater entering the aquatic resource.
- This Rehabilitation Plan has included the planting of indigenous vegetation that would function ecologically and in attenuating stormwater flow.
- It is also recommended that during the construction activities the turbidity be monitored to maintain baseline levels. Routine monitoring of turbidity should not yield values varying more than 15% that of baseline values for similar periods of the year. Monitoring should be done directly up- and downstream of the proposed construction.
- Frequent monitoring should consider possible sources of sediment and whether these are controlled and managed appropriately. Special attention should be given to the presence of any new erosion features and unstable slopes.

9.5.1.3.3 *Impacts on aquatic resource integrity.*

- Removal of alien and invasive plant species during the construction and operational phases.
- Re-vegetation and landscaping the wetland and buffer areas with indigenous wetland plant species.
- Stabilisation of gullies and drainage lines to prevent erosion.
- Planting of indigenous herbaceous plants on shallow banks and indigenous woody vegetation on steep banks to increase stability of banks, thereby preventing erosion.
- Implementation of topsoil management (stockpiling, topography shaping) and erosion control (berms, geotextiling, silt fences, hay bales and gabion structures).

9.5.2 **Conclusions**

Rehabilitation plans must be used to ensure the correct construction principles are followed throughout the construction phase. A project-whole environmental mind-set (from the construction workers to the project manager) will assist greatly in achieving the successful rehabilitation of the project area through correct

methodologies and efficient, coordinated teamwork by all involved. Monitoring of the entire process will further ensure the successful rehabilitation of the impacted area.

- Rehabilitation must be carefully sited to minimize the footprint and the loss of the natural habitat within the aquatic resource areas during the construction phase;
- The sensitive areas and buffer zones/flood line areas must be demarcated and strictly adhered to;
- Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species and in accordance with the instructions issued by the ECO/Aquatic Specialist;
- Trenches must be backfilled and re-vegetated as described in this Rehabilitation Plan.
- Stormwater should not discharge perpendicularly to the aquatic resource, but rather as parallel as possible to reduce impacts to the stream flow and the opposite bank.
- Additionally, breakers should be incorporated at the discharge points to reduce the velocity of stormwater entering the aquatic resource.
- This Rehabilitation Plan has included the planting of indigenous vegetation that would function ecologically and in attenuating stormwater flow.
- Consultation with Mr. D. Botha from Prism EMS along with other relevant experts regarding the proper disposal methods or use of the removed sediment is imperative; and
- The environmental impacts of the construction must be closely monitored in terms of both the upstream and downstream environment with regards to sediments loads & plumes, water flows and pollution build up (plastics, polystyrene, etc.

The rehabilitation may be undertaken with minimal harmful effects to the associated aquatic resources if the relevant rehabilitation measures as prescribed in the document are implemented and monitored correctly. If all mitigatory actions are adhered to, the construction activities will not have any detrimental impact on the aquatic resource.

9.6 Outline Scheme Report

The key issues and triggers identified during Scoping for the Outline Scheme Report include:

- Services will be required at the proposed development and thus an Outline Scheme Report is required to understand service availability and requirements.
- Stormwater needs to be properly managed on site.

The full Outline Scheme Report is appended in Section 14.6.6.

9.6.1 Key Findings

9.6.1.1 Terms of Reference

Bigen Africa Services (Pty) Ltd was appointed by Steyn City Properties (Pty) Ltd to prepare an Outline Scheme Report for civil engineering services in support of the proposed township of Riverside View Extension 84. The purpose of this report is to provide engineering services comment for the proposed new development with regards to roads, stormwater water and sanitation infrastructure located within the environs of the development site.

9.6.1.2 Water Supply Scheme

The City of Johannesburg Metropolitan Municipality is in terms of the Water Services Act (Act No. 108 of 1997) the Water Service Authority for the proposed development of Riverside View Extension 84.

Riverside View Ext 84 falls within the Diepsloot Reservoir Supply Zone. The Diepsloot Reservoir is supplied with a connection to the Rand Water supply line (RW33). The higher lying portion of Steyn City (Riverglen Extensions), portions of Riverside View Ext 34 and the proposed Riverside View Ext 84 are to be supplied from the Diepsloot Reservoir via the Dainfern PRV. A portion of the existing Dainfern, Diepsloot South and areas east of the R511 are also supplied from this PRV. The Water Supply Zones for the Steyn City Development and surrounding precincts are indicated in Figure 9-6.

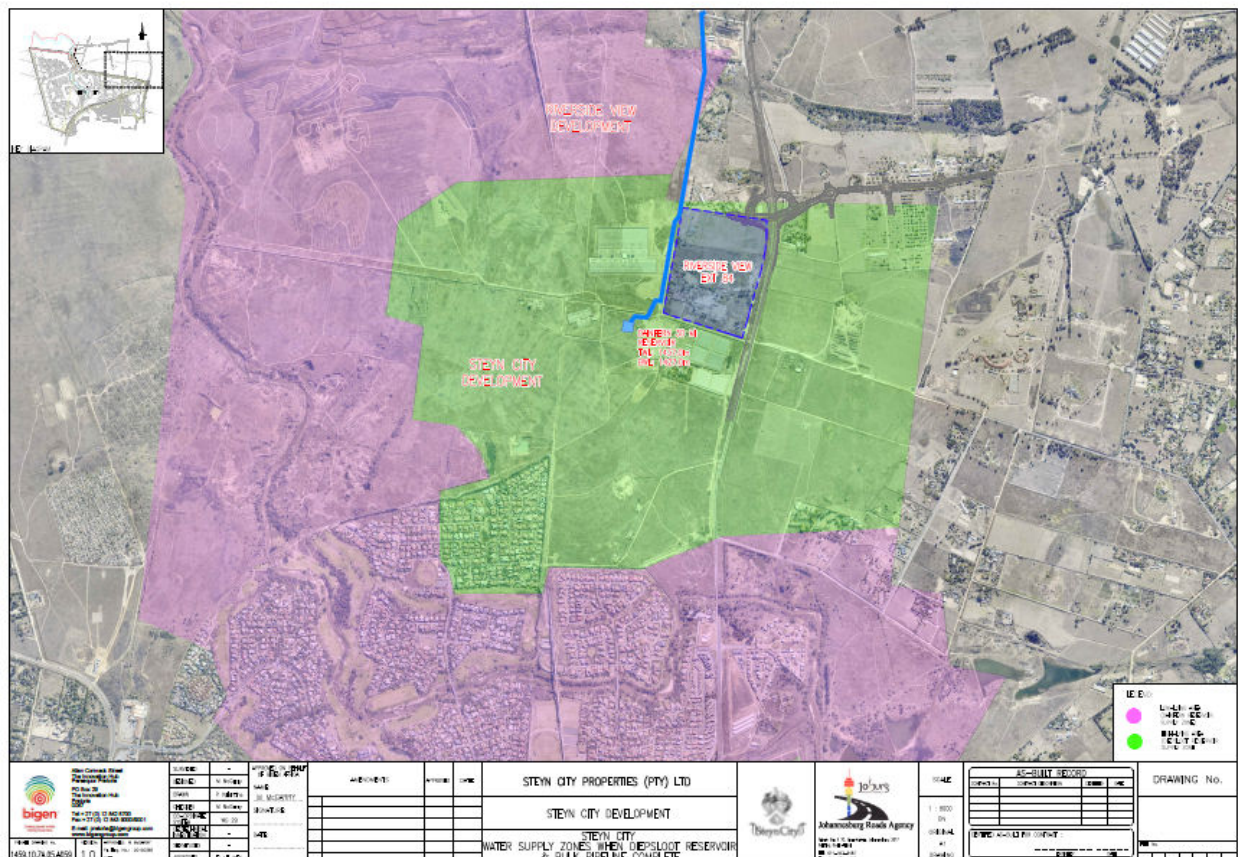


Figure 9-6: Water Supply Zones (Bigen Africa Services (Pty) Ltd, 2019)

The level of service for this development will be the high service level (level 3) of Johannesburg Water's Service delivery options. This service consists of a metered house connection to each residential 3 stand and is classified as service level 4 in the 'Guidelines for the Provision of Engineering Services and Amenities in Township Development' (Red Book). The water design standards were also taken from Table A3 Reference A and are summarised in Table 9-2.

Table 9-2: Water Design Standards (Bigen Africa Services (Pty) Ltd, 2019)

	Parameter	Element	Guideline
1	Level of service (High)	Water connection per unit	-
2	Pressure	Maximum (Static) Minimum (at peak flow)	9.0 bar 2.0 bar
3	Maximum flow velocities	Diameter ≤150 mm Diameter ≥ 200 mm	1,0 m/s – 3,5 m/s 1,5 m/s – 2,5 m/s
4	Peak Factor	Design peak (calculated using equivalent erven)	4,0 x average annual daily demand
5	Fire Conditions	Pipe Flow	38 l/s@ 0.7bar for residential 95 l/s @ 1.5bar for business, commercial, industrial
		Hydrant Flow	15 l/s
		Hydrant spacing	240 m maximum; residential 180m maximum, industrial
6	Pipe Materials	Erf Connections Distribution main ≤ 200mm	HDPE Class 12 uPVC Class 12 with spigot and socketed couplings
7	Pipe size	Network Pipes Adjacent house connections House connections across street	110 mm minimum 25mm minimum 32mm minimum 25mm minimum 2-4 stands 32mm minimum
8	Valves	Type Couplings Closing Spacing	RS valves up to 350mm ∅ Gate valves over 350mm ∅ Flanged (Table 1600/3) Counter Clockwise, non rising Spindle Maximum 600m, not more than

	Parameter	Element	Guideline
			4 valves to isolate a section
9	Pipe Location	10.5 m Reserve 13 m Reserve 16 m Reserve 20 m Reserve	1,4 m from erf boundary 2 m from erf boundary 2 m from erf boundary 2 m from erf boundary (All on high side of road reserve)
10	Cover to pipes	Minimum :Gravel roads Tarred roads and traffic areas Other areas 600mm Maximum :All areas	1 000mm 800mm 600mm 1500mm
11	Reservoir Storage Capacity	Gravity - Industrial Gravity – Other Pumped	45 hours 36hours 54 hours

In order to supply water to Riverside Extension 84 a connection to the Diepsloot Reservoir Supply zone will be required. This connection should be located downstream of the Dainfern PRV. This link water line, the proposed connection point to the Diepsloot Supply Zone and the proposed supply point for the development are indicated Figure 9-7 below.

The design and positioning of valves, fire hydrants, PRV valves, chambers and other fittings will be dealt with in the detail design phase. From the connection point a formal water reticulation system will then be constructed within the development, where water connections to individual stands forming the township will be made.

Water pipes construed with the Council Road Reserve will be constructed to Johannesburg Water Design Guidelines and Standards and will be handed over to the Council upon completion. The water reticulation within each stand of the development will remain private and maintained by the registered Body Corporate.

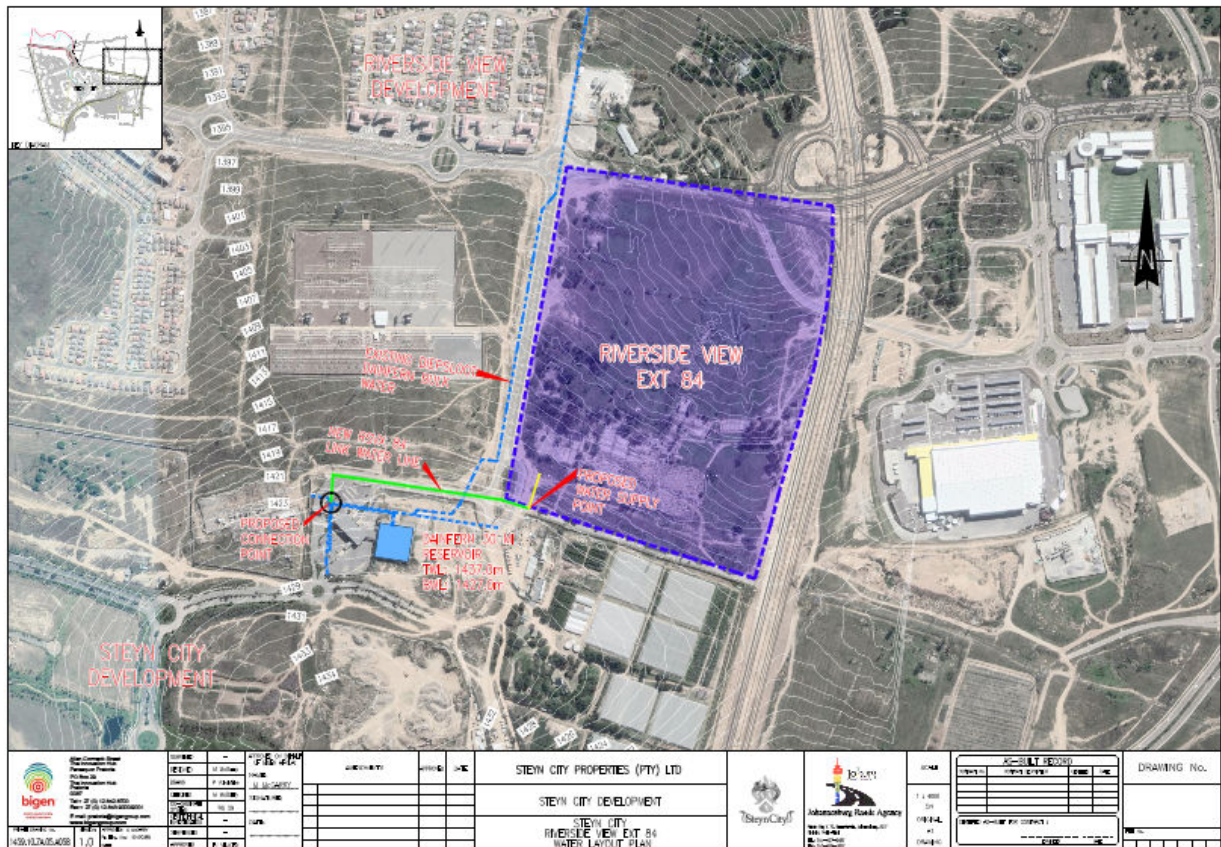


Figure 9-7: Water Services (Bigen Africa Services (Pty) Ltd, 2019)

The design of the water reticulation required for the development will accommodate the ultimate demands anticipated. The total average annual daily demand for Riverside View Ext 84 amounts to 0.48 Ml/day, with a peak hour demand total 24.99l/s.

9.6.1.3 Sanitation Scheme

The City of Johannesburg Metropolitan Municipality is in terms of the Water Services Act (Act No. 108 of 1997) the Water Service Authority for the proposed development of Riverside View Extension 84. As provided for in the above act, the City of Johannesburg entered into an agreement with Johannesburg Water (Pty) Ltd (JW), to fulfil the function of the Water Service Provider in their areas of jurisdiction.

The proposed Riverside View Extension 84 falls within the Diepsloot North Drainage Zone as described in the JW Masterplan for the Diepsloot Corridor Developments. The site drains towards the existing Bruma Outfall which is located to the north of the site (Figure 5-7: Diepsloot North Drainage Zone Figure 9-8). The Bruma Outfall Sewer drains towards the Northern Outfall Sewer eventually terminating at the Northern Waste Water Treatment Works.

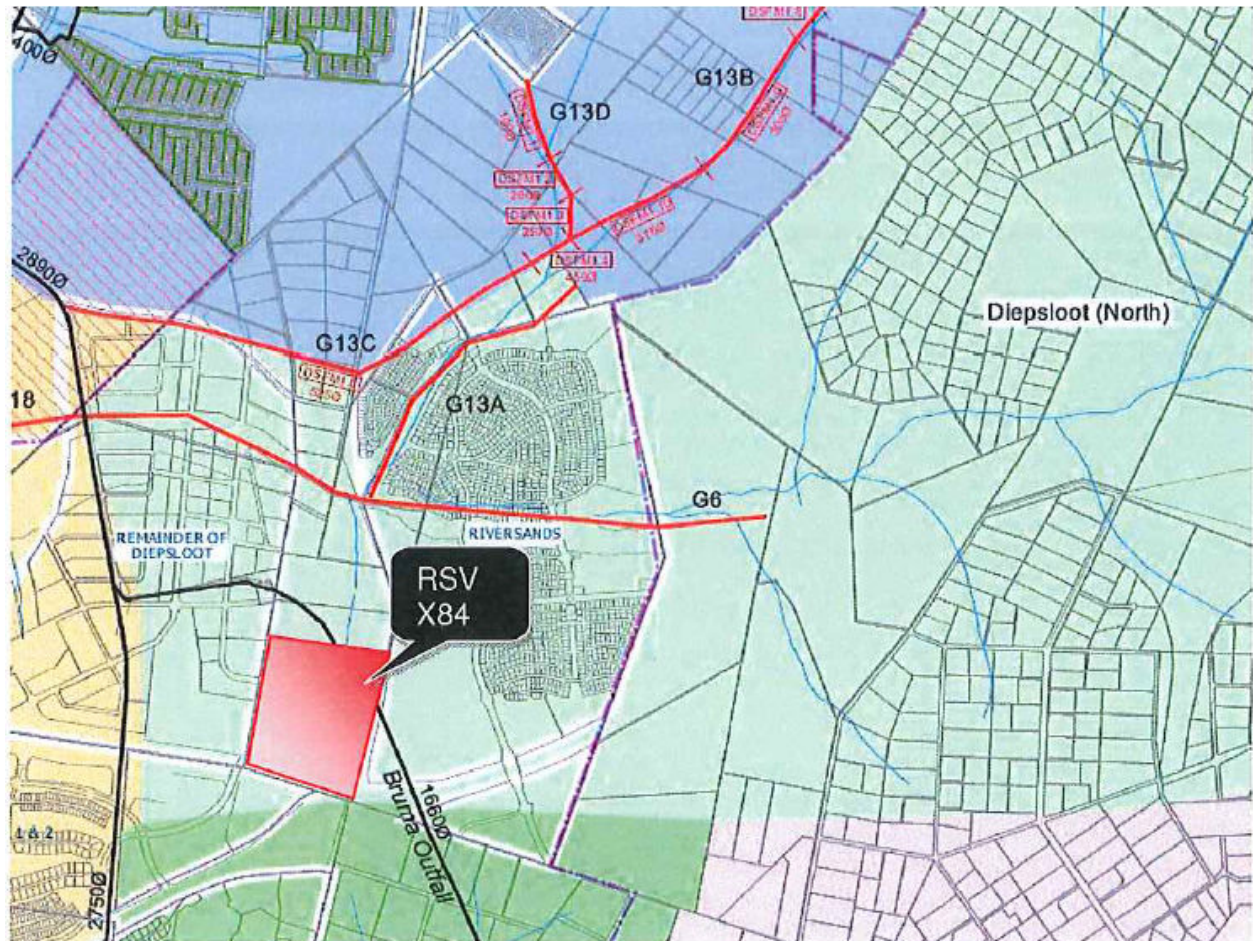


Figure 9-8: Diepsloot North Drainage Zone (Bigen Africa Services (Pty) Ltd, 2019)

The relevant sewage design standards which have been taken into account in the design of the services are indicated in Table 9-3

Table 9-3: Sewer Design Standards (Bigen Africa Services (Pty) Ltd, 2019)

	Parameter	Element	Guideline
1	Minimum pipe diameter	Gravity sewers Connections	160mm 110mm
2	Minimum Velocity at full flow	Gravity sewers Rising mains	0,7 m/s 0,7 m/s
3	Peak Factor	Residential	2.5
4	Stormwater Infiltration		15% of design flow
5	Pipe capacity	Flow level in pipe as percentage of diameter	67% at design flow
6	Minimum Gradients for Pipes	100 mm ø 150 mm ø 200 mm ø 300 mm ø and bigger	1 : 60 1 : 140 1 : 200 1 : 350

	Parameter	Element	Guideline
7	Hydraulic calculations	Manning Equation	N = 0.012
8	Pipe Materials	All pipes	uPVC Class 34
9	Location of Sewers	Street Reserve 10.5 m Reserve 13 m Reserve 16 m Reserve 20 m Reserve	1m from road reserve boundaries 2m from road reserve boundaries, 2m from road reserve boundaries 2m from road reserve boundaries (All on low side of road reserve)
10	Connections	For Stands	110 mm uPVC with slip on couplings
11	Cover over pipe	In road reserves Other areas	1 400mm (min) 1 000mm (min)
12	Manholes	Spacing	80 m maximum

As part of the development of Riverglen Erf 23 a 200mm diameter sewer line was constructed within the road reserve of View Road. Provision has been made for a future connection from Riverside View Ext 84 onto this sewer pipeline (Figure 9-9).

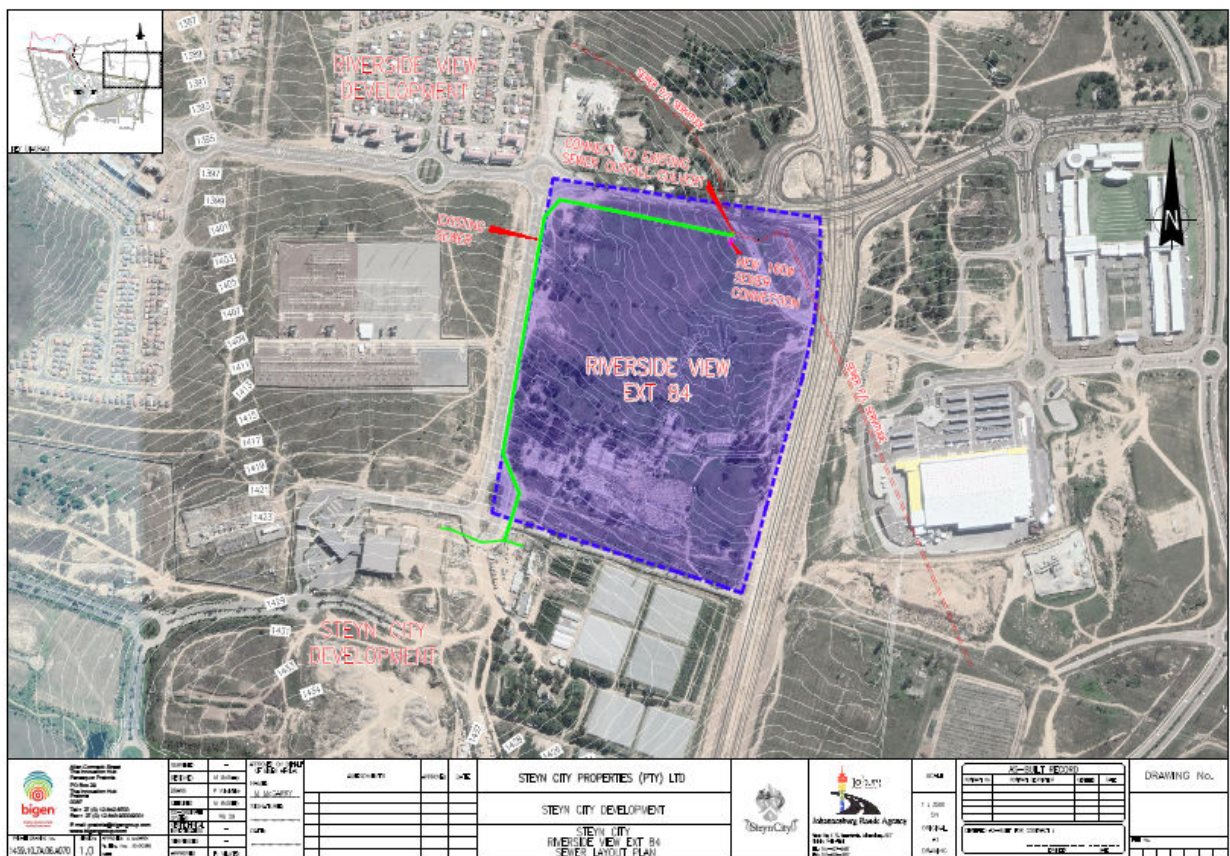


Figure 9-9: Sewer Services (Bigen Africa Services (Pty) Ltd, 2019)

The design demands used for the proposed development are summarised in the table below. Based on the proposed zoning and the applicable FSR, various alternatives for the combination of different land-uses are available, for the purposes of this report, a proportional split between each of the proposed land uses has been done to provide a balanced estimate of the demands. The sewer network will be designed to provide a connection point to each stand, either adjacent to the sewer pipeline or across the street from the sewer pipeline

Table 9-4: Sewer design demands (Bigen Africa Services (Pty) Ltd, 2019)

Development Erf	Land Use	Area (ha)	Usable area (%)	Unit	Average demand (Ml/day)	Peak Factor	PWWF (l/sec)
Erf 1, 2 "Special: with Place of Instruction, Residential Buildings and offices including ancillary uses such as restaurants and shops FSR = 0.6	Place of instruction	19.23	40	15 pupils/day	0.04	1.5	0.749
	Residential buildings (student accommodation)		35	0.55kl/100m2/day	0.22	2.3	6.799
	Administration offices		15	0.30kl/100m2/day	0.05	1.3	0.898
	Shops		7.5	0.18kl/100m2/day	0.02	1.5	0.311
	Restaurants		2.5	0.65kl/100m2/day	0.02	3	0.749
3	Special for access control	0.291	-	500l/unit	0.0005	2.3	0.015
4	Special for private road	-	-	-	-	-	-
5	Private open space	-	-	-	-	-	-
Total					0.35		9.721

9.6.1.4 Access and Parking

Regional access to the proposed development site will be from the future Rose Road/William Nicol Interchange. The future extension of Rose Road will continue and eventually merge with the east-west road, Porcupine Park Avenue. View Road serves as the north-south link to the development. There will be 3 accesses to the development. These are as follows:

- Access off View Road
 - The access is situated on the western boundary of the property, approximately 150m south of the intersection of Porcupine Park Avenue and View Road directly opposite the Eskom substation site access.

- Second access off View Road
 - The access is situated on the western boundary of the property, approximately 300m south of the intersection of Porcupine Park Avenue and View Road directly opposite the existing Eskom substation site access.
- Southern access
 - This access will be an internal link road from the existing Steyn City. This is considered the main access to the township as a large number of trip generated by the proposed development are expected to originate from within Steyn City and will make use of this access.

Internal roads for the development of Riverside View Ext 84 will not be taken over by the Local Authority and will be maintained by the Body Corporate set up as part of the development management.

The design criteria of external roads are to be based on the design standards of the Johannesburg Roads Agency and the Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development. The criteria are given for the various road classes on relevant road reserve widths (Table 9-5).

Table 9-5: Road Design Criteria (Bigen Africa Services (Pty) Ltd, 2019)

Parameter	Road Category				
	Local (Bus Class 4)	Distributor routes	Residential Access Collector Class 5a	Residential Access Loop Class 5b	
Road reserve width	20m		16m	13m	10.5m
Carriage way width	7.4m		6m	6m	5.5m
Minimum centre line Radii for angles of deflection less than 60°	150m		120m	5m	10m
Minimum centre line Radii for angles of deflection 60° and more	50m		50m	15m	15m
Roadway shoulders	1.8m		1.8m	1.1m	-
Desired maximum speed	60 km/h		50 km/h	40 km/hr	40 km/hr
Minimum stopping distances	85m		65m	45m	45m
Minimum gradient	0.5%		0.5%	0.5%	0.5%
Maximum gradient	7%		10%	12.5%	12.5%
Minimum K-value	12		12	6	6
Minimum vertical curve	40m		30m	30m	20m
Cross fall/camber	2% camber		25 camber	2% cross fall	2% cross fall

Super elevation	4%	2%	N/A	N/A
-----------------	----	----	-----	-----

9.6.2 Conclusion

The services required for the proposed development will be put in place as required and have been designed in line with the City of Johannesburg's requirements.

