

A.	Impact Rating: Construction	Pre-Construction	Proposed construction of Harmony Dam - Alternative B Design Option 3 (Preferred)	WITHOUT MITIGATION					WITH MITIGATION					Short Description of Mitigation Measures			
				Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent	Duration	Magnitude		Receiving Environment	With Mitigation Score (Impact assessment)	
No.	ASPECT		IMPACT														
			Potential loss of Kouebokkeveld Alluvium Fynbos / Wintershoek Sandstone Fynbos	-4	-2	-16	-8	-4		-6.8	-1	-1	-16	-1	-1		*Implementation of the EMPr * A suitably qualified ECO must be appointed;* Before any work is done physically demarcate the footprint of the proposed dam & access routes route and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area - This can be done with danger tape, which should be removed once the construction activities have been completed;* Ensure signs are put up reminding workers to stay on the existing roads;* Indiscriminate cleaning of areas must be avoided; * All alien plants to be removed within the construction footprint and immediate surroundings; * An integrated waste plan to be agreed upon and implemented; * Environmental Awareness training to be conducted with all workers. Recommendations from specialists to be included.
1	Botanical		Loss of Ecological Support Areas (ESA)	-8	-2	-8	-2	-2		-4.4	-1	-1	-4	-1	-1		**Implementation of the EMPr;* Before any work is done physically demarcate the footprint of the proposed dam & access routes and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. * Ensure signs are put up reminding workers to stay on the existing roads/ in the construction footprint. * Indiscriminate cleaning of areas must be avoided; * Environmental Awareness training to be conducted with all workers. Recommendations from specialists to be included.

	Soil contamination from vehicles on site	-16	-2	-4	-2	-2	-2	-5,2	-2	-1	-1	-1	-1	-1,2	<p>* Implementation of the EMPr. *Inspect all vehicles daily for the early detection of deterioration or leaks. * The contractor should ensure drip trays are placed under stationary vehicles. * Spill kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately; * Records must be kept of any spills; * Portable toilets must be located at least 32m from the boundary of the any streams must be serviced regularly in order to prevent leakage/spillage.</p>
	Loss of riparian habitat	-4	-2	-16	-4	-2	-2	-5,6	-2	-1	-1	-8	-1	-2,6	<p>*Implementation of the EMPr; * Before any work is done physically demarcate the footprint of the proposed dam &amp; access routes and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. * Ensure signs are put up reminding workers to stay on the existing roads; * Indiscriminate cleaning of areas must be avoided; * Environmental Awareness training to be conducted with all workers * As a precautionary measure, importance must be given to emergency preparedness with regards to any spillages or leakage of hydrocarbons on site. Recommendations from the specialist to be included.</p>
Water	Alteration of hydrology/ flow of the drainage line	-16	-4	-8	-8	-2	-2	-7,6	-2	-1	-1	-1	-1	<p>* Implementation of Monitoring Plan and Mechanical Systems to ensure Ecological FLOW requirements are met and to ensure that water is not cut off by the proposed dam. *Implementation of the EMPr, Environmental Awareness training to be conducted with all workers; * A suitably qualified ECO must be appointed; * Before any work is done physically demarcate the footprint of the proposed dam &amp; access routes and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area - This can be done with danger tape, which should be removed once the construction activities have been completed; * Ensure signs are put up reminding workers to stay on the existing roads and not to enter any streams; * Portable toilets must be located at least 32m from the boundary of the any streams must be serviced regularly in order to prevent leakage/spillage. * Recommendations from the specialist to be included.</p>	

	Surface & ground water contamination	-8	-2	-8	-4	-2	-4, 8	-2	-1	-1	-1	-1	-1	-1, 2	<p>* Implementation of the EMPr; *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area.</p> <p>*Concrete mixed on site as per the EMPr and surplus must be disposed of in the correct manner.</p> <p>* Inspect all vehicles daily for the early detection of deterioration or leaks.</p> <p>* The contractor should ensure drip trays are placed under stationary vehicles.</p>
3	Heritage  Loss of archaeological/ palaeological resources	-1	-1	-1	-2	-4	-1, 8	-1	-1	-1	-1	-1	-1	-	<p>*Implementation of the EMPr, *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. *In the case of any significant new fossil finds exposed during dam construction these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to Heritage Western Cape</p>
4	Dust  Potential dust from ground clearing and topsoil removal	-4	-2	-4	-1	-2	-2, 8	-1	-1	-1	-1	-1	-1	-	<p>*Implementation of the EMPr; *Dust will be monitored. If dust becomes a problem, dust will be controlled by means of water spray vehicles. No over watering of the site area or roads surfaces should occur. Speed limits must be enforced at all areas to limit the levels of dust pollution. Max speed of 40km/h must be maintained. Protect stockpiled topsoil using tarp or erosion blankets. Stockpile topsoil within an area where no stormwater runoff is expected</p>
5	Visual	-4	-2	-2	-1	-2	-2, 8	-1	-1	-1	-1	-1	-	-	<p>* Implementation of the EMPr; *Construction related activities should remain within the demarcated footprint</p>
6	Noise	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-	-	-	<p>*Implementation of the EMPr; *Construction related activities should take place in day time hours</p>

