N4 Collooney to Castlebaldwin, Proposed Road Development

APPENDIX NO. 14.2

Hydrological & Hydrogeological Impact Summary

PREPARED BY: Minerex Environmental Limited



Document Control

Status	Issued For	Signed	Approved
FINAL	Publication	CQ	CQ

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
1	Hydrology	Construction	Reduction in stream water quality	Drainage	Surface water quality in streams	High/ local	High	Minor loss of fishery	Small adverse	Moderate/ slight	Provision of controls within Erosion and Sediment Control Plan	Temporary	Negligible	Imperceptible
				Conservation areas	Unshin River cSAC pNHA	High/ international	Extremely high	Insufficient magnitude to affect use or integrity of receiving watercourses	Negligible	Imperceptible	and suitably sized crossings & culverts			
					Lough Arrow cSAC, SPA, pNHA			Moderate sensitivity to changes in water quality	Moderate adverse	Significant				
				Wetland habitats	Toberscanavan Lough	High/ regional	Very high	Insufficient magnitude to affect use or	Negligible	Imperceptible				
					Lackagh Fen	High/ regional	Very high	integrity of receiving						
					Boathole & Lough Corran	High/ regional	Very high	watercourses						
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					woodland Cuilencroobagh H Lough Aghalenane & H	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
				Fisheries value	Surface water quality	Medium	Medium	Minor loss of fishery	Small adverse	Slight				
2	Hydrology	Construction	Re- sectioning or re-	Drainage	Surface water quality in streams	High/ local	High	Minor loss of fishery	Small adverse	Moderate/ slight	Provision of controls within Erosion and	Permanent	Small adverse	slight
			aligning of								Sediment			Slight
			stream channels	Fisheries value	Surface water quality	Medium	Medium	Minor loss of fishery		Slight	Control Plan and suitably sized crossings & culverts			

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
3	Hydrology	Construction	Disturbanc e of	Drainage	Field drainage systems	Low	Low	Minor impact on integrity	Small adverse	Imperceptible	Provision of controls within	Permanent	Small adverse	Imperceptible
			existing field drainage systems	Conservation areas	Unshin River cSAC pNHA Lough Arrow cSAC, SPA, pNHA	High/ international	Extremely high	Insufficient magnitude to affect use or integrity of receiving watercourses	Negligible	Imperceptible	Erosion and Sediment Control Plan and suitably sized crossings		Negligible	Imperceptible
				Wetland habitats	Toberscanavan Lough	High/ regional	Very high				& culverts			
					Lackagh Fen	High/ regional	Very high							
					Boathole & Lough Corran	High/ regional	Very high							
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
				Flooding	Outfall 5	Low	Low	Increase in predicted flood level by >50mm	Moderate adverse	Slight			Moderate adverse	Slight
					Outfall 9				Large adverse	Slight/ moderate			Large adverse	Slight/ moderate
4	Hydrology	Operational	Increased attenuatio n and containme	Drainage	Surface water quality in streams	High/ local	High	Reduction in pollution risk of 50% or more where existing risk is <1% annually	Minor beneficial	Minor beneficial	None	Permanent	Minor beneficia	ll
			a	Conservation areas	Unshin River cSAC pNHA	High/ international	Extremely high							
					Lough Arrow cSAC, SPA, pNHA		3							
				Wetland habitats	Lackagh Fen	High/ regional	Very high							
					Boathole & Lough Corran	High/ regional	Very high							

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							•
				Fisheries value	Surface water quality	Medium	Medium	Reduction in pollution risk of 50% or more where existing risk is <1% annually	Minor beneficial	Minor beneficial			Minor beneficia	al
5	Hydrology	Operational	Increased risk of a serious accidental spillage	Drainage	Surface water quality in streams	High/ local	High	Calculated risk of a serious pollution incident is <0.5% annually	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
			Spinage	Conservation areas	Unshin River cSAC pNHA Lough Arrow cSAC, SPA, pNHA	High/ international	Extremely high							
				Wetland habitats	Lackagh Fen	High/ regional	Very high							
				Habitats	Boathole & Lough Corran	High/ regional	Very high							
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
				Fisheries value	Surface water quality	Medium	Medium							

