

## **APPENDIX C: DWS RISK ASSESSMENT MATRICES**

## RISK MATRIX (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)

Risk to be scored for construction and operational phases of the project. MUST BE COMPLETED BY SACNASP PROFESSIONAL MEMBER REGISTERED IN AN APPROPRIATE FIELD OF EXPERTISE.

| Upgrade | e of existing district | roads to widening / strengthen currer<br>not all of the projects                  | at crossings for some of the road options but   |  |             | Sev                                      | reity                              |       |          |               |          |             |                       |                        |              |           |            |              |             |                  |  |  |                                      |
|---------|------------------------|---|---|--|-------------|--|------------------------------------|-------|----------|---------------|----------|-------------|-----------------------|------------------------|--------------|-----------|------------|--------------|-------------|------------------|--|--|--------------------------------------|
| No.     | Phases                 | Activity  | Aspect  | Impact   | Flow Regime | Physico &<br>Chemical<br>(Water Quality) | Habitat (Geomorph<br>+ Vegetation) | Biota | Severity | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of<br>impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Confidence level | Control Measures   | Borderline LOW<br>MODERATE<br>Rating Classes | PES AND EIS OF<br>WATERCOURSE        |
| 1       | Construction           | Upgrade of existing district<br>reads to wideling strengthen<br>current crossings | Disturbance and clearling of vegetation<br>within the bed and banks of<br>watercourses is access the brogen<br>theory of the second second second second<br>required. Plant and associated<br>machinery will be used to remove /<br>install additional bridge inflastituture<br>approach noais, head will wait and<br>erosion protection and energy<br>dissipation structure, which will result<br>out genome (to age, used and or<br>and companitori). | Loss of riparian and or instream aquatic vegetation<br>invogin the disturbance, which could result in<br>and or sedimentation. The will also result in the<br>disturbance of aquatic biola as well as oreate habita<br>activities will occur within an area with pre-existing<br>disturbance.  | 1           | t  | 2                                  | 1     | 1,25     | 1             | 1        | 1.25        | 2                     | 3                      | 5            | ٢         | 11         | 35,75        | LOW         | 90-100           | Rehabilitate areas where active ensuion is identified to re-<br>instate natural topography and<br>hydrological conditions.<br>Interactive sector of the sector of th   |  | PES = C & D ES = Moderate to<br>Low  |
| 2       | Construction           |   | Localised potential changes to the flow<br>regime, by the impedance created by<br>structures are placed higher than the<br>natural riverbed levels  | Surface water flow may be impedid within the natural<br>channels when a structure is placed within the bed of<br>the watercourse during the construction phase, i.e. any<br>index. This is the special phase when considering that a<br>marker of these existing structure wave constrained<br>with due consideration of the natural inverteel levels and<br>do already create a small degree of impendence. | 2           | ·  |                                    | 1     | 1,25     |               | 2        | 425         | 2                     | 2                      | 5            |           | 18         | 42,5         | LOW         | 90-100           | The final design should take cognisance of typical<br>baseflows and should take cognisance of typical<br>baseflows and should be downstream of the also<br>when the levels up because and the should be an<br>the should be the should be an<br>the should be an |  | PES = C & D EIS = Moderate to<br>Low |
