FRESHWATER ASSESSMENT FOR THE PROPOSED DECOMMISSIONING AND REDEVELOPMENT OF EVERITE ASBESTOS WASTE CONSOLIDATION SITE

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Executive Summary

In 2000 the Everite operations closed at their Brackenfell factory. Group 5, who bought Everite, are in the process of exploring the longer term land use and safety issues and obtaining the necessary authorisations for the future development of the site. This freshwater assessment is intended to inform the environmental authorisation process regarding any freshwater features on the site.

The site was visited on 19 May 2012 to undertake a rapid assessment of freshwater features. The freshwater related features identified on the site are as follows:

- A large wetland area is located in the north western corner of the site. This feature is an artificially created depression specifically constructed to deal with storm water runoff from the site and is located at the lowest point on the site. The wetland are is dominated by bulrush *Typha capensis* which typically grows within storm water systems which receive a constant flow (low flow) and are often rich in nutrients.
- The central area of the site is elevated and consists of deep sandy soils. A number of drains have been constructed to channel water from the site into the wetland/storm water pond. The site largely consists of disturbed soils and invasive alien Port Jackson willows *Acacia saligna* and exotic grasses, as well as some dumping of rubble and litter.
- Along the outer edge of the northern and eastern portions of the property is a small drainage channel that simply carries runoff from the lower lying areas of the site also into the wetland/storm water pond. The drainage line on the site has no particular importance.

The wetland/storm water pond has no real significance in terms of biodiversity as it is an overgrown mono stand of bulrush. It does however provide some habitat for birdlife but more importantly it performs an important function in mitigating storm water on the site. It should preferably remain intact (with a small buffer area surrounding it of 15 m from the delineated edge) and be cleared of alien vegetation (largely Port Jackson willow).

As the pond is located at the lowest point on the site such a feature would anyway be require at that approximate locality to mitigate the storm water from the proposed development as per the City of Cape Town's storm water policy. Should the pond need to be relocated, one of similar size should be created elsewhere on the site.

The impact of the proposed development (preferred alternative) is expected to be limited, provided the following mitigation measures are implemented. An EMP be compiled and implemented for the construction and operational phases of the proposed development that includes the recommendations of this report. In addition, the storm water system design and management plan be developed in conjunction with the recommendations from an aquatic ecologist.

Key recommendations in this report are:

- The storm water pond in the north western corner of the site should be retained and a 15 m buffer retained from the wetland edge. Limited disturbance should be allowed within the buffer zone. The rehabilitation of disturbed areas must take place as soon as possible post construction.
- Construction on the site should preferable take place in the dry season when run-off on site can be well managed.
- Clearing or felling of invasive alien trees should take place within the buffer area and wetland. Advice of a botanist should be obtained to compile a programme on the removal and control of alien invasive plants.
- The intensity of storm water run-off should be reduced where possible through encouraging paving and surfaces that allow for greater infiltration. Storm water discharges should be dissipated before entering the storm water pond and should not be direct piped discharges.
- Litter should be prevented from entering the storm water pond.
- Approval should be obtained from the Department of Water Affairs for any activities such as the development of hard surfaces on the site.

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1. BACKGROUND

In 2000 the Everite operations closed at their Brackenfell factory. Closure entailed the decommissioning of plant and the release of land parcels for redevelopment. Over a period of 60 years while the factory was operational, asbestos wastes were disposed to a form of slimes dam on the site. The recent decommissioning (2000 onwards) included the consolidation of any other asbestos wastes into this disposal area, followed by engineering (covering) of the area and securing of the slopes with formalized drainage channels.

Group 5, who bought Everite, are in the process of exploring the longer term land use and safety issues and obtaining the necessary authorisations for the future development of the site. This freshwater assessment is intended to inform the environmental authorisation process regarding any freshwater features on the site.

Figure 1. Google Earth image of the Everite site

2. TERMS OF REFERENCE

The scope of work for this study is to undertake a Freshwater Assessment for the Basic Assessment Phase of the project, which will include the following:

- A situation assessment based existing information for the area and the detail on the proposed development, as well as a site assessment. The site's water bodies will be delineated and aquatic ecosystem present state as well as importance and sensitivity determined.

- The proposed activity, the potential impacts will be evaluated and mitigation measures proposed. The findings and recommendations will be written up and an overview of the key relevant legislation and implications given.

3. APPROACH TO THE STUDY AND STUDY LIMITATIONS AND ASSUMPTIONS

Input into this report was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and catchment, as well as by a more detailed assessment of the freshwater features at the site. The site was visited in May 2012. During the field visit, the characterisation, mapping and integrity assessments of the freshwater features were undertaken. This information/data was used to inform the potential impact of the proposed activities as well as the recommended mitigation measures.

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. Analysis of the freshwater ecosystems was undertaken according to nationally developed methodologies and was only undertaken at a rapid level and did not include any detailed mapping of habitats or biotic species identification. This level of assessment was however considered a suitable level of evaluation for this freshwater impact assessment. Recommendations are made based on wetland ecosystem functioning and site characteristics. These recommendations are based on professional opinion.

4. USE OF THIS REPORT

This report reflects the professional judgment of its author. The full and unedited content of this should be presented to the client. Any summary of these findings should only be produced in consultation with the author.

5. AQUATIC SYSTEMS IN THE STUDY AREA

5.1 Historical review of the site

Aerial photographs taken of the area in 1938, 1966, 1983, 2004 and 2007 (Figures 2 to 6) show the gradual development of the site and then its decommission. It can be seen that since 1938 (Figure 2 - the earliest available aerial photograph) the site has been disturbed and cleared of its natural vegetation. No wetland areas are visible on the early photographs of the site. The 2004 Google Earth image of the site shows the clean-up of the site and the development of the drainage channels. The storm water pond is however only clearly visible in the 2004 and 2007 images. From these images, it is clear that the pond was specifically constructed to capture runoff from the drainage channels on the site.