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
6	Hydrology	Operational	Increased volume & rate of runoff	Drainage	Surface water quality streams	High/ local	High	Negligible change in predicted peak flood level	Negligible	Imperceptible	Provision of attenuating systems, such as grassed surface water	Permanent	Negligible	Imperceptible
				Conservation areas	Unshin River cSAC pNHA Lough Arrow cSAC, SPA, pNHA	High/ international	Extremely high	No impact potential as increase <2% of average recharge			channels, wetland- attenuating ponds and suitably sized			
				Wetland habitats	Lackagh Fen	High/ regional	Very high	low potential as increase <5% of average recharge	Small/moderate adverse	Moderate/ slight	crossings & culverts			
					Boathole & Lough Corran	High/ regional	Very high							
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
				Flooding	Recorded areas of recurrant flooding	High/ local	High	Negligible change in predicted peak flood level	Negligible	Imperceptible				
				Fisheries value	Surface water quality	High/ international	Extremely high	Negligible change in predicted peak flood level						
7	Hydrology	Operational	Reduction in surface	Conservation areas	Unshin River cSAC pNHA	High/ international	Extremely high	No impact potential as abstraction <2% of	Negligible	Imperceptible		Permanent	Negligible	Imperceptible
			water catchment area		Lough Arrow cSAC, SPA, pNHA			average recharge						
				Wetland habitats	Lackagh Fen	High/ regional	Very high	low impact potential as abstraction <5% of average recharge for high dependency habitat	Small/moderate adverse	Slight				

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
					Boathole & Lough Corran	High/ regional	Very high							
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
8	Hydrology	Operational	Reduction in water quality in streams receiving routine runoff	Drainage	Surface water quality in streams receiving runoff	High/ local	High	Insufficient magnitude to affect use or integrity of receiving watercourses	Negligible	Imperceptible	Provision of water treatment systems, such as grassed surface water channels, wetland-	Permanent	Negligible	Imperceptible
				Conservation areas	Unshin River cSAC pNHA Lough Arrow cSAC, SPA, pNHA	High/ international	Extremely high				attenuating ponds, spill containment & interceptors			
				Fisheries value	Surface water quality streams receiving runoff	High/ local	High							
1	Hydrogeol	Construction	Reduction	Groundwater	Ballymote	High/ local	High	Resulting in impact on	Moderate adverse	Significant/	Provision of	Temporary	Negligible	Imperceptible
	ogy		in groundwat er quality	body status	Lavagh- Ballintougher Ballygawley			integrity or moderate changes to unsaturated zone		moderate	controls within Erosion and Sediment Control Plan and suitably sized crossings & culverts			

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
2	Hydrogeol ogy	Construction	Reduction in level of protection	Aquifer vulnerability	Road cuts 1 to 10	High/ local	High	Reduction in thickness of overburden providing protection to the bedrock aquifer	Small adverse	Moderate	Provision of controls within Erosion and Sediment Control Plan and suitably sized crossings & culverts	Temporary	Small adverse	Moderate/ slight
					Areas of soft ground for removal			Insufficient magnitude to affect use or integrity of attribute	Negligible	Imperceptible	None			
L					Borrow Pits			Temporary localised impact	Negligible	Imperceptible	None			
3	Hydrogeol ogy	Construction	Interceptio n of shallow groundwat er	Groundwater flow	Road cuts 3, 5 7, and 12	High/ local	High	Low impact potential as abstraction <5% of average recharge	Small adverse	Moderate	Collection of groundwater in narrow filter drain, separate from road runoff and diversion to existing open drain	Temporary	Small adverse	Moderate/ slight
					Areas of soft ground for removal			Insufficient magnitude to affect use or integrity of attribute	Negligible	Imperceptible	None			
					Borrow Pits			Temporary localised impact	Negligible	Imperceptible	None			
4	Hydrogeol ogy	Construction	Localised lowering of water table	Groundwater levels	Road cuts 3, 5 7 and 12	High/ local	High	Removal of small proportion of aquifer	Small adverse	Slight	Collection of groundwater in narrow filter drain, separate from road runoff and diversion to existing open drain	Temporary	Negligible	Imperceptible