| 3       | Construction           |   | Water quality may be affected by<br>various construction activities which<br>include oil and begin, spit of<br>cord states and the table such as concreted<br>or dry cement etc.  | During construction various materials, such as<br>sediments, dates di and commerciancine), could<br>downeteam areas. If y chance it is depresed via<br>sufface run-off, or are allowed to permeate into the<br>groundwater.  | 1           | 3  |                                    | 2     | 1,75     | 1             | 1        | 2,75        | ſ                     | t                      | 5            | t         |            | 30           | LOW         | 90-100           | Chemicals used for construction must be stored safely on<br>alls and surranded by bards. Chemical storage containers<br>early.<br>- Intering and containers of the store stores are detected<br>early.<br>- Intering and containers of the stores early and<br>- Entergrey plans must be in place in case of splitges and<br>- Entergrey plans must be in place in case of splitges and<br>- Entergrey plans must be in place in case of splitges and<br>- Entergrey plans must be in place in case of splitges and<br>- and surfaces and water counters.<br>- Hot schooling should be place from early and exclosed<br>- and surfaces and water counter<br>- and surfaces and water counter<br>- and surfaces and water counters.<br>- Entergrey and the instituted, and and surfaces<br>- Store and self-and the instituted, and and start<br>- Recommunities and the recognition of adjusters<br>- The consumption detection is for Animal the<br>proposed buffers shown in Figure 8 as shown in the Aquated<br>Assessment Allached   |  | FES=C & D ES= Moderate to<br>Low     |
| 4       | Construction           |   | Destruction of habitat that may contain<br>listed and / or protected aquatic locid<br>(faura and fora) of fragmentation of<br>critical blockweshy / ecclogical support<br>area  | Loss of any species of special concern and habitat<br>continuity / habitat fragmentation as a result works<br>within the bed or banks  | 2           | 2  | 2                                  | 1     | 1,75     | 2             | 1        | 435         | 2                     | 2                      | 5            | ٦         | 18         | 47.5         | LOW         | 90-100           | The final design should also applications of typical baselfores<br>that de available of the start of typical baselfores<br>at the start of the start of the start<br>should be maintained, thus allowed for continuity within the<br>three days and the start of the start of the start<br>should be maintained, thus allowed procession which should<br>of the construction bases completed, all disturbed areas<br>should be maintained, which regard receptation which should<br>construction. The start of the start of the start of the<br>constructions are the start of the start of the start of the<br>works area to prevent under any compaction of solits<br>which construction protection should be bimited to<br>the works area to prevent under any compaction of solits<br>which areas the protection should be bimited to<br>design to prevent bank instability and administration.  |  | PES = C & D ES = Moderate to<br>Low  |

| 5 Operations | Operational activities will be im<br>vertified using the bridge cookin<br>the only anticipated activities will<br>watercourse being the occasi<br>infrastructure (cluvers, guar or<br>entrastructure (cluvers, guar or<br>anticipated protection)activities<br>management features). | Ise to 5<br>p. NID<br>In the maintenance and repairs are concluded. Jul works<br>be limited to existing oranging dynamics within<br>the maintenance and repairs are concluded. Jul works<br>be limited to existing oranging dynamics<br>includes the stormwater and erosion protection<br>ref | 1   | 1 | • | 1 | 1   | 1 | 1 | 3  | 1 | 1 | 5 | 1 | 8 | 24 | LOW | 90-100 | Rebublicate areas where active encodes is identified to re-instant<br>standard topgraphy and<br>provide operation of the standard standard standard<br>recourses, and where it partials intervision to a stimulate<br>recourse of the instantion which can include the particle<br>recourses and where it partials intervision to a stimulate<br>inspirent simulation which can include the particle<br>recourses and where it partials intervision to a stimulate<br>inspirent simulation with the stimulation of the<br>inspirent simulation and the stimulation of the<br>action where a disregation one identified  | PES = C & D EIS = Moderate to<br>Low |
|--------------|--|---|-----|---|---|---|-----|---|---|----|---|---|---|---|---|----|-----|--------|---|--------------------------------------|