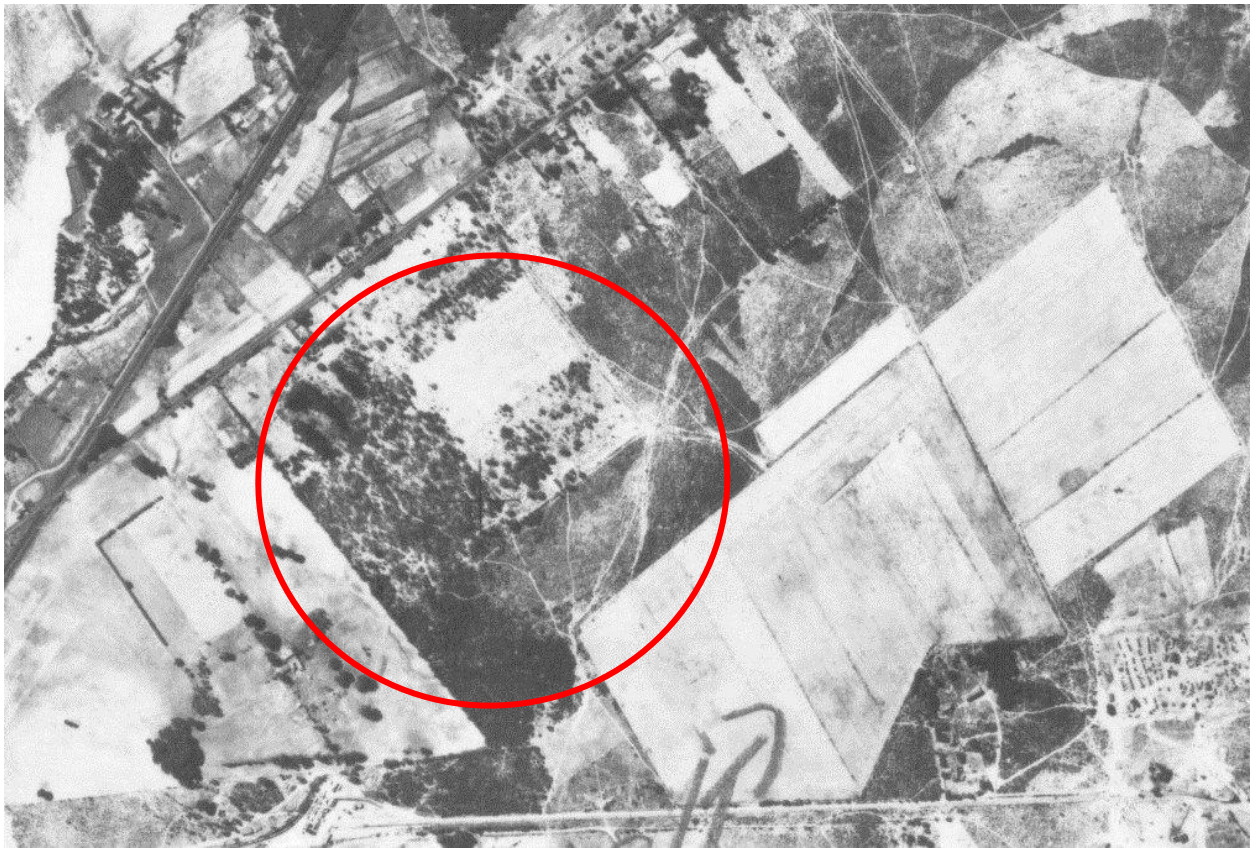


Figure 2. Orthophoto of the area surrounding the site taken in 1938

Figure 3. Orthophoto of the area surrounding the site taken in 1966

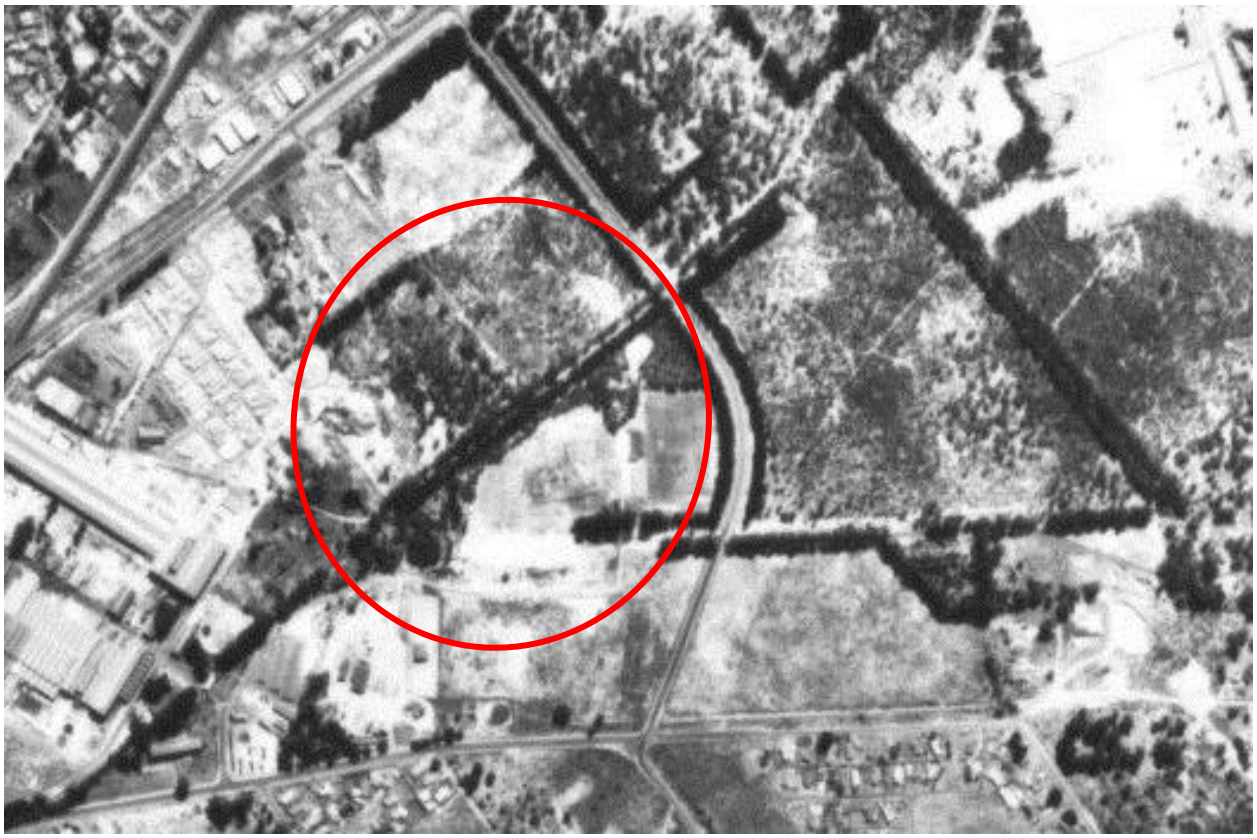


Figure 4. Orthophoto of the area surrounding the site taken in 1983

Figure 5. Google Earth image of the site from 2004

Figure 6. Google Earth image of the site from 2007

More recent Google Earth images of the site (Figure 1, taken in 2011 as the most recent available Google Earth image) show the site to be invaded by alien plants. The line of trees transecting the site borders a road through the site. The south-eastern half of the site is less disturbed and covered with grasses. No water features are apparent on this portion of the site.

5.2. Physical Characteristics of the Study Site

a. Visual Characteristics

The Everite site is located within in the Brackenfell in the City of Cape Town Metropole (Figure 7). The site covers approximately 10.6 ha of vacant land following the decommissioning of the Everite asbestos factory. The site is situated near the watershed between the Bottelary River Catchment (a tributary of the Kuils River) and the Kuils River Catchment. The surrounding area is completely urbanised and consists of a mix of residential, commercial and industrial activities.

