

ATTACHMENT E1 – EMISSIONS TO SURFACE WATER

The Applicant site lies at the edge of the catchment area for the Ward River which runs approximately 4km north of the site. The nearest watercourses to the application site are artificial (man made) ditches and/or small tributary streams on the eastern side which flow north towards the Ward River.

The only sub-surface water drainage infrastructure at the site at the site exists across the central infrastructure area where aggregate processing and concrete production activities are currently concentrated. Rain falling across the remainder of the application area either

- runs over unsealed ground into the existing quarry void and the pond on the eastern side of the quarry floor
- percolates down through the existing soil / rock at the ground surface as recharge to groundwater, at which point it joins groundwater flow toward the quarry face.

At the present time, groundwater levels at the North Quarry are lowered by means of sumps in the quarry floor. Surface water falling across the quarry and dewatered groundwater are collected in a pond on the eastern side of the quarry floor and pumped to an existing drainage channel / watercourse at original ground surface level via an existing pipe network. Water pumped to this channel is routed via existing settlement lagoons to discharge to a tributary stream which runs northwards out of the Applicant's property holding toward the Ward River. This discharge is regulated by way of a discharge licence issued by Fingal County Council.

During the proposed quarry backfilling operations, the upper surface of the backfilled soil will be graded so as to ensure that surface water run-off falling over the quarry footprint falls to sumps at temporary low points within the quarry floor or backfilled material. These temporary sumps will effectively function as primary settlement ponds and water collecting in them will be pumped (causing minimum agitation to ponded water) to the existing drainage channel / watercourse on the eastern side of the quarry. Water pumped to this channel will be routed via the existing settlement lagoons to discharge to the tributary stream which runs north toward the Ward River. Should it ever be necessary, additional settlement ponds and/or an oil interceptor can be provided to achieve discharge emission standards.

As previously outlined, any suspect contaminated waste imported to the proposed waste facility will be transferred to a covered shed in the south eastern corner of the application site. As the floor of the shed is sealed by a concrete slab and as no rainfall will come into contact with consignments of suspected contaminated waste, there is no requirement to install drainage infrastructure to provide for the separate collection and storage of potentially contaminated surface water run-off at the waste inspection and quarantine facility.

In the longer term, toward the end of the quarry backfilling works, the final restoration surface within and around the backfilled quarry void will be modified to ensure that surface water run-off across the area falls eastward toward the tributary stream of the Ward River (refer to the proposed restoration plan in Figure 2-4 of the Environmental Impact Statement).

Further details of surface water management at the waste recycling facility are provided in Chapter 2, Paragraphs 2.31 to 2.36 of the Environmental Impact Statement which accompanies this application.

TABLE E.1(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point:

Emission Point Ref. N ^o :	W4
Source of Emission:	Collected surface water run-off (rainfall) arising within the footprint of the existing quarry void
Location :	East of North Quarry, immediately downstream of existing settlement pond
Grid Ref. (10 digit, 5E,5N):	31117E 24178N
Name of receiving waters:	Existing unnamed stream east of north Quarry. Identified as a tributary stream of Ward River
Flow rate in receiving waters:	Discharge Point located close to head of sub-catchment for Tributary Stream of Ward River 0.004 m ³ .sec ⁻¹ Dry Weather Flow 0.008m ³ .sec ⁻¹ 95%ile flow
Available waste assimilative capacity:	Refer to Table E.1 (ii)

Emission Details:

(i) Estimated volume to be emitted			
Normal/day	246.1 m ³ /day	Maximum/day	2,800 m ³ /day (1 in 100yr rainfall event)
Maximum rate/hour	116.7m ³ /hr (1 in 100yr rainfall event)		

TABLE E.1(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : W4 (to be established)

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	Max. ¹ (kg/day)	Max. ¹ (kg/year)	
Total Suspended Solids	<u>Not Monitored</u>	<u>Not Monitored</u>			35mg/l	35mg/l	8.61kg/day	3142kg/yr	
pH	<u>Not Monitored</u>	<u>Not Monitored</u>			9	9			
Biochemical Oxygen Demand	<u>Not Monitored</u>	<u>Not Monitored</u>			25mg/l	25mg/l	6.15kg/day	2245kg/yr	
Nitrate	<u>Not Monitored</u>	<u>Not Monitored</u>			50mg/l	50mg/l	12.3kg/day	4490kg/yr	
Chemical Oxygen Demand	<u>Not Monitored</u>	<u>Not Monitored</u>			100mg/l O ₂	100mg/l O ₂	24.6kg/day O ₂	8979kg/yr O ₂	
Total Hydrocarbons	<u>Not Monitored</u>	<u>Not Monitored</u>			1mg/l	1mg/l	0.25kg/day	91.3kg/yr	