| 6 Operations | Stormwater ruroff in the opera<br>phase  | Increased velocity of surface water flows generated by hardened surfaces and through improper stormwater management increase the potential for erosion and the sedimentation downsiteam.  | n 1 | 2 | 2 | 1 | 1,5 | 1 | , | 35 | 1 | 1 | 5 |   |   | 28 | LOW | 90-100 | A stormwater management (plan must be developed in the<br>account studies) where dealing the stormwater detectance<br>and management (thereversion that must be instabled to<br>manage the increase of surface water flows directly into any<br>mutual systems. Ethics dominate musiquement must<br>instances) of exposed soil and the re-vegetation of any<br>distubed intertext. The effectiveness of the stormwater<br>energy dissipation structures must be inspected on an<br>energy dissipation structures must be inspected on an<br>ending base. perceptive must be inspected on an<br>ending these spectations where any engine<br>and the structures must be inspected on an<br>ending these spectations and the system and any<br>distingt to the structures of the stormwater<br>and must be an ending the structures and any<br>and would then change in nature and attributes, i.e.<br>stormwater detention pond. | PES = C & D ES = Moderate 10<br>Low  |

| NEW INTER<br>SUPPORTIN<br>AVOIDED | INAL ACCESS RO<br>G INFRASTRUCTI<br>VATERCOURSES | ADS AND UNDERGROUND CABLES - MI<br>IRE OF THE WIND FARMS (TURBINES, S<br>ALL PANS AND WETLANDS INCL OF B<br>PROPOSED LAYOUTS   | INOR WATERCOURSE CROSSINGS ONLY AS<br>SUBSTATIONS AND LAYDOWN AREAS HAVE<br>IUFFER HAVE ALSO BEEN AVOIDED BY THE   |   |             | Se                                       | verity                             |       |          |               |          |             |                         |                       |              |           |            |              |             |                  |   |  |                                      |
|-----------------------------------|--|--|--|---|-------------|--|------------------------------------|-------|----------|---------------|----------|-------------|-------------------------|-----------------------|--------------|-----------|------------|--------------|-------------|------------------|---|--|--------------------------------------|
| No.                               | Phases   | Activity   | Aspect   | Impact  | Flow Regime | Physico &<br>Chemical<br>(Water Quality) | Habitat (Geomorph<br>+ Vegetation) | Biota | Severity | Spatial scale | Duration | Consequence | Frequency o<br>activity | f Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Confidence level | Control Measures  | Borderline LOW<br>MODERATE<br>Rating Classes | PES AND EIS OF<br>WATERCOURSE        |
| 1 0                               | onstruction                                      | NEW MITERNAL ACCESS<br>ACOSS AND UNCERCOUND<br>CABLES - NINOR<br>WITERCOURSE COSSINGS<br>UNTERCOURSE COSSINGS<br>UND FARMS (CHOSSING)<br>WITERCOURSE SILL<br>WITO FARMS (FURSINES,<br>SUBSTATIONS AND LAYDOWN<br>AREAS INVA - AVOIDED<br>WITERCOURSES), ALL PANS<br>SUBSTRIN INFORMATION<br>AUTORISE AND AND AND AND<br>AUTORISE AND AND AND<br>AND AND AND AND AND<br>AND AND AND AND AND<br>AND AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND<br>AND AND AND<br>AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND AND<br>AND AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND<br>AND AND AND AND AND AND<br>AND AND AND AND AND AND<br>AND AND AND AND AND AND AND AND<br>AND AND AND AND AND AND AND AND AND<br>AND AND AND AND AND AND AND AND AND AND | Disturbance and clearing of vegetation<br>within the bed and banks of<br>roses of the second second second second<br>crossing site to insult clearer is an<br>required. Plant and associated<br>machinery will be used to the crossing<br>bridge infrastructures e.g. culterd, shape<br>advised in the second second second second<br>clearer is a second second second second<br>second second second second second second second second second second second<br>second second s | Loss of riparian and or instrum equatic vegetation<br>frough the disturbance, which could result in<br>unstable solib has the potential coreate encirc<br>and or sodimentation. The will also result in the<br>faiturbance of aquitacib bola as well as create habita<br>fragmentation if any such vegetation is present. | 1           | 2  | 2                                  | 2     | 1,75     | 1             | 2        | 4.75        | 2                       | 3                     | 5            | 1         | 11         | 52,25        | LOW         | 99-100           | Rehabilitate areas where active erosion is identified to re-<br>instate natural topography and<br>hydrological conditions.<br>Interaction, and the presists interventions to saturate<br>revegetation must be installed which can include the<br>application must be installed which can include the<br>application of the second second second second<br>hypelement allew vegetation control of program & ensure<br>additionation of comparison species with the<br>areas where allew vegetation was identified                          |  | PES = C & D ES = Moderate to<br>Low  |