9.7 Phase 1 Geotechnical Assessment

The key issues and triggers identified during Scoping for the Geotechnical Assessment include:

- It is necessary to understand the site soil conditions to ensure that the design and construction of the proposed development is done properly and safely.

The details of the Specialist are as follows:

- J Louis van Rooy
 - Qualifications: PhD
 - Experience: 35 year's experience
 - Affiliations: Pr Sci Nat., MSAIEG

The full Geotechnical Assessment is appended in Section 14.6.7. Please note that a separate study was undertaken for each property (Portion 124 and Portion 185). The summary below incorporates information from both studies. Also, please note that these studies were commissioned by the previous property owner but are still applicable to this proposed development.

9.7.1 Key Findings

9.7.1.1 Terms of Reference

The objective of the geotechnical investigation was to: -

- To determine the geology and the relevant mechanical properties of the soil and rock horizons present on site.
- To zone the site according to development suitability and to provide the NHBRC classification for each zone.
- To give general foundations recommendations.
- To comment on the excavation characteristics and possible uses of the materials underlying the site for installation of services as well as for use in the layer works in paving and roads.
- To comment on site water management aspects particularly pertaining to shallow groundwater or seepage.

9.7.1.2 Method of investigation

The fieldwork entailed site walkover, trial pitting and profile descriptions. Five trial pits were excavated for Portion 124 and an additional ten for Portion 185. A registered engineering geologist inspected the test pits and recorded the soil profiles using the standard procedures as recommended by AEG, SAIEG, SAICE (2002).

In addition, five disturbed samples from Portion 124 and two from Portion 185 were retrieved from selected layers and submitted for testing. Foundation indicator tests were performed in these samples to determine the particle size distribution and plasticity of the soil. The material was tested for foundation purposes. The pH and electrical conductivity were also determined to assess the corrosivity of the soils.

9.7.1.3 Geology

According to the 1: 50 000 geological sheet 2528 Pretoria, the site is underlain by granite-gneiss and granite of the Johannesburg Granite Dome and consist of poorly exposed biotite tonalite, trondhjemite, granodiorite and migmatite varieties.

9.7.1.4 Soil Profiles

Due to site modifications in the area, the natural profiles are somewhat disturbed in the upper parts. On Portion 124, the levelling of driving tees is one example, whilst on Portion 185, removal of topsoil for construction material purposes has also modified natural profiles. In addition, large areas are underlain by fill and some areas are cut platforms. The following applies to each site:

- Portion 124
 - As mentioned, due to historic site modifications, the natural soil profiles are somewhat disturbed. The areas that are less disturbed are generally covered by transported soils with an average thickness 0.3m;
 - The topsoil in the area is moist, dark brown, loose, intact clayey silty sand, with coarse quartz gravel.
 - The residual granite profile occurring from an average of 0.5m is slightly to very moist, grey to greyish brown mottled orange and black, medium dense intact clayey sand with Fe and Mn Nodules.
 - Groundwater seepage was only encountered on one test pit.
- Portion 185
 - As mentioned, large areas are underlain by fill and some areas are cut platforms. Test pits could not be positioned in most of the modified areas and the nature of the cut platforms and fills are not known.
 - Thin unnatural material referred to as "fill" covers parts of the undeveloped areas on site. Average thickness is 0.16m and it varies from sand to ash clinker.
 - The natural profiles comprise of transported soils overlying residual granite or well developed ferricrete horizons.

- The colluvium is generally dry, brown to grey, loose, intact, silty sand with quartz gravel and Fe and Mn nodules in some parts with abundant roots. The average thickness of this horizon is 0.28m.
- The residual granite profile occurring from an average depth of 0.3m is dry, greyish, white with orange discolouration, dense, pinholed, silty sand.
- Groundwater seepage was only encountered on one test pit.

9.7.1.5 Groundwater

On both sites, groundwater was only encountered on one test pit (TP3). Average seepage depth was 0.6m indicating semi impervious conditions on the residual granite horizons.

9.7.1.6 Engineering and Material Characteristics

The test results on the soil samples from Portion 124 indicate the following:

- The topsoil, pebble marker and ferruginized residual granite grade as clayey silty sand with relatively high gravel content, especially where Fe and Mn nodules and quartz gravel are concentrated.
- These materials are slightly or non-plastic with low linear shrinkage and low to medium grading modulus values.
- The potential expansiveness, based on the whole sample PI and percentage clay is also low.
- According to the Unified Soil Classification and PRA classification, the soils which fall in the SM & SC groups may be fair to good subgrade material, poor subbase and not suitable for base course in roads. The soils may be slight to medium compressibility/expansiveness, but low when compacted. Drainage will be poor to practically impervious when compacted and the material will be reasonably stable for use in embankments. The soils have fair shear strength when compacted and saturated with CBR values between 5 and 20 at OMC of 10-%.
- The residual granite contains varying clay percentages with relatively high clay content between 1.0m in TP2 and TP3. The material grades as silty clayey sand with little gravel.
- Linear shrinkage is moderate to high, slightly plastic, but with low potential expansiveness.
- According to the Unified Soil Classification and PRA classification, the soils which fall in the "CL and ML" groups may be fair to good subgrade material and not suitable for subbase or base course in roads. The soil may have slight to medium compressibility/expansiveness, but low when compacted. Drainage will be practically impervious when compacted and the material will not be stable in embankments. The soils have a fair shear strength when compacted and saturated.
- The site soils are extremely corrosive due to high electrical conductivity.

The test results on the soil samples from Portion 185 indicate the following:

- Both the transported and residual materials grade as silty sand with large gravel component in the transported layers due to the concentration of Fe and Mn nodules and quartz gravel.
- The soils have low or no plasticity, very low linear shrinkage and moderate grading modulus values.
- The potential expansiveness, based on the whole sample PI and percentage clay, is also low.

- According to the Unified Soil Classification and the PRA Classification, the soils fall into the “SM” group will be good subgrade material, poor to good subbase and not suitable for base course in roads. The soil may have slight to medium compressibility/expansiveness but will be low when compacted. Drainage will be fair to practically impervious when compacted and the material will be reasonably stable for the use in embankments. The soils will have good shear strength when compacted and saturated with CBR values between 10 and 40 at OMC of 11-16%.
- The transported soils are corrosive due to low acidity and high electrical conductivity.

9.7.1.7 Slope Stability and Erosion

For Portion 124, the slope gradients are 2° and 6° to the east and west with a slight gradient to the north. Natural slope instabilities are not expected. Due to the site gradient, cut to fill preparation are expected and care must be taken to prevent differential settlements from occurring across the cut and fill parts of the platforms. It will be essential to implement good and effective surface and groundwater management practice to prevent wet soil profile conditions, perched groundwater tables and surface seepage. This will be especially important close to the drainage channel. Concentrated runoff will also cause erosion.

Similarly, for Portion 185, are 2° and 6° to the north but locally easterly and westerly towards the shallow gully in the eastern half of the site. Natural slope instabilities are not expected. Due to the site gradient, cut to fill preparation are expected and care must be taken to prevent differential settlements from occurring across the cut and fill parts of the platforms. It also will be essential to implement good and effective surface and groundwater management practice to prevent wet soil profile conditions, perched groundwater tables and surface seepage. This will be especially important close to the drainage channel. Concentrated runoff will also cause erosion.

9.7.1.8 Excavation Classification with respect to Services

For Portion 124, no rock outcrops or corestones were seen. The materials are therefore classified as soft in the upper 1.5, surface. Due to ferruginization, the site soils may be unsuitable for use as bedding and/or backfill in pipelines.

For Portion 185, no rock outcrops or corestones were seen, however test pits were terminated in or near gradual refusal or refusal conditions at an average of 0.5m below surface. The materials on site are therefore classified as intermediate from 0.5m below surface. The TLB used could not penetrate the hard pan ferricrete horizon but softer conditions are usually underlying this ferruginized horizon in the residual granite. Due to ferruginization, the site soils may be unsuitable for use as bedding and/or backfill in pipelines.

9.7.1.9 Site Classification and Foundation Conditions

For Portion 124, the site classification is as follows:

- Zone 1: S-C1/2BDE
 - This zone covers most of the holding but excludes the gully area.

- Slight soil collapse and compressibility is expected due to localized open soil structure in surficial soil horizons.
- Shallow perched groundwater tables are present and seasonally wet surface conditions may also occur in cuts and lower lying areas.
- Surficial soils are expected to be erodible.
- Zone II: P (Flooding, marshy area)/3BL
 - The zone covers the area in the existing drainage channel. No residential development should be allowed in this zone without appropriate stormwater management measures.



Figure 9-10: Test Pit Locations and Geotechnical Zoning

For Portion 185, the site classification is as follows:

- Zone I: S1-C1
 - The zone covers most of the undeveloped part of the Portion 185, but excludes the gully and surface wet areas.
 - The residual profiles are leached and voided which may lead to additional settlements due to collapse and compressibility under load and increased moisture content.
 - Shallow perched groundwater tables are expected with seasonably wet surface conditions in cuts and on lower lying areas.
- Zone II: P (controlled fill and cut platforms)
 - This zone encompasses the presently built up and covered areas.
- Zone III: P (flooding, marshy area)

- This zone covered those areas that are prone to surface seepage and wet soil profile conditions as well as areas below the 1:100 year floodlines.
- Special drainage and water management precautions will be necessary to render these areas suitable for development.



Figure 9-11: Test Pit Locations and Geotechnical Zoning (Van Rooy, 2010)

9.7.2 Conclusion

For Portion 124, the following was concluded:

- Appropriate foundation design and building procedures should be implemented as listed in the report and the NHBRC Home Builders Manual.
- The major geological factors that may influence residential development are the following:
 - Slightly collapsible/compressible soil horizons
 - Seasonal shallow perched groundwater tables and surface wet conditions
 - Flooding and surface seepage in the gully area.

- The colluvium and residuum may exhibit settlements due to slightly collapsible upper soils, especially when loading and saturated.
- Special drainage measures will be necessary to prevent surface wet conditions.
- The site soils may not be suitable as fill and bedding for pipelines due to the coarse fraction and will be suitable and lower road layers and in embankments.

For Portion 185, the following was concluded:

- Appropriate foundation design and building procedures should be implemented to prevent damage to structures due to the geological conditions listed in this report.
- The major geological factors that may influence residential development are the following:
 - Slightly collapsible/compressible soil horizons
 - Seasonal shallow perched groundwater tables and/or perched groundwater tables and/or seepage.
 - Intermediate erodibility of surficial soil horizons.
 - Difficult excavation conditions below 0.5m.
 - Flooding in the gully running through the eastern part of the investigated site.
- Special attention should be given to surface water and groundwater drainage and additional site investigations will be necessary to determine the conditions under present covered platform areas.
- The site soils may not be suitable as fill and bedding for pipelines due to the coarse fraction and will be suitable and lower road layers and in embankments.

For both sites, a Phase 2 Geotechnical assessment will be required at the appropriate stage. This has been included as a requirement in the EMPr.

9.8 Traffic Impact Assessment

The key issues and triggers identified during Scoping for the Traffic Impact Assessment (TIA) include:

- The proposed development will result in additional traffic in the area. It is therefore important to understand the impact of the proposed development in terms of traffic. .

The details of the Specialist are as follows:

- WSP
 - Mercia Prinsloo, Traffic and Transportation Engineer
 - **Qualifications:** B.Eng. (Honours)
 - **Experience:** 5 years' experience.
 - **Affiliations:** ECSA Candidate
 - Herbert Phahlane, Traffic and Transportation Director
 - Qualifications: MTech
 - **Experience:** 17 years' experience.

- Affiliations: ECSA

The full Traffic Impact Assessment is appended in Appendix 14.6.8. Please note that based on comments, received from the Johannesburg Roads Agency, an additional memorandum was undertaken. The full TIA is therefore included as an annexure to this memo. Both the memo and the TIA are included in the Appendix but only the TIA is summarised below.

9.8.1 Key Findings

9.8.1.1 Terms of Reference

WSP has been appointed to undertake a Traffic Impact Assessment for the proposed township establishment on Riverside View X84 located north of Steyn City, Gauteng.

9.8.1.2 Methodology

Based on discussions with the Johannesburg Roads Agency (JRA), it was agreed that the Johannesburg North Visum Model will be used to determine the ultimate future background traffic volumes which include the latent rights in the area of which the entire Steyn City development forms part of. Given the current limited road network and construction in the area, conducting traffic counts at the intersections are deemed inaccurate and will not be a true representation of the traffic flow patterns.

In determining the site area, the South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual (TMH 16 volume 2, version 1.0, 2012) was consulted. TMH 16 also states that judgement should be used in selecting the intersections considered and therefore specific elements like extent of the development were also considered. A larger development will by its nature require a wider study area to be considered while for a smaller development the opposite will be true.

Given the number of trips this development will generate, the nature of the development and after consultation with the JRA, it was decided that the key intersections as mentioned below would be sufficient for analyses.

- Riversands Blvd / Riversands Rd (Rose Rd)
- Riversand Blvd / Erling Road
- Runnymead Ave / Cedar Rd
- Porcupine park Rd / View Rd

9.8.1.3 Site Access

There will be 3 accesses to the development. These are as follows:

- Access off View Road
 - The access is situated on the western boundary of the property, approximately 150m south of the intersection of Porcupine Park Avenue and View Road directly opposite the Eskom substation site access.
- Second access off View Road

- The access is situated on the western boundary of the property, approximately 300m south of the intersection of Porcupine Park Avenue and View Road directly opposite the existing Eskom substation site access.
- Southern access
 - This access will be an internal link road from the existing Steyn City. This is considered the main access to the township as a large number of trip generated by the proposed development are expected to originate from within Steyn City and will make use of this access.

9.8.1.4 Traffic Impact and Capacity Analysis

Capacity analysis of the relevant intersections were done using SIDRA 7 intersection analysis software. The purpose of the analysis is to determine the Levels of Service (LOS), volume / capacity ratios (v/c) and delays at each intersection for the scenario discussed below. Capacity analysis was undertaken for the weekday AM and PM peak hours.

—

Scenario 1- 2027 future background peak hour traffic volumes; *and*

Scenario 2 - 2027 background peak hour traffic volumes plus development traffic.

The status quo (2018 volumes and intersection layouts) do not form part of the analysis as the current road network and volumes are changing often and will only normalise once William Nicol Drive has been constructed and land parcels in the area have been developed to its land-use potential.

Based on the assessment, the following was noted:

- Riversands Road (Rose Road) / Riversands Boulevard
 - This intersection is controlled by a two-lane, 65m diameter traffic circle. This traffic circle was constructed in 2015 as part of the Riversands Development road upgrades. All four approaches at the intersection have two lanes per direction. This intersection currently operates at acceptable levels of service in the morning and afternoon peak periods and will continue to operate acceptably with the future 2027 traffic volumes and the proposed development trips.
 - No upgrades are required at this intersection
- Porcupine Park Avenue / View Road
 - This intersection is controlled by a two-lane, 40m diameter traffic circle. This traffic circle was constructed in 2017 as part of the Valumax Development road upgrades. Three approaches at the intersection have two lanes per direction and the northern approach has one-lane per direction. This intersection currently operates at acceptable levels of service in the morning and afternoon peak periods and will continue to operate acceptably with the future 2027 traffic volumes and the proposed development trips.
 - No upgrades are required at this intersection
- Riversands Boulevard / Erling Road

- This is a priority controlled T-intersection and all three approaches are stop -controlled. During the future 2027 traffic volume scenario, the intersection performance deteriorates and significant upgrades are required.
- As part of the K56 construction project, upgrades at this intersection was proposed. As part of the K56 project , this intersection will be signalised and an additional through lane will be added to the eastern approach.
- With these upgrades in place, the intersection operates acceptably during both analysed scenarios and no additional upgrades are required.
- Runnymead Avenue / Ceder Road
 - This intersection is currently a priority controlled T-Intersection with the traffic along Cedar Road having right of way. The northern approach currently experiences heavy delays in the peak hours. The Runnymead Road Extension project is currently underway with construction expected to start in the first quarter of 2019.
 - This intersection will form part of the Runnymead Project upgrades and will be upgraded to a traffic signal with the addition of a short shared left and right-turn lane on the northern approach.
 - After the implementation of the traffic signal and the upgrades indicated above, the intersection operates acceptably during all analysed scenarios and no further upgrades are proposed.

9.8.1.5 Non-motorised and Public Transport

The proposed township is situated in a rapidly developing area. With the implementation of the Steyn City northern contractor's gate, pedestrian walkways were built along View Road. These walkways situated on the western boundary of the site are deemed sufficient as the eastern boundary of the site consists of William Nicol Drive where pedestrian movement is not warranted.

Public transport lay-bys along Porcupine Park Road at its intersection with Yellowwood Boulevard were also built as part of the Valumax Development. These lay-bys are within walking distance from the development and will serve the development well.

Currently, there are no Rea Vaya BRT or Gautrain bus routes in the area and the tenants/employees/residents/scholars of the proposed development are dependent on Minibus taxis and the Johannesburg Metro Bus service as a mode of public transport.

9.8.2 Conclusion

Based on this traffic impact study, the following concluding remarks are relevant:

- The study forms part of a township establishment application for Riverside View X84.
- A basket of rights under the "Special" zoning is proposed and a 78 089m² office development is considered as a worst-case scenario from a trip generation point of view.
- Three access points to the township are proposed of which one access point serves as a link between Steyn City and Riverside View X84.

- Following the trip distribution and detailed capacity analysis, intersection upgrades are already planned as separate projects and will ensure that the impacted intersections will function at the necessary LoS.
- Public transport recommendations were also made as part of this report and captured in Section 7.

It is recommended that the proposed township application be supported from a traffic engineering perspective.

9.9 Stormwater Management Plan

The key issues and triggers identified during Scoping for the Stormwater Management Plan (SWMP) include:

- Comments from the City of Johannesburg and the GDARD regarding management of stormwater.
- The need to comply with the relevant policies regarding proper stormwater management.
- The fact that a wetland occurs on site and thus stormwater must be properly managed to reduce impacts.

The details of the Specialist are as follows:

- TekCiv Consulting Engineers:
 - Andrew Comley
 - **Qualifications:** B-Tech Civil Engineering (PrTech Eng, Pr No 200870219)
 - **Experience:** 16 Years in consulting engineering and 12 Years in professional engineering
 - **Affiliations:** Member of South African institute of Civil Engineers SAICE, current chairman of PMCD, Member of institute of Municipal Engineers South Africa IMESA

The full SWMP is appended in Appendix 14.6.9.

9.9.1 Key Findings

9.9.1.1 Scope

This report aims to provide information regarding the stormwater drainage and sustainable management requirements of the new development for the approval by the City of Johannesburg.

9.9.1.2 Site Characteristics

A summary of the site characteristics is as follows:

- The total site measures some 25 570 m².
- Elevation across the site ranges from 1422m to 1392m.
- The annual rainfall in this area is 750 mm.

- There is a wetland area flowing northward through the site. As per the SDP a wetland and buffer area of approximately 5500 m² has been created.
- The site currently has no buildings on it and is covered in veld grass and several medium and large trees which are scattered around the site.

9.9.1.3 Existing Stormwater Structures

A survey of the site, as well as information supplied by the Johannesburg Roads Agency have indicated that there is currently no formal stormwater infrastructure in the area into which the site can connect.

However, there are three temporary culverts under Porcupine Park Avenue that allows site drainage to the lower lying area. The stormwater pipes in View Road discharges onto the north western side of the property and then drains overland towards the wetland portion of the site.

9.9.1.4 Storm Water Run-Off and Model Selection

The Rational method is an accepted method to determine the peak flow in terms of run-off from a site and has been selected to calculate the run-off and attenuation requirements for the full extent of the site.

Due to the layout and topography of the site, and the constraints caused by the wetland area, as well as an Eskom Servitude running through the northern portion of the site, it is proposed that site be split into separate catchments and create separate attenuation ponds to manage the flow from each section.

9.9.1.5 Stormwater Attenuation

All run-off from the site will be routed to the attenuation ponds of each respective catchment. Each catchment area drains into an attenuation pond whereby the run-off from the area is throttled to release into the wetland and buffer zone at the 1:5 year pre-developed flow. Energy dissipating structures will be constructed at each outlet to limit any erosion and encourage sheet flow into the wetland area. See Figure 9-12 showing the separate attenuation ponds with their respective catchment area.

In general, stormwater attenuation will make use of the following:

- Grass lined attenuation ponds;
- Use of the soccer field to attenuate stormwater and allow for ground water recharge;
- Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
- Throttled outlet structures; and
- Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.

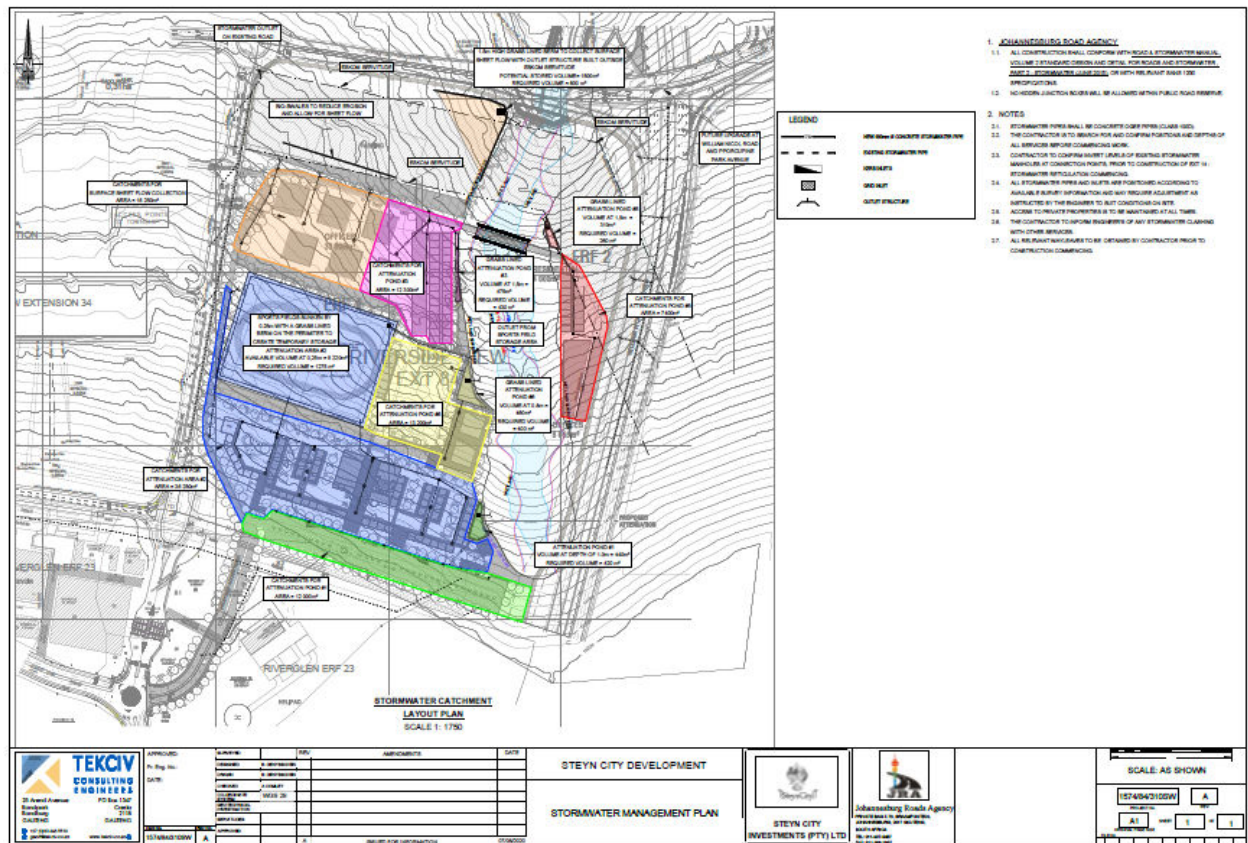


Figure 9-12: Catchment area and stormwater layout plan

Due to the layout of the site and wanting to adhere to best practice principles for stormwater management, the option to create separate catchments with their own attenuation areas was chosen.

For this option of individual catchment areas to be effective, the combined release of each attenuation pond may not exceed the 1:5 pre-developed flow for the total site. The table below indicates the combined release from each pond and compares it to the 1:5 yr pre-developed run-off for the site.

Table 9-6: Summary of Attenuation Ponds and Comparison to pre development run off

	Attenuation Ponds						Sum	Total Site – 1:5 Year Pre- development
	1	2	3	4	5	6		
Area (m ²)	14 200	71 000	60 150	16 050	21 600	15 450	198 450	199 860
Flow out (m ³ /s)	0.082	0.070	0.309	0.079	0.096	0.059	0.695	0.71
Stored Volume (m ³)	457	1210	1185	366	290	200	3708	3574

9.9.1.6 Stormwater Run-off and control

All run-off from the site will be routed to the attenuation ponds of each respective catchment.

Each catchment area drains into an attenuation pond whereby the run-off from the area is throttled to release into the wetland and buffer zone at the 1:5 year pre-developed flow. Energy dissipating structures will be constructed at each outlet to limit any erosion and encourage sheet flow into the wetland area.

The developed site will comprise of both kerb and grid inlets connecting to underground pipe systems that will flow into the either the attenuation ponds or open soccer field.

9.9.1.7 Road Crossing

Once the site is developed, a road crossing is to be constructed to allow access to the offices and residential development on the eastern side of the site. A road-bridge will be constructed which allows for the 1:100 year flow of 8.7 m³/s to pass under the road.

The bridge is to be constructed of pre-cast portal culverts and will extend the full width of the flood line. To cater for animal crossings, smaller culverts will be placed above the flood line to all for migration (Figure 9-13).

