

WATER USE LICENCE APPLICATION TECHNICAL REPORT

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

Comment Period: 11 September 2020 to 12 October 2020

Proponent:



STEYN CITY
PARKLAND RESIDENCE

Project Reference:

21637 – Riverside View Ext 84

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TABLE OF CONTENTS

1	INTRODUCTION.....	9
1.1	PROJECT DESCRIPTION.....	9
1.2	PROJECT LOCATION.....	11
1.3	CONTACT DETAILS	13
2	DETAILS OF ASSESSOR AND SPECIALISTS.....	13
3	REPORT OUTLINE AND REQUIREMENTS.....	15
4	LEGAL FRAMEWORK	15
4.1	NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) (ACT NO 107 OF 1998).....	15
4.2	NATIONAL WATER ACT (NWA) (ACT NO. 36 OF 1998)	16
5	WATER USES	18
5.1	WATER USE AUTHORISATION PROCESS	18
5.2	GAPS AND ASSUMPTIONS	20
5.3	DESCRIPTION OF WATER USE ACTIVITIES	21
5.4	WATER USES.....	32
6	PROFILE OF THE RECEIVING ENVIRONMENT	38
6.1	LOCAL CLIMATE	38
6.2	SURFACE WATER.....	39
6.3	SOCIO-ECONOMIC ENVIRONMENT	43
7	ALTERNATIVES ASSESSED AS PART OF THE EIR.....	49
7.1	LAYOUT ALTERNATIVES	49
7.2	ATTENUATION ALTERNATIVES.....	51
7.3	NO-GO ALTERNATIVE.....	54
8	PUBLIC PARTICIPATION.....	63
9	CONCLUSION	64
10	ANNEXURES	67
10.1	CURRICULUM VITAE OF ASSESSOR AND SPECIALISTS	68
10.2	PROCEDURAL REQUIREMENTS.....	69
10.3	SPECIALIST STUDIES	73
10.4	MAPPING	76
10.5	MASTERPLAN	77
10.6	SITE PHOTOGRAPHS.....	78

10.7	PUBLIC PARTICIPATION REPORT	79
10.8	ENVIRONMENTAL MANAGEMENT PROGRAMME.....	80
10.9	REHABILITATION PLAN.....	81
10.10	MONITORING PLAN	82
10.11	CONSTRUCTION METHODOLOGY/METHOD STATEMENT	83
10.12	CONSTRUCTION MANAGEMENT PLAN	84
10.13	CIVIL REPORTS AND DESIGNS	85
10.14	SECTION 27 MOTIVATION.....	86
10.15	STORMWATER REPORT	87
10.16	ENVIRONMENTAL IMPACT ASSESSMENT	88
10.17	RISK MATRIX	89

LIST OF FIGURES

FIGURE 1-1: LOCALITY MAP.....	12
FIGURE 1-2: AERIAL LOCALITY MAP.....	13
FIGURE 5-1: WATER USE AUTHORISATION PROCESS.....	19
FIGURE 5-2: LAYOUT	22
FIGURE 5-3: PRELIMINARY SITE DEVELOPMENT PLAN	24
FIGURE 5-4: WATER LAYOUT PLAN	25
FIGURE 5-5: SEWER SERVICES	27
FIGURE 5-6: TYPICAL MANHOLE DETAILS	28
FIGURE 5-7: STORMWATER.....	29
FIGURE 5-8: ROAD LAYOUT PLAN	30
FIGURE 5-9: CULVERT BRIDGE	31
FIGURE 5-10: WATER USES OVERVIEW MAP	34
FIGURE 5-11: WATER USES MAP 1.....	35
FIGURE 5-12: WATER USES MAP 2.....	36
FIGURE 6-1: MINIMUM, MAXIMUM AND AVERAGE TEMPERATURES FOR CHARTWELL, GAUTENG (WWW.WORLDWEATHERONLINE.CO.ZA).	38
FIGURE 6-2: AVERAGE RAINFALL AMOUNT (MM) AND RAINY DAYS (WORLD WEATHER ONLINE).....	39
FIGURE 6-3: NATIONAL WETLAND MAP VERSION 5 (NWM5) (VAN DEVENTER ET AL., 2019).....	40
FIGURE 6.4: FLOW ACCUMULATION MODEL.	40
FIGURE 6.5: QUANTITATIVE FLOW MODEL.	41
FIGURE 6.6: WETLAND BUFFER ZONES.....	42
FIGURE 6-7: HIGHEST EDUCATION LEVEL (ALL AGES) (STATS SA, 2017).....	43
FIGURE 6-8: EMPLOYMENT FOR THOSE AGED 15-64 (STATS SA, 2017)	44
FIGURE 6-9: COJ SDF 2040	46
FIGURE 7-1: PROPOSAL.....	50
FIGURE 7-2: ALTERNATIVE LAYOUT	51
FIGURE 7-3: PROPOSAL – ATTENUATION POND ALONG WETLAND	52
FIGURE 7-4: UPDATED PROPOSAL – ATTENUATION ALONG THE WETLAND.....	53
FIGURE 7-5: ALTERNATIVE - ATTENUATION POND TO THE NORTH OF THE SITE.....	54

LIST OF TABLES

TABLE 1-1.: CORNER POINT COORDINATES	12
TABLE 1-2.: SURVEYOR GENERAL DIAGRAM NUMBERS.....	12
TABLE 1-3.: DETAILS OF THE APPLICANT.....	13
TABLE 2-1.: DETAILS OF THE ASSESSOR	14
TABLE 5-1: PROPOSED ZONING	22
TABLE 5-2: WATER DESIGN STANDARDS	26
TABLE 5-3: SEWER DESIGN STANDARDS	27
TABLE 5-4: SUMMARY OF ATTENUATION PONDS AND COMPARISON TO PRE DEVELOPMENT RUN OFF.....	29
TABLE 5-5: DETAILS OF THE WATER USES BEING APPLIED FOR.....	37
TABLE 7-1: RISK MATRIX SUMMARY	60

1 INTRODUCTION

1.1 Project Description

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.

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 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 occurs within 500m of a wetland. The wetland has been delineated and together with a 32m buffer, excluded from the development footprint. However, in order to allow access to Erf 2, a wetland crossing is required over the wetland. In addition, multiple stormwater attenuation ponds are required and will be located outside the wetland. Connection to the existing sewer line is also required. Therefore, due to the proximity to the wetland, several activities are triggered in terms of Section 21 of the National Water Act (NWA) (Act No. 36 of 1998). These include:

- 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.

Prism Environmental Management Services (Prism EMS) has been appointed to undertake the requisite Water Use Licence Application (WULA) process.

1.2 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 to the north of Zeven Street. The corner point coordinates of the site are indicated in Table 1-1.

Table 1-1.: 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 1-2 below.

Table 1-2.: Surveyor General Diagram Numbers.

Portion	Surveyor General Diagram number
124	T0JR00000000038800124
185	T0JR00000000038800185

From a catchment perspective, the development occurs in Quaternary catchment area A21C and is part of Limpopo Water Management Area. Figure 1-1 and Figure 1-2 provide the locality map and aerial locality map respectively.

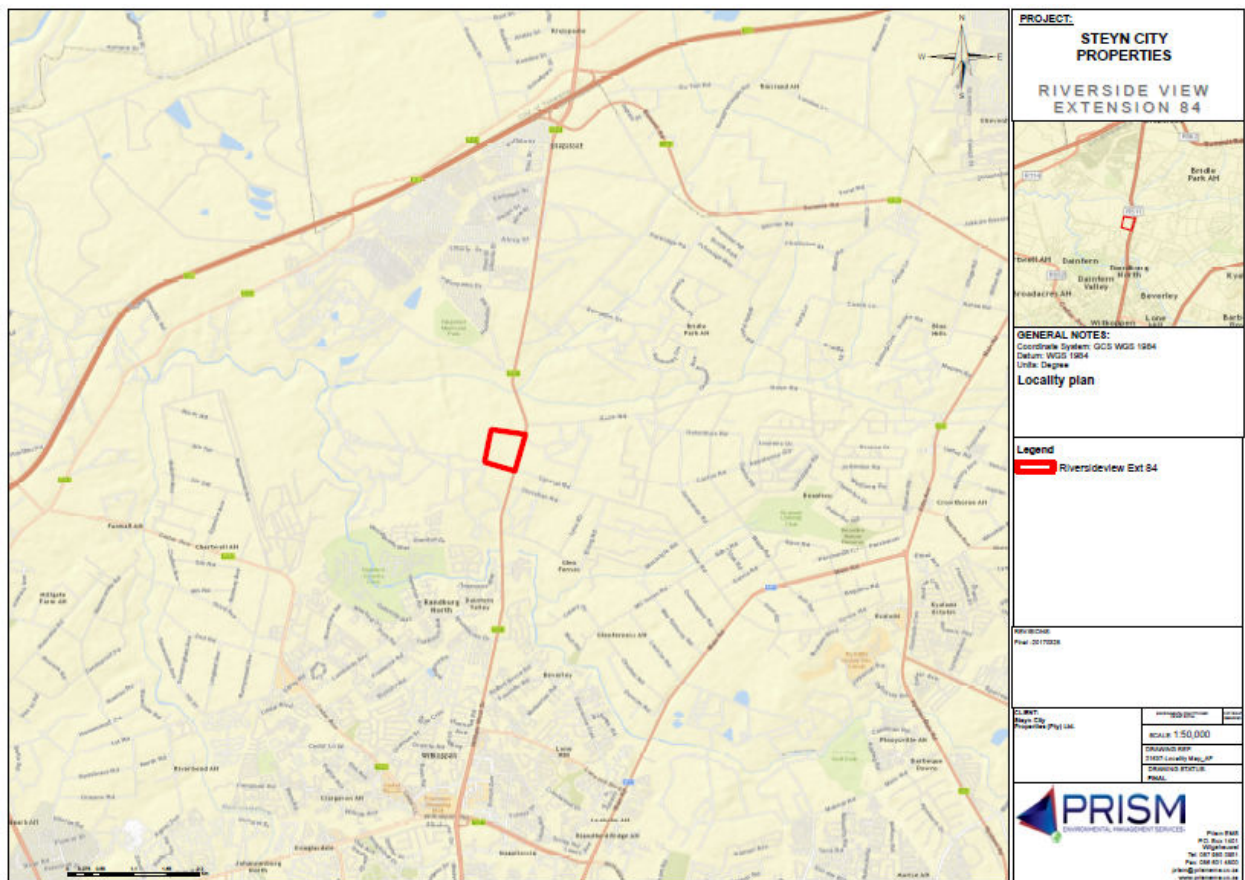


Figure 1-1: Locality Map

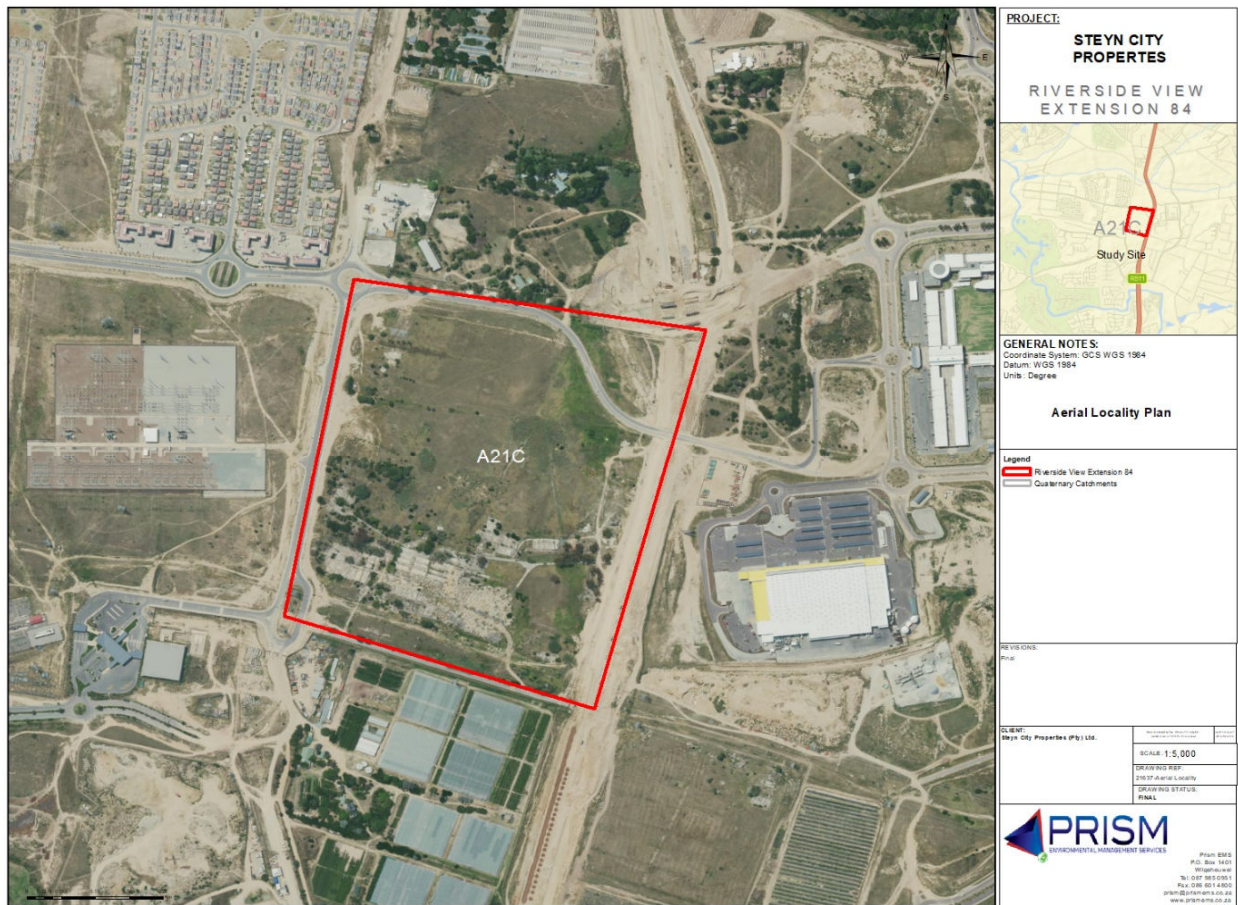


Figure 1-2: Aerial Locality Map

1.3 Contact Details

The applicant is the entity that will assume responsibilities as the holder of the WUL if granted. Details of the applicant is contained in Table 1-3.