¹ Based on average daily flow rate of 246m³/day



River Name	(08_645)
XY Location	312546,243696 (ING)

River Segment Map



Disclaimer

The source hydrometric data used to estimate the flow duration curve ordinates for ungauged catchments was obtained from (1) water level data and (2) the rating curve(s) generated for each hydrometric station. The Environmental Protection Agency and the Office of Public Works used these data, respectively, to calculate daily mean flows. The daily mean flows were then used by the Environmental Protection Agency to prepare flow duration curves for each station. Neither body accepts any liability for the subsequent handling of the data.



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The user should familiarise himself/herself with the catchment being studied and confirm that the ungauged site is in a natural catchment where flows conditions are suitable for the use of the model.

It is strongly recommended that the user examine the catchment descriptors contained in the report produced and confirm that the percentages of the various constituent elements are comparable to a natural catchment.

If the flow in a catchment is not entirely natural, the estimation of flows using the model in these catchments could be affected due to:

- existence of local conduit karst within the catchment;
- the selected location itself is on local conduit karst;
- regulation of the river flow on the river channel (e.g. power station, sluice gates etc)
- impacts of abstractions upstream of the selected location or the impact of the discharge associated with the abstraction into the same/different catchment;
- estimates of flow being sought at locations effected by storage effects at, or near, lake outfalls;
- lack of similar catchments with observed flows, ie where catchment descriptors lie outside the range of available gauging station catchments (e.g. the catchment area is under 5 km²);
- any other special circumstances that may affect river flows.

Expert judgement will be required to ensure that the estimate of flow is not unduly affected by any of these influences.

Please note that the model does not provide estimates of flood peaks and, specifically, should not be used for that purpose.

The EPA has also prepared estimates of DWF and long term 95 percentile flows which are also presented on the EPA web site. These data are presented at <http://www.epa.ie/whatwedo/monitoring/water/hydrometrics/data/>