| 2 C                               | onstruction                                      |  | Locatised potential changes to the flow<br>regime, by the impedance created by<br>the culverts when structures are placed<br>higher than the natural riverbed levels   | Surface water flow may be impacted within the natural<br>channels when a structure is placed within the bot of<br>the watercourse displace the construction bake, i.e. any<br>rated structures higher than the current natural river<br>levels may create impedance while construction bakes<br>place.                    | 2           |  |                                    | 2     | 1,5      | 1             | 2        | .5          | 2                       | 2                     | 5            |           | 18         | 45           | LOW         | 90-100           | The final design should take cognisance of typical<br>baseflows and should not create any impedance of flows<br>dutual final reviews upsteam and downsteam of the site<br>vectors of the state of the state of the state of the state<br>from moving up or downsteam.<br>Which movimes that any dottaction through the take<br>diversion movimes within the watercoards should be instate<br>drived any downsteam.<br>Net of the state of the state of the state of the state<br>diversion to prover thank instability and sedimentation. |  | PES = C & D EIS = Moderate to<br>Low |

| 3 Construction |   | Water quality may be affected by<br>various construction activities which<br>include oil and the splits, split of<br>construction of metalas such as concrete<br>or dry convent etc.   | During construction various materials, such as<br>sediments, diseal, ols and comentioxicnets, could<br>downstream areas, fby chance. It is dispersed via<br>surface run-fit, or a siloxed to permeate into the<br>groundwater. | ,   | 2 | 2 | 1.5  | , , | 1.5  | , | 1 | s 1 |    | 28 | LOW | 90-100 | Chemicals used for construction must be stored safely on<br>sile and surrounded by bunds. Chemical storage containers<br>must be regularly inspected as that any eaks are detected<br>early. A surrounder sources during<br>camp management. Less of safets are control<br>road surfaces and water courses. Who storage the<br>road suffices and water courses.<br>We stockpling should be place within a water course<br>of the storage management.<br>Surfaces and water courses.<br>We stockpling should be place within a water course.<br>Subscription and be in place in case of safetage containers<br>are an where run-off will be minimised, and be surrounded<br>by bunds.<br>Subscription and selementation into characters in all be<br>areas where run-off will be minimised, and be surrounded<br>by bunds.<br>The construction camp and meassary abulish facilities<br>means for construction waters must be byond the<br>means for construction water surger beyond the<br>Assessment Attached. | PES = C & D (15 = Moderate to<br>Low |
|----------------|---|--|--|-----|---|---|------|-----|------|---|---|-----|----|----|-----|--------|---|--------------------------------------|
| 4 Construction | _ | Destruction of habitat that may contain<br>listed and / or protected aquatic bolds<br>(fluars and fora) or fragmentation of<br>critical biodivensity / ecological support<br>area  | Loss of any species of special concern and habitat<br>continuity / habitat fragmentation created by the works<br>within the bed or banks   | . 1 | , | 3 | 1.5  | 2 1 | 45   | 2 | 2 | s 1 | 10 | 45 | LOW | 90-100 | •The final design should take cognisance of typical baseflows<br>and should not create any impedance of flows<br>and should not create any impedance of flows<br>whould be maintained, these always for continuity which the<br>inverteds it, and create any obstruction limiting any found from<br>moving up or downstream.<br>•Once construction has been completed, all disturbed areas<br>should be monitored with regard revegetation which should<br>occur naturally, impreventing unstalls call. Seeding should<br>only occur flat and the shown complete any compaction of onlis<br>which are not stable within 6 months post<br>which movement within the watercare should be limited to<br>the works area to prevent undue any compaction of onlis<br>which movement protection should be included in the<br>designs to prevent bank instability and sedimentation.   | PES = C & D IIS = Moderate to<br>Low |