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
					Areas of soft ground for removal			Insufficient magnitude to affect use or integrity of attribute	Negligible	Imperceptible	None			
					Borrow Pits			Temporary localised impact	Negligible	Imperceptible	None			
5	Hydrogeol ogy	Construction	Localised flooding	Karst features	Possible dolines & swallow holes	High/ local	High	Minor impact on integrity	Small adverse	Moderate/ slight	Provision of controls within Erosion and Sediment Control Plan and suitably sized crossings & culverts	Temporary	Small adverse	Moderate/ slight
6	Hydrogeol	Construction	Entry &	Karst features	Possible dolines	High/ local	High	Resulting in impact on	Moderate adverse	Significant/	Provision of	Temporary	Moderate	Significant/ moderate
	ogy		rapid transfer of contamina tion in subsurface		& swallow holes			integrity or loss of part of attribute		moderate	controls within Erosion and Sediment Control Plan and suitably sized crossings & culverts		adverse	
7	Hydrogeol	Construction	Potential	Karst features	Possible dolines	High/ local	High	Resulting in minor	Small adverse	Moderate/	Provision of	Temporary	Small	Moderate/ slight
	ogy	Construction	collapse of identified & unidentifie d karst features	Kustreatures	& swallow holes	The first section of the first		impact on integrity or loss of small part of attribute	Small duverse	slight	drainage control including ban on soakaway drains or French drains and use of sealed drainage	remporary	adverse	moderate/ signt

