

IMPACT ASSESSMENT, MANAGEMENT, MITIGATION AND MONITORING MEASURES

Please note: While sections are provided for impacts on certain aspects of the environment and certain impacts, the sections should also be copied and completed for all other impacts.

- (a) Impacts that may result from the planning, design and construction phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the planning, design and construction phase.

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

Nature of impact: Disturbance to subsurface geological layers
Discussion: Construction and excavation activities will affect the underlying geological layers on site to some extent. The depth of the rocks differs throughout the proposed area; therefore, the substrata will be affected differently.
Cumulative impacts: It is not anticipated that the impact will be high as the excavated substrata will be re-used for infilling and the integrity of the underlying ground structures will thus not be sacrificed.
Mitigation: Due to the nature of the impacts, not much can be done to mitigate the impact, only the severity of it can be managed. <ul style="list-style-type: none"> Mitigation and management for affecting geology is to ensure that removal of geological material and hardening are kept to a minimum and only within proposed development areas. Any cumulative impacts due to compaction/hardening of substrata such as damming of storm water elsewhere must be managed according to a site specific storm water management plan.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5		
Magnitude	6	2		
Probability	5	2		
Significance	65-High	16-Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	2 -Partial loss will occur			
Can impacts be mitigated?	2 - Partly			

Nature of impact: Disturbance to Bottelary River riverbed and banks
Discussion: Construction activities within and along the Bottelary river tributary will disturb the riverbed and banks due to excavations etc. The tributary on site has however been largely modified already.
Cumulative impacts: Exposing soil along steep slopes may lead to erosion if not mitigated.
Mitigation: <ul style="list-style-type: none"> Limit all construction activities to as small an area as possible to avoid disturbance of areas outside the development footprint. Conduct and complete construction work as quickly as possible during the dry summer months when stormwater and riverflow runoff are minimal. Undertake storm water management measures as required. Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	Not Applicable (No	

Duration	5	1	construction activities to take place during the No-Go Alternative)
Magnitude	4	2	
Probability	5	5	
Significance	55- Medium	20-Low	
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost		
Can impacts be mitigated?	2 -Partly		

Nature of impact: Impact of construction work on river hydrology/flow
Discussion: Construction activities may cause temporary impedance and/or divergence of river flow.
Cumulative impacts: Temporary impedance and/or divergence of river flow which may lead to erosion of riverbed and banks and disruption in current hydrological processes.
Mitigation: <ul style="list-style-type: none"> • Activities within the river channel during the construction phase should be limited as far as possible in terms of their spatial and temporal extent. • Construction work within the river channel should preferably take place before the onset of the rainfall period to ensure minimal impact on flow. • Construction should be completed as quickly as possible and temporary diversion channels should be created if heavy rainfall is predicted during the construction period. If required temporary diversion channels must divert the river flow around the construction areas into the downstream flow of the river.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1		
Magnitude	4	2		
Probability	5	5		
Significance	35- Medium	25 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented			
Can impacts be mitigated?	1-Yes			

Nature of impact: Soil erosion
Discussion: During construction access roads for construction, workers camps, etc. will cause a disturbance to the soil and the vegetation cover. This disturbance, unless carefully managed, could spread as a result of unnecessary construction of additional access roads or site clearing outside of approved development footprint. Construction camps, if not fenced and restricted in size, could result in unnecessarily large areas being disturbed. Soil erosion could occur due to wind (wind erosion cause dust pollution) or due to overland flow should rains fall during construction.
Cumulative impacts: Soil erosion due to exposed soil surfaces and clearing of vegetation could lead to further degradation on surrounding indigenous vegetation areas. Soil erosion may lead to loss in topsoil and impact environmental processes of adjacent sensitive environments.
Mitigation:

- Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase.
- Site clearance along the border of the no-go areas must be done under the supervision of an ECO.
- Personnel should be restricted to the construction camp site and immediate construction areas only.
- Undertake specific erosion monitoring and maintenance throughout the construction phase as and if required.
- Control access to roads and other areas to avoid disturbance of areas outside the development footprint.
- Undertake dust suppression as needed.
- Monitor soil erosion on a regular basis and rehabilitate impacted areas as soon as possible under supervision of appointed ECO.
- Stormwater discharge flow must be managed and restricted in such a manner that it does not cause erosion.
- Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	2	1		
Magnitude	10	6		
Probability	4	3		
Significance	72 - High	24 - Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented			
Can impacts be mitigated?	2 Partly – Disturbance to topsoil during construction is inevitable, but erosion and increased storm water runoff can be mitigated.			

