

Environmental Impact Matrix
(FOR DETERMINING SIGNIFICANCE OF ENVIRONMENTAL IMPACTS)
Tellurian Environmental (Pty) Ltd

Phase of project colour coding

Orange	PLANNING AND PRECONSTRUCTION PHASE
Light Blue	CONSTRUCTION PHASE
Light Green	OPERATIONAL PHASE
Purple	DECOMMISSION AND CLOSURE PHASE

Significance rating colour coding

White	Low
Yellow	Moderate to Low
Orange	Moderate
Red	Moderate to High
Dark Red	High

Overall Average Significance

Before mitigation measures	8.94
After mitigation measures	5.19

Significance Ratio

Before and After mitigation ratio*	58.14
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*Percentage value of mitigated impact as compared to unmitigated impact

															FOR A DETAILED REPORT, REFER TO THE ENVIRONMENTAL MANAGEMENT PLAN		
FLORA																	
Phase	Environmental impact	Nature of the Impact	Before Mitigation					After Mitigation					Irreplaceable (IP) / Irreversible (IV)	Description of mitigation measures			
			Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance					
	Activity or Action	Pos/Neg															
	Alien species proliferate due to disturbance of soil	Neg	1	1	2	5	20	Low	1	1	1	1	3	Low		Vehicles and workers must keep to demarcated pathways	
	Indigenous species be damaged by grading & influx of alien species	Neg	1	1	2	5	20	Low	1	1	2	1	4	Low		Monitor grading activity to prevent excessive disturbance	
	Alien species seeds spread due to disturbance	Neg	1	1	2	2	8	Low	1	1	2	1	4	Low		Keep to demarcated area to minimise spread of seeds	
	Alien species seeds spread from increased incidence of human/animal interaction with the dam	Neg	1	2	2	3	15	Low	1	1	1	2	6	Low		Try to reduce footprint on area to minimise seed disturbance	
	Change in vegetation types upstream of dam towards artificial wetland	Pos	2	3	2	3	21	Mod/Low								No mitigation as impact is positive. However alien invasive vegetation must be managed in these areas.	
	Uninhibited removal of indigenous plants and influx of alien plants	Neg	1	2	2	2	10	Low	1	1	2	1	4	Low		Minimise contact with existing indigenous plants	
	High concentration of disturbance, alien species thrive	Neg	1	2	2	2	10	Low	1	1	2	1	4	Low		Keep to demarcated areas - must be strictly penalised	
							Average Significance Value	16.00	Low						Average Significance Value	3.67	Low
FAUNA AND BIRDS																	
Phase	Environmental impact	Nature of the Impact	Before Mitigation					After Mitigation					Irreplaceable (IP) / Irreversible (IV)	Description of mitigation measures			
			Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance					
	Activity or Action	Pos/Neg															
	Disturbance of birds near water bodies by maintenance works	Neg	2	5	2	3	27	Mod/Low	2	5	1	2	16	Low		Educate staff on minimising the impact on fauna on site	
	Subterranean fauna disturbed by maintenance activity	Neg	1	5	2	3	24	Mod/Low	1	5	1	2	14	Low		Try to grade and dig within demarcated area, do not exceed	
	Disturbance of fauna by construction vehicles during maintenance	Neg	1	5	2	3	24	Mod/Low	1	5	1	2	14	Low		Minimise disturbance by educating staff on proper methods	
	Attenuation of stormwater runoff, affecting aquatic biota	Neg	1	5	3	3	27	Mod/Low	1	5	2	2	16	Low		Use vegetated berms uphill from the dam in addition to the artificial wetland where necessary	
	Silting of water in dams may affect fish life	Neg	2	5	2	3	27	Mod/Low	2	5	1	2	16	Low	IV	maintain artificial wetland to assist with slowing water entering these dams and to drop silt load before entering the dams	
	fish species downstream will be protected from pollutants in water	Pos	2	5	2	3	27	Mod/Low									
							Average Significance Value	26.00	Mod/Low						Average Significance Value	15.20	Low
SURFACE WATER																	
Phase	Environmental impact	Nature of the Impact	Before Mitigation					After Mitigation					Irreplaceable (IP) / Irreversible (IV)	Description of mitigation measures			
			Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance					
	Activity or Action	Pos/Neg															
	Potential for the dam to breach and lower reaches to flood	Neg	1	4	3	3	24	Mod/Low	1	1	1	3	9	Low		Use 3 consecutive vegetation swales in the shape of a half moon downhill from site to catch any run-off to Dams	
	Possible overflow associated with erosion	Neg	1	2	3	2	12	Low	1	1	2	2	8	Low		Use swales near the bottom of site to filter run-off	