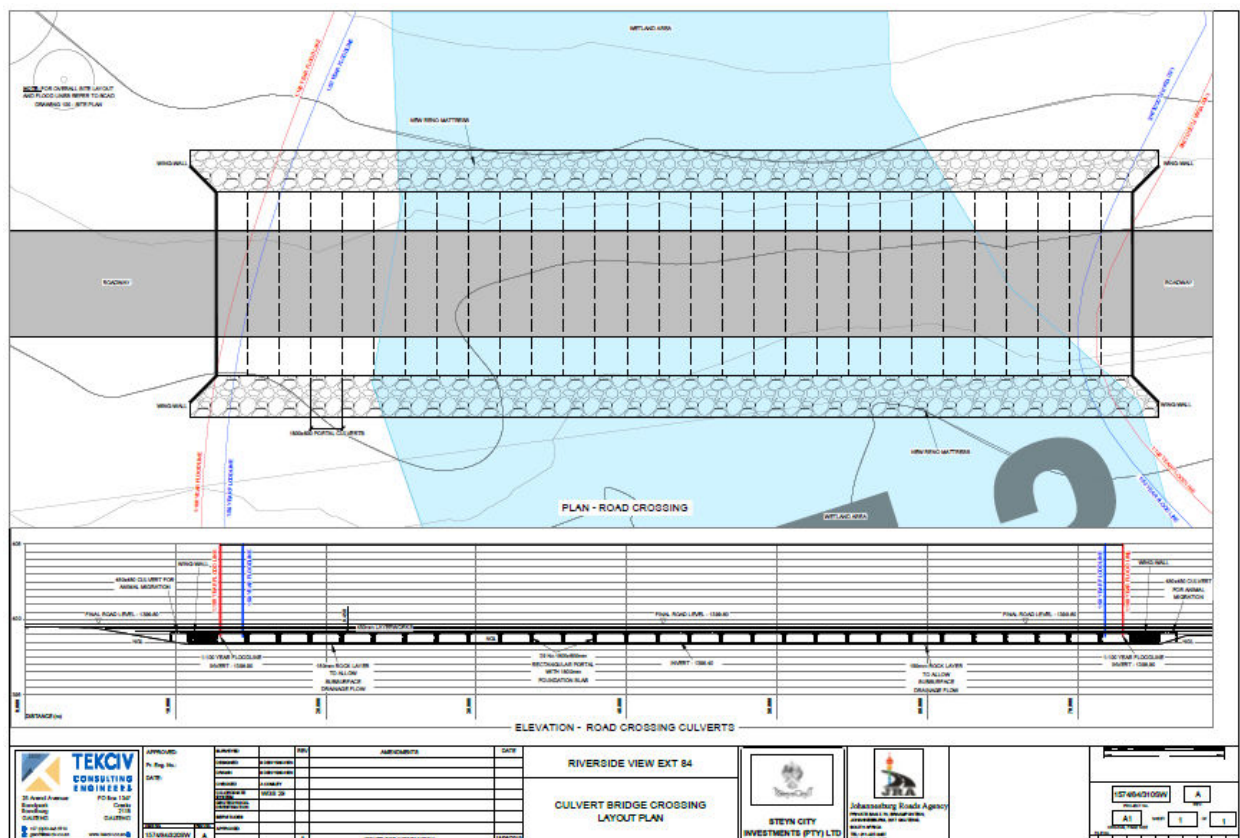


Figure 9-13: Culvert Bridge

9.9.2 Conclusion

The stormwater flow will be collected in a formal stormwater system which drains into grass-lined attenuation ponds, bio swales and open fields with the required storage meeting the municipal regulations.

The combined discharge from each attenuation structure will be reduced to pre-developed flows and allowed to discharge into the wetland area.

9.10 Assumptions and Limitations Identified by Specialists

The impacts identified as part of the various specialist studies have heavily influenced the impact assessment included in the EIA. As such, it is important to note the assumptions and limitations identified by the various specialists (where applicable):

- The following limitations with respect to the Biodiversity Baseline and Impact Assessment are applicable to this report:
 - As per the scope of work, the fieldwork component of the assessment comprised one assessment only, that was conducted during the wet season. This study has not assessed any temporal trends for the respective seasons;
 - • The spatial data might not be accurate or based on outdated features; ground truthing has been performed to try and increase the accuracy; and
 - • Despite these limitations, a comprehensive desktop study was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.
- The following limitations with respect to the Wetland Assessment are applicable to this report:
 - The study was limited to a snapshot view during a few site visits. The field investigations were undertaken during July 2014, to assess and delineate the Wetland zones present on the survey area. Further field assessments were conducted during October 2018 and January 2020 corroborate the delineated Wetland zones present on the survey area and to inform the development planning. Weather conditions during the survey were favourable for recordings. The delineations were recorded by hand held GPS.
 - It must be noted that, during the process of converting spatial data to final output drawings, several steps are followed that may affect the accuracy of areas delineated. Due care has been taken to preserve accuracy. Printing or other forms of reproduction may also distort the scale indicated in maps. It is therefore suggested that the wetland areas identified in this report be pegged in the field in collaboration with the surveyor for precise boundaries.
 - It is unlikely that more surveys would alter the outcome of this study radically.
- The following limitations with respect to the Heritage Impact Assessment are applicable to this report:
 - The authors acknowledge that the brief literature review is not exhaustive on the literature of the area.
 - Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded.
 - Similarly, the depth of the deposit of heritage sites cannot be accurately determined due to its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the

impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

10 IMPACT ASSESSMENT

10.1 Overall Impact Assessment

This section focuses on the potential environmental impacts that could be caused by the proposed development.

An 'impact' refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity. From a qualitative perspective, impacts were identified as follows:

- Impacts associated with listed activities contained in GN 983-985 of 4 December 2014 (Listing Notice, 1, 2 and 3), for which authorisation has been applied for;
- An assessment of the project activities and components; and
- Issues highlighted by I&APs (both the general public and authorities).

In addition to the above more qualitative descriptions of impacts, a more detailed quantitative assessment of impacts is also provided and specifically takes into account impacts to the receiving environment (Section 5) and the findings from Specialist Studies (Section 9). This quantitative impact assessment uses the impact assessment methodology discussed in the approved Scoping Report and Plan of Study for the EIA. A summary of the methodology is provided below.

The **significance** of an impact is defined as the combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The nature and type of impact may be direct or indirect and may also be positive or negative, refer to Table 10-1: below for the specific definitions.

Table 10-1: Nature and type of impact.

Nature and Type of Impact:			
IMPACT	Direct	Impacts that are caused directly by the activity and generally occur at the same time and place as the activity	✓/✗
	Indirect	Indirect or induced changes that may occur as a result of the activity. These include all impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity	✓/✗
	Cumulative	Those impacts associated with the activity which add to, or interact synergistically with existing impacts of past or existing activities, and include direct or indirect impacts which accumulate over time and space	✓/✗
	Positive	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will benefit significantly, and includes neutral impacts (those that are not considered to be negative)	✓
	Negative	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will be comprised	✗

Table 10-2: presents the defined criteria used to determine the **consequence** of the impact occurring which incorporates the extent, duration and intensity (severity) of the impact.

Table 10-2: Consequence of the Impact occurring.

CONSEQUENCE	Extent of Impact:	
	Site	Impact is limited to the site and immediate surroundings, within the study site boundary or property (immobile impacts)
	Neighbouring	Impact extends across the site boundary to adjacent properties (mobile impacts)
	Local	Impact occurs within a 5km radius of the site
	Regional	Impact occurs within a provincial boundary
	National	Impact occurs across one or more provincial boundaries
	Duration of Impact:	
	Incidental	The impact will cease almost immediately (within weeks) if the activity is stopped, or may occur during isolated or sporadic incidences
	Short-term	The impact is limited to the construction phase, or the impact will cease within 1 - 2 years if the activity is stopped
	Medium-term	The impact will cease within 5 years if the activity is stopped
	Long-term	The impact will cease after the operational life of the activity, either by natural processes or by human intervention
	Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient
	Intensity or Severity of Impact:	
	Low	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected
	Low-Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are modified insignificantly
	Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are altered
	Medium-High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes are severely altered
	High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will permanently cease

The **probability** of the impact occurring is the likelihood of the impacts actually occurring, and is determined based on the classification provided in Table 10-3.

Table 10-3: Probability and confidence of impact prediction

PROBABILITY	Probability of Potential Impact Occurrence:	
	Improbable	The possibility of the impact materialising is very low either because of design or historic experience
	Possible	The possibility of the impact materialising is low either because of design or historic experience
	Likely	There is a possibility that the impact will occur
	Highly Likely	There is a distinct possibility that the impact will occur
	Definite	The impact will occur regardless of any prevention measures

The **significance** of the impact is determined by considering the consequence and probability without taking into account any mitigation or management measures and is then ranked according to the ratings listed in Table 10-4:. The level of confidence associated with the impact prediction is also considered as low, medium or high (Table 10-5:).

Table 10-4: Significance rating of the impact.

Significance Ratings:		
SIGNIFICANCE	Low	Neither environmental nor social and cultural receptors will be adversely affected by the impact. Management measures are usually not provided for low impacts
	Low-Medium	Management measures are usually encouraged to ensure that the impacts remain of Low-Medium significance. Management measures may be proposed to ensure that the significance ranking remains low-medium
	Medium	Natural, cultural and/or social functions and processes are altered by the activities, and management measures must be provided to reduce the significance rating
	Medium-High	Natural, cultural and/or social functions and processes are altered significantly by the activities, although management measures may still be feasible
	High	Natural, cultural, and/or social functions and processes are adversely affected by the activities. The precautionary approach will be adopted for all high significant impacts and all possible measures must be taken to reduce the impact

Table 10-5: Level of confidence of the impact prediction

Level of Confidence in the Impact Prediction:		
CONFIDENCE	Low	Less than 40% sure of impact prediction due to gaps in specialist knowledge and/or availability of information
	Medium	Between 40 and 70% sure of impact prediction due to limited specialist knowledge and/or availability of information
	High	Greater than 70% sure of impact prediction due to outcome of specialist knowledge and/or availability of information

Once significance rating has been determined for each impact, management and mitigation measures must be determined for all impacts that have a significance ranking of Medium and higher in order to attempt to reduce the level of significance that the impact may reflect.

The EIA Regulations, 2014 specifically require a description is provided of the degree to which these impacts:

- can be reversed;
- may cause irreplaceable loss of resources; and
- can be avoided, managed or mitigated.

Based on the proposed mitigation measures the EAP will determined a mitigation efficiency (Table 10-6:) whereby the initial significance is re-evaluated and ranked again to effect a significance that incorporates the mitigation based on its effectiveness. The overall significance is then re-ranked and a final significance rating is determined.

Table 10-6: Mitigation efficiency

Mitigation Efficiency		
MITIGATION EFFICIENCY	None	Not applicable
	Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact. Positive impacts will remain the same
	Low	Where the significance rating reduces by one level, after mitigation
	Medium	Where the significance rating reduces by two levels, after mitigation
	High	Where the significance rating reduces by three levels, after mitigation
	Very High	Where the significance rating reduces by more than three levels, after mitigation

The reversibility is directly proportional the “Loss of Resource” where no loss of resource is experienced, the impact is completely reversible; where a substantial “Loss of resource” is experienced there is a medium degree of reversibility; and an irreversible impact relates to a complete loss of resources, i.e. irreplaceable (Table 10-7:).

Table 10-7: Degree of reversibility and loss of resources

Loss of Resources:		
DEGREE REVERSIBILITY & LOSS OF RESOURCES	No Loss	No loss of social, cultural and/or ecological resource(s) are experienced. Positive impacts will not experience resource loss
	Partial	The activity results in an insignificant or partial loss of social, cultural and/or ecological resource(s)
	Substantial	The activity results in a significant loss of social, cultural and/or ecological resource(s)
	Irreplaceable	The activity results in the complete and irreplaceable social, cultural and/or ecological loss of resource(s)
	Reversibility:	
	Irreversible	Impacts on natural, cultural and/or social functions and processes are irreversible to the pre-impacted state in such a way that the application of resources will not cause any degree of reversibility
	Medium Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if less than 50% resources are applied
	High Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if more than 50% resources are applied
	Reversible	Impacts on natural, cultural and/or social functions and processes are fully reversible to the pre-impacted state if adequate resources are applied

10.2 Qualitative Discussion of Impacts

10.2.1 Impacts Associated with Listed Activities

As mentioned, the project requires authorisation for certain activities listed in the 2014 EIA Regulations, which serve as triggers for the environmental assessment process. The potential impacts associated with the key listed activities are broadly stated in Table 10.8.

Table 10-8: Potential impacts associated with Listed Activities

Listing Notice	Activity	Description of Listed Activity	Potential Impact Overview
<i>NEMA: Listing Notice 1 (require Basic Assessment)</i>			
GN R 983 4 December 2014	19 (i)	<p><i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-</i></p> <p><i>(i) a watercourse;</i> <i>(ii) the seashore; or</i> <i>(v) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving-</i></p> <p><i>(a) will occur behind a development setback;</i> <i>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or</i> <i>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.</i></p>	<ul style="list-style-type: none"> • Potential adverse effects to resource quality (i.e. flow, in-stream and riparian habitat, aquatic biota and water quality) associated with working in-stream and alongside watercourses. • Destabilisation of affected watercourses. • Potential loss of sensitive environmental features along the watercourse. • Erosion and siltation of watercourse.
<i>NEMA: Listing Notice 2 (require Scoping and EIR)</i>			
GN R 984 4 December 2014	15	<p><i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>	<ul style="list-style-type: none"> • Loss of floral species. • Disturbance to fauna and avifauna during construction. • Loss of available habitat and associated impacts on fauna that depends on the habitat.
<i>NEMA: Listing Notice 3 (require Basic Assessment)</i>			
GN R 985 4 December 2014	4 (c)(iv)(v) (vi)	<p><i>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i></p> <p><i>(c) Gauteng</i></p> <p><i>i. A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>ii. National Protected Area Expansion Strategy Focus Areas;</i> <i>iii. Gauteng Protected Area Expansion Priority Areas;</i> <i>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</i> <i>v. Sites identified within threatened ecosystems listed in terms of the National Environmental</i></p>	<ul style="list-style-type: none"> • Loss of floral species. • Disturbance to fauna and avifauna during construction. • Loss of available habitat and associated impacts on fauna that depends on the habitat.

Listing Notice	Activity	Description of Listed Activity	Potential Impact Overview
		<p>Management Act: Biodiversity Act (Act No. 10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas; viii. Important Bird and Biodiversity Area (IBA); ix. Sites or areas identified in terms of an international convention; x. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA; xi. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or xii. Sites zoned for conservation use or public open space or equivalent zoning</p>	
<p>GN R 985 4 December 2014</p>	<p>12 (a)(i)(ii)</p>	<p><i>The clearance of an area of 300m² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p>C. Gauteng i. Within any critically endangered or endangered ecosystem listed in terms of Section 52 of NEMBA or prior to the publication of such list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004. ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<ul style="list-style-type: none"> • Loss of floral species. • Disturbance to fauna and avifauna during construction. • Loss of available habitat and associated impacts on fauna that depends on the habitat.
	<p>14 (c)(iv)(v) (vi)</p>	<p><i>The development of-</i> <i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i> <i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more</i></p> <p><i>where such development occurs-</i> a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -</p> <p><i>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i></p>	<ul style="list-style-type: none"> • Potential adverse effects to resource quality (i.e. flow, in-stream and riparian habitat, aquatic biota and water quality) associated with working in-stream and alongside watercourses. • Destabilisation of affected watercourses. • Potential loss of sensitive environmental

Listing Notice	Activity	Description of Listed Activity	Potential Impact Overview
		<p><i>c. Gauteng</i></p> <p><i>i. A protected area identified in terms of NEMPAA, excluding conservancies;</i></p> <p><i>ii. National Protected Area Expansion Strategy Focus Areas;</i></p> <p><i>iii. Gauteng Protected Area Expansion Priority Areas;</i></p> <p><i>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</i></p> <p><i>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);</i></p> <p><i>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;</i></p> <p><i>vii. Sites or areas identified in terms of an international convention;</i></p> <p><i>viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;</i></p> <p><i>ix. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or</i></p> <p><i>x. Sites zoned for conservation use or public open space or equivalent zoning.</i></p>	<p>features along the watercourse.</p>

10.2.2 Environmental Activities

In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project life-cycle (refer to Section 4.5). The main project activities as well as high-level environmental activities undertaken in the various project phases are listed in **Table 10-9**.

- Feasibility Studies
 - Technical, economic and environmental screening of alternatives;
 - Development of Outline Scheme Report;
 - Geotechnical Assessment; and
 - Environmental Authorization and WULA process.
- Pre-construction Phase
 - Detailed layouts and services designs;
 - Procurement process for Contractors; and
 - Procurement of other necessary materials.
- Construction Phase
 - Appointments and site camp set up;
 - Appoint Environmental Control Officer;
 - Set up site camp with temporary offices and administrative facilities;
 - Set up ablutions;

- Set up access control, security; signage and lighting;
- General materials storage and laydown areas
- Construction employment;
- Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility); and
- Temporary waste storage areas; these shall be established and managed in accordance with EMPr requirements.
- Sourcing of construction materials and equipment:
- All bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources.
- Excavation and earthworks
- Removal of existing surfacing material where necessary (concrete, asphalt etc.) which could involve excavation below ground level;
- Levelling and compaction using heavy machinery / earthmoving equipment.
- Potential for excavations and trenching in order to lay of below ground level equipment (cables, pipes, sumps, drainage etc.);
- Construction work within the existing dams;
- Potential for excavation dewatering in the event of water-table interception;
- Use of general mechanical equipment within construction areas (generators, cutting and welding equipment, compressors etc.).
- Operation Phase:
 - Operation of service facilities;
 - Maintenance of infrastructure;
 - School, residential and office uses and associated activities .
- Decommissioning Phase
 - Decommissioning of the development and associated services is not envisioned. However, should decommissioning be required the activity will need to comply with the appropriate environmental legislation and best practices at that time.

Table 10-9: Project Activities

Pre-Construction	Project Activities	
	Detailed layouts and services designs	
	Procurement process for Contractors	
	Procurement of other necessary materials	
	Environmental Activities	
	Appointment of Environmental Control Officer (ECO)	
	Approval of site camp/construction layout to minimise impact to the	
	Barricading of sensitive environmental features	
Construction	Project Activities	
	Appointments and site camp set up: <ul style="list-style-type: none"> • Set up site camp with temporary offices and administrative facilities; • Set up ablutions • Set up access control, security; signage and lighting • General materials storage and laydown areas • Construction employment • Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility) • Temporary waste storage areas; these shall be established and managed in accordance with EMPr requirements 	
	Sourcing of construction materials and equipment: <ul style="list-style-type: none"> • All bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources. 	
	Excavation and earthworks <ul style="list-style-type: none"> • Removal of existing surfacing material where necessary (concrete, asphalt etc.) which could involve excavation below ground level • Levelling and compaction using heavy machinery / earthmoving equipment • Potential for excavations and trenching in order to lay of below ground level equipment (cables, pipes, sumps, drainage etc.) • Construction work within the existing dams • Potential for excavation dewatering in the event of water-table interception • Use of general mechanical equipment within construction areas (generators, cutting and welding equipment, compressors etc.) 	
	Environmental Activities	
	Diligent compliance monitoring of the EMPr, environmental authorisation and other relevant environmental legislation	
	Continued consultation with I&APS (as required).	
	Environmental awareness creation	
	Operation	Project Activities
		Operation of service facilities;
Maintenance of infrastructure;		
School, residential and office uses and associated activities		
Environmental Activities		
Monitoring as and when required by the EMPr. Please note this will be limited during the operational phase.		

10.2.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation’s activities, products and services that are likely to interact with the environment and cause an impact. The following environmental

aspects have been identified for the proposed development which are linked to the project activities (note that only high level aspects are provided):

Table 10-10: Environmental Aspects

Pre-Construction	Aspects
	Inadequate consultation with I&APs
	Inadequate environmental and compliance monitoring
	Inadequate or lack of detailed designs and studies.
	Poor construction site planning and layout
	Absence of relevant permits (e.g. for species of conservation importance, heritage resources) – if required
	Lack of barricading of sensitive environmental features
	Poor waste management
	Absence of ablution facilities
Construction	Aspects
	Inadequate consultation with I&APs
	Inadequate environmental and compliance monitoring
	Lack of environmental awareness creation
	Indiscriminate site clearing
	Poor site establishment
Clearing or activities in sensitive areas (not linked to activities that are authorised).	
Operation	Aspects
	Inadequate consultation with I&APs
	Inadequate environmental and compliance monitoring
	Lack of environmental awareness creation
	Lack of maintenance
	Poor management of access to sensitive areas
	Poor management of stormwater
Poor management of litter and waste.	

10.2.4 Issues raised by Environmental Authorities and IAPs

The issues raised by authorities (both regulatory and commenting) and I&APs received to date during the execution of the Scoping and EIA process are captured and addressed in the Comments and Responses Report (**Appendix 14.5.5**). No objections have been received to date.

The following potential impacts were identified during the Scoping Phase:

- Impacts to existing Eskom transmission lines⁴
- Impacts to CBA and ESA areas;
- Impact to wetlands;
- Stormwater Management; and
- Sustainability.

These issues helped identify specialist and technical studies required and thus contributed to the assessment of impacts in Section 10.3.

⁴ Please note that Eskom Transmission did not raise any objections but instead included a number of measures that have been added to the I&AP database.

Furthermore, the following comments were received as part of the review of the EIR:

- Requests for information
 - Traffic Impact Assessment and Stormwater Management Plan
 - Information on William Nicol Drive Upgrade Timeframes
 - Information on whether there has been a change in the proposed development since Scoping.
- Support of the Development
 - From the Ward Councilor of the area.
- Comments from SAHRA
 - Support the development
 - Mitigation to include Chance Find Procedure.
- Comments from City of Johannesburg Impact Assessment and Compliance Monitoring
 - Concerns regarding the artificial source of water indicated by Wetland and Biodiversity specialists.
 - Concern regarding the conservation of the degraded grassland area and associated impact on Grass Owls.
 - Comments on Geotechnical Assessment.
 - Requirements for recreational open space.
 - Concern regarding stormwater.

These have not resulted in any changes to the assessment of impacts that was undertaken in the EIR made available for public review. The reasons for this are as follows:

- The artificial source of water indicated by the Wetland Assessment and Biodiversity Baseline and Impact Assessment relates to stormwater drainage channels and a historic earth dam. Google Earth imagery has been utilized to corroborate this and is included in Addendum 1 of the Comments and Responses Report. The delineated wetland and associated 32m wetland buffer however remain as indicated by the Wetland Specialist and are excluded from the development footprint (other than for the development of the wetland crossing).
- The degraded grassland was provided a sensitivity rating of low-medium. Further, approximately half of this area (1.3 ha) will be conserved as part of the wetland and wetland buffer.
- This area together with the wetland and wetland buffer provided 5 ha of area that can be used for roosting and foraging habitat for Grass Owls. In addition, a number of mitigation measures regarding Grass Owls have been included in the EMPr and thus the impact is not expected to be significant.

10.3 Quantitative Impact Assessment

Table 10-11 below provides a summary of the identified impacts and significance ranking (WOM = Without Mitigation) for the construction and operational phases of development. Impacts for each alternative (both layout and attenuation alternatives) are also provided. Brief management measures have been provided

for the purposes of assessing whether the implementation of recommended management measures may be sufficient to decrease the significance ranking (WM = With Mitigation).

Where possible, the impact assessments undertaken by the specialists have been integrated into the impact assessment below.

The full impact assessment is appended in Annexure 14.7.

Table 10-11: Summary of impact assessment for the construction phases

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
CONSTRUCTION PHASE												
Atmospheric Emissions	Negative	Dust emissions	Proposal layout	Yes	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. The following mitigation measures are suggested: • A speed limit of 20km/h must be maintained on all dirt roads. • Dust suppression by means of either water or biodegradable chemical agent is required.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	Proposal layout	Yes	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. The following mitigation measures are suggested: • In terms of transportation of workers and materials, collective transportation arrangements should be made to reduce individual car journeys where possible. • All vehicles used during the project should be properly maintained and in good working order. • All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable emissions.	Medium	Low	No Loss	Reversible
			Alternative Layout			Low-Medium	High		Medium	Low	No Loss	Reversible
			Proposal - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible
			Alternative - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Noise	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. The following mitigation measures are suggested: • Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. • Construction activities should be limited to daytime only.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
			No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Impacts to Wetlands	Negative	Water quality	Proposal layout	No	Direct	Low	High	Impacts related to <u>construction</u> of both the proposals and alternatives are similar. • The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, stormwater management, dry season construction, filtration. In addition, the following general measures should be implemented: • Chemical toilets must be supplied and maintained during the construction phase • Ablution facilities (chemical toilets) are to be provided by the Contractor, at a ratio of 1:10. • Ablution facilities (chemical toilets) must be erected within 100m from all workplaces but within the development footprint. • Toilets are to be secured to the ground, and must have a closing mechanism. • Toilet paper must be provided at these facilities and must be serviced once per week. • Certified contractors to maintain and remove chemical toilets regularly.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)				
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility		
CONSTRUCTION PHASE													
		Proposal - Stormwater			Low	High	<ul style="list-style-type: none"> The contractor must ensure that spillage does not occur when toilets are cleaned/serviced and contents must be properly stored and disposed of. Discharge of waste into the environment and/or burial of waste are strictly prohibited. Sanitary arrangements must be to the satisfaction of the PM, ECO, the local authorities and the applicable legal requirements. Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. Spill kits (absorbent material) must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. Significant spills should be reported to the Project Manager or Contractors Manager and ECO who should report this to the relevant authority 	High	Low	No Loss	Reversible		
		Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible		
		No-Go Option	Not Applicable	Not Applicable	None	None		None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Flow regime	Proposal layout			Low-Medium	High	<p>'Impacts related to construction of proposed stormwater is similar. However, as the alternative layout would require multiple service installations and potentially additional wetland crossings, intensity of the impact is likely to be higher and the impact would have a medium significance.</p> <p>* The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, stormwater management, dry season construction, filtration.</p> <p>In addition, the following general measures should be implemented:</p> <ul style="list-style-type: none"> Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if and where required. To reduce the loss of material by erosion, disturbance must be kept to a minimum. Where possible, natural vegetation should be retained to reduce the risk of erosion. Silt fences must be used to stabilise the site, reduce erosion and silt entering the natural environment. No unchecked silt may enter the natural environment. Proper stormwater management as per the approved stormwater management plan. Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. Surface-water run-off and stormwater must be directed away from trenches and areas of excavation. 	High	Low	No Loss	Reversible	
			Alternative Layout		No	Indirect	Medium		High	Low	Low-Medium	No Loss	Reversible
			Proposal - Stormwater			Low-Medium	High		High	Low	No Loss	Reversible	
			Alternative - Stormwater			Low-Medium	High		High	Low	No Loss	Reversible	
			No-Go Option	Not Applicable	Not Applicable	None	High		None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Habitat	Proposal layout			Low	High	<p>Impacts related to construction of both the proposals and alternatives are similar.</p> <p>* The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, minimal ingress and egress. In addition, the following general measures should be implemented:</p> <ul style="list-style-type: none"> The wetland area should be declared 'no-go' area's during the construction and must be demarcated prior to construction; All laydown, storage areas etc. should be restricted to within the 	High	Low	No Loss	Reversible	
			Alternative Layout	Yes	Indirect	Low	High		High	Low	No Loss	Reversible	