Nature of impact:

Impacts of construction activities on the water quality of surface and underground water resources

Discussion:

Construction activities can impact negatively upon the surface and groundwater resources on and adjacent to the site.

Possible chemicals found on site during construction as well as any hydrocarbon spillages will negatively affect the soil and surface or ground water interacting with it. Should the spills not be cleaned up and surface water infiltrate the ground, pollutants may even affect the groundwater resource.

Cumulative impacts:

Loss or pollution of surface and ground water resources.

Soil pollution might under extreme circumstances extend to areas outside the area of development. This will lead to higher sediment and solute content of water leaving the area, thus lowering water quality in the area and even pose a threat to human health in extreme circumstances.

Mitigation:

- All construction activities and personnel on site to stay within demarcated construction areas.
- Proper waste bins to be provided to construction staff and all waste to be regularly removed to municipal landfill site.
- Monitor for erosion. Should erosion be present, undertake maintenance activities such as planting of vegetation.
- All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.
- Any oil or diesel spills etc. must be reported to the site manager and rehabilitation measures must be taken immediately and contaminated soil disposed of at a licensed landfill site.
- The construction camp where construction vehicles are parked must be at least 30m away from the watercourse as measured from the edge of the watercourse.
- Contaminated runoff from the construction site(s) should be prevented from entering the stream.

- The construction camp should be located at least 30m away from the stream top of bank.
- All potential hazardous materials i.e. fuels, cement etc. should be properly stored and contained within the construction camp.
- Disposal of waste from the site should also be properly managed.
- Construction workers should be given ablution facilities at the construction sites that are located away from the river systems (at least 30m) and regularly serviced.
- These measures should be addressed, implemented and monitored in terms of the EMP for the construction phase.
- To limit the risk of contaminated runoff as well as sedimentation from impacting on the quality of the water in the stream, construction activities should preferably take place in the drier months of the year.
- All construction activities and personnel on site to stay within demarcated construction areas.
- Construction vehicles must be checked for leakages on a daily basis and repaired before allowed to work within watercourses if a leakage is detected.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	8	2		
Probability	4	2		
Significance	64- High	8 - Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented			
Can impacts be mitigated?	1-Yes			

Nature of impact:

Increase in and accumulation of storm water runoff

Discussion:

Removal of materials from the freshwater ecosystems and vegetated areas may cause an increase in storm water runoff and excavations may lead to accumulation/damming thereof on the site and surrounds.

Cumulative impacts:

Increase in storm water runoff could cause erosion and/or damming of water which may lead to additional negative impacts like further habitat degradation and transformation.

Mitigation:

- Implement a site specific stormwater management plan during construction to prevent uncontrolled increase in runoff speed and accumulation of stormwater runoff.
- Conduct and complete construction activities as far as possible during the dry summer months.
- Only excavate materials from proposed construction sites as according to approved layout plans.
- Do not remove any plant or soil materials from outside of the development areas.
- Do not create any additional access routes.
- Stabilise and rehabilitate areas disturbed outside of the development footprint areas immediately.
- Monitor impacted areas for erosion and accumulation of water on an ongoing basis and implement mitigation measures as and if required.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	2		
Magnitude	10	6		
Probability	5	3		
Significance	85 - High	27 – Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable	2 Partial loss of resources			

loss of resources		
Can impacts be mitigated?	2 Partly	

POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS

Nature of impact: Impact of proposed development activities on identified aquatic NFEPA's and/or Ecological Support Areas ("CESA").
Discussion: Proposed development activities will be within and lead to the development and disturbance of mapped aquatic NFEPA which is unavoidable should the development proceed.
Cumulative impacts: Disturbance to mapped, but highly degraded and transformed aquatic NFEPA.
Mitigation: <ul style="list-style-type: none"> • EMP and specialist recommendations and guidelines to be implemented • Undertake construction activities only in identified and specifically demarcated areas. • Rehabilitate impacted areas immediately after construction completion and maintain infrastructure and surrounds. • Litter must be collected from the abutting wetlands on a daily basis and by foot. All litter must be stored in suitable containers and disposed of at a licensed landfill site on at least a weekly basis. • No vehicles may be refuelled within 30m of the mapped wetland edges, and any refuelling areas must be appropriately bunded. • Site camps and areas for the storage of construction equipment and / or waste may not be located within 30m of the edge of any demarcated watercourse. • At the end of construction, allowance must be made for landscaping the area of disturbed watercourse area abutting the construction area plus a 10m setback area.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	1	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	4	2		
Probability	5	5		
Significance	50 - Medium	20 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	2 Partial loss of resources			
Can impacts be mitigated?	2 Partly			

