

ENVIRONMENTAL MANAGEMENT PROGRAMME
DEVELOPMENT OF RESIDENTIAL INFRASTRUCTURE WITHIN 32M OF TWO WATERCOURSES
IN THE WESTERN PORTION OF SEATON ESTATE (“LALELA” PRECINCT)
KWADUKUZA MUNICIPALITY
DC29/0021/2022



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1.0. PROJECT DESCRIPTION

1.1. BACKGROUND

Sherpa Trade & Invest 31 (Pty) Ltd are the holders of two valid Environmental Authorisations for development in the western portion of Seaton Estate:

- The original Environmental Authorisation for Seaton Estate was granted in 2005 (EIA/4951; area outlined in green in Figure 1). This Environmental Authorisation excluded Portion 143 of Farm Lot 69 No. 917, which was only purchased by Sherpa Trade & Invest 31 in 2018.
- Portion 143 of Farm Lot 69 No. 917 underwent a separate Environmental Impact Assessment and the property was incorporated into Seaton Estate. Environmental Authorisation was granted for the clearance of indigenous vegetation and the development of residential erven on Portion 143 of Farm Lot 69 No. 917 in 2020 (DC29/0009/2019; authorised development footprint shaded in yellow in Figure 1).

The DC29/0009/2019 Environmental Authorisation did not authorise any residential infrastructure within 32m of watercourses in this portion of the Estate. A separate application for Environmental Authorisation is therefore required to specifically assess the development of residential infrastructure within the 32m regulated area in this section of the Estate. Thirteen additional residential erven are proposed within the western portion of Seaton Estate; now known as the “Lalela” precinct. The thirteen additional residential erven are shaded in red in Figure 1.

Figure 2 provides the currently authorised layout for the Lalela precinct (484 residential erven and 6.5 hectares of PUD sites) with the thirteen residential erven still to be authorised outlined in red. Figure 3 provides a more detailed overview of the area applicable to this Environmental Authorisation and EMPr.

1.2. DESCRIPTION OF ACTIVITY

The scope of this EMPr is specific to the thirteen residential erven labelled 1, 3, 4, 10, 11, 18, 19, 44, 45, 52, 79, 80 & 89 in the AF Planning & Chris Krause Land Surveyors Layout Plan included as Figure 2. A more detailed overview of the residential erven is provided in Figures 3 and 4, which shows the environmentally sensitive areas. The remainder of the Seaton West development is covered under the EIA/4951/2005 and DC29/0009/2019 Environmental Authorisations (scope of authorisations shown in Figure 1).

Activities covered in the EMPr are described as follows: the development of 4 505m² of new residential infrastructure to be constructed within 32m of wetlands (680m² of infrastructure being developed within 25m of a hillslope wetland [HGM 3] and 3 825m² of infrastructure being developed within 15m of a valley head seep wetland [HGM 1]).

Figure 1: Western Portion of Seaton Estate Applicable to the DC29/EIA/4951/2005/AMEND/2018/2020/2021 Environmental Authorisation (Green), the DC29/0009/2019/AMEND/2021 Environmental Authorisation (Yellow) and the Thirteen (13) Residential Erven That Are Subject to a Separate Environmental Authorisation Due to Their Location within the 32m Regulated Area (Red).

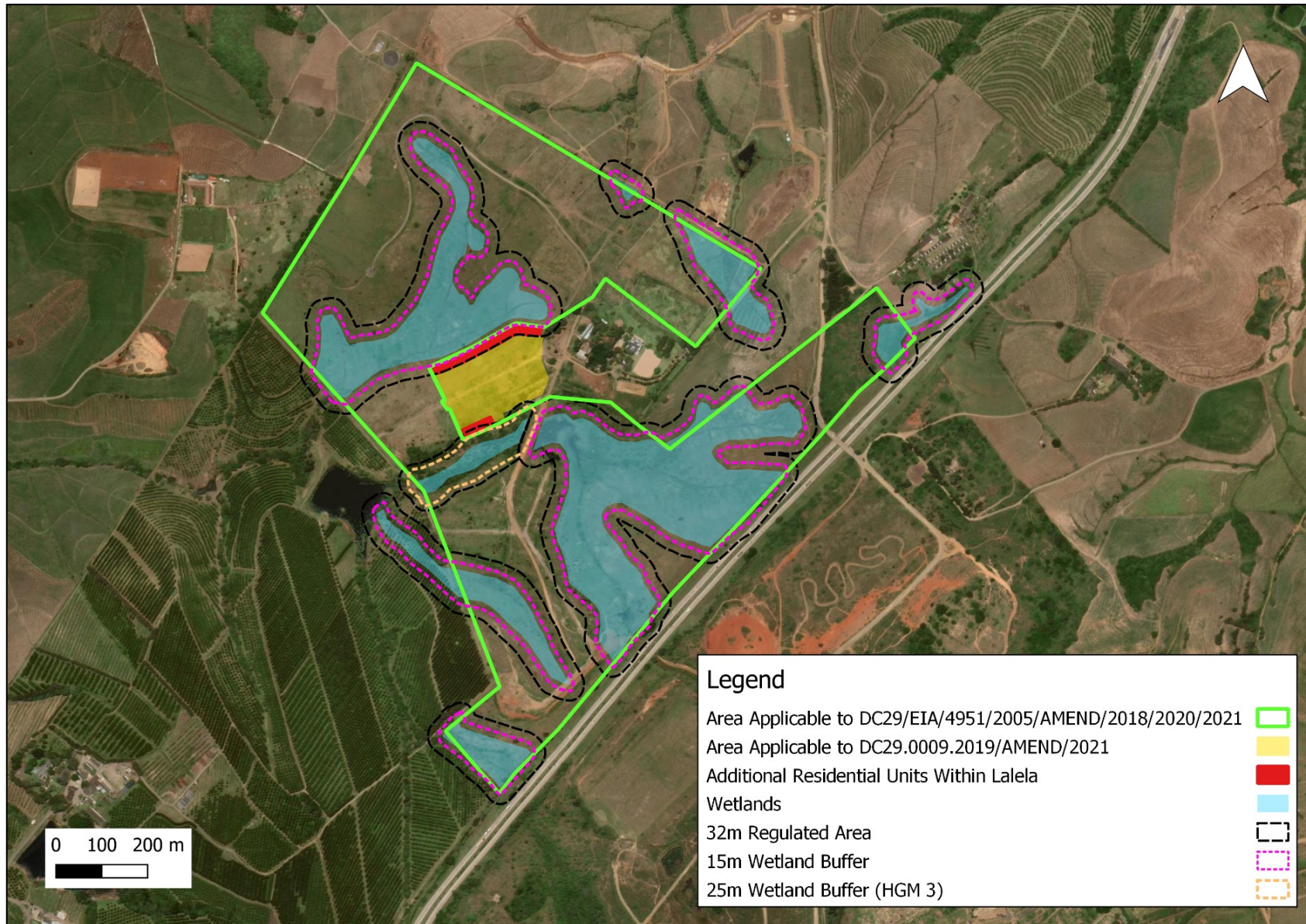


Figure 2: Location of the Thirteen Residential Erven Within Seaton West Which are Subject to a Separate Environmental Authorisation, Outlined in Red. All other erven are authorised under DC29/0009/2019/AMEND/2021 and DC29/EIA/4951/2005/AMEND/2018/2020/2021 (Source: AF Planning and Chris Krause Land Surveyors; 2021)