Table 1-3.: Details of the Applicant.

Applicant:	Steyn City Properties (Pty) Ltd
Contact Person:	Christo De Wet

2 DETAILS OF ASSESSOR AND SPECIALISTS

Prism EMS have been appointed to undertake the required Water Use Authorisation Process in terms of the Section 21 of the National Water Act (Act No. 36 of 1998) (NWA) for the aforementioned project. Details of the Environmental Assessment Practitioner are provided in Table 2-1 and the relevant Curriculum Vitae are appended in **Annexure 10.1**.

Table 2-1.: Details of the Assessor

Assessor:	Vanessa Stippel
Company:	Prism Environmental Management Services
Qualifications:	MSc. Ecology, Environment and Conservation
Experience:	9 years
Affiliation/ Registration	Professional Member of Southern African Institute of Ecologists and Environmental Scientists SACNASP Pr.Sci.Nat. (116221) Registered EAP (2019/175)
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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) 17 years' experience	South African Council for Natural Scientific Professions (SACNASP) registered Scientist Pr.Sci.Nat. (119979) Registered Member of Environmental Assessment Practitioners Association of South Africa (EAPASA) (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	Project Management and Report Review, Wetland Specialist
Aquatic Specialist	Prasheen Singh	MSc Aquatic Health (Cum Laude) 8 Years' Experience	South African Council for Natural Scientific Professions (SACNASP) registered Scientist Pr. Sci. Nat. (116822)	Monitoring and Rehabilitation Plan

3 REPORT OUTLINE AND REQUIREMENTS

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 define the Water Use Licence Application Technical Report as follows:

“Water use Licence Application Technical Report includes water use registration forms, public participation material and specialist studies.”

This report aims to provide all the necessary information related to the water uses detailed in the various water use licence forms. In addition, the appendices of this report include all the necessary additional information required for the processing of this application. A checklist has been provided as part of the Executive Summary and is aligned to the checklists contained in the R.267 of 24 March 2017.

4 LEGAL FRAMEWORK

4.1 National Environmental Management Act (NEMA) (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. 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.

4.1.1 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.

An Environmental Authorisation process is being undertaken together with the WULA. A copy of the Environmental Impact Assessment Report (EIR) is included in **Annexure 10.16**.

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

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which consider amongst other factors:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing flooding and droughts.

Part 1 of Chapter 4 (Use of Water) of the NWA sets out general principles for regulating water use. In general, a water use must be licensed unless it is listed in Schedule I, is an Existing Lawful Use, is permissible under a General Authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources.

Section 21 of the NWA lists water uses that must be licensed and includes:

- 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 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.*

Therefore, the following listed water uses that require a Water Use License according to Section 21 of the NWA are triggered for the proposed development:

- 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.

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. This WULA has been compiled in line with these requirements.

5 WATER USES

5.1 Water Use Authorisation Process

The Water Use Authorisation process followed for the proposed development is indicated in Figure 5-1. The following sections provide an overview of the process as it has been undertaken.

5.1.1 Pre-Application Enquiry Meeting and Submission of Application (DW755)

A Pre-Application Enquiry was submitted online on the EWULAAS System of the Department of Water and Sanitation (DWS) on 8 September 2020. This was followed up by email on the same day.

Please see **Annexure 10.2.1** for a copy of the EWULAAS notification and email.

As part of the Pre-Application Enquiry, information on the proposed development (DW755) was submitted.

5.1.2 Site Inspection and Confirmation of Information Requirements

As required by the Procedures, once the Department confirms a WUL process is required, it is necessary for a site visit with Departmental officials to take place. The site visit will be scheduled as soon as possible once feedback from the Department is received.

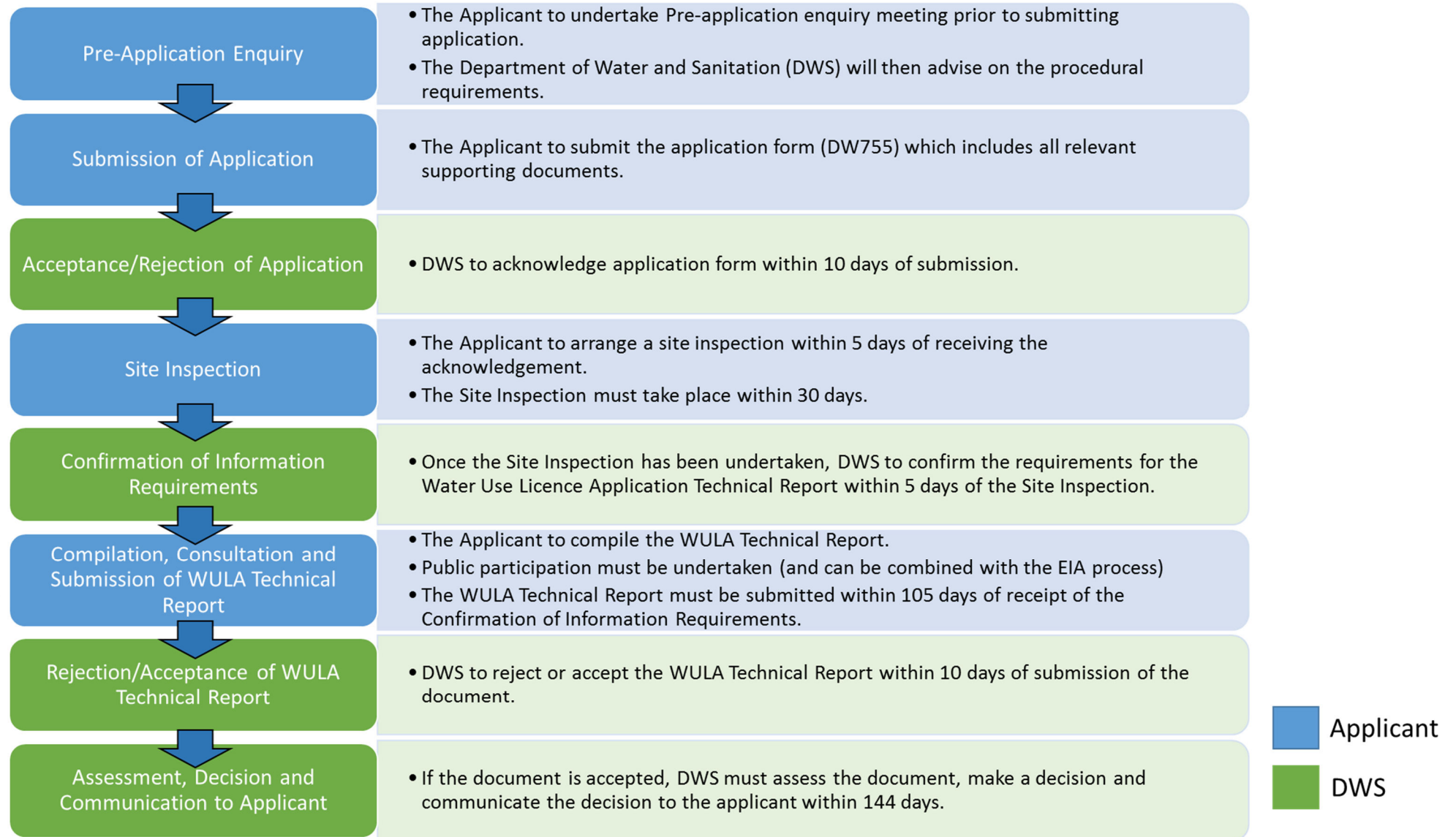


Figure 5-1: Water Use Authorisation Process

5.1.3 WULA Technical Report Compilation

Based on the Departments requirements, information gathering took place including desktop evaluation (via literature review, GIS, topographical maps etc.) as well as specialist studies conducted as part of the Environmental Impact Assessment Report (EIR). This information was used to compile the WULA Technical Report (this report) and associated WULA forms. The WULA Technical Report is currently available for public review as part of the review of the EIR. The WULA Technical Report will then be submitted to DWS. All WULA forms have been completed online as per the requirements of the new E-WULAAS System.

5.1.4 DWS Assessment

This Assessment and review step involves the assessment and review of the WULA by the designated official at the DWS Gauteng Regional Office. Should all necessary information be included, the WULA Technical Report will be accepted.

DWS will then undertake a technical evaluation and assessment of the application. If issuing a licence is recommended, a draft licence containing the required conditions will be compiled. The Regional Office official will then submit the application, together with their recommendation, the draft licence, and the supporting documentation, to the relevant delegated authority, who will decide on the application after the Water Use Authorisation Assessment Advisory Committee (WUAAC) has adjudicated on the application.

The decision and the licence, if granted, will be returned by the relevant delegated authority to the official at the DWS Regional Office, who will inform the applicant of the decision

5.2 Gaps and Assumptions

The impacts identified as part of the various specialist studies have heavily influenced the risk assessment included in the Technical Report. As such, it is important to note the assumptions and limitations identified by the various specialists (related to water uses):

- Wetland Assessment:
 - 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.

5.3 Description of Water Use Activities

The sections below provide an overview of the proposed water use activities. Please refer to Annexure 10.13 for a copy of the Outline Scheme Report and designs as well as Annexure 10.15 for the Stormwater Management Plan for more information.

5.3.1 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 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.

The layout of the proposed development is provided in Figure 5-2.



Figure 5-2: 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 5-1).

Table 5-1: 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 5-3. It should however be noted that this SDP can only be finalized during the City of Johannesburg town planning approval process.

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.

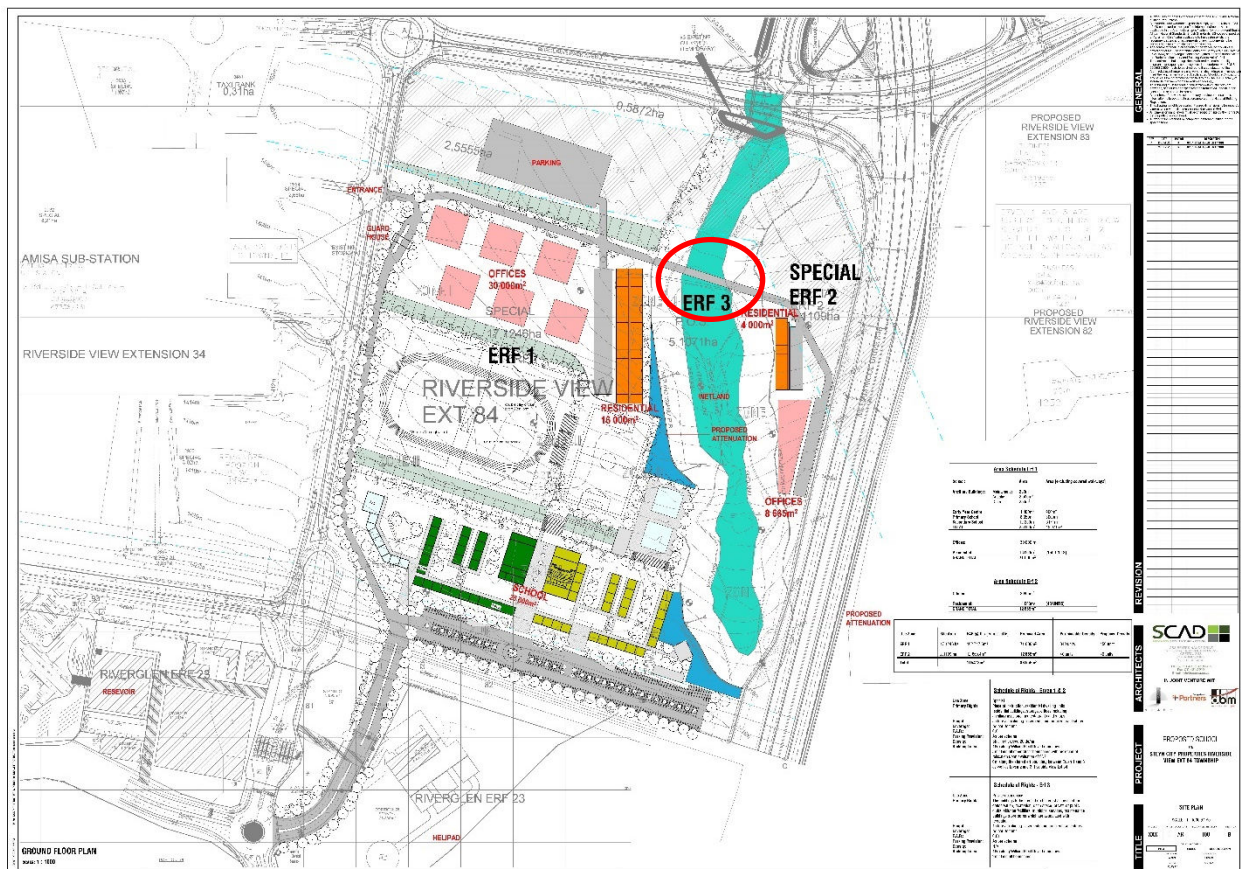


Figure 5-3: Preliminary Site Development Plan

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 5.3.6. and Figure 5-8 which also discussed the need for a bridge over the wetland.

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

5.3.2 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 5-4 below. A copy of the water layout plan is included in Annexure 10.13.

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.