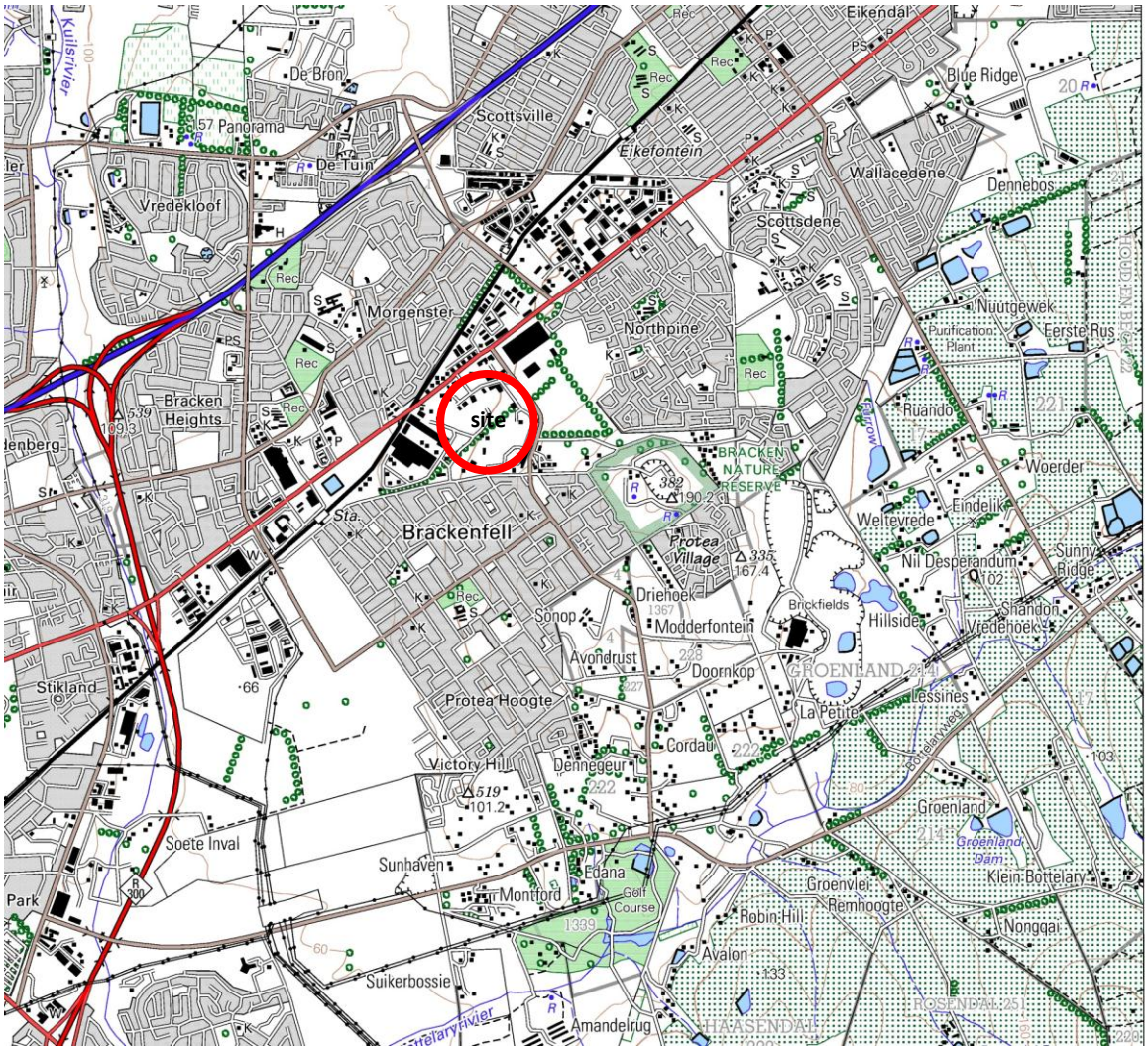


Figure 7. A topographical map (3318DC) indicating the location of the study area

The topography of the site varies significantly across the landscape, and the landscape itself is completely transformed as a result of previous activities on the site. The central area of the site is elevated and consists of deep sandy soils (Figure 8). A number of drains have been constructed to channel water from the site into the wetland/storm water pond located in the north western corner of the site. The site largely consists of disturbed soils and invasive alien Port Jackson willows *Acacia saligna* and exotic grasses, as well as some dumping of rubble and litter.

Figure 8. The large quarry on the southern portion of the site

b. Climate

The study site, as with most of the South-Western Cape, falls within the Mediterranean climate, where 80% of the mean annual precipitation for this area (around 550mm) is received in winter, from May to September (Figure 9). The average monthly temperature varies from 15°C in winter and 27°C in summer. Prevailing winds are south-easterly during the summer and north-westerly during the winter.

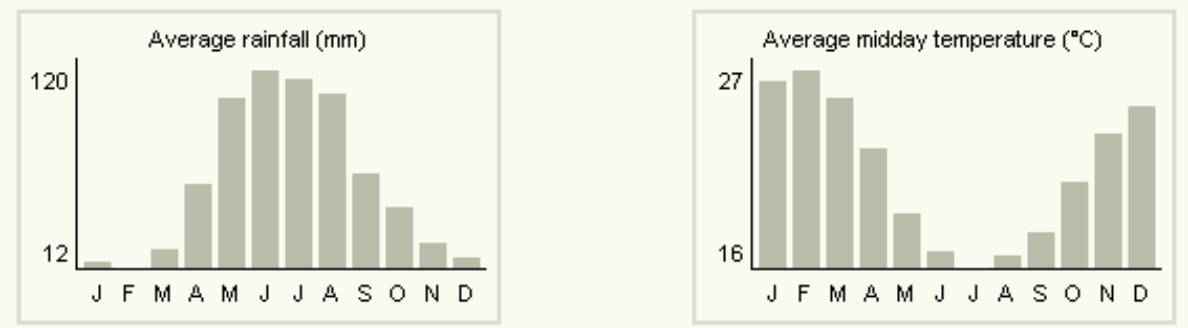


Figure 9. Average monthly rainfall and temperature values for the area (SA Explorer, 2008)

c. Geology and Soil

The geology can be described as quaternary alluvium derived mostly from Table Mountain sandstones and the Malmesbury Group clays (with some Cape Granite towards the north). The natural soil profile of the site has been extensively disturbed as a result of the past activities on the site. Much of the site is covered by deep, grey sandy soils (Figure 10). These soils have imperfect drainage and are highly erodible.