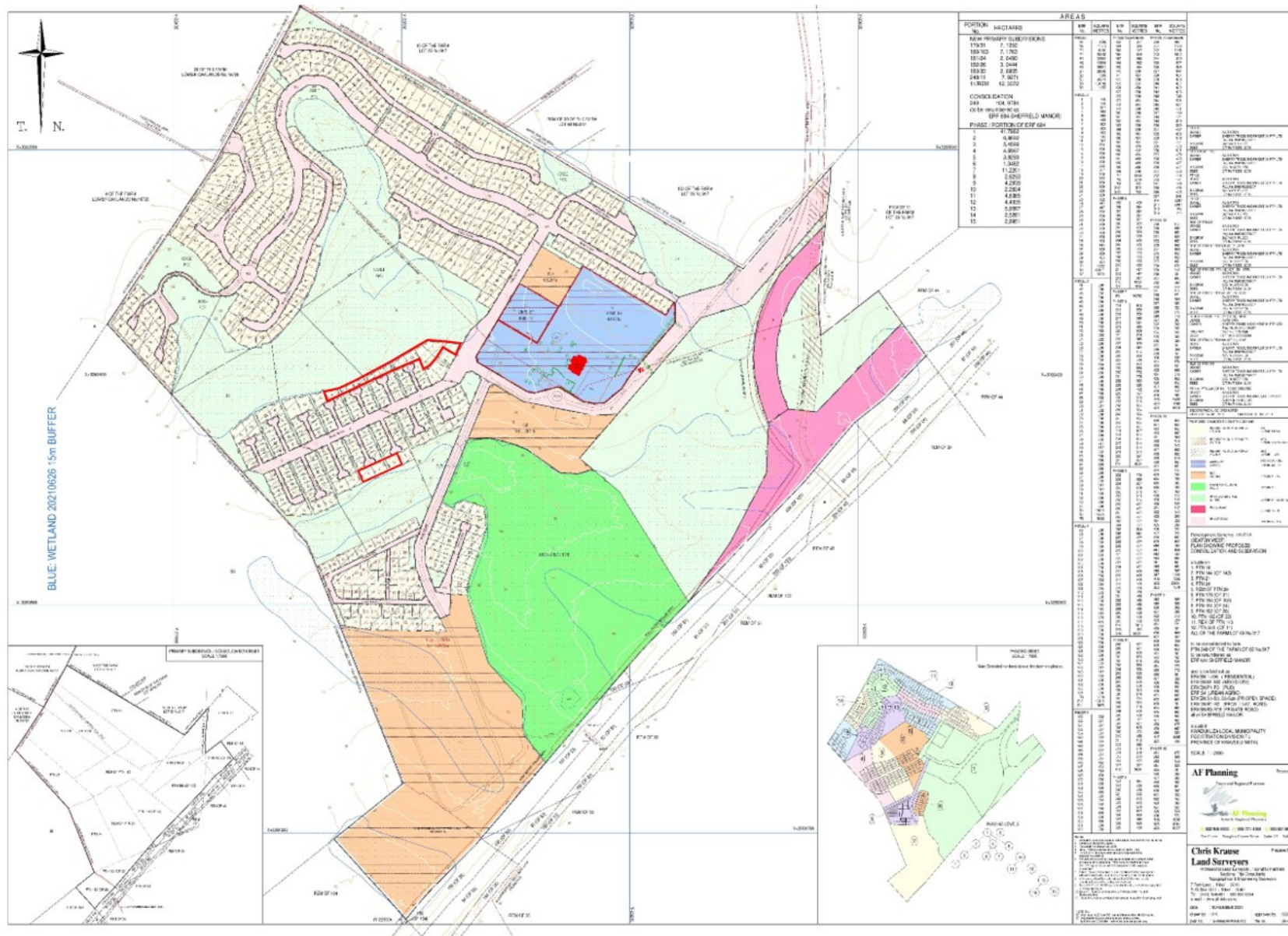
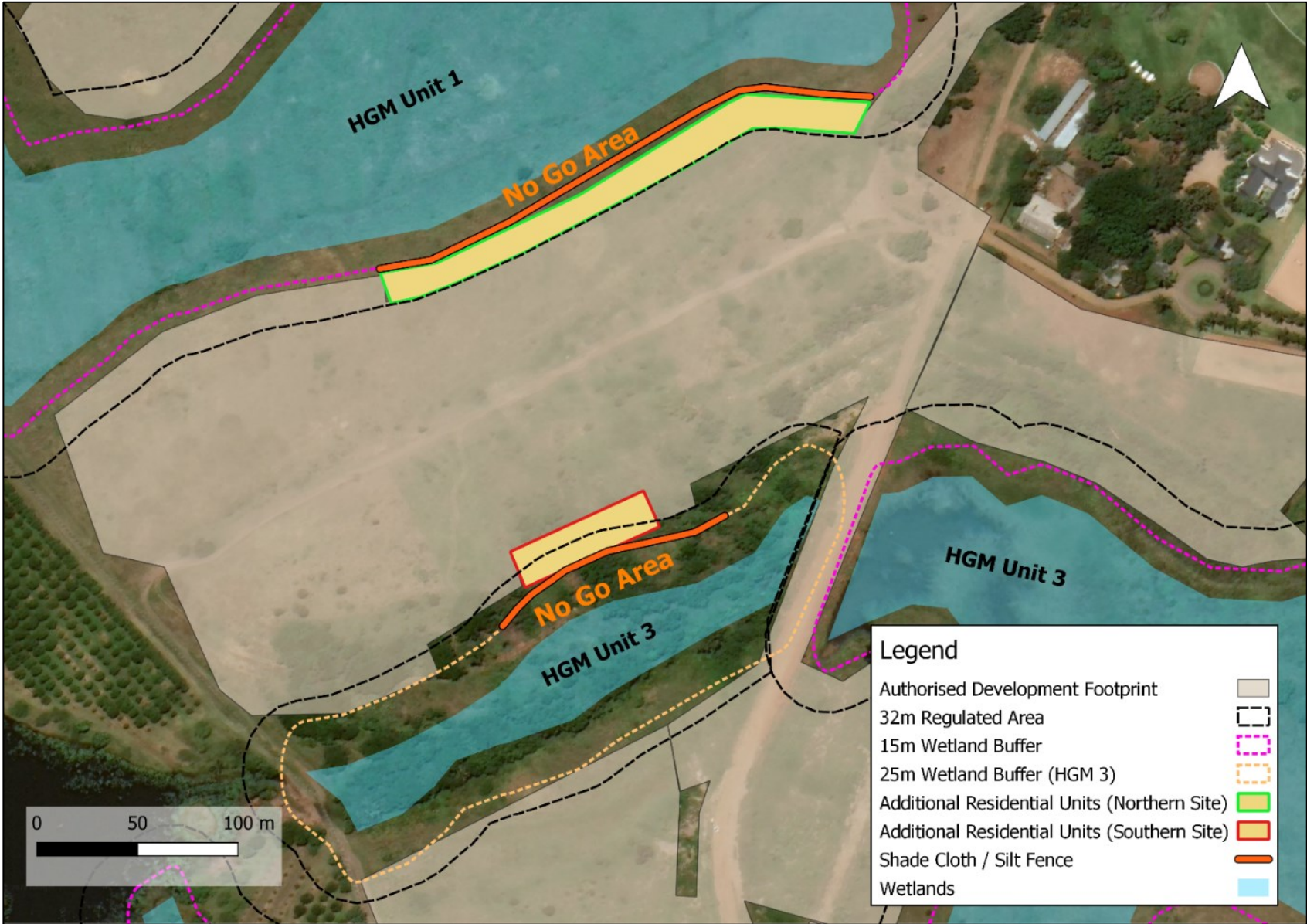


Figure 3: Thirteen Residential Erven Applicable to the DC29/0021/2022 Application and EMPr.



Figure 4: Location of Residential Infrastructure within 32m of Watercourses in the Lalela Precinct of Seaton Including Sensitive Environmental Areas to be Avoided During Construction.



1.3. ENVIRONMENTAL SENSITIVITIES

Prior to development taking place, the study area consisted of old cane land with very little natural habitat. The study area is currently used as an equestrian facility and therefore the grassland is well grazed and has been disturbed and transformed in some areas by the horses. The following sensitive environmental features have been identified within the study and are indicated in Figure 4:

- Several wetland systems originate in Seaton Estate and flow in all directions beyond the Estate boundaries. A 15m buffer is applicable around the wetlands.
- The wetlands and buffers form part of the greater Seaton Estate Open Space System. The Open Space System must remain undeveloped as these areas provide corridors with neighbouring developments.
- The wetlands and Open Space System within Seaton West must be re-vegetated to restore ecological integrity on the site in accordance with the Landscape Philosophy and Concept Master Plan attached under Appendix 1 and the Wetland Rehabilitation Plan under Appendix 2.

Contractors, Homeowners and Occupiers on site must be made aware of the environmental sensitivities and associated buffers. The wetland buffer must be clearly demarcated by the Environmental Control Officer (ECO) prior to construction commencing in that section of the Estate. An Environmental Awareness Plan has been prepared for Contractors working on site (section 5.0 of the EMPr). The Environmental Awareness Plan will form part of the Environmental Induction training prior to work commencing.

1.4. IMPACT MANAGEMENT OUTCOMES

Considering the type of activity and the environmental sensitivities associated with the site, impact management actions were formulated during the Environmental Impact Assessment to avoid, manage and mitigate risks that were identified for the different phases of the activity including planning and design, pre-construction activities, construction activities, rehabilitation / post-construction and operational activities (where applicable). Impact management actions are in place to achieve the following impact management outcomes:

The overall impact management outcome is for the creation of a sustainable development by avoiding ecologically sensitive areas and preventing downstream indirect impacts. This will be achieved through careful management of the construction phase in accordance with the management measures specified in this EMPr and the implementation of the greater Seaton Estate Wetland Rehabilitation Plan (attached as Appendix 2). The implementation of the Wetland Rehabilitation Plan is covered under the EIA/4951/2005 Environmental Authorisation. An improvement in local biodiversity is anticipated with highly invaded areas being rehabilitated with indigenous vegetation and retained as open space.