Nature of impact: Impact of proposed development activities on the Bottelary riparian habitat
Discussion: Proposed development activities will be within and lead to the development and disturbance of mapped aquatic NFEPA which is unavoidable should the development proceed.
Cumulative impacts: Disturbance to an river with an already highly modified riparian habitat.

Mitigation:

- EMP and specialist recommendations and guidelines to be implemented
- Undertake construction activities only in identified and specifically demarcated areas.
- Rehabilitate impacted areas immediately after construction completion and maintain infrastructure and surrounds.
- Litter must be collected from the abutting wetlands on a daily basis and by foot. All litter must be stored in suitable containers and disposed of at a licensed landfill site on at least a weekly basis.
- No vehicles may be refuelled within 30m of the mapped wetland edges, and any refuelling areas must be appropriately bunded.
- Site camps and areas for the storage of construction equipment and / or waste may not be located within 30m of the edge of any demarcated watercourse.
- At the end of construction, allowance must be made for landscaping the area of disturbed watercourse area abutting the construction area plus a 10m setback area.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	1	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	4	2		
Probability	5	5		
Significance	50 - Medium	20 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	2 Partial loss of resources			
Can impacts be mitigated?	2 Partly			

Nature of impact:

Impact on the naturally occurring terrestrial and aquatic fauna, avifauna and fish species occurring on the site and surrounds

Discussion:

No red data aquatic fauna, avifauna or fish species were identified during the site surveys, and none are believed to reside on the proposed development site, but indigenous freshwater fish species have previously been recorded elsewhere within the relevant tributary.

Fauna and avifauna most likely only occasionally visit the site and will move to the adjacent remaining undeveloped areas once construction commences and back once construction is finished.

Cumulative impacts:

Loss of aquatic fauna, avifauna or fish habitat.

Mitigation:

- Undertake construction activities only in identified and specifically demarcated areas and complete construction activities as quickly as possible.
- Rehabilitate disturbed areas outside of development footprint area immediately after construction and continue monitoring and removal of alien vegetation after construction completion.
- No pollution of any soil or water resources may occur as a result of the proposed activity,

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	6	2		
Probability	5	5		
Significance	65-High	20-Low		
Status	High negative significance if not	Low negative significance if mitigated		

	mitigated	
Reversibility	100%	
Irreplaceable loss of resources	2-Partial loss	
Can impacts be mitigated?	2- Partially mitigatable, impact can be restricted to proposed development areas as assessed and impacted areas outside of development footprint area can be rehabilitated and managed.	

Nature of impact: Introduction of alien and weed plant species
Discussion: Declared weeds or alien trees may be transported onto the site and spread to surrounding areas during construction. This may have management and cost impacts on such properties. Introduction of alien plant species via vehicular traffic is an important aspect that needs to be considered. Alien grass seeds for example may become attached to vehicles and be transported to site or be brought on to site in building materials such as sand. Without monitoring and control this could become problematic.
Cumulative impacts: Loss of potential biodiversity, ecosystems and natural habitat due to the spread of invader plants.
Mitigation: The mitigation measures mentioned below will help reduce the risk of introductions and will ensure that should introductions occur they are controlled timeously: <ul style="list-style-type: none"> • Undertake construction activities only in identified and specifically demarcated areas. • Do not import and use infill material on site containing alien or weed vegetation seeds/plants. • An important aspect of on-going maintenance is the monitoring of the rehabilitated sites and access road verges for alien plant species. • Wherever possible rehabilitation of disturbed area should be done with seeds collected from indigenous vegetation in the area during rehabilitation. • Implement an ongoing alien eradication program for the areas to be rehabilitated.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	6	4		
Probability	4	3		
Significance	56- Medium	21 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1-Will not be lost			
Can impacts be mitigated?	1-Yes, by implementing an alien eradication plan and continuing monitoring of alien regrowth			

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Nature of impact: Increased temporary construction jobs
Discussion: Temporary construction jobs will be created.
Cumulative impacts: <ul style="list-style-type: none"> • Influx of contract workers due to lack of skills. • Influx of job seekers due to jobs created.

