HALSTON

ENGINEERING REPORTS

(PROJECT 1)

Drawing Register			
Project Name	**Coolpowra OCGT**		
Project No.	**SEP-0398**		
Stage	**Planning**		
Distribution	**Issue Number**	**1**	**2**
	Issue Date	28.03.2024	07.06.2024
	Issued By:	SK	SK
Galway County Council		E	E&1H
An Bord Pleanála		E	E&5H
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CPA-HAL-OC-XX-DR-PL-1920	Percolation and Drainage Details		P01

Issue type:
H = Hardcopy
F = Fax
E = electronic

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Junctions Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
MH318	Manhole	582267.225	709083.743	52.050	1.425	50.625	Circular	1.500
MH319	Manhole	582228.498	709073.879	51.800	1.430	50.370	Circular	1.500
MH320	Manhole	582233.607	709043.253	51.950	1.425	50.525	Circular	1.500
MH321	Manhole	582193.534	709092.955	51.600	1.474	50.126	Circular	1.500
MH322	Manhole	582172.038	709088.773	51.500	1.511	49.989	Circular	1.500
MH323	Manhole	582143.167	709082.049	51.350	1.509	49.841	Circular	1.500
MH324	Manhole	582124.837	709077.616	51.250	1.503	49.747	Circular	1.500
MH325	Manhole	582105.253	709072.716	51.150	1.504	49.646	Circular	1.500
MH326	Manhole	582087.269	709068.485	51.075	1.522	49.553	Circular	1.500
MH327	Manhole	582067.574	709063.742	50.950	1.675	49.275	Circular	1.500
MH328	Manhole	582051.546	709059.783	50.900	1.708	49.192	Circular	1.500
MH329	Manhole	582036.273	709055.963	50.800	1.687	49.113	Circular	1.500
MH316	Manhole	582015.538	709050.164	50.700	1.811	48.889	Circular	1.500
MH315	Manhole	582025.157	709006.007	50.950	1.835	49.115	Circular	1.500
MH308	Manhole	582033.956	708970.564	51.100	1.802	49.298	Circular	1.500
MH314	Manhole	582053.537	708976.636	51.200	1.549	49.651	Circular	1.500
MH313	Manhole	582072.777	708981.418	51.300	1.550	49.750	Circular	1.500
MH312	Manhole	582098.987	708987.912	51.400	1.515	49.885	Circular	1.500
MH311	Manhole	582118.113	708992.398	51.500	1.506	49.994	Circular	1.500
MH310	Manhole	582143.378	708998.419	51.650	1.512	50.138	Circular	1.500
MH309	Manhole	582165.101	709003.732	51.750	1.500	50.250	Circular	1.500
MH307	Manhole	582058.940	708958.928	51.300	1.619	49.681	Circular	1.500
MH306	Manhole	582087.248	708960.237	51.400	1.577	49.823	Circular	1.500
MH305	Manhole	582117.139	708967.320	51.550	1.573	49.977	Circular	1.500
MH304	Manhole	582145.880	708974.728	51.700	1.575	50.125	Circular	1.500
MH303	Manhole	582171.716	708981.292	51.800	1.483	50.317	Circular	1.500
MH302	Manhole	582210.427	708990.381	52.000	1.435	50.565	Circular	1.500
MH301	Manhole	582234.915	708997.786	52.150	1.425	50.725	Circular	1.500
MH317	Manhole	582012.085	709068.551	50.650	3.023	47.627	Circular	1.500
MH330	Manhole	581975.401	709122.773	49.000	2.314	46.686	Circular	1.500
MH331	Manhole	581966.601	709135.147	49.000	2.500	46.500	Circular	1.500
MH332	Simple Junction	581939.263	709225.635					
MH304.1	Manhole	582150.751	708957.094	51.600	1.381	50.219	Circular	1.500
MH304.2	Manhole	582154.633	708941.112	51.500	1.190	50.310	Circular	1.500
MH305.1	Manhole	582119.734	708958.756	51.600	1.550	50.050	Circular	1.200
MH323.1	Manhole	582140.405	709093.978	51.450	1.510	49.940	Circular	1.200
MH325.1	Manhole	582102.952	709084.681	51.250	1.505	49.745	Circular	1.200
MH327.1	Manhole	582065.231	709075.705	51.050	1.675	49.375	Circular	1.200
MH322.2	Manhole	582192.219	709063.645	51.700	1.525	50.175	Circular	1.200
MH322.1	Manhole	582186.766	709081.984	51.500	1.425	50.075	Circular	1.200

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Junctions Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Access Required	Intersection Easting (m)	Intersection Northing (m)	Lock
MH318	☑	582267.225	709083.743	None
MH319	☑	582228.498	709073.879	None
MH320	☑	582233.607	709043.253	None
MH321	☑	582193.534	709092.955	None
MH322	☑	582172.038	709088.773	None
MH323	☑	582143.167	709082.049	None
MH324	☑	582124.837	709077.616	None
MH325	☑	582105.253	709072.716	None
MH326	☑	582087.269	709068.485	None
MH327	☑	582067.574	709063.742	None
MH328	☑	582051.546	709059.783	None
MH329	☑	582036.273	709055.963	None
MH316	☑	582015.538	709050.164	None
MH315	☑	582025.157	709006.007	None
MH308	☑	582033.956	708970.564	None
MH314	☑	582053.537	708976.636	None
MH313	☑	582072.777	708981.418	None
MH312	☑	582098.987	708987.912	None
MH311	☑	582118.113	708992.398	None
MH310	☑	582143.378	708998.419	None
MH309	☑	582165.101	709003.732	None
MH307	☑	582058.940	708958.928	None
MH306	☑	582087.248	708960.237	None
MH305	☑	582117.139	708967.320	None
MH304	☑	582145.880	708974.728	None
MH303	☑	582171.716	708981.292	None
MH302	☑	582210.427	708990.381	None
MH301	☑	582234.915	708997.786	None
MH317	☑	582012.085	709068.551	None
MH330	☑	581975.401	709122.773	None
MH331	☑	581966.601	709135.147	None
MH332				
MH304.1	☑	582150.751	708957.094	None
MH304.2	☑	582154.633	708941.112	None
MH305.1	☑	582119.734	708958.756	None
MH323.1	☐			None
MH325.1	☐			None
MH327.1	☐			None
MH322.2	☐			None
MH322.1	☐			None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH318	Inlet	Catchment Area 23	(None)	No Restriction
MH319	Inlet	Catchment Area 22 P303.000 P304.000 Catchment Area	(None)	No Restriction
MH320	Inlet	Catchment Area 24	(None)	No Restriction
MH321	Inlet	Catchment Area 21 P303.001	(None)	No Restriction
MH322	Inlet	Catchment Area 20 P303.002 P322.1	(None)	No Restriction

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH323	Inlet	Catchment Area 19 P303.003 P323.1	(None)	No Restriction
MH324	Inlet	P303.004 Catchment Area 3	(None)	No Restriction
MH325	Inlet	Catchment Area 18 P303.005 Catchment Area 14 Catchment Area 15 P325.1	(None)	No Restriction
MH326	Inlet	P303.006 Catchment Area 2	(None)	No Restriction
MH327	Inlet	Catchment Area 17 P303.007 Catchment Area 11 Catchment Area 12 P327.1	(None)	No Restriction
MH328	Inlet	P303.008 Catchment Area 1	(None)	No Restriction
MH329	Inlet	P303.009 Catchment Area 8 Catchment Area 9	(None)	No Restriction
MH316	Inlet	Catchment Area 16 P301.008	(None)	No Restriction
MH315	Inlet	Catchment Area 44 P301.007 Catchment Area 43	(None)	No Restriction
MH308	Inlet	Catchment Area 39 P301.006 P302.005	(None)	No Restriction
MH314	Inlet	P302.004 Catchment Area 6	(None)	No Restriction
MH313	Inlet	P302.003 Catchment Area 40	(None)	No Restriction
MH312	Inlet	P302.002 Catchment Area 5	(None)	No Restriction
MH311	Inlet	P302.001 Catchment Area 41	(None)	No Restriction
MH310	Inlet	Catchment Area 42 P302.000	(None)	No Restriction
MH309	Inlet	Catchment Area 4	(None)	No Restriction
MH307	Inlet	P301.005	(None)	No Restriction
MH306	Inlet	Catchment Area 38	(None)	No Restriction
	Inlet (1)	P301.004	(None)	No Restriction
MH305	Inlet	Catchment Area 35 P301.003 Catchment Area 36 P305.1	(None)	No Restriction
MH304	Inlet	P301.002 P304.1	(None)	No Restriction
MH303	Inlet	P301.001 Catchment Area 30	(None)	No Restriction
	Inlet (1)	Catchment Area 29	(None)	No Restriction
MH302	Inlet	Catchment Area 28 P301.000	(None)	No Restriction
MH301	Inlet	Catchment Area 27	(None)	No Restriction

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Junctions Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH317	Inlet	P303.010 P301.009	(None)	No Restriction
MH330	Inlet	P301.010	(None)	No Restriction
MH331	Inlet	P301.011	(None)	No Restriction
MH332	Inlet	P301.013	(None)	No Restriction
MH304.1	Inlet	P304.2 Catchment Area 32 Catchment Area 33 Catchment Area 31	(None)	No Restriction
MH304.2	Inlet	Catchment Area 34	(None)	No Restriction
MH305.1	Inlet	Catchment Area 37	(None)	No Restriction
MH323.1	Inlet	Catchment Area 13	(None)	No Restriction
MH325.1	Inlet	Catchment Area 10	(None)	No Restriction
MH327.1	Inlet	Catchment Area 7	(None)	No Restriction
MH322.2	Inlet	Catchment Area 25 Catchment Area 26	(None)	No Restriction
MH322.1	Inlet	Catchment Area (1) P322.2	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
MH318	Outlet	P303.000	Free Discharge
MH319	Outlet	P303.001	Free Discharge
MH320	Outlet	P304.000	Free Discharge
MH321	Outlet	P303.002	Free Discharge
MH322	Outlet	P303.003	Free Discharge
MH323	Outlet	P303.004	Free Discharge
MH324	Outlet	P303.005	Free Discharge
MH325	Outlet	P303.006	Free Discharge
MH326	Outlet	P303.007	Free Discharge
MH327	Outlet	P303.008	Free Discharge
MH328	Outlet	P303.009	Free Discharge
MH329	Outlet	P303.010	Free Discharge
MH316	Outlet	P301.009	Free Discharge
MH315	Outlet	P301.008	Free Discharge
MH308	Outlet	P301.007	Free Discharge
MH314	Outlet	P302.005	Free Discharge
MH313	Outlet	P302.004	Free Discharge
MH312	Outlet	P302.003	Free Discharge
MH311	Outlet	P302.002	Free Discharge
MH310	Outlet	P302.001	Free Discharge
MH309	Outlet	P302.000	Free Discharge
MH307	Outlet	P301.006	Free Discharge
MH306	Outlet	P301.005	Free Discharge
MH305	Outlet	P301.004	Free Discharge
MH304	Outlet	P301.003	Free Discharge
MH303	Outlet	P301.002	Free Discharge
MH302	Outlet	P301.001	Free Discharge
MH301	Outlet	P301.000	Free Discharge
MH317	Outlet	P301.010	Free Discharge
MH330	Outlet	P301.011	Free Discharge
MH331	Outlet	P301.012	Free Discharge
MH304.1	Outlet	P304.1	Free Discharge
MH304.2	Outlet	P304.2	Free Discharge
MH305.1	Outlet	P305.1	Free Discharge
MH323.1	Outlet	P323.1	Free Discharge
MH325.1	Outlet	P325.1	Free Discharge
MH327.1	Outlet	P327.1	Free Discharge
MH322.2	Outlet	P322.2	Free Discharge
MH322.1	Outlet	P322.1	Free Discharge

Pond

Type : Pond

Dimensions

Exceedance Level (m)	47.300
Depth (m)	1.000
Base Level (m)	46.300
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	3.932
Total Volume (m³)	1170.726

Depth (m)	Area (m²)	Volume (m³)
0.000	940.80	0.000
1.000	1416.84	1170.726

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	P301.012
Bypass Destination	(None)
Capacity Type	No Restriction

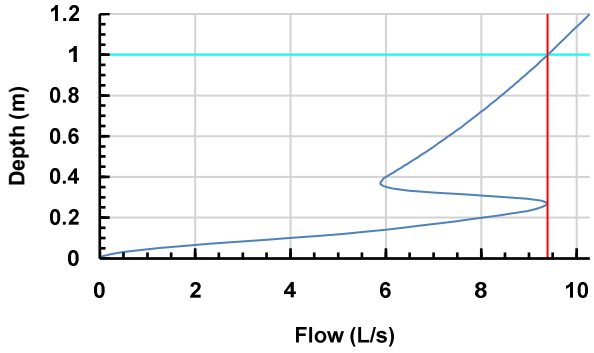
Outlets

Outlet

Outgoing Connection	P301.013
Outlet Type	Hydro-Brake®

Invert Level (m)	46.300
Design Depth (m)	1.000
Design Flow (L/s)	9.4
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0134-9400-1000-9400



Advanced

Perimeter	Circular
Length (m)	62.571
Friction Scheme	Manning's n
n	0.03

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Connections Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
P303.000	39.963	Pipe	160.000		0.6	225	52.050	50.625
P303.001	39.829	Pipe	163.396		0.6	225	51.800	50.370
P303.002	21.900	Pipe	159.851		0.6	225	51.600	50.126
P303.003	29.644	Pipe	200.000		0.6	300	51.500	49.989
P303.004	18.859	Pipe	200.000		0.6	300	51.350	49.841
P303.005	20.188	Pipe	200.000		0.6	300	51.250	49.747
P303.006	18.474	Pipe	199.145		0.6	300	51.150	49.646
P303.007	20.258	Pipe	190.000		0.6	300	51.075	49.553
P303.008	16.510	Pipe	200.000		0.6	450	50.950	49.275
P303.009	15.744	Pipe	200.000		0.6	450	50.900	49.192
P303.010	27.267	Pipe	200.000		0.6	450	50.800	49.113
P301.010	65.465	Pipe	200.000		0.6	600	50.650	47.627
P301.011	15.184	Pipe	83.472		0.6	600	49.000	46.686
P301.012	16.161	Pipe	80.805		0.6	600	49.000	46.500
P301.000	25.584	Pipe	159.901		0.6	225	52.150	50.725
P301.001	39.764	Pipe	160.000		0.6	225	52.000	50.565
P301.002	26.656	Pipe	139.141		0.6	225	51.800	50.317
P301.003	29.681	Pipe	200.000		0.6	375	51.700	50.125
P301.004	30.718	Pipe	200.000		0.6	375	51.550	49.977
P301.005	28.338	Pipe	200.000		0.6	375	51.400	49.823
P301.006	27.561	Pipe	150.000		0.6	375	51.300	49.681
P301.007	36.519	Pipe	200.000		0.6	450	51.100	49.298
P301.008	45.192	Pipe	200.000		0.6	450	50.950	49.115
P301.009	18.709	Pipe	200.000		0.6	450	50.700	48.889
P302.000	22.364	Pipe	200.000		0.6	300	51.750	50.250
P302.001	25.973	Pipe	180.000		0.6	300	51.650	50.138
P302.002	19.645	Pipe	180.000		0.6	300	51.500	49.994
P302.003	27.002	Pipe	200.000		0.6	300	51.400	49.885
P302.004	19.826	Pipe	200.000		0.6	300	51.300	49.750
P302.005	20.501	Pipe	200.000		0.6	300	51.200	49.651
P304.000	31.049	Pipe	200.000		0.6	225	51.950	50.525
P301.013	34.942	No Delay						
P304.2	16.447	Pipe	180.271		0.6	375	51.500	50.310
P304.1	18.294	Pipe	195.107		0.6	375	51.600	50.219
P305.1	8.948	Pipe	121.903		0.6	150	51.600	50.050
P323.1	12.244	Pipe	123.404		0.6	150	51.450	49.940
P325.1	12.185	Pipe	122.789		0.6	150	51.250	49.745
P327.1	12.190	Pipe	121.901		0.6	150	51.050	49.375
P322.2	19.133	Pipe	191.327		0.6	225	51.700	50.175
P322.1	16.218	Pipe	188.579		0.6	225	51.500	50.075

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Flow Restriction (L/s)
P303.000	51.800	50.375	Levels	
P303.001	51.600	50.126	None	
P303.002	51.500	49.989	None	
P303.003	51.350	49.841	None	
P303.004	51.250	49.747	Levels	
P303.005	51.150	49.646	None	
P303.006	51.075	49.553	None	
P303.007	50.950	49.446	Levels	
P303.008	50.900	49.192	None	
P303.009	50.800	49.113	None	
P303.010	50.650	48.977	Levels	
P301.010	49.000	47.300	Levels	
P301.011	49.000	46.504	Levels	
P301.012	47.300	46.300	None	
P301.000	52.000	50.565	None	
P301.001	51.800	50.317	None	
P301.002	51.700	50.125	None	
P301.003	51.550	49.977	Levels	
P301.004	51.400	49.823	None	
P301.005	51.300	49.681	None	
P301.006	51.100	49.497	Levels	
P301.007	50.950	49.115	None	
P301.008	50.700	48.889	None	
P301.009	50.650	48.795	None	
P302.000	51.650	50.138	None	
P302.001	51.500	49.994	None	
P302.002	51.400	49.885	None	
P302.003	51.300	49.750	None	
P302.004	51.200	49.651	None	
P302.005	51.100	49.548	None	
P304.000	51.800	50.370	None	
P301.013				
P304.2	51.600	50.219	None	
P304.1	51.700	50.125	None	
P305.1	51.550	49.977	None	
P323.1	51.350	49.841	None	
P325.1	51.150	49.646	None	
P327.1	50.950	49.275	None	
P322.2	51.500	50.075	None	
P322.1	51.500	49.989	None	

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH318	52.050 50.625	Diameter / Length: 1.500					Manhole - Access Required
E:582267.225 N:709083.743	1.425		{a} P303.000	Pipe	50.625	Diam/Width:225	Not Applicable
MH319	51.800 50.370	Diameter / Length: 1.500	{1} P303.000	Pipe	50.375	Diam/Width:225	Manhole - Access Required
E:582228.498 N:709073.879	1.430		{2} P304.000	Pipe	50.370	Diam/Width:225	
			{a} P303.001	Pipe	50.370	Diam/Width:225	Not Applicable
MH320	51.950 50.525	Diameter / Length: 1.500					Manhole - Access Required
E:582233.607 N:709043.253	1.425		{a} P304.000	Pipe	50.525	Diam/Width:225	Not Applicable
MH321	51.600 50.126	Diameter / Length: 1.500	{1} P303.001	Pipe	50.126	Diam/Width:225	Manhole - Access Required
E:582193.534 N:709092.955	1.474		{a} P303.002	Pipe	50.126	Diam/Width:225	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH322	51.500 49.989	Diameter / Length: 1.500	{1} P303.002 {2} P322.1	Pipe Pipe	49.989 49.989	Diam/Width:225 Diam/Width:225	Manhole - Access Required
E:582172.038 N:709088.773	1.511		{a} P303.003	Pipe	49.989	Diam/Width:300	Not Applicable
MH323	51.350 49.841	Diameter / Length: 1.500	{1} P303.003 {2} P323.1	Pipe Pipe	49.841 49.841	Diam/Width:300 Diam/Width:150	Manhole - Access Required
E:582143.167 N:709082.049	1.509		{a} P303.004	Pipe	49.841	Diam/Width:300	Not Applicable
MH324	51.250 49.747	Diameter / Length: 1.500	{1} P303.004	Pipe	49.747	Diam/Width:300	Manhole - Access Required
E:582124.837 N:709077.616	1.503		{a} P303.005	Pipe	49.747	Diam/Width:300	Not Applicable
MH325	51.150 49.646	Diameter / Length: 1.500	{1} P303.005 {2} P325.1	Pipe Pipe	49.646 49.646	Diam/Width:300 Diam/Width:150	Manhole - Access Required
E:582105.253 N:709072.716	1.504		{a} P303.006	Pipe	49.646	Diam/Width:300	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH326	51.075 49.553	Diameter / Length: 1.500	{1} P303.006	Pipe	49.553	Diam/Width:300	Manhole - Access Required
E:582087.269 N:709068.485	1.522		{a} P303.007	Pipe	49.553	Diam/Width:300	Not Applicable
MH327	50.950 49.275	Diameter / Length: 1.500	{1} P303.007 {2} P327.1	Pipe Pipe	49.446 49.275	Diam/Width:300 Diam/Width:150	Manhole - Access Required
E:582067.574 N:709063.742	1.675		{a} P303.008	Pipe	49.275	Diam/Width:450	Not Applicable
MH328	50.900 49.192	Diameter / Length: 1.500	{1} P303.008	Pipe	49.192	Diam/Width:450	Manhole - Access Required
E:582051.546 N:709059.783	1.708		{a} P303.009	Pipe	49.192	Diam/Width:450	Not Applicable
MH329	50.800 49.113	Diameter / Length: 1.500	{1} P303.009	Pipe	49.113	Diam/Width:450	Manhole - Access Required
E:582036.273 N:709055.963	1.687		{a} P303.010	Pipe	49.113	Diam/Width:450	Not Applicable
MH316	50.700 48.889	Diameter / Length: 1.500	{1} P301.008	Pipe	48.889	Diam/Width:450	Manhole - Access Required
E:582015.538 N:709050.164	1.811		{a} P301.009	Pipe	48.889	Diam/Width:450	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH315	50.950 49.115	Diameter / Length: 1.500	{1} P301.007	Pipe	49.115	Diam/Width:450	Manhole - Access Required
E:582025.157 N:709006.007	1.835		{a} P301.008	Pipe	49.115	Diam/Width:450	Not Applicable
MH308	51.100 49.298	Diameter / Length: 1.500	{1} P301.006	Pipe	49.497	Diam/Width:375	Manhole - Access Required
E:582033.956 N:708970.564	1.802		{2} P302.005	Pipe	49.548	Diam/Width:300	
			{a} P301.007	Pipe	49.298	Diam/Width:450	Not Applicable
MH314	51.200 49.651	Diameter / Length: 1.500	{1} P302.004	Pipe	49.651	Diam/Width:300	Manhole - Access Required
E:582053.537 N:708976.636	1.549		{a} P302.005	Pipe	49.651	Diam/Width:300	Not Applicable
MH313	51.300 49.750	Diameter / Length: 1.500	{1} P302.003	Pipe	49.750	Diam/Width:300	Manhole - Access Required
E:582072.777 N:708981.418	1.550		{a} P302.004	Pipe	49.750	Diam/Width:300	Not Applicable
MH312	51.400 49.885	Diameter / Length: 1.500	{1} P302.002	Pipe	49.885	Diam/Width:300	Manhole - Access Required
E:582098.987 N:708987.912	1.515		{a} P302.003	Pipe	49.885	Diam/Width:300	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH311	51.500 49.994	Diameter / Length: 1.500	{1} P302.001	Pipe	49.994	Diam/Width:300	Manhole - Access Required
E:582118.113 N:708992.398	1.506		{a} P302.002	Pipe	49.994	Diam/Width:300	Not Applicable
MH310	51.650 50.138	Diameter / Length: 1.500	{1} P302.000	Pipe	50.138	Diam/Width:300	Manhole - Access Required
E:582143.378 N:708998.419	1.512		{a} P302.001	Pipe	50.138	Diam/Width:300	Not Applicable
MH309	51.750 50.250	Diameter / Length: 1.500					Manhole - Access Required
E:582165.101 N:709003.732	1.500		{a} P302.000	Pipe	50.250	Diam/Width:300	Not Applicable
MH307	51.300 49.681	Diameter / Length: 1.500	{1} P301.005	Pipe	49.681	Diam/Width:375	Manhole - Access Required
E:582058.940 N:708958.928	1.619		{a} P301.006	Pipe	49.681	Diam/Width:375	Not Applicable
MH306	51.400 49.823	Diameter / Length: 1.500	{1} P301.004	Pipe	49.823	Diam/Width:375	Manhole - Access Required
E:582087.248 N:708960.237	1.577		{a} P301.005	Pipe	49.823	Diam/Width:375	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH305	51.550 49.977	Diameter / Length: 1.500	{1} P301.003 {2} P305.1	Pipe Pipe	49.977 49.977	Diam/Width:375 Diam/Width:150	Manhole - Access Required
E:582117.139 N:708967.320	1.573		{a} P301.004	Pipe	49.977	Diam/Width:375	Not Applicable
MH304	51.700 50.125	Diameter / Length: 1.500	{1} P301.002 {2} P304.1	Pipe Pipe	50.125 50.125	Diam/Width:225 Diam/Width:375	Manhole - Access Required
E:582145.880 N:708974.728	1.575		{a} P301.003	Pipe	50.125	Diam/Width:375	Not Applicable
MH303	51.800 50.317	Diameter / Length: 1.500	{1} P301.001	Pipe	50.317	Diam/Width:225	Manhole - Access Required
E:582171.716 N:708981.292	1.483		{a} P301.002	Pipe	50.317	Diam/Width:225	Not Applicable
MH302	52.000 50.565	Diameter / Length: 1.500	{1} P301.000	Pipe	50.565	Diam/Width:225	Manhole - Access Required
E:582210.427 N:708990.381	1.435		{a} P301.001	Pipe	50.565	Diam/Width:225	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH301	52.150 50.725	Diameter / Length: 1.500					Manhole - Access Required
E:582234.915 N:708997.786	1.425		{a} P301.000	Pipe	50.725	Diam/Width:225	Not Applicable
MH317	50.650 47.627	Diameter / Length: 1.500	{1} P303.010 {2} P301.009	Pipe Pipe	48.977 48.795	Diam/Width:450 Diam/Width:450	Manhole - Access Required
E:582012.085 N:709068.551	3.023		{a} P301.010	Pipe	47.627	Diam/Width:600	Not Applicable
MH330	49.000 46.686	Diameter / Length: 1.500	{1} P301.010	Pipe	47.300	Diam/Width:600	Manhole - Access Required
E:581975.401 N:709122.773	2.314		{a} P301.011	Pipe	46.686	Diam/Width:600	Not Applicable
MH331	49.000 46.500	Diameter / Length: 1.500	{1} P301.011	Pipe	46.504	Diam/Width:600	Manhole - Access Required
E:581966.601 N:709135.147	2.500		{a} P301.012	Pipe	46.500	Diam/Width:600	Not Applicable
MH332		Diameter / Length: 1.200	{1} P301.013	No Delay	Not Applicable	Not Applicable	Simple Junction
E:581939.263 N:709225.635							Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH304.1	51.600 50.219	Diameter / Length: 1.500	{1} P304.2	Pipe	50.219	Diam/Width:375	Manhole - Access Required
E:582150.751 N:708957.094	1.381		{a} P304.1	Pipe	50.219	Diam/Width:375	Not Applicable
MH304.2	51.500 50.310	Diameter / Length: 1.500					Manhole - Access Required
E:582154.633 N:708941.112	1.190		{a} P304.2	Pipe	50.310	Diam/Width:375	Not Applicable
MH305.1	51.600 50.050	Diameter / Length: 1.200					Manhole - Access Required
E:582119.734 N:708958.756	1.550		{a} P305.1	Pipe	50.050	Diam/Width:150	Not Applicable
MH323.1	51.450 49.940	Diameter / Length: 1.200					Manhole
E:582140.405 N:709093.978	1.510		{a} P323.1	Pipe	49.940	Diam/Width:150	Not Applicable
MH325.1	51.250 49.745	Diameter / Length: 1.200					Manhole
E:582102.952 N:709084.681	1.505		{a} P325.1	Pipe	49.745	Diam/Width:150	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Manhole Schedule Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH327.1	51.050 49.375	Diameter / Length: 1.200					Manhole
E:582065.231 N:709075.705	1.675		{a} P327.1	Pipe	49.375	Diam/Width:150	Not Applicable
MH322.2	51.700 50.175	Diameter / Length: 1.200					Manhole
E:582192.219 N:709063.645	1.525		{a} P322.2	Pipe	50.175	Diam/Width:225	Not Applicable
MH322.1	51.500 50.075	Diameter / Length: 1.200	{1} P322.2	Pipe	50.075	Diam/Width:225	Manhole
E:582186.766 N:709081.984	1.425		{a} P322.1	Pipe	50.075	Diam/Width:225	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Inflow Summary Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	MH319		Time of Concentration	0.008	100	0	100	0.008
Catchment Area 1	MH328		Time of Concentration	0.159	100	0	100	0.159
Catchment Area 2	MH326		Time of Concentration	0.113	100	0	100	0.113
Catchment Area 3	MH324		Time of Concentration	0.182	100	0	100	0.182
Catchment Area 4	MH309		Time of Concentration	0.142	100	0	100	0.142
Catchment Area 5	MH312		Time of Concentration	0.138	100	0	100	0.138
Catchment Area 6	MH314		Time of Concentration	0.162	100	0	100	0.162
Catchment Area 7	MH327.1		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 8	MH329		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 9	MH329		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 10	MH325.1		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 11	MH327		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 12	MH327		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 13	MH323.1		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 14	MH325		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 15	MH325		Time of Concentration	0.005	100	0	100	0.005
Catchment Area 16	MH316		Time of Concentration	0.068	100	0	100	0.068
Catchment Area 17	MH327		Time of Concentration	0.048	100	0	100	0.048
Catchment Area 18	MH325		Time of Concentration	0.043	100	0	100	0.043
Catchment Area 19	MH323		Time of Concentration	0.046	100	0	100	0.046
Catchment Area 20	MH322		Time of Concentration	0.027	100	0	100	0.027
Catchment Area 21	MH321		Time of Concentration	0.028	100	0	100	0.028
Catchment Area 22	MH319		Time of Concentration	0.050	100	0	100	0.050
Catchment Area 23	MH318		Time of Concentration	0.030	100	0	100	0.030
Catchment Area 24	MH320		Time of Concentration	0.035	100	0	100	0.035
Catchment Area 25	MH322.2		Time of Concentration	0.013	100	0	100	0.013
Catchment Area 26	MH322.2		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 27	MH301		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 28	MH302		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 29	MH303		Time of Concentration	0.036	100	0	100	0.036
Catchment Area 30	MH303		Time of Concentration	0.020	100	0	100	0.020
Catchment Area 31	MH304.1		Time of Concentration	0.029	100	0	100	0.029