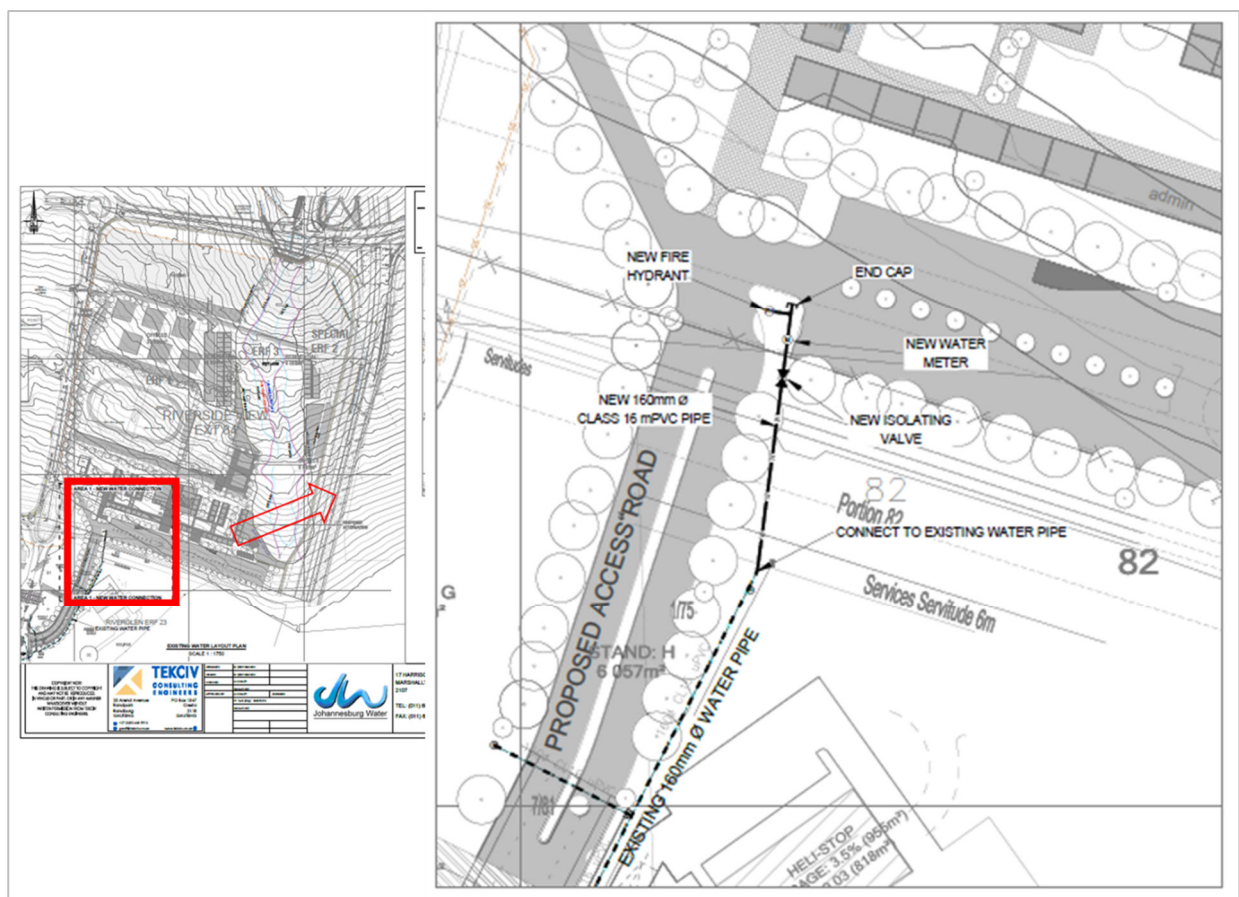


Figure 5-4: Water Layout Plan

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 5-2.

Table 5-2: 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

5.3.3 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 5-5). This connection point is just outside the 32m buffer area of the wetland. A copy of the sewer layout plan is included in Annexure 10.13.

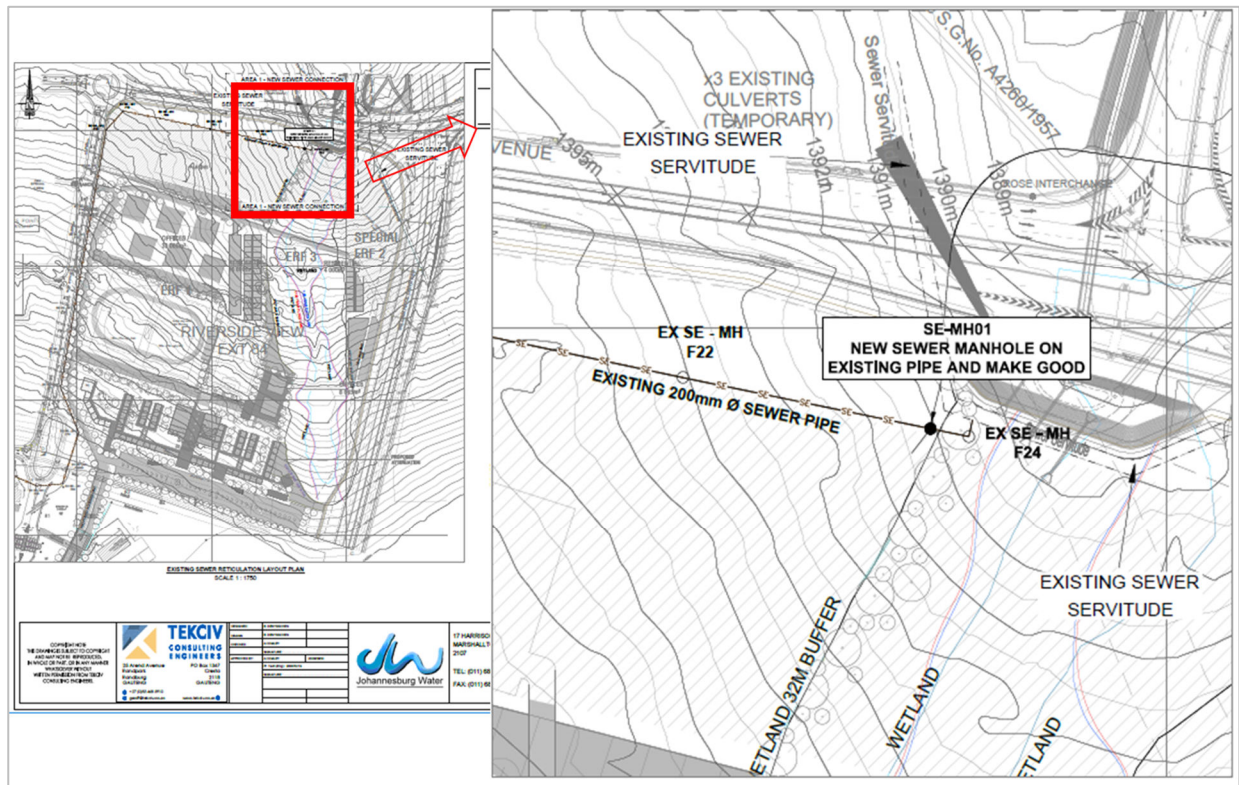


Figure 5-5: Sewer Services

The relevant sewage design standards which have been taken into account in the design of the services are indicated in Table 5-3.

Table 5-3: 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 5-6 below shows the typical manhole details.

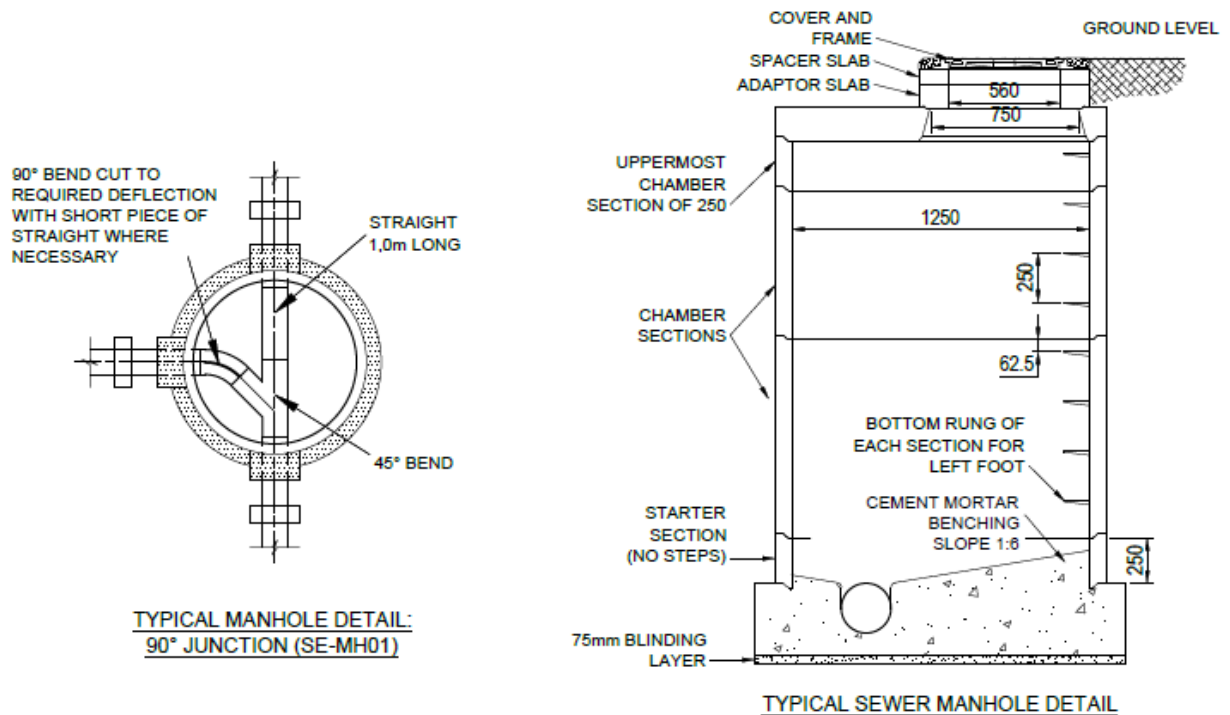


Figure 5-6: Typical Manhole Details

5.3.4 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 Annexure 10.15

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 5-4: 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

The proposed catchment and attenuation plan is provided in Figure 5-7. Please also see Annexure 10.13. for the A3 copies of drawings.

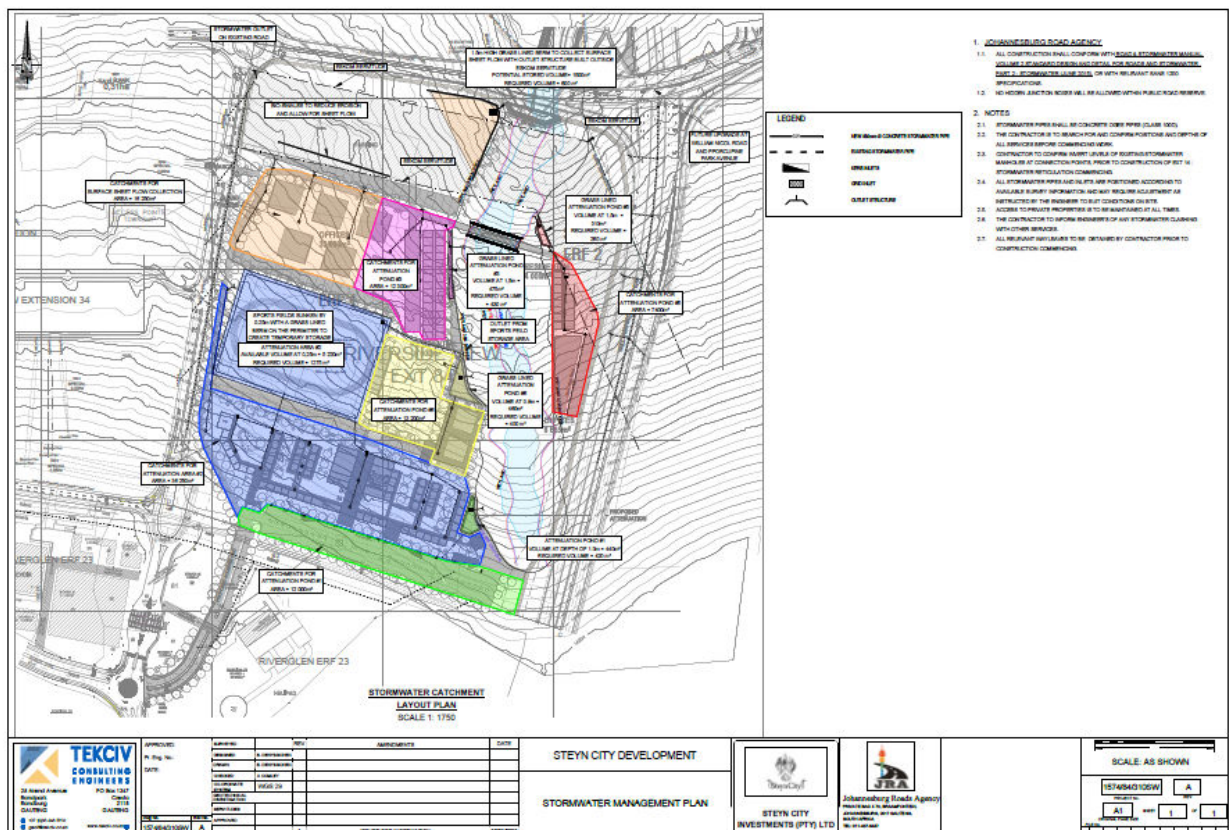


Figure 5-7: Stormwater

5.3.5 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 5-8 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.

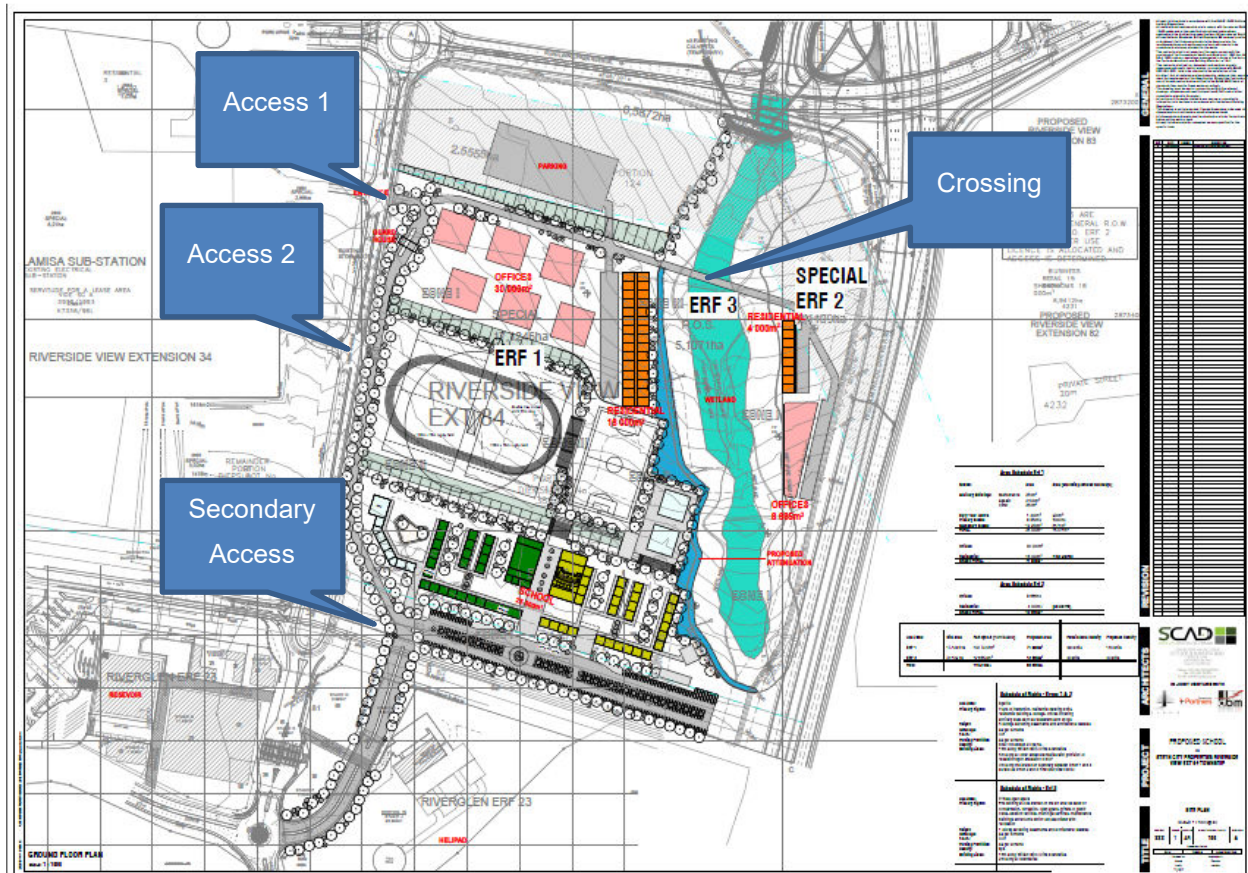


Figure 5-8: Road layout plan

5.3.6 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 5-8 above.