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility
CONSTRUCTION PHASE											
		Proposal - Stormwater			Low	High	development footprint; • Compilation and implementation of a Wetland Rehabilitation Plan.	High	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	Low	High	None required. However, it should be noted that the existing state of the wetland is poor and will continue to deteriorate without rehabilitation.	Not Applicable	None	Not Applicable	Not Applicable
Negative	Biota	Proposal layout	No	Indirect	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • The following mitigation measures suggested by the wetland specialist apply: Stock piling outside the wetland area, minimal ingress and egress. In addition, the following general measures should be implemented: • The wetland area should be declared 'no-go' area's during the construction and must be demarcated prior to construction; • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site; • No trapping, killing or poisoning of any wildlife should be allowed on site; • Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited.	High	Low	No Loss	Reversible
		Alternative Layout			Low	High		High	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
		No-Go Option			Not Applicable	Not Applicable		None	High	None required	Not Applicable
Negative	Geomorphology	Proposal layout	No	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • The following mitigation measures suggested by the wetland specialist apply: Stormwater management design and erosion control measures. In addition, the following general measures should be implemented: • Instability and erosion of steep slopes must be stabilised immediately. Re-vegetation in consultation with landscape architect and ECO should be done if and where required. • To reduce the loss of material by erosion, disturbance must be kept to a minimum. • Where possible, natural vegetation should be retained to reduce the risk of erosion. • Proper stormwater management as per the approved stormwater management plan. • Increased run-off during construction should be managed using berms, temporary cut-off drains, attenuation ponds or other suitable structures, in consultation with the ECO and resident Engineer. • Stormwater management system is to be installed as soon as possible following site establishment, to attenuate stormwater during the construction phase, as well as during the operational phase. • Surface-water run-off and stormwater must be directed away from trenches and areas of excavation.	High	Low	No Loss	Reversible
		Alternative Layout			Low-Medium	High		High	Low	No Loss	Reversible
		Proposal - Stormwater			Low-Medium	High		High	Low	No Loss	Reversible
		Alternative - Stormwater			Low-Medium	High		High	Low	No Loss	Reversible
		No-Go Option			Not Applicable	Not Applicable		None	Not Applicable	None required	Not Applicable

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
CONSTRUCTION PHASE												
Waste Generation	Negative	Domestic waste	Proposal layout	Yes	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Waste recycling to be put in place. • Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable. • All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes.	Medium	Low	No Loss	Reversible
			Alternative Layout			Low	High		Medium	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		Medium	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		Medium	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Construction waste	Proposal layout	Yes	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Litter (from outside the camp included) and concrete bags etc. must be collected and put into suitable closed bins on a daily basis. • Construction rubble must be disposed of at a registered site • No Construction rubble may be used for infilling.	Medium	Low	No Loss	Reversible
			Alternative Layout			Low	High		Medium	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		Medium	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		Medium	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Hazardous waste	Proposal layout	Yes	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • The classification of waste determines the handling methods and the ultimate disposal of the material. The contractor shall manage hazardous waste that are anticipated to be generated by his operations as follows: Characterise the waste to determine if it is general or hazardous. Obtain and provide an acceptable container with a label. Place hazardous waste material in the container. Inspect the container on a regular basis Haul the full container to the licenced and correct disposal site. Provide documentary evidence of proper disposal of the waste. • Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 80m ³ of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with.	Medium	Low	No Loss	Reversible
			Alternative Layout			Low	High		Medium	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		Medium	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		Medium	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Soil Alteration	Negative	Loss of topsoil	Proposal layout	Yes	Direct	Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • Top soil should be separated and re-used where possible.	Low	Low-Medium	Partial
Alternative Layout				Medium			High	Low		Low-Medium	Partial	High Degree
Proposal - Stormwater				Medium			High	Low		Low-Medium	Partial	High Degree
Alternative - Stormwater				Medium			High	Low		Low-Medium	Partial	High Degree
No-Go Option			Yes	Direct	Low-Medium	High	The site is degraded by historic land use. It is likely that there will be a continued loss of topsoil should the development not proceed as the site will remain in its degraded state.	None	Low-Medium	Partial	High Degree	
Negative		Loss of land capability	Proposal layout	Yes	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • Please note that according to the Gauteng Agricultural Potential Atlas IV, the agricultural potential of the site is a combination of built up, low and medium. The site has also not been used for agriculture and is degraded. The site is also identified as urban in terms of the GPEMF and is surrounded by residential and business uses. Therefore, it is not expected	None	Low-Medium	Partial	High Degree
			Alternative Layout			Low-Medium	High		None	Low-Medium	Partial	High Degree

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
CONSTRUCTION PHASE												
		Proposal - Stormwater			Low-Medium	High	that the site has a high agricultural potential. Impacts related to land capability are therefore not expected to be high.	None	Low-Medium	Partial	High Degree	
		Alternative - Stormwater			Low-Medium	High		None	Low-Medium	Partial	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Alteration of topography	Proposal layout			Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. 'Some of the Topography within the development footprint will be altered as part of the development. In order to ensure the change in topography does not impact stormwater, the following must be implemented: • Stormwater management measures in line with the SWMP must be implemented to ensure these designs do not impact on stormwater.	Low	Low-Medium	Partial	High Degree	
		Alternative Layout		No	Direct	Low-Medium		High	Low	Low-Medium	Partial	High Degree
		Proposal - Stormwater			Low-Medium	High		Low	Low-Medium	Partial	High Degree	
		Alternative - Stormwater			Low-Medium	High		Low	Low-Medium	Partial	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Soil pollution	Proposal layout			Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored and conduct a pre start-up inspection checklist. • All vehicle/equipment maintenance and washing must be done in the workshop area, equipped with a bund wall and grease trap oil separator. • Workshop area must be monitored for fuel and oil spills. • Drip trays must be checked and replaced for vehicles standing (parked) for prolonged periods. • Drip trays must be of a sufficient size and volume to collect any hydrocarbon leakages from a stationary vehicle. • Spill kits (absorbent material) must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. • Spilled substances must be contained in impermeable containers for removal to a licensed hazardous waste site. • Significant spills should be reported to the Project Manager or Contractors Manager and ECO who should report this to the relevant authority. • Waste must be managed in line with the requirements of the EMPr (see above).	High	Low	No Loss	Reversible	
		Alternative Layout		No	Direct	Low		High	High	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible	
		Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Resource Consumption	Negative	Proposal layout	Yes	Direct	None	High	Impacts related to construction of both the proposals and alternatives are similar. • During the construction phase the contractors will mainly make use of generators.	None	None	No Loss	Reversible	
		Alternative Layout			None	High		None	None	No Loss	Reversible	
		Proposal - Stormwater			None	High		None	None	No Loss	Reversible	

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
CONSTRUCTION PHASE												
Negative		Alternative - Stormwater			None	High		None	None	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Water consumption	Yes	Proposal layout	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • Enforce water saving strategies. • Environmental awareness training.	Low	Low	No Loss	Reversible	
			Alternative Layout		Low-Medium	High		Low	Low	No Loss	Reversible	
			Proposal - Stormwater		Low-Medium	High		Low	Low	No Loss	Reversible	
			Alternative - Stormwater		Low-Medium	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Fuel consumption	Yes	Proposal layout	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • Record and monitor fuel consumption regularly • Reduce theft of fuel (increase security)	Low	Low	No Loss	Reversible	
			Alternative Layout		Low-Medium	High		Low	Low	No Loss	Reversible	
			Proposal - Stormwater		Low-Medium	High		Low	Low	No Loss	Reversible	
			Alternative - Stormwater		Low-Medium	High		Low	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Raw materials consumption	Yes	Proposal layout	Direct	Low-Medium	High	Impacts related to construction of both the proposals and alternatives are similar. • Promote effective use of raw material.	Low	Low	No Loss	Reversible	
			Alternative Layout		Low-Medium	High		Low	Low	No Loss	Reversible	
			Proposal - Stormwater		Low-Medium	High		Low	Low	No Loss	Reversible	
Alternative - Stormwater			Low-Medium		High	Low		Low	No Loss	Reversible		
No-Go Option		Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
Effects on Biodiversity	Negative	Destruction, further loss and fragmentation of the vegetation community (including an area classified as CBA and ESA as well as an EN vegetation type)	Yes	Direct	Proposal layout	Medium-High	High	Impacts related to construction of both the proposals and alternatives are similar. 'Both layouts will result in a loss of habitat however, an ecological assessment was undertaken and found that the area has already been disturbed and as such the impact will not be extensive. The following mitigation measures suggested by the specialist will be undertaken: • All laydown, storage areas etc should be restricted to within the project area and all access roads must be kept within this area or from existing access roads; • Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded; • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and • Compilation of and implementation of an alien vegetation management plan for the entire site.	High	Low-Medium	Partial	High Degree
					Alternative Layout	Medium-High	High		High	Low-Medium	Partial	High Degree
					Proposal - Stormwater	Medium-High	High		High	Low-Medium	Partial	High Degree
					Alternative - Stormwater	Medium-High	High		High	Low-Medium	Partial	High Degree
					No-Go Option	Not Applicable	Not Applicable		None	High	None required. However, please note that the site is highly disturbed and degraded in parts.	Not Applicable
		Destruction of a habitat for the African Grass Owl (especially the centre of the project area)	Yes	Direct	Medium-High	High	Impacts related to construction of both the proposals and alternatives are similar. 'Both layouts will result in a loss of habitat however, an ecological assessment was undertaken and found that the area has already been disturbed and as such the impact will not be extensive. The following mitigation measures suggested by the specialist will be undertaken: • Before construction is to take place the area needs be walked through to	Medium	Low	Partial	High Degree	

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)				
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility		
CONSTRUCTION PHASE													
		Alternative Layout			Medium-High	High	chase up any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the specie to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested; • During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT); • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site; • No trapping, killing or poisoning of any wildlife should be allowed on site; • Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities; and • Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited	Medium	Low	Partial	High Degree		
		Proposal - Stormwater			Medium-High	High		Medium	Low	Partial	High Degree		
		Alternative - Stormwater			Medium-High	High		Medium	Low	Partial	High Degree		
		No-Go Option	Not Applicable	Not Applicable	None	High		Not Applicable	None	Not Applicable	Not Applicable		
		Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).	Proposal layout	Yes	Direct	Low		Medium	Impacts related to construction of both the proposals and alternatives are similar. 'Both layouts will result in a loss of habitat however, an ecological assessment was undertaken and found that the area has already been disturbed and as such the impact will not be extensive. Proper management and control of dust, noise and vibration (See specific impact assessments for dust and noise etc.) as well as impacts on fauna and flora above.	Medium	Low	Partial	High Degree
			Alternative Layout			Low		Medium		Medium	Low	Partial	High Degree
			Proposal - Stormwater			Low		Medium		Medium	Low	Partial	High Degree
			Alternative - Stormwater			Low		Medium		Medium	Low	Partial	High Degree
		No-Go Option	Not Applicable	Not Applicable	None	High		Not Applicable	None	Not Applicable	Not Applicable		
		Incidents, accidents and potential emergency situations	Negative	Pollution incidents	No	Direct		Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Spill kits to be located in strategic areas for when needed • Regular site and plant inspection must be conducted • Environmental awareness training	Low	Low	No Loss
Alternative Layout	Low						High	Low	Low		No Loss	Reversible	
Proposal - Stormwater	Low						High	Low	Low		No Loss	Reversible	
Alternative - Stormwater	Low						High	Low	Low		No Loss	Reversible	
No-Go Option	Not Applicable						Not Applicable	None	High		None required	Not Applicable	None
Negative	Impact to Eskom Transmission Line		No	Direct	Low	High	'Requirements from Eskom Transmission must be implemented.	Medium	Low	Partial	High Degree		
					Alternative Layout	Low		High	Medium	Low	Partial	High Degree	
					Proposal - Stormwater	Low		High	Medium	Low	Partial	High Degree	
					Alternative - Stormwater	Low		High	Medium	Low	Partial	High Degree	
No-Go Option	Not Applicable		Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable			
Negative	Health and safety	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • 24 hour security and access control. • Health and Safety awareness training. • Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. • A Safety Agent should be appointed • A Dedicated Occupational Health and Safety system to be implemented by Contractor's Safety Officer. To be monitored and audited by the Client's Safety Agent, in terms of the Construction Regulations (2003).	Low	Low	No Loss	Reversible			
				Alternative Layout	Low		High	Low	Low	No Loss	Reversible		
				Proposal - Stormwater	Low		High	Low	Low	No Loss	Reversible		
				Alternative - Stormwater	Low		High	Low	Low	No Loss	Reversible		

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility
CONSTRUCTION PHASE											
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Storage of hydrocarbons	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Best practice regarding storage of substances • Spill kits to be located in strategic areas for when needed • Environmental awareness training • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers	Low	Low	No Loss	Reversible
		Alternative Layout			Low	High		Low	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Fire	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Adhere to the appropriate emergency procedures • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers • In addition, designated smoking areas should be provided and there should be zero tolerance to smoking outside these areas. Cooking over open flames is not allowed.	Low	Low	No Loss	Reversible
		Alternative Layout			Low	High		Low	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
		No-Go Option	No	Direct	Low	High	The site is currently unoccupied and the risk for fire remains.	None	Low	No Loss	Reversible
Negative	Visual impact	Proposal layout	Yes	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. 'During construction, the site should be screened or walled off.	High	Low	No Loss	Reversible
		Alternative Layout			Low	High		High	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Safety and security	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • 24 hour access control to the site and 24 hour security. • Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined.	Medium	Low	No Loss	Reversible
		Alternative Layout			Low	High		Medium	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Medium	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Medium	Low	No Loss	Reversible
		No-Go Option	No	Direct	Low	High	The site is currently unoccupied. Should the develop not take place, there may be further safety and security issues in the area.	None	Low	No Loss	Reversible
Negative	Traffic disruptions	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. • Requirements of the Traffic Impact Assessment to be implemented as required • Speed limits on all existing roads must be adhered to at all times.	Low	Low	No Loss	Reversible
		Alternative Layout			Low	High		Low	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Loss of cultural heritage	Proposal layout	No	Direct	Low	High	Impacts related to construction of both the proposals and alternatives are similar. 'A Heritage Impact Assessment was undertaken and no significant heritage resources, buildings over 60 years old or burial sites were	High	Low	Partial	High Degree
		Alternative Layout			Low	High		High	Low	Partial	High Degree

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
CONSTRUCTION PHASE												
		Proposal - Stormwater			Low	High	identified and impacts cultural heritage is therefore not expected to be significant. The following mitigation measures recommended: •Implementation of the chance find procedure.	High	Low	Partial	High Degree	
		Alternative - Stormwater			Low	High		High	Low	Partial	High Degree	
		No-Go Option	Not Applicable	Not Applicable	None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Loss of sense of place	Proposal layout		No	Direct	'Impacts related to construction of both the proposals and alternatives are similar. Impacts are not expected to be significant as the site is currently vacant and disturbed and does not contribute to the sense of place. • Suitable screening to be put in place during construction to minimise visual impacts. • No littering to be allowed. • Good housekeeping practices to be followed	Low	Low	No Loss	Reversible	
			Alternative Layout					Low	Low	No Loss	Reversible	
			Proposal - Stormwater					Low	Low	No Loss	Reversible	
			Alternative - Stormwater					Low	Low	No Loss	Reversible	
			No-Go Option	Not Applicable				Not Applicable	None	High	None required	Not Applicable
	Positive	Change of land use	Proposal layout		Yes	Direct	A Town planning process is currently being undertaken to change the land use associated with the site. The proposed change in land use is in line with the GPEMF. The site is adjacent to Steyn City and will be used to provide schooling/residential/offices and storage space to compliment Steyn City. No mitigation measures other than the town planning process is required.	Low	+ Medium	No Loss	Reversible	
			Alternative Layout					+ Medium	High	Low	+ Medium	No Loss
Proposal - Stormwater				+ Medium				High	Low	+ Medium	No Loss	Reversible
Alternative - Stormwater				+ Medium				High	Low	+ Medium	No Loss	Reversible
No-Go Option			Not Applicable	Not Applicable				None	High	None required	Not Applicable	None
Economic	Positive	Proposal layout		Yes	Direct	'Impacts related to construction of both the proposals and alternatives are similar. The proposed CAPEX value of the development is R 15 000 000.00. This will have numerous multiplier effects in the local community. In order to ensure that this benefits the local community, it is recommended that local labour and suppliers are used where possible.	Low	+ Medium	No Loss	Reversible		
		Alternative Layout					+ Medium	High	Low	+ Medium	No Loss	Reversible
		Proposal - Stormwater					+ Medium	High	Low	+ Medium	No Loss	Reversible
		Alternative - Stormwater					+ Medium	High	Low	+ Medium	No Loss	Reversible
	Negative		No-Go Option			Medium	High	Should the development not proceed, the benefits to the local community will be long term and negative. Further, the goals of the GPEMF will also not be met. There are no mitigation measures available,	None	Medium	Partial	High Degree

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility
CONSTRUCTION PHASE											
Positive	Decline/increase in property value	Proposal layout	No	Direct	+ Medium	High	Impacts related to construction of both the proposals and alternatives are similar. The development of the proposed development will increase the property value of the site overall. Further, it will have a knock on effect and is likely to increase the value of neighbouring properties as well. No mitigation measures are required.	None	+ Medium	No Loss	Reversible
		Alternative Layout			+ Medium	High		None	+ Medium	No Loss	Reversible
		Proposal - Stormwater			+ Medium	High		None	+ Medium	No Loss	Reversible
		Alternative - Stormwater			+ Medium	High		None	+ Medium	No Loss	Reversible
	Negative	No-Go Option			Medium	High	The site was is vacant and is degraded and without development, the property value is likely to decrease. This will have knock on effects on the surrounding properties. No mitigation, save for development of the site, is available.	None	Medium	No Loss	Reversible
Positive	Employment	Proposal layout	Yes	Direct	+ Medium	None	Impacts related to construction of both the proposals and alternatives are similar. The proposed development will result in approximately 150 construction related employment opportunities for the local community. Local labour should be utilised as far as possible.	None	+ Medium	No Loss	Reversible
		Alternative Layout			+ Medium	None		None	+ Medium	No Loss	Reversible
		Proposal - Stormwater			+ Medium	None		None	+ Medium	No Loss	Reversible
		Alternative - Stormwater			+ Medium	None		None	+ Medium	No Loss	Reversible
	Negative	No-Go Option			Medium	None	Should the development not proceed, the benefits to the local community will be long term and negative as potential employment opportunities will be lost. No mitigation measures are available.	None	Medium	No Loss	Reversible

Table 10-12: Summary of impact assessment for the operation phase

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
OPERATIONAL PHASE												
Atmospheric Emissions	Not Applicable	Dust emissions	Proposal layout	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	No Loss	Reversible
			Alternative Layout			None	High		Not Applicable	None	No Loss	Reversible
			Proposal - Stormwater			None	High		Not Applicable	None	No Loss	Reversible
			Alternative - Stormwater			None	High		Not Applicable	None	No Loss	Reversible
			No-Go Option			None	High		None required	Not Applicable	None	Not Applicable
	Negative	Emissions from vehicles and equipment (CO ₂ , NO _x , SO _x , VOC's etc.)	Proposal layout	Yes	Indirect	Low	High	Impacts related to both the proposals and alternatives are similar. Most of the people attending the school will be children of people who live within Steyn City. By attending schools in close proximity to their residence, there will be a reduction in long distance travel as well as traffic. This should result in a small reduction in vehicle emissions in a larger area. However, there will be more traffic and cars in the area around the school which will result in a small increase. It is not expected that this impact will be significant.	Low	Low	No Loss	Reversible
			Alternative Layout			Low	High		Low	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
			No-Go Option			None	High		None required	Not Applicable	None	Not Applicable
	Negative	Noise	Proposal layout	No	Direct	Low	High	• The proposed development is adjacent to new residential and business uses and it is not expected that the use will result in significant noise pollution.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
			No-Go Option			None	High		None required	Not Applicable	None	Not Applicable
Impacts to Wetlands	Negative	Water quality	Proposal layout	No	Direct	Low	High	Impacts related to both the proposals and alternatives are similar. • A Outline Scheme Report has been undertaken and noted that sewer will connect to an existing sewer line and be treated at an existing WWTWs. Maintenance and management of the sewer connection (which has been designed outside of the wetland must be undertaken as per COJ's requirements). Furthermore, the impacts related to the alternative attenuation are expected to be greater as there would be one release point. During high rain events, it is expected that some erosion would occur and would result in siltation and reduced water quality. Implementation of the proposed attenuation layout is therefore recommended. • In addition, the following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Medium	High		Very Low	Medium	No Loss	Reversible
			No-Go Option			None	None		None required	Not Applicable	None	Not Applicable
	Not Applicable	Flow regime	Proposal layout	Not Applicable	Not Applicable	Low	High	The impacts related to the alternative attenuation are expected to be greater as there would be one release point. Changes to the flow regime are therefore expected to be significant. Implementation of the proposed attenuation layout is therefore recommended as this will include multiple release points along the wetland which will mimic wetland conditions. The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
		Proposal - Stormwater			Low	High	monitoring. Storm water management. Further, Alternative 1 is not preferred as the impacts to flow would be greater due to the deeper pond.	High	Low	No Loss	Reversible	
		Alternative - Stormwater			Medium	High		Very Low	Medium	No Loss	Reversible	
		No-Go Option			None	High		None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Habitat	Proposal layout	Yes	Indirect	Low	High	Both the proposal and alternatives exclude the development of the wetland and wetland buffer (except for some infrastructure such a wetland crossing and release points). Impacts to wetland habitat during operation are therefore incidental only and are not expected. * The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		High	Low	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable		None	High	None required	Not Applicable
	Negative	Biota	Proposal layout	No	Indirect	Low	High	Both the proposal and alternatives exclude the development of the wetland and wetland buffer (except for some infrastructure such a wetland crossing and release points). Impacts to wetland biota during operation are therefore incidental only and are not expected. Greater impacts are however expected for the alternative stormwater as there is only release point which may result in additional erosion and resultant turbidity. This would have a negative impact on wetland biota* The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area, continuous monitoring. Storm water management.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
			Proposal - Stormwater			Low	High		High	Low	No Loss	Reversible
			Alternative - Stormwater			Low-Medium	High		Low	Low-Medium	No Loss	Reversible
			No-Go Option			Not Applicable	Not Applicable		None	High	None required	Not Applicable
	Not Applicable	Geomorphology	Proposal layout	Not Applicable	Not Applicable	Low	High	Both the proposal and alternatives exclude the development of the wetland and wetland buffer (except for some infrastructure such a wetland crossing and release points). Impacts to wetland biota during operation are therefore incidental only and are not expected. Greater impacts are however expected for the alternative stormwater as there is only release point which may result in additional erosion. * The following mitigation measures from the Wetland specialist must be implemented: Rehabilitation of construction impacted area.	High	Low	No Loss	Reversible
			Alternative Layout			Low	High		High	Low	No Loss	Reversible
Proposal - Stormwater			Low			High	High		Low	No Loss	Reversible	
Alternative - Stormwater			Low			High	High		Low	No Loss	Reversible	
No-Go Option			None			Not Applicable	None required		Not Applicable	None	Not Applicable	None
Waste Generation	Negative	Domestic waste	Yes	Direct	Medium	High	Impacts related to both the proposals and alternatives are similar. • Recyclable waste streams must be separated from other waste streams. Waste to be separated into recyclable and non-recyclable waste. Waste separation needs to occur before waste is collected. • Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable. • All solid waste shall be disposed of by a certified contractor, off-site, at an	Medium	Low	No Loss	Reversible	
					Alternative Layout	Medium		High	Medium	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
		Proposal - Stormwater			Medium	High	approved landfill site if no municipal services are available. • Avoidance, reduction, re-use and recycling should be practiced wherever possible.	Medium	Low	No Loss	Reversible	
		Alternative - Stormwater			Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Not Applicable	Construction waste	Proposal layout	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable
			Alternative Layout			None	High		Not Applicable	None	Not Applicable	
			Proposal - Stormwater			None	High		Not Applicable	None	Not Applicable	
			Alternative - Stormwater			None	High		Not Applicable	None	Not Applicable	
			No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
	Negative	Hazardous waste	Proposal layout	Not Applicable	Not Applicable	None	High	No hazardous waste is expected during operation.	Not Applicable	None	Not Applicable	Not Applicable
			Alternative Layout			None	High		Not Applicable	None	Not Applicable	
Proposal - Stormwater			None			High	Not Applicable		None	Not Applicable		
Alternative - Stormwater			None			High	Not Applicable		None	Not Applicable		
No-Go Option			None			High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Soil Alteration	Negative	Loss of topsoil	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable	
					Alternative Layout	None		High	Not Applicable	None	Not Applicable	
					Proposal - Stormwater	None		High	Not Applicable	None	Not Applicable	
					Alternative - Stormwater	None		High	Not Applicable	None	Not Applicable	
		No-Go Option	Yes	Direct	Low-Medium	High	The site is highly degraded by historic land use. It is likely that there will be a continued loss of topsoil should the development not proceed as the site will remain in its degraded state,	None	Low-Medium	Partial	High Degree	
	Not Applicable	Loss of land capability	Proposal layout	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable
			Alternative Layout			None	High		Not Applicable	None	Not Applicable	
			Proposal - Stormwater			None	High		Not Applicable	None	Not Applicable	
			Alternative - Stormwater			None	High		Not Applicable	None	Not Applicable	
			No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Not Applicable	Alteration of topography	Proposal layout	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable	
		Alternative Layout			None	High		Not Applicable	None	Not Applicable		
		Proposal - Stormwater			None	High		Not Applicable	None	Not Applicable		
		Alternative - Stormwater			None	High		Not Applicable	None	Not Applicable		