| 5 Operations   | _ | Operational activities will be limited to<br>vehicles using the bridge crossings, with<br>where course the product of the cossing<br>infrastructure (cover), guera of tails and<br>erasis on protection/stamwater<br>management features). | Limited disturbance of the beds and banks while<br>maintenance and repairs are conducted, but would<br>be limited to the existing crossing bottprinted which<br>includes the stormwater and erosion protection<br>measures     | 1   | 1 | 1 | 1    | т т | 3    |   | 1 | s 1 | e  | 24 | LOW | 90-100 | Rehabilitate areas where active erosion is identified to re-instate<br>natural topography and<br>Monitor for hybrid organic conditions.<br>The second second second second second second<br>resources, and where it pervisis interventions to stimulate<br>revepted on must be installed which can include the packing of<br>loss rick, gesteristies such as aliansers, and<br>implement alien vegetation control program & ensure<br>establisher of indigenous species whith<br>areas where alien vegetation was identified  | PES = C & D EIS = Moderate to<br>Low |
| 6 Operations   |   | Stornwater ruroff in the operations phase  | Increased velocity of surface water flows generated by<br>hardered surfaces and through improper stormwater<br>management increase the potential for erosion and the<br>sedimentation downstream.                              | 2   | 2 | 1 | 1,75 |     | 3,75 |   | 1 |     | B  | 30 | LOW | 90-100 | A stormwater management plan must be developed in the<br>preconstruction phase, detailing the stormwater storkurse<br>and management interventions that must be installed to<br>manage the increased distributes water flows directly into any<br>mutual systems. Therefore isomwater management must<br>mattersels) of exposed soil and the re-explaint or any<br>distribute investments. The effectiveness of the stormwater<br>energy dissipation structures must be inspected on an<br>amula basis and markmand / improved as required during<br>tealmentation has become solvent in the operational phase.<br>No nond may be discharged or directive into the Pana, as<br>these are not toterant of excessive / regular volumes of water<br>and would then charge in nature and attributes, i.e.<br>stormwater detention poind.  | PES = C & D EIS = Moderate to<br>Low |

| NEW INTER<br>PAN | RNAL ACCESS ROAD | DS AND UNDERGROUND CABLES - WIT<br>INCL OF BUFFER HAVE ALSO BEEN AV | THIN 500m OF A WETLAND BOUNDARY. ALL<br>VOIDED BY THE PROPOSED LAYOUTS. |        |             | Sev                                      | rerity                             |       |          |               |          |             |                          |                        |              |           |            |              |             |                  |                  |  |                               |
|------------------|------------------|---|---|--------|-------------|--|------------------------------------|-------|----------|---------------|----------|-------------|--------------------------|------------------------|--------------|-----------|------------|--------------|-------------|------------------|------------------|--|-------------------------------|
| No.              | Phases           | Activity  | Aspect  | Impact | Flow Regime | Physico &<br>Chemical<br>(Water Quality) | Habitat (Geomorph<br>+ Vegetation) | Biota | Severity | Spatial scale | Duration | Consequence | Frequency of<br>activity | Frequency of<br>impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Confidence level | Control Measures | Borderline LOW<br>MODERATE<br>Rating Classes | PES AND EIS OF<br>WATERCOURSE |

| 1 | Construction | NEW INTERNAL ACCESS<br>RADBA AND UNCERROCIMD<br>CABLES WITHIN 180m OF A<br>Parks AND WITHANDS INCL<br>OF BUTTER NAVE ALSO BEEN<br>AVOIDED BY THE PROPOSED<br>AVOIDED BY THE PROPOSED<br>Loroschips within 30m of Pars<br>and Valley 36m systems but<br>ned vibin these systems set hay<br>have been avoided | Disturbance and clearing of vegetation<br>within the bed and banks of<br>without any set of the set of the<br>crossing site in banks of learning and<br>machinery will be used to the crossing<br>highlight infrastructure or could set of<br>approach roads, build seng wand<br>displays infrastructure, which will result<br>displays the structure, which will result<br>displays on structures, which will result<br>displays on structures and and or<br>set compaction). | Loss of riparian and or instream aquatic vegetation<br>brough the distubance, which could result in<br>and or sedimetation. This will also result in the<br>disturbance of aquatic biols as well as create habitat<br>fragmentation if any such vegetation is present.   | -<br>- | 2  | 2 | 2 | 1,75 | 1 | 2 | 475 | 2 | 3 | 5 | 1 | 11 | \$2.25 | LOW | 90-100 | Rehabilitate areas where active erosion is identified to re-<br>instate nutural topography and<br>hydrological confidence.<br>Monitor for erosion and instation within all-fields apaulia<br>to record and instation within all-fields apaulia<br>merceptation must be instated which can include the<br>packing of loss rock, gedeatilies such as soil savers; and<br>hydrolenet allen vegetation over dy organit & ansure<br>areas where allen vegetation was identified  | PES = C & D ISS = Moderate t<br>Low  |