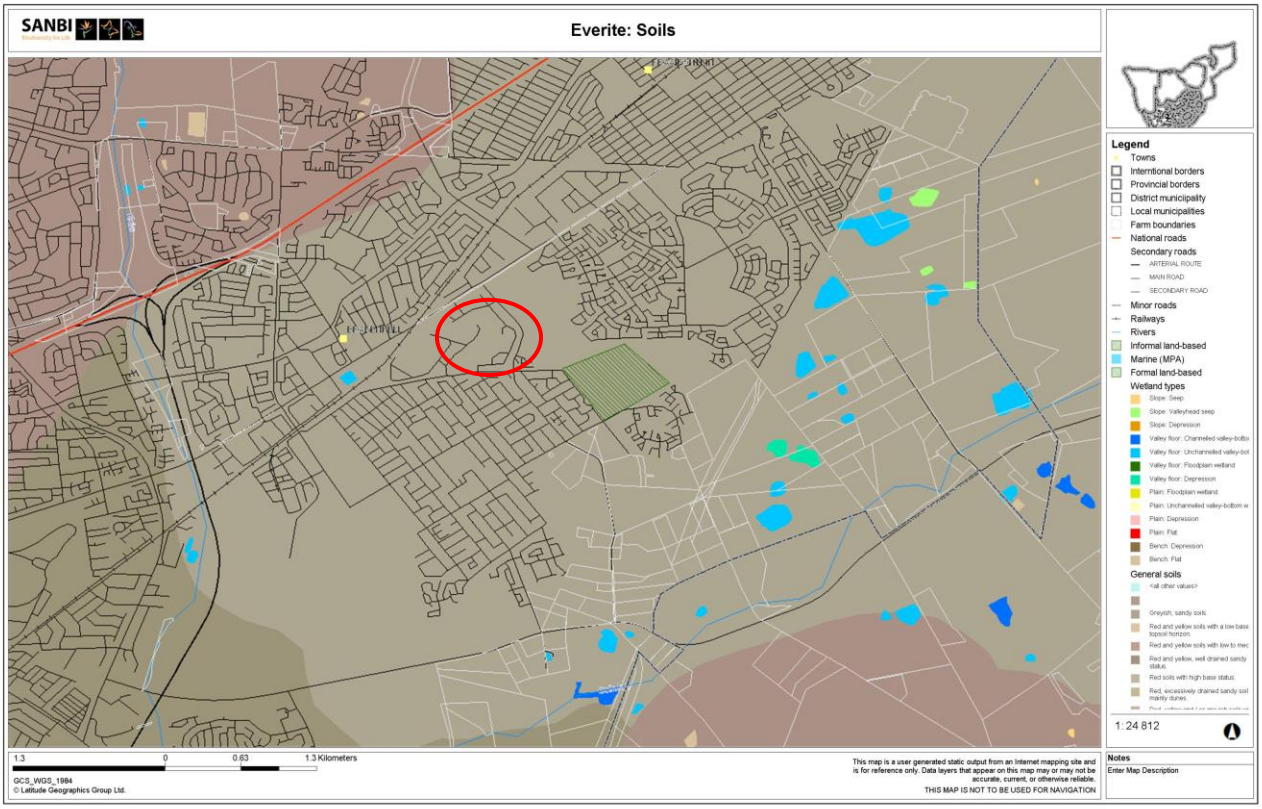


Figure 10. General soils map for the area surrounding the site (SANBI GIS, 2012)

d. Flora

The vegetation types that naturally occurred at the site are Cape Flats Sand Fynbos – Critically endangered (mauve in Figure 11). Its surrounding areas would have consisted of Swartland Granite Renosterveld (medium blue in Figure 11) and Swartland Shale Renosterveld (light blue in Figure 11). The site is however highly transformed and there is little remaining of the natural vegetation cover. Much of the current vegetation occurring on site is exotic, with many of the plants being of an invasive nature such as the Port Jackson willow *Acacia saligna*. The site and its surrounds are included in the City of Cape Town's Biodiversity network map (Figure 11). No critical biodiversity or wetland areas have been identified for the site or its surrounds.

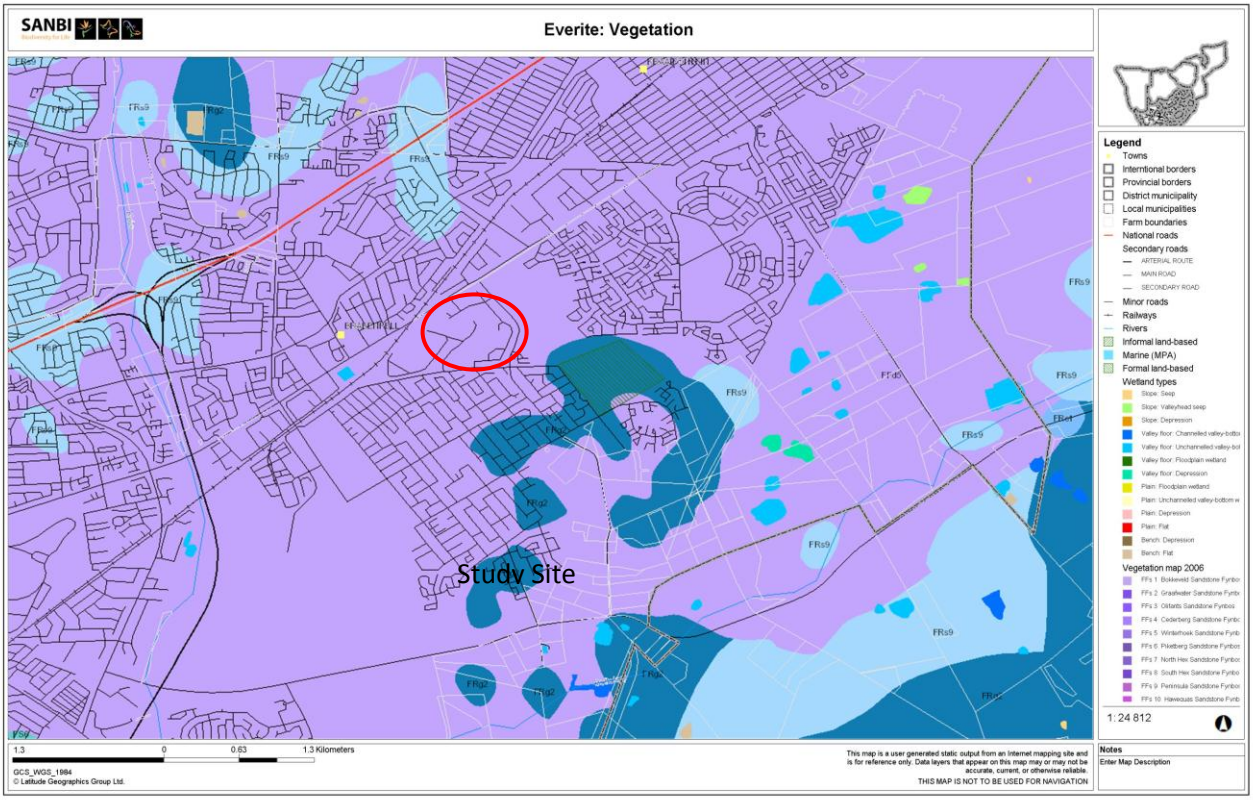


Figure 11. Vegetation map for the area and surroundings (SANBI Biodiversity GIS)