B.	Impact Rating: Construction Phase	Proposed construction of Harmony Dam - Alternative B Design Option 3 (Preferred)	WITHOUT MITIGATION					WITH MITIGATION					With Mitigation Score (Impact assessment)	Short Description of Mitigation Measures	
			Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent	Duration	Magnitude			Receiving Environment
No.	ASPECT	IMPACT													
1	Botanical	Potential loss of Kouebokkeveld Alluvium Fynbos / Wintershoek Sandstone Fynbos	-4	-2	-16	-8	-4	-6.8	-1	-1	-16	-1	-1	-4	<ul style="list-style-type: none"> <li>*Implementation of the EMPr; * A suitably qualified ECO must be appointed; * Environmental Awareness training to be conducted with all workers;</li> <li>* Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area</li> <li>* Access roads to the dam should be limited to a single circular route in and out. Ensure construction vehicles stay on existing roads and erect signs to remind workers not to deviate from the roads.</li> </ul>
		Loss Ecological Support Areas	-8	-2	-8	-2	-2	-4.4	-1	-1	-4	-1	-1	-1.6	<ul style="list-style-type: none"> <li>Implementation of the EMPr; *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area.</li> </ul>
		Soil contamination from vehicles/ concrete/ portable toilets	-16	-2	-8	-2	-2	-6	-1	-1	-1	-1	-1	-3	<ul style="list-style-type: none"> <li>* Implementation of the EMPr; *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area.</li> <li>*Concrete mixed on site as per the EMPr and surplus must be disposed of in the correct manner.</li> <li>Inspect all vehicles daily for the early detection of deterioration or leaks.</li> <li>* The contractor should ensure drip trays are placed under stationary vehicles.</li> <li>* Spill Kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately. Records must be kept of any spills.</li> <li>* Portable toilets must be placed no less than 32m from any watercourse/ stream and serviced regularly in order to prevent leakage/spillage. No portable toilets to be placed in watercourse 1 where the weir it to be rehabilitated.</li> </ul>

B.	Impact Rating: Construction Phase	Proposed construction of Harmony Dam - Alternative B Design Option 3 (Preferred)													
		WITHOUT MITIGATION					WITH MITIGATION								
No.	ASPECT	Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent	Duration	Magnitude	Receiving Environment	With Mitigation Score (Impact assessment)	Short Description of Mitigation Measures	
1	Botanical						-6.8						-4	*Implementation of the EMPr; * A suitably qualified ECO must be appointed; * Environmental Awareness training to be conducted with all workers; * Ensure construction activities are restricted to the demarcated footprint, strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area * Access roads to the dam should be limited to a single circular route in and out. Ensure construction vehicles stay on existing roads and erect signs to remind workers not to deviate from the roads.	
			-4	-2	-16	-8	-4		-1	-1	-1	-1	-1		
			-8	-2	-8	-2	-2	-4.4		-1	-1	-4	-1	1.6	Implementation of the EMPr; *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area.
							-6							* Implementation of the EMPr; *Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. * Concrete mixed on site as per the EMPr and surplus must be disposed of in the correct manner. * Inspect all vehicles daily for the early detection of deterioration or leaks. * The contractor should ensure drip trays are placed under stationary vehicles. * Spill kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately. Records must be kept of any spills. * Portable toilets must be placed no less than 32m from any watercourse/stream and serviced regularly in order to prevent leakage/spillage. No portable toilets to be placed in watercourse 1 where the weir it to be rehabilitated.	

<p>* Ensure construction activities and vehicles are restricted to the demarcated areas to prevent further degradation. Access roads to the dam should be limited to a singular route in and out. * Ensure construction footprint is kept as small as possible.</p>	-2.6																		<p>Loss of riparian habitat during construction of the dam wall</p>
<p>* Construction should be limited to the dry season          * Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. * Concrete to be mixed as per the EMPR and surplus must be disposed of in the correct manner. No concrete to end up in streams * Ensure no building material allowed to wash down stream * Line the spillway with natural stone rather than concrete; * Ensure construction footprint is kept as small as possible;</p>	-7.6																		<p>Alteration of hydrology/ flow of the drainage line</p>
<p>* Implementation of the EMPR; * Implementation of the EMPR; * Ensure construction activities are restricted to the demarcated footprint and strictly prohibit any vehicles or construction related activities outside of the demarcated footprint area. * Concrete mixed on site as per the EMPR and surplus must be disposed of in the correct manner. * Inspect all vehicles daily for the early detection of deterioration or leaks. * The contractor should ensure drip trays are placed under stationary vehicles.</p>	-2.6																		<p>Potential contamination of surface water &amp; ground water</p>
<p>* Implementation of the EMPR; * Spill kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately. Records must be kept of any spills. * Portable toilets must be placed no less than 32m from any watercourse/ stream and serviced regularly in order to prevent leakage/spillage. No portable toilets to be placed in watercourse 1 where the weir it to be rehabilitated.</p>	-3.8																		<p>Loss of archaeological/ palaeological resources</p>
<p>* Implementation of the EMPR; Dust will be monitored. If dust becomes a problem, dust will be controlled by means of water spray vehicles. No over watering of the site area or roads surfaces should occur. Speed limits must be enforced in all areas to limit the levels of dust pollution. Max speed of 40km/h must be maintained. Protect stockpiled topsoil using tarp or erosion blankets. Stockpile topsoil within an area where no stormwater runoff is expected</p>	-3.8																		<p>Potential dust from construction activities</p>