|---|--------------|---|--|--|--------|----|---|---|------|---|---|-----|---|---|---|---|----|--------|-----|--------|---|--------------------------------------|
| 2 | Construction | -   | Localised potential changes to the flow<br>the control of the second second second second second<br>the converts when structures are placed<br>higher than the natural riverbed levels   | Surface water flow may be impeded within the natural<br>channels when a structure in placed within the bed of<br>raised structures higher than the current natural river<br>levels may create impedance while construction takes<br>place.   | 2      | ۰. |   | 2 | 1.5  | 1 | 2 | 45  | 2 | 2 | 5 | 1 | 10 | 45     | LOW | 90-100 | •The final design should bite cognitisance of typical<br>baseflows and should not create any impedance of flows<br>+latural river levels upsteam and downstream of the site<br>should be enaitisated, thus allowing for controllarly within the<br>from movies up or downstream. On initing any flows<br>the stream of the site of the site of the site<br>flows movies up or downstream. Use the site of the<br>flow movies up or downstream<br>flows movies up or downstream<br>designs to prevent up and up of the site of solit<br>designs to prevent bank instability and updimentation.   | PES = C & D ES = Moderate t<br>Low   |
| 3 | Construction |   | Water quality may be affected by<br>various construction activities which<br>include oil and fuel spills, spill of<br>construction oftentials such as concrete<br>or dry content etc.  | During construction various materials, such as<br>sediments, diesel, dis and cementiconcrete, could<br>downstream areas, if by chance it is dispersed via<br>surface run-off, or ara lowed to permeate into the<br>groundwater.  |        | 2  |   | 2 | 1,5  | t | , | 25  | 1 |   | 5 | 1 |    | 28     | LOW | 90-100 | Chemicals used for construction must be stored safely on<br>safe and surrounded by bunds. Chemical storage containers<br>must be regularly inspected to that any leaks are detected<br>early.<br>Automotion contemposition of water sources during<br>camp management.<br>Camagemory plans must be in place in case of splitage onto<br>read surfaces and water context.<br>A storaging inspectial be placed within a water control<br>water survival be placed within a water control.<br>A storage of the storage of the storage of the<br>read water nun-Of with be minimised, and be surrounded<br>by bunds.<br>Storage of the efficience storage of the<br>read water source of the efficience storage of the<br>read water nun-Of with be minimised, and be surrounded<br>by bunds.<br>The construction camp and necessary advisor floring<br>read matterses) and the revegetation of any disturbed<br>reverbanks.<br>The construction camp and necessary advisor for<br>propose buffers shown in Figure 6 as shown in the Aquatic<br>Assessment Attached | PES = C & D EIS = Moderate<br>Low    |
| 4 | Construction |   | Destruction of habitat that may contain<br>littled and / or protected agapted bota<br>(farms and force) at aggrenatiation of<br>large bachwerkey / acategorial sepport<br>area   | Loss of any species of special concern and habitat<br>continuity / habitat fragmentation created by the works<br>within the lord or banks  | . 1    | ·  |   | 3 | 1,5  | 2 | 1 | 45  | 2 | 2 | 5 | 1 | 10 | 45     | LOW | 90-100 | •The final design should take cognisance of typical baseflows<br>and should not create any impedance of flows<br>•Astural refer eleval uprema and downstran of the stat<br>•Astural refer eleval uprema and downstran of the stat<br>refered, i.e. not create any obstruction limiting any fusion from<br>moving up or downstream.<br>•Once construction has been completed, all disturbed areas<br>double as monitored with regard regregation which should<br>only occur if solits are not stable within 6 months post<br>enstruction. •Which the watercoarse should be limited to<br>the service and targent underscatch of a follow<br>designs to prevent bask instability and sedimentation.   | PES = C.B. D.EIS = Moderate t<br>Low |