Catchment Area 32	MH304.1		Time of Concentration	0.048	100	0	100	0.048
Catchment Area 33	MH304.1		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 34	MH304.2		Time of Concentration	0.473	100	0	100	0.473
Catchment Area 35	MH305		Time of Concentration	0.034	100	0	100	0.034
Catchment Area 36	MH305		Time of Concentration	0.003	100	0	100	0.003
Catchment Area 37	MH305.1		Time of Concentration	0.006	100	0	100	0.006
Catchment Area 38	MH306		Time of Concentration	0.038	100	0	100	0.038
Catchment Area 39	MH308		Time of Concentration	0.036	100	0	100	0.036
Catchment Area 40	MH313		Time of Concentration	0.023	100	0	100	0.023
Catchment Area 41	MH311		Time of Concentration	0.025	100	0	100	0.025
Catchment Area 42	MH310		Time of Concentration	0.021	100	0	100	0.021
Catchment Area 43	MH315		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 44	MH315		Time of Concentration	0.036	100	0	100	0.036
Catchment Area (1)	MH322.1		Time of Concentration	0.040	100	0	100	0.040
TOTAL		**0.0**		**2.355**				**2.355**

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Outfall Details Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
MH332	Free Discharge		

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Title:	Company:		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland And Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	20.000
100.0	20.000
2.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH318	Rain 1: 1 years: +0 %: 30 mins: Winter	52.050	50.625	50.657	0.032	2.1	0.057	0.000	1.9	1.909	OK
MH319	Rain 1: 1 years: +0 %: 30 mins: Winter	51.800	50.370	50.433	0.064	8.0	0.113	0.000	6.9	7.821	OK
MH320	Rain 1: 1 years: +0 %: 30 mins: Winter	51.950	50.525	50.562	0.037	2.4	0.066	0.000	2.2	2.240	OK
MH321	Rain 1: 1 years: +0 %: 30 mins: Winter	51.600	50.126	50.194	0.068	8.8	0.119	0.000	7.9	9.605	OK
MH322	Rain 1: 1 years: +0 %: 30 mins: Winter	51.500	49.989	50.074	0.085	14.2	0.150	0.000	12.9	15.853	OK
MH323	Rain 1: 1 years: +0 %: 15 mins: Winter	51.350	49.841	49.942	0.101	15.3	0.178	0.000	17.7	14.683	OK
MH324	Rain 1: 1 years: +0 %: 30 mins: Winter	51.250	49.747	49.878	0.131	28.4	0.232	0.000	26.7	31.833	OK
MH325	Rain 1: 1 years: +0 %: 15 mins: Winter	51.150	49.646	49.789	0.143	28.4	0.253	0.000	31.6	26.704	OK
MH326	Rain 1: 1 years: +0 %: 15 mins: Winter	51.075	49.553	49.707	0.154	34.8	0.272	0.000	38.9	31.930	OK
MH327	Rain 1: 1 years: +0 %: 15 mins: Winter	50.950	49.275	49.421	0.146	41.9	0.258	0.000	43.8	35.689	OK
MH328	Rain 1: 1 years: +0 %: 15 mins: Winter	50.900	49.192	49.350	0.158	48.4	0.279	0.000	51.5	43.095	OK
MH329	Rain 1: 1 years: +0 %: 15 mins: Winter	50.800	49.113	49.272	0.159	51.8	0.281	0.000	56.9	43.392	OK
MH316	Rain 1: 1 years: +0 %: 15 mins: Winter	50.700	48.889	49.111	0.222	89.9	0.392	0.000	98.6	65.467	OK
MH315	Rain 1: 1 years: +0 %: 15 mins: Winter	50.950	49.115	49.316	0.201	79.2	0.355	0.000	87.9	62.555	OK
MH308	Rain 1: 1 years: +0 %: 15 mins: Winter	51.100	49.298	49.486	0.189	73.2	0.334	0.000	77.7	60.273	OK
MH314	Rain 1: 1 years: +0 %: 30 mins: Winter	51.200	49.651	49.783	0.133	30.4	0.234	0.000	28.0	32.649	OK
MH313	Rain 1: 1 years: +0 %: 30 mins: Winter	51.300	49.750	49.857	0.107	20.8	0.189	0.000	19.2	22.287	OK
MH312	Rain 1: 1 years: +0 %: 30 mins: Winter	51.400	49.885	49.991	0.107	20.5	0.189	0.000	19.2	20.843	OK
MH311	Rain 1: 1 years: +0 %: 30 mins: Winter	51.500	49.994	50.068	0.074	11.8	0.130	0.000	11.0	12.009	OK
MH310	Rain 1: 1 years: +0 %: 30 mins: Winter	51.650	50.138	50.211	0.073	10.8	0.129	0.000	10.1	10.436	OK
MH309	Rain 1: 1 years: +0 %: 30 mins: Winter	51.750	50.250	50.323	0.073	9.8	0.129	0.000	9.4	9.098	OK
MH307	Rain 1: 1 years: +0 %: 15 mins: Winter	51.300	49.681	49.823	0.142	41.4	0.251	0.000	46.4	34.786	OK
MH306	Rain 1: 1 years: +0 %: 15 mins: Winter	51.400	49.823	49.966	0.143	37.2	0.253	0.000	41.4	34.936	OK
MH305	Rain 1: 1 years: +0 %: 30 mins: Winter	51.550	49.977	50.121	0.144	42.2	0.254	0.000	39.1	45.322	OK
MH304	Rain 1: 1 years: +0 %: 30 mins: Winter	51.700	50.125	50.270	0.145	42.5	0.257	0.000	39.6	42.557	OK
MH303	Rain 1: 1 years: +0 %: 30 mins: Winter	51.800	50.317	50.368	0.051	5.9	0.091	0.000	5.3	5.902	OK
MH302	Rain 1: 1 years: +0 %: 30 mins: Winter	52.000	50.565	50.599	0.034	2.4	0.060	0.000	2.1	2.320	OK
MH301	Rain 1: 1 years: +0 %: 30 mins: Winter	52.150	50.725	50.751	0.026	1.3	0.046	0.000	1.1	1.161	OK
MH317	Rain 1: 1 years: +0 %: 15 mins: Winter	50.650	47.627	47.880	0.253	155.5	0.447	0.000	172.0	108.225	OK

MH330	Rain 1: 1 years: +0 %: 15 mins: Winter	49.000	46.686	46.908	0.222	172.0	0.392	0.000	174.1	108.168	OK
MH331	Rain 1: 1 years: +0 %: 15 mins: Winter	49.000	46.500	46.712	0.212	174.1	0.375	0.000	176.7	108.039	OK
MH332	Rain 1: 1 years: +0 %: 15 mins: Summer				0.000	3.8			3.8	2.843	OK
MH304.1	Rain 1: 1 years: +0 %: 30 mins: Winter	51.600	50.219	50.362	0.143	38.7	0.253	0.000	37.1	36.681	OK
MH304.2	Rain 1: 1 years: +0 %: 30 mins: Winter	51.500	50.310	50.440	0.130	32.6	0.230	0.000	31.8	30.309	OK
MH305.1	Rain 1: 1 years: +0 %: 30 mins: Winter	51.600	50.050	50.121	0.071	0.4	0.080	0.000	0.1	0.432	OK
MH323.1	Rain 1: 1 years: +0 %: 30 mins: Winter	51.450	49.940	49.970	0.030	1.6	0.034	0.000	1.5	1.462	OK
MH325.1	Rain 1: 1 years: +0 %: 15 mins: Winter	51.250	49.745	49.791	0.046	0.6	0.052	0.000	1.4	1.075	OK
MH327.1	Rain 1: 1 years: +0 %: 15 mins: Winter	51.050	49.375	49.423	0.048	0.6	0.054	0.000	1.3	1.075	OK
MH322.2	Rain 1: 1 years: +0 %: 30 mins: Winter	51.700	50.175	50.210	0.035	2.1	0.040	0.000	2.0	1.965	OK
MH322.1	Rain 1: 1 years: +0 %: 30 mins: Winter	51.500	50.075	50.127	0.052	4.8	0.059	0.000	4.5	4.535	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH318	Rain 1: 30 years: +20 %: 30 mins: Winter	52.050	50.625	50.678	0.053	5.5	0.093	0.000	5.1	5.107	OK
MH319	Rain 1: 30 years: +20 %: 15 mins: Winter	51.800	50.370	50.563	0.194	13.3	0.342	0.000	26.7	15.320	OK
MH320	Rain 1: 30 years: +20 %: 30 mins: Winter	51.950	50.525	50.586	0.061	6.4	0.108	0.000	6.1	5.978	OK
MH321	Rain 1: 30 years: +20 %: 15 mins: Winter	51.600	50.126	50.447	0.321	28.8	0.567	0.000	32.3	18.805	Surcharged
MH322	Rain 1: 30 years: +20 %: 15 mins: Winter	51.500	49.989	50.346	0.357	45.8	0.631	0.000	49.8	31.129	Surcharged
MH323	Rain 1: 30 years: +20 %: 15 mins: Winter	51.350	49.841	50.274	0.433	57.2	0.766	0.000	61.2	39.559	Surcharged
MH324	Rain 1: 30 years: +20 %: 15 mins: Winter	51.250	49.747	50.200	0.453	74.9	0.801	0.000	78.5	62.334	Surcharged
MH325	Rain 1: 30 years: +20 %: 15 mins: Winter	51.150	49.646	50.076	0.430	86.0	0.761	0.000	89.0	71.805	Surcharged
MH326	Rain 1: 30 years: +20 %: 15 mins: Winter	51.075	49.553	49.930	0.377	97.5	0.665	0.000	100.1	85.884	Surcharged
MH327	Rain 1: 30 years: +20 %: 15 mins: Winter	50.950	49.275	49.540	0.265	106.8	0.469	0.000	109.6	96.015	OK
MH328	Rain 1: 30 years: +20 %: 30 mins: Winter	50.900	49.192	49.472	0.280	131.8	0.495	0.000	128.3	158.542	OK
MH329	Rain 1: 30 years: +20 %: 15 mins: Winter	50.800	49.113	49.381	0.268	127.3	0.473	0.000	135.9	116.942	OK
MH316	Rain 1: 30 years: +20 %: 15 mins: Winter	50.700	48.889	49.335	0.446	241.1	0.788	0.000	245.4	176.302	OK
MH315	Rain 1: 30 years: +20 %: 15 mins: Winter	50.950	49.115	49.626	0.511	234.4	0.903	0.000	236.0	168.060	Surcharged
MH308	Rain 1: 30 years: +20 %: 15 mins: Winter	51.100	49.298	49.849	0.552	224.5	0.975	0.000	230.4	161.547	Surcharged
MH314	Rain 1: 30 years: +20 %: 15 mins: Winter	51.200	49.651	49.988	0.337	78.7	0.596	0.000	82.2	63.793	Surcharged
MH313	Rain 1: 30 years: +20 %: 15 mins: Winter	51.300	49.750	50.076	0.326	62.0	0.577	0.000	66.5	43.703	Surcharged
MH312	Rain 1: 30 years: +20 %: 15 mins: Winter	51.400	49.885	50.173	0.288	52.3	0.509	0.000	60.3	40.864	OK
MH311	Rain 1: 30 years: +20 %: 15 mins: Winter	51.500	49.994	50.210	0.216	27.5	0.381	0.000	42.0	23.552	OK

MH310	Rain 1: 30 years: +20 %: 30 mins: Winter	51.650	50.138	50.266	0.128	29.3	0.226	0.000	27.7	27.884	OK
MH309	Rain 1: 30 years: +20 %: 30 mins: Winter	51.750	50.250	50.376	0.126	26.2	0.223	0.000	25.4	24.314	OK
MH307	Rain 1: 30 years: +20 %: 15 mins: Winter	51.300	49.681	50.016	0.335	132.6	0.591	0.000	139.6	93.242	OK
MH306	Rain 1: 30 years: +20 %: 15 mins: Winter	51.400	49.823	50.178	0.355	126.0	0.627	0.000	132.6	93.503	OK
MH305	Rain 1: 30 years: +20 %: 15 mins: Winter	51.550	49.977	50.319	0.342	109.8	0.604	0.000	123.2	88.959	OK
MH304	Rain 1: 30 years: +20 %: 15 mins: Winter	51.700	50.125	50.422	0.297	89.1	0.525	0.000	104.9	83.393	OK
MH303	Rain 1: 30 years: +20 %: 15 mins: Winter	51.800	50.317	50.484	0.168	10.0	0.296	0.000	24.2	11.665	OK
MH302	Rain 1: 30 years: +20 %: 30 mins: Winter	52.000	50.565	50.622	0.057	6.5	0.101	0.000	6.0	6.222	OK
MH301	Rain 1: 30 years: +20 %: 30 mins: Winter	52.150	50.725	50.767	0.042	3.3	0.074	0.000	3.1	3.098	OK
MH317	Rain 1: 30 years: +20 %: 15 mins: Winter	50.650	47.627	48.075	0.448	381.4	0.792	0.000	401.0	292.446	OK
MH330	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.000	46.686	47.089	0.403	40.5	0.713	0.000	41.9	1388.753	OK
MH331	Rain 1: 30 years: +20 %: 1440 mins: Winter	49.000	46.500	47.089	0.589	41.9	1.041	0.000	40.4	1391.957	OK
MH332	Rain 1: 30 years: +20 %: 15 mins: Summer				0.000	9.3			9.3	8.713	OK
MH304.1	Rain 1: 30 years: +20 %: 30 mins: Winter	51.600	50.219	50.495	0.276	103.7	0.487	0.000	99.8	98.000	OK
MH304.2	Rain 1: 30 years: +20 %: 30 mins: Winter	51.500	50.310	50.561	0.251	87.3	0.444	0.000	85.3	80.983	OK
MH305.1	Rain 1: 30 years: +20 %: 15 mins: Winter	51.600	50.050	50.324	0.274	0.5	0.310	0.000	2.0	0.992	Surcharged
MH323.1	Rain 1: 30 years: +20 %: 15 mins: Winter	51.450	49.940	50.281	0.341	1.7	0.385	0.000	4.0	2.876	Surcharged
MH325.1	Rain 1: 30 years: +20 %: 15 mins: Winter	51.250	49.745	50.081	0.336	1.7	0.380	0.000	3.4	2.859	Surcharged
MH327.1	Rain 1: 30 years: +20 %: 15 mins: Winter	51.050	49.375	49.542	0.167	1.7	0.189	0.000	2.4	2.868	Surcharged
MH322.2	Rain 1: 30 years: +20 %: 15 mins: Winter	51.700	50.175	50.361	0.186	2.3	0.210	0.000	5.9	4.015	OK
MH322.1	Rain 1: 30 years: +20 %: 15 mins: Winter	51.500	50.075	50.356	0.281	8.9	0.318	0.000	11.4	9.125	Surcharged

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH318	Rain 1: 100 years: +20 %: 15 mins: Winter	52.050	50.625	50.952	0.327	2.9	0.578	0.000	7.9	5.276	Surcharged
MH319	Rain 1: 100 years: +20 %: 15 mins: Winter	51.800	50.370	50.943	0.574	22.3	1.014	0.000	27.7	20.542	Surcharged
MH320	Rain 1: 100 years: +20 %: 15 mins: Winter	51.950	50.525	50.958	0.433	3.4	0.765	0.000	8.9	6.038	Surcharged
MH321	Rain 1: 100 years: +20 %: 15 mins: Winter	51.600	50.126	50.820	0.694	30.4	1.226	0.000	35.9	24.378	Surcharged
MH322	Rain 1: 100 years: +20 %: 15 mins: Winter	51.500	49.989	50.699	0.710	52.7	1.254	0.000	58.5	40.369	Surcharged
MH323	Rain 1: 100 years: +20 %: 15 mins: Winter	51.350	49.841	50.601	0.760	68.8	1.343	0.000	74.5	51.258	Surcharged
MH324	Rain 1: 100 years: +20 %: 15 mins: Winter	51.250	49.747	50.491	0.744	92.1	1.315	0.000	97.7	80.684	Surcharged
MH325	Rain 1: 100 years: +20 %: 15 mins: Winter	51.150	49.646	50.297	0.651	108.0	1.150	0.000	112.5	92.940	Surcharged
MH326	Rain 1: 100 years: +20 %: 15 mins: Winter	51.075	49.553	50.054	0.501	123.5	0.885	0.000	126.8	111.160	Surcharged
MH327	Rain 1: 100 years: +20 %: 15 mins: Winter	50.950	49.275	49.597	0.322	135.6	0.569	0.000	139.3	124.283	OK
MH328	Rain 1: 100 years: +20 %: 15 mins: Winter	50.900	49.192	49.527	0.335	154.7	0.591	0.000	161.0	149.953	OK
MH329	Rain 1: 100 years: +20 %: 15 mins: Winter	50.800	49.113	49.432	0.319	162.0	0.564	0.000	172.0	151.378	OK
MH316	Rain 1: 100 years: +20 %: 15 mins: Winter	50.700	48.889	49.441	0.552	285.7	0.975	0.000	288.7	228.402	Surcharged
MH315	Rain 1: 100 years: +20 %: 15 mins: Winter	50.950	49.115	49.824	0.709	274.2	1.253	0.000	279.1	217.665	Surcharged
MH308	Rain 1: 100 years: +20 %: 15 mins: Winter	51.100	49.298	50.134	0.837	262.9	1.478	0.000	269.0	209.195	Surcharged
MH314	Rain 1: 100 years: +20 %: 15 mins: Winter	51.200	49.651	50.334	0.683	91.4	1.208	0.000	98.5	82.586	Surcharged
MH313	Rain 1: 100 years: +20 %: 15 mins: Winter	51.300	49.750	50.450	0.700	68.0	1.237	0.000	75.6	56.561	Surcharged
MH312	Rain 1: 100 years: +20 %: 15 mins: Winter	51.400	49.885	50.560	0.675	57.4	1.194	0.000	65.7	52.881	Surcharged
MH311	Rain 1: 100 years: +20 %: 15 mins: Winter	51.500	49.994	50.601	0.607	35.8	1.072	0.000	44.0	30.499	Surcharged

MH310	Rain 1: 100 years: +20 %: 15 mins: Winter	51.650	50.138	50.630	0.492	24.8	0.869	0.000	33.4	26.511	Surcharged
MH309	Rain 1: 100 years: +20 %: 15 mins: Winter	51.750	50.250	50.640	0.390	13.8	0.689	0.000	22.8	23.100	Surcharged
MH307	Rain 1: 100 years: +20 %: 15 mins: Winter	51.300	49.681	50.359	0.678	153.9	1.197	0.000	160.8	120.759	Surcharged
MH306	Rain 1: 100 years: +20 %: 15 mins: Winter	51.400	49.823	50.566	0.743	145.8	1.313	0.000	153.9	120.980	Surcharged
MH305	Rain 1: 100 years: +20 %: 15 mins: Winter	51.550	49.977	50.753	0.776	132.8	1.371	0.000	142.1	115.451	Surcharged
MH304	Rain 1: 100 years: +20 %: 15 mins: Winter	51.700	50.125	50.887	0.762	112.5	1.346	0.000	123.0	108.826	Surcharged
MH303	Rain 1: 100 years: +20 %: 15 mins: Winter	51.800	50.317	51.024	0.707	25.5	1.250	0.000	34.9	17.988	Surcharged
MH302	Rain 1: 100 years: +20 %: 15 mins: Winter	52.000	50.565	51.096	0.531	11.7	0.939	0.000	20.1	8.891	Surcharged
MH301	Rain 1: 100 years: +20 %: 15 mins: Winter	52.150	50.725	51.111	0.386	1.8	0.682	0.000	9.9	3.901	Surcharged
MH317	Rain 1: 100 years: +20 %: 15 mins: Winter	50.650	47.627	48.185	0.558	460.8	0.986	0.000	493.5	378.880	OK
MH330	Rain 1: 100 years: +20 %: 1440 mins: Winter	49.000	46.686	47.313	0.627	50.6	1.107	0.000	50.4	1752.774	Surcharged
MH331	Rain 1: 100 years: +20 %: 1440 mins: Winter	49.000	46.500	47.324	0.824	50.4	1.457	0.000	50.0	1774.827	Surcharged
MH332	Rain 1: 100 years: +20 %: 15 mins: Summer				0.000	7.8			7.9	8.186	OK
MH304.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.600	50.219	50.920	0.701	66.7	1.239	0.000	77.6	92.971	Surcharged
MH304.2	Rain 1: 100 years: +20 %: 15 mins: Winter	51.500	50.310	50.935	0.625	45.9	1.104	0.000	57.1	76.866	Surcharged
MH305.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.600	50.050	50.768	0.718	0.6	0.812	0.000	6.3	1.649	Surcharged
MH323.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.450	49.940	50.616	0.676	2.2	0.765	0.000	5.9	3.737	Surcharged
MH325.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.250	49.745	50.308	0.563	2.2	0.637	0.000	5.1	3.697	Surcharged
MH327.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.050	49.375	49.601	0.226	2.2	0.255	0.000	3.2	3.709	Surcharged
MH322.2	Rain 1: 100 years: +20 %: 15 mins: Winter	51.700	50.175	50.717	0.542	3.0	0.613	0.000	6.6	5.192	Surcharged
MH322.1	Rain 1: 100 years: +20 %: 15 mins: Winter	51.500	50.075	50.713	0.638	10.5	0.722	0.000	14.2	11.824	Surcharged

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	Rain 1: 1 years: +0 %: 960 mins: Winter	46.577	46.577	0.277	0.277	22.9	277.381	0.000	0.000	9.4	492.759	76.307	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Pond	Rain 1: 30 years: +20 %: 1440 mins: Winter	47.089	47.089	0.789	0.789	40.4	883.566	0.000	0.000	9.4	1150.782	24.528	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Percentage Available (%)	Status
Pond	Rain 1: 100 years: +20 %: 960 mins: Winter	47.291	47.291	0.991	0.991	68.6	1157.725	0.000	0.000	9.4	878.038	1.111	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P303.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH318	MH319	52.050	50.657	0.045	1.909	0.3	0.05	1.9	OK
P303.001	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH319	MH321	51.800	50.433	0.066	7.821	0.7	0.17	6.9	OK
P303.002	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH321	MH322	51.600	50.193	0.075	6.989	0.7	0.19	7.9	OK
P303.003	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH322	MH323	51.500	50.072	0.092	11.531	0.7	0.17	13.3	OK
P303.004	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH323	MH324	51.350	49.942	0.113	14.683	0.7	0.23	17.7	OK
P303.005	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH324	MH325	51.250	49.878	0.136	31.833	0.9	0.34	26.7	OK
P303.006	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH325	MH326	51.150	49.789	0.149	26.704	0.9	0.4	31.6	OK
P303.007	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH326	MH327	51.075	49.707	0.150	31.930	1.1	0.48	38.9	OK
P303.008	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH327	MH328	50.950	49.421	0.152	35.689	0.9	0.19	43.8	OK
P303.009	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH328	MH329	50.900	49.350	0.158	43.095	1.0	0.23	51.5	OK
P303.010	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH329	MH317	50.800	49.272	0.156	43.392	1.2	0.25	56.9	OK
P301.010	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH317	MH330	50.650	47.880	0.249	108.225	1.5	0.35	172.0	OK
P301.011	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH330	MH331	49.000	46.908	0.215	108.168	1.9	0.23	174.1	OK
P301.012	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH331	Pond	49.000	46.712	0.149	108.039	3.2	0.23	176.7	OK

P301.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH301	MH302	52.150	50.751	0.030	1.161	0.4	0.03	1.1	OK
P301.001	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH302	MH303	52.000	50.599	0.043	2.320	0.4	0.05	2.1	OK
P301.002	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH303	MH304	51.800	50.368	0.098	5.902	0.3	0.12	5.3	OK
P301.003	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH304	MH305	51.700	50.270	0.145	42.557	1.0	0.28	39.6	OK
P301.004	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH305	MH306	51.550	50.121	0.143	45.302	1.0	0.28	39.1	OK
P301.005	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH306	MH307	51.400	49.966	0.143	34.936	1.1	0.29	41.4	OK
P301.006	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH307	MH308	51.300	49.823	0.139	34.786	1.2	0.28	46.4	OK
P301.007	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH308	MH315	51.100	49.486	0.195	60.273	1.2	0.34	77.7	OK
P301.008	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH315	MH316	50.950	49.316	0.212	62.555	1.2	0.39	87.9	OK
P301.009	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH316	MH317	50.700	49.111	0.214	65.467	1.3	0.43	98.6	OK
P302.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH309	MH310	51.750	50.323	0.073	9.098	0.7	0.12	9.4	OK
P302.001	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH310	MH311	51.650	50.211	0.073	10.436	0.8	0.12	10.1	OK
P302.002	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH311	MH312	51.500	50.068	0.090	12.009	0.6	0.13	11.0	OK
P302.003	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH312	MH313	51.400	49.991	0.107	20.843	0.9	0.25	19.2	OK
P302.004	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH313	MH314	51.300	49.857	0.120	22.287	0.7	0.25	19.2	OK
P302.005	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH314	MH308	51.200	49.783	0.128	32.649	1.0	0.36	28.0	OK
P304.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH320	MH319	51.950	50.562	0.050	2.240	0.3	0.06	2.2	OK

P301.013	Rain 1: 1 years: +0 %: 480 mins: Winter	No Delay	Pond	MH332		46.574	0.048	333.651	0.0		9.4	
P304.2	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH304.2	MH304.1	51.500	50.440	0.137	30.309	0.9	0.21	31.8	OK
P304.1	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH304.1	MH304	51.600	50.362	0.144	36.681	0.9	0.26	37.1	OK
P305.1	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH305.1	MH305	51.600	50.110	0.096	0.304	0.1	0.05	0.8	OK
P323.1	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH323.1	MH323	51.450	49.970	0.062	1.462	0.2	0.09	1.5	OK
P325.1	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH325.1	MH325	51.250	49.791	0.094	1.075	0.1	0.09	1.4	OK
P327.1	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH327.1	MH327	51.050	49.423	0.097	1.075	0.1	0.08	1.3	OK
P322.2	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH322.2	MH322.1	51.700	50.210	0.044	1.965	0.4	0.05	2.0	OK
P322.1	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH322.1	MH322	51.500	50.127	0.068	4.535	0.4	0.12	4.5	OK