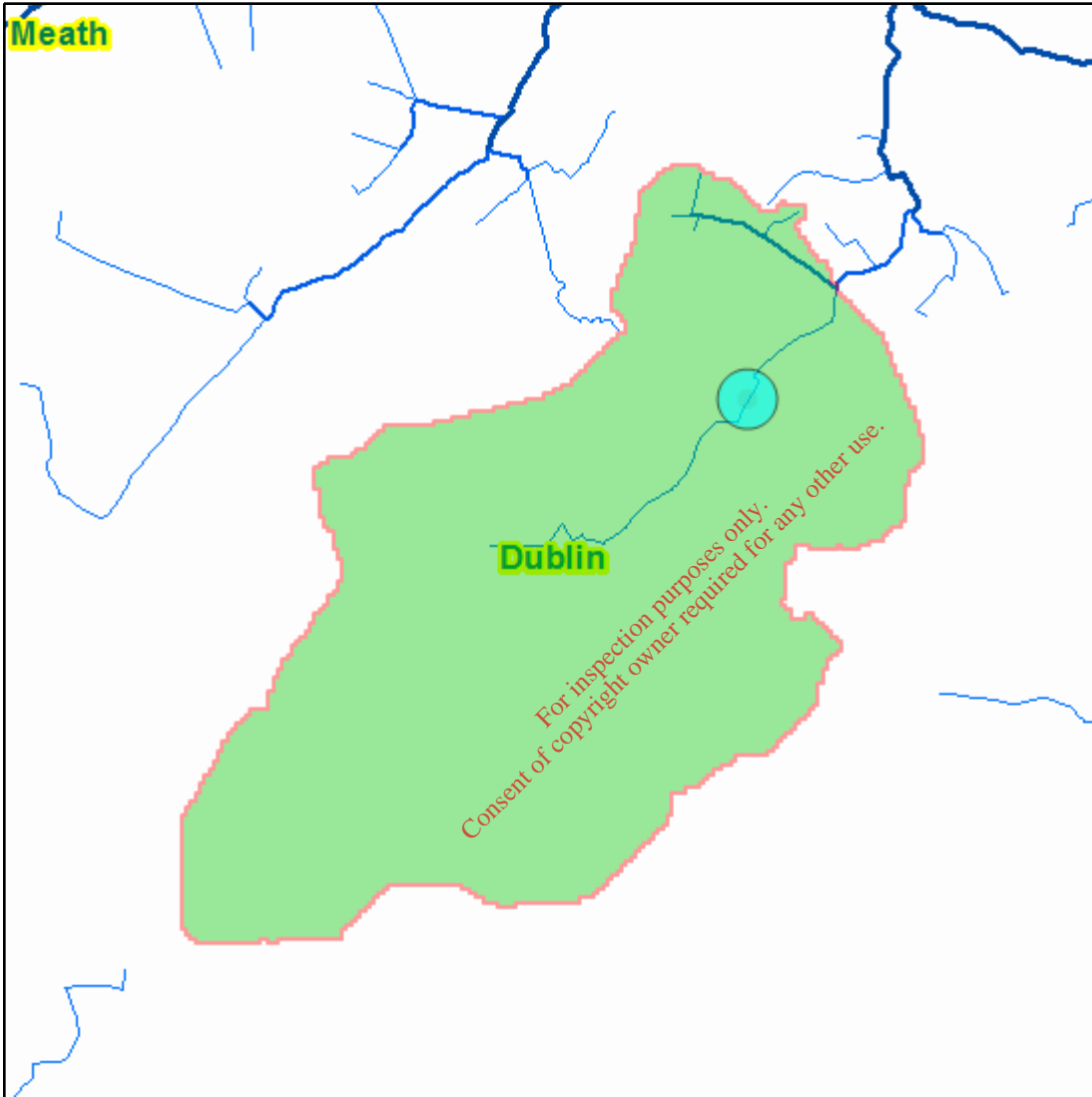
The data produced by the model for specific stations should be compared to the data contained in this file of DWF and long term 95percentile flows.

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River Name	(08_645)
XY Location	312546,243696 (ING)

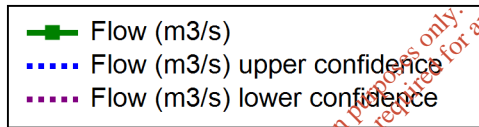
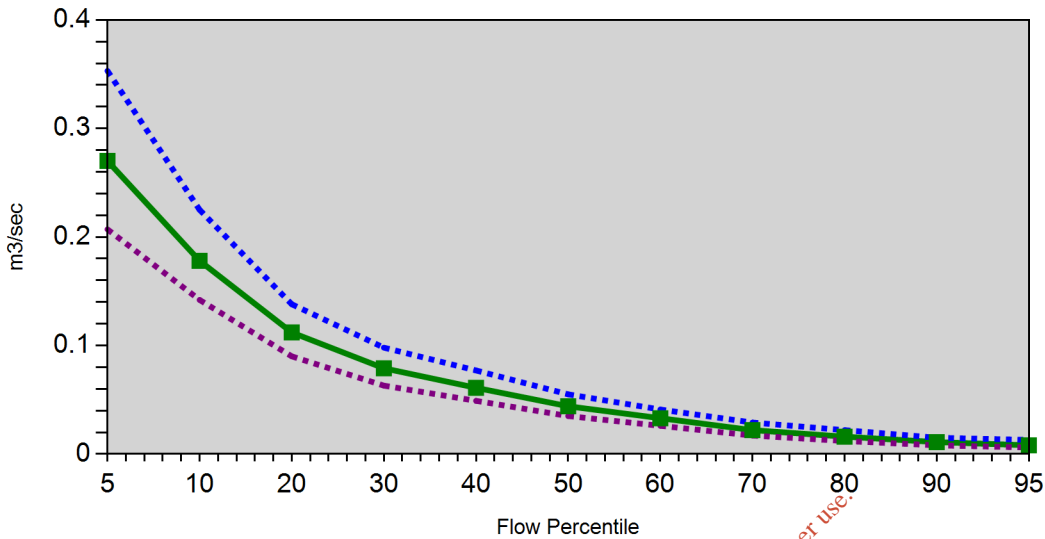
Nested Catchment Map