Table 1: Impact Management Outcomes

Primary Impact Management Outcome: <i>To create a sustainable development by avoiding ecologically sensitive areas and preventing downstream indirect impacts.</i>		
#	Impact Management Outcome	Phase
1	Prevent disturbance to proximal and downstream wetlands during construction.	Construction
2	Stormwater management to reduce flow quantity and velocity discharging into valley lines.	Construction and Operation
3	No long-term, indirect impact on the functioning of the wetland system (on site and further downstream).	Operation

2.0. LEGISLATION

Table 2 provides a list of legislation and municipal planning frameworks which are applicable to the activity. The holder of the Environmental Authorisation, Contractors working on site and Homeowners must be aware of the legal requirements and address non-compliances when they arise.

Table 2: Legislation Applicable to The Construction & Operation of Seaton Estate.

Legislation	Acronym	Comment
National Environmental Management Act (Act No. 107 of 1998 as amended).	NEMA	NEMA provides environmental management principles that are applicable across South Africa to fulfil section 24 of the Constitution, which is the right to “an environment that is not harmful to their health or wellbeing”. Section 24 of NEMA defines the activities requiring Environmental Authorisation and the processes to be followed to obtain Environmental Authorisation (published in the Environmental Impact Assessment Regulations, 2014 as amended). This application triggers Activity 12 in Listing Notice 1 of the Environmental Impact Assessment Regulations, 2014 as amended. A Basic Assessment process is therefore underway to obtain Environmental Authorisation prior to any activities commencing.
National Environmental Management: Waste Act (Act No. 59 of 2008 as amended).	NEM: WA	NEM: WA provides measures to protect health and the environment of South Africa by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that trigger a Waste Management License however measures have been provided in the Environmental Management Programme (EMPr) to ensure that waste management is compliant with the requirements of NEM: WA during the construction and operation of the residential erven.
National Environmental Management Biodiversity Act (Act No. 10 of 2004).	NEM: BA	To manage and conserve South Africa’s Biodiversity and protect species and ecosystems that warrant national protection. As per the findings of the Ecological Assessment, the site is highly transformed, and the vegetation is of low ecological significance. Wetland and drainage features, however, offer some ecological value. The recommended, and previously authorised, 15m wetland buffer has been adhered to. No development falls within the 15m buffer or within any wetland environment. The proposed development does not require any specific permissions in terms of NEM:BA however the landowner must comply with the requirements of the Alien and Invasive Species Regulations (2020) which have been published in terms of section 97(1) of NEM:BA. These regulations categorise invasive species and outlines the way these species must be controlled by landowners. Section 52 of NEMBA allows for the publication of a national list of ecosystems that are threatened and in need of protection. The property is located within the KwaZulu-Natal Coastal Belt Ecosystem which has been identified as “vulnerable” by the South African National Biodiversity Institute (SANBI).
National Environmental Management: Air Quality Act (Act No. 39 of 2004).	NEM: AQA	Regulates air quality to protect the environment by providing measures to prevent pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that trigger an Air Emissions License however measures have been provided in the EMPr to ensure that air quality is managed in line with the requirements of NEM: AQA during the construction and operation of residential erven.
National Water Act (Act No. 36 of 1998) (as amended).	NWA	Provides for fundamental reform of the law relating to water resources. Infrastructure will be constructed within 500m of various watercourses. This area of Seaton Estate has been issued with a Water Use License (Licence No.: 11/U30E/ACI/10565; File No.: 27/2/1/U530/1/4/5/34). This Water Use License is applicable to the previously authorised layout and is in the process of being amended to accommodate the increase in density within the estate including the thirteen residential units applicable to this application.
National Forests Act (Act No. 84 of 1998).	NFA	To conserve and protect natural forests and woodlands as well as ensuring development with principles of sustainable management. The Department of Forestry Fisheries and Environment (DFFE) governs the removal, disturbance, cutting or damaging of protected tree species and natural forests.

		No natural forests or protected tree species will be impacted by the proposed development.
National Heritage Resources Act (Act No. 25 of 1999).	NHRA	For the management of national heritage resources and to nurture and conserve heritage resources so that they may be bequeathed to future generations. The study area has been largely transformed by long-term sugarcane farming. There is no existing infrastructure that will be impacted within the study area and therefore no structures with heritage or archaeological value. No graves are located on site. The property falls within a “high” palaeontological (i.e. fossils) sensitive area. A desktop Palaeontological Impact Assessment was therefore carried out and is attached under Appendix B. The findings of the report are summarised in section 4.0 below.
KwaDukuza Local Municipality Integrated Development Plan (2021 – 2026)	KDM IDP	The KwaDukuza SDF classifies the larger Sheffield Beach area as an area with immediate development potential. The proposed application is not in conflict with the densification principles contained in the SDF. A separate town planning application is underway ensuring the properties are correctly zoned to accommodate the increase in density.
iLembe District Municipality Integrated Development Plan (2021/2022 Review).	iLembe IDP	The larger Sheffield Beach is identified as an urban settlement zone. “Construction and Property Development” is one of the main economic sectors of iLembe Municipality identified in the IDP. The development is as per the principle listed under section 5.2.5.5 of the IDP: “Growth and development is to be consolidated to achieve appropriate densities and thresholds to support social infrastructure”. As above, a separate town planning application is underway and will motivate the rezoning to ensure that the development is aligned with the iLembe IDP

3.0. MONITORING REQUIREMENTS

As per the findings of the Environmental Impact Assessment, the holder of the Environmental Authorisation is responsible for appointing an independent Environmental Control Officer (ECO) to monitor the implementation of the impact management actions. Table 3 provides a summary of the monitoring requirements to ensure effective implementation of the EMPr. It is noted that the mitigation measures listed in the EMPr as well as the Conditions of the Environmental Authorisation must be adhered to.

The appointed ECO must have the following skills:

- Knowledge and understanding of the construction industry.
- Knowledge of good practise environmental management standards.
- Understanding of the legal context of the activity including the Duty of Care and Polluter Pays principles.
- At least 1 year experience in the ECO field.

Table 3: Monitoring Requirements

Method of Monitoring	Site inspection by ECO to monitor the implementation of the EMPr during construction and the post-construction audit. <ul style="list-style-type: none"> • Visual inspections & photographs for record keeping purposes. • Water samples taken from HGM1 and HGM 3 in the western portion of Seaton Estate (HGM units labelled in Figure 4).
Frequency of Monitoring	<ul style="list-style-type: none"> • Monthly site inspection by ECO during construction. • Annual water quality samples must be taken by the ECO during construction and operational phases. • One post-construction audit by ECO on completion of each phase of the development.

<p>Mechanism for Monitoring Compliance</p>	<ul style="list-style-type: none"> • Written audit report to be submitted by the ECO after the site inspection to the Holder of Environmental Authorisation, relevant Contractor and EDTEA: Compliance, Monitoring & Enforcement. • The following water quality indicators must be monitored at HGM 1 & 3: <ul style="list-style-type: none"> ▪ Faecal coliforms ▪ <i>E.coli</i> ▪ N & P ▪ Ammonia ▪ pH • Wetland specialist to provide comment on the Present Ecological State (PES) of HGM 1, HGM 2 and HGM 3 in Seaton West on an annual basis to ensure that there is no degradation of the wetland condition (HGM units labelled in Figure 3). The PES score should improve over time as the rehabilitation of the site is carried out. Baseline results as follows: <ul style="list-style-type: none"> ▪ HGM 1 (Valley Head Seep) <ul style="list-style-type: none"> - Transformed primarily on account of historical land use changes. - Subject to drainage to facilitate farming activities and historic infilling to accommodate fields and other equestrian facilities. - Minor erosion and bank collapse evident. - PES category “D” or <i>largely modified</i>. - Ecological functions are primarily sediment trapping, erosion control and trapping of phosphate and nitrates. ▪ HGM 3 (Hill Side Seep) <ul style="list-style-type: none"> - This is the largest wetland on site and has been significantly impacted by anthropogenic factors. - Drainage is in a westerly direction, underneath the N2. The wetland drains into an agricultural dam located on the neighbouring property, Upton Farm. The water from this dam is used to irrigate Macadamia orchards on the neighbouring property. - A road bisects the wetland creating an attenuation feature, which has been taking into consideration during the design of the stormwater management plan. This attenuation feature supports a maturing sedge community. - PES category “C” or <i>moderately modified</i>. - Ecological functions are primarily flood attenuation, toxicant removal and redress of nutrient loading.
<p>Program for Reporting on Compliance</p>	<ul style="list-style-type: none"> • Prior to a Contractor commencing with construction on a certain section of the Estate, environmental induction training must be carried out in accordance with the Environmental Awareness Plan in section 5.0. • The register in section 6.0 must be signed by all Primary Contractors working on the site. • The roles and responsibilities of the individuals involved must be determined and the line of communication outlined by the ECO in the audit reports. • Any non-compliances with the EMPr identified during the site inspection must be reported to the relevant Contractor, who must rectify the non-compliance immediately or within a reasonable timeframe as agreed upon with the ECO. • An Environmental Audit Report, compliant with Appendix 7 of the NEMA EIA Regulations 2014 as amended, must be compiled by the ECO and submitted to the relevant parties as listed above. • Should a major change in water quality be identified, the source of the pollutant must be identified and rectified immediately. Rehabilitation measures may be required, which must be prescribed by the ECO in conjunction with a qualified aquatic specialist.