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Connections Summary Storm Phase: OCGT, Fuel Storage & Surrounds	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P303.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH318	MH319	52.050	50.678	0.081	5.107	0.4	0.13	5.1	OK
P303.001	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH319	MH321	51.800	50.563	0.225	15.301	0.7	0.66	26.7	OK
P303.002	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH321	MH322	51.600	50.447	0.225	18.805	0.8	0.79	32.3	Surcharged
P303.003	Rain 1: 30 years: +20 %: 15 mins: Summer	Pipe	MH322	MH323	51.500	50.283	0.300	27.710	0.7	0.64	49.9	OK
P303.004	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH323	MH324	51.350	50.274	0.300	39.557	0.9	0.78	61.2	Surcharged
P303.005	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH324	MH325	51.250	50.200	0.300	62.334	1.1	1	78.5	Surcharged
P303.006	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH325	MH326	51.150	50.076	0.300	71.805	1.3	1.13	89.0	Surcharged
P303.007	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH326	MH327	51.075	49.930	0.300	85.884	1.4	1.24	100.1	Surcharged
P303.008	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH327	MH328	50.950	49.540	0.272	96.015	1.1	0.48	109.6	OK
P303.009	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH328	MH329	50.900	49.472	0.270	158.542	1.3	0.56	128.3	OK
P303.010	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH329	MH317	50.800	49.381	0.259	116.942	1.4	0.6	135.9	OK
P301.010	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH317	MH330	50.650	48.075	0.431	292.446	1.8	0.83	401.0	OK
P301.011	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH330	MH331	49.000	47.062	0.356	292.321	2.3	0.53	403.2	OK
P301.012	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH331	Pond	49.000	46.839	0.257	291.796	3.5	0.53	405.5	OK

P301.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH301	MH302	52.150	50.767	0.050	3.098	0.5	0.08	3.1	OK
P301.001	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH302	MH303	52.000	50.622	0.081	6.222	0.5	0.15	6.0	OK
P301.002	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH303	MH304	51.800	50.484	0.225	11.600	0.6	0.55	24.2	OK
P301.003	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH304	MH305	51.700	50.401	0.277	113.746	1.2	0.75	106.0	OK
P301.004	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH305	MH306	51.550	50.319	0.349	88.780	1.2	0.87	123.2	OK
P301.005	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH306	MH307	51.400	50.178	0.345	93.503	1.2	0.94	132.6	OK
P301.006	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH307	MH308	51.300	50.016	0.344	93.242	1.3	0.86	139.6	OK
P301.007	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH308	MH315	51.100	49.849	0.450	161.547	1.4	1.01	230.4	Surch arged
P301.008	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH315	MH316	50.950	49.626	0.450	168.060	1.5	1.03	236.0	Surch arged
P301.009	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH316	MH317	50.700	49.335	0.397	176.302	1.7	1.08	245.4	OK
P302.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH309	MH310	51.750	50.376	0.127	24.314	0.9	0.32	25.4	OK
P302.001	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH310	MH311	51.650	50.266	0.132	27.884	0.9	0.33	27.7	OK
P302.002	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH311	MH312	51.500	50.210	0.252	23.552	0.7	0.51	42.0	OK
P302.003	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH312	MH313	51.400	50.173	0.300	40.864	0.9	0.77	60.3	OK
P302.004	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH313	MH314	51.300	50.076	0.300	43.703	0.9	0.85	66.5	Surch arged
P302.005	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH314	MH308	51.200	49.988	0.300	63.793	1.2	1.05	82.2	Surch arged
P304.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH320	MH319	51.950	50.586	0.087	5.978	0.4	0.17	6.1	OK

P301.013	Rain 1: 30 years: +20 %: 1440 mins: Winter	No Delay	Pond	MH332		47.089	0.054	1147.417	0.0		9.4	
P304.2	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH304.2	MH304.1	51.500	50.561	0.263	80.983	1.0	0.57	85.3	OK
P304.1	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH304.1	MH304	51.600	50.495	0.276	98.000	1.1	0.7	99.8	OK
P305.1	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH305.1	MH305	51.600	50.324	0.150	0.813	0.1	0.13	2.0	Surcharged
P323.1	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH323.1	MH323	51.450	50.281	0.150	2.874	0.2	0.25	4.0	Surcharged
P325.1	Rain 1: 30 years: +20 %: 15 mins: Winter	Pipe	MH325.1	MH325	51.250	50.081	0.150	2.859	0.2	0.22	3.4	Surcharged
P327.1	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH327.1	MH327	51.050	49.541	0.150	3.909	0.2	0.24	3.8	Surcharged
P322.2	Rain 1: 30 years: +20 %: 15 mins: Summer	Pipe	MH322.2	MH322.1	51.700	50.299	0.172	3.439	0.2	0.16	6.1	OK
P322.1	Rain 1: 30 years: +20 %: 15 mins: Summer	Pipe	MH322.1	MH322	51.500	50.295	0.225	7.954	0.3	0.32	12.2	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: OCGT, Fuel Storage & Surrounds	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P303.000	Rain 1: 100 years: +20 %: 15 mins: Summer	Pipe	MH318	MH319	52.050	50.804	0.225	4.372	0.3	0.25	10.4	OK
P303.001	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH319	MH321	51.800	50.943	0.225	19.863	0.7	0.68	27.7	Surcharged
P303.002	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH321	MH322	51.600	50.820	0.225	24.378	0.9	0.87	35.9	Surcharged
P303.003	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH322	MH323	51.500	50.699	0.300	40.247	0.8	0.75	58.5	Surcharged
P303.004	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH323	MH324	51.350	50.601	0.300	51.232	1.1	0.95	74.5	Surcharged
P303.005	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH324	MH325	51.250	50.491	0.300	80.684	1.4	1.25	97.7	Surcharged
P303.006	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH325	MH326	51.150	50.297	0.300	92.940	1.6	1.43	112.5	Surcharged
P303.007	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH326	MH327	51.075	50.054	0.300	111.160	1.8	1.58	126.8	Surcharged
P303.008	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH327	MH328	50.950	49.597	0.328	124.283	1.1	0.61	139.3	OK
P303.009	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH328	MH329	50.900	49.527	0.327	149.953	1.3	0.71	161.0	OK
P303.010	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH329	MH317	50.800	49.432	0.305	151.378	1.5	0.75	172.0	OK
P301.010	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH317	MH330	50.650	48.185	0.509	378.880	1.9	1.02	493.5	OK
P301.011	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH330	MH331	49.000	47.123	0.410	378.613	2.4	0.66	495.6	OK
P301.012	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH331	Pond	49.000	46.888	0.302	377.391	3.5	0.65	497.2	OK

P301.000	Rain 1: 100 years: +20 %: 15 mins: Summer	Pipe	MH301	MH302	52.150	50.885	0.225	2.716	0.3	0.29	11.9	OK
P301.001	Rain 1: 100 years: +20 %: 15 mins: Summer	Pipe	MH302	MH303	52.000	50.860	0.225	5.411	0.5	0.52	21.3	Surcharged
P301.002	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH303	MH304	51.800	51.024	0.225	15.059	0.9	0.79	34.9	Surcharged
P301.003	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH304	MH305	51.700	50.479	0.351	148.292	1.2	0.95	133.6	OK
P301.004	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH305	MH306	51.550	50.753	0.375	114.852	1.3	1.01	142.1	Surcharged
P301.005	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH306	MH307	51.400	50.566	0.375	120.980	1.4	1.09	153.9	Surcharged
P301.006	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH307	MH308	51.300	50.359	0.375	120.759	1.5	0.99	160.8	Surcharged
P301.007	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH308	MH315	51.100	50.134	0.450	209.195	1.7	1.18	269.0	Surcharged
P301.008	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH315	MH316	50.950	49.824	0.450	217.665	1.8	1.22	279.1	Surcharged
P301.009	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH316	MH317	50.700	49.441	0.450	228.402	1.8	1.27	288.7	Surcharged
P302.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH309	MH310	51.750	50.398	0.149	31.696	0.9	0.42	33.1	OK
P302.001	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH310	MH311	51.650	50.288	0.162	36.378	0.9	0.44	36.5	OK
P302.002	Rain 1: 100 years: +20 %: 15 mins: Summer	Pipe	MH311	MH312	51.500	50.412	0.300	27.238	0.6	0.54	44.8	Surcharged
P302.003	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH312	MH313	51.400	50.560	0.300	52.881	0.9	0.84	65.7	Surcharged
P302.004	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH313	MH314	51.300	50.450	0.300	56.561	1.1	0.97	75.6	Surcharged
P302.005	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH314	MH308	51.200	50.334	0.300	82.586	1.4	1.26	98.5	Surcharged
P304.000	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH320	MH319	51.950	50.958	0.225	5.738	0.2	0.24	8.9	Surcharged

P301.013	Rain 1: 100 years: +20 %: 1440 mins: Summer	No Delay	Pond	MH332		47.183	0.047	1184.821	0.0		9.4	
P304.2	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH304.2	MH304.1	51.500	50.639	0.344	105.520	1.0	0.74	109.4	OK
P304.1	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH304.1	MH304	51.600	50.577	0.356	127.704	1.2	0.89	127.4	OK
P305.1	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH305.1	MH305	51.600	50.768	0.150	1.049	0.4	0.39	6.3	Surcharged
P323.1	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH323.1	MH323	51.450	50.616	0.150	3.711	0.3	0.37	5.9	Surcharged
P325.1	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH325.1	MH325	51.250	50.308	0.150	3.697	0.3	0.32	5.1	Surcharged
P327.1	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH327.1	MH327	51.050	49.591	0.150	5.090	0.3	0.3	4.7	Surcharged
P322.2	Rain 1: 100 years: +20 %: 30 mins: Summer	Pipe	MH322.2	MH322.1	51.700	50.239	0.088	6.098	0.5	0.18	6.8	OK
P322.1	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH322.1	MH322	51.500	50.713	0.225	11.517	0.4	0.38	14.2	Surcharged

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Junctions Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Name	Junction Type	Easting (m)	Northing (m)	Cover Elevation (m)	Depth (m)	Invert Elevation (m)	Chamber Shape	Diameter (m)
MH510	Manhole	582307.656	709058.047	52.600	1.125	51.475	Circular	1.200
MH509	Manhole	582322.103	709038.168	53.000	1.653	51.347	Circular	1.200
MH511	Simple Junction	582336.142	709107.854					

Name	Access Required	Intersection Easting (m)	Intersection Northing (m)	Lock
MH510	☑	582307.656	709058.047	None
MH509	☑	582322.103	709038.168	None
MH511				

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH510	Inlet	Catchment Area	(None)	No Restriction
MH509	Inlet	P501.004	(None)	No Restriction
	Inlet (1)	P503.000	(None)	No Restriction
MH511	Inlet	P501.006	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
MH510	Outlet	P503.000	Free Discharge
MH509	Outlet (1)	P501.005	Free Discharge

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Stormwater Controls Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Pond

Type : Pond

Dimensions

Exceedance Elevation (m)	52.300
Depth (m)	1.000
Base Elevation (m)	51.300
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:x)	4.495
Total Volume (m³)	280.515

Depth (m)	Area (m²)	Volume (m³)
0.000	158.91	0.000
1.000	423.28	280.515

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	P501.005
Bypass Destination	(None)
Capacity Type	No Restriction

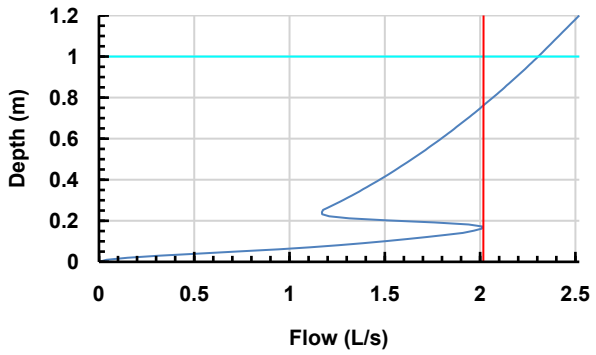
Outlets

Outlet (1)

Outgoing Connection	P501.006
Outlet Type	Hydro-Brake®

Invert Elevation (m)	51.300
Design Depth (m)	1.000
Design Flow (L/s)	2.3
Objective	Minimize Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0069-2300-1000-2300



Advanced

Perimeter	Circular
Length (m)	27.145
Friction Scheme	Manning's n
n	0.03

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Connections Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Name	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Elevation (m)	Upstream Invert Elevation (m)
P503.000	24.575	Pipe	192.180		0.6	225	52.600	51.475
Branch: P501.000								
P501.000	26.317	Pipe	199.375		0.6	225	53.350	52.225
P501.001	19.181	Pipe	199.806		0.6	225	53.320	52.093
P501.002	37.544	Pipe	200.000		0.6	225	53.300	51.997
P501.003	70.721	Pipe	197.466		0.6	300	53.100	51.809
Branch: P502.000								
P502.000	15.022	Pipe	200.000		0.6	225	53.000	51.785
P502.001	30.645	Pipe	200.000		0.6	225	53.000	51.710
Branch: P504.000								
P504.000	17.395	Pipe	141.037		0.6	150	53.000	51.680
P502.002	20.972	Pipe	198.742		0.6	225	53.000	51.557
P501.004	20.313	Pipe	195.291		0.6	300	53.100	51.451
P501.005	9.943	Pipe	198.858		0.6	375	53.000	51.350
P501.006	56.234	No Delay						

Name	Downstream Cover Elevation (m)	Downstream Invert Elevation (m)	Part Family	Lock	Flow Restriction (L/s)
P503.000	53.000	51.347		None	
Branch: P501.000					
P501.000	53.320	52.093		None	
P501.001	53.300	51.997		None	
P501.002	53.100	51.809		None	
P501.003	53.100	51.451		None	
Branch: P502.000					
P502.000	53.000	51.710		None	
P502.001	53.000	51.557		None	
Branch: P504.000					
P504.000	53.000	51.557		None	
P502.002	53.100	51.451		None	
P501.004	53.000	51.347		None	
P501.005	51.800	51.300		None	
P501.006					

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Manhole Schedule Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH510	52.600 51.475	Diameter / Length: 1.200					Manhole - Access Required
E:582307.656 N:709058.047	1.125		{a} P503.000	Pipe	51.475	Diam/Width:225	Not Applicable
MH509	53.000 51.347	Diameter / Length: 1.200	{1} P501.004 {2} P503.000	Pipe Pipe	51.347 51.347	Diam/Width:300 Diam/Width:225	Manhole - Access Required
E:582322.103 N:709038.168	1.653		{a} P501.005	Pipe	51.350	Diam/Width:375	Not Applicable
MH511		Diameter / Length: 1.200	{1} P501.006	No Delay	Not Applicable	Not Applicable	Simple Junction
E:582336.142 N:709107.854							Not Applicable

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Inflow Summary Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area	MH510		Time of Concentration	0.203	100	0	100	0.203
Branch: P501.000								
Branch: P502.000								
Branch: P504.000								
TOTAL		**0.0**		**0.203**				**0.203**

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Outfall Details Storm Phase: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Outfalls

Outfall	Outfall Type	Fixed Surcharged Elevation (m)	Elevation Curve
MH511	Free Discharge		

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Title:	Company:		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	20.000
100.0	20.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Junctions Summary Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH510	Rain 1: 100 years: +20 %: 15 mins: Winter	52.600	51.475	52.069	0.594	71.4	0.672	0.000	67.9	33.025	Surcharged
MH509	Rain 1: 100 years: +20 %: 480 mins: Winter	53.000	51.347	51.665	0.318	9.7	0.360	0.000	8.9	111.809	OK
MH511	Rain 1: 1 years: +0 %: 15 mins: Summer				0.000	0.7			0.7	0.729	OK

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Stormwater Controls Summary Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Pond	Rain 1: 100 years: +20 %: 480 mins: Winter	51.665	51.665	0.365	0.365	8.9	72.378	0.000	0.000	2.0	68.539	336	74.198

Project:	Date:		
COOLPOWRA	20/05/2024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company:		
Type: Stormwater Controls Summary Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Status
OK

Project: COOLPOWRA	Date: 20/05/2024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: OCGT Carpark Flow Path: OCGT Carpark	Company: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P503.000	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH510	MH509	52.600	52.069	0.225	33.025	1.7	1.82	67.9	Surcharged
P501.005	Rain 1: 100 years: +20 %: 15 mins: Winter	Pipe	MH509	Pond	53.000	51.522	0.148	32.164	1.9	0.43	61.1	OK
P501.006	Rain 1: 30 years: +20 %: 30 mins: Winter	No Delay	Pond	MH511		51.477	0.006	5.301	0.0		2.0	

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Junctions Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Junction Type	Easting (m)	Northing (m)	Cover Elevation (m)	Depth (m)	Invert Elevation (m)	Chamber Shape	Diameter (m)
MH101	Manhole	582362.455	709345.911	54.525	1.425	53.100	Circular	1.200
MH102	Manhole	582383.379	709348.271	54.400	1.440	52.960	Circular	1.200
MH103	Manhole	582387.671	709324.877	54.175	1.431	52.744	Circular	1.200
MH105	Manhole	582389.851	709304.703	54.000	1.425	52.575	Circular	1.200
MH106	Manhole	582394.373	709272.342	53.700	1.533	52.167	Circular	1.200
MH108	Manhole	582396.396	709258.589	53.550	1.375	52.175	Circular	1.200
MH104	Manhole	582368.727	709323.713	54.500	1.425	53.075	Circular	1.200
MH107	Manhole	582371.166	709269.975	53.900	1.425	52.475	Circular	1.200
MH109	Manhole	582402.852	709273.191	53.700	1.633	52.067	Circular	1.500

Name	Access Required	Intersection Easting (m)	Intersection Northing (m)	Lock
MH101	☑	582362.455	709345.911	All
MH102	☑	582383.379	709348.271	All
MH103	☑	582387.671	709324.877	All
MH105	☑	582389.851	709304.703	All
MH106	☑	582394.373	709272.342	All
MH108	☑	582396.396	709258.589	All
MH104	☑	582368.727	709323.713	None
MH107	☑	582371.166	709269.975	None
MH109	☑	582402.852	709273.191	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
MH101	Inlet	Catchment Area 10	(None)	No Restriction
MH102	Inlet	P101.000 Catchment Area 11	(None)	No Restriction
MH103	Inlet	Catchment Area 4 P101.001 Catchment Area 5 P102.000	(None)	No Restriction
MH105	Inlet	Catchment Area 3 P101.002	(None)	No Restriction
MH106	Inlet	P101.003 P103.000	(None)	No Restriction
MH108	Inlet	Catchment Area 1	(None)	No Restriction
MH104	Inlet	Catchment Area 6 Catchment Area 7 Catchment Area 9 Catchment Area 8	(None)	No Restriction
MH107	Inlet	Catchment Area 2	(None)	No Restriction
MH109	Inlet	P101.004 P104.000	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
MH101	Outlet	P101.000	Free Discharge
MH102	Outlet	P101.001	Free Discharge
MH103	Outlet	P101.002	Free Discharge
MH105	Outlet	P101.003	Free Discharge
MH106	Outlet	P101.004	Free Discharge
MH108	Outlet	P104.000	Free Discharge
MH104	Outlet	P102.000	Free Discharge
MH107	Outlet	P103.000	Free Discharge
MH109	Outlet	P101.005	Free Discharge

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Stormwater Controls Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Elevation (m)	53.000
Depth (m)	0.990
Base Elevation (m)	52.000
Number of Crates Long	17
Number of Crates Wide	5
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	0.8
Crate Width (m)	0.8
Crate Height (m)	0.33
Total Volume (m^3)	51.173

Inlets

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	P101.005
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Side Infiltration Rate (m/hr)	0.32
Safety Factor	2.0

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Connections Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Elevation (m)	Upstream Invert Elevation (m)
P101.003	32.675	Pipe	80.085		0.6	225	54.000	52.575
P101.001	23.784	Pipe	110.110		0.6	225	54.400	52.960
P101.002	20.292	Pipe	120.073		0.6	225	54.175	52.744
P101.000	21.056	Pipe	150.403		0.6	225	54.525	53.100
P102.000	18.979	Pipe	57.339		0.6	225	54.500	53.075
P103.000	23.327	Pipe	75.738		0.6	225	53.900	52.475
P101.004	8.522	Pipe	85.000		0.6	225	53.700	52.167
P104.000	15.966	Pipe	147.483		0.6	225	53.550	52.175
P101.005	6.844	Pipe	102.536		0.6	300	53.700	52.067

Name	Downstream Cover Elevation (m)	Downstream Invert Elevation (m)	Part Family	Lock
P101.003	53.700	52.167		None
P101.001	54.175	52.744		None
P101.002	54.000	52.575		None
P101.000	54.400	52.960		None
P102.000	54.175	52.744		None
P103.000	53.700	52.167		None
P101.004	53.700	52.067		None
P104.000	53.700	52.067		None
P101.005	53.000	52.000		None

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Manhole Schedule Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH101	54.525 53.100	Diameter / Length: 1.200					Manhole - Access Required
E:582362.455 N:709345.911	1.425		{a} P101.000	Pipe	53.100	Diam/Width:225	Not Applicable
MH102	54.400 52.960	Diameter / Length: 1.200	{1} P101.000	Pipe	52.960	Diam/Width:225	Manhole - Access Required
E:582383.379 N:709348.271	1.440		{a} P101.001	Pipe	52.960	Diam/Width:225	Not Applicable
MH103	54.175 52.744	Diameter / Length: 1.200	{1} P101.001 {2} P102.000	Pipe Pipe	52.744 52.744	Diam/Width:225 Diam/Width:225	Manhole - Access Required
E:582387.671 N:709324.877	1.431		{a} P101.002	Pipe	52.744	Diam/Width:225	Not Applicable
MH105	54.000 52.575	Diameter / Length: 1.200	{1} P101.002	Pipe	52.575	Diam/Width:225	Manhole - Access Required
E:582389.851 N:709304.703	1.425		{a} P101.003	Pipe	52.575	Diam/Width:225	Not Applicable

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Manhole Schedule Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH106	53.700 52.167	Diameter / Length: 1.200	{1} P101.003 {2} P103.000	Pipe Pipe	52.167 52.167	Diam/Width:225 Diam/Width:225	Manhole - Access Required
E:582394.373 N:709272.342	1.533		{a} P101.004	Pipe	52.167	Diam/Width:225	Not Applicable
MH108	53.550 52.175	Diameter / Length: 1.200					Manhole - Access Required
E:582396.396 N:709258.589	1.375		{a} P104.000	Pipe	52.175	Diam/Width:225	Not Applicable
MH104	54.500 53.075	Diameter / Length: 1.200					Manhole - Access Required
E:582368.727 N:709323.713	1.425		{a} P102.000	Pipe	53.075	Diam/Width:225	Not Applicable
MH107	53.900 52.475	Diameter / Length: 1.200					Manhole - Access Required
E:582371.166 N:709269.975	1.425		{a} P103.000	Pipe	52.475	Diam/Width:225	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Manhole Schedule Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Name	Cover Elevation (m) Invert Elevation (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
MH109	53.700 52.067	Diameter / Length: 1.500	{1} P101.004	Pipe	52.067	Diam/Width:225	Manhole - Access Required
E:582402.852 N:709273.191	1.633		{2} P104.000	Pipe	52.067	Diam/Width:225	
			{a} P101.005	Pipe	52.067	Diam/Width:300	Not Applicable

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Inflow Summary Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area 1	MH108		Time of Concentration	0.020	100	0	100	0.020
Catchment Area 2	MH107		Time of Concentration	0.018	100	0	100	0.018
Catchment Area 3	MH105		Time of Concentration	0.016	100	0	100	0.016
Catchment Area 4	MH103		Time of Concentration	0.017	100	0	100	0.017
Catchment Area 5	MH103		Time of Concentration	0.002	100	0	100	0.002
Catchment Area 6	MH104		Time of Concentration	0.017	100	0	100	0.017
Catchment Area 7	MH104		Time of Concentration	0.006	100	0	100	0.006
Catchment Area 8	MH104		Time of Concentration	0.004	100	0	100	0.004
Catchment Area 9	MH104		Time of Concentration	0.008	100	0	100	0.008
Catchment Area 10	MH101		Time of Concentration	0.026	100	0	100	0.026
Catchment Area 11	MH102		Time of Concentration	0.016	100	0	100	0.016
TOTAL		**0.0**		**0.149**				**0.149**

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Title:	Company Address:		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	20.000
100.0	20.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Junctions Summary Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH101	Rain 1: 1 years: +0 %: 30 mins: Winter	54.525	53.100	53.131	0.031	1.8	0.035	0.000	1.7	1.668	OK
MH102	Rain 1: 1 years: +0 %: 30 mins: Winter	54.400	52.960	52.995	0.035	2.8	0.039	0.000	2.6	2.674	OK
MH103	Rain 1: 1 years: +0 %: 30 mins: Winter	54.175	52.744	52.799	0.055	6.2	0.062	0.000	5.7	6.133	OK
MH105	Rain 1: 1 years: +0 %: 30 mins: Winter	54.000	52.575	52.626	0.051	6.8	0.057	0.000	6.4	7.152	OK
MH106	Rain 1: 1 years: +0 %: 960 mins: Winter	53.700	52.167	52.329	0.162	1.3	0.183	0.000	1.1	28.725	OK
MH108	Rain 1: 1 years: +0 %: 960 mins: Winter	53.550	52.175	52.329	0.154	0.2	0.174	0.000	0.2	4.360	OK
MH104	Rain 1: 1 years: +0 %: 30 mins: Winter	54.500	53.075	53.103	0.028	2.4	0.032	0.000	2.3	2.228	OK
MH107	Rain 1: 1 years: +0 %: 30 mins: Winter	53.900	52.475	52.496	0.021	1.2	0.024	0.000	1.2	1.131	OK
MH109	Rain 1: 1 years: +0 %: 960 mins: Winter	53.700	52.067	52.329	0.262	1.3	0.463	0.000	1.2	33.079	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH101	Rain 1: 30 years: +20 %: 30 mins: Winter	54.525	53.100	53.151	0.051	4.8	0.058	0.000	4.6	4.470	OK
MH102	Rain 1: 30 years: +20 %: 30 mins: Winter	54.400	52.960	53.018	0.058	7.6	0.065	0.000	7.2	7.162	OK
MH103	Rain 1: 30 years: +20 %: 30 mins: Winter	54.175	52.744	52.839	0.095	17.0	0.107	0.000	15.9	16.381	OK
MH105	Rain 1: 30 years: +20 %: 960 mins: Winter	54.000	52.575	52.772	0.197	2.6	0.223	0.000	2.6	58.453	OK
MH106	Rain 1: 30 years: +20 %: 960 mins: Winter	53.700	52.167	52.772	0.605	2.9	0.684	0.000	2.7	67.682	Surcharged
MH108	Rain 1: 30 years: +20 %: 960 mins: Winter	53.550	52.175	52.772	0.597	0.4	0.675	0.000	0.4	10.334	Surcharged
MH104	Rain 1: 30 years: +20 %: 30 mins: Winter	54.500	53.075	53.121	0.046	6.4	0.051	0.000	6.3	5.943	OK
MH107	Rain 1: 30 years: +20 %: 960 mins: Winter	53.900	52.475	52.772	0.297	0.4	0.336	0.000	0.4	9.223	Surcharged
MH109	Rain 1: 30 years: +20 %: 960 mins: Winter	53.700	52.067	52.772	0.705	3.1	1.246	0.000	3.0	77.638	Surcharged