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Soil pollution	Proposal layout	No	Direct	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable	
		Alternative Layout			None	High		Not Applicable	None	Not Applicable		
		Proposal - Stormwater			None	High		Not Applicable	None	Not Applicable		
		Alternative - Stormwater			None	High		Not Applicable	None	Not Applicable		
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Resource Consumption	Negative	Electricity consumption	Yes	Direct	Proposal layout	Medium	High	Impacts related to both the proposals and alternatives are similar • Promote effective electricity consumption.	Low	Low-Medium	No Loss	Reversible
					Alternative Layout	Medium	High		Low	Low-Medium	No Loss	Reversible
					Proposal - Stormwater	Medium	High		Low	Low-Medium	No Loss	Reversible
					Alternative - Stormwater	Medium	High		Low	Low-Medium	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Water consumption	Yes	Direct	Proposal layout	Medium	High	Impacts related to both the proposals and alternatives are similar • Promote effective water conservation measures.	Medium	Low	No Loss	Reversible
					Alternative Layout	Medium	High		Medium	Low	No Loss	Reversible
					Proposal - Stormwater	Medium	High		Medium	Low	No Loss	Reversible
					Alternative - Stormwater	Medium	High		Medium	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Negative	Fuel consumption	Yes	Direct	Proposal layout	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable
					Alternative Layout	None	High		Not Applicable	None	Not Applicable	Not Applicable
					Proposal - Stormwater	None	High		Not Applicable	None	Not Applicable	Not Applicable
					Alternative - Stormwater	None	High		Not Applicable	None	Not Applicable	Not Applicable
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Raw materials consumption	Yes	Direct	Proposal layout	Low-Medium	High	Impacts related to both the proposals and alternatives are similar • Promote effective use of raw material.	Low	Low	No Loss	Reversible	
				Alternative Layout	Low-Medium	High		Low	Low	No Loss	Reversible	
				Proposal - Stormwater	Low-Medium	High		Low	Low	No Loss	Reversible	
				Alternative - Stormwater	Low-Medium	High		Low	Low	No Loss	Reversible	
	No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
Effects on Biodiversity	Negative	Continued encroachment and displacement of the vegetation community due to alien invasive plant species,	Yes	Indirect	Proposal layout	Low-Medium	High	Impacts related to both proposal and alternatives are similar. Recommended mitigation measures from the specialists include: • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and • Compilation of and implementation of an alien vegetation management plan for the entire site.	Medium	Low	No Loss	Reversible
					Alternative Layout	Low-Medium	High		Medium	Low	No Loss	Reversible
					Proposal - Stormwater	Low-Medium	High		Medium	Low	No Loss	Reversible
					Alternative - Stormwater	Low-Medium	High		Medium	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
	particularly in previously disturbed areas.	No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic and dust).	Proposal layout	Yes	Indirect	Low-Medium	High	Impacts related to both proposal and alternatives are similar. Mitigation measures related to dust, traffic and noise to be implemented.	Medium	Low	No Loss	Reversible	
		Alternative Layout			Low-Medium	High		Medium	Low	No Loss	Reversible	
		Proposal - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible	
		Alternative - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Loss of faunal species (road mortalities and/or poaching).	Proposal layout	Yes	Direct	Low-Medium	High	It is not expected that any fauna will be found on site during operation. The Management Corporation must include the requirement in their rule book that should any be found that the relevant organisation be called to safely remove the species. No trapping, killing or poisoning of any wildlife should be allowed on site under any circumstances.	Medium	Low	No Loss	Reversible	
		Alternative Layout			Low-Medium	High		Medium	Low	No Loss	Reversible	
		Proposal - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible	
		Alternative - Stormwater			Low-Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Habitat degradation (litter and alien vegetation encroachment);	Proposal layout	Yes	Indirect	Medium	High	Impacts related to both proposal and alternatives are similar. Recommended mitigation measures from the specialists include: •Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and •Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site • Compilation of and implementation of an alien vegetation management plan for the entire site.	Medium	Low	No Loss	Reversible	
		Alternative Layout			Medium	High		Medium	Low	No Loss	Reversible	
		Proposal - Stormwater			Medium	High		Medium	Low	No Loss	Reversible	
		Alternative - Stormwater			Medium	High		Medium	Low	No Loss	Reversible	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Negative	Introduction of pest species (e.g. rats and flies) due to the new habitats that's created by an increase in waste levels.	Proposal layout	Yes	Direct	Low-Medium	High	Impacts related to both proposal and alternatives are similar. Recommended mitigation measures from the specialists include: •Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	High	None	No Loss	Reversible	
		Alternative Layout			Low-Medium	High		High	None	No Loss	Reversible	
		Proposal - Stormwater			Low-Medium	High		High	None	No Loss	Reversible	
		Alternative - Stormwater			Low-Medium	High		High	None	No Loss	Reversible	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
Incidents, accidents and potential emergency situations	Negative	Pollution incidents	Proposal layout	No	Direct	Low	High	• Sewer connection pipe must be managed and maintained in line with COJ requirements.	Low	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility
		Alternative Layout			Low	High		Low	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Health and safety	Proposal layout	No	Direct	Low	High	• 24 hour security and access control.	Low	Low	No Loss	Reversible
		Alternative Layout			Low	High		Low	Low	No Loss	Reversible
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Impact to Eskom Transmission Line	Proposal layout	No	Direct	Low	High	'Requirements from Eskom Transmission must be implemented.	Medium	Low	Partial	High Degree
		Alternative Layout			Low	High		Medium	Low	Partial	High Degree
		Proposal - Stormwater			Low	High		Medium	Low	Partial	High Degree
		Alternative - Stormwater			Low	High		Medium	Low	Partial	High Degree
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Storage of hydrocarbons	Proposal layout	No	Direct	None	High	Impacts not applicable to the operational phase. No mitigation required.	Not Applicable	None	Not Applicable	Not Applicable
		Alternative Layout			None	High		Not Applicable	None	Not Applicable	Not Applicable
		Proposal - Stormwater			None	High		Not Applicable	None	Not Applicable	Not Applicable
		Alternative - Stormwater			None	High		Not Applicable	None	Not Applicable	Not Applicable
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable
Negative	Fire	Proposal layout	No	Direct	Low	High	• Adhere to the appropriate emergency procedures • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers	Low	Low	No Loss	Reversible

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Social		Alternative Layout			Low	High		Low	Low	No Loss	Reversible	
		Proposal - Stormwater			Low	High		Low	Low	No Loss	Reversible	
		Alternative - Stormwater			Low	High		Low	Low	No Loss	Reversible	
		No-Go Option	No	Direct	Low	High	The site is currently unoccupied. Should the develop not take place, the potential for fires on site and on neighbouring properties remains as is.	None	Low	No Loss	Reversible	
	Negative	Visual impact	Proposal layout			Low	High		None	Low	No Loss	Reversible
			Alternative Layout			Low	High		None	Low	No Loss	Reversible
			Proposal - Stormwater	Yes	Direct	Low	High	As the development is in line with the development goals of the area, no mitigation measures are required or recommended.	None	Low	No Loss	Reversible
			Alternative - Stormwater			Low	High		None	Low	No Loss	Reversible
		No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Positive	Safety and security	Proposal layout			+Low	High		Low	+Low	No Loss	Reversible
			Alternative Layout			+Low	High		Low	+Low	No Loss	Reversible
			Proposal - Stormwater	No	Direct	+Low	High	Due to the development of the site, safety and security in the area is likely to improve. In addition, the following will be implemented which will assist with this: • 24 hour access control to the site and 24 hour security.	Low	+Low	No Loss	Reversible
			Alternative - Stormwater			+Low	High		Low	+Low	No Loss	Reversible
	Negative		No-Go Option	No	Direct	Low	High	The site is currently unoccupied . Should the develop not take place, there may be further safety and security issues in the area.	None	Low	No Loss	Reversible
	Negative	Traffic disruptions	Proposal layout			Low-Medium	High		High	Low	No Loss	Reversible
			Alternative Layout			Low-Medium	High		High	Low	No Loss	Reversible
Proposal - Stormwater			No	Direct	Low-Medium	High	• Access roads to be put in place as discussed in the TIA to be implemented. Planned upgrades in the area will meet the requirements for the traffic of the development.	High	Low	No Loss	Reversible	
Alternative - Stormwater					Low-Medium	High		High	Low	No Loss	Reversible	
No-Go Option		Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
Not Applicable	Loss of cultural heritage	Proposal layout			None	High		None	None	No Loss	Reversible	
		Alternative Layout			None	High		None	None	No Loss	Reversible	
		Proposal - Stormwater	Not Applicable	Not Applicable	None	High	Impacts not applicable to the operational phase. No mitigation required.	None	None	No Loss	Reversible	

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)			
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility	
Negative		Alternative - Stormwater			None	High		None	None	No Loss	Reversible	
		No-Go Option			None	High	None required	Not Applicable	None	Not Applicable	Not Applicable	
	Loss of sense of place	Proposal layout	No	Direct	Low	High	Impacts to sense of place are not expected, due to the extensive developments that already occur in the area. As the development is in line with the development goals of the area, no mitigation measures are required or recommended.	None	Low	No Loss	Reversible	
		Alternative Layout			Low	High		None	Low	No Loss	Reversible	
		Proposal - Stormwater			Low	High		None	Low	No Loss	Reversible	
		Alternative - Stormwater			Low	High		None	Low	No Loss	Reversible	
	No-Go Option	Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
	Positive	Change of land use	Proposal layout	Yes	Direct	+ Medium	High	A Townplanning process is currently being undertaken to change the land use associated with the site. The proposed change in land use is in line with the GPEMF. No mitigation measures other than the townplanning process is required.	Low	+ Medium	No Loss	Reversible
			Alternative Layout			+ Medium	High		Low	+ Medium	No Loss	Reversible
			Proposal - Stormwater			+ Medium	High		Low	+ Medium	No Loss	Reversible
Alternative - Stormwater					+ Medium	High	Low		+ Medium	No Loss	Reversible	
No-Go Option		Not Applicable	Not Applicable	None	High	None required	Not Applicable	None	Not Applicable	Not Applicable		
Economic	Decline/increase in economy	Proposal layout	Yes	Direct	+ Medium	High	Once operational the development will provide housing opportunities in the area and thus will contribute to the economy in the area as people living in the area will likely purchase goods in nearby stores etc. This will have an economic multiplier effect in the local community. No mitigation measures are required.	None	+Medium-High	No Loss	Reversible	
		Alternative Layout			+ Medium	High		None	+ Medium	No Loss	Reversible	
		Proposal - Stormwater			+ Medium	High	Once operational the development will provide education, residential and business opportunities in the area and thus will contribute to the economy in	None	+ Medium-High	No Loss	Reversible	

IMPACTS					RANKING WITHOUT MITIGATION	CONFIDENCE	IMPLEMENTATION OF MANAGEMENT MEASURES	RANKING WITH MITIGATION	DEGREE REVERSABILITY & LOSS OF RESOURCE (AFTER MITIGATION)		
Nature	Description	Alternative	Cumulative	Type	Significance (A + B + C) X P	Confidence	Description and/or Mitigation and Management Measures (if applicable)	Mitigation Effectiveness	Significance	Loss of Resources	Reversibility
		Alternative - Stormwater			+ Medium	High	the area. This will have an economic multiplier effect in the local community. No mitigation measures are required.	None	+ Medium	No Loss	Reversible
Negative		No-Go Option			Medium	High	Should the development not proceed, the benefits to the local community will be long term and negative. Further, the goals of the GPEMF will also not be met. There are no mitigation measures available,	None	Medium	Partial	High Degree
Positive	Decline/increase in property value	Proposal layout	No	Direct	+ Medium	High	The development of the school/business/residential development will increase the property value of the site overall. Further, it will have a knock on effect and is likely to increase the value of neighbouring properties as well. No mitigation measures are required.	None	+ Medium	No Loss	Reversible
		Alternative Layout			+ Medium	High		None	+ Medium	No Loss	Reversible
		Proposal - Stormwater			+ Medium	High		None	+ Medium	No Loss	Reversible
		Alternative - Stormwater			+ Medium	High		None	+ Medium	No Loss	Reversible
Negative		No-Go Option			Medium	High	The site was previously is vacant and degraded and without development, the property value is likely to decrease. This will have knock on effects on the surrounding properties. No mitigation, save for development of the site, is available.	None	Medium	No Loss	Reversible
Positive	Employment	Proposal layout	Yes	Direct	+ Medium	None	The proposed development will result in approximately 150 permanent full time operation related employment opportunities for the local community. Local labour should be utilised as far as possible.	None	+ Medium	No Loss	Reversible
		Alternative Layout			+ Medium	None		None	+ Medium	No Loss	Reversible
		Proposal - Stormwater			+ Medium	None		None	+ Medium	No Loss	Reversible
		Alternative - Stormwater			+ Medium	None		None	+ Medium	No Loss	Reversible
Negative		No-Go Option			Medium	None	Should the development not proceed, the benefits to the local community will be long term and negative as potential employment opportunities will be lost. No mitigation measures are available.	None	Medium	No Loss	Reversible

10.4 Description of Impacts

A discussion of impacts to various aspects is provided below. Impacts that have been identified as having a low-medium impact significance rating and higher (before mitigation) are discussed in more detail within the subsection in terms of their risks or concerns affecting the environment. A discussion on how mitigation measures are expected to decrease/increase the significance rating is also provided as well as input from specialists where this input was used to assess impacts.

In addition, it is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. A Cumulative impact refers to *“the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions”*. Cumulative impacts can result from individually minor, but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place frequently and over a period of time that the effects cannot be assimilated by the environment. Cumulative impacts are also discussed in the subsections that follow.

10.4.1 Atmospheric Emissions

10.4.1.1 Overview

In terms of atmospheric emissions, two potential impacts were identified during both construction and operation, namely, dust emissions and emissions from vehicles and equipment. These impacts are not expected to differ between the proposals and alternatives.

For construction, both impacts were identified as having a ‘low’ significance. Mitigation measures include ensuring that speed limits on dirt roads are maintained and that dust suppression measures are utilized. In terms of the emissions from construction vehicles, these will be mitigated by ensuring that all vehicles and other machinery comply with road worthy requirements and legislation in terms of allowable emissions. During operation, it is not expected that there will be any impacts related to dust as the site will be landscaped and vegetated. In term of vehicle emissions, the school will mainly cater for students of Steyn City residents and thus will immunize the distance travelled. However, overall, the development will result in more cars in the immediate area. It is not expected that this impact will be significance.

10.4.1.2 Cumulative Impacts:

Both dust emissions and emissions from vehicles and equipment are cumulative in nature as they are compounded by existing activities in the environment. However, during the construction phase, these impacts are short term in nature and are of a low intensity. Regardless, mitigation measures to reduce these impacts are vital and must be implemented. For vehicle emissions in the operational phase, it should be noted that the proposed development will not create new vehicle emissions but does act to concentrate them. This is not expected to be a significant impact.

10.4.2 Noise

10.4.2.1 Overview

Noise impacts will occur throughout construction but will be of a low significance. These impacts are not expected to differ between the proposals and alternatives. Mitigation measures will further reduce the significance of this impact and include:

- Ensuring that all equipment and machinery comply with the manufacturer's specifications; and
- Ensuring that construction activities must be limited to the day.

During operation, there will be some noise impacts especially from the school however, this impact will have a low significance and will be in line with the adjacent land uses in the area. The development will be walled which will also reduce the significance further.

10.4.2.2 Cumulative Impacts:

It is not expected that this will be a cumulative impact as the area around the site is already partly developed for residential use. Residential use is not associated with high noise impacts (for example like for industrial use).

10.4.3 Impacts to Wetland

10.4.3.1 Overview

A Wetland Assessment (Prism EMS, 2020) was undertaken and the following results were attained:

- The wetland attained a low overall PES (Present Ecological State)
 - RSV84_UCVB was found to be highly modified. The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable. This wetland system is impacted by historical activities both in the catchment as well as directly on the wetland system where the impacts are continues. It forms part of a larger wetland system. The trajectory of change for the wetland ecological status is predicted that conditions are likely to deteriorate slightly over the next 5 years without major intervention.
- The wetland attained a Moderate Ecological Importance and Sensitivity (EIS) score.
 - The RSV84_UCVB, Unchanneled Valley Bottom Wetland is considered ecologically important and sensitive on a local scale. The biodiversity of this wetland is generally not sensitive to flow and habitat modifications. It plays a small role in moderating the quantity and quality of water of major rivers. The system drains into further downstream wetland and streams before reaching major rivers. The Ecological Importance and Sensitivity (EIS) for this system is thus considered to be Moderate.
- The wetland Recommended Ecological Classification (REC) classification was rated as:
 - The wetland will be impacted to some extent by the proposed development activities. This impact will be localised and at the transitional point leading from the development and infrastructure installations into the wetland and buffer area. It will in all likelihood regress slightly in terms of its current Ecological Category if not managed in specific during the

construction period. Stormwater management for the site is required in specific the construction phase. This will mitigate the impact on the wetlands. Rehabilitation of the impacts and maintenance of the system will further mitigate the impacts and could improve the sustainability of the system. It is thus rated that the Recommended Ecological Category (REC) should fall into:

- Category D for RSV84_UCVB

Potential impacts to the wetland in the development site include the following:

- Water Quality;
- Flow regime;
- Habitat;
- Biota; and
- Geomorphology.

For most of the above, these impacts range from 'low' to low-medium' in significance (without mitigation) and are similar for both proposals and alternatives. With mitigation, these impacts decreased to a 'low' significance. Mitigation measures recommended by the specialist included:

- Silt protection measure to be implemented in consultation with the wetland specialist (ECO).
- Ingress and Egress must be managed to minimise impacts in respect of compaction of the wetland soils.
- Single entry and exit points must be established.
- These areas must be scarified as part of the rehabilitation plan.
- Stock piling must be located outside the delineated wetland and buffer boundaries.
- An approved stormwater management plan must be implemented.
- Velocity dissipation structures and sheet flow structures (such as reno mattresses) must also be installed to prevent water flowing through culverts to gain velocity and be released uncontrolled.
- Dispersed flow must be attained post formal structures.
- Sheet flow must be promoted to mimic natural flow patterns.

For the flow regime however, impacts related to construction of proposed stormwater is similar. However, as the alternative layout would require multiple service installations and potentially additional wetland crossings, intensity of the impact is likely to be higher and the impact would have a medium significance. It is not preferred for this reason.

In addition to the above, the design of the proposed development took into account the delineated wetland and associated 32m buffer. Further, discussions between the wetland specialist and the engineering team resulted in the Proposed Stormwater Layout which allows for dispersed flow and mimics natural flow patterns.

During operation (as with construction), potential impacts to water quality, flow regime, habitat, biota and geomorphology may occur. However, these impacts are expected to have a low significance for the either layout alternative or the Proposed Stormwater Layout. In contrast, impacts to water quality and flow regime are expected to have a medium significance for the Alternative Stormwater layout. This is due to the fact that this stormwater plan only has one large attenuation and one release point. It therefore will have a large impact on the flow regime. It is also more likely to contribute to erosion and resultant siltation of the wetland which would negatively affect water quality. This would also likely negatively impact wetland biota. It is therefore not preferred from a wetland perspective.

Comments from the City of Johannesburg Impact Management and Compliance Monitoring were received on 12 October 2020 and raised concern that the artificial source of water noted in the Wetland Assessment as well as the Biodiversity Baseline and Impact Assessment hadn't been taken into account. A detailed response is provided in Addendum 1 of the Comments and Responses Report. In summary, Figure 10-1 below shows the location of the earth dam and stormwater drainage channels that were developed on the site historically and identified as the artificial source. The impact assessment therefore takes into account the impacts to the delineated wetland and the preliminary site development as well as the proposed layout have been designed to conserve and rehabilitate the wetland and associated 32m buffer area.



Figure 10-1: Artificial source

In addition, concern was raised regarding stormwater and the impact of a single release from the attenuation. However, it should be noted that the design was done in consultation with the wetland specialist

and specifically catered for multiple releases. Instead of creating one large attenuation pond with multiple releases, the engineers based their design on having multiple catchments within the development and each of these catchments having a specific attenuation pond and release. There are therefore six (6) separate release points along the full length of the watercourse. This mimics natural flow regimes and minimises impacts to the wetland area. Figure 10-2 has been compiled to indicate the release points and stormwater system. Impacts related to stormwater are therefore satisfactorily mitigated.

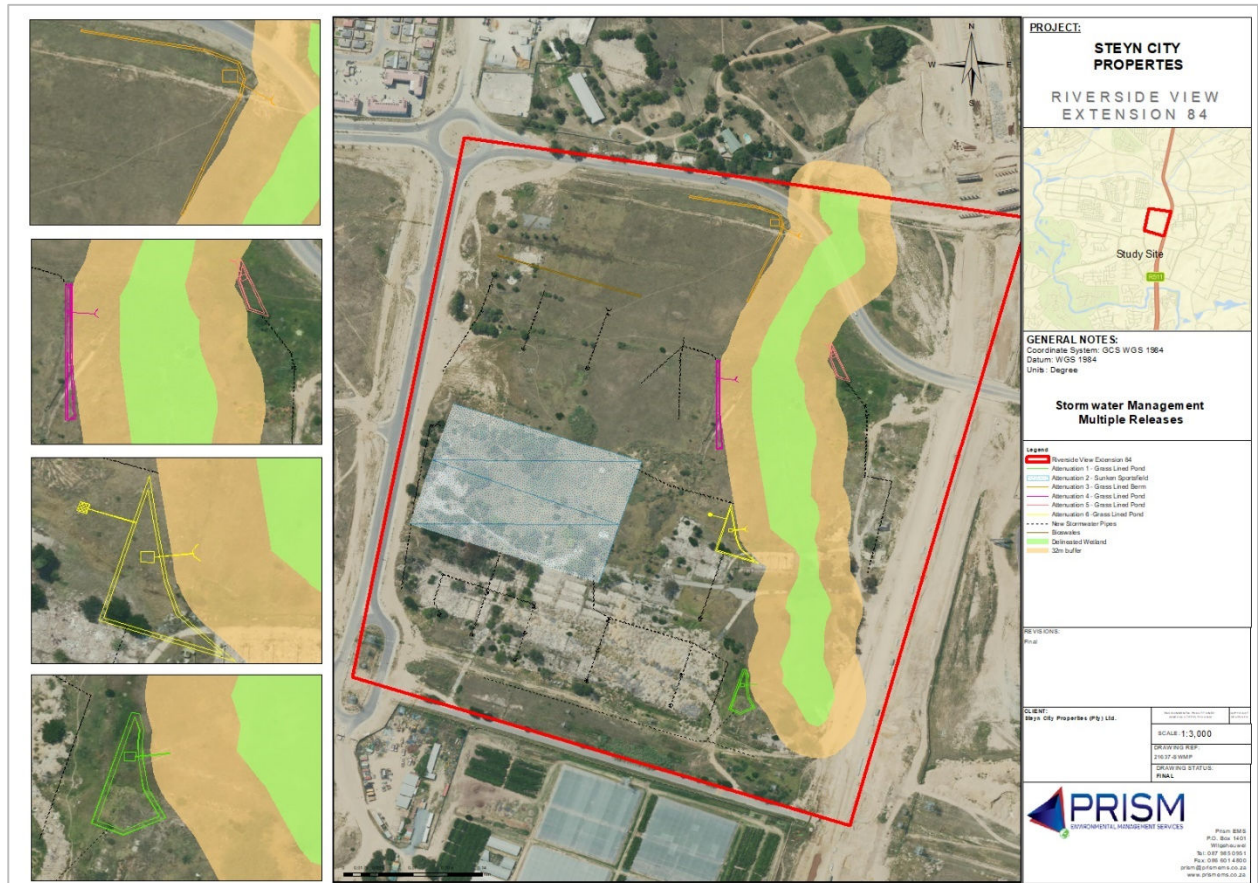


Figure 10-2: Stormwater Management System showing Multiple Releases

10.4.3.2 Cumulative Impacts:

Due to the existing overall PES and EIS as well as the poor water quality in the wetland, any impact to the wetland can be seen to be cumulative in nature. However, a number of mitigation measures have been suggested and must be implemented. The most of important of these, is the incorporation of the wetland area into the development, proper management of stormwater and rehabilitation of the wetland system.

10.4.4 Waste Generation

10.4.4.1 Overview

The proposed development will produce waste during both the construction and operational phases. During construction, impacts are expected to be 'low' (before mitigation). Impacts will be further reduced through the implementation of the Waste Management Plan included in the EMPr. Mitigation measures related to the construction phase include:

- Waste recycling to be put in place.
- Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable.
- All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site if no municipal services is available. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes.
- Litter (from outside the camp included) and concrete bags etc. must be collected and put into suitable closed bins on a daily basis.
- Construction rubble must be disposed of at a registered landfill site
- General wastewater on site to be collected and disposed of at a registered communal facility.
- The classification of waste determines the handling methods and the ultimate disposal of the material. The contractor shall manage hazardous waste that are anticipated to be generated by his operations as follows: Characterise the waste to determine if it is general or hazardous (Use the Appendix 1 of the Norms and Standards for the Classification of Waste for landfill to determine whether additional classification is required). Obtain and provide an acceptable container with a label. Place hazardous waste material in the container. Inspect the container on a regular basis Haul the full container to the licenced and correct disposal site. Provide documentary evidence of proper disposal of the waste.
- Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 80m³ of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with.

During operation, the volume of domestic waste will increase and without mitigation would result in a 'medium' significant impact. Construction and hazardous waste is not expected. Mitigation measures related to the operation phase include:

- Recyclable waste streams must be separated from other waste streams. Waste to be separated into recyclable and non-recyclable waste. Waste separation needs to occur before waste is collected.
- Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable.
- All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site if no municipal services is available.
- Avoidance, reduction, re-use and recycling should be practiced wherever possible.

These mitigation measures will decrease the impacts to a low significance.

10.4.4.2 Cumulative Impacts:

All waste generated will add to the waste generated by existing and future developments as such waste generation is cumulative in nature. Minimization and recycling of waste must be undertaken to reduce this impact.

10.4.5 Soil Alteration

10.4.5.1 Overview

In terms of soil alteration, impacts related to loss of topsoil, loss of land capacity, alteration of topography, soil erosion and soil pollution were assessed.

10.4.5.1.1 Loss of Topsoil

As the wetland area and associated 32m buffer will not be developed (approximately 5 ha), the proposed development does include a fairly large area which will not be impacted upon. Furthermore, strict measures will be in place to ensure that topsoil is separated and stockpiled on site so that it can be used for landscaping and rehabilitation of the site. Based on this, the impact was assessed as 'low-medium' after mitigation.

10.4.5.1.2 Alteration of Topography

During construction, landscaping of the site will take place which will result in changes in the topography. The site is at an elevation of 1422m on the southern boundary and falls to 1392m at the northern boundary. The average grade across the whole site is thus 6.73%. Some levelling out will therefore be required for the development. This will change the topography of the site. However, as the site does not occur on a ridge, this change is not expected to be highly significant. Changes to topography must be properly designed and landscaped and include proper stormwater management. With the implementation of these mitigation measures, the expected impact is 'low' in significance. No impacts to topography are expected during operation.

10.4.5.1.3 Loss of Land Capability

Land capability is defined as the inherent capacity of land to be productive under sustained use and specific management methods. By developing the area will result in a loss of land capability in terms of the natural area and soil. The site is however altered and thus the capability of the area was already degrading. Further, according to the Gauteng Agricultural Atlas IV, the site has a mixed agricultural potential of built up, low and moderate. Based on this, the impact is seen to be of a 'low-medium' significance.

10.4.5.1.4 Soil Erosion

Soil erosion is another potential impact, however with proper mitigation, this impact can be sufficiently mitigated. Much of these mitigation measures will be implemented as part of the landscaping of the site which will stabilise any disturbed areas and prevent soil erosion.

10.4.5.1.5 Soil Pollution

Lastly, in terms of soil pollution, impacts may occur but would be incidental in nature and if cleaned properly, will result in a very low significance impact. Mitigation measures include:

- All vehicle/equipment maintenance and washing must be done in the workshop area, equipped with a bund wall and grease trap oil separator.
- Workshop area must be monitored for fuel and oil spills.
- Spills must be cleaned up immediately and remediated to the satisfaction of the ECO; and
- Spill kits must be comprehensive and available on site at all times. An adequate supply of absorbent material must be available to accommodate emergency spills.

10.4.5.2 Cumulative Impacts:

Loss of land capability can be seen to be cumulative as developments in the Gauteng area have reduced the available land that can be productive. No mitigation measures are possible for this impact however it should be noted that the site is already impacted and has a low agricultural potential and thus this impact is not seen to be highly significant.

10.4.6 Resource Consumption

10.4.6.1 Overview

Four types of resource consumption were assessed, namely, water, electricity, raw materials and fuel. During construction, all resource consumption was assessed to be at a 'low-medium' level except electricity which was not expected to have an impact as generators would likely be used. Mitigation measures during construction include the following:

- Enforce water saving strategies;
- Environmental awareness training;
- Record and monitor fuel consumption regularly;
- Reduce theft of fuel (increase security); and
- Promote effective use of raw material.

Based on these mitigation measures, the impacts are expected to decrease to a 'low' level.