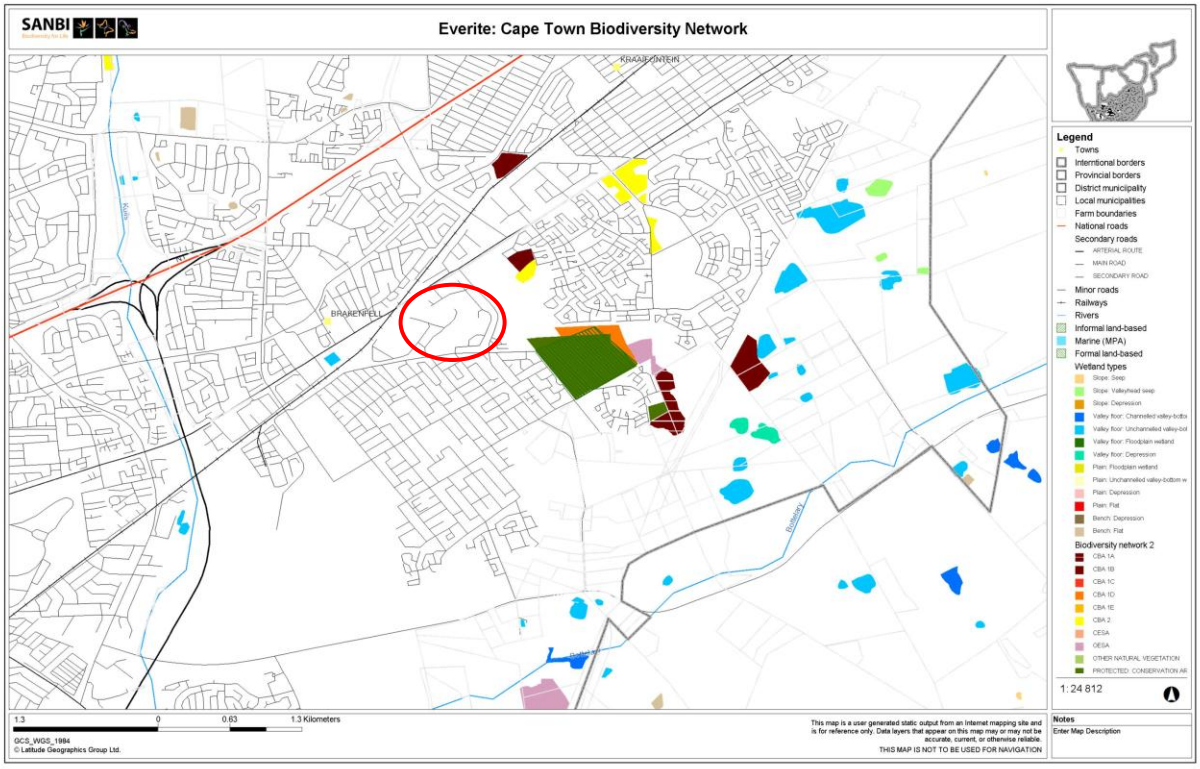


Figure 12. Cape Town's Biodiversity networkmap for the site and surrounding areas (SANBI Biodiversity GIS)

e. Aquatic Features

The proposed development falls on the watershed between the catchments of the Bottelary and Kuils Rivers. These rivers in general flow within an unconfined valley which consists largely of alluvial sands. As a result the rivers are predominantly of a wetland nature. The water related features on the site consist of a number of drainage features which are mostly man made as well as a large storm water pond. These features are discussed in more detail in the following section on Freshwater Assessment.

Figure 13. Google Earth image of water realted features on the site

f. Land use

The land use practice in the vicinity is largely commercial and industrial. Much of the wider surrounding area forms part of the residential suburb of Brackenfell which is growing rapidly while further to the east the land is still zoned for agriculture. Very little of the area is undeveloped and the natural vegetation is largely transformed. The Brackenfell Nature Reserve however lies directly to the south east of the site and is a protected area (Figure 14).

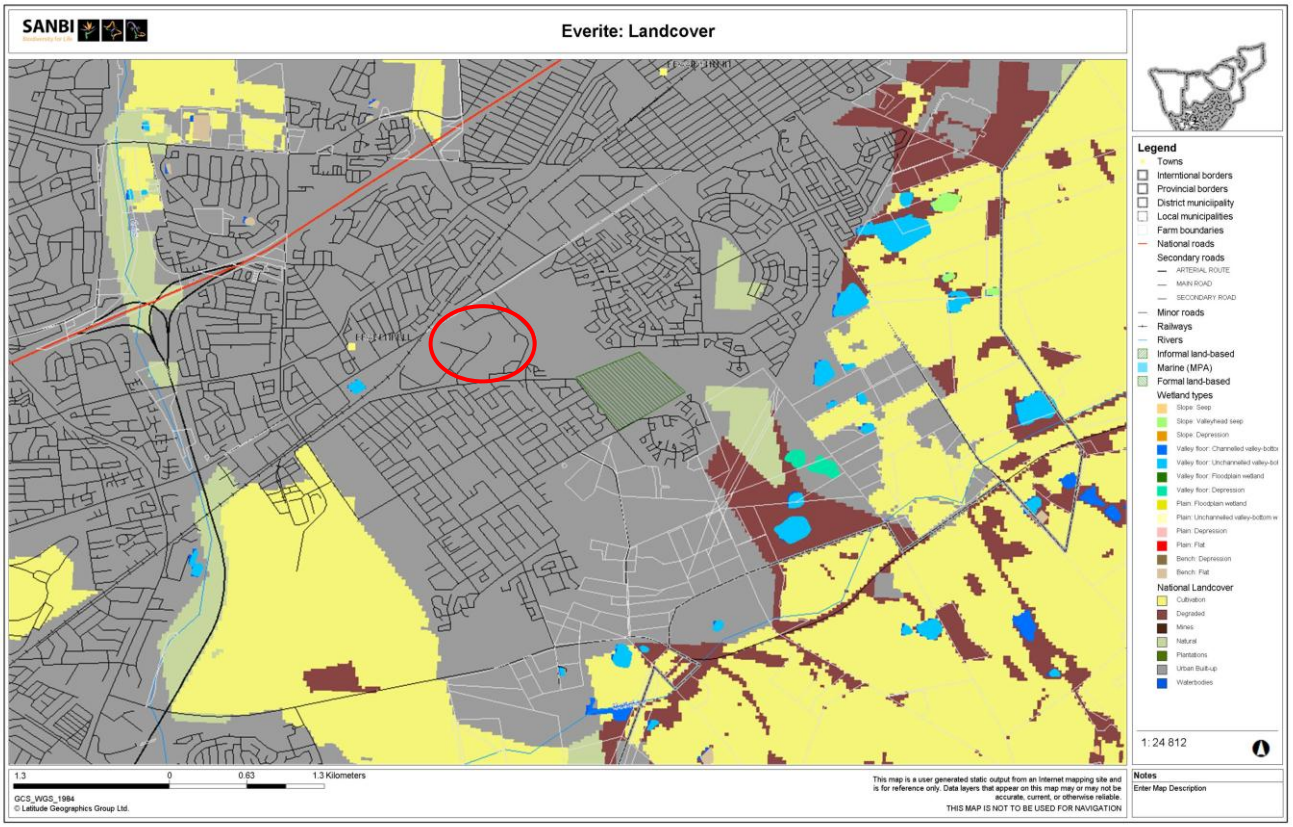


Figure 14. The site and its surrounding areas are largely transformed by peri-urban and agricultural activities (SANBI Biodiversity GIS)

5.3. Freshwater Assessment

As previously mentioned the Everite site is already highly modified. From the historical assessment of the site, there were no naturally created freshwater features on the site and all recent features were created during the development of the site. From a freshwater functionality point of view, the only aquatic feature of concern is the storm water pond in the north-western corner of the site. This artificial "wetland" provides an essential function of mitigating the impacts of the storm water arising from the site on the surrounding areas.

WET-EcoServices and WET-Health, were utilised to assess the present ecological state of the wetland, as well as the benefits and services supplied by it to the existing hydrology and water quality of the area.

The freshwater environments identified on the site are described below:

- A large wetland area (approximately 2000 m^2) is located in the north western corner of the site (Figures 15 and 16). This appears to be an artificially created depression specifically constructed to deal with storm water runoff from the site and is located at the lowest point on the site. The wetland area is dominated by bulrush *Typha capensis* which typically grows

within storm water systems that receive a constant flow (low flow) and are often rich in nutrients.

- The central area of the site is elevated and consists of deep sandy soils. A number of drains have been constructed to channel water from the site into the wetland/storm water pond (Figure 17). The site largely consists of disturbed soils and invasive alien Port Jackson willows *Acacia saligna* and exotic grasses, as well as some dumping of rubble and litter.
- Along the outer edge of the northern and eastern portions of the property is a small drainage channel that simply carries runoff from the lower lying areas of the site also into the wetland/storm water pond (Figure 18).

The above-mentioned features were identified as part of a rapid assessment of the wet environments on the proposed site. The drainage line on the site has no particular importance. The wetland/storm water pond has no real significance in terms of biodiversity as it is an overgrown mono stand of bulrush *Typha capensis*.