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Junctions Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
MH101	Rain 1: 100 years: +20 %: 30 mins: Winter	54.525	53.100	53.159	0.059	6.3	0.067	0.000	6.1	5.827	OK
MH102	Rain 1: 100 years: +20 %: 30 mins: Winter	54.400	52.960	53.026	0.066	9.9	0.075	0.000	9.4	9.334	OK
MH103	Rain 1: 100 years: +20 %: 960 mins: Winter	54.175	52.744	52.959	0.215	2.8	0.243	0.000	2.8	63.000	OK
MH105	Rain 1: 100 years: +20 %: 960 mins: Winter	54.000	52.575	52.959	0.384	3.2	0.434	0.000	3.2	73.474	Surcharged
MH106	Rain 1: 100 years: +20 %: 960 mins: Winter	53.700	52.167	52.958	0.791	3.5	0.895	0.000	3.4	84.964	Surcharged
MH108	Rain 1: 100 years: +20 %: 960 mins: Winter	53.550	52.175	52.958	0.783	0.6	0.886	0.000	0.5	12.924	Surcharged
MH104	Rain 1: 100 years: +20 %: 30 mins: Winter	54.500	53.075	53.127	0.052	8.4	0.059	0.000	8.2	7.743	OK
MH107	Rain 1: 100 years: +20 %: 960 mins: Winter	53.900	52.475	52.958	0.483	0.5	0.547	0.000	0.4	11.599	Surcharged
MH109	Rain 1: 100 years: +20 %: 960 mins: Winter	53.700	52.067	52.958	0.891	3.9	1.575	0.000	3.8	97.289	Surcharged

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 1 years: +0 %: 960 mins: Winter	52.329	52.329	0.329	0.329	1.2	16.995	0.000	29.989	0.0	0.000	66.789	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Stormwater Controls Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 30 years: +20 %: 960 mins: Winter	52.772	52.772	0.772	0.772	3.0	39.892	0.000	69.665	0.0	0.000	22.045	OK

Project:	Date:		
COOLPOWRA	20/05/0024		
	Designed by:	Checked by:	Approved By:
	TG & JH	DML	DML
Report Details:	Company Address:		
Type: Stormwater Controls Summary Storm Phase: AGI & Gas	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	Rain 1: 100 years: +20 %: 960 mins: Winter	52.958	52.958	0.958	0.958	3.8	49.520	0.000	87.177	0.0	0.000	3.231	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P101.003	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH105	MH106	54.000	52.626	0.054	7.152	0.9	0.11	6.4	OK
P101.001	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH102	MH103	54.400	52.995	0.045	2.674	0.5	0.05	2.6	OK
P101.002	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH103	MH105	54.175	52.799	0.053	6.133	0.8	0.12	5.7	OK
P101.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH101	MH102	54.525	53.131	0.033	1.668	0.5	0.04	1.7	OK
P102.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH104	MH103	54.500	53.103	0.041	2.228	0.5	0.03	2.3	OK
P103.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH107	MH106	53.900	52.496	0.039	1.131	0.3	0.02	1.2	OK
P101.004	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH106	MH109	53.700	52.224	0.061	8.275	0.9	0.12	6.9	OK
P104.000	Rain 1: 1 years: +0 %: 30 mins: Winter	Pipe	MH108	MH109	53.550	52.201	0.052	1.271	0.3	0.03	1.3	OK
P101.005	Rain 1: 1 years: +0 %: 15 mins: Winter	Pipe	MH109	Cellular Storage	53.700	52.127	0.093	6.763	0.6	0.08	8.5	OK

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P101.003	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH105	MH106	54.000	52.662	0.134	19.138	1.1	0.31	18.0	OK
P101.001	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH102	MH103	54.400	53.018	0.076	7.162	0.6	0.14	7.2	OK
P101.002	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH103	MH105	54.175	52.839	0.091	16.381	1.1	0.34	15.9	OK
P101.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH101	MH102	54.525	53.151	0.054	4.470	0.6	0.11	4.6	OK
P102.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH104	MH103	54.500	53.121	0.070	5.943	0.6	0.09	6.3	OK
P103.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH107	MH106	53.900	52.509	0.121	3.031	0.3	0.05	3.1	OK
P101.004	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH106	MH109	53.700	52.405	0.225	20.572	1.1	0.35	19.6	Surcharged
P104.000	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH108	MH109	53.550	52.405	0.225	2.848	0.3	0.08	3.5	Surcharged
P101.005	Rain 1: 30 years: +20 %: 30 mins: Winter	Pipe	MH109	Cellular Storage	53.700	52.405	0.300	22.034	1.0	0.2	21.9	Surcharged

Project: COOLPOWRA	Date: 20/05/0024		
	Designed by: TG & JH	Checked by: DML	Approved By: DML
Report Details: Type: Connections Summary Storm Phase: AGI & Gas	Company Address: LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co.Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m^3)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P101.003	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH105	MH106	54.000	52.678	0.197	24.889	1.2	0.41	23.7	OK
P101.001	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH102	MH103	54.400	53.026	0.089	9.334	0.6	0.19	9.4	OK
P101.002	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH103	MH105	54.175	52.856	0.107	21.349	1.1	0.44	20.9	OK
P101.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH101	MH102	54.525	53.159	0.063	5.827	0.7	0.14	6.1	OK
P102.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH104	MH103	54.500	53.127	0.082	7.743	0.6	0.12	8.2	OK
P103.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH107	MH106	53.900	52.528	0.207	3.825	0.3	0.07	4.1	OK
P101.004	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH106	MH109	53.700	52.528	0.225	26.631	1.1	0.46	25.8	Surcharged
P104.000	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH108	MH109	53.550	52.528	0.225	3.722	0.3	0.11	4.6	Surcharged
P101.005	Rain 1: 100 years: +20 %: 30 mins: Winter	Pipe	MH109	Cellular Storage	53.700	52.528	0.300	28.741	0.9	0.26	28.9	Surcharged

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Stormwater Controls Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Infiltration Trench

Type : Infiltration Trench

Dimensions

Exceedance Elevation (m)	53.000
Depth (m)	1.000
Base Elevation (m)	52.000
Freeboard (mm)	0
Porosity (%)	30
Length (m)	5.000
Long. Slope (1:x)	500.00
Width (m)	0.750
Total Volume (m³)	1.187

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	150
No. of Barrels	1
Release Height (m)	0.700
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Base Infiltration Rate (m/hr)	0.16
Side Infiltration Rate (m/hr)	0.16
Safety Factor	1.0
Conductivity (m/hr)	50.0

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Inflow Summary Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analyzed (ha)
Catchment Area	Infiltration Trench		Time of Concentration	0.002	100	0	100	0.002
TOTAL		**0.0**		**0.002**				**0.002**

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Title:	Company::		
Rainfall Analysis Criteria	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Runoff Type	Dynamic
Output Interval (mins)	15
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☑
Rainfall Depth (mm)	1.0
Run Time (mins)	1440

Rainfall

Rain 1

Type: FSR

Region	Scotland and Ireland
M5-60 (mm)	14.5
Ratio R	0.300
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	20.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date:		
COOLPOWRA	30/04/2024		
	Designed by:	Checked by:	Approved By:
FILTER DRAIN EXAMPLE	TG & JH	DML	DML
Report Details:	Company::		
Type: Stormwater Controls Summary Storm Phase: Access Road	LALLY CHARTERED ENGINEERS Udaras Business Park Tourmakeady, Co. Mayo		

Rain 1: 100 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Infiltration Trench	Rain 1: 100 years: +20 %: 15 mins: Winter	52.175	52.082	0.165	0.082	0.2	0.140	0.000	0.269	0.0	0.000	88.245	OK

Fire Water Retention Calculation

General Method - Any Area

Number	Calculation Steps	Response	Comment
1.1	Max Flow of Local Hydrants (l/min)	1500	Input Required
1.2	Fire Duration (Hours) This should be set at 6 hours unless the local fire authority has advised that a reduced time is acceptable. Note: Minimum duration is 1.5 hours	6	Input Required
1.3	Max FW volume from hydrants during Fire Event m^3	540	
1.4	Total Fire Water/Foam to be provided by Local Fire Brigade (m^3)	27.2	Input Required
1.5	Total Fire Water/Foam Stored on Site (m^3)	2000	Input Required
1.6	Volume of Product Loss (m^3) See Section 4.5 of the Guidance Document for further information	0	Input Required
1.7	Area of Site which shares common drainage with Assessment Area (m^2)	23500	Input Required
1.8	1 in 10 year 24hour rainfall event for local area (m)	0.048	Input Required
1.9	Rain Water (m^3)	1128	
	Fire Water Retention Required (m^3)	**3695**	

BRE Digest 365 Soil Infiltration Tests

For

Halston
on behalf of Coolpowra Flexgen Ltd

At

Coolpowra,
Co. Galway

Date of Issue: 22/05/2024

INTRODUCTION

This report is based on the findings of soil infiltration test examinations and provides calculations of soil infiltration rates as per BRE Digest 365, carried out by Lally Chartered Engineers.

The site assessment was undertaken on the 11th & 12th of April 2024.

3 no. Trial pits (T1, T2, T3) were dug by excavator and all indicated a well-drained subsoil profile. (See photographs).

The assessment and report have been undertaken in accordance with the following documents.

BRE Digest 365 CIRIA Guidance Documents,

Met Eireann rainfall return periods for Coolpowra, Co. Galway.

SITE SPECIFIC INFORMATION

Site Address: Coolpowra, Co. Galway

Project Management by Halston, on Behalf of Coolpowra Flexgen Ltd.

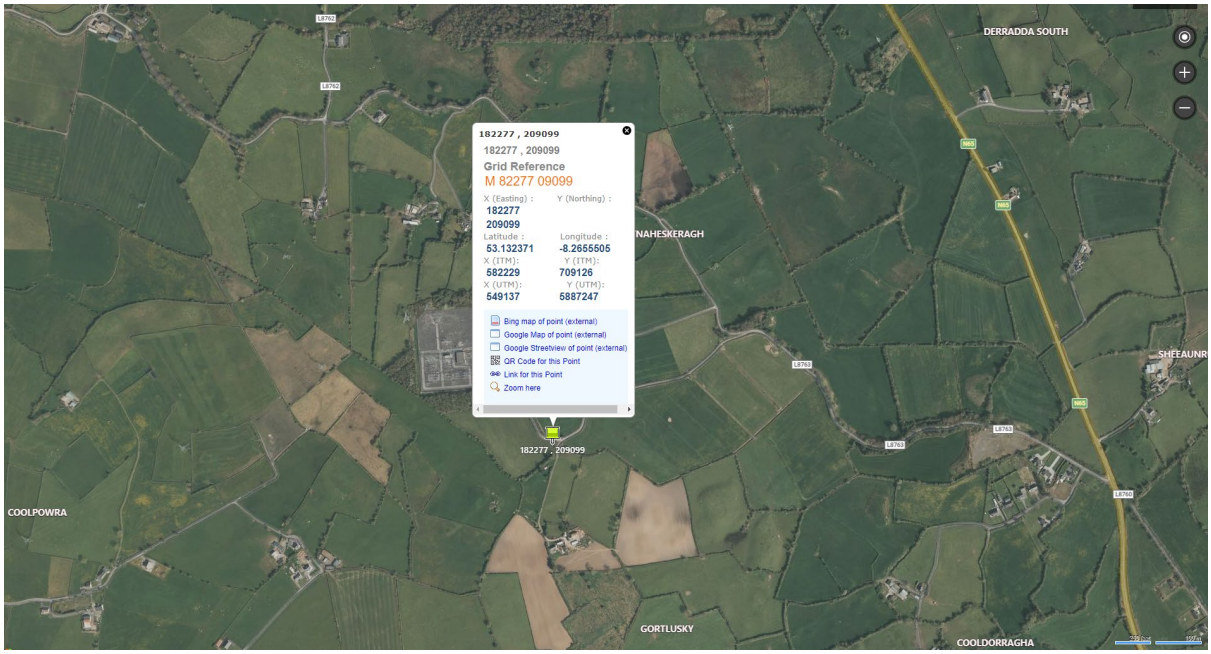


Fig 1. Site Location

Irish Grid Coordinates: Easting 182277, Northing 209099,

ITM Coordinates: Easting 582229, Northing 709126

GSI MAPS

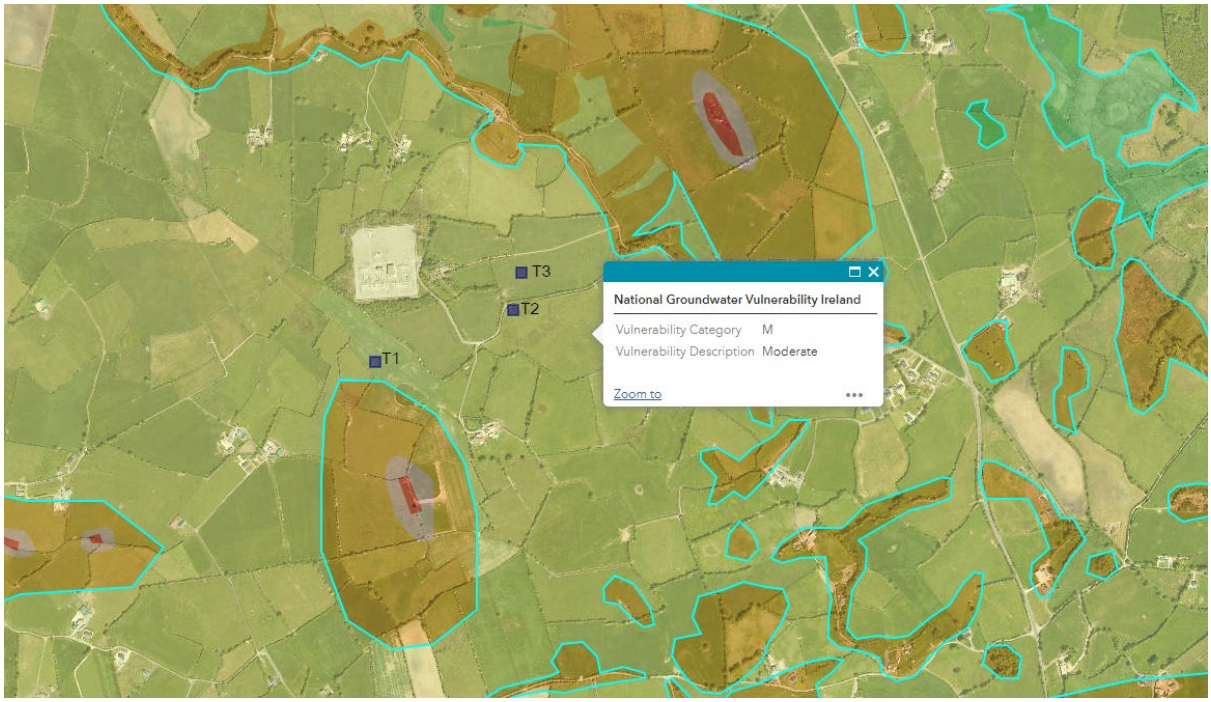


Fig 2. Groundwater Vulnerability – Moderate

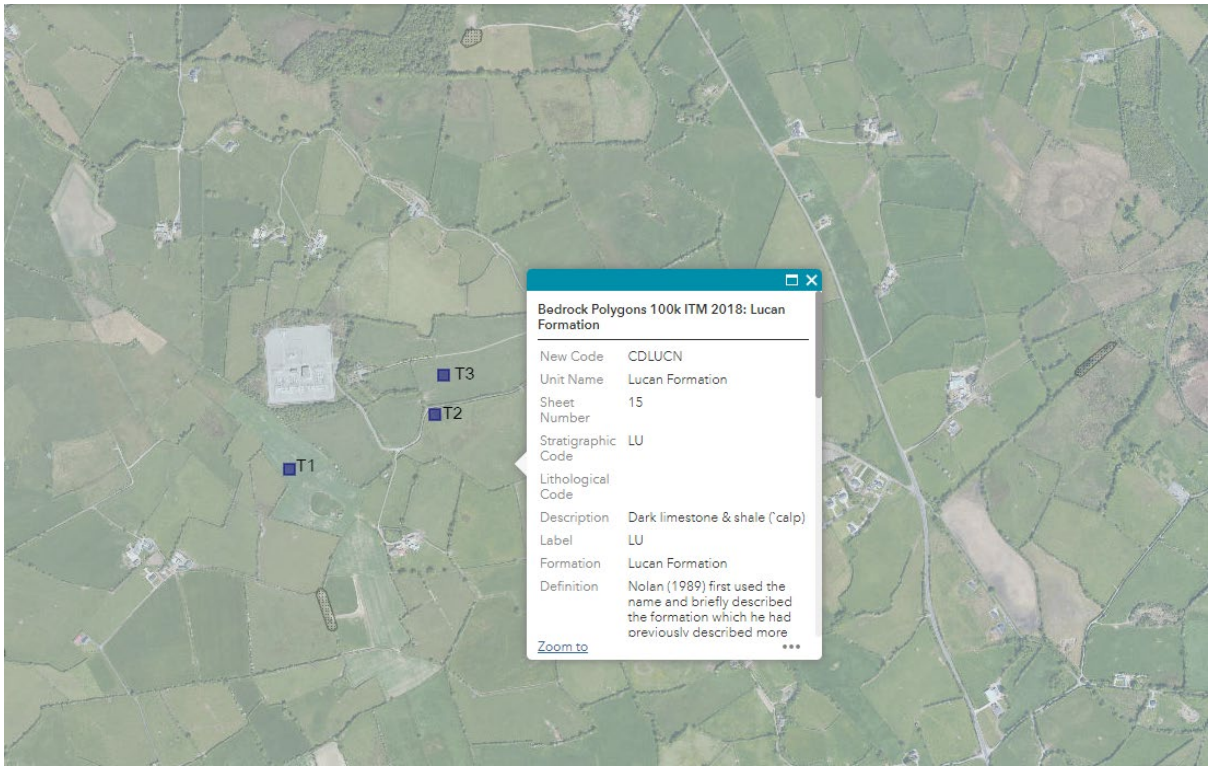


Fig 3. Bedrock – Lucan Formation

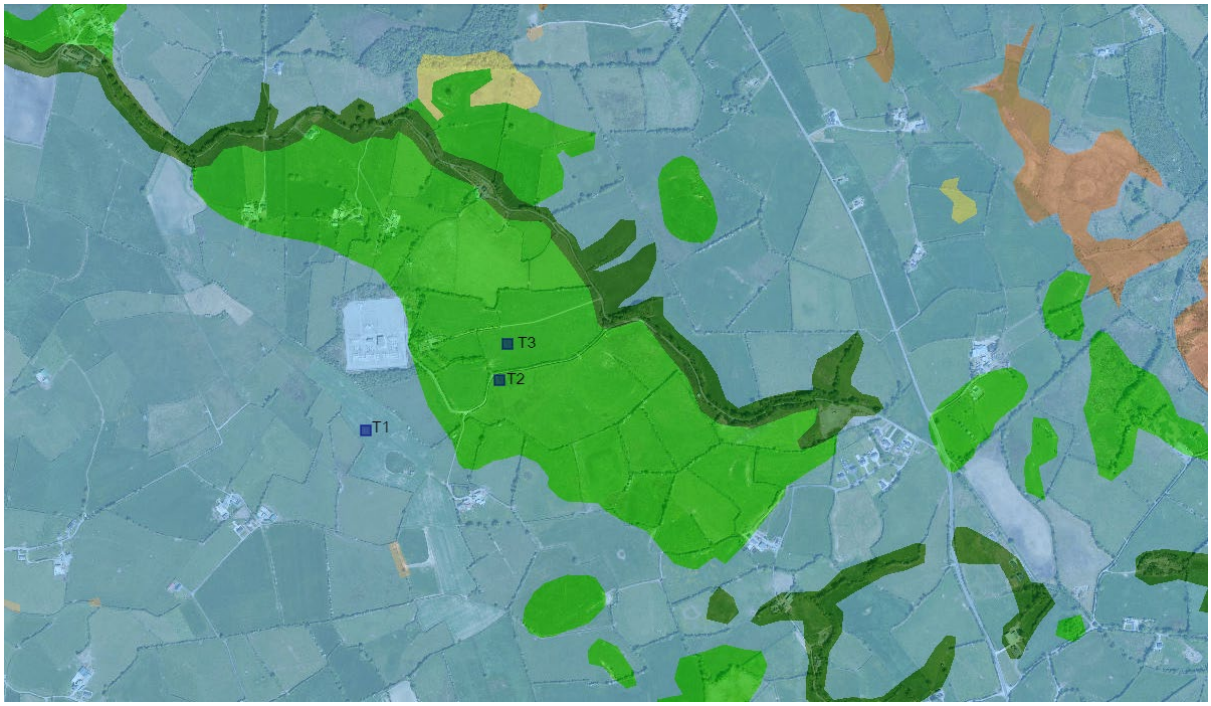


Fig 4. Subsoils – T1 - TLs, T2-T3 - GLs

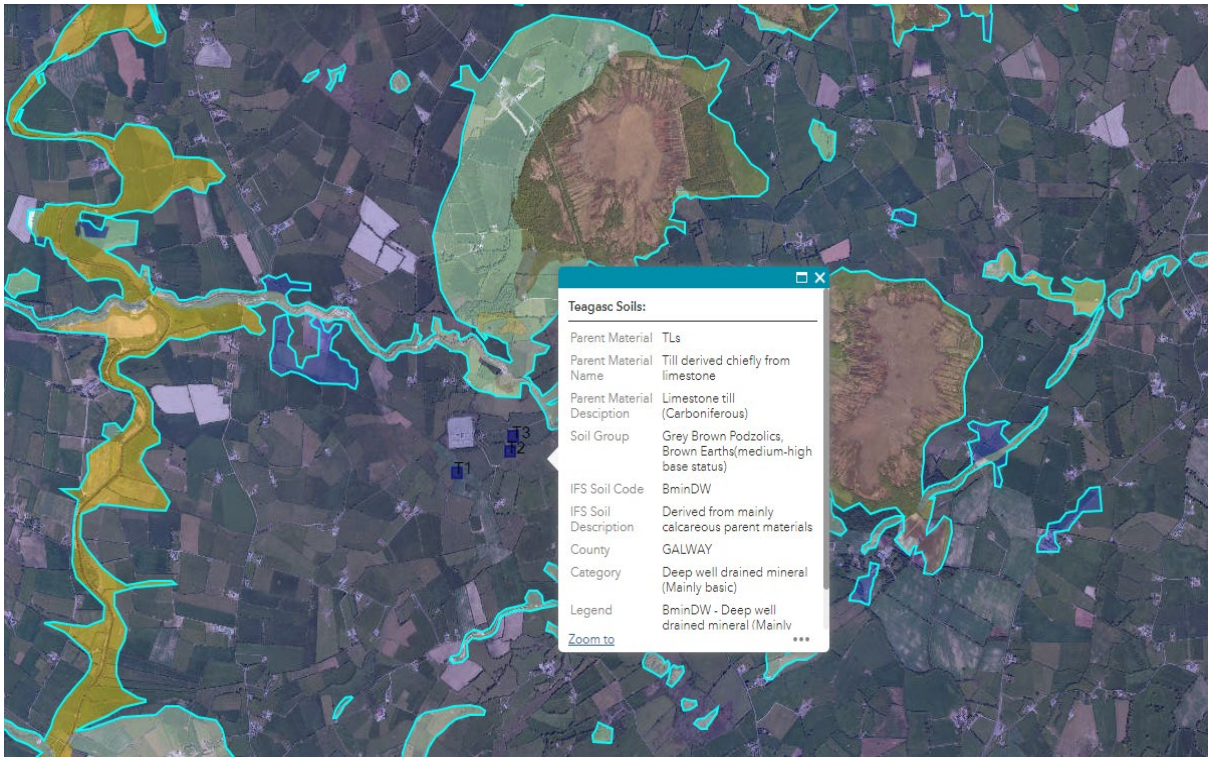


Fig 5. Teagasc Soils – BminDW – Deep well drained mineral

TRIAL PIT 1 (T1)

A trial pit measuring 1.70m long x 1.0m wide x 2.0m deep was dug by excavator. The soil/subsoil profile consisted of an uncompact crumb topsoil 0.3m deep over a brownish grey coloured uncompact gravel layer 1.70m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – TLs - Till derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.8m. The time for water to infiltrate from 75% to 25% of the effective depth was 60 minutes or 3600 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.7	1.2	2	1.2	0.8	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	2 1.2 0.2 0.6	2 0.8 0.6 0.2			
	Average Time Taken to Drop 25% to 75% test hole =					60

Inputs		
Input Time Taken to drop from 75% to 25%	**60.00**	Minutes
Input depth to invert of outlet (m)	**1.20**	Meters
Input depth of soakway below outlet	**0.80**	Meters
Input Length Soakpit (m)	**1.70**	Meters
Input Width Soakpit (m)	**1.20**	Meters
Effective Depth = 0.5 soakaway (m)	**0.4**	Meters
Mean Surface Area of Soakway	**4.36**	m2
Surface Area subjected to infiltration	**4.94**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0001125** **1.125E-04**	**m/hr** **0.4048583**

PIC 1 - T1

PIC 2 - T1

PIC 3 - T1

TRIAL PIT 2 (T2)

A trial pit measuring 1.80m long x 0.9m wide x 1.6m deep was dug by excavator. The soil/subsoil profile consisted of firm dense topsoil 0.5m deep over a blueish grey coloured compact gravel layer 1.10m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – GLs - Gravel derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.85m. The time for water to infiltrate from 75% to 25% of the effective depth was 175 minutes or 10500 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.8	0.9	1.6	0.75	0.85	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	1.6 0.75 0.2125 0.6375	1.6 0.85 0.6375 0.2125			
	Average Time Taken to Drop 25% to 75% test hole =					175

Inputs		
Input Time Taken to drop from 75% to 25%	**175.00**	Minutes
Input depth to invert of outlet (m)	**0.75**	Meters
Input depth of soakway below outlet	**0.85**	Meters
Input Length Soakpit (m)	**1.80**	Meters
Input Width Soakpit (m)	**0.90**	Meters
Effective Depth = 0.5 soakaway (m)	**0.425**	Meters
Mean Surface Area of Soakway	**3.915**	m2
Surface Area subjected to infiltration	**4.32**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0000441** **4.409E-05**	**m/hr** **0.1587302**

Pic 4 – T2

Pic 5 – T2

Pic 6 – T2

TRIAL PIT 3 (T3)

A trial pit measuring 1.70m long x 1.2m wide x 1.4m deep was dug by excavator. The soil/subsoil profile consisted of compact topsoil 0.6m deep over a blueish grey coloured compact gravel layer 0.80m deep.

The soil types observed in the trial hole are consistent with the GSI maps soils description.

Teagasc Soils - BminDW - Deep well drained mineral (Mainly basic).

Subsoils – GLs - Gravel derived from Limestones.

Bedrock Geology - Lucan Formation - Dark limestone & shale.

These can be moderately to well drained.

The effective depth of the soakaway test was 0.80m. The time for water to infiltrate from 75% to 25% of the effective depth was 75 minutes or 4500 sec.