Mitigation:

- Local contractors, employing or seeking to employ local (historically disadvantaged individuals (HDIs) from the region who are suitably qualified, should get preference.
- The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the developer.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Status	-	Due to the job creation only being of an temporary nature this impact is rated as a medium positive significance	Medium Negative Impact, no construction to take place so no temporary jobs to be created.	

Nature of impact:
Traffic impacts due to construction on and along urban roads with high traffic volumes.

Discussion:
Construction to take place at existing road infrastructure will have a temporary impact on existing traffic potentially leading to additional congestion.

Cumulative impacts:
Increase in traffic congestion during peak traffic hours and higher risk of vehicle accidents within the associated area.

Mitigation:

- Site specific traffic management measures to be implemented as and when required.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	2	2		
Magnitude	8	6		
Probability	5	4		
Significance	65 - High	40 - Medium		
Status	High negative significance if not mitigated	Medium negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1- No resources will be lost			
Can impacts be mitigated?	2 Partly			

Nature of impact:
Impact of construction workers on local community safety and security

Discussion:
Construction workers on site may pose a safety and security risk to neighbouring communities if not managed

Cumulative impacts:
Theft of property of neighbouring communities.

Mitigation:
As a proclaimed work site the workers should be restricted to remain within the work site during working hours. A penalty system should be implemented on site to penalise workers who is guilty of trespassing, theft etc.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	Not Applicable (No	

Duration	5	1	construction activities to take place during the No-Go Alternative)
Magnitude	6	0	
Probability	4	2	
Significance	56- Medium	4-Low	
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost		
Can impacts be mitigated?	1-Yes, by implementing a penalty system and restricting workers movements to remain onsite during working hours.		

Nature of impact: Impact of litter or waste from the construction site on the surrounding communities.
Discussion: Construction workers and activities on site may cause polluting of surrounding areas with litter and waste from the construction site.
Cumulative impacts: Litter and waste polluting the surrounding areas.
Mitigation: <ul style="list-style-type: none"> • Appropriate refuse disposable facilities shall be provided at the proposed construction site • Daily clearance of construction litter on the site and surrounds shall be undertaken. • Waste to be disposed of via closed containers/vehicles at the municipal landfill site.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1		
Magnitude	6	0		
Probability	4	2		
Significance	56- Medium	4-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1-Will not be lost			
Can impacts be mitigated?	1-Yes.			

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

Nature of impact: The potential impact of the proposed development on archaeological, paleontological and heritage remains
Discussion: A Notice of Intent to Develop was submitted to the HWC and the following record of decision was received – <i>You are hereby notified that, since there is no reason to believe that the proposed 'development', will impact on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.</i>
Cumulative impacts: None expected.
Mitigation: Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and HWC must be notified without delay.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation

Extent	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)
Duration	5	1	
Magnitude	10	0	
Probability	1	1	
Significance	17- Low	2-Low	
Status	Low negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	0% reversibility – once the historical features are destroyed, it cannot be recovered.		
Irreplaceable loss of resources	3- Yes, completely irreplaceable		
Can impacts be mitigated?	1-Yes		

POTENTIAL IMPACTS OF NOISE

Nature of impact: Noise due to construction machinery
Discussion: Construction machinery may cause noise disturbance to the directly adjacent land users/ owners. It is not anticipated that the noise will be considerable and will only be temporary.
Cumulative impacts: Noise due to construction activities may cause a nuisance to adjacent residential areas.
Mitigation: <ul style="list-style-type: none"> • Construction activities should be restricted to weekday working hours. • Machinery and vehicles should be regularly maintained to prevent excessive noise. • All machinery and work activities must adhere to the requirements of the noise regulations.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1		
Magnitude	4	2		
Probability	3	2		
Significance	24-Low	10-Low		
Status	Low negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	This will not be a long term impact nor will it have an impact on the natural processes. It is thus 100% reversible.			
Irreplaceable loss of resources	1- No resources will be lost.			
Can impacts be mitigated?	2 Partly – Construction noise will occur but it is not expected to be significant			

POTENTIAL VISUAL IMPACTS

Nature of impact: Impact of construction activities on the surrounding land users / owners and tourists visual landscape of the area.
Discussion: The surrounding land users/ owners will be exposed to the presence of the construction machinery and sites. It is not anticipated that the visual impact of the construction activities will be very significant as the visual landscape of the site and surrounds is already transformed due to urban developments.