The proposed design of the crossing is provided in Figure 5-9 below and is also included in Annexure 10.13. 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.

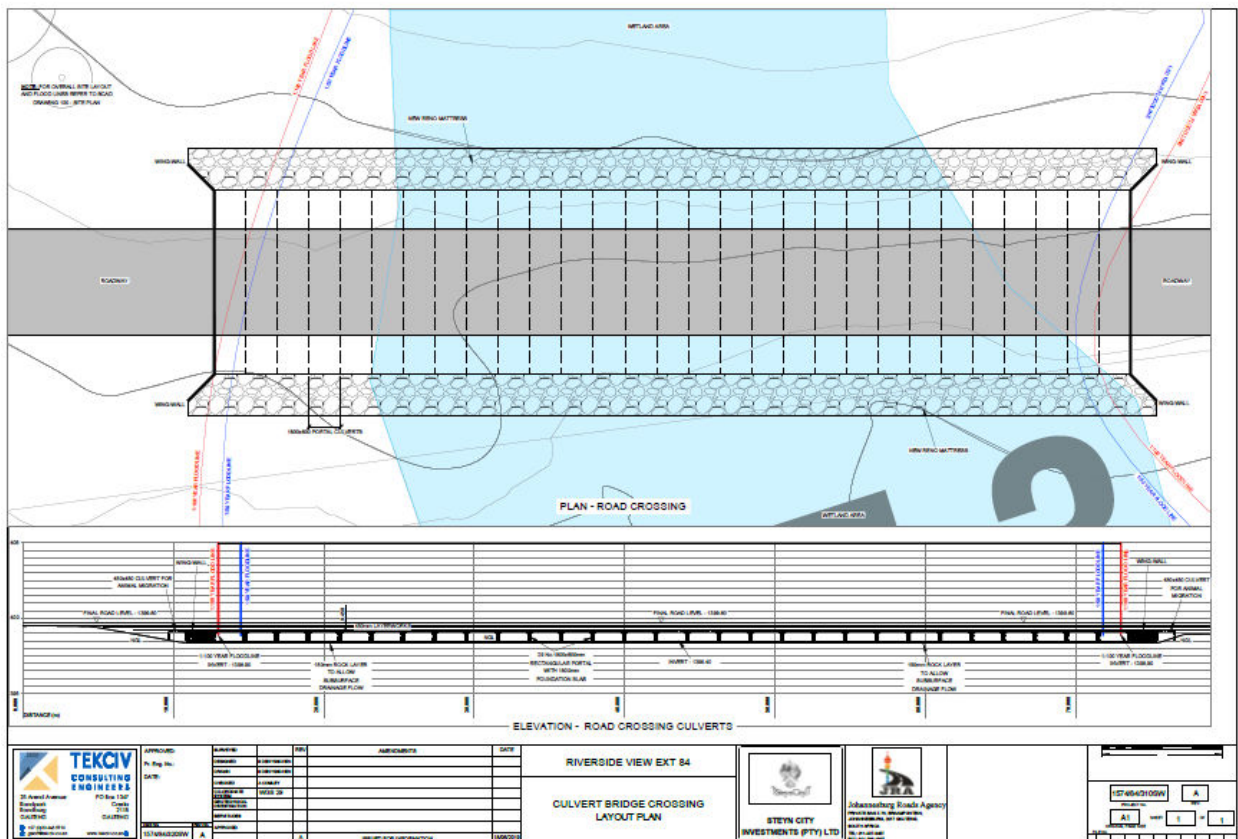


Figure 5-9: Culvert Bridge

5.4 Water Uses

According to Section 22 of the NWA a person may only use water under the following circumstances:

- Without a license –
 - o If that water use is permissible under Schedule 1;
 - o If that water use is permissible as a continuation of an Existing Lawful Use; or
 - o If that water use is permissible in terms of a General Authorisation issued under Section 39;
- If the water use is authorised by a license under this Act; or
- If the responsible authority has dispensed with a license requirement under Section 22(3) of the Act.

In the case of this project a licence is required to undertake the water uses that are associated with the project, based on the likely risk, nature, and extent of potential impacts of the proposed project on the affected water resources.

5.4.1 Existing Lawful Water Uses

The applicant, the Steyn City Properties (Pty) Ltd., does not have any Water Use Licenses awarded to them for the development of the Riverside View Extension 84. They do have a number of water use licences in place for the development of the main Steyn City Lifestyle Estate which is adjacent to the site.

5.4.2 Relevant Exemptions

There are no relevant exemptions applicable.

5.4.3 Generally Authorized Water Uses

In terms of Section 22(1) of the NWA a person may use water without a license if that water use is permissible in terms of a General Authorisation (GA) issued under Section 39 of the Act. An assessment was done of the General Authorisations under the NWA and the following GAs are in place:

- General Authorisation in terms of Section 39 of the National Water Act (Act No 36 of 1998) for water uses as defined in Section 21 (c) or Section 21 (i) (GN 509 of 2016).
 - o Due to the fact that the project involves a sewer connection as well as internal sewer reticulation and occurs within 500m of a wetland, the GA does not apply.
- General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998) in terms of Section 21 (c) and (i) for the purpose of rehabilitating a wetland for conservation purposes (GN 1198 of 18 December 2009):
 - o This is only applicable to organs of state undertaking wetland rehabilitation. Further, the GA notes that the GA does not apply if the water user must make additional activities in terms of Section 21 of the Act. As such, this GA is not applicable.

Thus, whilst a number of general authorisations exist for the activities identified above, they are not applicable due to the proximity of the project to wetlands on site and the fact the development includes

sewer services. Therefore, all water uses will be applied for under Section 21 of the National Water Act below.

5.4.4 Description of New Water Use

In order to ensure ease of understanding, an overview of all water uses is provided in Figure 5-10. This is followed by a number of detailed maps for each area (Figure 5-11 and Figure 5-12) together with tabulated water uses (Table 5-5). This table correlates to the Water Use License Application Forms that will be submitted to DWS as part of the Final Technical Report. Please note that the only the starting point coordinates are shown on the maps.