4.0. IMPACT MANAGEMENT ACTIONS

Mitigation measures provided in the table below have been formulated during the Environmental Impact Assessment process to ensure that Seaton Estate is a sustainable development, as contemplated in the principles of NEMA. The actions aim to:

- (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; and
- (ii) Comply with any prescribed environmental management standards or practices.

The tables below indicate the persons who will be responsible for the implementation of the mitigation measures / actions. Abbreviations provided below:

- Independent Environmental Control Officer *ECO*
- Engineer *ENG*
- Holder of Environmental Authorisation *DEV*
- Homeowners *HO*
- Architect *ARC*
- Contractors *CON*
- Landscaper *LAND*

4.1. PLANNING & DESIGN

Table 4: Impact Management Actions to be Adhered to During the Planning & Design Phase for the Thirteen Residential Erven Outlined in Yellow in Figure 3.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).	During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed: <ul style="list-style-type: none"> • Final platform design must take into consideration the natural slope and contours of the site so that there are no unnecessarily steep slopes cut, exacerbating erosion. 	ENG	
	Alteration of surface hydrology in terms of surface flows (SDP, 2021).	The stormwater disposal system, as per the SMA drawing #4226-001-410, attached to the EMPr, must be substantially adhered to. The Stormwater Management Plan (SWMP) forms part of the greater Seaton West management plan and ensures that all stormwater is attenuated on site before being released into the valley lines. The following is applicable to stormwater management within the study area: <ul style="list-style-type: none"> • The stormwater management plan must be implemented on site as soon as practically possible to reduce uncontrolled stormwater runoff into the surrounding environment. • Stormwater from all residential sites must be directed into a piped system which can accommodate significant rainfall events. • The piped stormwater system must connect into the greater Seaton West stormwater management system as depicted in the SMA drawing #4226-001-410. 	ENG	

<p>Increase in hard surfaces on the property.</p>	<p>Alteration of the local hydrological regime (SDP, 2021). Increase in the velocity and volume of stormwater runoff into wetlands leading to erosion and sedimentation. Potential to decrease groundwater recharge and intensify flood events downstream.</p>	<p>There will be an increase in hard surfaces resulting in a change in surface runoff associated with the establishment of roadways and residential infrastructure.</p> <ul style="list-style-type: none"> All erven boundaries must be located outside of the 15m wetland buffer (northern sites) and all residential infrastructure associated with the southern sites, located 25m from the wetland edge. <p>The following must be adhered to during the operational phase of the development so that the hydrology of the site remains intact (i.e. as per the pre-development state):</p> <ul style="list-style-type: none"> Stormwater runoff from hard surfaces must not be discharged directly into the valley lines / wetland systems but must be directed into the piped system to allow for free flow of water beneath roads. All precipitation must be encouraged to percolate into the surrounding soils through the use of grass swales / furrows and unlined attenuation features (i.e. groundwater recharge). Permeable paving is encouraged where large hard surfaces are proposed (i.e. parking areas). 	<p>ENG</p> <p>ENG, ARC & LAND</p>	
<p>Residential activities within 32m of wetland HGM 1 & 3.</p>	<p>Overall decrease in water quality in wetland systems over time.</p>	<p>From a design perspective, the following is required to reduce the likelihood of a decrease in water quality in the downstream wetlands during the operational phase.</p> <ul style="list-style-type: none"> Soap and other hydrocarbons (paint, chemicals etc.) must not be permitted to enter the stormwater system as this will result in “dirty” stormwater entering the wetlands. All dirty water from kitchens and bathrooms must be directed into the sewer system and not stormwater. Water from residential units (i.e. water features, car washing, ponds etc.) must be discharged in a controlled manner onto the natural ground and not onto road surfaces or into the piped stormwater system. 	<p>ENG & ARC</p> <p>HO</p>	
<p>Increase in the number of people residing in the area.</p>	<p>Increased reliance on the electricity supply in the Tinley Manor area.</p>	<ul style="list-style-type: none"> The developer must implement energy saving technology and equipment to reduce the electricity demand (i.e. solar water heaters, PV panels, LED technology etc.). Streetlight luminaires within the development area must be LED Luminaires. 	<p>DEV & ARC</p>	
	<p>Increased pressure on the bulk potable water supply and sewerage disposal network in the Sheffield Beach area.</p>	<p>The thirteen residential units were taken into consideration in the Engineering Services Report (ESR) prepared by SMA Consultants. The ESR confirms that there is sufficient capacity for services in terms of water and sewer. The total water demand anticipated for the entire Seaton West development, including the additional residential infrastructure, is 1.38MI/day.</p> <ul style="list-style-type: none"> Potable water will be provided to the development by Siza Water from the Tafeni Reservoir. In an effort to reduce reliance on the municipal system, all residential units must include a rainwater harvesting tank. <p>A total bulk sewer demand of 1.01MI/day is anticipated for Seaton West, including the additional residential infrastructure.</p> <ul style="list-style-type: none"> All sewage generated will be discharged into an existing outfall sewer owned by Siza Water and treated at the Sheffield Wastewater Treatment Works. Proposed water and sewer reticulation layouts are attached to the ESR. The holder of the EA and Siza Water are in the process of entering into a service level agreement. 	<p>DEV & ENG</p>	

4.2. PRE-CONSTRUCTION

Table 5: Impact Management Actions to be Adhered to During the Pre-Construction Phase for the Thirteen Residential Erven Outlined in Yellow in Figure 3.

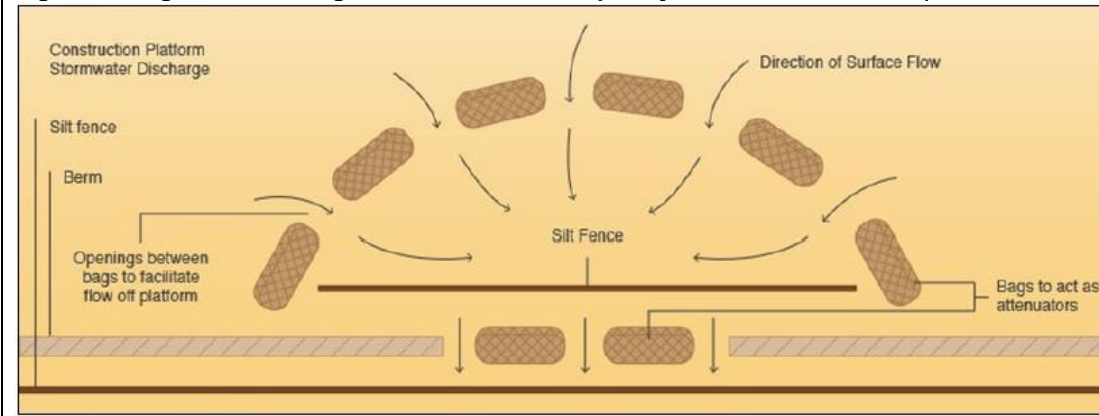
Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).	<p>During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed:</p> <ul style="list-style-type: none"> The 15m wetland buffer must be clearly demarcated by the Contractor in collaboration with the ECO prior to earthworks commencing on site. Signs must be erected warning construction staff of the environmentally sensitive area and restrictions associated with it. The ECO must carry out an environmental toolbox talk with the Contractor and all vehicle operators prior to earthworks commencing. The training must include the identification of the wetland areas and the associated restrictions (see Environmental Awareness Plan included in the EMPr). 	<p>CON & ECO</p> <p>DEV</p> <p>ECO</p>	
	Construction staff littering and unintentionally disturbing the adjacent wetland.	<ul style="list-style-type: none"> All areas outside the designated residential erven footprint must be designated as no-go areas prior to earthworks commencing on site (i.e. silt fences and signage). The ECO must carry out an environmental toolbox talk with the Contractor and all vehicle operators prior to earthworks commencing. The training must include the identification of the wetland and the restrictions associated with the zone. 	<p>CON & ECO</p> <p>ECO</p>	
Environmental Training	Minimising environmental risk through training and awareness of environmentally sensitive areas.	<ul style="list-style-type: none"> All staff working on site must have basic environmental awareness training prior to construction commencing on site. Environmental Awareness Plan (section 5.0.) must be implemented on site. Staff must sign a training register. 	CON	
Final Layout Plan	Final layout compliant with authorisation and not encroaching into environmentally sensitive areas.	<ul style="list-style-type: none"> The layout of all proposed infrastructure (roads, services and platforms) must be pegged out and clearly demarcated prior to construction commencing. The ECO must inspect the pegs prior to earthworks commencing on site to ensure compliance with authorised layout (Figures 1 - 4). 	CON & ECO	