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
8	Hydrogeol ogy	Construction	Reduction in groundwat er quality	Groundwater quality	Regionally important aquifer	High/ local	High	Resulting in impact on integrity or loss of part of attribute	Moderate adverse	Significant/ moderate	Provision of controls within Erosion and Sediment Control Plan and suitably sized crossings & culverts	Temporary	Negligible	Imperceptible
9	Hydrogeol ogy	Construction	Reduction in groundwat	GWDTE's	Lackagh Fen Boathole &	High/ regional High/ regional	Very high Very high	Resulting in impact on integriry or loss of part of attribute	Moderate adverse	Significant/ moderate	Provision of controls within Erosion and	Temporary	Negligible	Imperceptible
			er quality		Lough Corran Carrowkeel wet	High/ regional	Very high	or attribute			Sediment Control Plan			
					woodland Cuilencroobagh	High/ local	High				and suitably sized crossings			
					Lough Aghalenane & Ardloy Lough Fen	High/ international	Extremely high				& culverts			
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
10	Hydrogeol ogy	Construction	Interceptio n of shallow	GWDTE's	Lackagh Fen	High/ regional	Very high	Low impact potential as abstraction <5% of average recharge	Negligible	Imperceptible	None	Temporary	Negligible	Imperceptible
			groundwat er		Boathole & Lough Corran	High/ regional	Very high							
					Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
11	Hydrogeol ogy	Operational	Reduction in	GWDTE's	Lackagh Fen	High/ regional	Very high	Medium risk of pollution to	Moderate adverse	Significant/ moderate	Provision of water	Permanent	Negligible	Imperceptible
	- 57		groundwat er quality		Boathole & Lough Corran	High/ regional	Very high	groundwater from routine runoff			treatment systems, such			
			er quanty		Carrowkeel wet woodland	High/ regional	Very high	Toutine runon			as grassed surface water			
					Cuilencroobagh Lough	High/ local	High				channels, wetland-			
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high				attenuating ponds, spill containment &			
					Tawnagh Lake Swallow hole complex	High/ regional	Very high				interceptors			
13	Hydrogeol ogy	Operational	Increased risk of a	Groundwater body status	Ballymote	High/ local	High	Calculated risk of a serious pollution	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
	067		serious	body status	Lavagh- Ballintougher			incident is <0.5%						
			accidental spillage		Ballygawley			annually						
					- "							-		
14	Hydrogeol ogy	Operational	Reduction in	Groundwater body status	Ballymote	High/ local	High	No impact potential as abstraction <2% of	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
			groundwat er		Lavagh- Ballintougher			average recharge						
			contributi ons		Ballygawley									
												_		
15	Hydrogeol ogy	Operational	Increase in level of protection	Aquifer vulnerability	Proposed road realignment	High/ local	High	Minor improvement in attribute quality	Minor beneficial	Minor beneficial	None	Permanent	Minor beneficial	Minor beneficial
	_						_							
16	Hydrogeol ogy	Operational	Localised backing-up of water table	Groundwater levels	All road cuts, borrow pits & areas of soft ground for removal	High/ local	High	Insufficient magnitude to affect use or integrity of receiving watercourses	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
17	Hydrogeol ogy	Operational	Reduction in groundwat er quality receiving routine runoff	Groundwater quality	Regionally important aquifer	High/ local	High	Medium risk of pollution to groundwater from routine runoff	Moderate adverse	Significant/ moderate	Provision of water treatment systems, such as grassed surface water channels, wetland-attenuating ponds, spill containment & interceptors	Permanent	Negligible	Imperceptible
40		0 11 1			0 : "	10:171	10: 1		A) 1: :1.1		N.		AL 1: 11.1	
18	Hydrogeol ogy	Operational	Increased risk of a serious accidental spillage	Groundwater quality	Regionally important aquifer	High/ local	High	Calculated risk of a serious pollution incident is <0.5% annually	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
19	Hydrogeol ogy	Operational	Increased risk of a	GWDTE's	Lackagh Fen	High/ regional	Very high	Calculated risk of a serious pollution	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
	557		serious accidental		Boathole & Lough Corran	High/ regional	Very high	incident is <0.5% annually						
			spillage		Carrowkeel wet woodland	High/ regional	Very high	armaany						
					Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
20	Hydrogeol	Operational	Increased volume &	GWDTE's	Lackagh Fen	High/ regional	Very high	Low impact potential as total <5% of average	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
	ogy		rate of runoff		Boathole & Lough Corran	High/ regional	Very high	recharge						
			Talloll		Carrowkeel wet woodland	High/ regional	Very high							
					Cuilencroobagh Lough	High/ local	High							

No.	Environme ntal aspect	Phase	Potential impact	Attribute	Feature	Quality/ value	Attribute importance	Impact consequence	Impact magnitude	Impact significance	Mitigation	Impact duration	Residual impact magnitude	Residual impact significance
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
21	Hydrogeol	Operational	Reduction	GWDTE's	Lackagh Fen	High/ regional	Very high	Low impact potential	Negligible	Imperceptible	None	Permanent	Negligible	Imperceptible
	ogy	operationa.	in groundwat er	GWG/123	Boathole & Lough Corran	High/ regional	Very high	as abstraction <5% of average recharge	1108.18.12	perception		remanent	. regingiane	регосравае
			contributi ons		Carrowkeel wet woodland	High/ regional	Very high							
			Olis		Cuilencroobagh Lough	High/ local	High							
					Aghalenane & Ardloy Lough Fen	High/ international	Extremely high							
					Tawnagh Lake Swallow hole complex	High/ regional	Very high							
22	Hydrogeol ogy	Operational	Reduction available	wells	Carrownagark	High	high	Slight decrease in yield	Negligible	Imperceptible	None	Permanent	Imperceptible	Imperceptible
	- 3,		water yield		Toberscanavan	High	medium	Loss of well	Large	significant			significant	significant
			volume		Doorly (west)	High	high	Slight decrease in yield	Negligible	Imperceptible			Imperceptible	Imperceptible
					Doorly (east)	High	high	Slight decrease in yield	Negligible	Imperceptible	1		Imperceptible	Imperceptible
		_			Ardloy	High	high	Slight decrease in yield	Negligible	Imperceptible			Imperceptible	Imperceptible