Figure 15. View of wetland

Figure 16. View of one of the drains into wetland area

Figure 17. View of drainage line

a. Habitat integrity

The Present Ecological Status (PES) Method (DWAF 2005) was used to establish a broad evaluation of the integrity of the entire site in terms of its freshwater features. The assessment method was based on the modified Habitat Integrity approach developed by Kleynhans (DWAF, 1999; Dickens *et al*, 2003). The table below displays the criteria and results from the assessment of the habitat integrity of the wetlands. These criteria were selected based on the assumption that anthropogenic modification of the criteria and attributes listed under each selected criterion can generally be regarded as the primary causes of the ecological integrity of a wetland.

As the storm water pond assessed is man-made and not natural, this PES assessment is rather an indication of the sustainability of the freshwater feature to continue to function as a wetland feature rather than to measure any modification from a 'natural' state.

Table 1. Habitat integrity assessment criteria and results for freshwater systems at the Everite site (score of 0=critically modified to 5=unmodified)

Criteria & Attributes	Relevance	Score
Hydrologic		
Flow Modification	Consequence of abstraction, regulation by impoundments or increased runoff from human settlements or agricultural land. Changes in flow regime (timing, duration, frequency), volumes, velocity which affect inundation of wetland habitats resulting in floralistic changes or incorrect cues to biota. Abstraction of groundwater flows to the wetland.	1.5
Permanent Inundation	Consequence of impoundment resulting in destruction of natural wetland habitat and cues for wetland biota.	1.0
Water Quality		
Water Quality Modification	From point or diffuse sources. Measure directly by laboratory analysis or assessed indirectly from upstream agricultural activities, human settlements and industrial activities. Aggravated by volumetric decrease in flow delivered to the wetland.	2
Sediment Load Modification	Consequence of reduction due to entrapment by impoundments or increase due to land use practices such as overgrazing. Cause of unnatural rates of erosion, accretion or infilling of wetlands and change in habitats.	2.5
Hydraulic/Geomorphic		
Canalisation	Results in desiccation or changes to inundation patterns of wetland and thus changes in habitats. River diversions or drainage.	1
Topographic Alteration	Consequence of infilling, ploughing, dykes, trampling, bridges, roads, railway lines and other substrate disruptive activities that reduce or change wetland habitat directly in inundation patterns.	1
Biota		
Terrestrial Encroachment	Consequence of desiccation of wetland and encroachment of terrestrial plant species due to changes in hydrology or geomorphology. Change from wetland to terrestrial habitat and loss of wetland functions.	2.5
Indigenous Vegetation Removal	Direct destruction of habitat through farming activities, grazing or firewood collection affecting wildlife habitat and flow attenuation functions, organic matter inputs and increases potential for erosion.	1.5
Invasive Plant Encroachment	Affects habitat characteristics through changes in community structure and water quality changes (oxygen reduction and shading).	2
Alien Fauna	Presence of alien fauna affecting faunal community structure.	3.5
Over use of Biota	Overgrazing, over fishing, etc.	3.5
Total Mean		2.0
Category		**D**

The storm water pond is considered to be in a largely modified state, which is typical of storm water related wetland features in urban areas. The condition of the freshwater ecosystem is considered to still be at an acceptable and sustainable level (Table 2).

Table 2. Relation between scores given and ecological categories

Scoring Guidelines	Interpretation of Mean* of Scores for all Attributes: Rating of Present Ecological Status Category (PESC)
Natural, unmodified - score=5.	Within general acceptable range CATEGORY A >4; Unmodified, or approximates natural condition.
Largely natural - score=4.	CATEGORY B >3 and <4; Largely natural with few modifications, but with some loss of natural habitats.
Moderately modified- score=3.	CATEGORY C >2 and <3; moderately modified, but with some loss of natural habitats.
Largely modified - score=2.	CATEGORY D <2; largely modified. A large loss of natural habitats and basic ecosystem functions has occurred.
	OUTSIDE GENERALLY ACCEPTABLE RANGE
Seriously modified - rating=1.	CATEGORY E >0 and <1; seriously modified. The losses of natural habitats and basic ecosystem functions are extensive.
Critically modified - rating=0.	CLASS F 0; critically modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat.

b. Ecological Importance and Sensitivity (EIS)

EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.

Table 3. Definition of the four-point scale used to assess biotic and habitat determinants presumed to indicate either importance or sensitivity

Four point scale	Definition
1	One species/taxon judged as rare or endangered at a local scale.
2	More than one species/taxon judged to be rare or endangered on a local scale.
3	One or more species/taxon judged to be rare or endangered on a Provincial/regional scale.
4	One or more species/taxon judged as rare or endangered on a National scale (i.e. SA Red Data Books)

Table 4. Ecological importance and sensitivity categories (DWAF, 1999)

EISC	General description	Range of median
Very high	Quaternaries/delineations that are considered to be unique on a national and international level based on unique biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are usually very sensitive to flow modifications and have no or only a small capacity for use.	>3-4
High	Quaternaries/delineations that are considered to be unique on a national scale based on their biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) may be sensitive to flow modifications but in some cases may have substantial capacity for use.	>2-≤3
Moderate	Quaternaries/delineations that are considered to be unique on a provincial or local scale due to biodiversity (habitat diversity, species diversity, unique species, rare and endangered species). These rivers (in terms of biota and habitat) are not usually very sensitive to flow modifications and often have substantial capacity for use.	>1-≤2
Low/ marginal	Quaternaries/delineations that are not unique on any scale. These rivers (in terms of biota and habitat) are generally not very sensitive to flow modifications and usually have substantial capacity for use.	≤1

Table 5. Results of the EIS assessment for the freshwater features on the Everite site

Biotic Determinants	Score
Rare and endangered biota	0
Unique biota	0
Intolerant biota	0
Species/taxon richness	0
Aquatic Habitat Determinants	
Diversity of aquatic habitat types or features	1
Refuge value of habitat type	2
Sensitivity of habitat to flow changes	1
Sensitivity of flow related water quality changes	1
Migration route/corridor for instream and riparian biota	1
National parks, wilderness areas, Nature Reserves, Natural Heritage sites, Natural areas, PNEs	0
RATINGS	0
EIS CATEGORY	**Marginal**

The ecological importance and sensitivity of the storm water pond is considered to be marginal.

c. Ecosystem Services Supplied by the freshwater features

The assessment of the ecosystem services supplied by the storm water pond/wetland was conducted according to the guidelines as described by Kotze *et* al (2005). An assessment was undertaken that examines and rates the services listed in Table 6. The characteristics were scored according to the general levels of services provided. It is important to manage the wetlands to ensure that they can continue to provide the valued goods and services.

Table 6. Goods and services assessment results for wetlands (where a score of 0 = low and 4 = high)

Goods and services	Score
Flood attenuation	3.5
Stream flow regulation	2.5
Sediment trapping	3.5
Phosphate trapping	3
Nitrate removal	3.5
Toxicant removal	3.5
Erosion control	2.5
Carbon storage	2
Maintenance of biodiversity	1.5
Water supply for human use	0
Natural resources	0
Cultivated foods	0
Cultural significance	0
Tourism and recreation	0
Education and research	0

The main functionality of the 'wetland area' is to mitigate the quality and flow impacts of runoff emanating from the site. A secondary and small function of the pond is that it now provides habitat for typical wetland associated biota such as birdlife such as the Southern Red Bishop *Euplectes orix* and amphibians. In terms of habitat however the pond is dominated completely by the bulrush *Typha capensis* (a reed species typical of storm water related water features particularly within urban areas) with very little open water.