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Flow Duration Curve (Flow in m3/sec)



%ile	flow(m3/sec)	upper 95% confidence limit m3/sec	lower 95% confidence limit m3/sec
5	0.27	0.353	0.207
10	0.178	0.225	0.142
20	0.112	0.138	0.09
30	0.079	0.098	0.063
40	0.061	0.077	0.049
50	0.044	0.055	0.035
60	0.033	0.041	0.026
70	0.022	0.029	0.017
80	0.016	0.022	0.012
90	0.011	0.015	0.008
95	0.008	0.013	0.006

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Catchment Descriptors		
General		
Descriptor	Unit	Value
Area	sq km	5.9
Average Annual Rainfall (61-90)	mm/yr	744
Stream Length	km	2.3
Drainage Density	Channel length (km)/catchment area (sqkm)	0.4
Slope	Percent Slope	1.3
FARL	Index (range 0:1)	1

Soil	
Code	% of Catchment
Poorly Drained	27.3
Well Drained	58.7
Alluvmin	1.3
Peat	0
Water	0
Made	12.7

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Subsoil Permeability		
Code	Explanation	% of Catchment
H	High	2.8
M	Moderate	0
L	Low	51.2
ML	Moderate/Low	0
NA	No Subsoil/Bare Rock	46

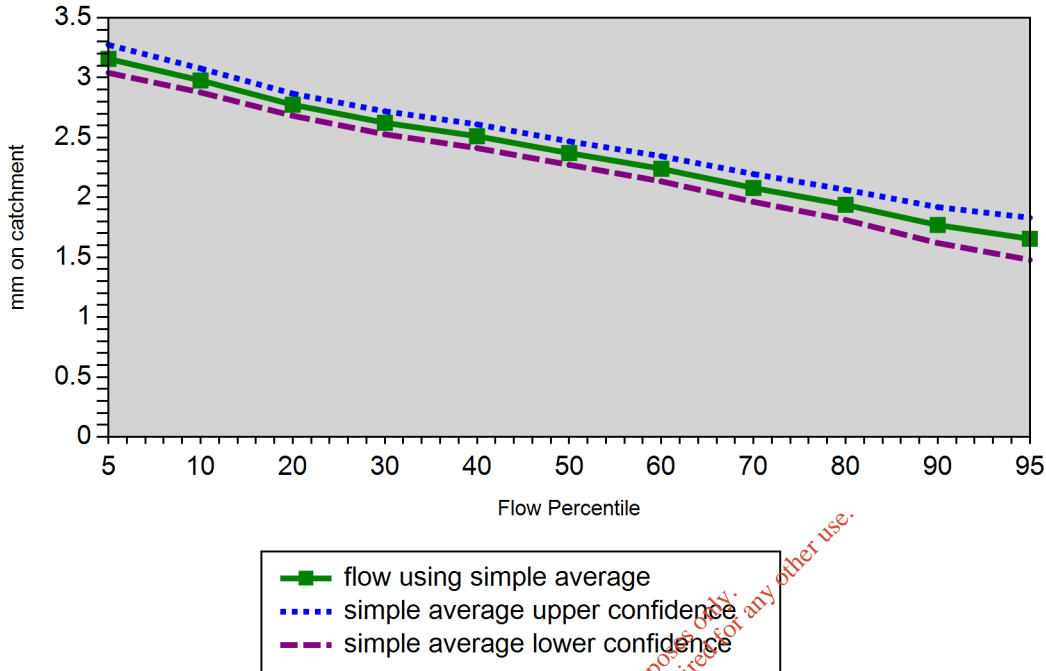
Aquifer		
Code	Explanation	% of Catchment
LG_RG	LG: Locally important sand-gravel aquifer RG: Regionally important sand-gravel aquifer	0
LL	Locally important aquifer which is moderately productive only in local zones	63.5
LM_RF	LM: Locally important aquifer which is generally moderately productive RF: Regionally important fissured bedrock aquifer	0
PU_PL	PU: Poor aquifer which is generally unproductive PL: Poor aquifer which is generally unproductive except for local zones	36.5
RKC_RK	Regionally important karstified aquifer dominated by conduit flow	0
RKD_LK	Regionally important karstified aquifer dominated by diffuse flow	0