4.3. CONSTRUCTION

Table 6: Impact Management Actions to be Adhered to During Construction of the Thirteen Residential Units Outlined in Yellow in Figure 3.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Earthworks on site creating platforms for development.	Clearance of 0.45 hectares of indigenous vegetation from within the KwaZulu-Natal Coastal Belt Grassland (CB3) ecosystem.	<p>The vegetation to be cleared consists of a mixture of secondary grassland and alien invasive vegetation. Horse paddocks used for grazing are currently established in portions of this area. The following impact management actions must be adhered to, to manage this impact:</p> <ul style="list-style-type: none"> • Clearance of vegetation must be done in phases to ensure soil stability is not compromised. • The Lalela Precinct Landscaping Philosophy must be adhered to (attached to the EMPr) to ensure that the open space system is managed and re-vegetated, improving biodiversity on site. This includes the re-vegetation of the open space corridors in between the rows of residential erven. 	CON	
	Exposed soil susceptible to erosion resulting in sediment deposition into wetland systems reducing functionality (SDP, 2021).	<p>During excavation, sediment and other material have the potential to accumulate in low-lying portions of the site (i.e. wetland systems). Management interventions are therefore required to restrict sediment movement during construction. The following mitigation is proposed:</p> <ul style="list-style-type: none"> • Establish cut off drains above and below excavations. • Temporary stormwater control measures must be implemented prior to earthworks commencing on site to retard flow and attenuate water (Figure 5). This includes the identification of areas susceptible to erosion (i.e. valley lines and steep slopes), the strategic installation of silt fences to prevent wash away and the establishment of reno mattresses / gabion baskets / other velocity reducing devices to reduce overland flow which results in sediment wash away. These temporary control measures can be erected in the buffer zones. • Excavated soils must be returned to trenches and compacted prior to earthmoving machinery vacating the site. • Any eroded areas must be addressed and rectified when they arise to prevent further erosion from occurring. • Exposed banks must be vegetated as soon as practicably possible once earthworks in the area are complete. • All areas outside the designated residential erven must be designated as no-go areas. • No heavy vehicles, material storage areas or stockpiles are permitted within the wetlands or within the 15m wetland buffer associated with the northern sites and the 25m wetland buffer associated with the southern sites. • Stockpiles to be managed to prevent runoff during high precipitation. 	CON	

Figure 5: Diagram Illustrating the Placement of Temporary Stormwater Controls (Source: SDP, 2021).



Disturbance leading to establishment and proliferation of alien invasive vegetation on site and within the surrounding wetland environment.

- The “*Eradication of Alien Invasive Plant*” Management Plan must be implemented on site during construction (section 5.4.2 of the EMP). This Management Plan includes a list of common alien invasive plant species anticipated on site, identification photographs and eradication measures.
- Alien invasive species must not be permitted to establish on site.
- The clearance of alien vegetation must take place in phases and make use of registered herbicides where necessary.

CON

Construction of 4505m² of residential infrastructure within 32m of two wetlands

Encroachment into wetland buffers increasing the potential for reduced wetland functionality and indirect impacts on downstream wetlands.

- Residential infrastructure to be constructed within 32m of HGM 1 and HGM 3 includes residential units, road / driveways and service infrastructure (water, sewer and stormwater pipelines). To ensure that no construction activities take place within the recommended wetland buffers, the following is applicable:
- A shade cloth / silt fence must be erected along the respective wetland buffers (15m from HGM Unit 1 and 25m from the HGM Unit 3) (orange in Figure 4).
 - This silt fence must be maintained throughout the construction period to ensure that it prevents silt and construction material from washing / blowing into the wetlands.
 - All infrastructure must be constructed behind the silt fence.
 - Should erosion of the platform embankment occur, the disturbed area must be rehabilitated in collaboration with the ECO.
 - The only personnel permitted within the wetland buffer area are staff conducting alien vegetation clearance and / or wetland rehabilitation in accordance with the Wetland Rehabilitation Plan attached to the EMP.
 - No storage of material must take place along the boundary of the silt fence.
 - Heavy construction machinery and equipment are not permitted within the wetland buffers.
 - All construction machinery / equipment on site must be in good working order to ensure there are no leaks.

CON

<p>Site Camp</p>	<p>Incorrect placement of the site camp indirectly impacting adjacent sensitive wetland area.</p>	<p>It is unlikely that a separate site camp will be required for the thirteen residential erven applicable to this application as one site camp will be established for the entire Seaton West / Lalela Precinct development. Should a site camp be specifically established for these thirteen erven, the following measures are applicable:</p> <ul style="list-style-type: none"> • The site camp must be located outside of the 32m regulated area associated with all watercourses within Seaton Estate. • The site camp must be located on a flat portion of land and must include a parking area for vehicles. • Signage is to be erected outside site camp indicating relevant contact details of responsible person in case of complaints or emergencies after hours. 	<p>CON</p>	
<p>Record Keeping</p>	<p>Proof of safe disposal & sustainably sourced material.</p>	<p>The following documents must be retained on site for auditing purposes:</p> <ul style="list-style-type: none"> • Environmental Authorisation • Environmental Management Program • Environmental Audits for the site • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets • Safe disposal slips for waste (general, hazardous and chemical toilets) • Proof of raw material sourcing (i.e. building sand, gravel etc.) • Environmental training registers • Record of incidents on site, including photographs (if applicable) • Any other permits, licenses or approvals that may be applicable to the site. 	<p>CON</p>	
<p>Vehicles & Equipment</p>	<p>Disturbance to areas adjacent to construction site and contamination of environment.</p>	<ul style="list-style-type: none"> • Major vehicle servicing is not permitted on site. Only emergency / minor repair work is permitted. • A drip tray must be used to capture any spills during emergency / minor repair work. • Construction vehicles must not be washed on site unless water can be captured in a sump and hydrocarbons / other contaminants removed prior to water being released into the surrounding environment. • No vehicles are permitted within the sensitive No-Go areas illustrated in Figure 4 (except during the construction of the stormwater attenuation facilities in the wetland buffer). • Vehicles must not exceed the Estate speed limit of 40km/h. • Roadways must be demarcated at site set up. No ad hoc roads must be constructed. 	<p>CON</p>	
<p>Material Storage Areas & Stockpiles</p>	<p>Sedimentation risk and unsustainable use of top soil.</p>	<ul style="list-style-type: none"> • Soil stockpiles must not exceed 2m in height, must be covered, or grassed to prevent erosion caused by exposure to heavy wind or rain. • Stockpiling of material must not take place on steep slopes where there is an opportunity for material to wash into the surrounding environment. • Where the slope is greater than 1:2, bunds must be positioned at 20m intervals at foot of stockpile. • Top soil stripped off the site must be stockpiled separately and used during rehabilitation / landscaping. • The top soil stockpile must be kept free of weeds and alien invasive species. 	<p>CON</p>	