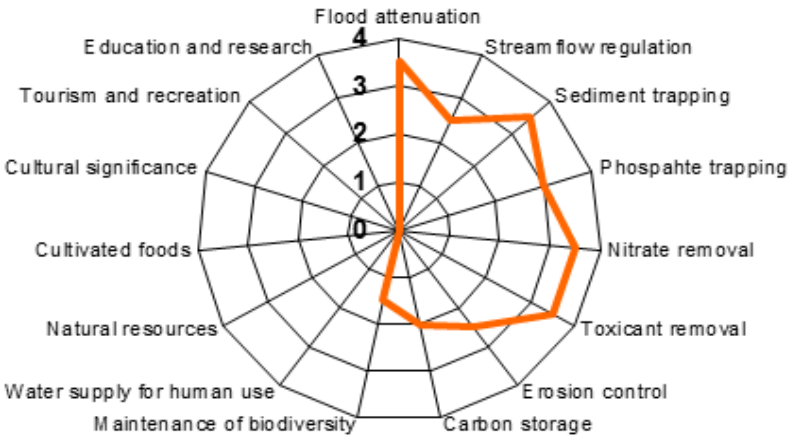


Figure 18. Ecosystem services provided by the wetland

6. ASSESSMENT OF IMPACTS

6.1. Legislative and Regulatory requirements

The following Acts, regulations and ordinances are applicable to the development:

- **The National Environmental Management Act (Act No. 107 of 1998)**

Chapter Seven of the NEMA states that:
"*Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*".

The Act also clearly states that the landowner, or the person using or controlling the land, is responsible for taking measures to control and rectify any degradation. These may include measures to:
"(a) investigate, assess and evaluate the impact on the environment;
(b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment:
(c) cease, modify or control any act, activity or process causing the pollution or degradation:
(d) contain or prevent the movement of pollutants or degradation: or
(e) eliminate any source of pollution or degradation: or
(f) remedy the effects of the pollution or degradation."

- **NEMA Basic Assessment Regulations, GN R543 of 2010**

Activities listed in terms of Chapter 5 of NEMA in Government Notice No. R. 544, 5 and 6 trigger a mandatory Basic Assessment, or even a full scoping EIA process, prior to development.

The National Environmental Management Second Amendment Act (Act No.8 of 2004) provided for formal procedures for offenders in terms of Section 24G to apply for rectification of the unlawful commencement of listed activities.

- **National Water Act, 1998 (Act No. 36 of 1998)**

The purpose of the National Water Act is to provide a framework for the equitable allocation and sustainable management of water resources. Both surface and groundwater sources are redefined by the Act as national resources which cannot be owned by any individual, and rights to which are

not automatically coupled to land rights, but for which prospective users must apply for authorisation and register as users. The National Water Act also provides for measures to prevent, control and remedy the pollution of surface and groundwater sources. The DWA needs to give authorization for any of the water uses are defined by the National Water Act and range from abstraction and storage of water, wastewater disposal and discharge to change of the bed, banks and characteristics of a water resource. Various levels of authorization exist and are described below.

- **Regulations Requiring that a Water User be Registered, GN R.1352 (1999)**

Regulations requiring the registration of water users were promulgated by the Minister of the DWA in terms of provision made in section 26(1)(c), read together with section 69 of the National Water Act, 1998. Section 26(1)(c) of the Act allows for registration of all water uses including existing lawful water use in terms of section 34(2). Section 29(1)(b)(vi) also states that in the case of a general authorisation, the responsible authority may attach a condition requiring the registration of such water use. The Regulations (Art. 3) oblige any water user as defined under section 21 of the Act to register such use with the responsible authority and effectively to apply for a Registration Certificate as contemplated under Art.7(1) of the Regulations.

- **General Authorisation in terms of s. 39 of the National Water Act, GN R 1199 of 2009** (General Authorisation for Section 21(c) and (i) water uses only)

Government Notice R1199 was issued as a revision of the General Authorisations (No. 1191 of 1999) for Section 21 (c) and (i) water uses as defined under the National Water Act (Act 36 of 1998). The revision was published and came into effect on 2009/12/18. According to the preamble to Part 6 of the National Water Act, "*This Part establishes a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette...*"
"The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary…"

No section 21 (c) or (i) water use activity within 500m of a wetland area can be Generally Authorised and a full water use licence assessment process needs to be followed in this case. The 'wetland' on the Everite site can be clearly seen as a man-made feature that was constructed solely to mitigate the impacts of storm water emanating from the site. The National Water Act however does not distinguish between artificial and natural wetland areas, they are only identified based on their characteristics as defined by the Act, that is:
``wetland'' means 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 Department of Water Affairs will need to be approach with regards to the need for a water use licence application for any intended activity on the site.

6.2. Description of impacts

Listed impacts to the wetland features are as follows:

- **Impact - water quality impairment:** There is a potential associated with the development for some impairment of the surface water quality to occur, namely sedimentation and other pollutants resulting from the construction phase and possibly the operational phase.

  Significance of impacts without mitigation: Low negative impact due to the fact that the storm water pond was specifically constructed for the purpose of mitigating the impacts of storm water runoff from the site.

  Proposed mitigation: The water quality impacts during the construction phase in particular should be addressed through the Environmental Management Plan, which is implemented by an on-site Environmental Officer. Contaminated runoff from the construction site should be prevented from directly entering the water features where possible. Construction activities should preferably be carried out in the dry season to ensure that the contaminated run-off can easily be managed on site. Constructed areas should be covered with suitable vegetation cover as soon as possible after construction is completed.

  The water quality impacts during the operational phase should primarily be dealt with through the design of the storm water system and through implementation of a storm water management plan. The storm water management plan should address aspects such as:

  - Introduce suitable indigenous wetland vegetation and habitat diversity within storm water systems. An opportunity is possible to specifically deal with this mitigation measure within the storm water channels between the aquatic features/storm water dams. These connecting systems should preferably not be piped but be created drainage features.
  - Litter transported in the storm water systems should be prevented from entering the storm water pond.
  - Storm water run-off should also be reduced as far as possible (see mitigation measures described below) to reduce erosion of soils on the steeper gradient slopes.

  Significance of impacts after mitigation: Provided that the mitigation measures are effectively implemented the water quality impacts of the development should be limited to a low negative to negligible impact. These impacts can also be adequately dealt with on site, to ensure that the by-laws of the City with regards to storm water management are complied with.

- **Impact - flow modification:** The alteration of the surface cover of the site is likely to result in a change in the run-off characteristics on site. In particular, one could expect that with an increase in the hardened surfaces on site, there will be an increase in the intensity and volume of storm water run-off from the site.

  Significance of impacts without mitigation: Low to medium negative impact

  Proposed mitigation: Implementation of the storm water management plan mentioned above should mitigate the impact of increased storm water flows. Such a management plan should also include the following flow related mitigation measures:

  - The development activities should not occur within the 1:50 year flood line.
  - Reduce run-off on the site through encouragement of surfaces that allow for infiltration where possible rather than impervious surfaces.

  Significance of impacts after mitigation: Low impact

- **Modification of wetland habitat**: It is unlikely that there would be any modification of 'wetland' habitat as result of the altered storm water characteristics if unmitigated as this feature has be created specifically to mitigate storm water runoff. However, should development take place too close to the edges of the reeds, one could expect some direct habitat disturbance to take place.