Stations in Pooling group			
%ile Flow	Station 1	Station 2	Station 3
5	09049	08002	09102
10	09049	08002	09102
20	09049	08002	09102
30	09049	08002	09102
40	09049	08002	09002
50	25222	08002	15005
60	25222	08002	15005
70	25222	08002	15005
80	25222	15005	15010
90	25222	15005	15010
95	25222	15005	15010

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Flow Duration Curve (mm on catchment)

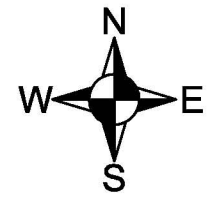
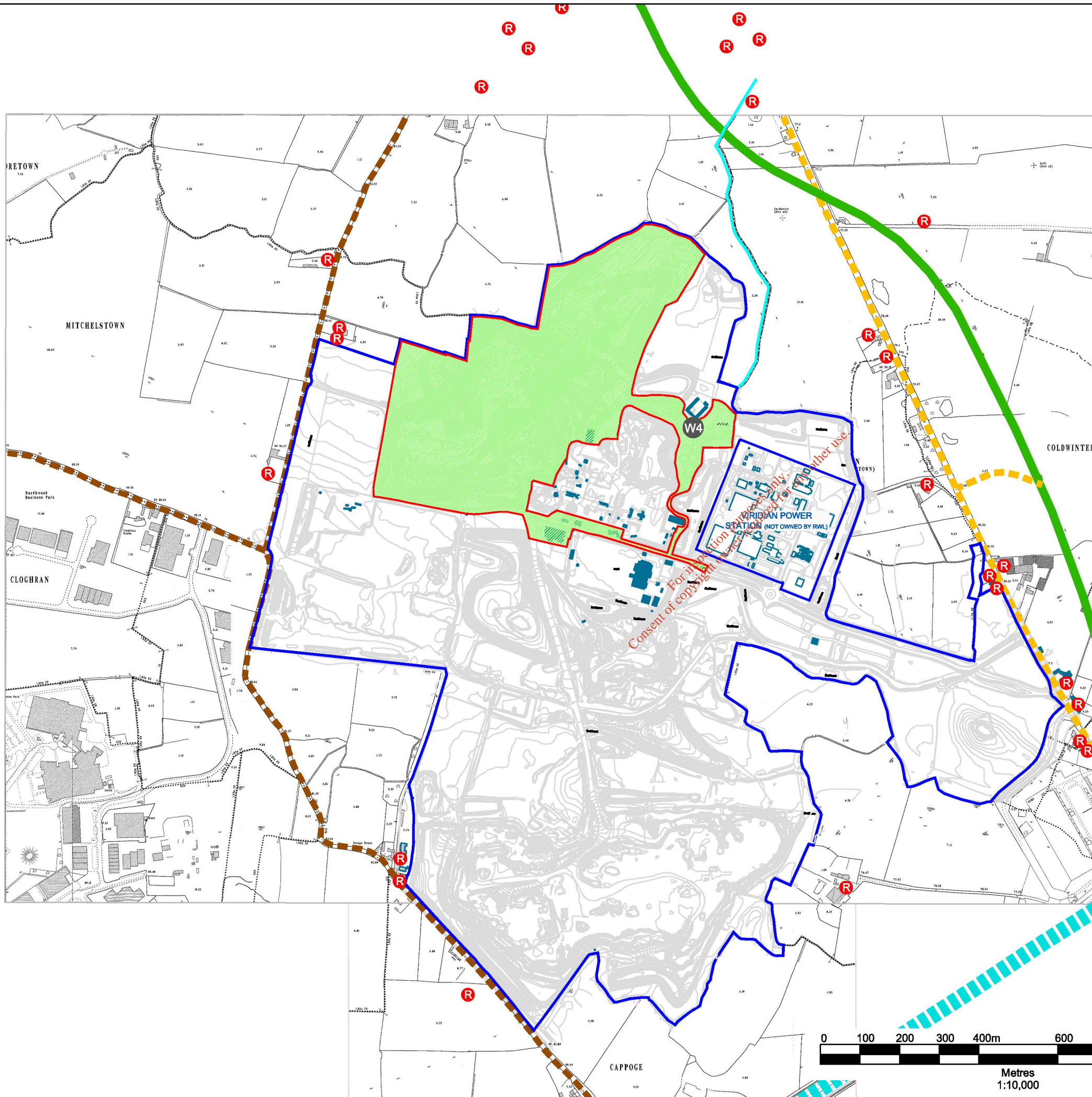