However, during operation, more excessive resource consumption is expected and thus for all aspects except fuel consumption, a 'low-medium' to 'medium' level of significance was expected prior to mitigation. As with construction, water saving, energy and raw material conservation strategies will be supported. This will result in a decrease in the level of significance to a 'low' level.

10.4.6.2 Cumulative Impacts:

All four types of resource consumption (water, electricity, raw materials and fuel) have a cumulative impact as they add to the existing and future use of resources.

10.4.7 Effects on Biodiversity

10.4.7.1 Overview

In order to assess the various potential impacts on biodiversity, a Biodiversity Baseline and Impact Assessment was undertaken. From a vegetation perspective, the study found that there were two main habitat types on site.

This includes degraded grassland where the habitat was considered to be predominantly intact (*Imperata cylindrica* was found within this habitat which is known to be directly correlated to *Tyto capensis* (Grass-Owl), which utilise dense stands of this plant species as breeding and foraging habitat. However, no currently known breeding sites occur here. Wet areas were also identified within this habitat; however, it is presumed that the source of the water in these areas is from an artificial source (this was confirmed by the wetland study which didn't identify this as wetland habitat). From a sensitivity perspective, a **low-moderate** sensitivity score was given to this area. The second habitat was identified as being transformed habitat and mainly consists of dumps and impacts associated with edge effects in relation to the urban area. This habitat hosted a large number of the exotic alien plant species recorded within the project area and has been impacted upon and transformed to such an extent that it will need many years or recovery and active rehabilitation to recover to a near-natural state and therefore this area was given a **low sensitivity** rating.

A detailed impact assessment was undertaken and was taken into account in the EIA Impact Assessment. In summary, the following potential impacts were considered for the construction phase.

- Potential impacts were considered on terrestrial vegetation communities
 - Destruction, further loss and fragmentation of the vegetation community (including an area classified as CBA and ESA as well as an EN vegetation type); and
 - Destruction of habitat for the African Grass Owl (especially the central portion of the project area).
- Potential impacts on faunal communities include:
 - Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).

In addition, the following impacts were considered as part of the Operational phase.

- Potential impacts were considered on terrestrial vegetation communities:
 - Continued encroachment and displacement of the vegetation community due to alien invasive plant species, particularly in previously disturbed areas.
- Potential impacts on faunal communities include:
 - Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic and dust);
 - Loss of faunal species (road mortalities and/or poaching);
 - Habitat degradation (litter and alien vegetation encroachment); and
 - Introduction of pest species (e.g. rats) due to the new habitats and food sources that are created by an increase in waste levels.

Comments received from the City of Johannesburg Impact Management and Compliance Monitoring raised concern that this habitat was not conserved as part of the development layout and thus that there were unacceptable impacts to the grassland and associated *Tyto capensis*.



Figure 10-3: Degraded grassland area to be conserved

This however was assessed as part of the Impact Assessment and as noted therein, this impact could be satisfactorily mitigated through a number of mitigation measures. Firstly, as indicated in Figure 10-3 above, approximately half of this habitat will be conserved (around 1.3 ha). In addition to this 1.3 ha, the wetland specialist found *Imperata cylindrica* in the wetland habitat and wetland buffer area which compromises 5ha of the site. This area will be rehabilitated and will provide additional foraging and roosting habitat for *Tyto capensis*⁵.

In addition to this, a number of additional mitigation measures have been recommended by the specialist and included in the EMP including:

- Before construction is to take place the area a site walk should be undertaken to identify any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the species to move out of the area; should the species not move

⁵ It should however be noted that the specialist himself did not identify this species on site but this potential impact was ascertained through information provided from the Grass Owl Project.

away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested;

- During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT).

Therefore, all impacts could be satisfactorily mitigated to a low or absent level will the implementation of necessary mitigation measures. These measures have been incorporated into the EMP.

10.4.7.2 Cumulative Impacts:

Impacts to biodiversity can be seen to be cumulative in nature as development is prolific in Gauteng. However, based on the GPEMP, the site occurs in the urban development area and thus is in line with development priorities in the province. Furthermore, it should be noted that the wetland has been delineated and will be excluded for the development footprint. Specific mitigation measures are included to rehabilitate this wetland and to ensure that the necessary plant species required by Grass Owls are included in the area to mitigate impacts to foraging Grass Owls. It should also be noted that the delineated wetland currently includes species which are used by Grass Owls.

10.4.8 Incidents, accidents and potential emergency situations

10.4.8.1 Overview

Four main impacts were assessed linked to incidents, accidents and potential emergency situations. These included:

- Pollution incidents;
- Impacts to Eskom Transmission Line;
- Health and safety;
- Storage of hydrocarbons; and
- Fire.

During construction, it was found that whilst these impacts could potentially have a low-medium intensity, they are incidental in nature and thus were assessed to be of a 'low' significance (before mitigation). In addition, several mitigation measures will be implemented which will reduce the significance of these impacts even further. These include ensuring that a Safety Agent is appointed and that all staff undergo health and safety awareness training. In addition, pollution incidents and impacts associated with the storage of hydrocarbons will be mitigated through the proper storage of materials and by ensuring that spill kits are available to deal with any spills. In addition, hydrocarbons and hazardous material will be stored properly (in bunded areas) to ensure that any pollution incidents are contained. In addition, the requirements of Eskom Transmission must be implemented.

During operation, impacts related to storage of hydrocarbons is not expected. Pollution impacts related to the sewer connection was assessed to have a 'low' significance as it would be incidental in nature. The

sewer connection which occurs outside of the wetland and wetland buffer should be managed and maintained to COJ's requirements. Health and Safety as well as impacts to the Eskom Transmission Line was also assessed to have a low impact. 24 hour security and access control will be put in place and the school and development will be run according to the necessary legislation, guidelines and best practices.

During both construction and operation, fires are possible but would be incidental and limited to the neighbouring areas. Whilst the intensity would be low-medium, the overall significance would be 'low'. In addition, a number of mitigation measures will be implemented. These include:

- Adhere to the appropriate emergency procedures
- Firefighting equipment must be accessible on site at all times.
- Display of emergency numbers

10.4.8.2 Cumulative Impacts:

Impacts relating to incidents, accidents and potential emergency situations are not seen to be cumulative as they are limited to the specific site in question.

10.4.9 Social

10.4.9.1 Overview

From a social perspective, impacts to the following attributes were assessed:

- Visual impact;
- Safety and security;
- Traffic disruptions;
- Loss of cultural heritage;
- Loss of sense of place; and
- Change of land use.

These are discussed below.

10.4.9.1.1 Visual Impact

During construction, the visual impact will be limited and can be effectively mitigated through building a boundary wall. In addition, proper housekeeping will ensure that litter is kept to a minimum. During operation, the visual impact is more long term in nature however, the development is in line with the development in the area as well as the GPEMF and is thus seen to have a low significance. Further, a suitable boundary wall will ensure that the development is screened from adjacent neighbours. Based on this, the pre-mitigation impact which was 'low' will be further reduced.

10.4.9.1.2 Safety and Security

During construction, crime may increase due to the influx of workers into the area. This impact would be short-term in nature (i.e. limited to construction) and would potentially impact neighbouring properties.

Without mitigation, the potential impact would be 'medium'. However, a number of mitigation measures will be implemented. These include:

- 24-hour access control to the site and 24-hour security; and
- Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined.

Based on the above, and the fact that the construction employment will be managed by the relevant contractor (i.e. there will not be an employment desk on site), the impact is seen to be 'low'.

During operation, the potential impact will be incidental in nature. Mitigation measures include 24-hour access control and security at the development. Based on this, the impact is thought to be 'low'.

10.4.9.1.3 Traffic Disruptions

In terms of traffic, there will be traffic disruptions during the construction phase. These however will be short-term (limited to construction). Mitigation measures include:

- Requirements of the Traffic Impact Assessment to be implemented as required.
- Speed limits on all existing roads must be adhered to at all times.

Based on this, the impact will be 'low' during construction.

During the operation of the development would potentially have a significant impact however a Traffic Impact Assessment was undertaken and determined that due to already planned future upgrades on intersections around the development will ensure that the level of service will be satisfactory. The impact on traffic will be mitigated to 'low' during operation.

10.4.9.1.4 Loss of Cultural Heritage

In terms of heritage, the Heritage Impact Assessment was undertaken and found that the property is severely disturbed, highly overgrown and building rubble from demolished structures are scattered over the study area. All structures on site besides one has been destroyed after 2008. The remaining structure (Feature 1) is not indicated on archival maps and is therefore assumed not older than 60 years. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and is therefore of no heritage significance. In addition, the study found no significant archaeological sites or material was recorded during the survey and based on the SAHRIS Paleontological Sensitivity Map, the area is of insignificance paleontological sensitivity. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of Section 36 of the Act no burial sites were recorded. The study noted that due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can

commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure as outlined below:

During operation, no impacts are envisioned.

10.4.9.1.5 Loss of Sense of Place

The proposed development will impact the sense of place of the area as it results in a change of land use. During construction, impacts are not expected to be significant as the site is currently vacant and disturbed and does not contribute to the sense of place. This impact was also assessed as part of the Heritage Impact Assessment. In regards to this, the specialist noted that the study area is surrounded by industrial and residential developments and road infrastructure developments and the proposed residential development will not impact negatively on significant cultural landscapes or viewsapes. The following mitigation measures are recommended:

- Suitable screening to be put in place during construction to minimise visual impacts.
- No littering to be allowed.
- Good housekeeping practices to be followed.

This impact also extends to operation, but is not expected to be significant as the proposed development will be undertaken in line with the existing development in the area. It is also in line with the development goals of the area.

10.4.9.1.6 Change in Land Use

The proposed development will result in a change in land use (from undetermined to special). This is seen as a positive impact as it will allow utilization of the site in line with the development goals in the area. The proposed change in land use is in line with the GPMEF. Furthermore, the proposed development aims to provide the necessary school opportunities required for the Steyn City Development. No mitigation measures other than the town planning process is required.

10.4.9.2 Cumulative Impacts:

Safety and security, traffic disruptions and change in land use are all cumulative in nature. However, with the implementation of the recommended mitigation measures, the impacts are not seen to be significant.

10.4.10 Economic

10.4.10.1 Overview

From an economic perspective, there are three main aspects that were assessed

- Decline/increase in economy;
- Decline/increase in property value; and
- Employment.

For both construction and operation, all three were assessed as having a positive medium benefit. Firstly, the proposed CAPEX value of the development is R 15 000 000.00. This will have numerous multiplier effects in the local community. In order to ensure that this benefits the local community, it is recommended that local labour and suppliers are used where possible. Secondly, the development will increase the property value of the site overall. Further, it will have a knock-on effect and is likely to increase the value of neighbouring properties as well. Lastly, the proposed development will result in approximately 150 construction related employment opportunities for the local community. Further, another 150 operation related employment opportunities are also expected. Local labour should be utilised as far as possible.

10.4.10.2 Cumulative Impacts:

Increases in economy and increase in the economy are both cumulative in nature and will thus have a compounded positive impact. In light of the fact that there is a high unemployment in the area, this is very important.

10.5 Mitigation

According to the EIA Regulations, 2014, "mitigation" means to "*anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible*". Based on this definition, it possible to see that a mitigation hierarchy exists.

At the bottom of this hierarchy is the most preferred option which includes **prevention (1)**. These mitigation measures aim to avoid impacts completely. Some mitigation measures suggested for the proposed development are at this level (for example, designing the development around the wetland and 32m wetland buffer area).

The second level of mitigation is **reduction (2)** which involves mitigation measures that minimise impacts. Most of the mitigation measures suggested for the proposed development fall into this level.

Mitigation measures for the proposed development also include **remediation measures (3)** for environmental impacts. These measures focus on remediating or rehabilitating areas after they have been impacted.

Compensation (4) involves compensating the loss of an entire feature. In the case for the environment, this usually means consideration of an off-set associated with rehabilitation and mitigation. No offsets or compensation measures are included in the mitigation measures for the proposed development.

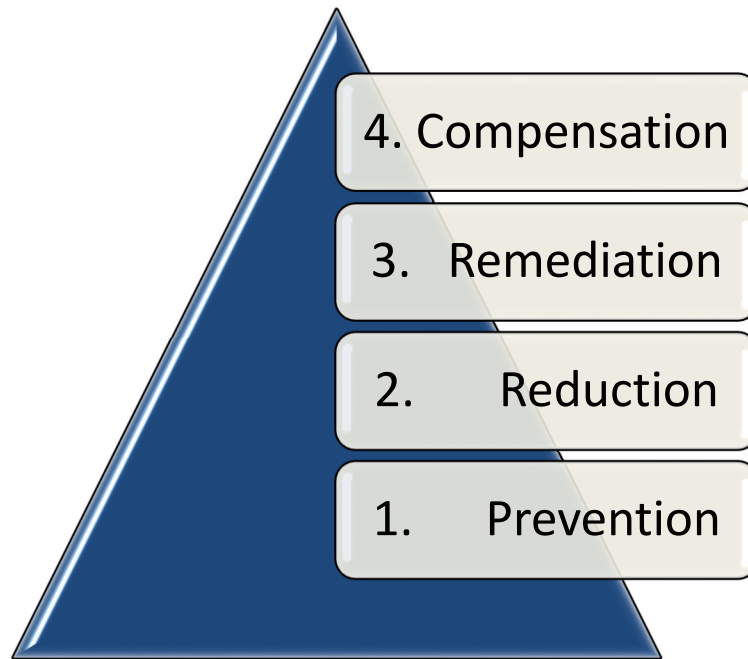


Figure 10-4: Mitigation Hierarchy

An EMPr will be developed based on the findings of the impact assessment of the EIA and in line with the requirements of Appendix 4 of GN 982 of 4 December 2014. The EMPr represents a detailed plan of action and includes site-specific mitigation measures for all medium to high (significant) impacts. The mitigation and management measures will include a combination of the following:

- Physical environmental management structures.
- Monitoring and compliance of pollution and regulatory requirements.

All liability for the implementation of the EMPr (as well as the EIA findings and environmental authorisation) lies with the project applicant which in this case is the **Steyn City Properties (Pty) Ltd.**

10.6 Assessment of Alternatives

According to the EIA Regulations, 2014, alternatives can be defined as:

“Different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

(a) property on which or location where the activity is proposed to be undertaken;

(b) type of activity to be undertaken;

(c) design or layout of the activity;

(d) technology to be used in the activity; or

(e) operational aspects of the activity;

and includes the option of not implementing the activity;

The EIA Regulations, 2014 also require that the EIA Report undertake “a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic,


heritage and cultural aspects of the environment”. The aim of this process is to identify the most ideal location for the activity within the preferred site based on the “lowest level of environmental sensitivity” identified during the assessment.

10.6.1 Comparative Assessment based on Receiving Environment and Impact Assessment

In line with the above, this section aims to provide a comparative analysis of the alternatives based on the receiving environment and impact assessment (Section 5 and Section 10.3. respectively). The aim of this comparative assessment is to identify the Best Practicable Environmental Option (BPEO). Münster (2005) defines BPEO as the alternative that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”.

Table 10-13 provides the comparative analysis of layout alternatives and shows that the proposed layout is preferred as it will allow for simplified access and services connections. It also only requires one wetland crossing.

Table 10-13: Comparative Analysis Between Layout Alternatives (black shaded blocks show preference, if any)

	Proposed Layout	Layout Alternative	Reason
Atmospheric Emissions	<i>No preference</i>		<ul style="list-style-type: none"> In terms of dust and vehicle and equipment emissions, there is no difference between the two layout alternatives.
Noise	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives involve the construction of a boundary wall which will reduce noise pollution.
Surface Water		X	<ul style="list-style-type: none"> The Proposed Layout only includes one crossing and only requires one service installation for the erf and thus reduces impact to the flow regime of the wetland.
Waste Generation	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives will result in waste being generated. As such, there is no difference between alternatives.
Soil Alteration	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives will result in soil alteration.
Resource Consumption	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives require resources. There is therefore no preference.
Effects on Biodiversity	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives will develop the full site (other than the wetland and wetland buffer) and will therefore have similar impacts in terms of biodiversity.

Incidents and Accidents	<i>No preference</i>	<ul style="list-style-type: none"> Both alternatives are similar and will have similar impacts related to incidents and accidents.
Social	<i>No preference</i>	<ul style="list-style-type: none"> Both alternatives are similar and will have similar impacts.
Economic	<i>No preference</i>	<ul style="list-style-type: none"> Both alternatives are similar and will have similar impacts.

Table 10-14 provides the comparative analysis of the stormwater layout options. The Proposed Stormwater Layout is preferred. Preliminary discussions with the wetland specialist indicated that a long, thin attenuation pond which runs alongside the existing wetland and has multiple release points would be most environmentally sound and would mimic the wetland conditions existing on site. In line with this, the engineers have designed a proposed attenuation pond alongside the wetland. Further, as part of the development of the SWMP, the Proposal (Attenuation along the Wetland) has been further designed to ensure that it is practicable and will meet the requirements of the City of Johannesburg. To the end, additional attenuation is provided as part of the sports field, and on the eastern side of the wetland.

Table 10-14: Comparative Analysis Between Stormwater Layout Alternatives (black shaded blocks show preference, if any)

	Proposed Stormwater Layout	Alternative Stormwater Layout	Reason
Atmospheric Emissions	<i>No preference</i>		<ul style="list-style-type: none"> In terms of dust and vehicle and equipment emissions, there is no difference between the two stormwater alternatives.
Noise	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact noise generation and thus there is no difference between the two alternatives.
Surface Water	✓	X	<ul style="list-style-type: none"> The Proposed Stormwater Layout involves multiple attenuation ponds being used to promote sheet flow and minimise impacts to the wetland habitat. It is therefore preferred.
Waste Generation	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact waste generation and thus there is no difference between the two alternatives.
Soil Alteration	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives will result in soil alteration.
Resource Consumption	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact resource consumption and thus there is no difference between the two alternatives.

	Proposed Stormwater Layout	Alternative Stormwater Layout	Reason
Effects on Biodiversity	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact biodiversity impacts and thus there is no difference between the two alternatives.
Incidents and Accidents	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact Incidents and Accidents and thus there is no difference between the two alternatives.
Social	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact Social aspects and thus there is no difference between the two alternatives.
Economic	<i>No preference</i>		<ul style="list-style-type: none"> Stormwater alternatives do not impact Economic aspects and thus there is no difference between the two alternatives.


10.6.2 Input from Specialist Studies

Specialist studies are an important aspect of the EIA process. In the case of the proposed Riverside View Extension 84 development, specialists had numerous requirements for the proposed development. The two sets of alternatives are assessed in terms of how well they meet these requirements in Table 10-15 below. Both environmental and technical specialist inputs are included. Based on general requirements from the specialists that have been interpreted by the EAP in light of the alternatives, the following are preferred:

- Proposed Layout; and
- Proposed Stormwater Layout.

Table 10-15: Comparative Analysis Between Alternatives taking into account Specialist Requirements (black shaded blocks show preference, if any)

	Specialist Study Requirements	Proposed Layout	Layout Alternative	Proposed Stormwater Layout	Alternative Stormwater Layout
Biodiversity Baseline and Impact Assessment	<ul style="list-style-type: none"> A number of mitigation measures recommended and included in the EMPr. 	<i>No preference</i>			
Wetland Assessment	<ul style="list-style-type: none"> Wetland and 32m buffer to preserved. Proper stormwater management including multiple release points to mimic wetland functions and improve sheet flow. 	<i>No preference</i>		✓	X
Heritage Impact Assessment	<ul style="list-style-type: none"> A number of mitigation measures recommended and included in the EMPr. 	<i>No preference</i>			
Aquatic Resources Monitoring Program and Auditing Plan	<ul style="list-style-type: none"> Monitoring to be undertaken. 	<i>No preference</i>			
Aquatic Resources Rehabilitation Plan	<ul style="list-style-type: none"> A number of requirements for Rehabilitation to be undertaken. 	<i>No preference</i>			
Outline Scheme Report	<ul style="list-style-type: none"> Additional service connections and crossings would be required. OSR has been developed in line with the wetland specialist's recommendation and thus include includes a long, thin attenuation with multiple releases. 	✓	X	✓	X
Stormwater Management Plan	<ul style="list-style-type: none"> The stormwater management plan has been compiled in a way to reduce impacts to the wetland and incorporates multiple 	<i>No preference</i>		✓	X

	Specialist Requirements	Study	Proposed Layout	Layout Alternative	Proposed Stormwater Layout	Alternative Stormwater Layout
	attenuation ponds and multiple releases.					
Geotechnical Assessment	• N/A		<i>No preference</i>			
Traffic Impact Assessment	• Additional accesses may be required and would thus not align with the findings of the TIA.			X	<i>No preference</i>	

10.6.3 “No-Go” Option

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives. The ‘no go’ alternative is not supported due to the following reasons:

- The proposed use of the site for the primary rights will fulfil a need for an all-phase school / residential use / storage / offices with ancillary shops and restaurants, to cater for the varying demands of the residents of Steyn City Estate. There is therefore a need for such a development especially in light of the fact that there is an increasing need for the provision of adequate schools in close proximity - or within the secure environment - of an upmarket estate, which is also located close to transport, employment and other urban opportunities. **Should the proposed development not go ahead, there will not be the required provision of schooling services which is required for Steyn City as well as the area in general.**
- Furthermore, the proposed rights for the Riverside View Ext 84 Township includes provision for residential buildings and residential densities of up to 20 dwelling units per hectare. This will contribute towards the supply of residential land, by better utilization of the land. The residential land use is also complementary to the other proposed land uses of Riverside View Ext 84 as well as the land uses of the neighbouring Steyn City Lifestyle Estate, to which it will be linked. **Should the development not go ahead, the site will not be utilized and provision of this associated residential use will not be made. This would be an opportunity cost.**
- The location of the proposed development along William Nicol Drive and the future interchange adjacent to and north-east of the site is also desirable, since it provides for easy access from William Nicol Drive (K46), via Porcupine Park Avenue to Riverside View Ext 84. The development is also close to existing engineering services and road network, which is presently being upgraded. **Should the development not be approved, the opportunity for utilization of available services and roads in the area will be lost.**
- In terms of the Gauteng Provincial Environmental Management Framework, the majority of the proposed development falls within Zone 1. A small section falls within Zone 2 however, the development footprint is excluded from this area. The proposed development is thus in line with

the intention of the zone 1 which is to: "streamline urban development activities in it and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the COJ Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas." Further, as the development is within the urban development boundary, the proposed development will promote compact city development. **Should the development not proceed, the site will not be utilized in line with intentions of Zone of the GPEMF.**

- The main implication of the No Go Option is that should the development not proceed, there will be a loss of the economic benefits of the investment of approximately R15 million in the area. There will also be a loss of the 150 construction related employment opportunities and 150 operation related employment opportunities. This would be a significant negative impact as 25% of people in the Municipality are unemployed. **The no-go alternative would result in a loss of these positive economic benefits.**

10.7 Motivation for the Preferred Development Footprint/Best Practicable Environmental Option (BPEO)

The EIA Regulations, 2014 require that the EIA Report include a "a concluding statement indicating the preferred alternative development location within the approved site" as well as a "a motivation for the preferred development footprint within the approved site". In line with this, the recommendations of specialists, technical considerations and the concept of the BPEO, the recommended alternatives are as follows:

- Proposed Layout; and
- Proposal – Attenuation Pond along Wetland.

The Proposed Layout was selected for the following reasons:

- The western side of the development is consolidated into one erf (Erf 1). This simplifies services and access to the site.
- This simplified access and services may also result in a lesser impact on the wetland as only one wetland crossing to Erf 2.

The Proposed Stormwater Layout was selected for the following reasons:

- Preliminary discussions with the wetland specialist indicated that a long, thin attenuation pond which runs alongside the existing wetland and has multiple release points would be most environmentally sound and would mimic the wetland conditions existing on site.
- As part of the development of the SWMP, the Proposal (Attenuation along the Wetland) has been further designed to ensure that it is practicable and will meet the requirements of the City of Johannesburg. To the end, additional attenuation to what initially envisioned is provided as part of the sports field, and on the eastern side of the wetland.
- The Proposed Stormwater Layout is in line SUDS and makes use of the following:

- Grass lined attenuation ponds;
 - Use of the soccer field to attenuate stormwater and allow for ground water recharge;
 - Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
 - Throttled outlet structures; and
 - Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.
- Impacts to the water quality, flow regime, biota and geomorphology is reduced through having multiple release points (associated with multiple separate and small attenuation ponds) as this mimics the natural wetland conditions.