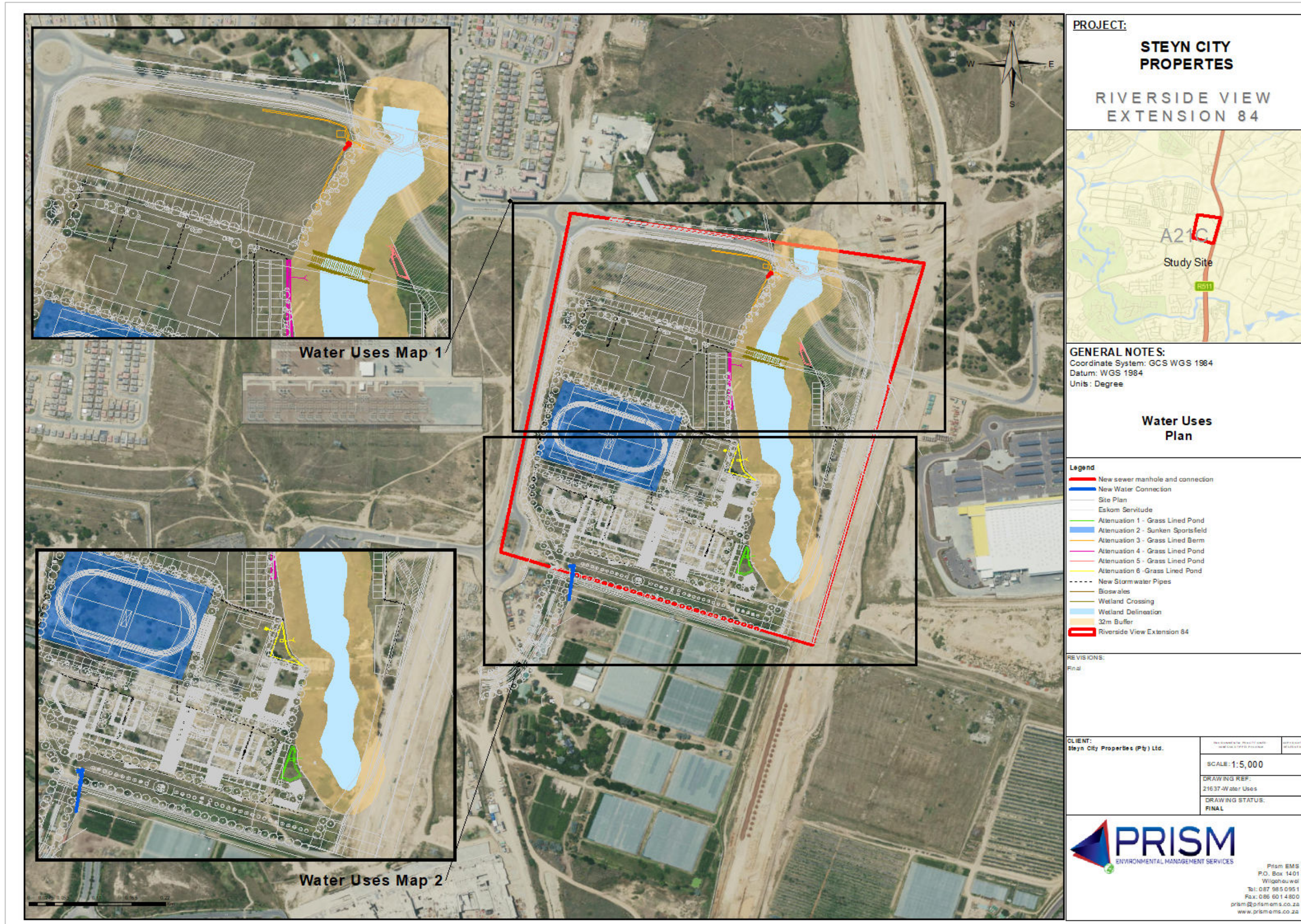


Figure 5-10: Water Uses Overview Map

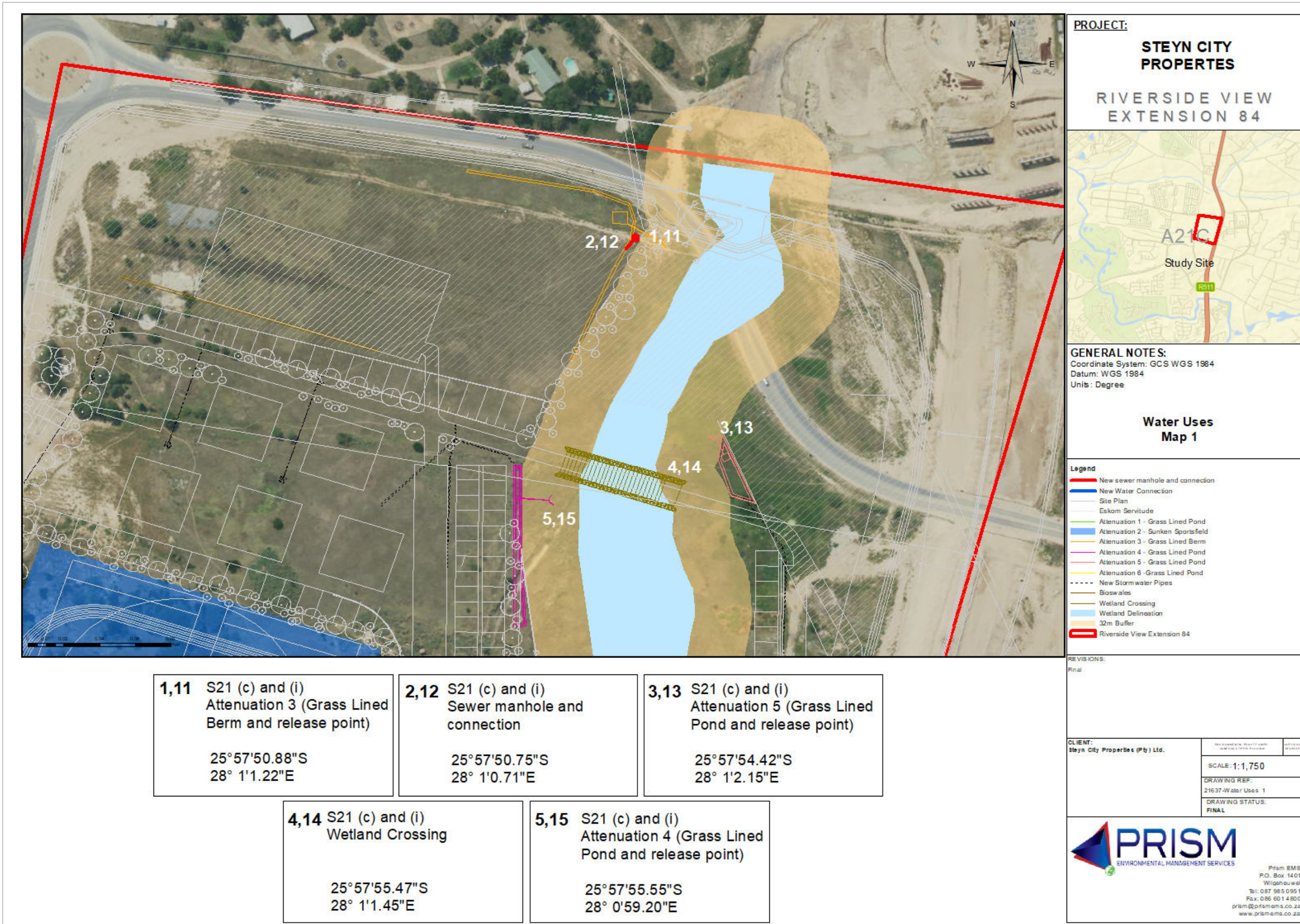


Figure 5-11: Water Uses Map 1

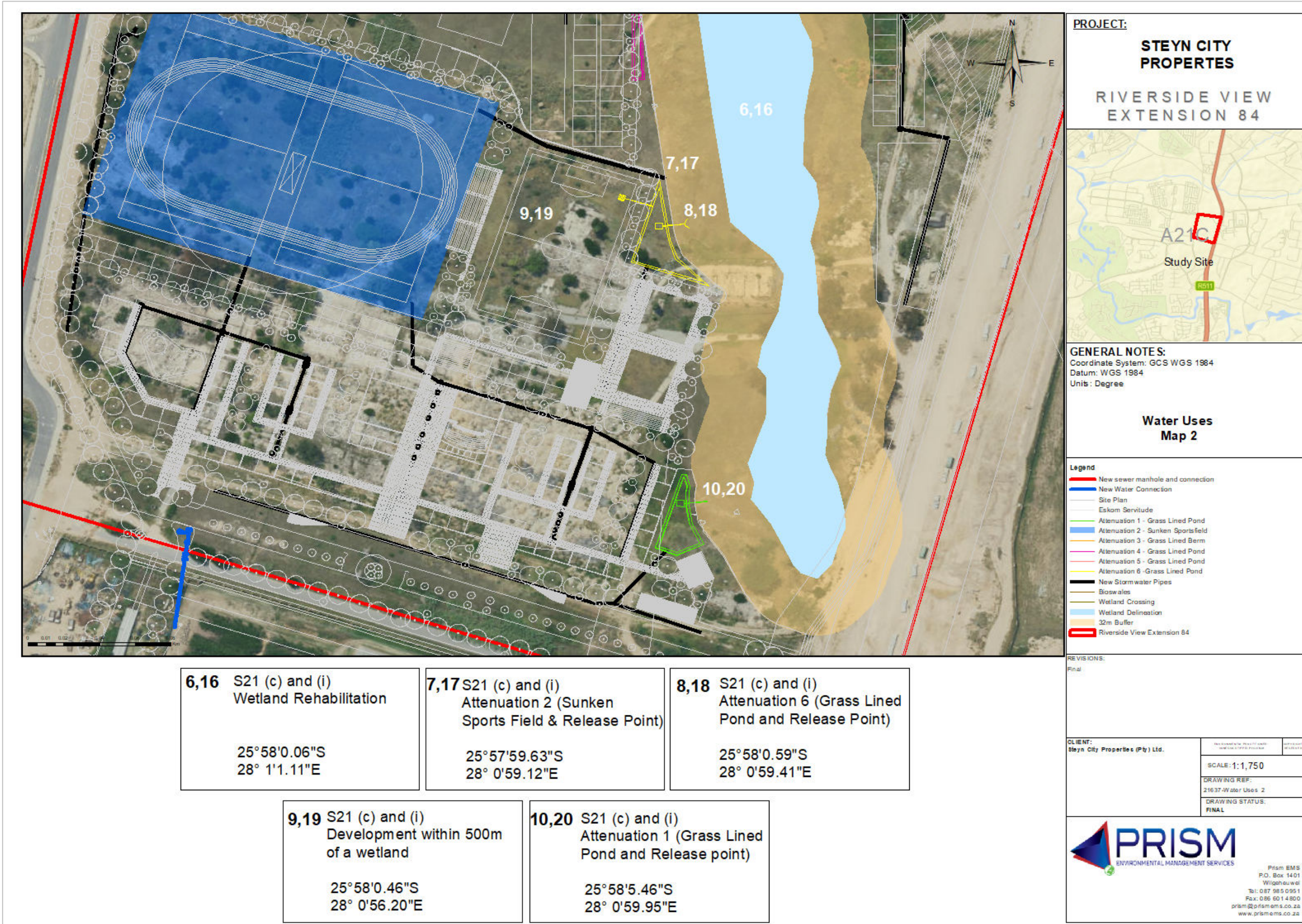


Figure 5-12: Water Uses Map 2

Table 5-5: Details of the water uses being applied for

Form Ref (Related to Online System*)	Map	Property Details	Water Use	Description of Water Use	Dimensions (m / m ³)/Details	Purpose	Co-ordinates		QC
							Start	End	
1, 11	Map 1	Portion 124 of the Farm Diepsloot 388 JR	Section 21(c) and (i)	Attenuation 3 (Grass Lined Berm and release point)	1.7m high grass lined berm to collect surface sheet flow with outlet structure built outside Eskom Servitude Stored Volume at 1.7m = 1185 m ³ .	To properly manage stormwater on the site.	25°57'50.88"S 28° 1'1.22"E	25°57'49.54"S 28° 0'57.63"E	A21C
2, 12				Sewer Manhole and Connection	Connection to existing 200mm diameter sewer line. New manhole to be put in place. Connection is 8m in length	To provide sewer services to the development.	25°57'50.75"S 28° 1'0.71"E	25°57'50.96"S 28° 1'0.55"E	
3, 13				Attenuation 5 (Grass Lined Pond and Release Point)	1.5m high Grass lined attenuation pond. Stored volume at 1.5m = 290 m ³ .	To properly manage stormwater on the site.	25°57'54.42"S 28° 1'2.15"E	25°57'55.51"S 28° 1'2.86"E	
4, 14		Portion 124 and Portion 185 of the Farm Diepsloot 388 JR		Wetland Crossing	This crossing will involve the development of a road-bridge which will allow for the 1:100-year flow of 8.7 m ³ /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.	To provide access between Erf 1 and Erf 2	25°57'55.86"S 28° 1'2.95"E	25°57'54.57"S 28° 0'58.46"E	
5, 15				Attenuation 4 (Grass Lined Pond and Release Point)	1.5m high Grass Lined Attenuation Pond Stored Volume at 1.5m = 366m ³	To properly manage stormwater on the site.	25°57'55.57"S 28° 0'59.16"E	25°57'57.83"S 28° 0'58.62"E	
6, 16	Map 2	Portion 185 of the Farm Diepsloot 388 JR		Wetland Rehabilitation	Wetland Rehabilitation will be undertaken as per the Aquatic Resources Rehabilitation Plan	To improve the current functioning of the wetland.	25°58'0.06"S 28° 1'1.11"E		
7, 17				Attenuation 2 (Sunken Sports Field) and Release Point	Sports field sunken by 0.5m with a grass lined berm on the bottom half of the field to create temporary storage Stored Volume at 0.5m = 1210m ³	To properly manage stormwater on the site.	25°57'59.63"S 28° 0'59.12"E	25°58'0.14"S 28° 0'48.59"E	
8, 18		Attenuation 6 (Grass Lined Pond and Release Point)		0.3m high Grass Lined Attenuation Pond Stored Volume at 0.3m = 200m ³	To properly manage stormwater on the site.	25°58'0.59"S 28° 0'59.41"E	25°58'1.17"S 28° 0'58.66"E		
9, 19		Portion 124 and Portion 185 of the Farm Diepsloot 388 JR		Development within 500m of a wetland	Development of Riverside View Extension 84 including roads and internal services	To provide an all phase school as well as Residential, Storage and Offices with ancillary Shops and Restaurants uses storage, residential, offices	25°58'0.46"S 28° 0'56.20"E		
10,20		Portion 185 of the Farm Diepsloot 388 JR		Attenuation 1 (Grass Lined Pond and Release Point)	1m high Grass Lined Attenuation Pond 1 Stored Volume at 1.0m = 457m ³	To properly manage stormwater on the site.	25°58'5.46"S 28° 0'59.95"E	25°58'6.30"S 28° 0'58.91"E	

*Please note as per the requirements of the online system, a separate activity number is provided for Section 21 (c) and (i) activities.

6 PROFILE OF THE RECEIVING ENVIRONMENT

6.1 Local Climate

The climatological data for the Chartwell area is provided below.

6.1.1 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) (Error! Reference source not found.).

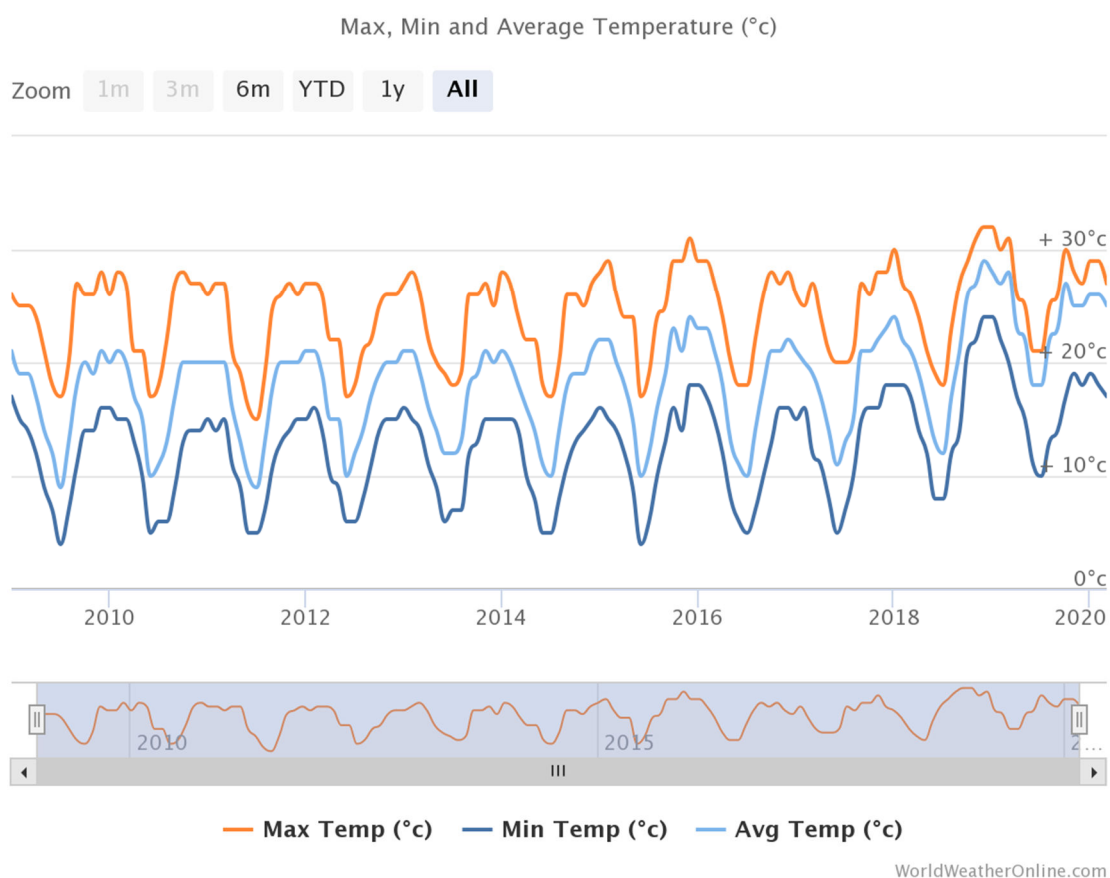


Figure 6-1: Minimum, Maximum and Average Temperatures for Chartwell, Gauteng (www.worldweatheronline.co.za).

6.1.2 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 6-2 below shows the average rainfall in Chartwell, Gauteng for the period 2009 to 2020.

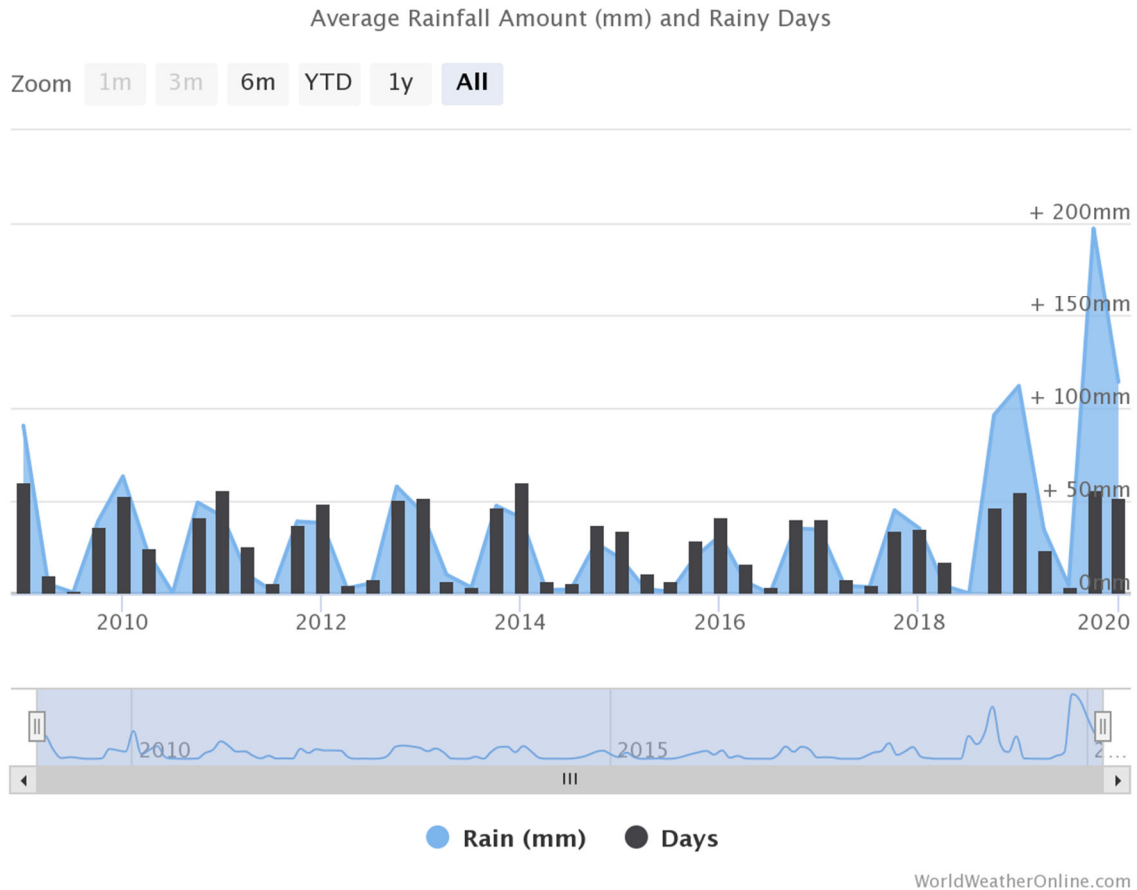


Figure 6-2: Average Rainfall Amount (mm) and Rainy Days (World Weather Online)

6.2 Surface Water

Information on the status of the surface water environment is provided in the subsections that follow. Where applicable, information has been sourced from the Wetland Assessment undertaken by Prism EMS in 2020 (**Annexure 10.3**).