Log Flow (mm on catchment)			
%ile	mm	upper 95% confidence limit	lower 95% confidence limit
5	3.157	3.274	3.04
10	2.977	3.077	2.877
20	2.774	2.866	2.682
30	2.623	2.719	2.527
40	2.511	2.61	2.412
50	2.37	2.468	2.272
60	2.239	2.344	2.134
70	2.079	2.195	1.963
80	1.938	2.064	1.812
90	1.769	1.919	1.619
95	1.654	1.83	1.478

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- NOTES**
1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
 2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000711 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND
 3. TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

- LEGEND**
- ROADSTONE WOOD LTD. LANDHOLDING (c. 201.8 ha)
 - WASTE LICENCE APPLICATION AREA (c. 35.9 ha)
 - N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
 - NORTH ROAD (R135)
 - LOCAL ACCESS ROAD
 - M50 MOTORWAY
 - LOCATION OF NEAREST RESIDENCES
 - SURFACE WATER EMISSION POINT

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 NORTH ROAD, FINLAS, DUBLIN 11
SURFACE WATER EMISSIONS

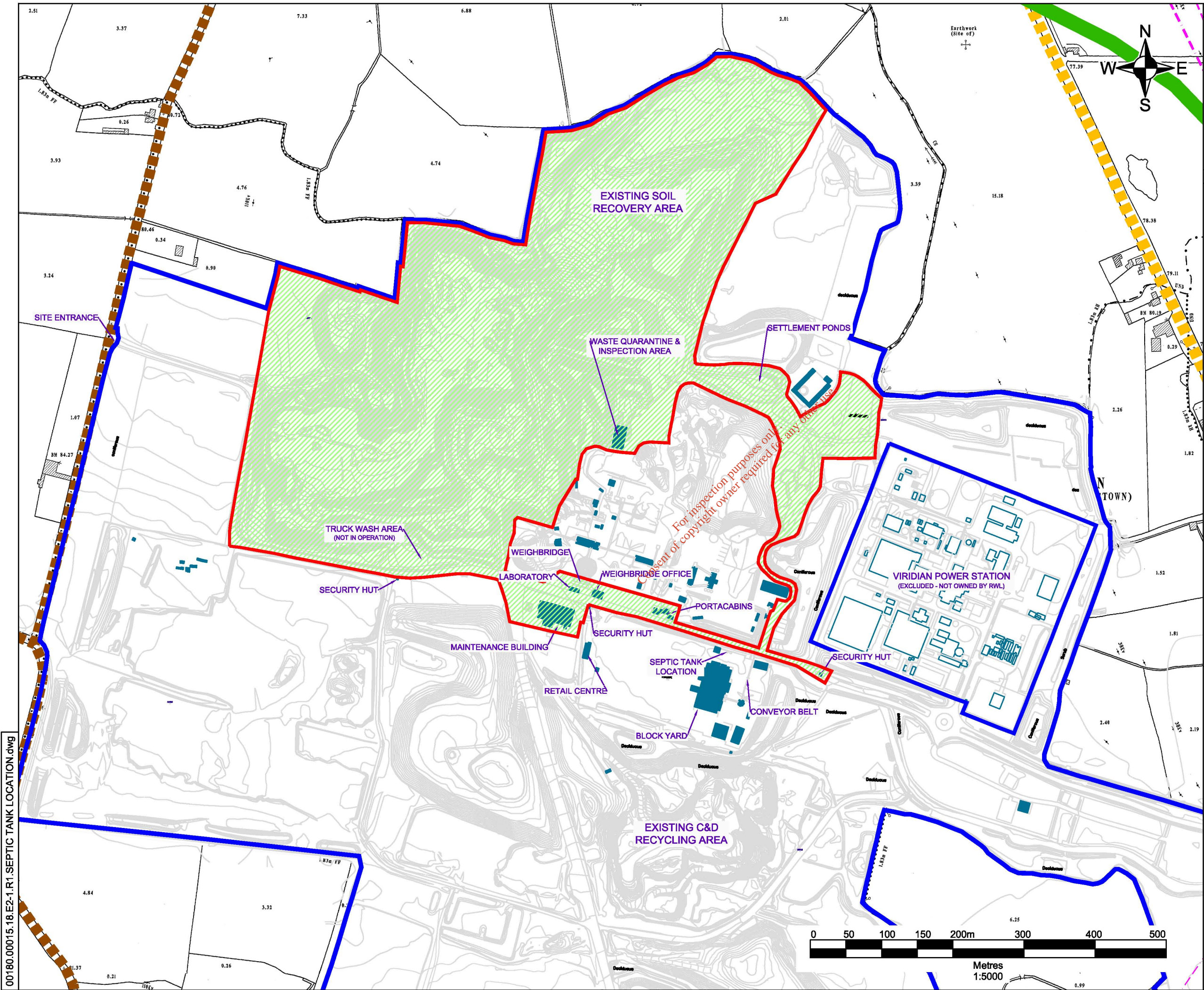
FIGURE E1-1
 Scale 1:10,000 @ A3 Date FEBRUARY 2011