Based on the above, the proposed layout for the Development is provided in Figure 10-5 and the proposed stormwater is provided in Figure 10-6 (updated Stormwater Layout)

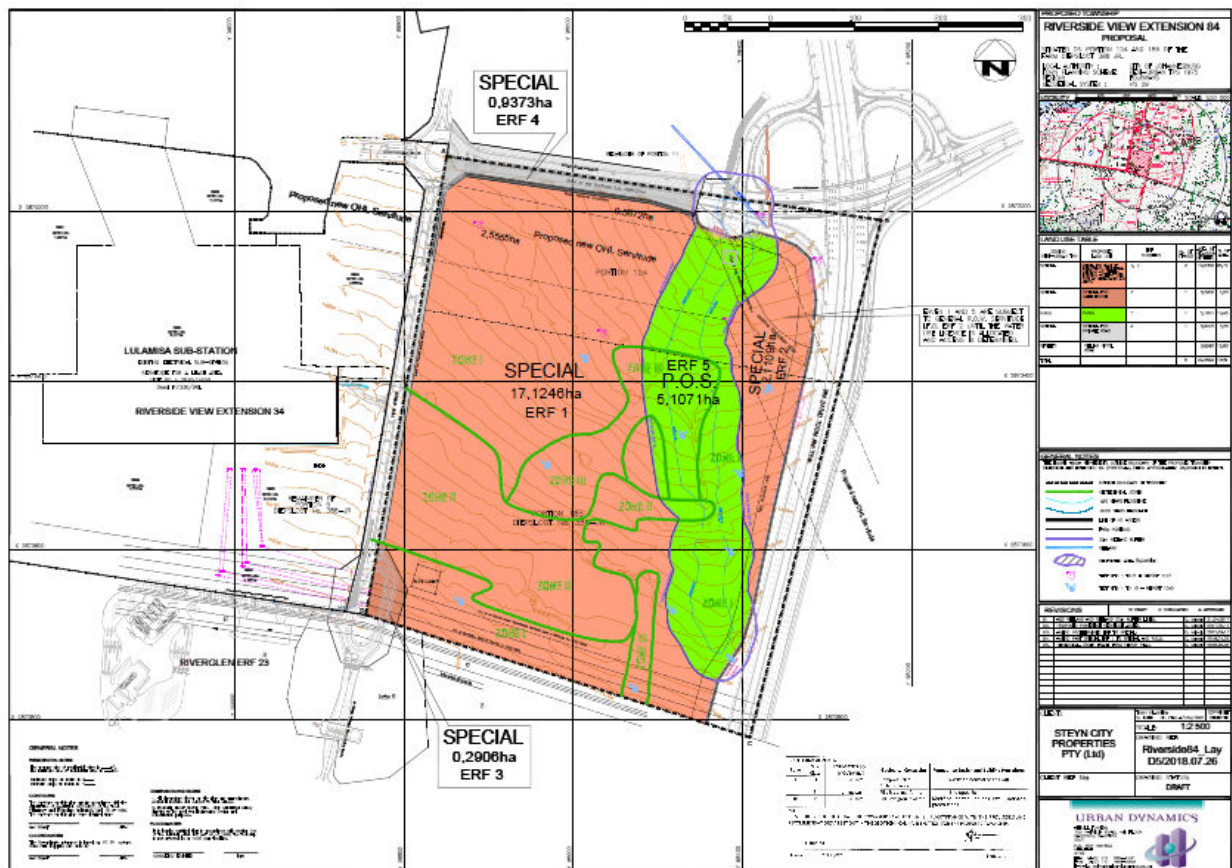


Figure 10-5: Proposed Layout

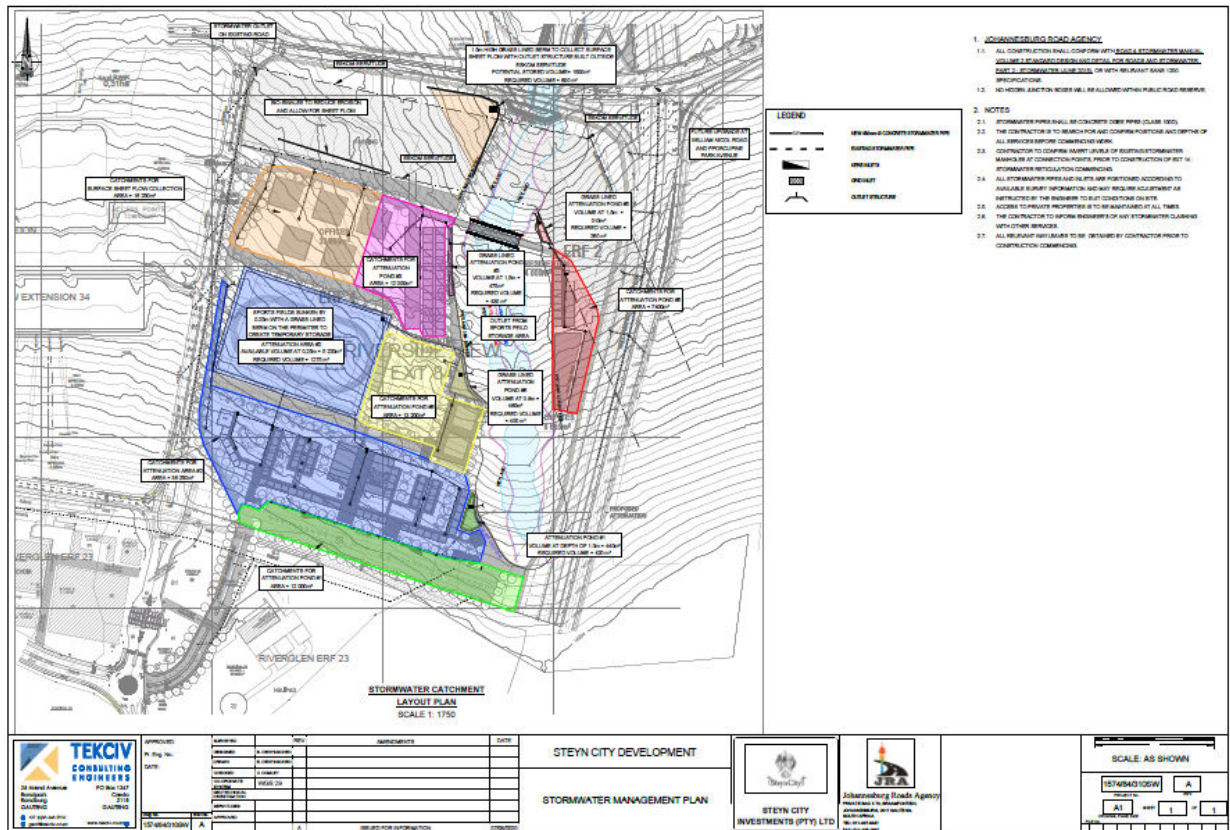


Figure 10-6: Updated Proposal – Attenuation along the Wetland (multiple attenuation ponds with multiple releases)

11 ENVIRONMENTAL IMPACT STATEMENT

The EIA Regulations 2014 require that the EIA Report include an Environmental Impact Statement that includes the following:

- A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers;
- A summary of the key findings of the environmental impact assessment; and
- A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

In addition, the EIA Report must include the following:

- Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorization.
- The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.
- A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;
- Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;
- Any specific information that may be required by the competent authority; and
- Any other matters required in terms of section 24(4)(a) and (b) of the Act.

In order to ensure that the Impact Statement is comprehensive and includes all the requirements of the Regulations, this section aims to meet the abovementioned requirements.

11.1 Sensitive Environmental Features

Figure 11-1 provides an overview of sensitive features that should be taken into account during construction and operation of the Development. These features include:

- **Wetlands and 32m wetland buffer**– this area must be demarcated and only construction related to authorized infrastructure can occur within this area. Due to the fact that the wetland and associated buffer will also provide foraging habitat for the Grass Owl (see below). The sensitivity is given as **Medium** for the 32m buffer and **Medium-high** for the wetland area. Rehabilitation of this wetland must be undertaken as per the Aquatic Resources Rehabilitation Plan. It should be noted that part of the degraded Grass Owl Habitat falls within the wetland and wetland buffer and this area therefore take on the sensitivity of the wetland and wetland buffer as it is higher than that of the grassland.
- **Grass Owl Habitat** – some degraded habitat (with a **low medium** sensitivity) may provide foraging habitat for Grass Owls (*Tyto capensis*). This section falls within the development footprint and will be partly developed however approximately 1.3 ha will be conserved as part of the wetland and wetland buffer. The Final Sensitivity Map has been updated to indicate this area that will be conserved (burnt orange line). Further, a number of mitigation measures have been recommended by the specialist and incorporated into the EMP. These are also highlighted here:
 - Before construction is to take place the area needs be walked through to flush out any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the specie to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested;
 - During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT);
 - It should also be noted that the wetland and associated wetland buffer will be rehabilitated and will also provide foraging habitat for this species.

The rest of the site was identified as having a **low** sensitivity.

These features are further show together with the draft Site Plan which provides an indication of infrastructure and buildings planned as part of the development. Water, sewer and stormwater is also shown (Figure 11-2). As noted previously in this report, the Site Plan is at a draft stage and will be finalized during the SDP process. A copy of the final SDP will be provided to the Department when available.

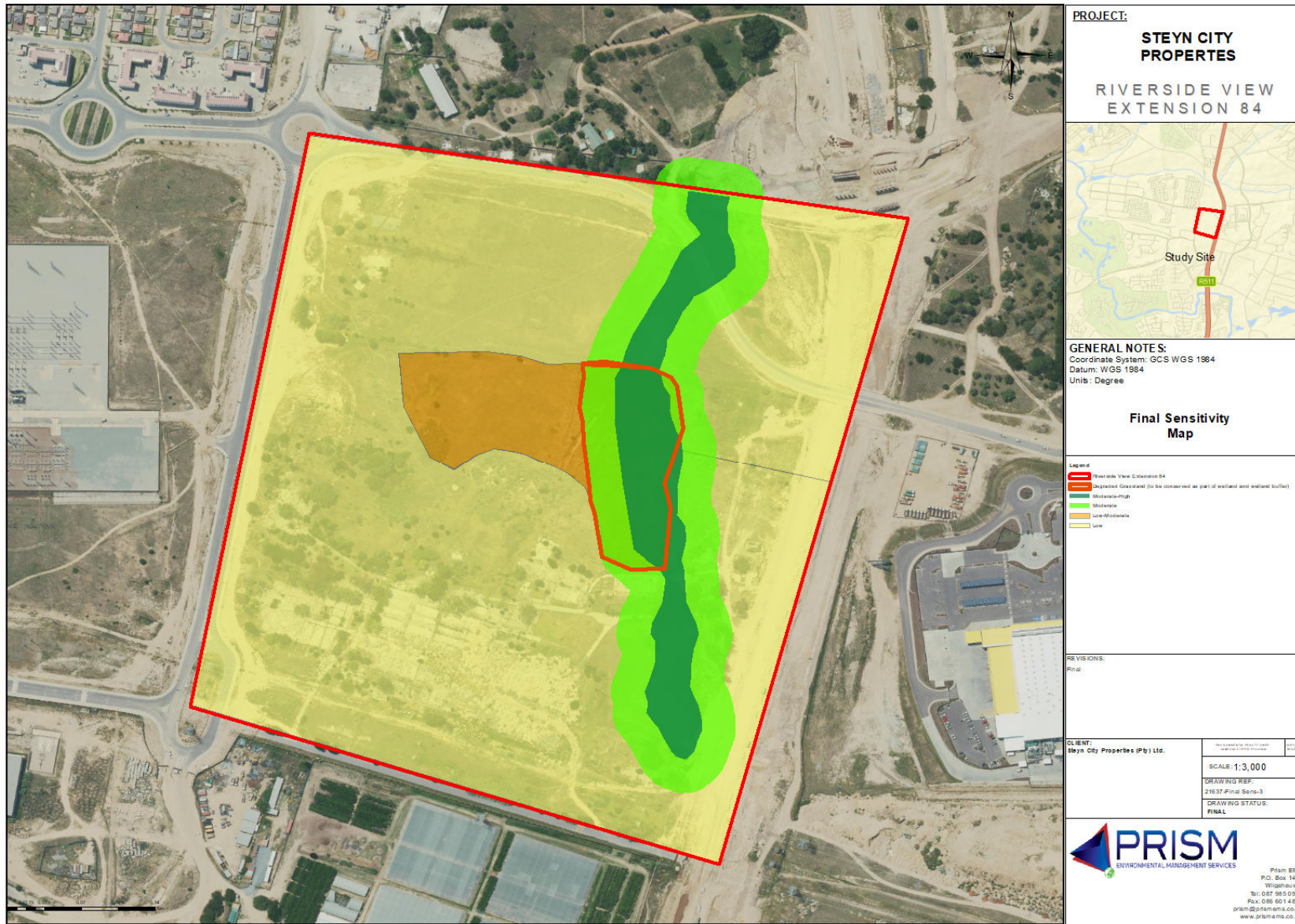


Figure 11-1: Sensitivity Map

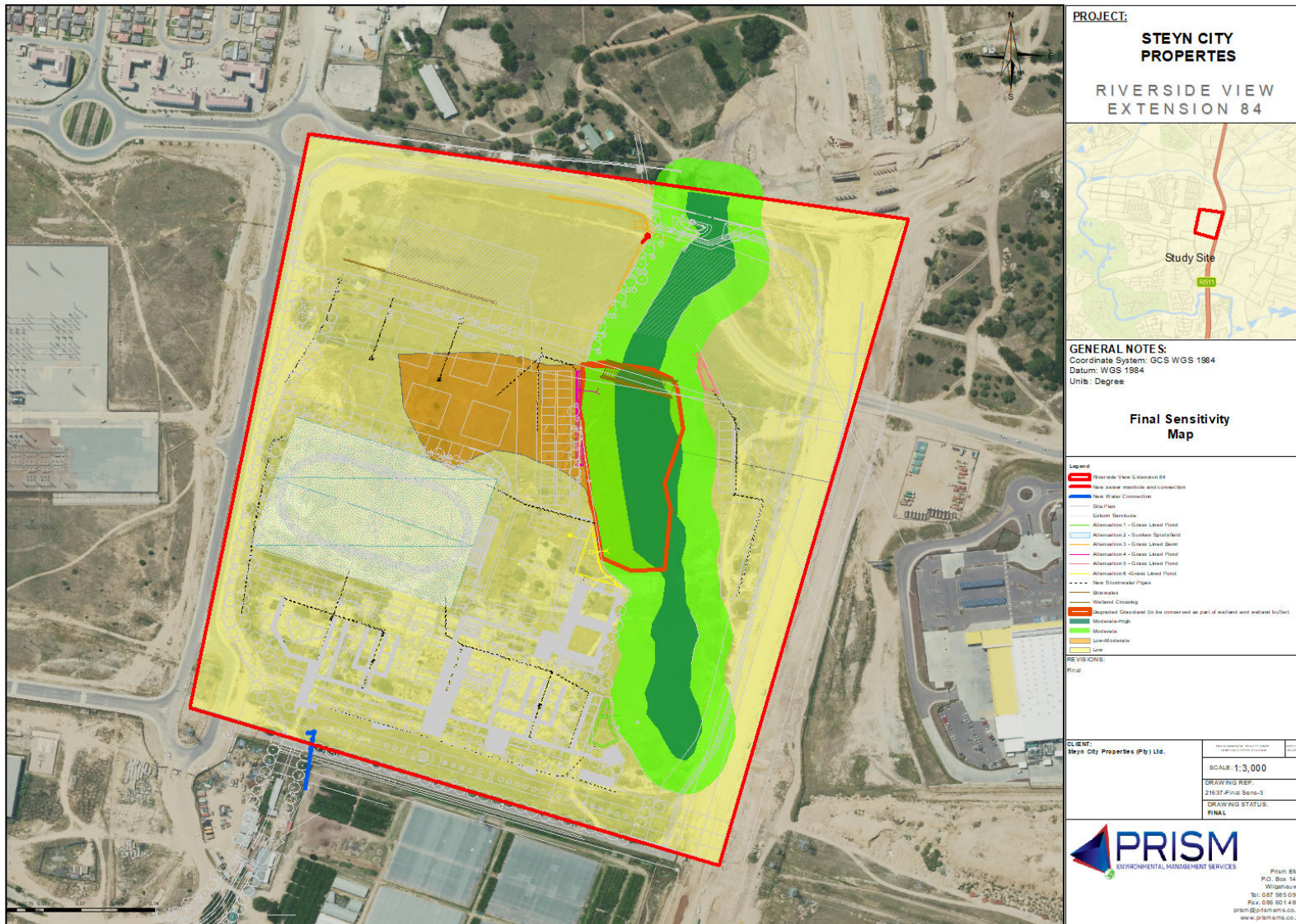


Figure 11-2: Sensitivity Map Overlaid with Preliminary Site Plan and Stormwater and Services

11.2 Summary of Impacts

A detailed discussion on impacts is provided in Section 10.3 and 10.4 however in summary, all impacts can be satisfactorily mitigated to low or low-medium significance. A summary of impacts is provided in Table 11-1.

Table 11-1: Summary of Impacts

	Potential Impacts
Atmospheric Emissions	<ul style="list-style-type: none"> In terms of atmospheric emissions, two potential impacts were identified during construction and operation, namely, dust emissions and emissions from vehicles and equipment. Impacts could be reduced to 'low' through the implementation of mitigation measures.
Noise	<ul style="list-style-type: none"> During construction, noise impacts will be associated with construction equipment and vehicles. Activities will be limited to the day and all equipment must comply with manufacturers specifications. Based on this, the impact would be low. During operation, there will be some noise impacts especially from the school however, this impact will have a low significance and will be in line with the adjacent land uses in the area. The development will be walled which will also reduce the significance further.
Wetlands	<ul style="list-style-type: none"> Construction impacts to the wetland in the development site include Water Quality; Flow regime; Habitat; Biota; and Geomorphology. For most of the above, these impacts range from 'low' to low-medium' in significance (without mitigation) and are similar for both proposals and alternatives. With mitigation, these impacts decreased to a 'low' significance. For the flow regime however, impacts related to construction of proposed stormwater is similar. However, as the alternative layout would require multiple service installations and potentially additional wetland crossings, intensity of the impact is likely to be higher and the impact would have a medium significance. It is not preferred for this reason. During operation (as with construction), potential impacts to water quality, flow regime, habitat, biota and geomorphology may occur. However, these impacts are expected to have a low significance for the either layout alternative or the Proposed Stormwater Layout. In contrast, impacts to water quality and flow regime are expected to have a medium significance for the Alternative Stormwater layout. This is due to the fact that this stormwater plan only has one large attenuation and one release point. It therefore will have a large impact on the flow regime. It is also more likely to contribute to erosion and resultant siltation of the wetland which would negatively affect water quality. This would also likely negatively impact wetland biota. It is therefore not preferred from a wetland perspective.
Waste Generation	<ul style="list-style-type: none"> The proposed development will produce waste during both the construction and operational phases. During construction, impacts are expected to be 'low' (before mitigation). Impacts will be further reduced through the implementation of the Waste Management Plan included in the EMPr. During operation, the volume of domestic waste will increase and without mitigation would result in a 'medium' significant impact. Construction and hazardous waste is not expected.
Soil Alteration	<ul style="list-style-type: none"> In terms of impact to topsoil, the proposed development does include a fairly large area which will not be impacted upon. Furthermore, strict measures will be in place to ensure that topsoil is separated and stockpiled on site so that it can be used for landscaping and rehabilitation of the site. Based on this, the impact was assessed as 'low-medium' after mitigation.

	Potential Impacts
	<ul style="list-style-type: none"> • During construction, landscaping of the site will take place which will result in changes in the topography. The average grade across the whole site is thus 6.73%. Some levelling out will therefore be required for the development. This will change the topography of the site. However, as the site does not occur on a ridge, this change is not expected to be highly significant. Changes to topography must be properly designed and landscaped and include proper stormwater management. With the implementation of these mitigation measures, the expected impact is 'low' in significance. No impacts to topography are expected during operation. • Land capability is defined as the inherent capacity of land to be productive under sustained use and specific management methods. By developing the area will result in a loss of land capability in terms of the natural area and soil. The site is however altered and thus the capability of the area was already degrading. Further, according to the Gauteng Agricultural Atlas IV, the site has a mixed agricultural potential of built up, low and moderate. Based on this, the impact is seen to be of a 'low-medium' significance. • Soil erosion is another potential impact, however with proper mitigation, this impact can be sufficiently mitigated. Much of these mitigation measures will be implemented as part of the landscaping of the site which will stabilise any disturbed areas and prevent soil erosion. • Lastly, in terms of soil pollution, impacts may occur but would be incidental in nature and if cleaned properly, will result in a very low significance impact.
Resource Consumption	<ul style="list-style-type: none"> • Four types of resource consumption were assessed, namely, water, electricity, raw materials and fuel. During construction, all resource consumption was assessed to be at a 'low-medium' level except electricity which was not expected to have an impact as generators would likely be used. Based on a number of recommended mitigation measures, the impacts are expected to decrease to a 'low' level. • However, during operation, more excessive resource consumption is expected and thus for all aspects except fuel consumption, a 'low-medium' to 'medium' level of significance was expected prior to mitigation. As with construction, water saving, energy and raw material conservation strategies will be supported. This will result in the decrease in the level of significance to a 'low' level.
Effects on Biodiversity	<ul style="list-style-type: none"> • The following potential impacts were considered for the construction phase. <ul style="list-style-type: none"> ○ Destruction, further loss and fragmentation of the vegetation community (including an area classified as CBA and ESA as well as an EN vegetation type); and ○ Destruction of habitat for the African Grass Owl (especially the central portion of the project area). ○ Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration). • The following impacts were considered as part of the Operational phase. <ul style="list-style-type: none"> ○ Continued encroachment and displacement of the vegetation community due to alien invasive plant species, particularly in previously disturbed areas. ○ Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, traffic and dust); ○ Loss of faunal species (road mortalities and/or poaching); ○ Habitat degradation (litter and alien vegetation encroachment); and ○ Introduction of pest species (e.g. rats) due to the new habitats and food sources that are created by an increase in waste levels. • All impacts could be satisfactorily mitigated to a low or absent level will the implementation of necessary mitigation measures. These measures have been incorporated into the EMP. It should specifically noted that in terms of Grass Owl that whilst the area identified by the specialist is being developed, the full wetland


	Potential Impacts
	<p>and wetland buffer is excluded for the development and includes the necessary foraging habitat for the Grass Owl. This also further mitigates this impact.</p>
Incidents and Accidents	<ul style="list-style-type: none"> • Four main impacts were assessed linked to incidents, accidents and potential emergency situations. These included: Pollution incidents, Impacts to the Eskom Transmission Line, Health and safety; Storage of hydrocarbons; and Fire. • During construction, it was found that whilst these impacts could potentially have a low-medium intensity, they are incidental in nature and thus were assessed to be of a 'low' significance (before mitigation). In addition, several mitigation measures will be implemented which will reduce the significance of these impacts even further. These include ensuring that a Safety Agent is appointed and that all staff undergo health and safety awareness training. In addition, pollution incidents and impacts associated with the storage of hydrocarbons will be mitigated through the proper storage of materials and by ensuring that spill kits are available to deal with any spills. In addition, hydrocarbons and hazardous material will be stored properly (in bunded areas) to ensure that any pollution incidents are contained. • During operation, impacts related to storage of hydrocarbons is not expected. Pollution impacts related to the sewer connection was assessed to have a 'low' significance as it would be incidental in nature. The sewer connection which occurs outside of the wetland and wetland buffer should be managed and maintained to COJ's requirements. Health and Safety was also assessed to have a low impact. 24 hour security and access control will be put in place and the school and development will be run according to the necessary legislation, guidelines and best practices. • During both construction and operation, fires are possible but would be incidental and limited to the neighbouring areas. Whilst the intensity would be low-medium, the overall significance would be 'low'. In addition, a number of mitigation measures will be implemented and will further decrease the significance.
Social	<ul style="list-style-type: none"> • From a social perspective, impacts to the following attributes were assessed: Visual impact; Safety and security; Traffic disruptions; Loss of cultural heritage; Loss of sense of place; and Change of land use. • During construction, the visual impact will be limited and can be effectively mitigated through building a boundary wall. In addition, proper housekeeping will ensure that litter is kept to a minimum. During operation, the visual impact is more long term in nature however, the development is in line with the development in the area as well as the GPMEF and is thus seen to have a low significance. Further, a suitable boundary wall will ensure that the development is screened from adjacent neighbours. Based on this, the pre-mitigation impact which was 'low' will be further reduced. • During construction, crime may increase due to the influx of workers into the area. This impact would be short-term in nature (i.e. limited to construction) and would potentially impact neighbouring properties. Without mitigation, the potential impact would be 'medium'. However, a number of mitigation measures will be implemented. Based on the above, and the fact that the construction employment will be managed by the relevant contractor (i.e. there will not be an employment desk on site), the impact is seen to be 'low'. During operation, the potential impact will be incidental in nature. Mitigation measures include 24-hour access control and security at the development. Based on this, the impact is thought to be 'low'. • In terms of traffic, there will be traffic disruptions during the construction phase. These however will be short-term (limited to construction). Based on this and the implementation of the necessary mitigation measures, the impact will be 'low' during construction. During the operation of the development would potentially have a significant impact however a Traffic Impact Assessment was undertaken and determined that due to already planned future upgrades on intersections


	Potential Impacts
	<p>around the development will ensure that the level of service will be satisfactory. The impact on traffic will be mitigated to 'low' during operation.</p> <ul style="list-style-type: none"> • In terms of heritage, the Heritage Impact Assessment was undertaken and found that due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. During operation, no impacts are envisioned. • The proposed development will impact the sense of place of the area as it results in a change of land use. During construction, impacts are not expected to be significant as the site is currently vacant and disturbed and does not contribute to the sense of place. This impact also extends to operation, but is not expected to be significant as the proposed development will be undertaken in line with the existing development in the area. It is also in line with the development goals of the area. • The proposed development will result in a change in land use (from undetermined to special). This is seen as a positive impact as it will allow utilization of the site in line with the development goals in the area. It will also provide the necessary school required for the Steyn City Development. The proposed change in land use is in line with the GPEMF. No mitigation measures other than the townplanning process is required.
Economic	<ul style="list-style-type: none"> • From an economic perspective, there are three main aspects that were assessed which included Decline/increase in economy; Decline/increase in property value; and Employment. • For both construction and operation, all three were assessed as having a positive medium benefit. Firstly, the proposed CAPEX value of the development is R 15 000 000.00. This will have numerous multiplier effects in the local community. In order to ensure that this benefits the local community, it is recommended that local labour and suppliers are used where possible. Secondly, the development will increase the property value of the site overall. Further, it will have a knock-on effect and is likely to increase the value of neighbouring properties as well. Lastly, the proposed development will result in approximately 150 construction related employment opportunities for the local community. Further, another 150 operation related employment opportunities are also expected. Local labour should be utilised as far as possible.

11.3 Recommendations from Specialist Reports

An overview of the recommendations of the various environmental and technical specialists are provided in Table 11-2. Please note that only the main mitigation measures are provided. All mitigation measures are however included in the EMP.

Table 11-2: Specialist recommendations

	Recommendations	Development to proceed
Biodiversity Baseline and Impact Assessment	<ul style="list-style-type: none"> • All laydown, storage areas etc should be restricted to within the project area and all access roads must be kept within this area or from existing access roads; • Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded; • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion 	

	Recommendations	Development to proceed
	<p>during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and</p> <ul style="list-style-type: none"> • Compilation of and implementation of an alien vegetation management plan for the entire site. • Before construction is to take place the area needs be walked through to chase up any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the specie to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested; • During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT); • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site; • No trapping, killing or poisoning of any wildlife should be allowed on site; • Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities; and • Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited 	
Wetland Assessment	<ul style="list-style-type: none"> • A wetland monitoring programme should be developed based on this baseline assessment and audited against on a bi-annual basis. Feedback from the monitoring should be used to measure and mitigate further negative impacts, if found. • The wetland monitoring occurring on a bi-annual basis should be conducted by a skilled professional qualified in assessing and understanding the complex nature of wetlands and their associated drivers. • The wetland and 32m wetland buffer must be incorporated into the development. • The wetland should be rehabilitated to improve functioning. • Silt protection measure to be implemented in consultation with the wetland specialist (ECO). • Ingress and Egress must be managed to minimise impacts in respect of compaction of the wetland soils. • Single entry and exit points must be established. • These areas must be scarified as part of the rehabilitation plan. • Stock piling must be located outside the delineated wetland and buffer boundaries. • An approved stormwater management plan must be implemented. 	

	Recommendations	Development to proceed
	<ul style="list-style-type: none"> Velocity dissipation structures and sheet flow structures (such as reno mattresses) must also be installed to prevent water flowing through culverts to gain velocity and be released uncontrolled. Dispersed flow must be attained post formal structures. Sheet flow must be promoted to mimic natural flow patterns. 	
Heritage Impact Assessment	<ul style="list-style-type: none"> Chance find procedure to be implemented. 	✓
Aquatic Resources Monitoring Program and Auditing Plan	<ul style="list-style-type: none"> Monitoring to be undertaken as included in the report. 	✓
Aquatic Resources Rehabilitation Plan	<ul style="list-style-type: none"> Rehabilitation of the aquatic resource to be undertaken as described. 	✓
Outline Scheme Report	<ul style="list-style-type: none"> Designs provided by both reports must be implemented to ensure that required services are in place. 	N/A
Stormwater Management Plan		
Geotechnical Assessment	<ul style="list-style-type: none"> N/A 	N/A
Traffic Impact Assessment	<ul style="list-style-type: none"> Three access points to the township are proposed of which one access point serves as a link between Steyn City and Riverside View X84. Following the trip distribution and detailed capacity analysis, intersection upgrades are already planned as separate projects and will ensure that the impacted intersections will function at the necessary LoS. 	✓

11.4 Impact Management Objectives and Outcomes

Impact management objectives and outcomes will be provided in the EMPr to ensure that the proposed development is sustainable and has not significantly negative impacts. A summary of these management objectives are provided below:

- Planning and layout of construction site is undertaken responsibly to ensure protection of sensitive environmental features.