| 5 | Operations   |   | Operational activities will be limited to<br>vehicles using the bridge crossing, with<br>wetercourse being the occasional<br>repara and maintenance of the crossing<br>instanctural (counts, guard ratia<br>encolor protection/stormwater<br>management features).   | Limited disturbance of the beds and banks while<br>maintenance and repairs are conducted, but would<br>be limited to the existing crossing bodynined which<br>includes the source and the source of the sour | 1      |    |   | 1 | 1    | 1 | 1 | 3   | 1 | 1 | 5 | 1 | 8  | 24     | LOW | 90-100 | Rehabilitate areas where active erosion is identified to re-instate<br>natural topography and<br>topography and topography and<br>Monitor for erose and topography and topography<br>resources, and where it persists instructions to stimulate<br>revegetation must be installed which can include the packing of<br>four tork operative its persist interpretions to stimulate<br>revegetation must be installed which can include the packing of<br>four tork operative scale and a serve and<br>implement alien vegetation control program. Remarke<br>establishmet of indigenous persists whith<br>areas where alien vegetation was identified   | PES = C & D EIS = Moderate t<br>Low  |

| 6           | Operations            |  | Stormwater runoff in the operations<br>phase   | Increased velocity of carfoce water flows generated by<br>hardened surfaces and through improper stommader<br>management increase the potential for excession and then<br>sedimentation downstream.   | 2           | 2  | 2                                  | 1     | 1,75     | 4             | 1        | 3.75        | t                     | 1                      | 5            | 1         | 8          | 30           | LOW         | 90-100          | A stormwater management plan must be developed in the<br>preconstruction phase, detailing the stormwater afructures<br>and management interventions that must be instabled to be<br>nature a systems. Effective stormwater management must<br>include effective stormwater management must<br>include effective stormwater management must<br>mature as planes. Effective stormwater management must<br>include effective store that here exceptision of any<br>energy disapplications. Store and the nervegetision of any<br>energy disapplications, appendix where any ensuing<br>to the operational phase, specially water any ensuing<br>on the store and the store any ensuing<br>the store and the store any ensuing<br>the store and the store any ensuing<br>the store and the store any ensuing<br>and would here change in nature and attributes, i.e.<br>stormwater detention pool.  | PES = C & D EIS = Moderate to<br>Low |
|-------------|-----------------------|--|--|---|-------------|--|------------------------------------|-------|----------|---------------|----------|-------------|-----------------------|------------------------|--------------|-----------|------------|--------------|-------------|-----------------|---|--------------------------------------|
| TURBINES, H | ARDSTAND AREAS AND HA | BLADE LAYDOWRS WITHIN SOOM OF A WETLAN<br>VE BEEN AVOIDED INCL OF BUFFER THEREFORE   | ,<br>ND ROUNDARY - ALTHOUGH ALL PANS AND WETLANDS<br>NO DIRECT IMPACTS   | s   |             | Se                                       | verity                             |       |          |               |          |             |                       |                        |              |           |            |              |             |                 |   |                                      |
| No.         | Phases                | Activity   | Aspect   | Impact  | Flow Regime | Physico &<br>Chemical<br>(Water Quality) | Habitat (Geomorph<br>+ Vegetation) | Biota | Severity | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of<br>impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Confidence leve | Borderline LOW<br>MODERATE<br>Rating Classes  | PES AND EIS OF<br>WATERCOURSE        |
| 1           | Construction          | Turbines, havdstands and<br>ligodon areas optivithis 900m<br>of vetland boundary, but not<br>within any wetland areas or the<br>associated buffers | Disturbance and clearing of vegetation<br>within 500m of a wetland boundary  | Al welands (pers and valley bottom enac) have<br>been reviced by the proposed tayouts thus no direct<br>disturbance of any vegetation or soils associated with<br>these systems are anticipated   | 1           | s  | 1                                  | 1     | 4        | 1             | 1        |             | r                     | 1                      | 5            | 1         |            | 24           | LOW         | 90-100          | Approval of the current layout is provided in which wetland areas will be avoided 1   | PES = C & D ISS = Moderate to<br>Low |