Cumulative impacts:

As with all construction activities, the visual impact on the surrounding humans is temporary and will not have a long term effect.

Mitigation:

- Limit construction activities to the proposed development footprint areas.
- Construction camp must be neatly fenced and construction site must be neat and tidy.
- Stockpile construction materials in one specific area.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1		
Magnitude	2	2		
Probability	3	3		
Significance	18- Low	12-Low		
Status	Low negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%			
Irreplaceable loss of resources	1- The visual resource will not be lost, merely changed. The surrounding landscape character will remain the same, namely urban area.			
Can impacts be mitigated?	2 – Partly			

- (b) Impacts that may result from the operational/maintenance phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the operational phase.

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

Nature of impact: Impact on hydrology/flow due to impedance
Discussion: Proposed infrastructure within and along the wetlands may cause impedance of existing flow if not maintained.
Cumulative impacts: Impedance and/or divergence of current stormwater flow which may lead to erosion and or degradation and change of current hydrological processes.
Mitigation: <ul style="list-style-type: none"> In the longer term, the proposed structures should not impede the flow. All infrastructures should be kept free of debris, intrusive growth of invasive alien plants and sediment build-up, as to prevent potential impedance of flow. The structures should therefore be checked periodically, particularly after higher flow events and before the onset of winter to ensure that the structure is not blocked with woody debris, sand deposits and reeds that will impede high flows. The selective removal of reeds, invasive <i>Acacia saligna</i> and <i>Eucalyptus</i> trees should also take place if obstructing flow through the structure and should be undertaken with the advice of an aquatic ecologist.

Criteria	Amandel Road Bridge Alternative 1		No-go Alternative
	Without Mitigation	With Mitigation	
Extent	2	2	Not Applicable (No development activities to take place during the No-Go Alternative)
Duration	5	1	
Magnitude	8	6	
Probability	5	3	
Significance	75-High	27-Low	
Status	High negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1-Yes		

POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS

Nature of impact: Impact of operational and maintenance activities of proposed development on remaining riparian habitat and associated instream water quality.
Discussion: Maintenance and operational activities of the proposed infrastructure may lead to edge effects such as disturbance, pollution, erosion or spread of alien vegetation encroachment on remaining riparian habitat.
Cumulative impacts: Erosion, pollution, loss of indigenous vegetation species and further degradation of aquatic ecosystems.
Mitigation: <ul style="list-style-type: none"> Undertake infrastructure maintenance activities only along existing and maintained access routes and do not create any additional access roads. If maintenance is required within sensitive ecological areas such as riparian areas an aquatic specialist must provide input into the method statements before maintenance work is to be conducted. No indigenous vegetation clearance or waste dumping activities may take place within or adjacent to the infrastructure areas during maintenance activities. Rehabilitate impacted riparian areas immediately if disturbed. Ongoing monitoring and clearing of alien vegetation species and must be implemented by the municipality along the proposed infrastructure and on adjacent remaining undeveloped areas. Ongoing monitoring and rectification of erosion and removal of illegal waste dumping as required.

- Municipality to ensure that no development or any other illegal activities occurs within the surrounds and that infrastructure are maintained.

Criteria	Amandel Road Bridge Alternative 1		No-go Alternative
	Without Mitigation	With Mitigation	
Extent	3	1	Not Applicable (No development activities to take place during the No-Go Alternative
Duration	5	1	
Magnitude	6	2	
Probability	5	2	
Significance	70- High	8-Low	
Status	High negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated		
Can impacts be mitigated?	1- Completely		

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Nature of impact:

Expansion and upgrade of existing road infrastructure within the Kuilsrivier area.

Discussion:

The proposed activity will result in the expansion of the City's road network, thus alleviating congestion and making areas more accessible. The Municipality is mandated in terms of the PSDF to provide and maintain road infrastructure and networks. The activity is therefore in line with the objectives manifested in the PSDF and local Service Delivery Implementation Plan

Cumulative impacts:

Additional access and alleviation of traffic congestion within specific areas.