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Collection of potentially polluted water in dams. Preventing entering lower reaches.	Pos	1	4	3	3	24	Mod/Low										
Possible silting of the Dams due to slowing of water entering the dams	Neg	1	4	3	2	16	Low	1	1	1	2	6	Low				The maintenance of the artificial wetland upstream of the dam will cause the water to slow sufficiently to drop the silt load before entering the dam.
Nutrient rich water from accidental leaks at the WWTW may enter the dam and cause eutrophication	Neg	2	4	3	3	27	Mod/Low	1	4	1	3	18	Low	IV			Maintenance of the artificial wetland upstream of the dam will allow the absorption of a portion of the toxicants by wetland vegetation before entering the dam.
Possible outflow of polluted water in case of dam breach	Neg	2	4	3	2	18	Low	1	4	1	2	12	Low				Use 3 consecutive vegetation swales in the shape of a half moon downhill from site to catch any run-off to Dams
An artificial wetland will form upstream due to the nutrient rich water and attenuation of water. This will further slow the water and change the hydrology	Neg	2	4	3	3	27	Mod/Low	1	4	2	3	21	Mod/Low	IV			Use swales to catch and filter flow into Dams
The newly formed artificial wetland formed upstream of the dam will attenuate water and give it time to settle out most pollutants before entering the dam	Pos	2	4	3	3	27	Mod/Low										
The water collected in the dam and attenuation ponds will be re-used as grey water. Therefore saving water from the already stressed and fully committed water allocation for the area. Thereby recycling water on the property.	Pos	2	3	3	3	24	Mod/Low										
The surface water hydrology has been altered due to the construction of the dam	Neg	2	4	3	3	27	Mod/low	1	4	2	3	21	Mod/Low				Use vegetation swales downstream to collect the run-off water and eroded soils
The dam is attenuating flood events for the bottom reaches of the drainage line	Neg	2	4	2	2	16	Low	1	4	1	2	12	Low	IV			Do not use leaking vehicles, check proper working order
Average Significance Value						22.00	Mod/Low	Average Significance Value						13.38	Low		

TOPOGRAPHY

Phase	Environmental impact	Nature of the Impact	Before Mitigation					After Mitigation					Irreplaceable (IP) / Irreversible (IV)	Description of mitigation measures			
			Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance					
	Activity or Action	Pos/Neg															
	The topography of the area will change in relation to the hydrology	Neg	2	5	2	3	27	Mod/Low	1	5	1	2	14	Low		Inspect for erosion and maintain area	
	If polluted water leaves dam, Spread of contaminants with increased flow velocities off steeper slopes	Neg	1	5	3	2	18	Mod/Low	1	5	2	2	16	Low		Use vegetation swales downstream to collect the run-off water and eroded soils	
	The dam walls will create steeper slopes immediately downstream of the dams (increasing erosion potential)	Neg	1	5	2	3	24	Mod/Low	1	5	1	2	14	Moderate		Use vegetation swales downstream to collect the run-off water and eroded soils	
	Steeper slopes will create faster run-off and soil erosion	Neg	1	5	2	3	24	Mod/Low	1	5	1	2	14	Moderate		Use vegetation swales downstream to collect the run-off water and eroded soils	
	The change in topography may negatively impact surface water hydrology	Neg	2	5	3	3	30	Mod/Low	2	5	2	2	18	High		Use vegetation swales downstream to collect the run-off water and eroded soils	
Average Significance Value						24.60	Mod/Low	Average Significance Value						15.20	Low		

SOIL

Phase	Environmental impact	Nature of the Impact	Before Mitigation					After Mitigation					Irreplaceable (IP) / Irreversible (IV)	Description of mitigation measures		
			Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance				
	Activity or Action	Pos/Neg														
	Unnecessary loss of soils due to site preparation	Neg	1	1	2	2	8	Low	1	1	1	2	6	Low		Reseed immediately after disturbance. Cover seeded area with T65 shade net to prevent erosion
	Erosion due to unstable soils affected by rains etc.	Neg	1	1	2	2	8	Low	1	1	1	2	6	Low		Inspect the area for any instability in the dam wall or any potential leaks or erosion and conduct ongoing maintenance
	Removal of plants, causing soil erosion	Neg	1	1	2	2	8	Low	1	1	1	2	6	Low		Cover area with T65 shade net to reduce erosion
	Loss of soils due to embankment loss stability	Neg	1	2	2	2	10	Low	1	1	2	1	4	Low		All vehicles must keep to demarcated paths
	Potential spillage of fuel from construction vehicles pollute the soil during maintenance	Neg	1	2	2	3	15	Low	1	1	2	2	8	Low		Keep vehicles in good working order, not leaking fuel
	Unforeseen flooding or road stormwater related problems	Neg	1	2	2	2	10	Low	1	1	1	2	6	Low		Train staff on environmental aspects, report incidents ASAP
	Removal of plants, reducing soil stability and causing erosion	Neg	1	2	3	3	18	Low	1	1	2	2	8	Low		Use T65 shade nets to stabilise soils, reinstate plants

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