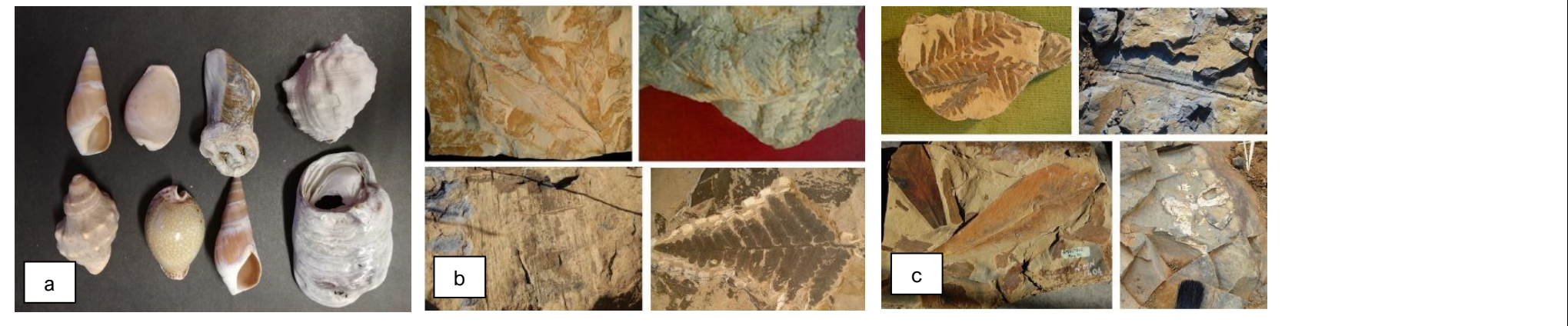
<p>Erosion Stormwater Management</p>	<p>& Sedimentation risk to downstream environment (including wetland area).</p>	<ul style="list-style-type: none"> • Blanket stripping of a site must not be undertaken as this will exacerbate erosion. Cane and ruderal vegetation on site must be maintained until landscaping / rehabilitation commences. • Temporary stormwater channels and protective measures must be established prior to earthworks taking place. • Areas more prone to erosion must be identified and additional measures put in place to control stormwater and erosion (i.e. sand bags, berms, stone pitching etc.). • During the excavation of trenches, excavated soil must be placed on adjacent ground <u>above</u> the trench (i.e. higher than the trench). • Silt fences must be installed below construction areas where water flow is evident. This is to attenuate flow and trap sediment. • Erosion control devices / silt fences must be monitored and maintained to reduce the build up of sediment. • Where required, contour drains and bunds must be kept intact until vegetative yield is sufficient to prevent soil slip and erosion. • Stormwater from individual homesteads / residential complexes must be directed into bunds / sumps. No direct disposal of stormwater onto adjacent properties or surrounding environment. • Energy dissipation mechanisms must be incorporated into stormwater systems (i.e. reno-mattresses, rocks etc.) • Signs of erosion must be addressed immediately to prevent further erosion from taking place. • Disturbed areas are more susceptible to the establishment of Alien Invasive Plants (AIP). On-going AIP control must be carried out in accordance with the Eradication of AIP Procedure (section 5.4.2). • Grassed road verges must be established once earthworks is complete. • Sodds to be planted on exposed embankments to encourage vegetation growth. 	<p>CON</p>	
<p>Waste Management</p>	<p>Littering and improper storage / disposal of waste accumulating on site and within adjacent sensitive wetland areas.</p>	<ul style="list-style-type: none"> • All waste generated on site must be disposed of in the designated waste management area to ensure that it is not blown around the site into the environmentally sensitive areas or adjacent properties. • The waste management area must be located outside of the 32m regulated area. • A general waste skip / similar receptacle must be accessible to all construction sites within Seaton Estate. • General waste must be removed from site on a weekly basis to ensure there is no build up in the skip / waste receptacle. • All waste must be stored under cover to prevent rain ingress and/or waste from being blown around site. • No waste must be buried or burnt on site or dumped in environmentally sensitive areas (i.e wetland associated buffer area). 	<p>CON</p>	
	<p>Hydrocarbons or other liquids / chemicals entering the surrounding environment and</p>	<ul style="list-style-type: none"> • Reduce requirements for storage and use of noxious liquids (i.e. fuel) on site. 	<p>CON</p>	

	wetland habitat reducing functionality.	<ul style="list-style-type: none"> • Potentially hazardous substances¹ to be stored in a fenced off area that is undercover to prevent contamination of rainwater. • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets. • The hazardous storage area must not be located within 15m of the wetlands. • All potentially hazardous substances must be stored, in a bunded area (110% capacity of largest container) with an impermeable surface to prevent soil contamination during handling. • No bulk storage of fuel on site (>30m³). • Decanting of potentially hazardous substances must be carried out within the confines of a drip tray / similar or using a hand pump. • Hazardous waste must be disposed of at a registered hazardous landfill site. 		
	Construction staff using the surrounding environment as ablutions.	<ul style="list-style-type: none"> • Ablution facilities must be accessible to all construction workers. • Toilets must be located within the site camp, outside of the respective wetland buffers. • No pit latrines are permitted on site. • All staff must utilise the ablution facilities provided and must not use the surrounding environment. • The ablution facilities must not be located on steep slopes, within environmentally sensitive areas or the Open Space System. • Ablution facilities must be checked regularly and kept in a clean state. • Toilets should be screened as far as is practically possible. 	CON	
Spills & Incidents	Hydrocarbons or other liquids / chemicals contaminating watercourses and the surrounding environment.	<ul style="list-style-type: none"> • The ECO's environmental toolbox talk must include a spill response procedure and incident reporting so all staff know how to clean up minor and major spills (included in the Environmental Awareness Plan; section 5.0 of the EMPr). • Drip trays must be available near the hazardous storage area and where hazardous materials are being used on the site. • A Spill Kit / similar must be available near the hazardous storage area. 	CON	
Dust & Emissions	Exposed bare soil resulting in dusty conditions on and off site (SDP, 2021).	<ul style="list-style-type: none"> • During high winds, dust suppressing must take place using water carts / hose to prevent excessive dust on site. • Any fine materials stockpiled on site must be covered to prevent dust from being blown around. • Material transported to site on the back of trucks must be covered, • A complaints register must be maintained on site and any complaints received addressed timeously. • If dust becomes a nuisance, shade cloth and other screening techniques must be used to reduce dust from entering other properties. 	CON	
Noise	Noise becoming a nuisance on site and to nearby residents.	<ul style="list-style-type: none"> • All construction vehicles must be well maintained to reduce noise on site. • All construction vehicles and equipment must be fitted with standard silencers. 	CON	

¹ Hazardous substances refer to substances scheduled in the Hazardous Substances Act (1973) and Hazardous Chemical Substances Regulations (1995) and include paint, oils, fuels, solvents, pesticides.

		<ul style="list-style-type: none"> No construction vehicles or machinery to operate outside of construction working hours (07:00 – 18:00). A complaints register must be maintained on site and any complaints received addressed timeously. 		
Conduct	Construction staff becoming a nuisance to neighbouring homeowners.	<ul style="list-style-type: none"> No construction work must take place between 07:00 and 18:00. Neighbours to be advised prior to work being done outside the above times. All construction staff must enter and leave the Estate through the main entrance off the MR228. No open fires are permitted on site. No poaching of fauna or removal of vegetation from site. 	CON	
Cultural / Heritage	Items of historical, archaeological or cultural significance destroyed or disturbed during excavations.	<ul style="list-style-type: none"> During earthworks, should any objects with historical, archaeological or cultural significance be uncovered, all work in this area must cease and the heritage authority, AMAFA, notified. Objects with historical, archaeological or cultural significance must not be destroyed or removed from site without prior permission from AMAFA. Should any human remains be discovered, all work in this area must cease and the South African Police contacted for further direction. 	CON	
Palaeontological / Fossils	Fossils destroyed or disturbed during excavations.	<ul style="list-style-type: none"> During earthworks, the following procedure must be adhered to if fossils are discovered (see photographs provided below for examples of the type of fossils that could be found on the site): <ul style="list-style-type: none"> When excavations begin the rocks must be given a cursory inspection by the ECO or designated person. Any fossiliferous material (shells, plants, insects, bone, coal – see Figure 6) must be put aside in a protected place. This way construction activities will not be interrupted. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (see below). Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. If there is any possible fossil material found then a qualified palaeontologist, must visit the site to inspect the selected material. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils. If no fossils are found and the excavations have finished then no further monitoring is required. 	CON & ECO	

Figure 6: Example of fossils from the Vryheid Formation in the Main Karoo Basin and Maputaland Group (a) Examples of some shallow marine shells, oyster on the lower right and (b) Photographs of fossils from the Vryheid Formation (source: Proff. Marion Bamford).



4.4. REHABILITATION / POST CONSTRUCTION

Once construction is complete in a certain area of Seaton (i.e. Contractor completes construction of a residential unit), the Contractor and ECO must ensure that the mitigation measures listed in the table below are adhered to. This will ensure that there will be no residual impacts on the environment remaining once construction is complete. Rehabilitation will therefore take place in a phased manner concurrently with construction.