6.2.1 Desktop Assessment

As part of the Wetland Assessment, a desktop assessment was undertaken. 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).

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 6-3). In addition, a Flow Accumulation Model and Quantitative Flow Model was undertaken using GIS and showed the accumulation of water in the wetland system and flow quantitatively through the wetland system respectively (Figure 6.4 and Figure 6.5)

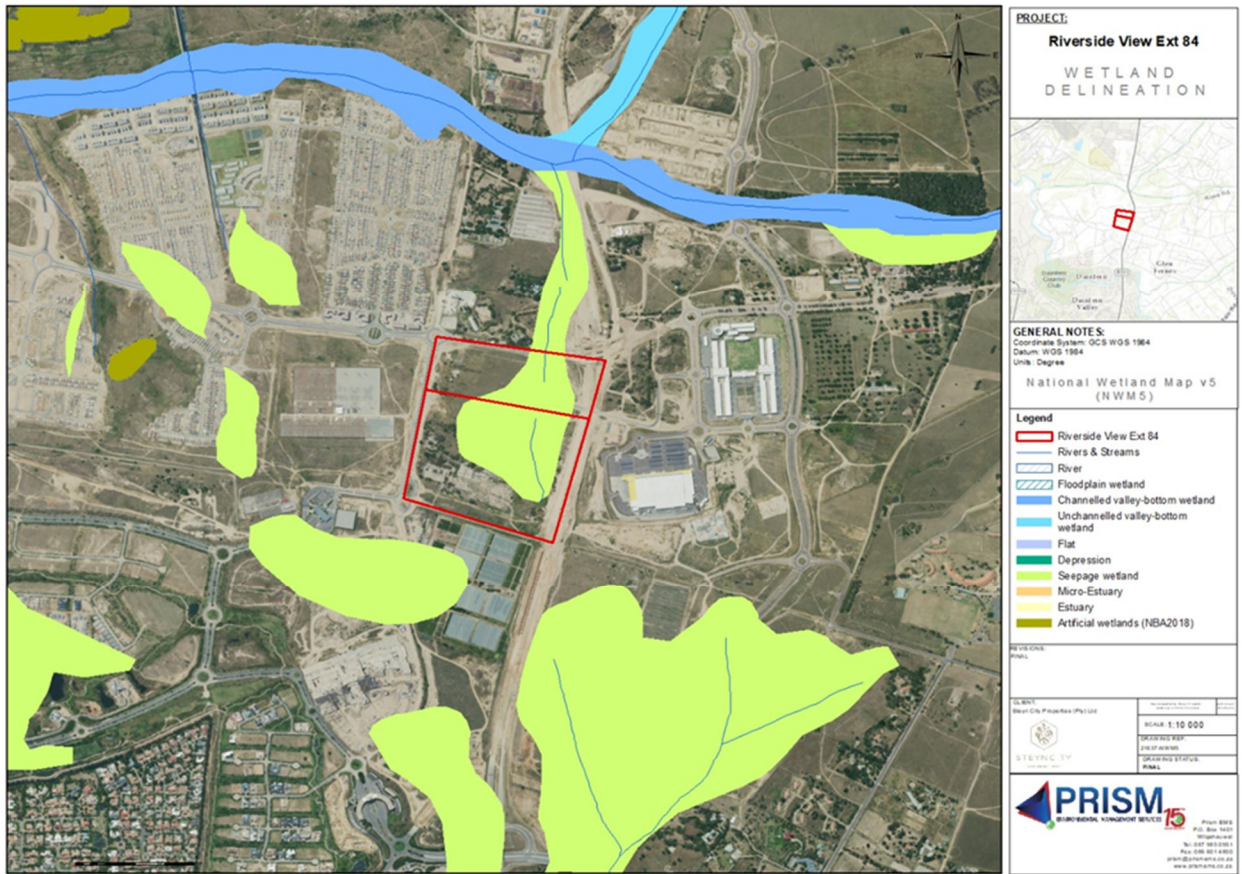


Figure 6-3: National Wetland Map version 5 (NWM5) (Van Deventer et al., 2019).

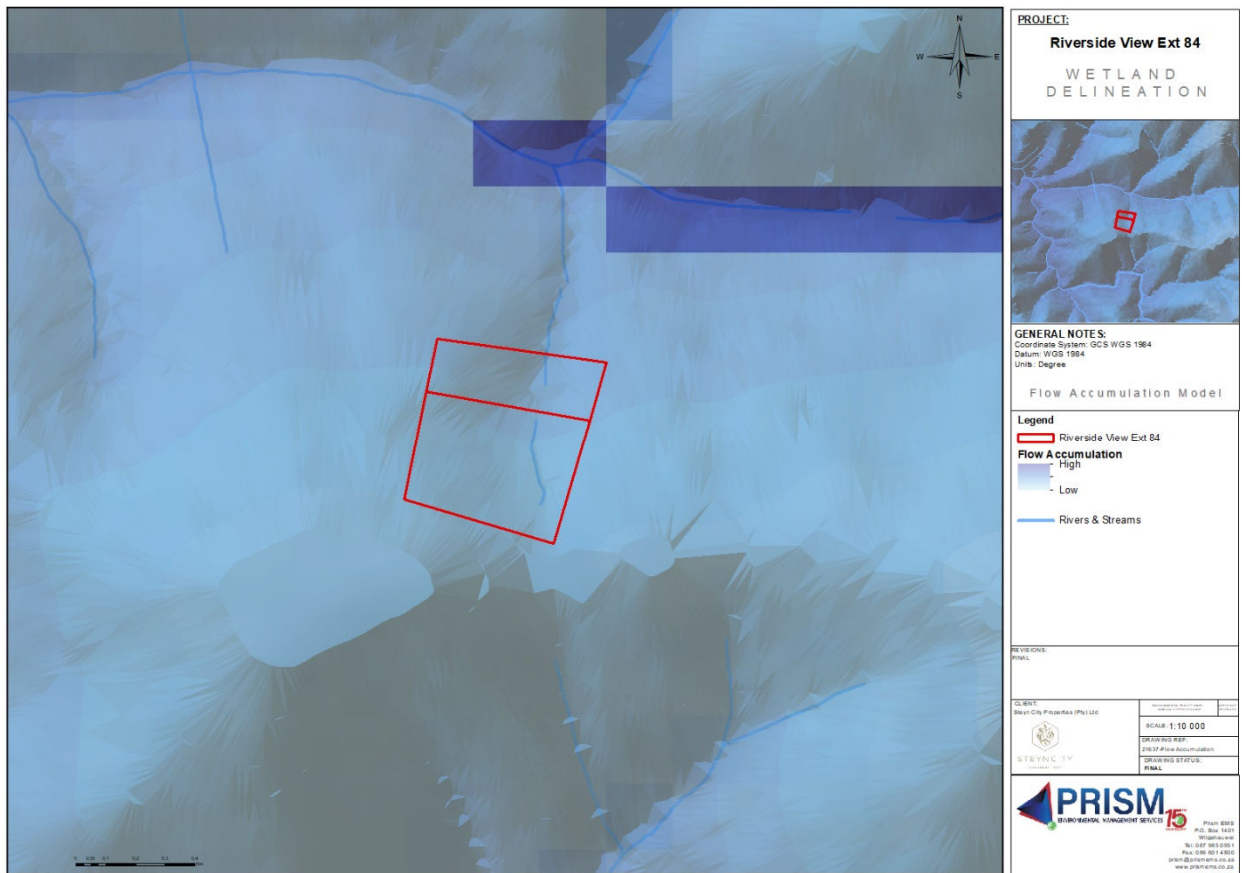


Figure 6.4: Flow Accumulation Model.

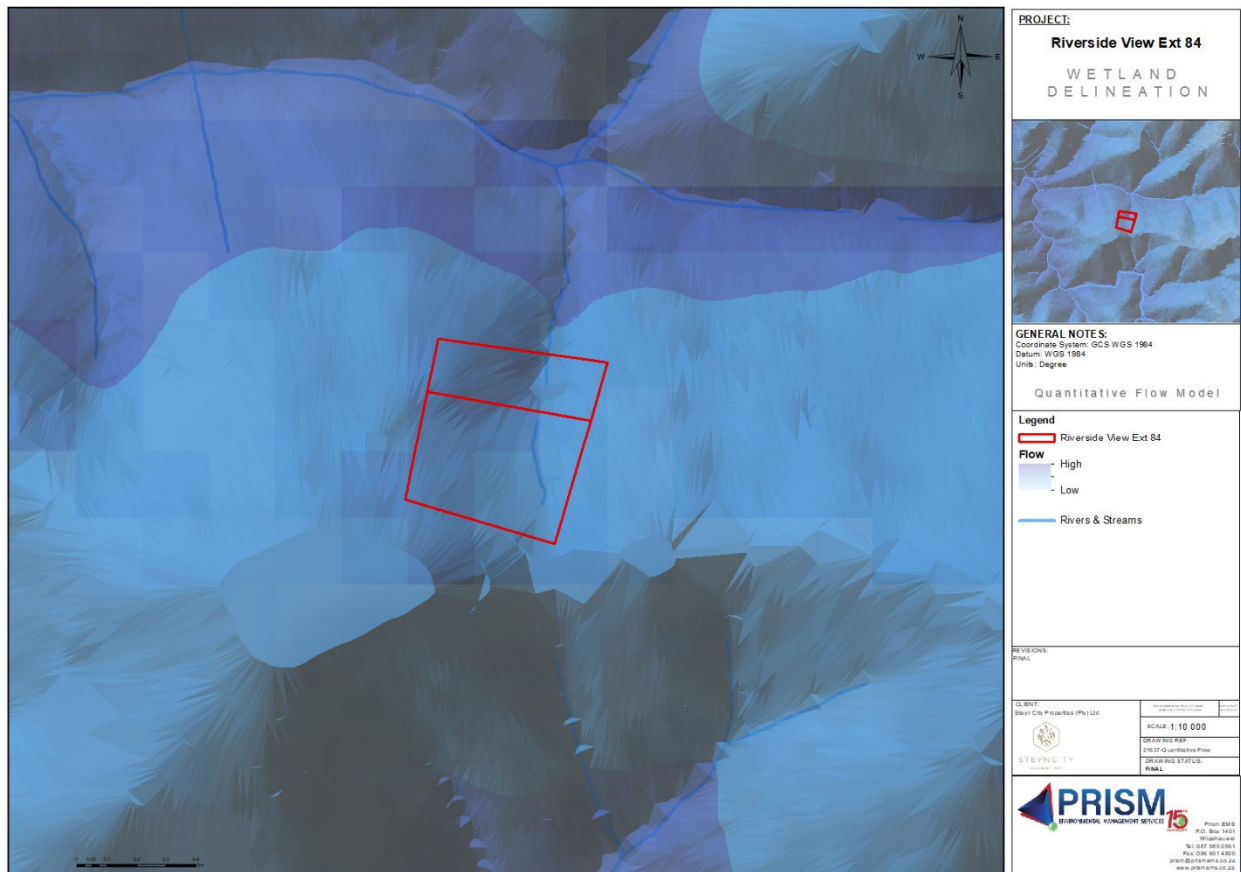


Figure 6.5: Quantitative Flow Model.

6.2.2 Field Investigation

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. The field investigations concluded that one natural wetland unit could be recorded as per the DWAF, 2005 guidelines (**Error! Reference source not found.**). A 32m wetland buffer was also delineated and is also indicated. The wetland found:

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

The PES (Present Ecological State), Ecological Importance and Sensitivity (EIS) and Recommended Ecological Classification (REC) were determined as follows:

- 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

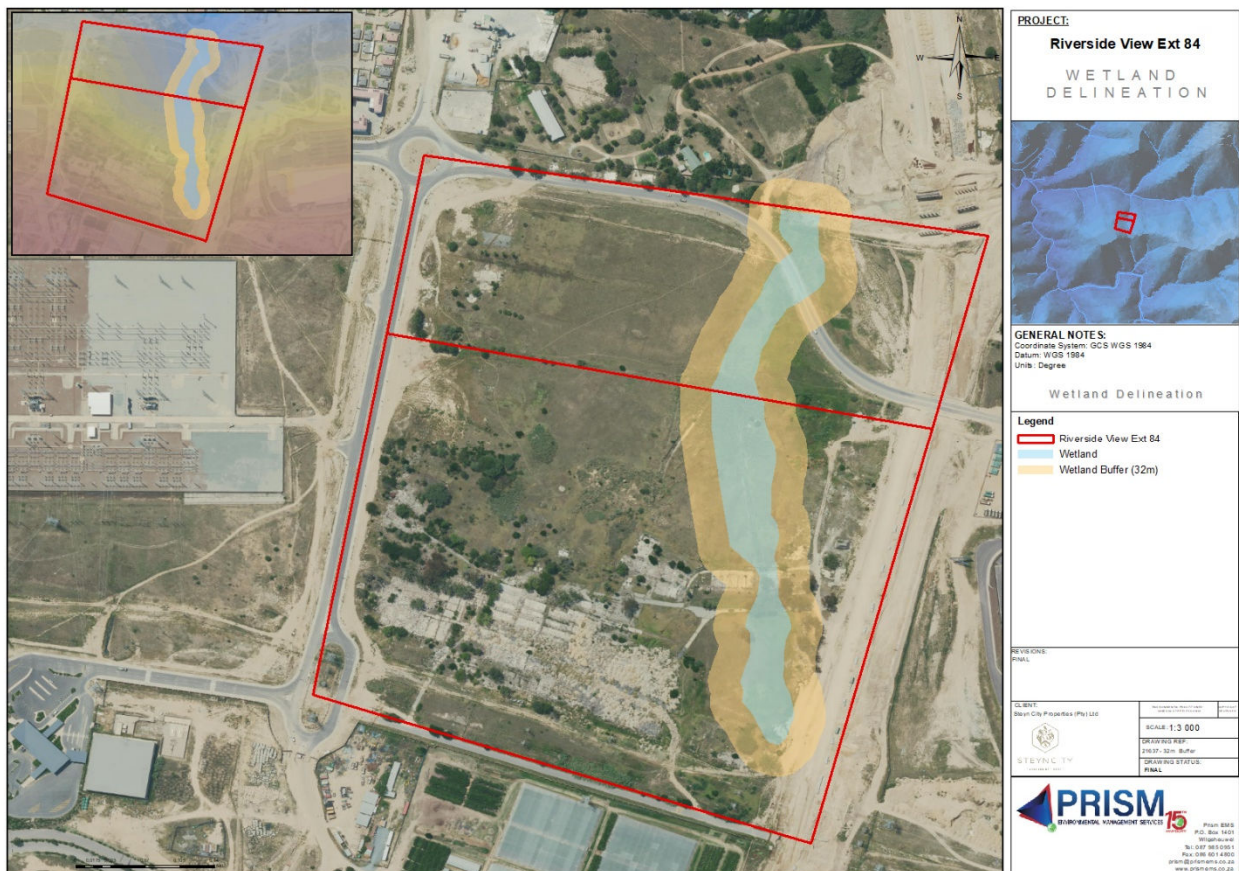


Figure 6.6: Wetland Buffer Zones

6.3 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.