Test Hole Size	**Length**	**Width**	**Depth**	**Inlet Level**	**Depth Water Test**	
	m	**m**	**m**	**m**		
	1.7	1.2	1.4	0.6	0.8	
Depth to Water Table	n/a					
Infilltration Test No. 1	**Description**	**Depths**	**Staff Reading**			**Time Taken**
Details *Average Fill Details*	Trench Depth Inlet Depth 25% Water Drop 75% Water Drop	1.4 0.6 0.2 0.6	1.4 0.8 0.6 0.2			
	Average Time Taken to Drop 25% to 75% test hole =					75

Inputs		
Input Time Taken to drop from 75% to 25%	**75.00**	Minutes
Input depth to invert of outlet (m)	**0.60**	Meters
Input depth of soakway below outlet	**0.80**	Meters
Input Length Soakpit (m)	**1.70**	Meters
Input Width Soakpit (m)	**1.20**	Meters
Effective Depth = 0.5 soakaway (m)	**0.4**	Meters
Mean Surface Area of Soakway	**4.36**	m2
Surface Area subjected to infiltration	**4.94**	m2
Volume Outflowing between 75% and 25%	**2**	m3
Soil Infilltration m/s	**0.0000900** **8.997E-05**	**m/hr** **0.3238866**

Pic 7 – T3

Pic 8 – T3

Pic 9 – T3

Pic 10 – T3

APPENDIX

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 182277, Northing: 209099,

DURATION	Interval 6months,	1year,	Years 2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.5,	4.0,	4.7,	5.2,	5.5,	6.7,	7.9,	8.7,	9.9,	10.9,	11.6,	12.8,	13.7,	14.4,	N/A ,
10 mins	3.6,	4.9,	5.6,	6.5,	7.2,	7.7,	9.3,	11.0,	12.2,	13.8,	15.1,	16.2,	17.8,	19.1,	20.1,	N/A ,
15 mins	4.3,	5.8,	6.5,	7.7,	8.4,	9.0,	10.9,	13.0,	14.3,	16.2,	17.8,	19.1,	21.0,	22.4,	23.6,	N/A ,
30 mins	5.7,	7.5,	8.5,	9.9,	10.8,	11.5,	13.7,	16.1,	17.6,	19.7,	21.6,	23.0,	25.1,	26.7,	28.1,	N/A ,
1 hours	7.6,	9.9,	11.0,	12.6,	13.7,	14.5,	17.1,	19.9,	21.6,	24.0,	26.1,	27.7,	30.1,	31.9,	33.4,	N/A ,
2 hours	10.2,	12.9,	14.3,	16.2,	17.5,	18.4,	21.4,	24.6,	26.6,	29.3,	31.6,	33.4,	36.0,	38.0,	39.6,	N/A ,
3 hours	12.0,	15.1,	16.6,	18.7,	20.1,	21.2,	24.4,	27.9,	30.0,	32.9,	35.4,	37.2,	40.0,	42.1,	43.8,	N/A ,
4 hours	13.6,	16.9,	18.5,	20.8,	22.3,	23.4,	26.8,	30.4,	32.7,	35.7,	38.3,	40.2,	43.1,	45.3,	47.0,	N/A ,
6 hours	16.1,	19.7,	21.5,	24.0,	25.7,	26.9,	30.6,	34.5,	36.9,	40.1,	42.8,	44.9,	47.9,	50.2,	52.0,	N/A ,
9 hours	19.0,	23.1,	25.1,	27.8,	29.6,	30.9,	34.9,	39.0,	41.6,	45.0,	47.9,	50.1,	53.2,	55.6,	57.5,	N/A ,
12 hours	21.4,	25.8,	27.9,	30.8,	32.7,	34.1,	38.3,	42.7,	45.3,	48.9,	51.9,	54.1,	57.4,	59.8,	61.8,	N/A ,
18 hours	25.4,	30.2,	32.5,	35.7,	37.7,	39.2,	43.7,	48.3,	51.1,	54.9,	58.0,	60.3,	63.8,	66.3,	68.3,	N/A ,
24 hours	28.6,	33.8,	36.2,	39.6,	41.7,	43.2,	48.0,	52.8,	55.7,	59.6,	62.8,	65.2,	68.7,	71.3,	73.4,	80.2,
2 days	35.2,	41.3,	44.2,	48.2,	50.7,	52.5,	58.1,	63.8,	67.2,	71.7,	75.5,	78.3,	82.4,	85.4,	87.9,	95.8,
3 days	40.7,	47.7,	50.9,	55.5,	58.3,	60.4,	66.7,	73.1,	77.0,	82.1,	86.3,	89.5,	94.1,	97.5,	100.2,	109.1,
4 days	45.7,	53.4,	57.0,	62.0,	65.1,	67.4,	74.4,	81.4,	85.7,	91.3,	96.0,	99.5,	104.5,	108.2,	111.2,	121.0,
6 days	54.6,	63.7,	67.9,	73.8,	77.4,	80.1,	88.2,	96.4,	101.4,	108.0,	113.4,	117.4,	123.2,	127.6,	131.0,	142.3,
8 days	62.7,	73.0,	77.8,	84.4,	88.5,	91.6,	100.8,	110.0,	115.6,	123.0,	129.1,	133.6,	140.1,	145.0,	148.9,	161.5,
10 days	70.3,	81.7,	87.0,	94.4,	98.9,	102.3,	112.4,	122.6,	128.8,	136.9,	143.7,	148.6,	155.9,	161.2,	165.5,	179.4,
12 days	77.5,	89.9,	95.8,	103.8,	108.7,	112.4,	123.5,	134.6,	141.3,	150.1,	157.5,	162.9,	170.7,	176.5,	181.2,	196.3,
16 days	91.1,	105.5,	112.3,	121.5,	127.3,	131.5,	144.3,	157.1,	164.9,	175.0,	183.4,	189.6,	198.7,	205.4,	210.7,	228.1,
20 days	104.0,	120.2,	127.9,	138.3,	144.7,	149.5,	163.9,	178.3,	187.0,	198.4,	207.9,	214.8,	225.0,	232.4,	238.4,	257.9,
25 days	119.3,	137.8,	146.4,	158.2,	165.6,	171.0,	187.2,	203.5,	213.4,	226.3,	236.9,	244.8,	256.2,	264.6,	271.3,	293.3,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

Site Assessment

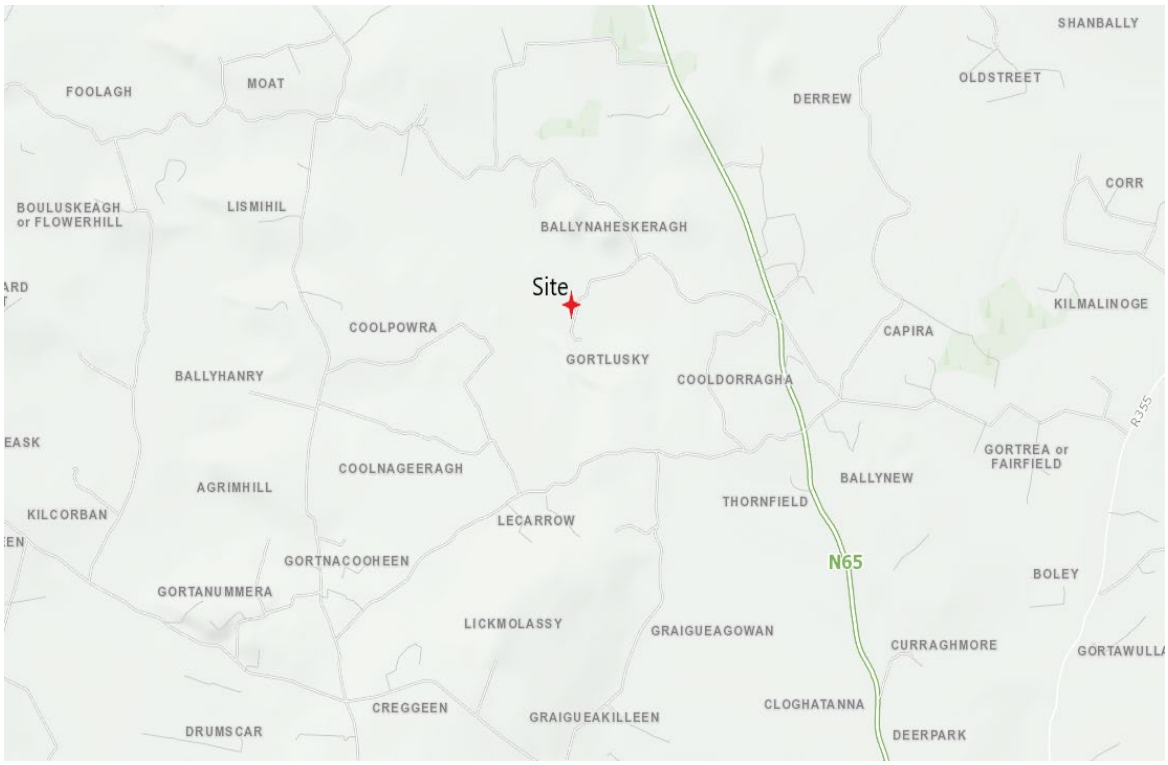
For

COOLPOWRA FLEXGEN LIMITED

At

COOLPOWRA

CO. GALWAY



Date of Issue: 17/04/2024

APPENDIX A: SITE CHARACTERISATION FORM

File Reference: 24-018

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: COOLPOWRA FLEXGEN LTD Surname:

Address:

COOLPOWRA, CO. GALWAY

Site Location and Townland:

COOLPOWRA, CO. GALWAY

Number of Bedrooms: Maximum Number of Residents: 4

Comments on population equivalent

5 PE Based on 10 no. full time office/maintenance staff with canteen
Hydraulic loading 60 litres /day/person
Organic Loading (BOD5) 30 grams/day/person

Proposed Water Supply:

Mains ☐ Private Well/Borehole ☑ Existing well on-site Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): National soils - Mullabane, BminDW - Deep well drained mineral

Subsoil, (Specify Type): TLs, Till derived from limestones

Bedrock Type: Lucan Formation - limestone and shale

Aquifer Category: Regionally Important | Locally Important LI Poor

Vulnerability: Extreme ☐ High ☐ Moderate ☑ Low ☐

Groundwater Body: Tynagh Status Good

Name of Public/Group Scheme Water Supply within 1 km: Irish Water

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): Capira/Derrew Bog NHA 1.92km East, Ardgraigue Bog SAC/pNHA 4.18km North

Past experience in the area: Septic tanks & proprietary effluent treatment systems with percolation area used in locality

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

Local groundwaters are a potential target at risk,
Groundwater Protection Response: R1, According to EPA code of practice this is categorized as Acceptable subject to normal good practice

Barroughter Bog SAC/pNHA 5.66km South.

Desk study suggests site should be suitable subject to percolation test results

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: Level landscape

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☐ Relatively Flat (<1:20) ✔

Slope Comment | | West - East

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

Dwelling - 150m South
Dwelling - 286m South

Existing Land Use:

Agricultural tillage & grazing

Vegetation Indicators:

grass, mature hedging at ditches, some mature trees along boundaries

Groundwater Flow Direction: West - East

Ground Condition:

Good, Solid under foot, no surface ponding observed

Site Boundaries:

mature hedging & trees

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

Local access road to right of test location continuing North East and joining L-8763

Outcrops (Bedrock And/Or Subsoil):

None present

Surface Water Ponding:

None present

Lakes:

Lake Segment_Code 25_283, Approx 1.50km Southeast

Beaches/Shellfish Areas:

None present

Wetlands:

None present

Karst Features:

None present

Watercourses/Streams:*

Stream 35m North West flowing to River shannon (lower)

***Note and record** water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

None present

Springs:*

None present

Wells:*

Domestic well approximately 150m South (at dwelling)

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

The land appears well drained,
Main targets at risk are - receiving groundwaters, stream approximately 35m Northwest, Domestic well approximately 150m South

Visual assessment would suggest site should be suitable subject to percolation test results.

***Note and record** water level

3.2 Trial Hole (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m): 2.10

Depth from ground surface to bedrock (m) (if present): 2.10

Depth from ground surface to water table (m) (if present): n/a

Depth of water ingress: 0

Rock type (if present): Limestones

Date and time of excavation: 11-Apr-2024 10:00

Date and time of examination: 12-Apr-2024 09:00

Depth of Surface and Subsurface Percolation Tests		Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m		Topsoil	3 threads > 90mm 1 Ribbon > 40mm non dilatant	Crumb	Compact	Brown	Grass roots
0.2 m							
0.3 m							
0.4 m	P-Test						
0.5 m							
0.6 m							
0.7 m		Gravel with clay, Cobbles & Boulders	0 threads 0 Ribbons	Granular	Firm	Blue/Grey	Cobbles/Boulders
0.8 m	T-Test						
0.9 m							
1.0 m							
1.1 m							
1.2 m							
1.3 m							
1.4 m							
1.5 m							
1.6 m							
1.7 m							
1.8 m							
1.9 m							
2.0 m							
2.1 m	Pit						
2.2 m							
2.3 m							
2.4 m							
2.5 m							
2.6 m							
2.7 m							
2.8 m							
2.9 m							
3.0 m							
3.1 m							
3.2 m							
3.3 m							
3.4 m							
3.5 m							

Likely Subsurface Percolation Value: 30

Likely Surface Percolation Value: 10

Note: *Depth of percolation test holes should be indicated on log above. ('Enter Surface or Subsurface at depths as appropriate).

** See Appendix E for BS 5930 classification.

*** 3 samples to be tested for each horizon and results should be entered above for each horizon.

**** All signs of mottling should be recorded.

3.2 Trial Hole (contd.) Evaluation:

Good depth at 2.10m
Bedrock at 2.10m
no water present

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	400	400	400
Depth from ground surface to base of hole (mm) (B)	800	800	800
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	305 x 310	300 x 310	305 x 305

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	11-Apr-2024	11-Apr-2024	11-Apr-2024
	Time	10:30	10:45	11:00
2nd pre-soak start	Date	11-Apr-2024	11-Apr-2024	11-Apr-2024
	Time	15:00	15:05	15:10

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	12-04-2024	12-04-2024	12-04-2024
Time filled to 400 mm	09:00	09:05	09:10
Time water level at 300 mm	09:35	10:00	10:55
Time (min.) to drop 100 mm (T_{100})	35.00	55.00	105.00
Average T_{100}			65.00

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq$ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	09:35	10:30	55.00	10:00	11:10	70.00	10:55	12:55	120.00
2	10:30	12:00	90.00	11:10	13:00	110.00	12:55	15:40	165.00
3	12:00	14:30	150.00	13:00	16:00	180.00	15:40	19:20	220.00
Average Δt Value			98.33			120.00			168.33
	Average Δt/4 = [Hole No.1]		24.58 (t_1)	Average Δt/4 = [Hole No.2]		30.00 (t_2)	Average Δt/4 = [Hole No.3]		42.08 (t_3)

Result of Test: Subsurface Percolation Value = 32.22 (min/25 mm)

Comments:

Test result - 32.22 - According to EPA code of practice Table 6.4, site suitable for Secondary treatment system and soil polishing filter or Tertiary treatment system and infiltration area

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Tim§e hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Result of Test: Subsurface Percolation Value = 0.00 (min/25 mm)

Comments:

3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	400	400	400
Dimensions of hole [length x breadth (mm)]	305 x 300	300 x 300	310 x 310

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	11-Apr-2024	11-Apr-2024	11-Apr-2024
	Time	11:10	11:20	11:30
2nd pre-soak start	Date	11-Apr-2024	11-Apr-2024	11-Apr-2024
	Time	15:15	15:20	15:25

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	12-Apr-24	12-Apr-24	12-Apr-2024
Time filled to 400 mm	09:00	09:05	09:10
Time water level at 300 mm	09:17	09:30	09:28
Time to drop 100 mm (T_{100})	17.00	25.00	18.00
Average T_{100}			20.00

If T_{100} > 480 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground
If $T_{100} \leq$ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	09:17	09:40	23.00	09:30	10:10	40.00	09:28	09:55	27.00
2	09:40	10:25	45.00	10:10	11:15	65.00	09:55	10:45	50.00
3	10:25	11:35	70.00	11:15	12:45	90.00	10:45	12:10	85.00
Average ΔT Value			46.00			65.00			54.00
	Average ΔT/4 = [Hole No.1]		11.50 (T_1)	Average ΔT/4 = [Hole No.2]		16.25 (T_2)	Average ΔT/4 = [Hole No.3]		13.50 (T_3)

Result of Test: Surface Percolation Value = 13.75 (min/25 mm)

Comments:

Test result - 13.75 - According to EPA code of practice Table 6.4, site suitable for Secondary treatment system and soil polishing filter or Tertiary treatment system and infiltration area

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.
3. North point should always be included.
4. (a) Scaled sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Site specific cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site including landmarks (date and time referenced).
7. Pumped design must be designed by a suitably qualified person.

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of proposed infiltration / treatment area: 1:200

Are all minimum separation distances met? ✔

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system) 1.20

Percolation test result: Surface: 13.75 Sub-surface: 32.22

Not Suitable for Development ☐ **Suitable for Development** ✔

Identify all suitable options

1. Septic tank system (septic tank and percolation area) **(Chapter 7)** — No
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)** — Yes
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)** — Yes

Discharge Route [1]

Ground water

5.0 SELECTED DWWTS

Propose to install: Secondary Treatment System and soil polishing filter

and discharge to: Ground Water

Invert level of the trench/bed gravel or drip tubing (m) 0.80

Site Specific Conditions (e.g. special works, site improvement works testing etc.

SEE SITE SPECIFIC REPORT
For your site, we recommend a Novo IRL6+ wastewater treatment plant which is designed to treat a maximum of 900 litres of wastewater per day. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66. The Novo IRL6+ has a capacity of 4000 litres, of which 2400 are in the primary chamber, this ensures a long desludging interval.

The proposed solution for disposal is percolation trenches which consists of a series of pipework which distributes the effluent for treatment using in situ subsoil.
Based on a Population of 5 and a percolation value of 21-40 on the site, the chosen polishing filter for this site is percolation trenches. The minimum amount of pipe required will be 60m. This is based on trench length required per person for the given percolation value as stated in table 10.1 of the EPA Code of Practice 2021.
It recommends that each percolation trench should be equal in length and no longer than 10m

[1] A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m^3)		Percolation Area		Mounded Percolation Area	
		No. of Trenches		No. of Trenches	
		Length of Trenches (m)		Length of Trenches (m)	
		Invert Level (m)		Invert Level (m)	

SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m^2)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type: Novo IRL6+

Capacity PE: 6

Sizing of Primary Compartment: 2.40 m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*

Option 1 - Direct Discharge Surface area (m^2)

Option 2 - Pumped Discharge Surface area (m^2)

Option 3 - Gravity Discharge Trench length (m): 60.00

Option 4 - Low Pressure Pipe Distribution Trench length (m)

Option 5 - Drip Dispersal Surface area (m^2)

SYSTEM TYPE: Tertiary Treatment System and infiltration / treatment area (Section 10.2)

Identify purpose of tertiary treatment	Provide performance information demonstrating system will provide required treatment levels	Provide design information
Receiving Subsoils	BOD5 - 11mg/l NH4N - 8 mg/l SS - 16 mg/l	SR66 and the EPA Code of Practice

DISCHARGE ROUTE:

Groundwater	✔	Hydraulic Loading Rate * ($l/m^2.d$)	60.00	Surface area (m^2)	
Surface Water **		Discharge Rate (m^3/hr)			

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

6.0 TREATMENT SYSTEM DETAILS

QUALITY ASSURANCE:

Installation & Commissioning

Installation and Commissioning to be undertaken and completed by competent and trained personnel

On-going Maintenance

Maintenance to be undertaken and completed by competent and trained personnel

7.0 SITE ASSESSOR DETAILS

Company: Lally Chartered Engineers

Prefix: Mr First Name: David Surname: Lally

Address: Údarás Business Park, Tourmakeady, Co.Mayo

Qualifications/Experience: BE CEng MAppSc MIEI MIOSH

Date of Report: 17-Apr-2024

Phone: 0872804367 E-mail david@lallyeng.com

Indemnity Insurance Number: B07401503624

Signature: _____ _____

ENGINEERS IRELAND
David Lally
Chartered Engineer
Registrant 058146
of The Institution of Engineers of Ireland

FETAC
Further Education and Training Awards Council
Comhairle na nDámhachtaini Breisoideachais agus Oiliúna

Level 6 Specific Purpose Certificate
Teastas Cuspóra Shainiúil Leibhéal 6

Site Suitability On-Site Wastewater Treatment

Awarded to
Bronnta ar

David Michael Lally

15/12/2008

EF294258 722383

Chair/Cathaoirleach FETAC

Chief Executive/Príomhfheidhmeannach FETAC

APPENDIX

(1) 1:50000 OS Map

(2) Photographs – Trial hole, test hole and site

(3) Geology Maps

(4) Percolation Details – Installation & Specification Report

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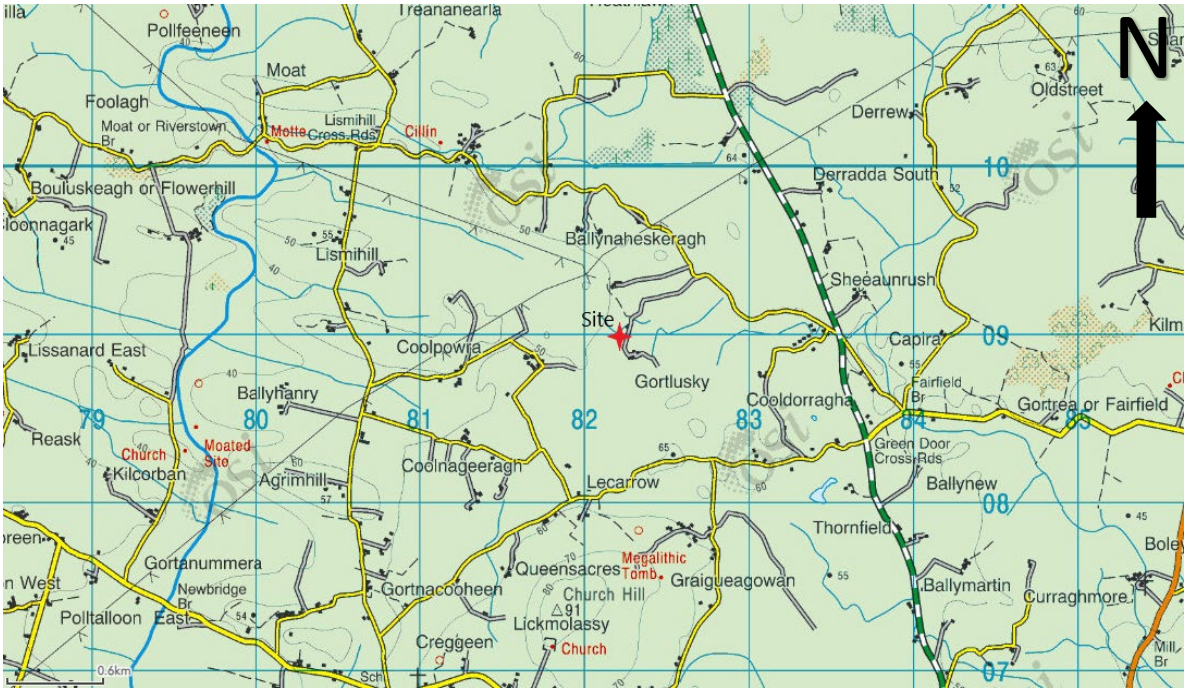
(1) 1:50000 OS Map



(2) Photographs

P-HOLE 1

T-HOLE 1

P-HOLE 2

T-HOLE 2

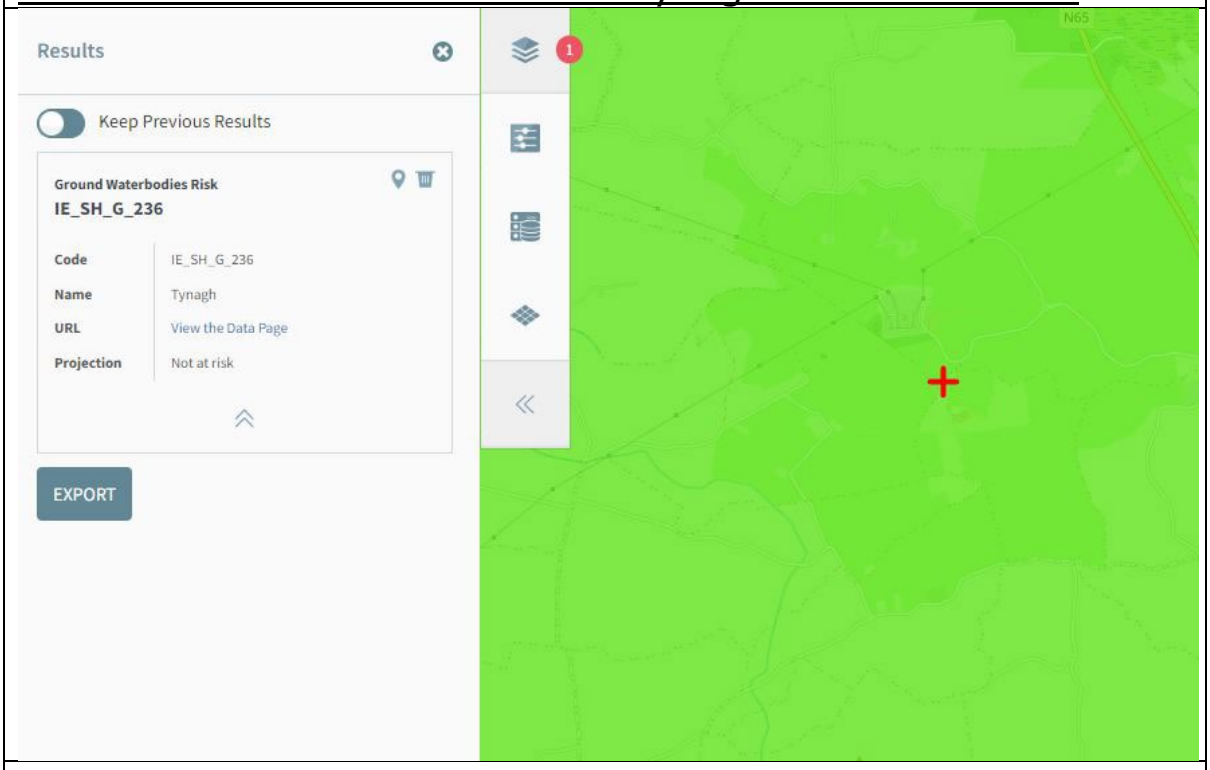
P-HOLE 3

T-HOLE 3

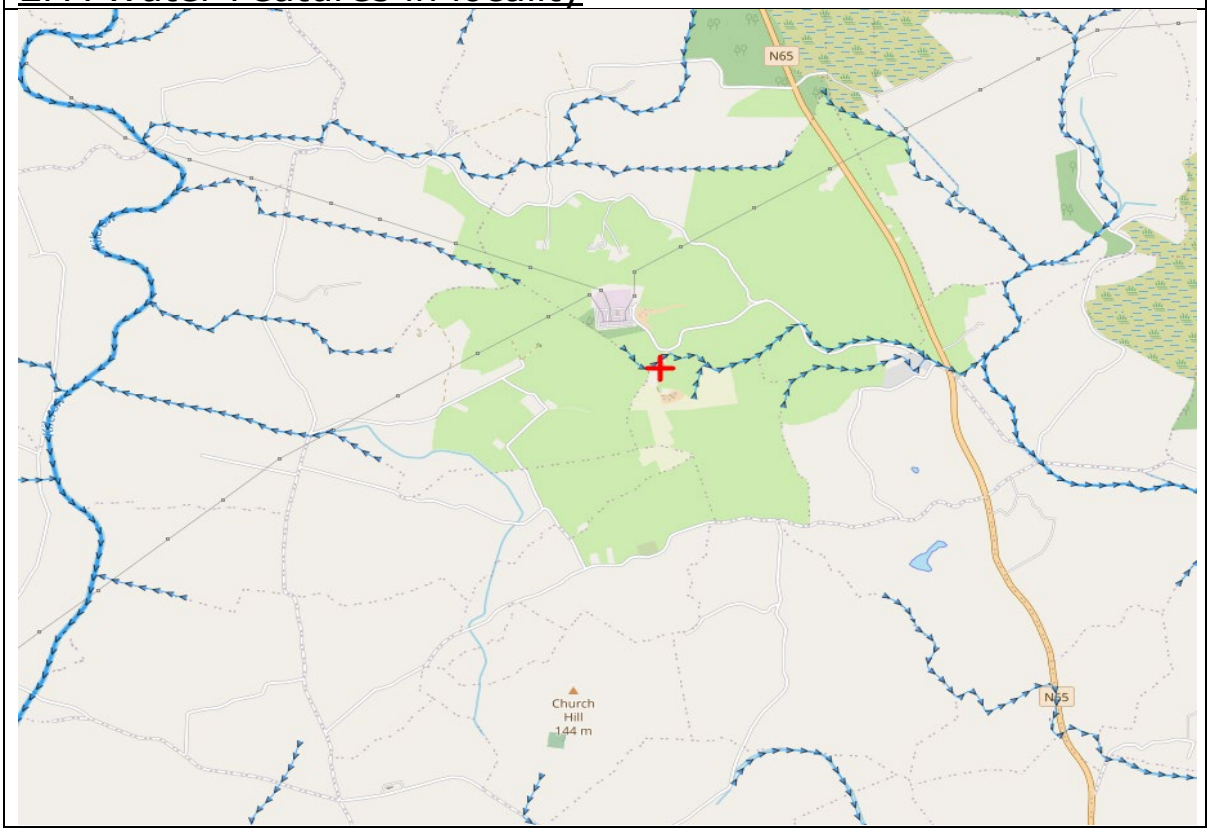
(2) Photographs - Trial Hole

(3) Geology Maps

EPA Ground Waterbodies Risk – Tynagh – Status - Good

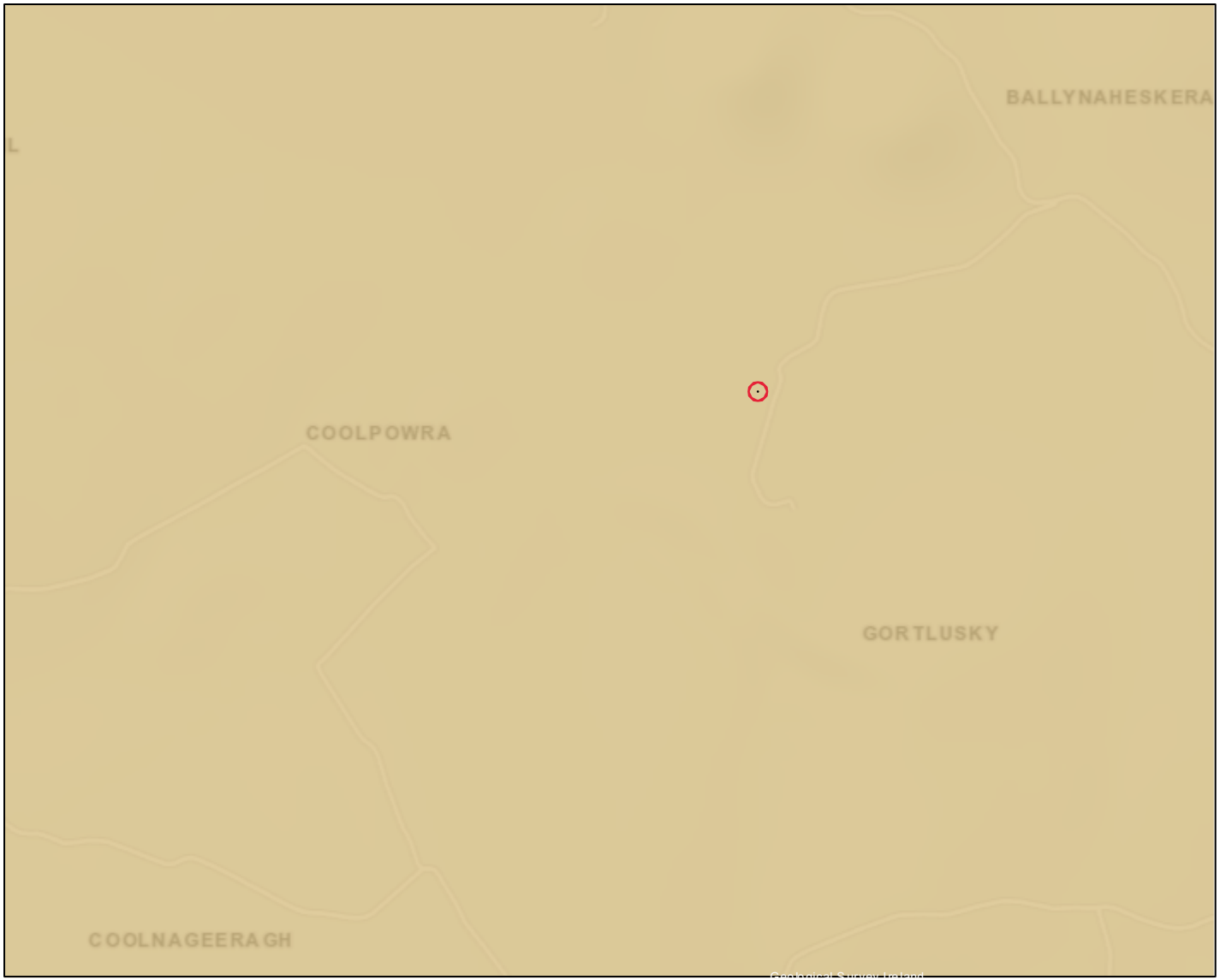


EPA Water Features in locality



Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Aquifers - Locally Important



Legend

IE_GSI_Bedrock_Aqui...