  Significance of impacts without mitigation: Low negative impact

  Proposed mitigation: The construction of the development in the north western extent of the property must not take place in the wetland area. All alien vegetation should be cleared around this area and landscaping is not encouraged. It is believed that this area will naturally recover from the direct (dust, pollution) and indirect (change in passive infiltration of the vicinity) disturbances. A buffer area of 15 m wide should be established from the edge of the pond system. Storm water run-off should not be discharged directly into the wetland area but should be allowed to dissipate through the buffer area. The chosen route for the sewage pipelines (or the bulk water supply line) should also be located outside of the wetland and buffer area.

  Significance of impacts after mitigation: Very Low to Negligible impact

- **Cumulative impacts**

The proposed change of land use on the Everite site's cumulative impact on the aquatic features at the site and well as in its surrounds, results largely from the change in quality and quantity (flow patterns) of the storm water. It is therefore essential that the storm water design and management plan for the site ensure that there is no significant change in the characteristics of the storm water leaving the site. This is in accordance with the City of Cape Town's By-lay for storm water management. It is thus recommended that the existing storm water pond on the site be retained to provide this functionality.

7. RECOMMENDATIONS AND CONCLUSIONS

The site was visited on 19 May 2012 to undertake a rapid assessment of any freshwater features that may occur on the site. The freshwater related features identified on the site are as follows:

- A large wetland area that is located in the north western corner of the site. This feature is an artificially created depression specifically constructed to deal with storm water runoff from the site and is located at the lowest point on the site. The wetland area is dominated by bulrush *Typha capensis* which typically grows within storm water systems that receive a constant flow (low flow) and are often rich in nutrients.
- The central area of the site is elevated and consists of deep sandy soils. A number of drains have been constructed to channel water from the site into the wetland/storm water pond. The site largely consists of disturbed soils and invasive alien Port Jackson willows *Acacia saligna* and exotic grasses, as well as some dumping of rubble and litter.
- Along the outer edge of the northern and eastern portions of the property is a small drainage channel that simply carries runoff from the lower lying areas of the site also into the wetland/storm water pond. The drainage line on the site has no particular importance.

The wetland/storm water pond has no real significance in terms of biodiversity as it is an overgrown mono stand of bulrush. It does however provide some habitat for birdlife but more importantly it performs an important function in mitigating storm water on the site. It should preferably remain intact (with a small buffer area surrounding it of 15 m from the delineated edge) and be cleared of alien vegetation (largely Port Jackson willow).

As the pond is located at the lowest point on the site such a feature would anyway be require at that approximate locality to mitigate the storm water from the proposed development as per the City of Cape Town's storm water policy. Should the pond need to be relocated, one of similar size should be created elsewhere on the site.

The impact of the proposed development (preferred alternative) is expected to be limited, provided the following mitigation measures are implemented. An EMP be compiled and implemented for the construction and operational phases of the proposed development that includes the recommendations of this report. In addition, the storm water system design and management plan be developed in conjunction with the recommendations from an aquatic ecologist.

Key recommendations in this report are:

- The storm water pond in the north western corner of the site should be retained and a 15 m buffer retained from the wetland edge. Limited disturbance should be allowed within the buffer zone. The rehabilitation of disturbed areas must take place as soon as possible post construction.
- Construction on the site should preferable take place in the dry season when run-off on site can be well managed.

- Clearing or felling of invasive alien trees should take place within the buffer area and wetland. Advice of a botanist should be obtained to compile a programme on the removal and control of alien invasive plants.
- The intensity of storm water run-off should be reduced where possible through encouraging paving and surfaces that allow for greater infiltration. Storm water discharges should be dissipated before entering the storm water pond and should not be direct piped discharges.
- Litter should be prevented from entering the storm water pond.
- Approval should be obtained from the Department of Water Affairs for any activities such as the development of hard surfaces on the site.

8. REFERENCES

Department of Water Affairs and Forestry. (1999). *Resource Directed Measures for Protection of Water Resources. Volume 3: River Ecosystems Version 1.0*. Resource Directed Measures for Protection of Water Resources, Pretoria, South Africa.

Department of Water Affairs and Forestry. (2007). *River Ecoclassification: Manual for Ecostatus Determination (Version 2)*. Riparian Vegetation Response Index, Water Research Commission Report Number KV 168/05. Pretoria.

Dickens, C. Kotze, D. Mashigo, S. MacKay H. & Graham M. Guidelines for integrating the protection, conservation and management of wetlands into catchment management planning (Report TT220/04)

Kotze, D., Marneweck, G.C., Batchelor, A.L., Lindley, D.S. And Collins, N.B. 2005: *WET-EcoServices: A technique for rapidly assessing ecosystem services supplied by wetlands.* Dept. Tourism, Environmental and Economic Affairs, Free State.

Mucina, L. and Rutherford, M. C. (eds.) (2004) Vegetation map of South Africa, Lesotho and Swaziland. Strlitzia 18. South African National Biodiversity Institute, Pretoria.

APPENDIX A: DECLARATION OF INDEPENDENCE BY The independent PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Antonia Belcher, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Signature of the specialist:

12 June 2012

Date:

APPENDIX B: ABBREVIATED CURRICULUM VITAE:

Full Name	Antonia Belcher
Profession	Aquatic Ecologist and Environmental Management (P. Sci. Nat. 400040/10)
Contact details	60 Dummer Street, Somerset West, 7139; Telephone: 082 883 8055

Relevant work experience:

Due to my involvement in the development and implementation of the River Health Program in the Western Cape, I have been a key part of the team that has undertaken six catchment or area wide 'state-of-river' assessments as well as routine monitoring and specialised assessments of rivers and wetlands in all the major catchments for the Western Cape.

Relevant work experience follows:

Belcher, A. 2007. Freshwater Assessment Input into The Storm water Master Plan for the Upper Mosselbank River Near Durbanville, City of Cape Town.

Belcher, A. 2008. Ecological Assessment of the Vlermuiskelderskloof Spruit. Proposed construction of an instream dam, Farm 143 Portion 4, Napier.

Belcher, A. 2008. Freshwater Ecological Screening Study: Helderberg Integrated Waste Management Facility.

Belcher, A. 2009. Freshwater Assessment: Proposed Upgrading of the Grabouw Wastewater Treatment Works.

Belcher, A. 2009. Freshwater Assessment input into the Environmental Management Plan for Moorreesburg and Malmesbury.

Belcher, A. 2009. Freshwater Assessment for the Proposed Improvement of Structures along the R27, Section 10 and 11 between Kenhardt and Keimoes.

Belcher, A. 2010. Freshwater Assessment for the Proposed Improvement of National Route 7 Section 1 between the Melkbos and Atlantis Intersections

Belcher, A. 2011. Freshwater Assessment for the Proposed Ibhubesi Power Project

Belcher, A. 2012. Freshwater Screening Assessment for the proposed solar energy facility on Portion 3 of Farm 18 (Onder Rietvlei) in the District of Aurora

DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I, Antonia Belcher, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

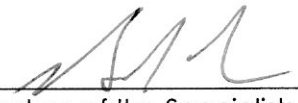
- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or

  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review specialist must be submitted);

- In terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;

- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared or to be prepared as part of the application; and

- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.



Signature of the Specialist: 9 September 2021 Date:

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Name of company (if applicable):