6.3.1 City of Johannesburg Socio-Economic Environment

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 6-7 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).

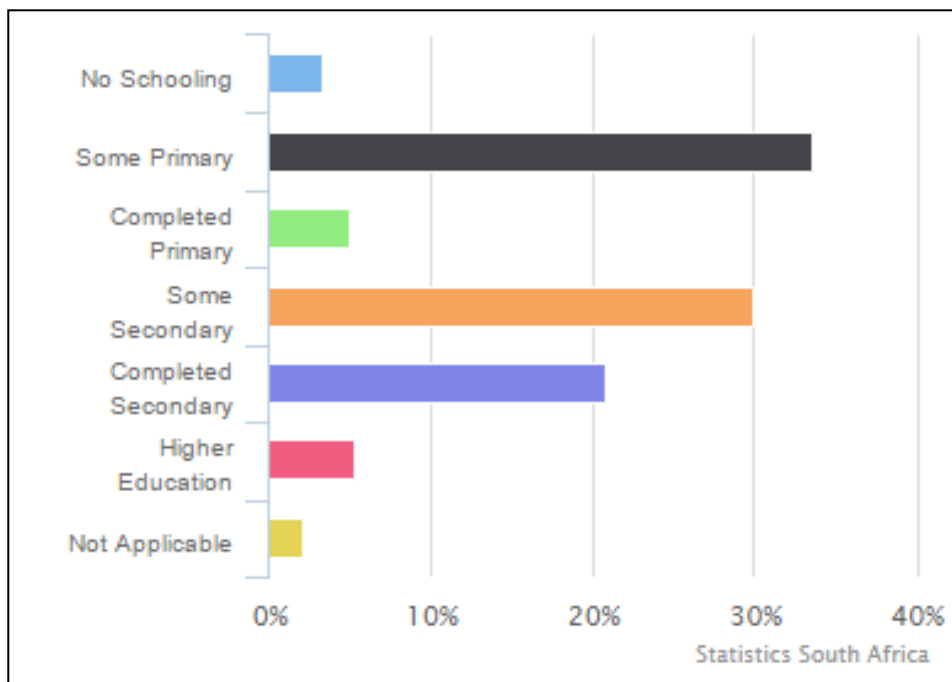


Figure 6-7: Highest Education Level (All Ages) (Stats SA, 2017).

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 6-8). 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).

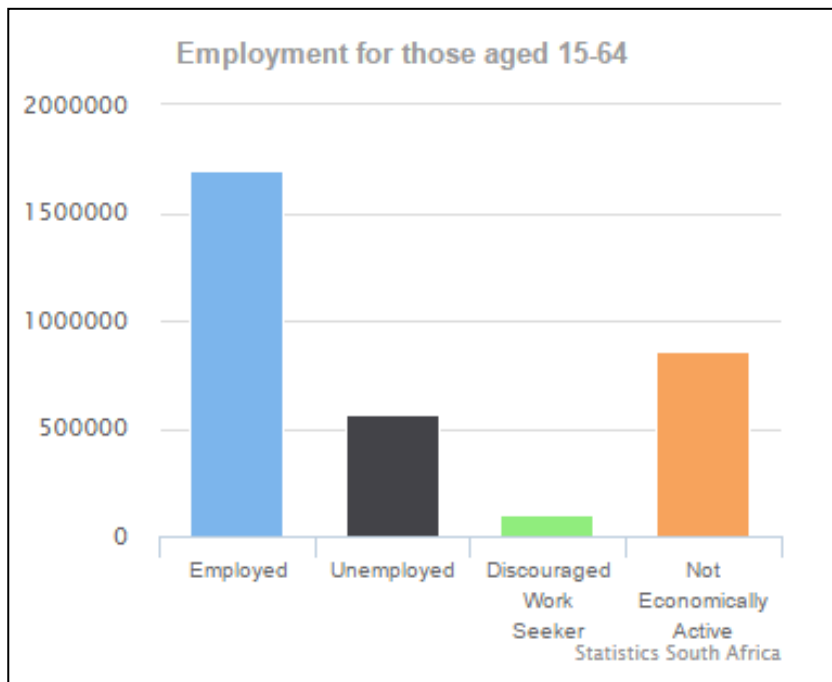


Figure 6-8: Employment for those aged 15-64 (Stats SA, 2017)

6.3.2 Planning Documents

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:

6.3.3 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.

6.3.4 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 6-9 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.

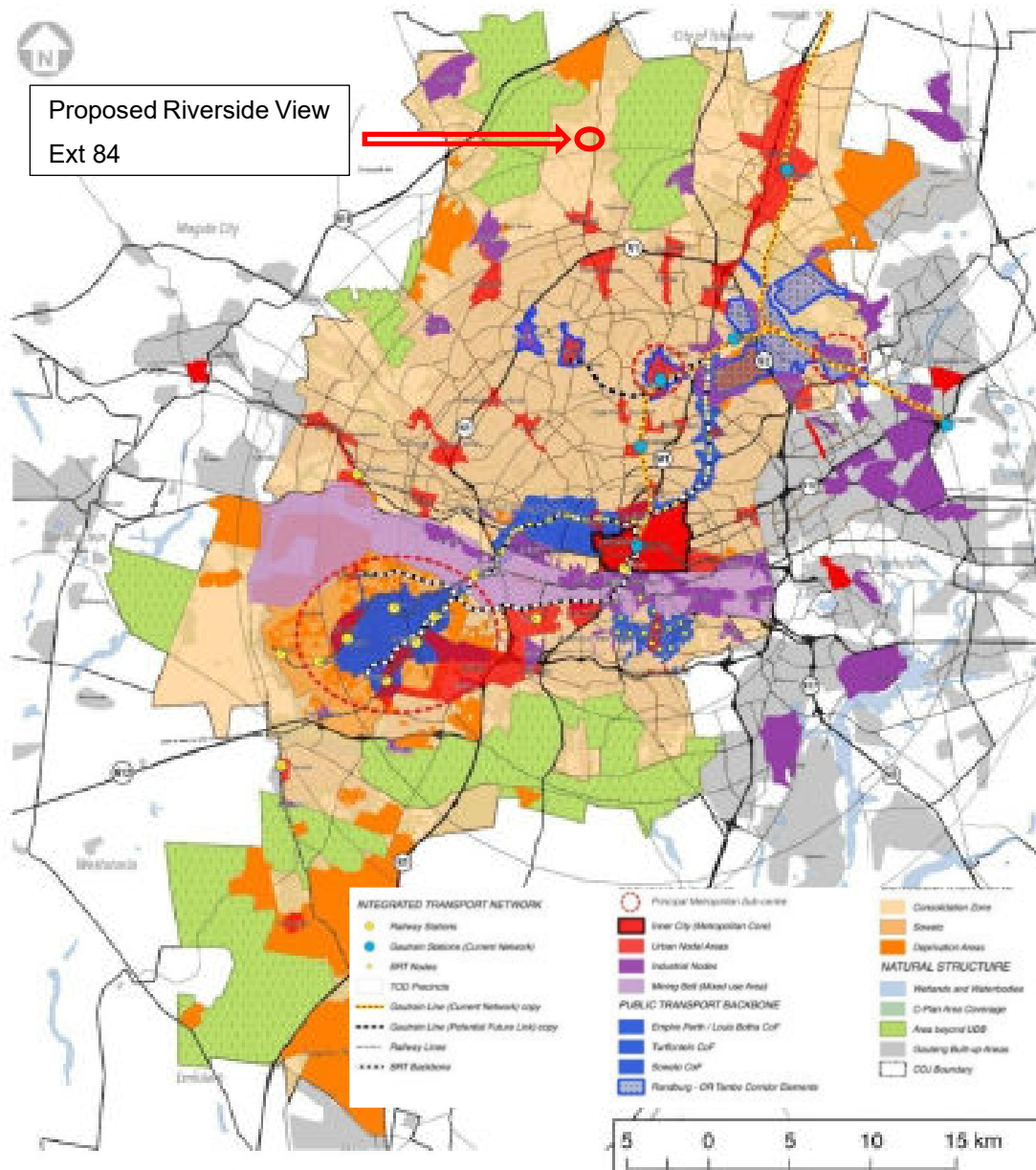


Figure 6-9: COJ SDF 2040

6.3.5 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).

6.3.6 Socio-Economic Motivation

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.

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. Whilst an approved site occurs within the Steyn City development, this site is not ideal due to its size and location.

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.

7 ALTERNATIVES ASSESSED AS PART OF THE EIR

In line with the EIA Regulations, 2014, a number of alternatives have been assessed for the proposed development. These are pertinent to the WULA process as well and 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.

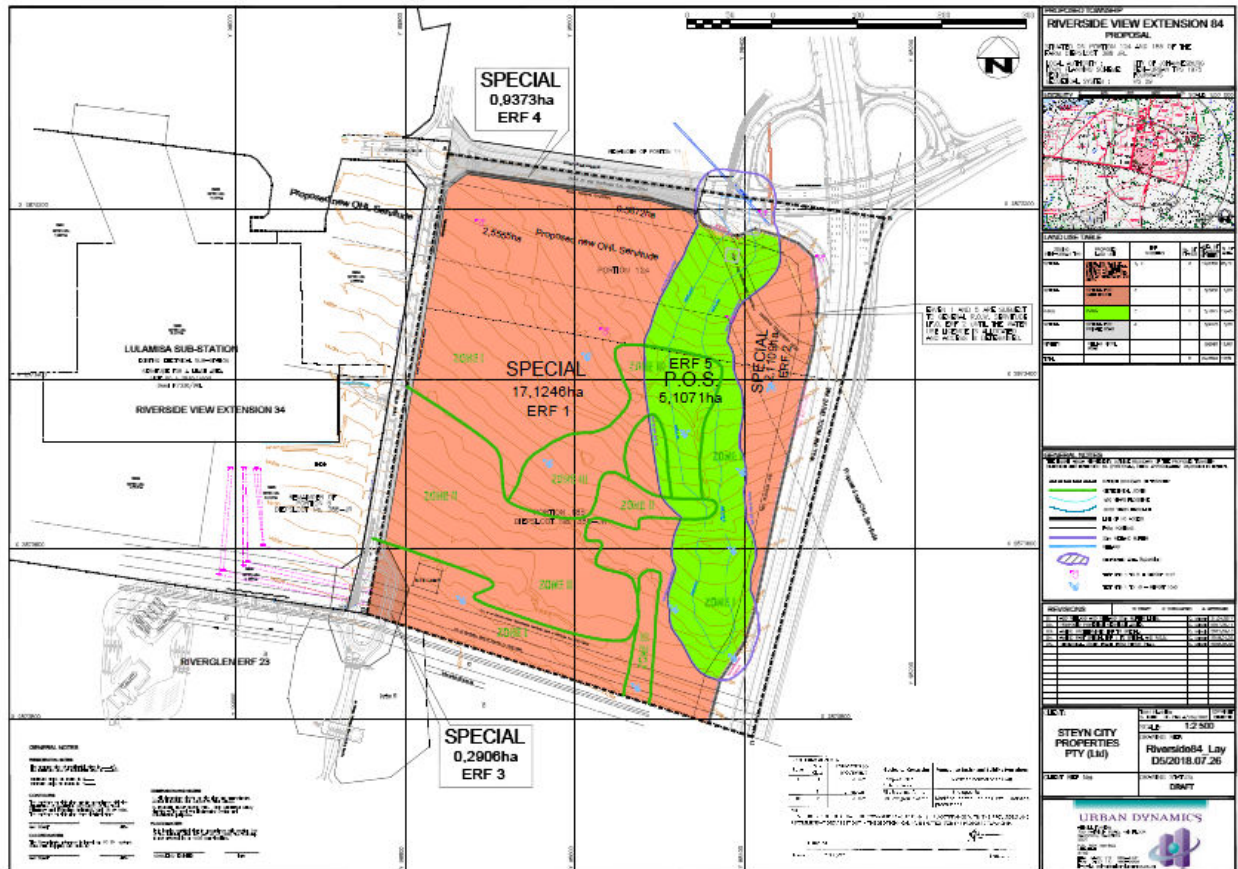


Figure 7-1: Proposal

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.