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- Rk - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Rf/Rk - Regionally Important Aquifer - Fissured bedrock/Regionally Important Aquifer - Karstified
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake
- Unclassified

Scale: 1:10,000

Geological Survey Ireland

N W E S

0 0.05 0.1 0.2 mi

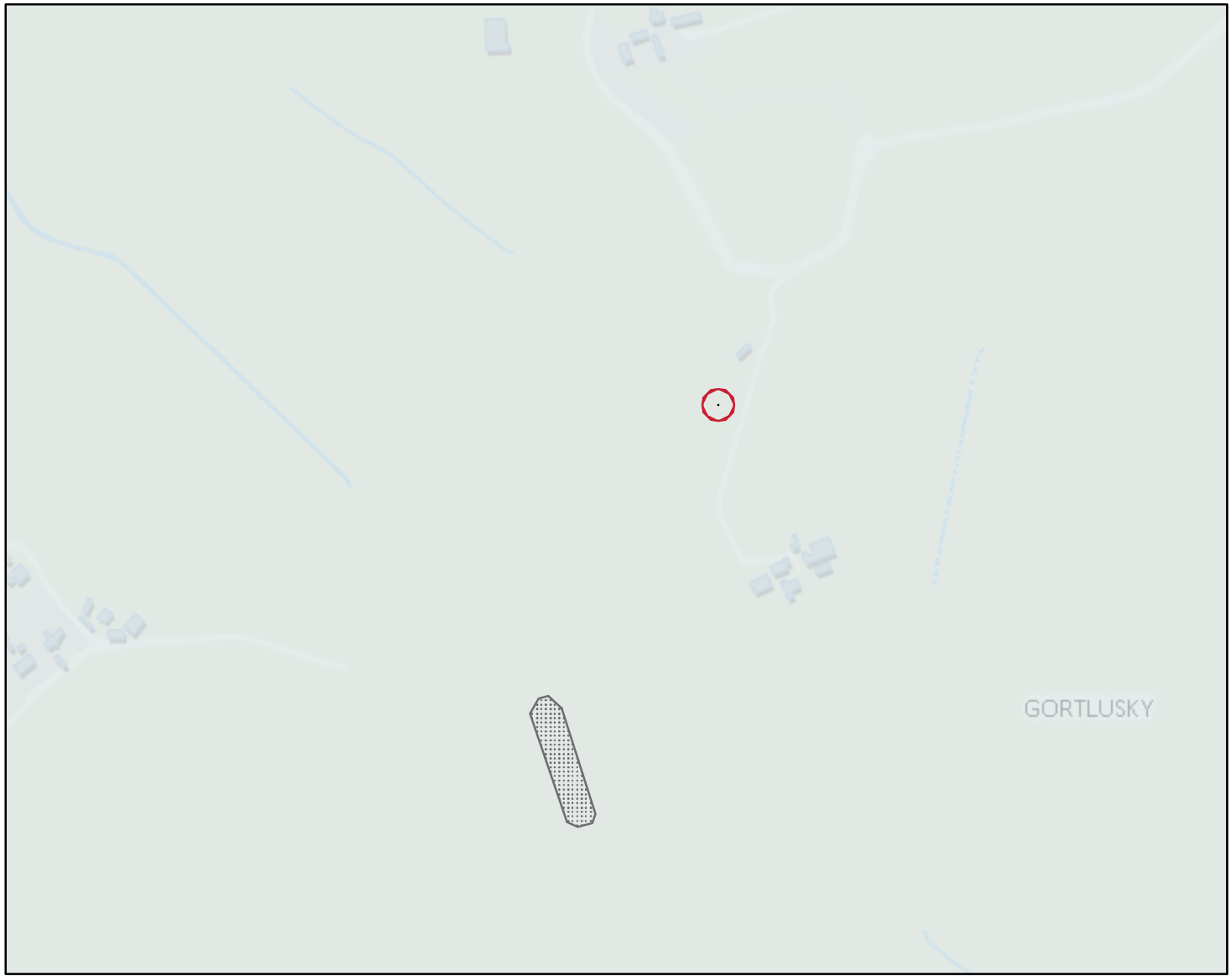
0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 581,978 708,931

4/17/2024, 11:08:18 AM

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Bedrock - Lucan Formation



Legend

Bedrock Outcrops 100 ITM 2018

Bedrock Polygons 100k ITM 2018

Lucan Formation

Scale: 1:5,000

Geological Survey Ireland

N W E S

0 0.035 0.07 0.14 mi

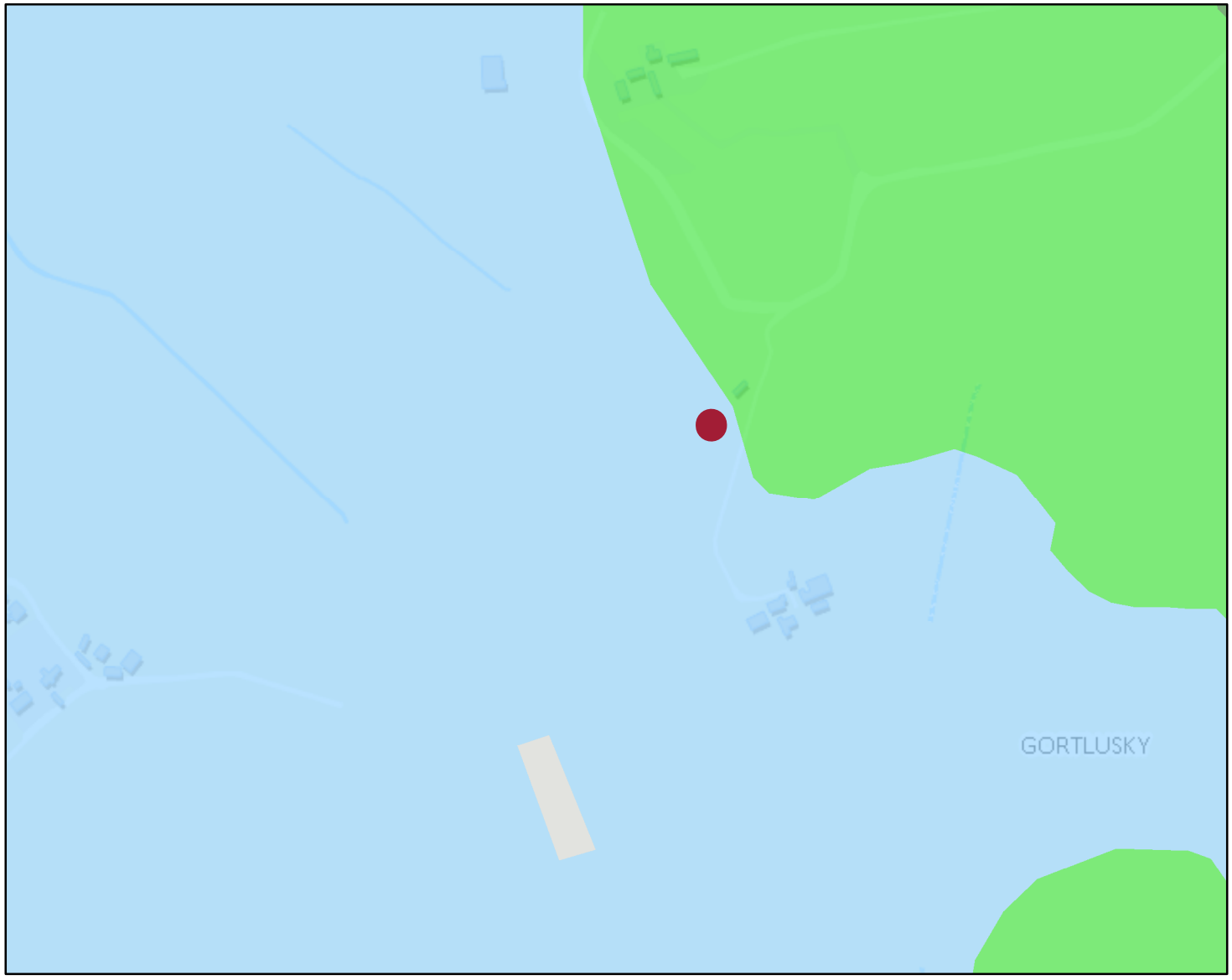
0 0.05 0.1 0.2 km

Map Centre Coordinates (ITM) 582,117 708,966

4/17/2024, 9:10:17 AM

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Subsoils - TLs



Legend

IE_GSI_Quaternary_Sediments_50K_I...

- BasEsk, Eskers comprised of gravels of basic reaction
- GLs, Gravels derived from Limestones
- Rck, Bedrock outcrop or subcrop
- TLs, Till derived from limestones

Scale: 1:5,000

Geological Survey Ireland

N W E S

0 0.035 0.07 0.14 mi
0 0.05 0.1 0.2 km

Map Centre Coordinates (ITM) 582,119 708,995
4/16/2024, 4:43:30 PM

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Surface water features in locality

Legend

River Network and River Flow Direction Arrows

Scale: 1:5,000

Geological Survey Ireland

N W E S

0 0.035 0.07 0.14 mi
0 0.05 0.1 0.2 km

Map Centre Coordinates (ITM) 582,117 708,966
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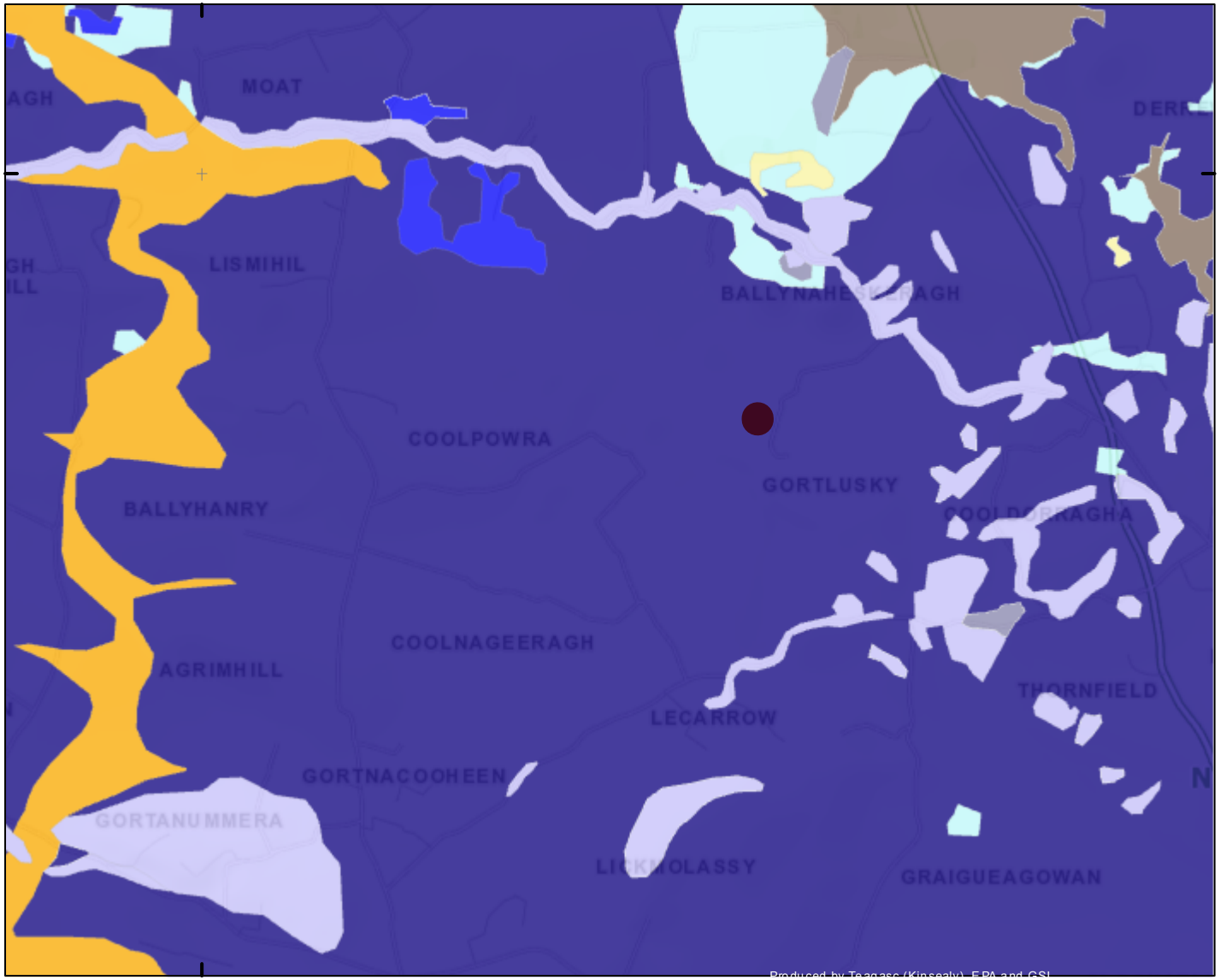
Teagasc Soils - BminDW



Scale: 1:25,000

Geological Survey Ireland

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 581,577 708,774

4/17/2024, 9:47:32 AM

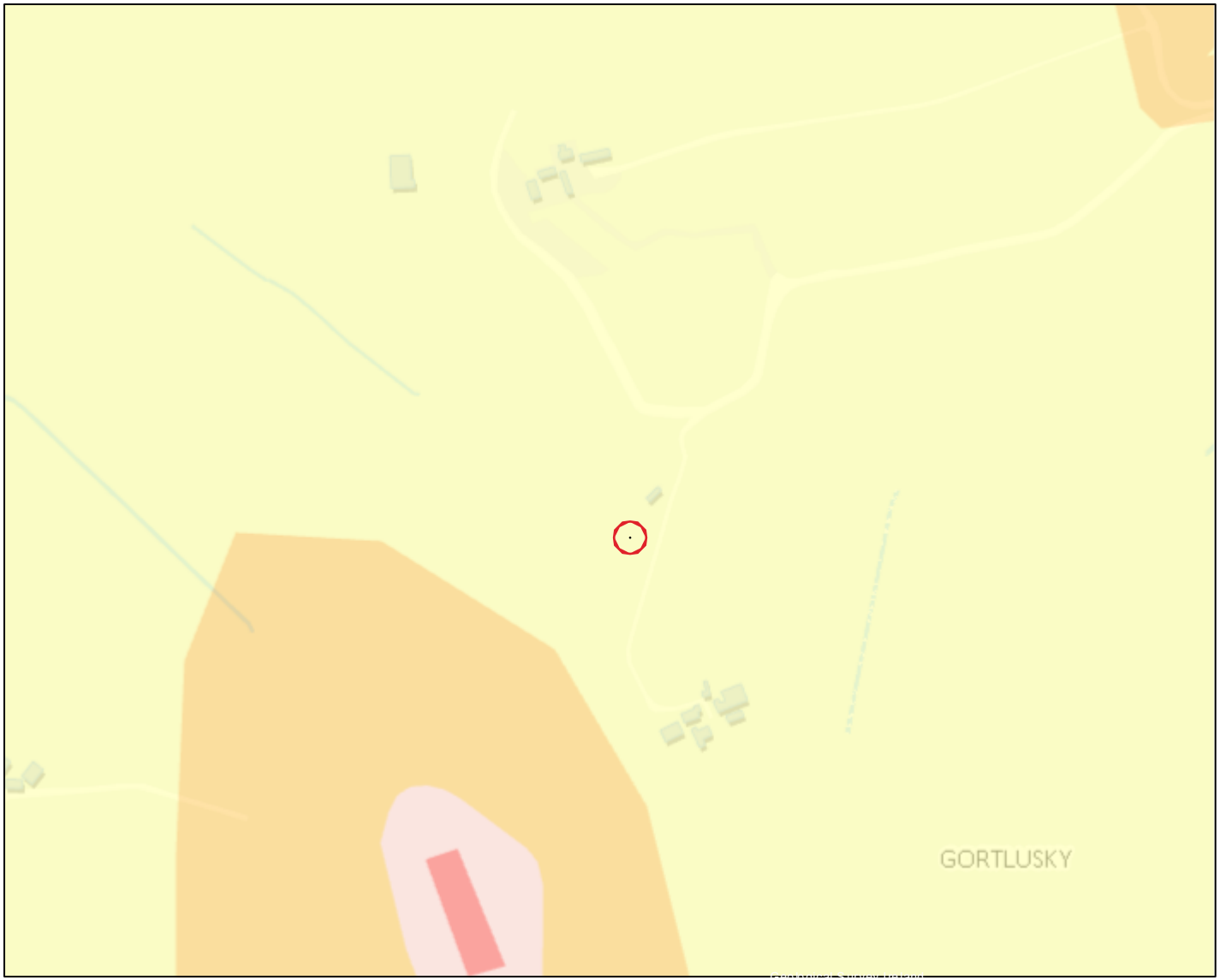
Legend

TEAGASC_Soils_50K...

- AminDW - Deep well drained mineral (Mainly acidic)
- AminPD - Mineral poorly drained (Mainly acidic)
- AminPDPT - Peaty poorly drained mineral (Mainly acidic)
- AminSW - Shallow well drained mineral (Mainly acidic)
- AminSP - Shallow poorly drained mineral (Mainly acidic)
- AminSPPT - Shallow peaty poorly drained mineral (Mainly acidic)
- AminSRPT - Shallow, rocky, peaty/non-peatymi... complexes (Mainly acidic)
- BminDW - Deep well drained mineral (Mainly basic)
- BminPD - Mineral poorly drained (Mainly basic)
- BminPDPT - Peaty poorly drained mineral (Mainly basic)
- BminSW - Shallow well drained mineral (Mainly basic)
- BminSP - Shallow poorly drained mineral (Mainly basic)
- BminSPPT - Shallow peaty poorly drained mineral (Mainly basic)
- BminSRPT - Shallow, rocky, peaty/non-peatymi... complexes (Mainly basic)
- BktPt - Blanket peat
- FenPt - Fen peat
- RsPt - Raised Peat
- Cut - Cutover/cutaway peat
- AlluvMIN - Alluvial (mineral)
- AlluvMRL - Alluvial (marl)
- Lac - Lacustrine type soils
- Scree - Scree
- AeoUND - Aeolian undifferentiated
- MarSands - Marine sand and gravel
- MarSed - Marine/estuarine sediments
- Made - Made ground
- Water - Water
- Unclass

Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Vulnerability - Moderate



Legend

IE_GSI_Groundwater_...

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low
- Water

Scale: 1:5,000

Geological Survey Ireland

N W E S

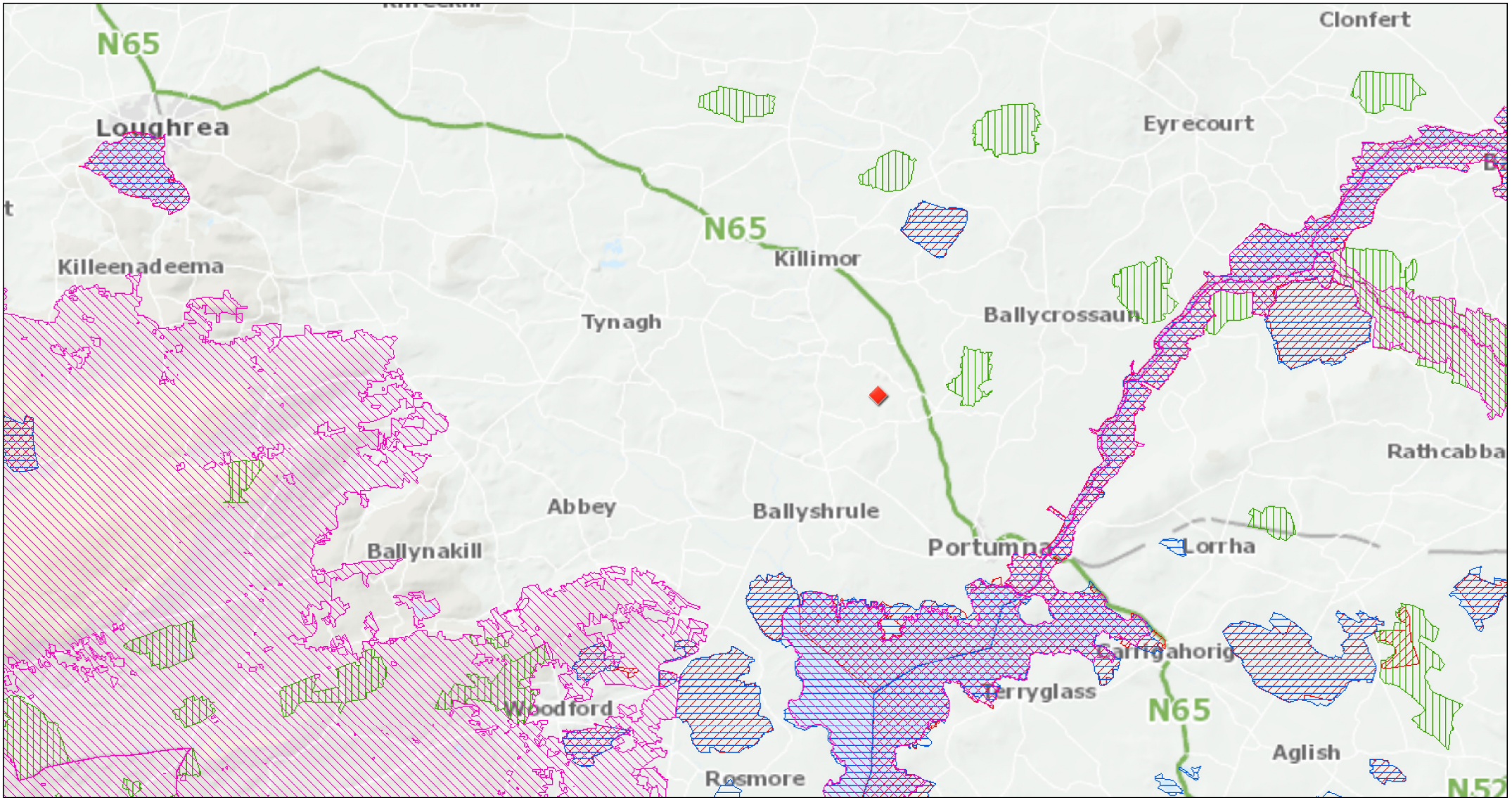
0 0.035 0.07 0.14 mi

0 0.05 0.1 0.2 km

Map Centre Coordinates (ITM) 582,183 709,077

4/16/2024, 4:29:09 PM

NPWS Designations Viewer



4/17/2024, 10:15:15 AM

1:175,634

- Special Protection Areas (SPA)
- Proposed Natural Heritage Areas (pNHA)
- Natural Heritage Areas (NHA)
- Special Area of Conservation (SAC)

0 1.25 2.5 5 mi
0 2 4 8 km

Tricel Site Recommendation Report
Tricel Novo Package Plant and Gravity Soil Polishing filter (Percolation Area)

Date	17/04/2024
Report No:	TSA_G_15248
Client Name	COOLPOWRA FLEXGEN LTD
Site Location & Townland	COOLPOWRA, PORTUMNA, Galway

Thank you for choosing Tricel for your wastewater treatment requirements. This report contains the following information for your site and is based on a population of 5 and a subsurface/surface value of between 21-40.

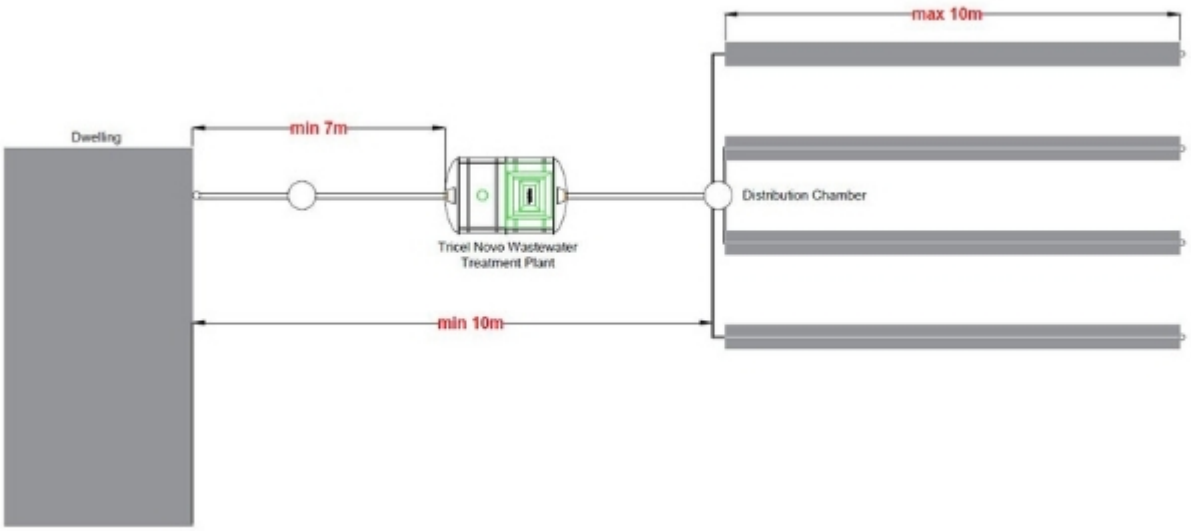
The population is calculated based on 'EPA Wastewater Treatment Manuals (1999) - Treatment systems for small communities, business, leisure centres and hotels' which outlines the following recommended wastewater loading rates:

Situation	Source	Hydraulic Load litres/day/person)	Organic Load (BOD5) grams/day/person	Users
Industrial	Office and/or factory with canteen	60	30	10

The Design Population Equivalent (PE) for this wastewater treatment system is 5. This PE value is based on the Organic Load of 300 BOD5 grams/day per person.