Mitigation:

Maintain services infrastructure as proposed.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Status	High Negative Significance	High Positive Significance	High Negative Significance - ongoing successful services provision and traffic congestion alleviation cannot be ensured/promoted	

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

It is not anticipated that any further impact on the cultural-historical aspects of the site will occur during this phase, however should any burials, fossils or other historical material be encountered during maintenance activities of the operational phase, work must cease immediately and HWC must be contacted.

POTENTIAL IMPACTS OF NOISE

Nature of impact:

Noise due to traffic along proposed roads.

Discussion:

Traffic along the proposed new road infrastructure will lead to an increase in traffic noise along the immediate surrounding residential areas. However due to the existing road infrastructure already within the applicable areas it is not expected that the additional traffic noise will lead to a significant increase in traffic noise.

Cumulative impacts:

Noise due to traffic along new roads may cause a nuisance to adjacent residential areas.

Mitigation:

Due to the nature of this impact not much can be done to mitigate it except for implementing the necessary road safety requirements and allocating suitable speed limits along the road sections within high density residential areas.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	2	Not Applicable (No development activities to take place during the No-Go Alternative)	
Duration	5	5		
Magnitude	6	4		
Probability	5	5		
Significance	65 - High	55 – Medium		
Status	High negative significance if not mitigated	Medium negative significance if mitigated		
Reversibility	100% reversible but highly unlikely			
Irreplaceable loss of resources	1- No resources will be lost.			
Can impacts be mitigated?	2 Partly – Traffic noise will occur but it is not expected to be significant in comparison to existing traffic noise.			

POTENTIAL VISUAL IMPACTS**Nature of impact:**

Impact of development on the surrounding land users / owners and tourist's visual landscape of the area.

Discussion:

The surrounding land users/ owners will be exposed to the presence of the new road development.

It is however not anticipated that the visual impact of the new road development will be very significant as the visual landscape of the site and surrounds is already transformed due to urban developments such as major roads, landfill site and high density residential areas.

Cumulative impacts:

It is not expected that the potential visual impact of the proposed development will lead to any additional cumulative impacts.

Mitigation:

Maintain proposed infrastructure and surrounding undeveloped areas and ensure that it is kept clean and clear of illegal waste dumping and debris.

Criteria	Amandel Road Bridge Alternative 1		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	Not Applicable (No development activities to take place during the No-Go Alternative)	
Duration	1	1		
Magnitude	2	2		
Probability	3	3		
Significance	18- Low	12-Low		
Status	Low negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100% reversible but highly unlikely			
Irreplaceable loss of resources	1- The visual resource will not be lost, merely changed. The surrounding landscape character will remain the same, namely urban area.			
Can impacts be	2 – Partly			

mitigated?		
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(c) Impacts that may result from the decommissioning and closure phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

The decommissioning of the infrastructure developments are not anticipated in the near future. Impacts during this phase will however be similar to that of the construction phase. Mitigation and management measures will be related to the technology of the day and needs to be discussed at such time as decommissioning will occur. All structures must be removed and the area rehabilitated to the state as before construction had commenced (dependent upon the end land use agreement). Waste, where possible must be recycled. All concrete introduced must be removed off site to a licensed waste facility.

POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS

The decommissioning of proposed developments is not anticipated in the near future. Impacts during this phase will however be similar to that of the construction phase. Mitigation and management measures will be related to the technology of the day and needs to be discussed at such time as decommissioning will occur. All structures must be removed and the area rehabilitated to a near natural state (dependent upon the end land use agreement). Waste, where possible must be recycled. All concrete introduced must be removed off site to a licensed facility

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Potential decommissioning of the proposed infrastructure developments will mean that the Municipality will not be able to provide certain essential services to the public. Decommissioning is therefore highly unlikely and undesirable.

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

It is not anticipated that any further impact on the cultural-historical aspects of the site will occur during this phase as no further disturbance outside of the already impacted areas will take place during decommissioning.

POTENTIAL IMPACTS OF NOISE

The impacts and their significance anticipated to occur during this phase will be the same as that of the construction phase. Mitigation measures during this phase will remain the same as for the construction phase.

POTENTIAL VISUAL IMPACTS

The impacts and their significance anticipated to occur during this phase will be the same as that of the construction phase. Mitigation measures during this phase will remain the same as for the construction phase.