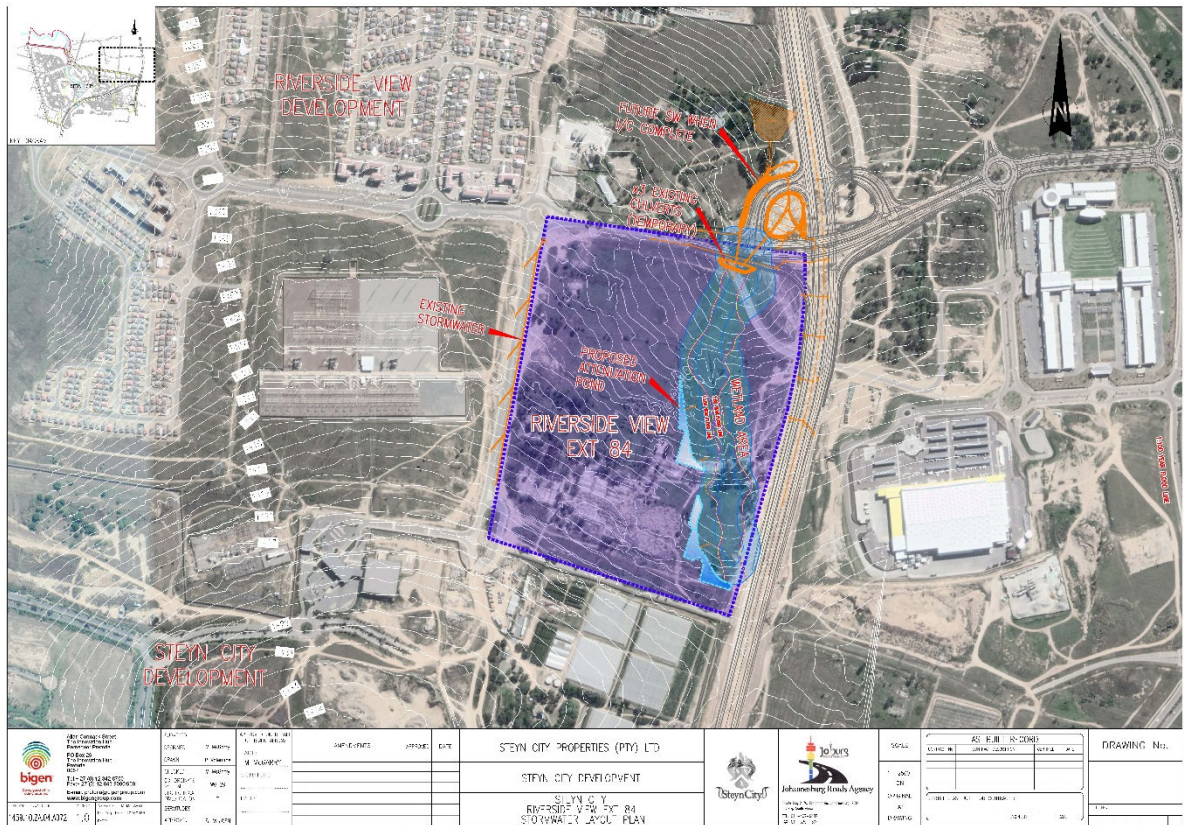


Figure 7-3: Proposal – Attenuation Pond along Wetland

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.

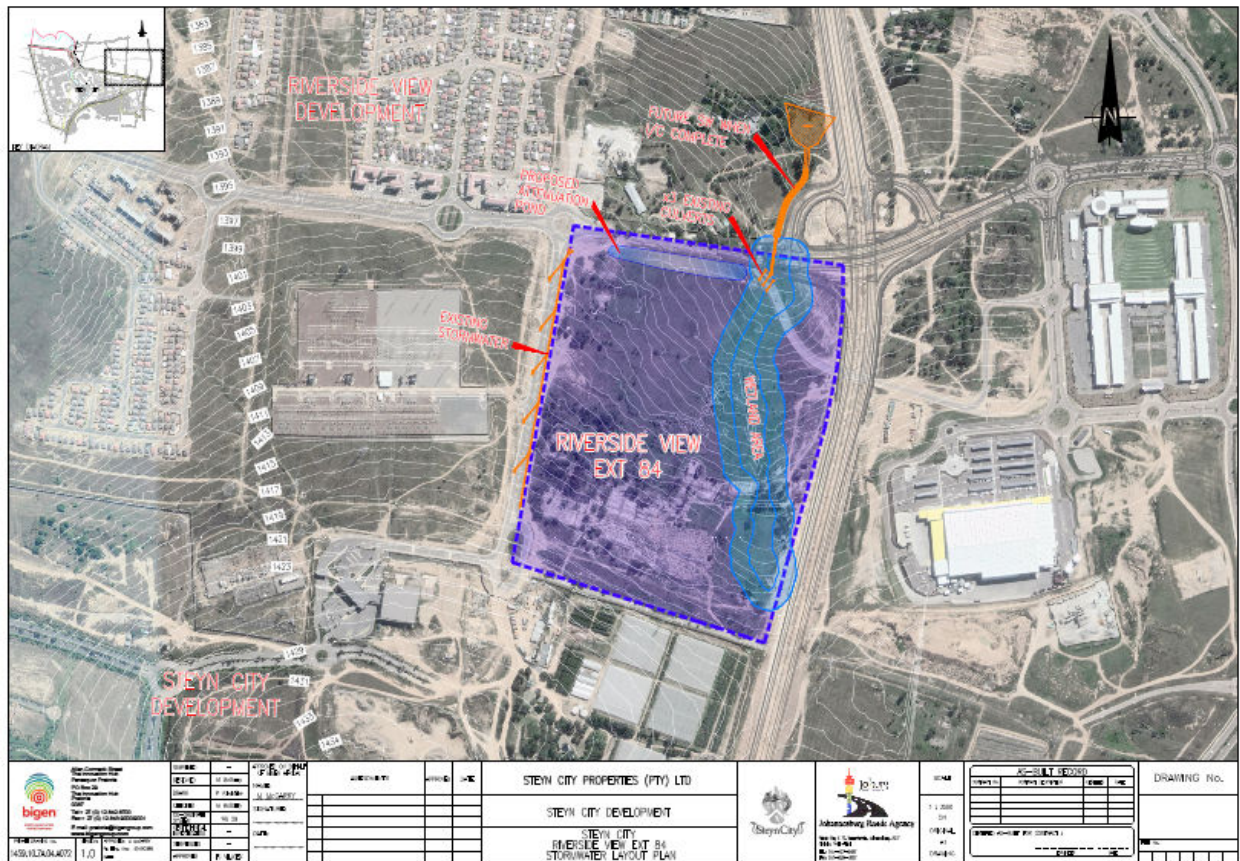


Figure 7-5: Alternative - Attenuation Pond to the north of the site

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.

7.3.1 Environmental Impact Statement

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 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 additional 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

Two proposed layouts were assessed. The layout proposal involves the development of 3 separate erven (Erf 1 and 2 will be zoned "Special" whilst Erf 3 will be 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. This is preferred as it allows for one consolidated erf that is large enough for an all-phase school. It also allows for only one connection point to services. Access to the development is also simplified. In addition, two stormwater layouts were also assessed. The proposal was developed as a result of discussions with the wetland specialist who 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. This Proposal was further developed as part of the SWMP. To the end, additional attenuation is provided as part of the sports field, and on the eastern side of the wetland. Due to the provision of multiple release points which mimic existing wetland conditions, the Proposed Attenuation is preferred.

7.3.1.1 Need for the Project

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.

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.

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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.

7.3.1.2 Sensitivity

A Wetland Assessment was 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 EMP. The specialist noted that the project can be supported should all the mitigation measures be implemented and monitored against.

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.

7.3.1.3 Impact Assessment

A detailed impact assessment has been undertaken and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (Refer to EIR). Most impacts have a low significance once mitigation measures were applied. The following can be noted in terms of impacts to the Wetland:

- 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.

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 Layout Proposal and Stormwater Proposal should be authorised.**

In addition, to the above impact statement, a risk matrix in terms of the GN 509 of 2016 has been compiled to better understand the risks associated with the proposed development. However as discussed previously, due to the fact that sewer activities are included the GA. Furthermore, the development of a wetland crossing will likely have a moderate impact. This can be mitigated but remains with the moderate level during construction. Impacts are all low during operation. A summary is provided in Table 7-1 below and the full risk assessment in **Annexure 10.17**.

Table 7-1: Risk Matrix summary

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	PES of Watercourse	EIS of Watercourse
1	(c) and (i)	Construction	Construction of School, Offices, Fields, Residential units, roads and associated services within 500m of a wetland	Clearing of vegetation and general construction works within 500m of a wetland	Loss of biodiversity and habitat	52	L	E - Seriously modified	Moderate
					Siltation	55.25	L	E - Seriously modified	Moderate
					Erosion	42.25	L	E - Seriously modified	Moderate
					Increased turbidity	45.5	L	E - Seriously modified	Moderate
					Flow modification	55.25	L	E - Seriously modified	Moderate
					Geology and Soils, impact on topography and loss of top soil.	55.25	L	E - Seriously modified	Moderate
2	(c) and (i)	Construction	Construction of Wetland Crossing	Clearing of vegetation and general construction works within wetland	Loss of biodiversity and habitat	105	M	E - Seriously modified	Moderate
					Siltation	105	M	E - Seriously modified	Moderate
					Erosion	105	M	E - Seriously modified	Moderate
					Increased turbidity	105	M	E - Seriously modified	Moderate
					Flow modification	105	M	E - Seriously modified	Moderate

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	PES of Watercourse	EIS of Watercourse
					Geology and Soils, impact on topography and loss of top soil.	101.25	M	E - Seriously modified	Moderate
3	(c) and (i)	Construction	Construction vehicles and equipment on site.	Waste water discharge from hydrocarbon spills within 500m of a wetland	Water quality issues	45.5	L	E - Seriously modified	Moderate
4	(c) and (i)	Construction	Concrete mixing	Waste water discharge from concrete mixing within 500m of a watercourse	Water quality issues	45.5	L	E - Seriously modified	Moderate
5	(c) and (i)	Operation	Routine maintenance as and when required.	Maintenance of residential development, stormwater attenuation and associated services	Siltation	24	L	E - Seriously modified	Moderate
					Erosion	24	L	E - Seriously modified	Moderate
					Increased turbidity	24	L	E - Seriously modified	Moderate
					Flow modification	24	L	E - Seriously modified	Moderate
6	(c) and (i)	Operation		Increased stormwater	Siltation	42.75	L	E - Seriously modified	Moderate

No.	Section 21 water uses	Phases	Activity	Aspect	Impact	Significance	Risk Rating	PES of Watercourse	EIS of Watercourse
			Management of stormwater on site	due to development (please note that water is attenuated according to SUDS principles, please refer to Stormwater Management Plan).	Change to hydrological regime and increased potential for erosion	45	L	E - Seriously modified	Moderate
					Increased turbidity	40.5	L	E - Seriously modified	Moderate
					Flow modification	45	L	E - Seriously modified	Moderate
					Diversion and increased velocity of surface water	45	L	E - Seriously modified	Moderate

8 PUBLIC PARTICIPATION

Public Participation has been conducted in line with the Regulations regarding the Procedural Requirements for Water Use License Applications and Appeals (R. 267 of 24 March 2017). All public participation has been integrated with the EIR. A public participation report has been compiled and is included in **Annexure 10.7**.

9 CONCLUSION

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.

A number of specialist studies were undertaken to determine the potential impact including a Wetland Assessment which found that whilst the development would impact the wetland, this impact could be mitigated satisfactorily. In addition, there are a number of socio-economic benefits associated with the development. These include the necessary provision of a required School to support the Steyn City Lifestyle Estate. In addition, 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. Further, 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.

A detailed impact assessment has been undertaken and assessed the types of impact, duration of impacts, likelihood of potential impacts as well as the overall significance of the impact occurring (Refer to EIR). Most impacts have a low significance once mitigation measures were applied. The following can be noted in terms of impacts to the Wetland:

- 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.

Based on the mitigation measures included in the EMP, Monitoring Plan and Rehabilitation Plan, it is the recommendation of the EAP that the WUL for the proposed development be authorised. The following recommendations accompany this recommendation:

- Monitoring should be undertaken as per the requirements of the Monitoring Plan and should include the following:
 - Wetland Assessment:
 - 1 Post construction assessment
 - ECO Site Inspections
 - Weekly inspections and monthly reporting
 - Water Use Licence Compliance Audits
 - As per the WUL Requirements
 - Closure audit (within 6 months of construction completion)
 - Rehabilitation Audit
 - 1 audit to be undertaken during each phase (pre-construction, construction and post construction).
- Rehabilitation of impacted areas must be undertaken as per the requirements of the Rehabilitation Plan. In particular, the following should be undertaken:
 - 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.

- Construction must be undertaken in line with the requirements of the WUL, EA and EMPr.
- The Licensee must conduct an annual internal audit on compliance with the conditions of license. A report on the audit shall be submitted to the Provincial Head within one month of the finalization of the audit.
- The Licensee must appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this license. The first audit must be conducted within 6 (six) months from the date of commencement of construction activities on site. The report on the audit shall be submitted to the Provincial Head within one month of finalization of the report.
- The Licensee shall notify the Department of the commencement of activities.
- Any incident that causes or may cause water pollution must be reported to the Provincial Head or his/her designated representative within 24 hours.

10 ANNEXURES

10.1 Curriculum Vitae of Assessor and Specialists

To prevent duplication, please refer to Appendix 14.1 of the EIR

10.2 Procedural Requirements

10.2.1 Pre-Application Enquiry

10.2.2 Confirmation of WUL Process

No correspondence has been received as of yet due to issues with the EWULAAS website followed by the lockdown period.

10.2.3 Email Confirmation – Site Visit and Information Requirements

No correspondence has been received as of yet due to issues with the EWULAAS website followed by the lockdown period. No Site visit has taken place as of yet.

10.3 Specialist Studies

10.3.1 Wetland Assessment

To prevent duplication, please refer to Appendix 14.6 of the EIR

10.3.2 Geotechnical Assessment

To prevent duplication, please refer to Appendix 14.6 of the EIR

10.3.3 Traffic Impact Assessment

To prevent duplication, please refer to Appendix 14.6 of the EIR

10.4 Mapping

10.5 Masterplan

10.6 Site Photographs

10.7 Public Participation Report

10.8 Environmental Management Programme

To prevent duplication, please refer Appendix 14.8 of the EIR

10.9 Rehabilitation Plan

To prevent duplication, please refer Appendix 14.6 of the EIR

10.10 Monitoring Plan

To prevent duplication, please refer Appendix 14.6 of the EIR

10.11 Construction Methodology/Method Statement

10.12 Construction Management Plan

10.13 Civil Reports and Designs

To prevent duplication, please refer Appendix 14.6 of the EIR

10.14 Section 27 Motivation

10.15 Stormwater Report

To prevent duplication, please refer Appendix 14.6 of the EIR

10.16 Environmental Impact Assessment

The WULA technical report forms part of the EIR which is made available for public review. The EIR is therefore not included here to prevent duplication.

10.17 Risk Matrix