C.	Impact Rating: Operational Phase	Proposed construction of Harmony Dam - Alternative B Design Option 3 (Preferred)	WITHOUT MITIGATION				WITH MITIGATION				With Mitigation Score (Impact assessment)	Short Description of Mitigation Measures			
			Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent			Duration	Magnitude	Receiving Environment
1	ASPECT	IMPACT													
1	Water	Erosion and sedimentation	-4	-2	-4	-2	-1	-1	-1	-1	-1	-1	-1	-1	<ul style="list-style-type: none"> <li>* Monitor areas below the dam wall after heavy rainfall events for erosion and sedimentation.</li> <li>* Should erosion and incision be noted, immediate corrective measures must be undertaken.</li> <li>* Nuisance vegetation and sedimentation to be removed to ensure overflow;</li> <li>* Rehabilitation measures may include the filling of erosion gullies and rills, and the stabilization of gullies with silt fences.</li> </ul>
		Alteration of hydrology/ flow of the drainage line/ shortening of the hydroperiod	-16	-2	-8	-8	-2	-2	-1	-1	-1	-1	-1	-1	-1
2	Dust	Potential dust form operations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	No dust expected during operations
3	Visual	Potential visual impact form operations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	No visual impact expected during operations, the dam will fit in with the surrounding land use which is agriculture
4	Noise	Potential noise impact from operations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	No noise expected during operations



D.	Impact Rating: Rehabilitation Phase	Proposed construction of Harmony Dam - Alternative B Design Option 3 (Preferred)										Short Description of Mitigation Measures		
		WITHOUT MITIGATION					WITH MITIGATION							
No.	ASPECT	Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent	Duration	Magnitude	Receiving Environment	With Mitigation Score (Impact assessment)	
1	Botanical	-16	-2	-4	-2	-2	-5,2	-2	-1	-1	-1	-1	-1	* Vehicles should be inspected to reduce risk of potential soil contamination from hydrocarbon spills. * The contractor should ensure drip trays are placed under stationary vehicles/ trucks. * Spill kits must be available. Workers should be trained how to use spill kits to rectify a spill immediately. Records must be kept of any spills.
2	Water	-8	-2	-16	-2	-2	-6	-2	-1	-2	-1	-1	-1	* Ensure construction activities and vehicles are restricted to the demarcated areas to prevent further degradation. Access roads to the dam should be limited to a singular route in and out; * Vehicles will not be permitted to drive through the streams
3	Dust	-4	-1	-1	-1	-1	-1,6	-1	-1	-1	-1	-1	-1	* Ensure construction activities and vehicles are restricted to the demarcated areas to prevent further degradation. Access roads to the dam should be limited to a singular route in and out; * Vehicles will not be permitted to drive through the streams  Dust will be monitored If dust becomes a problem, dust will be controlled by means of water spray vehicles or other practical means. No over-watering of the mining area or roads surfaces should occur. Under extreme windy conditions work will be stopped.
4	Visual	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	No visual impact during rehabilitation, if anything rehabilitation of the area will increase visual aesthetic of the area
5	Noise	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	* Noise is expected to be minimal; *No communities in close proximity to the construction site * Works should take place during daylight hours.

E	Impact Rating: Go	No-Go	NO-GO Alternative	WITHOUT MITIGATION						WITH MITIGATION						Short Description of Mitigation Measures		
				Probability	Extent	Duration	Magnitude	Receiving Environment	Without Mitigation Score (Baseline)	Probability	Extent	Duration	Magnitude	Receiving Environment	With Mitigation Score (Impact assessment)			
No.	ASPECT	IMPACT																
1	Botanical	Potential loss of Kouebokkeveld Alluvium Fynbos / Wintershoek Sandstone Fynbos	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.	
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
2	Water	Loss of riparian habitat	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.	
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
3	Heritage	Loss of archaeological/ palaeological resources	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.	
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.

4	Dust	Potential dust from ground clearing and topsoil removal	-1	-1	-1	-1	-1	-1	-1	-1	-1	-5	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
5	Visual		-1	-1	-1	-1	-1	-1	-1	-1	-1	-5	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.
6	Noise		-1	-1	-1	-1	-1	-1	-1	-1	-1	-5	The implementation of the no-go option would mean the status quo of the environment will remain the same. No mitigation measures recommended.