Table 7: Impact Management Actions to be Adhered to Once Construction is Complete.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Post-Construction Audit	To ensure the site is stable and there are no outstanding environmental non-compliances that need to be corrected by the Contractor.	<ul style="list-style-type: none"> • The ECO must carry out a post-construction inspection of the site once construction in certain areas of the Estate is complete. • Clearance from the ECO must be obtained to ensure there are no outstanding environmental non-compliances prior to the Contractor vacating the site. • The following areas must be audited by the ECO in the post-construction inspection: <ul style="list-style-type: none"> - No waste / litter remaining on site; - There is no evidence of spills or building rubble remaining on site; - There are no left over building material remaining on site; - All exposed surfaces have been rehabilitated / landscaped to avoid sediment wash away; - Stormwater management has been formalised; - There is no evidence of erosion; and - No environmentally sensitive areas, indicated in Figure 4, have been damaged. If damage is evident, rehabilitation measures must be prescribed by the ECO and carried out by the Contractor. 	CON & ECO	

<p>Unintentional damage to wetlands</p>	<p>Rehabilitation to improve PES and functionality.</p>	<ul style="list-style-type: none"> • Where the wetland has been damaged the following measures are to be taken to ensure restoration of the habitat: <ul style="list-style-type: none"> ○ ECO must assess the damaged area ○ Any construction debris or contaminants within the wetland must be removed ○ Original soil structure must be restored ○ Any impedence or diversion to waterflow must be removed ○ Area must be vegetated with riparian or wetland species. • No loose soil or damaged banks can be left behind after construction. 	<p>CON & ECO</p>	
<p>Rehabilitation of Open Space System.</p>	<p>Re-establish indigenous vegetation and faunal habitat. This is a positive impact.</p>	<p>Through the rehabilitation of open space on site, indigenous vegetation and faunal habitat will be re-established across Seaton West.</p> <ul style="list-style-type: none"> • The open space system must be planted in accordance with the Landscape Philosophy and Concept Master Plan prepared by Land Art Studio and attached to the EMPr. • No planting of exotic botanical species. 	<p>ECO & LAND</p>	
	<p>Rehabilitation of wetland areas</p>	<ul style="list-style-type: none"> • The layout of the Seaton Residential Estate has taken into consideration the location of delineated wetlands which will be rehabilitated as an ecological feature of the estate. • Wetlands within the estate must be rehabilitated to improve the current functionality. The implementation of the Wetland Rehabilitation Plan is covered under the greater Seaton Estate EA (EIA/4951/2005). • As per discussions with the adjacent landowner during previous assessments, HGM, 3 below the attenuation dam wall must be allocated a “no go” area during the operation of the Estate to prevent residents from traversing through the wetland, walking dogs etc. This must be incorporated into the Body Corporate Rules. 	<p>CON & ECO</p>	
<p>Earthworks on site creating platforms for development.</p>	<p>Alteration of habitat and faunal ethos (SDP, 2021).</p>	<p>The alteration of habitat is inevitable and cannot be fully mitigated. The alteration of habitat and faunal ethos will be alleviated during the rehabilitation phase where the following is applicable:</p> <ul style="list-style-type: none"> • Once earthworks are complete in a section, exposed banks must be vegetated as soon as practicably possible. • All open space areas must be maintained as per the Landscape Philosophy and Concept Master Plan (attached to the EMPr). 	<p>CON DEV & LAND</p>	

4.5. OPERATION

Provided that the above mitigation measures /actions are adhered to, the operational phase will have a low impact on the surrounding environment. Table 8 provides mitigation measures which are ongoing through-out the lifespan of the project.

Table 8: Impact Management Actions to be Adhered to During the Operational Phase.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Increase in hard surfaces on the property.	Alteration of the local hydrological regime (SDP, 2021). Increase in the velocity and volume of stormwater runoff into wetlands leading to erosion and sedimentation. Potential to decrease groundwater recharge and intensify flood events downstream.	<p>The following must be adhered to during the operational phase of the development so that the hydrology of the site remains intact (i.e. as per the pre-development state):</p> <ul style="list-style-type: none"> • The wetland buffers form part of the Seaton Estate open space system. The Homeowners Association are responsible for the implementation of the Wetland Rehabilitation Plan prepared by SDP and attached to the EMPr. • Stormwater runoff from hard surfaces must not be discharged directly into the valley lines / wetland systems but must be directed into the piped system to allow for free flow of water beneath roads. • All precipitation must be encouraged to percolate into the surrounding soils through the use of grass swales / furrows and unlined attenuation features (i.e. groundwater recharge). • Permeable paving is encouraged where large hard surfaces are proposed (i.e. parking areas). • All open space areas must be vegetated to decrease hard panning wherever feasible. • The holder of the Environmental Authorisation as well as the individual property owners are bound to the Landscape Philosophy and Concept Plan attached to the EMPr. 	<p>ENG</p> <p>ENG</p> <p>ENG & ARC</p> <p>LAND</p> <p>DEV & HO</p>	
Residential activities within 32m of wetland HGM 1 & 3.	Overall decrease in water quality in wetland systems over time.	<ul style="list-style-type: none"> • The wetland specialist recommends that water quality sampling be conducted upstream and downstream of Seaton West. This monitoring includes the following: <ul style="list-style-type: none"> ▪ Annual water quality samples must be taken from HGM 1 & HGM 3 (Figure 4) at the furthest points downstream of the site. The following parameters must be recorded: Faecal coliforms, <i>E.coli</i>, N & P, Ammonia & pH. • A wetland specialist is to provide comment on the Present Ecological State (PES) of HGM 1 and HGM 3 in Seaton West on an annual basis to ensure that there is no degradation of the wetland condition. The PES score should improve over time as the rehabilitation of the site is carried out (see baseline results under Table 3). • To further protect the wetland systems during operation, phytoremediation systems must be established at all stormwater outlet points under the guidance of the ECO. The ECO to advise on what species must be planted to reduce sediment from entering the wetland system and remove excess nitrates. 	<p>DEV, HO & ECO</p>	

5.0. ENVIRONMENTAL AWARENESS PLAN

This Environmental Awareness Plan describes the manner in which the holder of the Environmental Authorisation must inform all Contractors and employees of the environmental risk which may result from their work; and that the risks must be dealt with to avoid pollution or the degradation of the environment.

5.1. INDUCTION

All Primary Contractors working within Seaton Estate must receive a copy of the Environmental Awareness Plan and sign the register attached stating that they have received a copy of the EMPr and are aware of the environmental risks. Contact details for the Environmental Control Officer (ECO) must be provided below if Contractors require any clarification or assistance with the demarcation of sensitive areas (shown in Figure 4).

Table 9: Important Contact Information.

Designation	Company	Contact Person	Contact Details
Holder of the Environmental Authorisation	Sherpa Trade and Invest 31 (Pty) Ltd		As per the requirements of the Protection of Personal Information Act (POPI), contact details to be provided prior to construction.
Seaton Estate Manager	Sherpa Trade and Invest 31 (Pty) Ltd		
Environmental Control Officer	SDP Ecological and Environmental Services		
Landscaper	Land Art Studio		
Consulting Engineer	SMA Consultants		
Environmental Assessment Practitioner	Confluence Strategic Development		

5.2. ENVIRONMENTALLY SENSITIVE AREAS

Please refer to section 1.3 of the EMPr and Figure 4, which provides a description of the environmentally sensitive areas associated with Seaton Estate. These areas must be demarcated and avoided during construction. Contractors must be aware of the primary Impact Management Outcome for the Estate, which is **to create a sustainable development by avoiding ecologically sensitive areas and preventing downstream indirect impacts.**

5.3. BASIC ENVIRONMENTAL TRAINING POINTS

All staff working within Seaton Estate must receive basic environmental training, which includes the items listed below. Please note that the ECO is available to conduct environmental training should the Contractor prefer.

- Context of Seaton Estate and the applicability of the EA and EMPr.
- The location of environmentally sensitive features within the Estate (Figure 4).
- Restrictions associated with the environmentally sensitive features (i.e. buffers, open space linkages, vehicle no-go areas etc.)
- Waste management (general & hazardous).
- No cement mixing directly on exposed soil outside of construction footprint.
- Management of hazardous substances (paint, oil, drip trays, spills etc.).
- Sanitation (i.e. the use of toilets).

5.4. PROCEDURES FOR HANDLING ENVIRONMENTAL RISKS

All construction staff working within Seaton Estate must be aware of the procedures listed below.

5.4.1. SPILL RESPONSE²

In the event of a spillage, the following procedure must be adhered to so that there is minimal impact on the surrounding environment. Diesel and oil are the most likely hydrocarbons that will be spilled on the site.

1. **ASSESS THE RISK**
 - WHAT was spilled; and
 - HOW MUCH was spilled.
2. **SELECT THE RELEVANT PERSONAL PROTECTIVE EQUIPMENT (PPE)**
3. **CONFINE THE SPILL**
 - Block, Divert away from sensitive environmental areas and confine spill.
 - Use absorbents or boom in Spill Kit
 - Stop the flow of the spill.
4. **STOP THE SOURCE**
5. **EVALUATE THE SPILL AND IMPLEMENT APPROPRIATE CLEAN UP**
 - Re-assess the spill and decide on most appropriate method of clean up.
 - Absorb spill using materials in Spill Kit or soil / wood chips.
 - Using a broom, rag or other material, scrub the impacted area or using a spade, dig out the contaminated soil.
6. **DECONTAMINATE**
 - All PPE must be removed and disposed of as hazardous waste if contaminated.
 - All rags / materials used during the clean up as well as the actual spilled material must be disposed of as hazardous waste.
7. **REPORTING**
 - Responsible person to determine if the spill constitutes an “incident”, see definition below.
 - All incidents must be reported as per the procedure outlined in section 5.4.3.

² Seven Step Spill Procedure Accessed from Border Hazmat: Specialised Environmental Cleaning (<http://borderhazmat.co.za/7-step-spill-procedure/>). Accessed on 12th March 2021.