| 2           | Construction          |  | Water quality may be affected by<br>various construction activities which<br>include of and fuel splits, split of<br>construction chemicals such as concrete<br>or dry cement etc. | All weflands (pans and valley bottom areas) have<br>been avcided by the proposed layouts thus no direct<br>disturbance of these systems are anticipated   | 1           |  |                                    | 2     | 1.25     | 1             | 1        | 3.25        | ,                     | 1                      | 5            | 1         |            | 26           | LOW         | 99-100          | Chemicals used for construction must be stored safely on<br>site and sumranded by bunds. Chemical storage containers<br>must be regulary inspected so that any cleaks are detected<br>early.<br>Chemical Storage Chemical Storage Containers<br>Chemical Storage Chemical Storage Chemical<br>Chemical Storage Chemical Storage Chemical<br>Chemical Storage Chemical Storage Chemical Storage<br>Chemical Storage | PES = C & D IIS = Moderate to<br>Low |
| 3           | Construction          |  | Destruction of habitat that may contain<br>listed and / or protected aquatic holds<br>(manu and floria) in any manufaction of<br>critical bodivensity / ecological support<br>and  | Loss of any species of special concern and habitat<br>continuity. Abditat Regrestration created by the works<br>been avoided by the proposed lipsical thus or direct<br>disturbance of any vegetation or solis associated with<br>these systems are anticipated | 1           | r  |                                    | 1     | 1        | 1             | 1        | 1           | 1                     | 1                      | 5            | 1         | 8          | 24           | LOW         | 90-100          | •The final design should take cognisance of typical baseflows<br>and should not create any impedance of flows to<br>should not create any impedance of flows to<br>should be maintenined, thus allowing for contrauty within the<br>moving or of downstream. Contracting with the should<br>moving use of downstream. Contracting with the should<br>be monitored with regard regregation which should<br>occur naturally, thus preventing unstable soils. Seeding should<br>occur naturally, thus preventing unstable soils. Seeding should<br>construction has been completed, all disturbed preventions<br>with the movement within the vatercourse should be limited to<br>we want are as to prevent should any constraint of<br>which are not prevent should any constraint of all<br>eventuation.   | PES = C & D ISS = Moderate to<br>Low |

| 4 Construction |   | Placement of elevate structures  | Localised postential changes to the flow regime, by the<br>impedance created when arruptures are placed higher<br>than the natural levels  | ı | Ţ |   | 1 | 1 | · · · | 3 | 1 | 1 | 5 |   | 8 | 24 | LOW | The final design should take organisance of typic<br>baseBows and should not create any impedance<br>vibual five freeks upstream and downstream<br>should be maintained, thus allowing for centrally<br>should be maintained, thus allowing for centrally<br>when the should be maintained and the sate<br>of the should be maintained and the sate<br>of the should be allowed and the sate and the<br>feed and basis eracion protection should be not<br>design to prevent bank instability and sedment  | tows<br>te sile<br>fauna<br>é imited<br>of soits<br>al in the<br>o.  |                                     |
|----------------|---|--|--|---|---|---|---|---|-------|---|---|---|---|---|---|----|-----|--|--|-------------------------------------|
| 5 Operations   | - | Stomwater ruroff in the operations<br>phase due to placement of hard<br>surfaces | Increased solubility of darksen and a flow generated by<br>Insident furface and through interrupt incomment<br>management increase the potential for encoding and then<br>sedimentation downdream. | 1 | 1 | 1 | 1 | 1 | 1 1   | 3 |   | 1 | 5 | • | 8 | 24 | LOW | A stormwater management plan must be develop<br>preconstruction phase, detailing the stormwater<br>and management intervention that must be advelop<br>natural systems. Effective stormwater managem<br>include effective stabilization (gabons and Ren-<br>mathreases) of exposed soil and the re-expetision<br>entry discapation that and the stormwater management<br>include effective stabilizations must be impedi-<br>ated and the stability of the stability of the<br>annual basis and maritained / improved as requi-<br>tains the operational phase, expectisily other any<br>the numbring the discharged or directed into the<br>these are not toberard develoaries/registary would<br>and woold then charge in nature and attributes, i<br>stormwater detention pord. | l in the<br>chares<br>d to<br>into any<br>must<br>f any<br>muster /<br>an<br>f during<br>asion or<br>a g phase.<br>Inn, as<br>o of water | PES = C & D ES = Moderate to<br>Low |