Based on the information provided to us and using SR66 and the EPA Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10), the appropriate solution for treating wastewater on your site is a Tricel Novo Package Plant and Gravity Soil Polishing filter (Percolation Area).

Typical layout of a Tricel Novo Package Plant and Gravity Soil Polishing filter (Percolation Area):



Note:
In the above named site, a substitute wastewater treatment system may not be put in place of the following recommendation.

This recommendation only applies to the above named site based on the information supplied to Tricel.

A Site Characterisation Form should accompany this report. Tricel cannot be responsible for misinformation due to misleading information being received by us from clients.

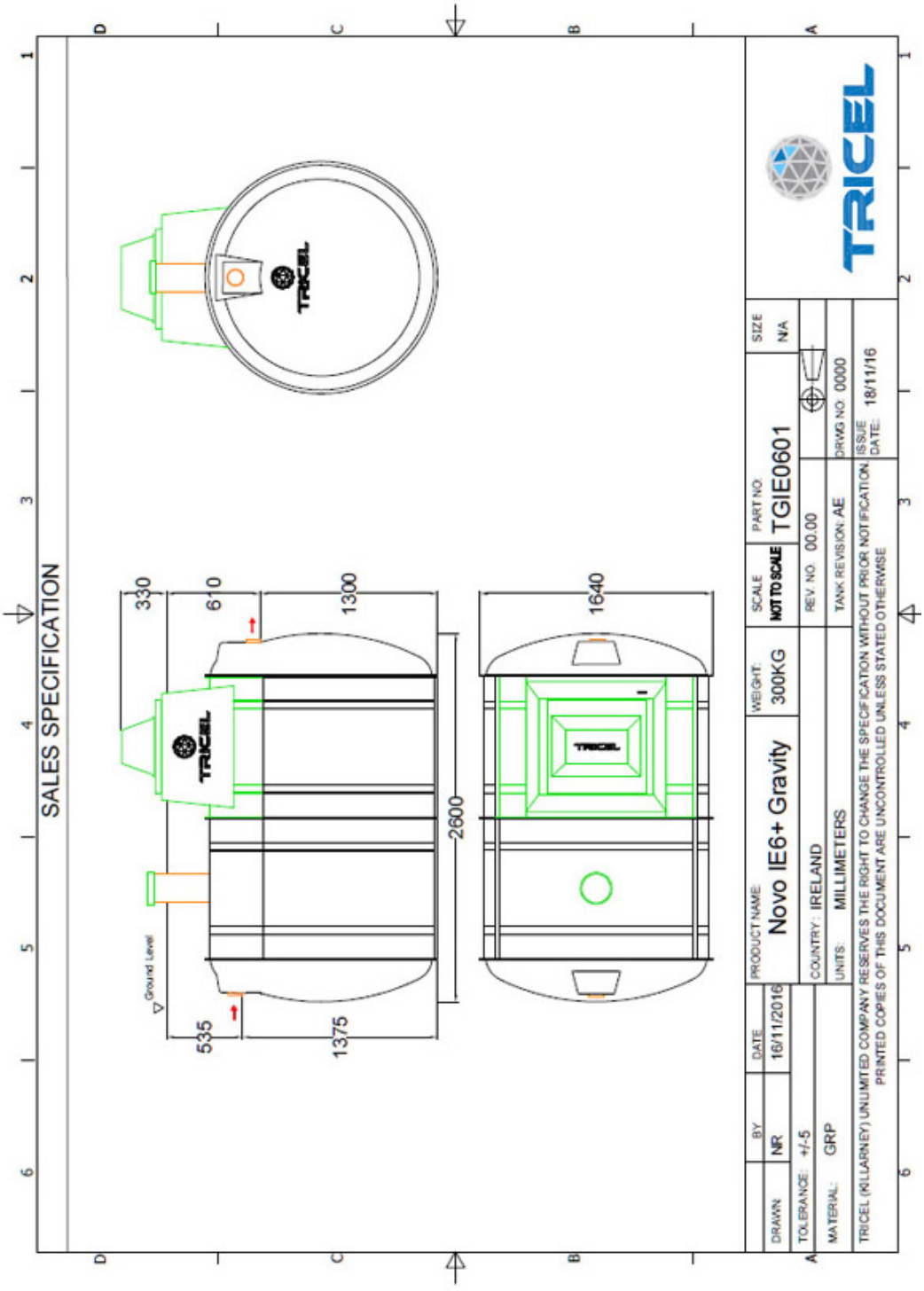
Section 1: Information on the Novo Package Plant

- Manufacturers report and sizing of the Tricel Novo Package Plant.
- Drawings of the Novo Package Plant.
- Certification of the selected Novo Package Plant.
- Brochure on the Novo Package Plant.
- Optional Novo maintenance agreement.

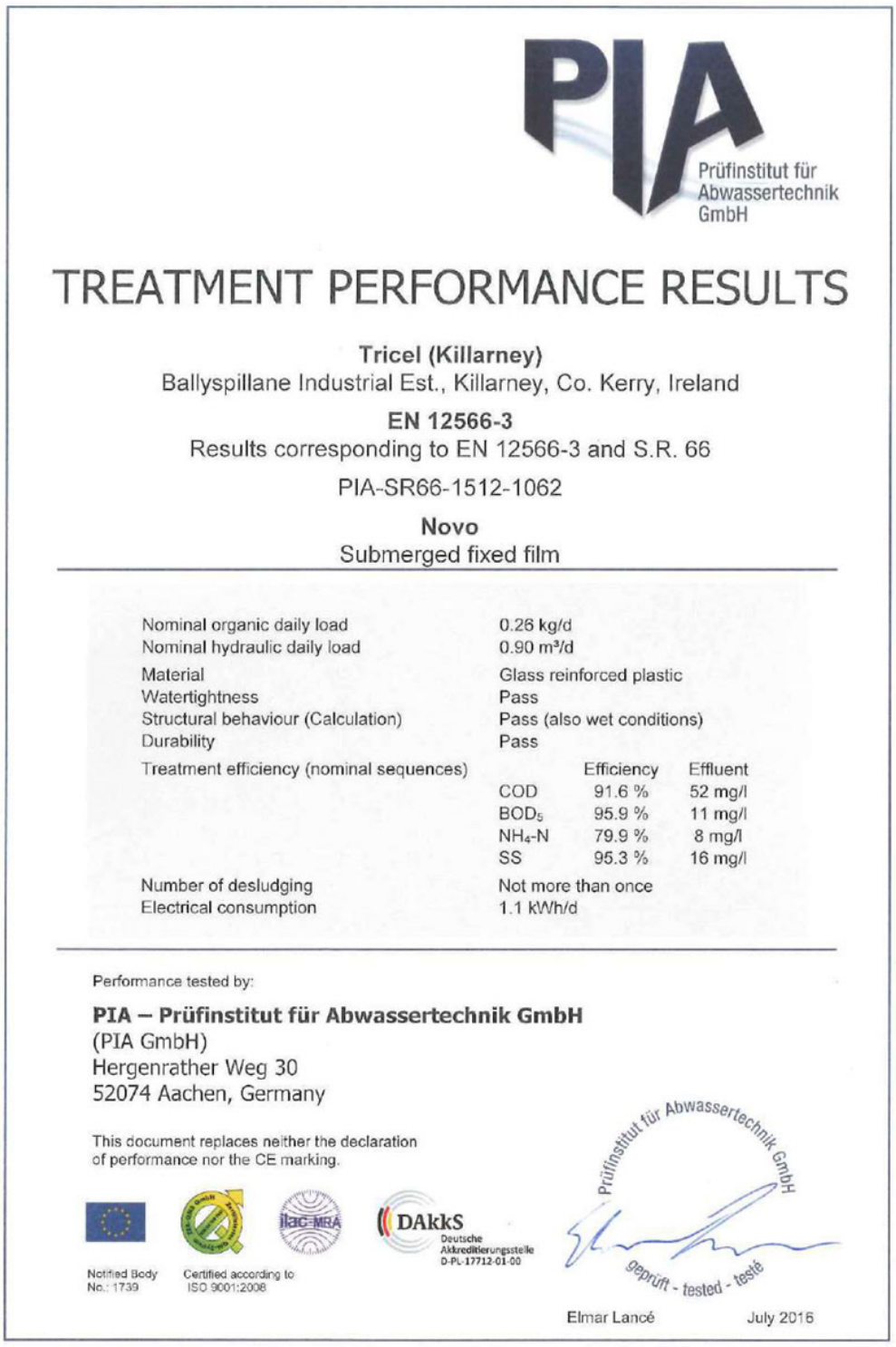
For your site, we recommend a Novo IRL6+ wastewater treatment plant which is designed to treat a maximum of 900 litres of wastewater per day. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.

The Novo IRL6+ has a capacity of 4000 litres, of which 2400 are in the primary chamber, this ensures a long desludging interval.

Section 1


SALES SPECIFICATION
330
610
1300
1640
2600
535
1375
Ground Level
TRICEL
PRODUCT NAME: Novo IE6+ Gravity
WEIGHT: 300KG
SCALE: NOT TO SCALE
PART NO: TGIE0601
SIZE: N/A
REV. NO: 00.00
TANK REVISION: AE
DRWG NO: 0000
ISSUE DATE: 18/11/16
DRAWN: NR
DATE: 16/11/2016
TOLERANCE: +/-5
MATERIAL: GRP
COUNTRY: IRELAND
UNITS: MILLIMETERS
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION
PRINTED COPIES OF THIS DOCUMENT ARE UNCONTROLLED UNLESS STATED OTHERWISE

Certificate in accordance with SR66 for EN12566-Part 3



Prüfinstitut für Abwassertechnik GmbH

TREATMENT PERFORMANCE RESULTS

Tricel (Killarney)
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

EN 12566-3
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1512-1062

Novo
Submerged fixed film

Nominal organic daily load	0.26 kg/d		
Nominal hydraulic daily load	0.90 m³/d		
Material	Glass reinforced plastic		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	91.6 %	52 mg/l
	BOD_5	95.9 %	11 mg/l
	NH_4-N	79.9 %	8 mg/l
	SS	95.3 %	16 mg/l
Number of desludging	Not more than once		
Electrical consumption	1.1 kWh/d		

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Elmar Lancé July 2016

NOVO BROCHURE

Homeowners: Individual domestic installation

▶ The lightweight nature of the system makes for easy on-site delivery.

▶ No need for big excavators and large holes that disrupt and disturb your garden.

▶ Very low visual impact from fully installed units.

Larger projects: Commercial installations up to 50PE

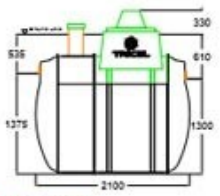
▶ These units are suitable for installation at housing estates, camping sites, hotels etc., and have low maintenance and running costs.

▶ Each WWTP unit is constructed of lightweight SMC and is easy to maneuver which simplifies the installation process.

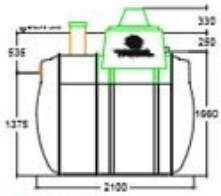
▶ Example of a fully installed 50PE Novo wastewater treatment unit in a 5-star hotel.

Technical characteristics/ Plant dimensions

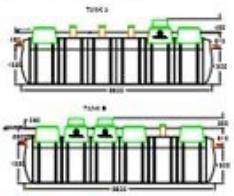
Novo Design Population		No. of people	Length	Width	Height	Nominal Inlet/ outlet diameter	Weight empty	Inlet invert to base	Outlet invert to base	Inlet invert to ground level	Air blower rating
			m			mm	kg	m			watts
IE6		1-6	2.1	1.64	2.24	110	270	1.375	1.3	0.535	60
IE6+		2-6	2.6	1.64	2.24	110	300	1.375	1.3	0.535	60
IE8		2-8	2.6	1.64	2.24	110	300	1.375	1.3	0.535	80
IE10		3-10	3.1	1.64	2.24	110	370	1.375	1.3	0.535	80
IE12		4-12	3.6	1.64	2.27	110	400	1.375	1.3	0.535	100
IE18		6-18	4.6	1.64	2.27	110	500	1.375	1.3	0.535	200
IE24		8-24	6.6	1.64	2.27	150	700	1.35	1.3	0.56	200
IE30	Tank A	10-30	2.6	1.64	1.99	150	300	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	200 + 80
IE36	Tank A	12-36	3.6	1.64	1.99	150	400	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	200 + 80
IE42	Tank A	14-42	5.6	1.64	2.27	150	600	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	200 x 2
IE50	Tank A	16-50	6.6	1.64	2.27	150	700	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	200 + 120 + 80



▶ **IE6 gravity outlet**
Up to 6PE domestic gravity flow outlet.



▶ **IE6 pumped outlet**
1-6 domestic pumped unit. Suitable for pumping to a raised discharge area (over).



▶ **Gravity IE50 outlet**
Suitable for commercial installation, caters for up to 50 people.

Tricel Novo riser options for deep installation

Tricel offer 3 different manhole riser heights to suit different invert/inlet levels. Manhole risers allow for the positioning of the treatment plants at the depth which is optimum to each individual installation.Wastewater is gravity fed from the home to your treatment plant. The inlet pipe's position from the premises determines the excavation depth for the WWT plant. Tricel offer a choice of manhole risers 250mm/500mm/750mm to help with installation where site conditions require a flexible solution.

Tricel Novo: Wastewater Treatment System

Service Agreement

Establishing a regime of yearly inspections and maintenance is advised to ensure that your Tricel Novo continues to perform to the same high standards throughout its lifetime. The service agreement covers travel, the service and the labour cost of servicing only. Other labour costs are excluded, as are all replacement parts.

Tricel (Killarney) Unlimited Company, Ballyspillane Industrial Estate, Killarney, Co. Kerry, V93 X253, Ireland ("the Company") enter this Tricel Novo service agreement with the Customer named below:

Customer Details:			
Name:			
Address:		Address of Site: (If other)	
Telephone No.:			
Date of Tricel Novo Order:			
Work Order No.:			
Date of Delivery of Tricel Novo:			
Date of System Commissioning:			
Service Agreement Fee Paid:			
Date of Service Agreement Commencement:			
Unit Serial No.:			

During routine servicing, the service technician will perform a series of checks and procedures:

Checks:

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and in good condition.
- General appearance and condition of the treatment system is good.

Procedures:

- The blower is tested.
- The blower filter is replaced.
- The system alarm is tested.
- The pump and float-switch are tested (If applicable).
- The vents are cleared of any blockages.
- The sludge level in the primary chamber is measured.

Notes:

- Full inspection labour is covered (including any immediate minor system adjustment required). This service agreement does not cover the cost of any labour or materials that may arise as a result of this inspection.
- Components that require replacing will incur additional charges.
- All service agreements exclude de-sludging.

Tricel (Killarney) Unlimited Company trading as Tricel.

March 2017

Section 2: Information on the disposal route

The proposed solution for disposal is percolation trenches which consists of a series of pipework which distributes the effluent for treatment using in situ subsoil.

Based on a Population of 5 and a percolation value of 21-40 on the site, the chosen polishing filter for this site is percolation trenches. The minimum amount of pipe required will be 60m. This is based on trench length required per person for the given percolation value as stated in table 10.1 of the EPA Code of Practice 2021.

It recommends that each percolation trench should be equal in length and no longer than 10m

Please see attached the accompanying documents in Section 2 for the Percolation area

- Percolation area separation distances
- Construction Requirements

The location and construction of the percolation area is the responsibility of the site engineer. A full site layout drawing should accompany this report.

The EPA CoP 2021 outlines the design, siting and construction requirements for percolation areas.

The tables below outline some of the key factors to take into consideration when designing and locating a polishing filter.

Table 6.2: Minimum separation distances from the entire DWWTS

Features			DWWTS – periphery of tank/plant and infiltration/ treatment area (m)
Public/group water supply abstraction points/wells			60
Down-gradient domestic well	3 ≤ PV ≤ 10 (usually SAND- or GRAVEL-dominated material)	Depth of soil/subsoil > 2.0 m between invert level and bedrock, and water table 1.2–2.0 m	60
		Depth of soil/subsoil 2.0–8.0 m between invert level and bedrock, and water table > 2.0 m	40
		Depth of soil/subsoil > 8.0 m between invert level and bedrock, and water table > 2.0 m	30
	10 < PV ≤ 30 (usually SILT- or SAND- or silty GRAVEL-dominated material)	Depth of soil/subsoil 1.2–8.0 m between invert level and bedrock	45
		Depth of soil/subsoil > 8.0 m between invert level and bedrock	30
	30 < PV ≤ 120 (usually SILT/ CLAY- or CLAY-dominated material)	Depth of soil/subsoil 1.2–3.0 m between invert level and bedrock	40
		Depth of soil/subsoil ≥ 3.0 m between invert level and bedrock	30
Alongside domestic well			25
Up-gradient domestic well			15
Karst feature			15
Lake or foreshore			50
Watercourse/stream			10
Open drain or drainage ditch			10
Adjacent tank/plant and percolation area, polishing filter or infiltration area			10
On-site dwelling house			7 (tank/plant)
			10 (free water surface constructed wetland)
			10 (infiltration/ treatment area)
Neighbouring dwelling house			7 (tank/plant)
			25 (free water surface constructed wetland)
			10 (infiltration/ treatment area)
Surface water soakaway[a]			5
Road			4
Slope break/cuts			4
Trees[b]			3
Site boundary			3
Heritage features, NHA/SAC/SPA[c]			See note

PV, percolation value.

[a] The soakaway for surface water drainage should be located down-gradient of the infiltration/treatment area; it should also be ensured that this distance is maintained from neighbouring storm water disposal areas or soakaways.

[b] Tree roots may lead to PFPs developing. The canopy spread indicates potential root coverage.

[c] The distances required depend on the importance of the feature. Therefore, advice should be sought from the local authority and/or from the the Department of Housing, Local Government and Heritage, specifically the National Monuments Service and the National Parks and Wildlife Service.

Table 6.2 EPA CoP 2021: Minimum separation distances

Table 10.1: Infiltration/treatment area and trench length design for tertiary treatment, per PE

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m^2)	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m^2)	Area required per person (m^2)
3 ≤ PV ≤ 20	≥7.5	≥6	≥6	≥5	≥3.75
21 < PV ≤ 40	≥15	≥12	≥12	≥14	≥7.5
41 < PV ≤ 50	≥30	≥17	≥17	≥16	≥15
51 < PV ≤ 75	≥50	≥19	≥19	≥22	≥25
76 < PV ≤ 90	–	–	≥28	≥34	–
91 < PV ≤ 120	–	–	–	≥54	–

Table 10.1 from EPA CoP 2021 - Loading rates for the soil polishing filter

Table 7.3: Requirements of a percolation trench (gravity fed)

Percolation trench characteristics	Requirements
Slope of pipe from tank to distribution device	1 in 40 for earthenware or concrete, 1 in 60 for uPVC
Slope of percolation trench from distribution device	1 in 200
Length of percolation pipe in each trench	18 m maximum
Minimum separation distance between percolation trenches	2 m (2.5 m centre to centre)
Diameter of pipe from septic tank to distribution device	100–110 mm
Percolation pipes[a]	100 mm bore, perforated (typically at 4, 6 and 8 o'clock) smooth wall PVC drainage pipes with perforations of 8 mm diameter at about 75 mm centres along the pipe or pipes with similar hydraulic properties. Maximum of six pipes per distribution device
Width of percolation trench	500 mm
Depth of percolation trench	Ideally, about 850mm[b] below ground surface depending on site (as per Figures 7.1 and 7.3)
Depth of unsaturated soil and/or subsoil beneath percolation trench and above the bedrock and the water table	Minimum 1.2 m for GWPRs of R1 or R2[1]. Minimum 2.0 m for GWPRs of R2[2], R2[3], R2[4], R3[1] or R3[2]
Backfilling of percolation trench (see Figure 7.1)	300 mm of 12–32 mm washed gravel or broken stone aggregate on invert; pipe laid at a 1 in 200 slope surrounded by 12–32 mm clean washed gravel or broken stone aggregate and with 150 mm of similar aggregate over pipe; geotextile layer followed by topsoil to ground surface
Geotextile	Geotextile should be in accordance with EN ISO 10319
Access/inspection points and vents	These are recommended for the ends of the percolation pipes. The covers should be visible and installed to prevent entry of water. They may also be used for rodding or scouring purposes

a Before installation the holes in the percolation pipe should be inspected to check that they are the correct size and free from debris.

b The percolation pipes may be located at a shallower depth, provided that a minimum of 450 mm of material is placed above the pipes to provide the required protection against damage from above.

Table 7.3 EPA CoP 2021: Construction of percolation trenches. For secondary treated waste water, the maximum length of percolation pipe in each trench should be 10m as outlined in section 10.1.1 option 3

Terms and conditions:

Tricel cannot accept responsibility for incorrect site details or calculations as these are based on user inputs which are outside of Tricel control.
Full terms of website use are available at www.tricelsiteassessor.ie./TermsOfWebsiteUse

FOUL HOLDING TANKS

For buildings with low occupancy that require foul water management,

Foul water storage on site will be by means of 10,000Ltr underground cesspool tanks.

These cesspool tanks are simply holding tanks in which treatment does not take place.

Tanks shall be fitted with a 'high level' alarm for monitoring the tank for optimum usage and shall be emptied by a licensed waste carrier when full.

Each cesspool tank must be installed in a level condition and bedded on, and surrounded with, 225mm thickness of concrete.

The sizing of the tanks is calculated based on 5PE at 60Litres per day for a 31-day period.

5PE x 60l/day x 31 days = 9,300Litres.

A 10,000Ltr tank will provide an additional buffer of 700Litres/11.66 days usage.

Fig 1.Klargester 10,000Ltr

Example shown is a Klargester 10000Ltr underground cesspool tank.
Tank Weight: *680.000kg* - Dimensions: *L:3915mm* - Diameter: *2020mm*
Material: *GRP* - Invert *500mm*

NS GRP FORECOURT SEPARATORS - DECLARATION OF PERFORMANCE

kingspan-klargester-fs010-dop-en-oct2021-v1

1.Unique identification code of the product-type:

Separator Systems for Light Liquids, GRP Construction
FS010

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

Serial Number/Works Order Number printed on the Product Information Label & affixed to product

3. Intended use/es of the product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

Collection & Separation of Light Liquids from Wastewater by means of gravity and/or coalescence & able to contain a spillage from a 7,600 litre road tanker compartment.

4. Manufacturer name, registered trade name or registered trade mark and contact address as required under Article 11(5):

Kingspan Water & Energy Ltd
College Rd North
Aston Clinton, Aylesbury, Buckinghamshire
HP22 5EW

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

N/A

6. System/s of assessment and verification of constancy of performance (AVCP) of the product as set out in CPR, Annex V:

4

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN:858-1:2002

Notified body/ bodies:

Notified Body No: 1739 + PIA Prüfinstitut für Abwassertechnik GmbH

8. Declared performance/s:

Essential characteristics		Performance			Harmonised technical specification
Crushing Resistance (vertical load test)		Pass (also wet conditions)			EN:858-1:2002
Structural Behaviour		Pass			
Reaction to fire		Class E			
Water Tightness (water test)		Pass			
Material Durability		Creep Factor amaterial = 0,48 (average value)			
		Ageing Factor (β) = 0,46 (average value)			
Treatment Efficiency	Sample	Specified Maximum Light Liquid (mg/l)	Actual Light Liquid (mg/l)		
	1	≤10	<0.100	Pass	
	2	≤10	<0.130	Pass	
	3	≤10	<0.100	Pass	
	4	≤10	<0.100	Pass	
	5	≤10	<0.100	Pass	
	Average	≤5	<0.106	Pass	
Electrical Consumption		n/a			

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

David Anderson – Water Business Unit Director

At Portadown on 22 September 2021

Water Management Solutions

Separators
Product Brochure

Fully compliant range of Separators for a variety of commercial and industrial applications

kingspan.me/water

Kingspan®

Fuel/Oil Separators for Commercial and Industrial Applications

Contact our expert local separators team for technical advice on your project requirements.

Email **Water-ME@kingspan.com** and a member of our team will be in touch.

Surface water drains typically discharge to a watercourse or indirectly into underground waters (groundwater) via a soakaway. Contamination of surface water by oil, chemicals or suspended solids can cause these discharges to have a serious impact on the receiving water.

UK environment regulators, the Environment Agency; the Scottish Environment Protection Agency (SEPA); and the Department of Environment (DOE); have all published guidance on surface water disposal, which includes dealing with pollution both at source and at the point of discharge from site (so-called 'end of pipe' treatment). These techniques are known as 'Sustainable Drainage Systems' (SuDS).

Where run-off is draining from relatively low risk areas such as car parks and non-operational areas, a source control approach - such as permeable surfaces or infiltration trenches - may offer a suitable means of treatment, removing the need for a separator.

Oil separators are installed on surface water drainage systems to protect receiving waters from pollution by oil, which may be present due to minor leaks from vehicles or from across the plant, or from more major events like accidental spillage.

Effluent from industrial processes and vehicle washing should normally be discharged to the foul sewer (subject to the approval of the sewerage undertaker) for further treatment at a municipal treatment works.

Separator Standards and Types
The UK has adopted a two-part European Standard (BS EN 858-1:2002 and BS EN 858-2:2003; Reference 5) for the design, use, selection, installation, operation and maintenance of prefabricated oil separators.New prefabricated separators should comply with the standard.

Separator Classes
The standard refers to two 'classes' of separator, based on performance under standard test conditions.

Class I
Designed to achieve a concentration of less than 5mg/l of oil under standard test conditions, a Class I separator should be used when the separator is required to remove very small oil droplets. Class 1 separators always discharge to a watercourse.

Class II
Designed to achieve a concentration of less than 100mg/l oil under standard test conditions, Class II separators are suitable for dealing with discharges where a lower quality requirement applies. Class II separators discharge effluent to a foul sewer.

Bypass separators
Bypass separators fully treat all flows generated by rainfall rates of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows above this rate are allowed to bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small.

Full retention separators
Full retention separators treat the full flow that can be delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

On large sites, some short term flooding may be an acceptable means of limiting the flow rate and hence the size of full retention systems.

Forecourt separators
Forecourt separators are full retention separators specified to retain on site the maximum spillage likely to occur on a petrol filling station. They are required for both safety and environmental reasons and will treat spillages occurring during vehicle refuelling and road tanker delivery. The size of the separator is increased in order to retain the possible loss of the contents of one compartment of a road tanker, which may be up to 7,600 litres.