5.4.2. ERADICATION OF ALIEN INVASIVE PLANTS

Alien Invasive Plant (AIP) species rapidly establish in disturbed areas due to the lack of competition from other indigenous species. AIP species rapidly colonise and area and can spread to other areas within Seaton Estate. It is therefore important for construction staff to receive some training on how to identify and remove AIPs before they become a nuisance and negatively impact the rehabilitation efforts underway within the study area. The list below can also be used by homeowners and the Seaton Homeowners Association when eradicating AIP species during the operational phase of the development.




Notes:





- Mechanical removal of AIPs (i.e. hand pulling / slashing) is preferred above chemical control especially in the No-Go areas / Open Space System.
- All mixes given as a percentage (ml per 100 l water/diesel).
- Apply methods either by species or by area i.e. multiple areas, one species or one area, multiple species.
- Autumn and winter - basal stem and cut stump treatments, no foliar spraying.
- Spring and summer - foliar spraying can be done on suitable plants. Rule of thumb - don't spray anything over 1.5 m tall. Spray during the morning (8 am to 11 am) during calm conditions.
- NB PPE when spraying - rubber gloves, goggles, respirator, apron/chemical overall, rubber boots.
- NEVER use diesel for foliar application.
- If in doubt check the herbicide label.
- Follow up treatment/clearance is essential for effective AIP management.



Table 10: Alien Invasive Plant Management at Seaton Estate³.




	Species	Common Name	Category (NEMBA)	Size class	Mechanical control	Chemical control	Special considerations	Photographs
Terrestrial AIPs	<i>Ageratum conyzoides</i>	Invading ageratum	1b	All plants	Hand pull, slash, mow regularly	Foliar spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
	<i>Caesalpinia decapetala</i>	Mauritius thorn	1b	Small plants (<1 m)	Hand pull, slash	Foliar spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		




³ Information in the table has been obtained from SDP: Ecological and Environmental Services.

			Large plants (>1 m)	Slash and cut, pull up root.	Foliar spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%). If plants are higher than 1.5 m, cut back and spray regrowth when 0.5 m high.		
<i>Cestrum laevigatum</i>	Ink Berry	1b	Small plants (<1 m)	Hand pull, slash.	None		
			Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%). Basal stem application with 1.0% Triclopyr (Garlon 480) in diesel.		
<i>Chromolaena odorata</i>	Triffid Weed	1b	Small plants (<1 m)	Hand pull, slash, mow.	Foliar spray 0.375% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
			Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%)	To address dense infestations: 1) cut back plants and treat stump during winter 2) treat regrowth with a foliar spray once spring regrowth has occurred (new growth approx 0.5m in height). Use dye to mark sprayed plants.	

<i>Datura stramonium</i>	Common thorn apple	1b	All Plants	Hand pull	Foliar spray Glyphosate (Springbok 360 SL) @ 2l per Ha.	Hand pulling should be sufficient on smaller properties.	
<i>Grevillea robusta</i>	Silky oak	3	Small plants (<1 m) and coppice	Hand pull and slash	Try: foliar spray 0.75% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
			Large trees and saplings > 1 m	Fell or ring bark	Try: Treat cut stump with 2.0% Triclopyr (Garlon 480) in diesel or water with adjuvant (Actipron Super @ 0.5%)		
<i>Ipomoea purpurea</i>	Morning glory	1b	All plants	Pull down and slash	Scrape and paint stem using undiluted Glyphosate (Springbok 360 SL or similar).		

<i>Ipomoea alba</i>	Moon flower	1b	All plants	Pull down and slash	Scrape and paint stem using undiluted Glyphosate (Springbok 360 SL or similar).		
<i>Lantana camara</i>	Lantana	1b	Small plants (<1 m)	Hand pull and slash	Foliar spray 0.75 - 1% Picloram (Access 240 SL) in water with adjuvant (Actipron Super @ 0.5%)		
			Large plants (>1 m)	Slash and cut, pull up root.	Treat cut stump with 1.0% Picloram (Access 240 SL) in water with adjuvant (Actipron Super @ 0.5%)	Apply to low cut stumps (10–20cm) preferably with a single cut surface. Apply to complete cut surface of stumps with a diameter or <10cm. Where multiple stumps are present, all cut surfaces must be treated. For bigger stumps apply to the cambial region (sapwood) of the cut surface. In all cases, apply until the point of run-off. A follow-up spray as a coppice application may be required. Use dye to mark cut stumps.	
<i>Melia azedarach</i>	Syringa	1b	Small plants (<1 m)	Hand pull and slash	None		

			Large trees and saplings > 1 m	Fell or ring bark	Trees up to 25 cm stem diameter: Basal stem application with 2.0% Triclopyr (Garlon 480) in diesel. Larger trees: Treat cut stump with the same mixture (or in water with adjuvant - Actipron Super @0.5%)		
<i>Pennisetum purpureum</i>	Napier Fodder	1b	All plants	Cut back and pull up roots	Cut back and treat regrowth with a Glyphosate (Springbok 360 SL or similar) herbicide - 1.5% solution with water.		
<i>Psidium guajava</i>	Guava	2/3 in KZN	Small plants (<1 m)	Hand pull and slash	Foliar spray 1.5% fluroxypyr / picloram (Plenum 160 ME) in water with adjuvant (Actipron Super @ 0.5%)		
			Large trees and saplings > 1 m	Fell or ring bark	Treat cut stump with 12.5% Imazapyr (ECO-Imazapyr 100SL) in water	Use dye to mark treated stumps	
<i>Ricinus communis</i>	Castor Oil	1b	Small plants (< 1m)	Hand pull and slash	None		

			Large plants (>1 m)	Cut back and pull up roots	Treat cut stump with 1.0% luroxypyr / picloram (Plenum 160 ME) in water with adjuvant (Actipron Super @ 0.5%)		
<i>Schinus terebinthefolius</i>	Brazilian Pepper	1b in KZN	Small plants (<1 m)	Hand pull	None		
			Large plants (>1 m)	Fell or ring bark	Basal stem treatment using 2.0% Triclopyr (Garlon 480) in diesel.	Coppices readily. Dispose of cut material.	
<i>Solanum mauritianum</i>	Bugweed	1b	Small plants (up to 1.5 m)	Hand pull	Foliar spray 0.5% Triclopyr (Garlon 480) in water with adjuvant (Actipron Super @ 0.5%)		
			Large plants (>1.5 m)	Cut back and pull up roots	Basal stem treatment using 2.0% Triclopyr (Garlon 480) in diesel.		

5.4.3. REPORTING OF ENVIRONMENTAL INCIDENTS

Definitions

" <i>Incident</i> " as defined in NEMA	An unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property.
" <i>Incident</i> " as defined in NWA	Incident or accident in which a substance- (i) pollutes or has the potential to pollute a water resource: or (ii) has or is likely to have, a detrimental effect on a water resource.
" <i>responsible person</i> " as defined in NEMA & NWA	Includes any person who- (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident.
" <i>relevant authority</i> " as defined in NEMA	(i) a municipality with jurisdiction over the area in which an incident occurs; (ii) a provincial head of Department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs; (iii) the Director-General; (iv) any other Director-General of a national department.

Procedure should an *incident*, as defined above, occur on site:

The responsible person or, where the incident occurred in the course of that person's employment, his or her employer	Complete an Emergency Incident Report (template provided in Appendix 4). The report must be sent to the following personnel within 14 days of the incident occurring. (i) the Director-General of the Department of Environmental Affairs; (ii) the Director-General of the Department of Water & Sanitation; (iii) the South African Police Services and the relevant fire prevention service; (iv) the relevant provincial head of department or municipality; (v) The relevant catchment management agency, if applicable; and All persons whose health may be affected by the incident.
The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident-	(i) Take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (ii) Undertake clean-up procedures; (iii) Remedy the effects of the incident; (iv) Assess the immediate and long-term effects of the incident on the environment and public health;

Should the responsible person fail to comply, or inadequately comply with a directive received by a relevant authority, there be uncertainty as to who the responsible person is; or there be an immediate risk of serious danger to the public or potentially serious detriment to the environment, a relevant authority may take the measures it considers necessary to contain and minimise the effects of the incident; undertake clean-up procedures; and remedy the effects of the incident. A relevant authority may claim reimbursement of all reasonable costs incurred by it in terms of subsection (8) from every responsible person jointly and severally.

APPENDIX 1

LAND ART STUDIO - LANDSCAPE PHILOSOPHY AND CONCEPT MASTER PLAN



APPENDIX 2

WETLAND REHABILITATION PALN (SDP, DECEMBER 2019)



APPENDIX 3

STORMWATER MANAGEMENT PLAN (SMA CONSULTANTS, OVERALL STORMWATER MANAGEMENT PLAN 4226-001-410, 2021)

APPENDIX 4
EMERGENCY INCIDENT REPORT TEMPLATE