- Environmental awareness creation and training is undertaken throughout the construction phase in order to minimise environmental impacts and ensure compliance to relevant legislation and authorisations
- Minimise environmental impacts associated with emergency procedures
- A safe working environment for contractors/construction workers and the public is provided.
- Proper management of site clearing is undertaken to ensure minimal environmental disturbance.
- Minimise environmental impacts associated with site establishment
- Ensure access to sensitive environmental features is restricted and proper access control is in place
- Minimal disturbances to traffic due to delivery of construction material.
- Proper management of labour force is undertaken to ensure that:
 - There are no security-related issues or disturbance to tenants or landowners outside the construction footprint.
 - There is optimal use of local labourers.
 - There is no disturbance to sensitive environmental feature
- Minimise environmental impacts associated with ablution facilities.
- Reduce the generation of waste by changing behaviours of contractors throughout the development
- Re-use waste generated by the construction where possible thereby resulting in decreased waste disposal volumes
- Waste separation and recycling must be undertaken as part of construction
- Waste generated during the Development to be disposed of at licenced landfills
- Minimal environmental impacts associated with waste
- Effective and safe management of hazardous and non-hazardous materials on site, in order to minimise the impact of materials on the environment.
- Minimal environmental impacts associated with the management of workshops and equipment
- Ensure that all possible causes of pollution are mitigated as far as possible to minimise impacts to the surrounding environment.
- Prevent polluted water from entering the surface water.
- Minimise noise disturbance to surrounding areas
- Preserve protected flora species outside of construction areas.
- Control alien plants and noxious weeds.
- Minimal impact to fauna species.
- To have no adverse impact on the historical inheritance of the area.
- The preservation and appropriate management of new findings should these be discovered during construction.
- Adequate reinstatement and rehabilitation of construction areas.
- Water conservation mechanisms to be implemented.
- Electricity reduction mechanisms to be implemented.

11.5 Assumptions, Uncertainties and Gaps in Knowledge

The following potential uncertainties have been identified:

- The Impact Assessment undertaken is influenced heavily by the findings of the specialist studies. Some assumptions, gaps and uncertainties are applicable to these Specialist Studies (refer to Section 9.10). These are therefore inherent to the impact assessment and associated Environmental Impact Assessment. That said, the assumptions, gaps and uncertainties are minimal and are not expected to affect the outcome of this assessment.
- The Site Plan is only at draft stage and will be finalized through the SDP process. The exact locations of infrastructure and buildings therefore may be subject to change. It is however assumed that that these changes will not be significant nor result in major changes to the assessment of impacts. A copy of the Final SDP will be provided to the Department as a condition of the EA and a requirement of the EMPr.

11.6 Reasoned Opinion of EAP

11.6.1 Summary of EIA Report Findings

Steyn City Properties (Pty) Ltd. plans to develop Riverside View Ext 84 on portions 124 and 185 of the farm Diepsloot 388 JR. The proposed zoning of the development will be *Special for: Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops* and aims to provide a school, offices and residential buildings. Private Open space will also be incorporated into the development which form parts of the Steyn City Parkland Residence which has been designed to be a modern, mixed land use and mixed income development. A number of services will be required in support of the development and include:

- Water:
 - There is an existing 160mm water pipe just south of the development within the existing Steyn City Boundary.
 - A short connection pipe to this pipe will made (160 mm diameter Class 16 MVPC Pipe).
- Sewer
 - As part of the development of Riverglen Erf 23 a 200mm diameter sewer line was constructed within the road reserve of View Road. Provision has been made for a future connection from Riverside View Ext 84 onto this sewer pipeline. This connection point is just outside the 32m buffer area of the wetland.
 - A new sewer manhole will be required.
- Stormwater
 - Due to the layout and topography of the site, and the constraints caused by the wetland area, as well as an Eskom Servitude running through the northern portion of the site, the stormwater management plan proposes that the site be split into six(6) separate catchments and create six (6) separate attenuation ponds to manage the flow from each section.

- All run-off from the site will be routed to the attenuation ponds of each respective catchment. Each catchment area drains into an attenuation pond whereby the run-off from the area is throttled to release into the wetland and buffer zone at the 1:5 year pre-developed flow. Energy dissipating structures will be constructed at each outlet to limit any erosion and encourage sheet flow into the wetland area.
- In general, stormwater attenuation will make use of the following:
 - Grass lined attenuation ponds;
 - Use of the soccer field to attenuate stormwater and allow for ground water recharge;
 - Bio swales with stone filled sumps to allow for run-off retardation, encourage sheet flow and absorption into the underlying soil;
 - Throttled outlet structures; and
 - Energy dissipation slabs to limit erosion and encourage sheet flow at outlets.
- Access
 - Three access points will be provided for.
 - Access off View Road
 - The access is situated on the western boundary of the property, approximately 150m south of the intersection of Porcupine Park Avenue and View Road directly opposite the Eskom substation site access.
 - Second access off View Road
 - The access is situated on the western boundary of the property, approximately 300m south of the intersection of Porcupine Park Avenue and View Road directly opposite the existing Eskom substation site access.
 - Southern access
 - This access will be an internal link road from the existing Steyn City. This is considered the main access to the township as a large number of trip generated by the proposed development are expected to originate from within Steyn City and will make use of this access.
- Roads and Wetland Crossing
 - No road upgrades are required.
 - An internal road will allow access through the site and to Erf 2. A Wetland Crossing is required for the latter.
 - This crossing will involve the development of a road-bridge which will allow for the 1:100-year flow of 8.7 m³/s to pass under the road. The bridge is to be constructed of pre-cast portal culverts and will extend the full width of the flood line. To cater for animal crossings, smaller culverts will be placed above the flood line to allow for migration

The Proposed Development triggered a number of activities from Listing Notice 1, 2 and 3 of the EIA Regulations, 2014 As such a Scoping and EIA process was undertaken to assess the impacts of the proposed development and to ensure that the development was in line with the concept of sustainable

development captured in NEMA. In addition, a Water Use Licence Application (WULA) is also required and has been undertaken concurrently with the EIA process.

Public Participation was undertaken throughout the process and to date no objections have been raised. Comments from Authorities and I&APs were however received during the initial notification and review of the Scoping Report and assisted in streamlining the EIA process. Main concerns raised included:

- Impacts to existing Eskom transmission lines
- Impacts to CBA and ESA areas;
- Impact to wetlands;
- Stormwater Management; and
- Sustainability.

Based on the concerns raised, listed activities and potential impacts associated with the development, a number of specialist studies were undertaken to assess the impacts associated with the development. Several technical studies were also undertaken and informed the EIA process. Specialist and technical studies included:

- Biodiversity Baseline and Impact Assessment;
- Wetland Assessment;
- Heritage Impact Assessment;
- Aquatic Resources Monitoring Program and Auditing Plan;
- Aquatic Resources Rehabilitation Plan;
- Outline Scheme Report (including Stormwater Management Plan);
- Traffic Impact Assessment; and
- Geotechnical Assessment.

A Biodiversity Baseline and Impact Assessment found that whilst the site falls within ESA and a CBA: Important area and within a threatened ecosystem, it has been altered (historically and currently). The area was mainly transformed by large amounts of alien invasive plant species and dumping of large amounts of building rubble. The site is also known to have African Grass-owls (*Tyto capensis*), the Kyalami African Grass Owl Project and EWT noted that the bird does not use the area as a nesting site but does forage in the area. Impact were assessed for both the construction and operation phase (including impacts to African Grass-owls). All impacts could be satisfactorily mitigated to a low or absent level with the implementation of necessary mitigation measures. It was therefore the opinion of the specialists that the proposed project can be favourably considered should the all the mitigations measures and recommendations be adhered to.

A Wetland Assessment was also undertaken and found one wetland on site. The wetland attained a low overall PES as it is impacted by historical activities both in the catchment as well as directly on the wetland system where the impacts are continues. The wetland also attained a Moderate EIS. The biodiversity of

this wetland is generally not sensitive to flow and habitat modifications. It plays a small role in moderating the quantity and quality of water of major rivers. In terms of the REC, the specialist found that the wetland fell within Category D as the wetland will be impacted to some extent by the proposed development activities. This impact will be localised and at the transitional point leading from the development and infrastructure installations into the wetland and buffer area. It will in all likelihood regress slightly in terms of its current Ecological Category if not managed in specific during the construction period. Stormwater management for the site is required in specific the construction phase. This will mitigate the impact on the wetlands. Rehabilitation of the impacts and maintenance of the system will further mitigate the impacts and could improve the sustainability of the system. These mitigation measures (stormwater management, rehabilitation amongst others) have been included in the EMPr. The specialist noted that the project can be supported should all the mitigation measures be implemented and monitored against.

The Heritage Impact Assessment found that the property is severely disturbed, highly overgrown and building rubble from demolished structures are scattered over the study area. All structures on site besides one has been destroyed after 2008. The remaining structure (Feature 1) is not indicated on archival maps and is therefore assumed not older than 60 years. The structures' potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and is therefore of no heritage significance. In addition, the study found no significant archaeological sites or material was recorded during the survey and based on the SAHRIS Paleontological Sensitivity Map, the area is of insignificance paleontological sensitivity. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of Section 36 of the Act no burial sites were recorded. The study area is surrounded by industrial and residential developments and road infrastructure developments and the proposed residential development will not impact negatively on significant cultural landscapes or viewsapes. Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

An Aquatic Resources Monitoring Program and Auditing Plan was compiled and noted that recommended monitoring will provide the necessary information regarding the associated impacts. The monitoring tools may be used to determine the baseline state of the different ecosystems. By doing this, the bio-monitoring data can be measured against the data obtained during the baseline state. Any changes can then be recorded. With this information it will be possible to monitor the extent of the impacts on various aspects of the associated aquatic ecosystems. The necessary mitigation measures can be developed according to the information that will be gathered using the monitoring tools discussed.

An Aquatic Resources Rehabilitation Plan was also developed to ensure the correct construction principles are followed throughout the construction phase. The plan noted that if all mitigatory actions are adhered to, the construction activities will not have any detrimental impact on the aquatic resource.

In terms of services, the Outline Scheme Report and Stormwater Management Plan found that the services required for the proposed Development will be put in place. Municipal sources of water are available. In terms of sewer, connection to the existing sewer line will take place. A dedicated stormwater system will also be implemented and will ensure proper management of runoff on site. This system proposed is in line with the recommendations of the Wetland Specialist as it provides for multiple releases to mimic natural wetland functioning.

A Traffic Impact Assessment was undertaken and proposed 3 accesses to the site which have been incorporated into the proposed layout (Two off of View Road and a Southern Access from Steyn City). In addition, capacity analysis of the relevant intersections were done to determine the Levels of Service (LOS), volume / capacity ratios (v/c) and delays at each intersection for a number of scenarios. The analysis and findings suggested that existing upgrades as well as future planned upgrades will ensure that surrounding intersections operate at acceptable Level of Service. Public Transport Lay bays are already in place in the area. The study therefore recommended that the proposed township application be supported from a traffic engineering perspective.

In terms of the impact assessment undertaken as part of the EIA Report, a qualitative and quantitative approach was followed. From a qualitative perspective, impacts related to listed activities and raised by I&APs were assessed. This was then followed by a more detailed quantitative assessment which incorporated the findings of the specialists where possible. Overall, all impacts could be mitigated satisfactorily. Alternatives were then compared and assessed based on their impact to environmental attributes as well as how well they incorporated the requirements of the various specialists. Based on this assessment, the recommended alternatives are as follows:

- The Proposed Layout (Proposal); and
- Proposal – Attenuation Pond along Wetland.

The no-go option/alternative was not supported for a number of reasons, the most of important of which being that should the development not proceed, there will be a loss of the economic benefits of the investment of approximately R15 million in the area. There will also be a loss of the 150 construction related employment opportunities and 150 operation related employment opportunities. This would be a significant negative impact as 25% of people in the Municipality are unemployed. The no-go alternative would result in a loss of these positive economic benefits.

Public Participation was undertaken, and a 30-day public review was provided to I&APs to facilitate their comment. Comments received included:

- Requests for information
 - Traffic Impact Assessment and Stormwater Management Plan
 - Information on William Nicol Drive Upgrade Timeframes
 - Information on whether there has been a change in the proposed development since Scoping.

- Support of the Development
 - From the Ward Councilor of the area.
- Comments from SAHRA
 - Support the development
 - Mitigation to include Chance Find Procedure.
- Comments from City of Johannesburg Impact Assessment and Compliance Monitoring
 - Concerns regarding the artificial source of water indicated by Wetland and Biodiversity specialists.
 - Concern regarding the conservation of the degraded grassland area and associated impact on Grass Owls.
 - Comments on Geotechnical Assessment.
 - Requirements for recreational open space.
 - Concern regarding stormwater.

Please refer to Appendix 14.5.5. for a copy of the Comments and Responses Report as well as Appendix 14.5.6.4 for a copy of the comments received during the EIR public review. Please note that in order to provide a detailed response to the City of Johannesburg, an addendum to the Comments and Responses Report has been compiled and should be read in conjunction with the Comments and Responses Report.

The main concerns raised relate to the artificial water source, stormwater management and the conservation of the degraded grassland. Whilst these comments have been properly considered they have not resulted in significant changes to the proposals or impact assessment. The reasons for this are as follows:

- The artificial source of water indicated by the Wetland Assessment and Biodiversity Baseline and Impact Assessment relates to stormwater drainage channels and a historic earth dam. Google Earth imagery has been utilized to corroborate this and is included in Addendum 1 of the Comments and Responses Report. The delineated wetland and associated 32m wetland buffer however remain as indicated by the Wetland Specialist and are excluded from the development footprint (other than for the development of the wetland crossing).
- The degraded grassland was provided a sensitivity rating of low-medium. Further, approximately half of this area (1.3 ha) will be conserved as part of the wetland and wetland buffer.
- This area together with the wetland and wetland buffer provided 5 ha of area that can be used for roosting and foraging habitat for Grass Owls. In addition, a number of mitigation measures regarding Grass Owls have been included in the EMPr and thus the impact is not expected to be significant.

11.6.2 Reasons for Decision

Based on the findings of the specialist studies and impact assessment and taking into account the successful implementation of the EMPr, it is felt that the Proposed Riverside View Extension 84 Development should proceed. In summary, the following reasons form the basis of this opinion.

- The proposed zoning of the development will be *Special for: Place of Instructions, Residential buildings and Offices, including ancillary uses such as restaurants and shops* and aims to provide a school, offices and residential buildings. Private Open space will also be incorporated into the development which forms part of the Steyn City Development. The proposed use of the site for the primary rights will fulfil a need for an all-phase school / residential use / storage / offices with ancillary shops and restaurants, to cater for the varying demands of the residents of Steyn City Estate. This is especially important in light of the size of the development and the need for a school for every 1000 residential erven.
- Steyn City has one existing School, however another one is required due to the size of the development. The proposed development provides an ideal location on the boundary as it will access from within Steyn City as well as from outside of the Estate. It is also large enough to allow for an all phase school.
- There is therefore a need for such a development especially in light of the fact that there is an increasing need for the provision of adequate schools in close proximity - or within the secure environment - of an upmarket estate, which is also located close to transport, employment and other urban opportunities. In particular, we note that the provision of adequate schooling and housing is a basic human right, which every South African is entitled to. In order to cater for a necessary sized school, a site that is big enough is required. The site is outside Steyn City but close enough to allow easy access from Steyn City as well as access from a point outside of the main access gate of Steyn City.
- Furthermore, the proposed rights for the Riverside View Ext 84 Township includes provision for residential buildings and residential densities of up to 20 dwelling units per hectare. This will contribute towards the supply of residential land, by better utilization of the land.
- The location of the proposed development along William Nicol Drive and the future interchange adjacent to and north-east of the site is also desirable, since it provides for easy access from William Nicol Drive (K46), via Porcupine Park Avenue to Riverside View Ext 84. The development is also close to existing engineering services and road network, which is presently being upgraded.
- The residential land use is also complementary to the other proposed land uses of Riverside View Ext 84 as well as the land uses of the neighbouring Steyn City Lifestyle Estate, to which it will be linked.
- In terms of the Gauteng Provincial Environmental Management Framework, the majority of the proposed development falls within Zone 1. A small section falls within Zone 2 however, the development footprint is excluded from this area. The proposed development is thus in line with the intention of the zone 1 which is to: "streamline urban development activities in it and to promote development infill, densification and concentration of urban development within the urban development zones as defined in the Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas." Further, as the development is within the urban development boundary, the proposed development will promote compact city development. A wetland area has been identified on site however has been delineated and the wetland and 32m buffer have been excluded from the development footprint.

- The site is currently located in an area zoned as 'undetermined', and has mixed agricultural potential (combination of low, medium and built up). No excessive opportunity costs are therefore envisioned.
- The site is currently impacted upon by existing land uses and is in close proximity to roads and services. Using this site therefore reduces the need for greenfields development elsewhere as well as the need to develop extensive bulk services and roads to service the site.
- Services required for the development are available and connections will be developed during the construction phase.
- No environmental or technical specialist study identified any fatal flaws related to the site selection for the proposed development
- In addition, all impacts identified as part of specialist studies and the impact assessment could be satisfactorily mitigated to 'low' or 'low-medium'. As such no significantly negative impacts are expected.
- The economic benefits of the proposed development include the investment of approximately R15 million in the area. This will have a positive economic impact in the area.
- Approximately 150 construction related employment opportunities and 150 operation related employment opportunities will be created through the development of the Riverside View Extension 84 This results in a significantly positive impact as 25% of people in the Municipality are unemployed and any employment opportunities are therefore important.
- The assumptions, uncertainties and gaps are such that the impact assessment is expected to be accurate.
- The mitigation measures included in the EMPr are thought to adequately mitigate impacts so that the impact management objectives can be met.
- The comparison of alternatives resulted in the selection of the BPEO for the site:
 - The Proposed Layout (Proposal); and
 - Proposal – Attenuation Pond along Wetland (multiple attenuation ponds with multiple releases).

11.6.3 Proposed Conditions

A number of critical mitigation measures accompany this recommendation and should be included as conditions of the environmental authorisation (should it be granted). These include:

- A copy of the Final Site Development Plan must be provided to the Department once finalized through the SDP process. This document should be submitted prior to the commencement of construction.
- An Environmental Control Officer (ECO) should be appointed to ensure compliance to the authorization and EMPr. Weekly inspections and monthly reports are recommended unless specific requirements are called for a specific activity or incident to be rehabilitated at short notice.
- Compilation of and implementation of an alien vegetation management plan for the entire site.

- Before construction is to take place the area needs be walked through to chase up any faunal species that might be found in the area. If the African Grass Owl is observed in the project area, enough time should be given to the specie to move out of the area; should the species not move away on its own the appropriate authority should be contacted to assist with the relocation. In this case the EWT associated with the Kyalami African Grass Owl project is suggested;
- During the operational phase it is suggested that the open land area be monitored for the presence of the African Grass Owl to assist with its conservation in the area (or access be given to the area to a monitoring program such as the one administered by the EWT);
- No trapping, killing or poisoning of any wildlife should be allowed on site;
- Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities;
- Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited
- A wetland monitoring programme should be developed based on this baseline assessment and audited against on a bi-annual basis. Feedback from the monitoring should be used to measure and mitigate further negative impacts, if found.
- The wetland monitoring occurring on a bi-annual basis should be conducted by a skilled professional qualified in assessing and understanding the complex nature of wetlands and their associated drivers.
- The wetland and 32m wetland buffer must be incorporated into the development.
- The wetland should be rehabilitated to improve functioning.
- Silt protection measure to be implemented in consultation with the wetland specialist (ECO).
- Ingress and Egress must be managed to minimise impacts in respect of compaction of the wetland soils.
- Single entry and exit points must be established.
- These areas must be scarified as part of the rehabilitation plan.
- Stock piling must be located outside the delineated wetland and buffer boundaries.
- An approved stormwater management plan must be implemented.
- Velocity dissipation structures and sheet flow structures (such as reno mattresses) must also be installed to prevent water flowing through culverts to gain velocity and be released uncontrolled.
- Dispersed flow must be attained post formal structures.
- Sheet flow must be promoted to mimic natural flow patterns.
- Chance find procedure for heritage to be implemented.
- A Phase 2 Geotechnical Assessment must be undertaken prior to construction and a copy of the report submitted to the Department. Detailed design should be in line with the findings of the report.

11.6.4 Authorisation Validity

The proposed development includes operational activities and thus once construction has commenced, the authorization will be viewed to be permanently valid. The proposed period for which the environmental authorization should be valid prior to operation is 10 years with an option to extend if necessary. Should construction not commence within this period, the authorization will lapse and new authorization process would be required.

11.6.5 Management of Rehabilitation/Decommissioning

Decommissioning of the proposed Development and associated services is not envisioned. However, should decommissioning be required the activity will need to comply with the appropriate environmental legislation and best practices at that time.

Remediation and rehabilitation of the construction footprint will be undertaken prior to operation. Mitigation measures to ensure proper rehabilitation are included in the EMPr.

12 EAP UNDERTAKING

I, Vanessa Stippel, as the Environmental Assessment Practitioner managing this application provide the following affirmation in relation to -

- the correctness of the information provided in the reports;
- the inclusion of comments and inputs from stakeholders and I&APs;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;



Designation: Senior Environmental Assessment Practitioner

Prism Environmental Management Services

Company

20 October 2020

Date

13 REFERENCES

- Bigen Africa Services (Pty) Ltd. (2019). *Proposed Township of Riverside View Ext 84 - Civil Engineering Outline Scheme Report*. Johannesburg: Unpublished Report.
- Botha, D. W. (2020). *Wetland Assessment (PES, EIS, REC) - Riverside View Ext. 84*. Johannesburg: Prism Environmental Management Services.
- DIT 500. (2013). *Mogale City Local Municipality Tourism Strategy Development*. Krugersdorp.
- DWAF. (1996d). *South African Water Quality Guidelines Volume 2: Recreational Use*. Pretoria: Department of Water Affairs and Forestry (DWAF).
- DWAF. (2005). *A practical field procedure for the identification and delineation of wetlands and riparian areas*. Pretoria: Department of Water Affairs and Forestry.
- DWAF. (2007). *Manual for the assessment of a Wetland Index of Habitat Integrity for South Africa floodplain and channelled valley bottom wetland types*. Department of Water Affairs and Forestry. Pretoria: Resource Quality Services: Department of water Affairs and Forestry.
- Erasmus, M., Steyn, L., & Husted, A. (2020). *Biodiversity Baseline & Impact Assessment - Proposed Riverside View Expansion 84 Development*. Johannesburg: The Biodiversity Company.
- HCAC - Heritage Consultants. (2019). *Heritage Impact Assessment for the proposed development of Riverside View Extension 84, City of Johannesburg, Gauteng*. Johannesburg: Unpublished Report.
- Kleynhans, C. J., Thirion, C., & Moolman, J. (2005). *A Level I River Ecoregion classification System for South Africa, Lesotho and Swaziland*. Pretoria: Department of Water Affairs and Forestry.
- Kleynhans, C. J., Thirion, C., & Moolman, J. (2005). *Level I River Ecoregional Classification System for South Africa, Lesotho and Swaziland*. Pretoria: Department of Water Affairs and Forestry Resource Quality Services.
- Kotze, D. C., Breen, C. M., & Klug, J. R. (1994). *Wetland-use: A wetland management decision support system for the KwaZulu Natal Midlands*. Water Research Commission: WRC Report No 501/2/94.
- Mogale City Local Municipality. (2011). *State of the Environment Report*. Krugersdorp: Mogale City Local Municipality.
- Mogale City Local Municipality. (2013). *Mogale City Local Municipality Draft Baseline Assessment Report*. Krugersdorp.
- Prism EMS. (2020). *Wetland Assessment for Riverside View Extension 84*. Johannesburg: Unpublished Report.
- SANBI. (2009). *Further development of a proposed national wetland classification system for South Africa*. Pretoria: South African National Biodiversity Institute.
- SANS. (2015). *South African National Standard (SANS). Drinking Water Part 1: Microbiological, physical, aesthetic and chemical determinands*. Pretoria: SABS Standards Division.
- Statistics South Africa. (2011). *Census 2011 Data - Mogale City Local Municipality*. Johannesburg: Statistics South Africa.
- The Biodiversity Company. (2019). *Biodiversity Baseline & Impact Assessment - Proposed Riverside View Expansion 84 Development*. Johannesburg: Unpublished Report.
- Van Rooy, J. L. (2010). *Report on Phase 1 Geotechnical Investigations on Portion 185 of the Farm Diepsloot 388 JR, Johannesburg, Gauteng Province*. Unpublished Report.

Van Rooy, J. L. (2011). *Report of Phase 1 Geotechnical Site Investigations on Portion 124 of the Farm Diepsloot 388 JR, Johannesburg, Gauteng Province*. Unpublished Report.

14 APPENDICES

14.1 Curriculum Vitae of EAP

14.2 Alternatives

14.3 Draft Site Plan and Designs

14.4 A3 Maps and Drawings

14.5 Public Participation

14.5.1 Interested and Affected Party Database

14.5.2 Proof of Initial Notification

14.5.2.1 Newspaper Notices

14.5.2.2 Site Notices

14.5.2.3 Background Information Document

14.5.2.4 Proof of Initial Notification

14.5.3 Proof of Notification of Review of Scoping Report

14.5.3.1 Newspaper Notices

14.5.3.2 Site Notices

14.5.3.3 Background Information Document

14.5.3.4 Proof of Notification

14.5.3.5 Proof of Delivery to Authorities

14.5.4 Proof of Notification of Review of the EIA Report

14.5.4.1 Proof of Notification of Registered I&APs

14.5.4.2 Proof of Delivery to Authorities

14.5.5 Comments and Responses Report

14.5.5.1 Addendum 1 – Responses to COJ Comments

14.5.5.2 Addendum 2 – Responses to GDARD Comments

14.5.6 Comments Received

14.5.6.1 Comments during Initial Notification

14.5.6.2 Comments during Review of Scoping Report

14.5.6.3 Comments received after submission of Scoping Report

14.5.6.4 Comments received during public review of EIR

14.5.7 GDARD Approval of Scoping

14.5.8 GDARD Approval of Public Participation Plan

14.6 Specialist and Technical Studies

14.6.1 Biodiversity Baseline and Impact Assessment

14.6.2 Wetland Assessment

14.6.3 Phase 1 Heritage Impact Assessment

14.6.4 Monitoring Plan

14.6.5 Wetland Rehabilitation Plan

14.6.6 Outline Scheme Report

14.6.7 Geotechnical Assessment

14.6.8 Traffic Impact Assessment

14.6.9 Stormwater Management Plan

14.7 Impact Assessment

14.8 Environmental Management Programme

14.9 Water Use Licence Application | WULA Technical Report