ATTACHMENT E2 – EMISSIONS TO SEWER

There will be no emissions to public (Local Authority) sewers associated with the operation of the proposed waste recovery facility.

Roadstone Wood Ltd. currently has one existing wastewater effluent (septic) tank servicing its existing staff facilities at Huntstown. Any wastewater effluent produced at staff facilities is discharged to the septic tank at the location shown on Figure B2.3 of Attachment B2.

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NOTES

1. EXTRACT FROM 1:2,500 ORDNANCE SURVEY DIGITAL SHEET NO'S. 3062-A, 3062-B, 3062-C, 3062-D, 3063-A, 3063-C, 3130-A & 3130-B
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3. TOPOGRAPHIC SURVEY PREPARED BY FUGRO BKS BASED ON MAY 2009 AERIAL PHOTOGRAPHY

LEGEND

	ROADSTONE WOOD LTD. LANDHOLDING (c. 201.8 ha)
	WASTE LICENCE APPLICATION AREA (c. 35.9 ha)
	N2 NATIONAL PRIMARY ROUTE (DUAL CARRIAGEWAY)
	NORTH ROAD (R135)
	LOCAL ACCESS ROAD

00180.00015.18.E2-1.R1.SEPTIC TANK LOCATION.dwg

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**ROADSTONE WOOD LTD.
WASTE LICENCE APPLICATION**

**WASTE RECOVERY FACILITY,
HUNTSTOWN QUARRY,
NORTH ROAD, FINGLAS, DUBLIN 11**

SEPTIC TANK LOCATION

FIGURE E2-1

Scale 1:5,000 @ A3	Date FEBRUARY 2011
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ATTACHMENT E3 – NOISE EMISSIONS

Noise at the application site will be generated by HGV truck movements and by earthworks equipment (bulldozer) during backfilling phase. There are no fixed (point) noise sources at the site.

Baseline noise levels and an assessment of the ambient noise levels generated by HGV movements and earthmoving during the operational life of the waste recovery facility are provided in Chapter 8 of the Environmental Impact Statement.

There will, in a worst case scenario, be a minor incremental increase in noise levels generated at the application site over and above existing ambient levels (which have reduced slightly in recent years due to scaling back of extraction and concrete production activities). In the medium to long-term, on completion of the quarry restoration works, there will be lower noise emissions from the site.

Further details and assessment of noise emissions at the waste recycling facility are provided in Chapter 8 of the Environmental Impact Statement which accompanies this application.

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ATTACHMENT E4 – ENVIRONMENTAL NUISANCES

Dust Control

Refer to Chapter 2, Paragraphs 2.99 and 2.100 of the Environmental Impact Statement.

Traffic Control

Refer to Chapter 2, Paragraphs 2.101 to 2.104 of the Environmental Impact Statement.

Road Cleansing

In order to prevent transport of mud and potential contaminants on internal and public roads, all traffic exiting the waste recovery facility will be directed through the existing water bath facility at the central infrastructure area within Huntstown Quarry, refer to Chapter 2, Paragraphs 2.15 and 2.30 of the Environmental Impact Statement accompanying this waste licence application.

The amount of mud carried onto the public road network is further reduced by periodic sweeping of the paved internal access road and the existing local road in front of the site.

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