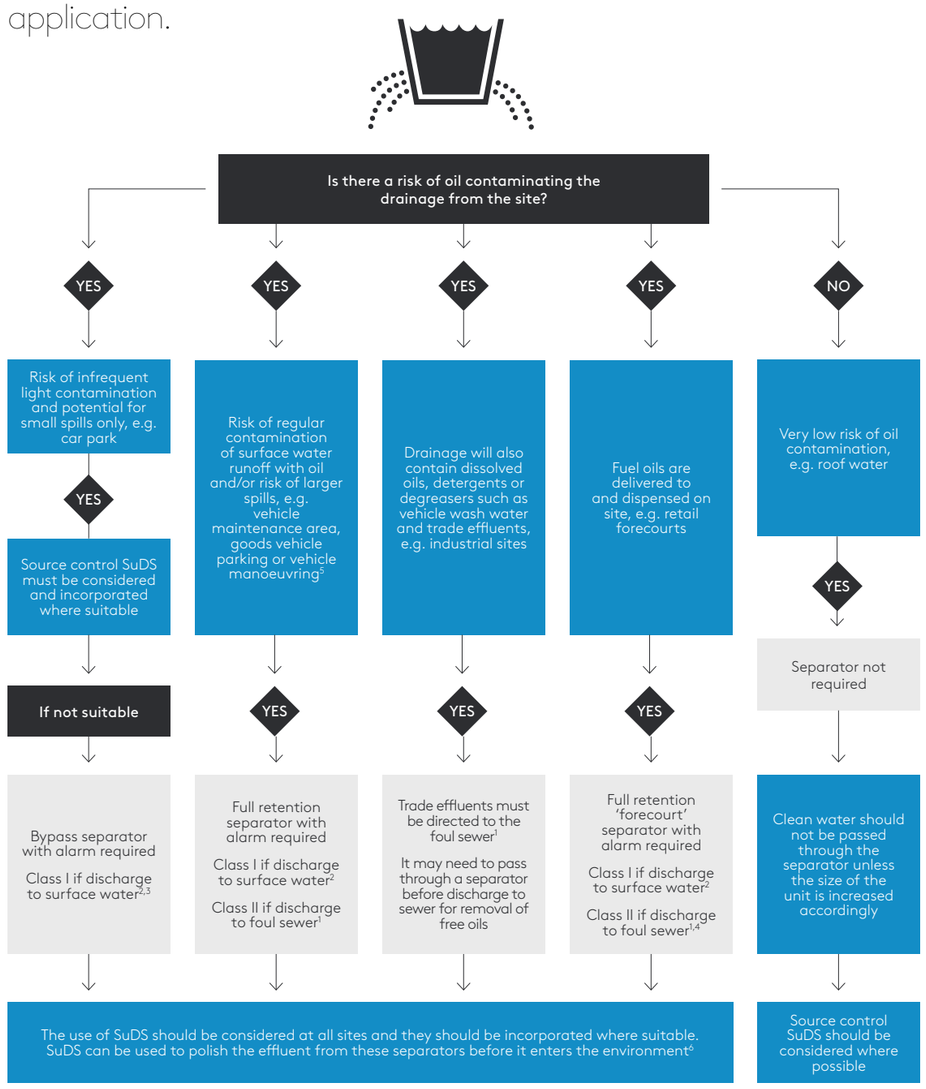
Selecting the right separator
The chart on the following page gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways. For further detailed information, please consult your local Water/Environmental Agency.

Kingspan has a specialist team who provide technical assistance in selecting the appropriate separator for your application.

Choosing the Right Separator

Kingspan has a specialist team who provide expert technical assistance in selecting the appropriate separator for your application.

The chart below gives guidance to aid selection of the appropriate type of fuel/oil separator for use in surface water drainage systems which discharge into rivers and soakaways.



1 You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.

2 You must seek prior permission from the relevant environmental body before you decide which separator to install.

3 In this case, if it is considered that there is a low risk of pollution a source control SuDS scheme may be appropriate.

4 In certain circumstances, the sewer provider may require a Class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.

5 Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.

6 In certain circumstances, a separator may be one of the devices used in the SuDS scheme. Ask us for advice.

Bypass Separators

NSB RANGE

Kingspan NSB range achieved on average <1mg/l under EN 858-1 testing conditions

Performance
Kingspan was one of the first UK manufacturers to have separators tested to BS EN 858-1. In 2006, we introduced the NSB range of bypass separators. The NSB number denotes the maximum flow at which the separator treats liquids. The British Standards Institute (BSI) tested the required range of Kingspan bypass separators, and certified their performance in relation to their flow and process performance, assessing the effluent qualities to the requirements of BS EN 858-1. Kingspan bypass separator designs follow the parameters determined during the testing of the required range of bypass separators.

Each bypass separator design includes the necessary volume requirements for:
- Oil separation capacity
- Oil storage volume
- Silt storage capacity
- Coalescer (Class 1 units only).

The unit is designed to treat the first 10% of peak flow ('first flush principle'). The calculated drainage areas served by each separator are indicated according to the formula NSB = 0.0018A(m^2). Flows generated by higher rainfall rates will pass through part of the separator, bypassing the separation chamber.

Class I separators are designed to achieve a concentration of 5mg/litre of oil under standard test conditions.

Features
Light and easy to install.
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Oil alarm system available (required by BS EN 858-1)
- Extension access shafts for deep inverts
- Maintenance from ground level
- GRP or rotomoulded construction (subject to model).

To specify a nominal size bypass separator, the following information is needed:

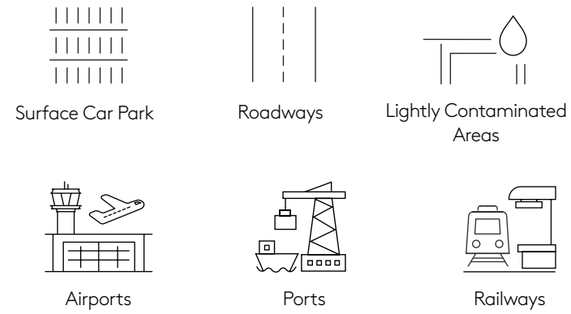
- The calculated flow rate for the drainage area served. Our designs are based on the assumptions that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the flow is not pumped
- The drain invert inlet depth
- Pipework type, size and orientation.

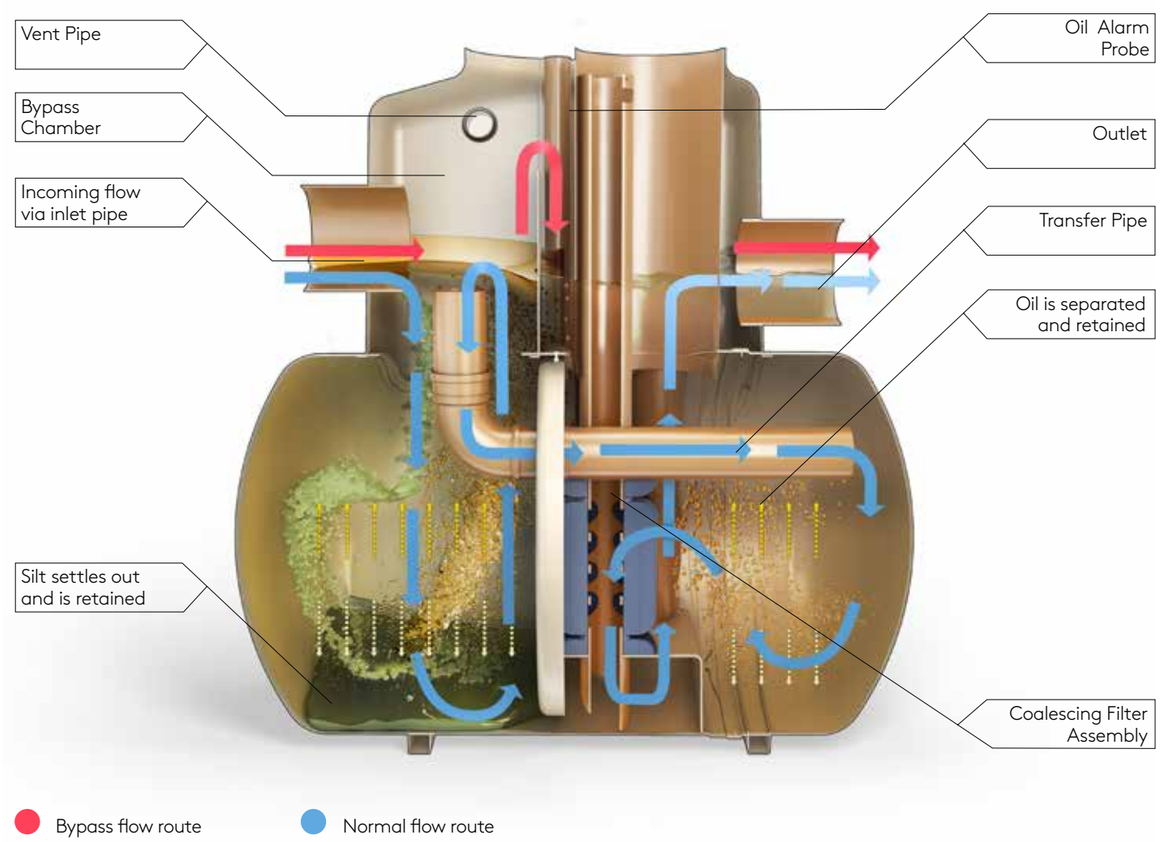
Technical Specifications

Model Reference	Flow (l/s)	Peak Flow Rate (l/s)	Drainage Area(M^2) Based on UK rainwater flow	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)**
				Silt	Oil								
Polyethylene Chamber Construction													
NSBP003	3	30	1670	300	45	1700	1350	600	1420	1320	100	500	160
NSBP004	4.5	45	2500	450	60	1700	1350	600	1420	1320	100	500	160
NSBP006	6	60	3335	600	90	1700	1350	600	1420	1320	100	500	160
GRP Chamber Construction													
NSBE010	10	100	5560	1000	150	2069	1220	750	1450	1350	100	700	315
NSBE015	15	150	8335	1500	225	2947	1220	750	1450	1350	100	700	315
NSBE020	20	200	11111	2000	300	3893	1220	750	1450	1350	100	700	375
NSBE025	25	250	13890	2500	375	3575	1420	750	1680	1580	100	700	375
NSBE030	30	300	16670	3000	450	4265	1420	750	1680	1580	100	700	450
NSBE040	40	400	22222	4000	600	3230	1920	600	2185	2035	150	1000	500
NSBE050	50	500	27778	5000	750	3960	1920	600	2185	2035	150	1000	600
NSBE075	75	750	41667	7500	1125	5841	1920	600	2235	2035	200	950	675
NSBE100	100	1000	55556	10000	1500	7661	1920	600	2235	2035	200	950	750
NSBE125	125	1250	69444	12500	1875	9548	1920	600	2235	2035	200	950	750

** Systems to cater for larger flow rates are available on request. Email water-ME@kingspan.com for further information.*
** Some units have more than one access shaft – diameter of largest shown | ** Larger pipework available on request.*

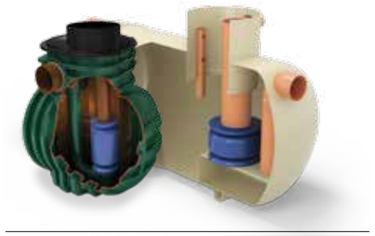
Applications
Kingspan's range of bypass separators are typically used for the following applications:





Full Retention Separators

NSF RANGE



Kingspan NSF range achieved on average <1mg/l under EN 858-1 testing conditions

Performance
Kingspan were the first UK manufacturer to have the required range (3-30 l sec) certified to BS EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates. The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they meet the effluent quality requirements of BS EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity
- Oil storage volume
- Silt storage capacity
- Coalescer (Class I units only)
- Automatic closure device.

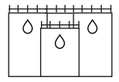
Kingspan full retention separators treat the whole of the specified flow.

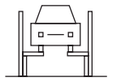
Features
- Light and easy to install
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Oil alarm system available
- Vent points within necks
- Extension access shafts for deep inverts
- Maintenance from ground level
- GRP or rotomoulded construction (subject to model)

To specify a nominal size full retention separator, the following information is needed:

- The calculated flow rate for the drainage area served. Our designs are based on the assumptions that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped
- The required discharge standard
- The drain invert inlet depth
- Pipework type, size and orientation.

Applications
Full retention separators are used in high risk spillage areas such as:


Fuel Distribution Depots


Vehicle Workshops


Scrap Yards


Airports

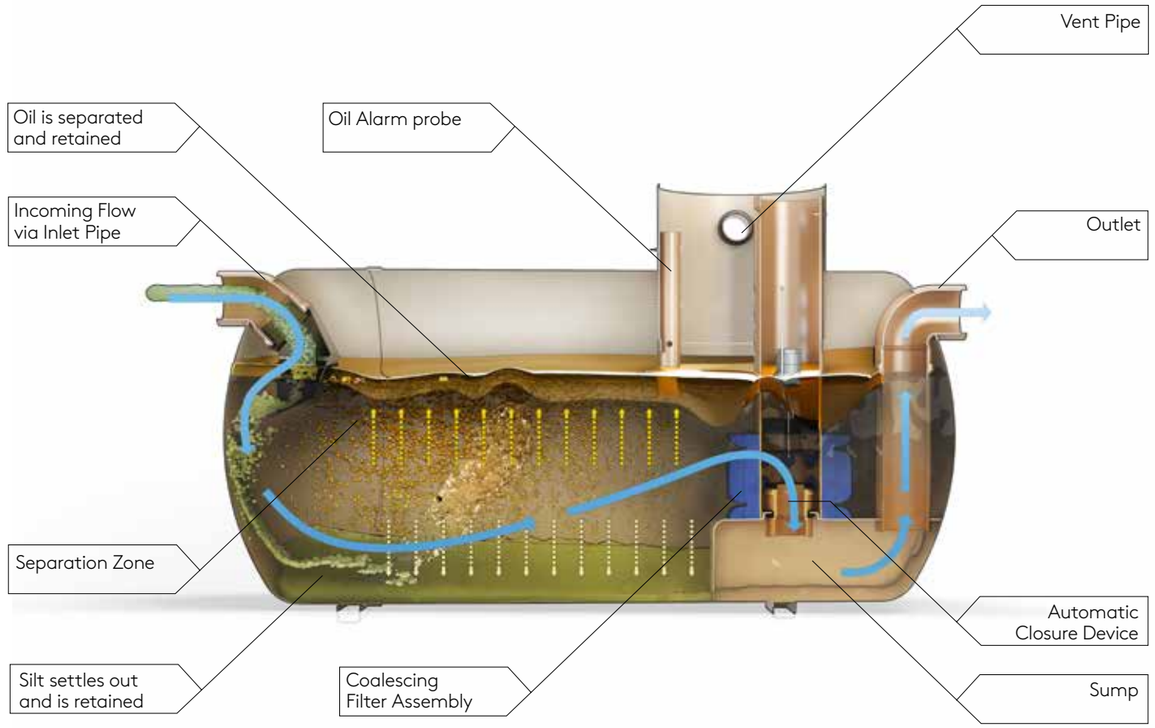

Ports


Railways

Technical Specifications

Model Reference	Flow (l/s)	Drainage Area (m2) PPG-3 (0.018)	Storage Capacity (Ltrs)		Length (mm)	Diameter (mm)	Manhole Cover Dimensions (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)
			Silt	Oil							
Polyethylene Chamber Construction											
NSFP003	3	170	300	30	1700	1350	600	1410	1335	550	160
NSFP006	6	335	600	60	1700	1350	600	1410	1335	550	160
GRP Chamber Construction											
NSFA010	10	555	1000	100	2610	1225	600	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	600	1050	1000	1000	200
NSFA020	20	1115	2000	200	3200	2010	600	1810	1760	1000	315
NSFA030	30	1670	3000	300	3915	2010	600	1810	1760	1000	315
NSFA040	40	2225	4000	400	4640	2010	600	1810	1760	1000	315
NSFA050	50	2780	5000	500	5425	2010	600	1810	1760	1000	315
NSFA065	65	3160	6500	650	6850	2010	600	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	600	2500	2450	1000	315
NSFA100	100	5560	10000	1000	6200	2820	600	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	600	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	600	2500	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	600	2500	2450	1000	525
NSFA200	200	11110	20000	2000	11,280	2820	600	2500	2450	1000	600

** Systems to cater for larger flow rates are available on request. Email water-ME@kingspan.com for further information*
** Some units have more than one access shaft – diameter of largest shown.*



Forecourt Separators

Compliance
Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.

In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt. The separator has been designed to ensure that oil cannot exit the separator in the event of a major spillage, therefore the separator should be emptied immediately.

Features
- Light and easy to install
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Extension access shafts for deep inverts
- Maintenance from ground level
- Class I and Class II design
- Oil storage volume
- Coalescer (Class I unit only)
- Automatic closure device
- Oil alarm system available

Installation
The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill.

If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.

The separator should be installed and vented in accordance with local Health and Safety guidelines.

Technical Specifications

Separator Class	Backfill Type	Total Capacity (Ltrs)	Drainage Area (m^2)	Peak Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base to Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Empty Weight (kg)
I/II	Concrete	10000	835	15	3915	2020	600	2180	2130	50	600	160	620
I/II	Concrete	10000	1115	20	3915	2020	600	2180	2130	50	600	200	620

Local and remote separator monitoring solutions

Kingspan offer both local oil level alarm systems and remote monitoring solutions, specifically designed to help you manage your separator system(s).

SmartServ Remote Monitoring Solution
Kingspan's intelligent fuel/oil separator monitoring system ('SmartServ') is a cost effective solution designed to offer greater control over your separator system. SmartServ is also fully compliant with British European Standard EN 858-1.

Benefits
- Helps avoid costly overflows
- Saves money
- Greater control over assets

Oil Level Alarm System
British European Standard EN 858-1 requires that all separators are to be fitted with an oil level alarm system and that it should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

Benefits
- Easily fitted to existing tanks
- Excellent operational range
- Visual and audible alarm

Washdown and Silt Units

Performance
Vehicle wash down facilities must not be allowed to discharge directly into surface water. Instead, their discharge must be directed to a foul connection leading to a municipal treatment works as it is likely to contain emulsifiers, soaps and detergents, which can dissolve and disperse the oils.

Features
- Light and easy to install
- Inclusive of silt storage volume
- Fitted inlet/outlet connectors
- Vent points within necks
- Extension access shafts for deep inverts

Applications


Car Wash


Tool Hire Depots

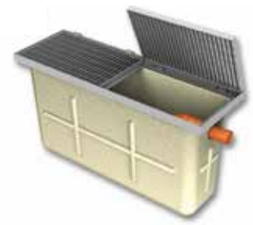

Truck Cleansing


Construction compounds cleansing points

Technical Specifications

Model Ref	Total Capacity (Ltrs)	Max.rec. Silt (Ltrs)	Max. Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base To Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Approx. Empty (Kg)
W1/010	1000	500	3	1123	1225	460	1150	1100	50	500	160	60
W1/020	2000	1000	5	2074	1225	460	1150	1100	50	500	160	120
W1/030	3000	1500	8	2952	1225	460	1150	1100	50	500	160	150
W1/040	4000	2000	11	3898	1225	460	1150	1100	50	500	160	180
W1/060	6000	3000	16	4530	1440	600	1360	1310	50	500	160	320
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160	585
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160	680
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160	770
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160	965
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160	1200

Car Wash Silt Trap



Features
- FACTA Class B covers
- Light and easy to install
- Maintenance from ground level

Technical Specifications

Model Ref	Total Capacity (Ltrs)	Max.rec. Silt (Ltrs)	Max. Flow Rate (L/s)	Length (mm)	Diameter (mm)	Access Shaft Diameter (mm)	Base Inlet Invert (mm)	Base To Outlet Invert (mm)	Standard Fall Across (mm)	Min Inlet Invert (mm)	Standard Pipework Diameter (mm)	Approx. Empty (Kg)
W1/080	8000	4000	22	3200	2020	600	2005	1955	50	500	160	585
W1/100	10000	5000	27	3915	2020	600	2005	1955	50	500	160	680
W1/120	12000	6000	33	4640	2020	600	2005	1955	50	500	160	770
W1/150	15000	7500	41	5435	2075	600	1940	1890	50	500	160	965
W1/190	19000	9500	52	6865	2075	600	1940	1890	50	500	160	1200

Middle Eastern Installations

Kingspan operate in over 85 countries worldwide, with currently over 5 million water management system installations. Take a look at a selection of our case studies below.

Experience

OVER 60 YEARS

QA

Hamad International Airport
Qatar
Fuel/Oil Separators

EAU

Jumeirah Lake Towers
Dubai
Fuel/Oil Separators

EAU

Four Seasons Hotel
Abu Dhabi
Fuel/Oil Separators and Grease Separators

OM

Sohar Labour Camp
Oman
Forecourt Separators and Sewage Treatment Plants

KW

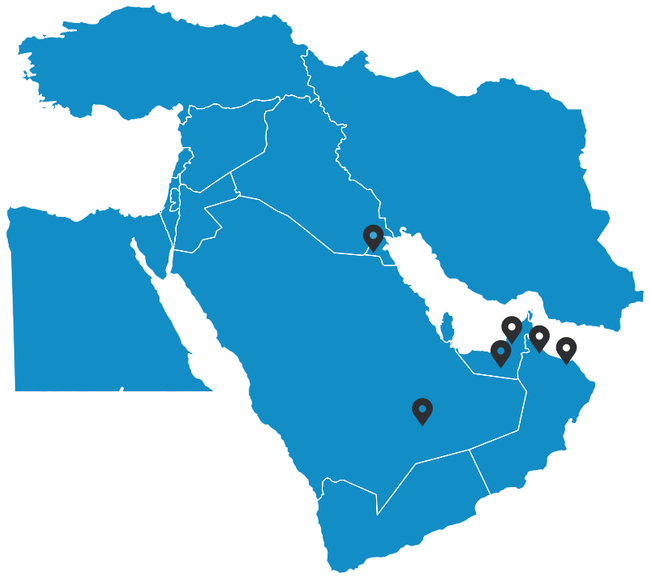
AZ-Zour Desalination Plant
Kuwait City
Fuel/Oil Separators and Package Pumping Stations

OM

Muscat Airport
Oman
Fuel/Oil Separators

SA

Haramain 'Western Railway' High Speed Rail Project
Saudi Arabia
Fuel/Oil Separators



Other Water Management Solutions from Kingspan

Expert Advice Available

Kingspan offer a full range of commercial, domestic and industrial wastewater treatment solutions. To find out more information on any of our products featured, email water-ME@kingspan.com or visit our website at kingspan.me/water

Domestic Sewage Treatment Plants

Commercial Sewage Treatment Plants

Domestic and Commercial Pumping Stations

Rainwater Harvesting Systems

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Hydro International

Stormbloc® Optimum Range

Attenuate or infiltrate surface water effectively even in challenging urban environments

Product Summary

The Stormbloc® Optimum range comprises two resilient geocellular storage systems that provide underground storage and infiltration of surface water runoff; **Stormbloc® Extra** and **Stormbloc®**, plus an inspection chamber, the **Stormbloc® Inspect**.

The system helps meet Sustainable Drainage System (SuDS) objectives by returning stormwater back to the natural water cycle at or near its source, without taking up valuable space for amenity or development above ground.

The lightweight materials, combined with robust design make them easy to transport, quick to install and extremely durable. With an optimum-strength option for high-traffic areas and a lighter option for landscape and low-traffic areas, the Stormbloc® Optimum range provides a space-saving solution for many applications.

Applications

- New and retrofit Sustainable Drainage (SuDS) schemes.
- Infiltration / soakaway schemes.
- Attenuation schemes.
- Highways and infrastructure projects.
- To increase swale / pond capacity.
- Car parks and Park & Ride schemes.
- Housing Developments.
- Schools and Public / Civil schemes.
- Aquifer re-charge.
- Storage for rainwater harvesting and re-use

Benefits

Maximise storage

The Stormbloc® Optimum range can store 960 litres of stormwater below ground in 1 cubic metre of volume, more than 60% more stormwater storage in the same volume when compared to conventional gravel infiltration trenches.

Save space on site

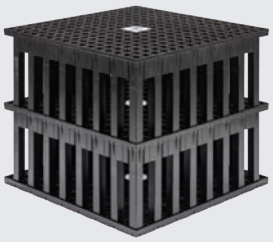
Both Stormbloc® Extra and Stormbloc® stack into compact nests for transport and storage, saving up to 75% of valuable space. The nested units save time and cost during installation, enabling more storage volume to be lifted into excavations at any one time.

Lightweight with two strength options

For more flexible designs choose between the high-strength Stormbloc® Extra for deep or high-loaded installations and Stormbloc® for shallower installations with lighter loads such as landscaped or low-traffic areas.

Stormbloc® Optimum range

Stormbloc®



A lighter, cost-effective option suitable for landscaped or low-traffic areas. Access for inspection and maintenance can be included where required using Stormbloc® Inspect chambers and Stormbloc® Extra blocks.

Stormbloc® Extra

A high-strength option ideal for installation beneath high-traffic areas such as roads, car parks and warehouse yards. Access for inspection and maintenance is via Stormbloc® Inspect chambers and the channels in the blocks allow access for CCTV and cleaning to ensure that the storage volume of the system isn't reduced by the build up of silts.

Stormbloc® Inspect

The Stormbloc® Inspect offers an unrivalled level of accessibility to any Stormbloc® Extra or Stormbloc® installation. This modular access chamber, sited within the tank, has identical dimensions to a Stormbloc® Extra module and so can be easily incorporated into the layout of the infiltration or storage system.

Find out about the Stormbloc® Optimum range can help you design cost-effective, space-saving surface water control systems:

→ **https://hydro-int.com/en/stormbloc-optimum**

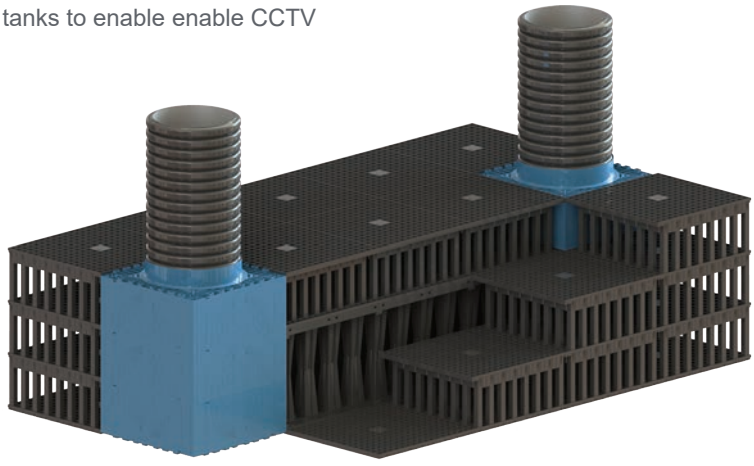
Technical information

	Stormbloc®		Stormbloc® Extra		
Application suitability	Lighter loaded areas, such as landscaped or low traffic areas (cars ≤ 2.5t)		Heavy loaded area and High-traffic areas such as car parks, roads and warehouse yards.		
Maximum installation depth	3 m		4 m		
Cover depth	Landscaped area, no traffic	Light traffic loading ≤ 2.5 t	Landscaped area, no traffic	Light traffic loading ≤ 2.5 t	Roads & HGV loading yards with traffic loading ≤44 t
	0.5 m - 1.5 m	0.8 m - 1.5 m	≥0.4 m	≥0.6 m	≥0.8 m
Material	Polypropylene (up to 100% recycled material)		Polypropylene		
	Half block		Full block		Half block
Length / Width / Height	800 / 800 / 330 mm (Note: for the bottom layer add 30 mm for the base plate)		800 / 800 / 660 mm		800 / 800 / 360 mm
Nominal block volume	0.230 m^3		0.422 m^3		0.230 m^3
Nominal storage capacity per unit	0.220 m^3		0.405 m^3		0.221 m^3
Constructed weight	10 kg (1 element and 1 baseplate)		18.6 kg		13.7 kg
Porosity	96%		96 %		96%
Vertical ultimate compressive strength	313 kN/m^2		420 kN/m^2		420 kN/m^2
Horizontal ultimate compressive strength	93 kN/m^2		165 kN/m^2		225 kN/m^2

Inspection and maintenance

To ensure that the storage volume of the systems aren't compromised by the build up of silts, Stormbloc® Inspect chambers can be added to Stormbloc® Extra tanks to enable enable CCTV inspection, maintenance and cleaning.

Access for inspection and maintenance of Stormbloc® tanks can be provided by adding Stormbloc® Inspect chambers and constructing a row of Stormbloc® Extra blocks through the tank.



Smart Maintenance

A Hydro-Logic® Smart Maintenance package can be added to either Stormbloc® Extra or Stormbloc® tanks to provide near real-time level information and send automated alerts when the tank requires maintenance.

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Web: hydro-int.com

Find out more about our flow control and storage/infiltration solutions. Book a free training session at:

→ hydro-int.com/en/uk-cpd