

Appendix 8-3 – Drehid Surface Water Annual Monitoring Results



QUARTER 4/ANNUAL 2014
COMPLIANCE REPORT OF WEEKLY
SURFACE WATER MONITORING AT THE
BORD NA MÓNA DREHID WASTE
MANAGEMENT FACILITY, CO. KILDARE IN
COMPLIANCE WITH WASTE LICENCE
REGISTER NO. W0201-03

For the Attention of:	Mr. James Dunn / Mr. Ciaran Geoghegan Bord na Móna Waste Management Facility, Drehid, Co. Kildare
Site Work Completed By:	Stephen Stapleton
Prepared by:	Mr. Stephen Stapleton Environmental Scientist
Reviewed by:	Mr. Peter Coogan Environmental Team Leader
Anua File Ref:	ECS4847- Quarter 4/Annual_ SW
Monitoring Date:	October/November/December 2014
Report Date:	January 2014

EXECUTIVE SUMMARY

In accordance with Waste Licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the Waste Licence (SW6, SW5 and SW4). Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

No exceedences for Suspended Solids (35mg/l) and BOD (25mg/l) were noted at SW 6 (Settlement Lagoon) when compared to their respective ELV during quarter 4. There was two exceedences for Ammonia in quarter 4 week 46 (0.66mg/l) and Week 47 (0.053mg/l).

SW-5 is downstream of SW-6. There was two exceedences for Ammonia in quarter 4 week 44 (0.81mg/l) and week 45 (1.20mg/l). There was one suspended solids exceedence detected at SW-5 on week 44 (37mg/l). No exceedences of any remaining parameters were recorded during quarter four.

SW4 is located on the Cushaling Stream downstream of SW5. From Table 2.1 (C) we observe that no exceedences were noted during quarter four of 2014.



Mr. Stephen Stapleton
Environmental Scientist



Mr. Peter Coogan
Environmental Team Leader

1.0 **SURFACE WATER**

1.2 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and marked on the map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Settlement Lagoons
SW-5	SW5 is downstream of SW6 at Settlement Lagoon outfall
SW-4	SW4 is located on the Cushing Stream downstream of SW5 at Dillons Bridge.

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2004	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-1998	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

SW6		Quarter 4														
Parameter	Units	Emission Limit	wk38	wk39	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48 Note 1	Wk49 Note 1	wk50	wk51 Note 1
pH	pH Units	-	7.5	-	7.5	7.4	7.6	7.7	7.7	8.1	7.6	7.5	-	-	7.5	-
Conductivity	µS/cm	-	530	-	528	514	529	528	526	761	515	530	-	-	561	-
BOD	mg/l	25 mg/l	<2	<2	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/l	-	15	14	15	15	14	14	15	16	15	15	-	-	20	-
COD	mg/l	-	18	11	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	15	<5	10	<5	-	-	<5	-
Ammonia (as NH4)	mg/l	0.5 mg/l	0.30	0.24	0.12	0.27	0.15	0.05	0.03	0.14	0.66	0.53	-	-	0.04	-

Note 1: No discharge from site during this week,

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

SW5		Quarter 4														
Parameter	Units	Emission Limit	wk38	wk39	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51
pH	pH Units	-	7.6		7.5	7.3	7.6	7.5	7.4	7.4	7.2	7.2	7.5	7.6	7.7	7.3
Conductivity	µS/cm	-	397		422	386	422	394	394	400	290.3	324	498	537	563	309
BOD	mg/l	25 mg/l	<2	<2	-	-	-	-	-	-	-	-	-	-	-	<2
Chloride	mg/l	-	13	13	16	14	13	13	14	14	13	13	15	14	15	13
COD	mg/l	-	59	58	-	-	-	-	-	-	-	-	-	-	-	94
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	15	20	37	6	<5	21	<5	<5	7	33
Ammonia (as NH4)	mg/l	0.5 mg/l	0.05	0.08	0.06	0.08	0.13	0.22	0.81	1.20	0.40	0.27	0.09	0.14	0.27	0.44

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4	Quarter 4															
Parameter	Units	Emission Limit	wk38	wk39	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51
pH	pH Units	-	7.7		7.70	7.40	7.5	7.5	7.6	7.5	7.4	7.5	7.4	7.6	7.6	7.4
Conductivity	µS/cm	-	540		539	492	519	502	525	496	442	510	498	536	565	458
BOD	mg/l	25 mg/l	<2	<2	-	-	-	-	-	-	-	-	-	-	-	<2
Chloride	mg/l	-	13	13	15	15	13	13	14	14	14	15	15	14	15	14
COD	mg/l	-	42	57	-	-	-	-	-	-	-	-	-	-	-	72
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	8	21
Ammonia (as NH4)	mg/l	0.5 mg/l	0.03	<0.03	0.03	<0.03	0.03	<0.03	0.04	0.15	0.10	0.06	0.08	0.14	0.27	0.12

Table 2.1 (D): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

Client ID		SW-4	SW-5	SW-6	Emission Limit Value
Received Date & Time		17/09/2014 12:37:04	17/09/2014 12:37:05	17/09/2014 12:37:06	
Sample Type		Surface Water	Surface Water	Surface Water	
pH	<i>pH units</i>	7.7	7.6	7.5	
Conductivity @ 25°C	<i>µS/cm</i>	540	397	530	
NH3-N	<i>mg/l</i>	0.02	0.04	0.23	
NH4-N	<i>mg/l</i>	0.03	0.05	0.30	0.50
BOD	<i>mg/l O2</i>	<2	<2	<2	25
COD	<i>mg/l O2</i>	42	59	18	
Suspended solids	<i>mg/l</i>	<5	<5	<5	35
Chloride	<i>mg/l</i>	13	13	15	
PO4-P	<i>mg/l</i>	0.08	<0.01	0.04	
Total Phosphorous	<i>mg/l</i>	0.12	<0.05	<0.05	
N03-N	<i>mg/l</i>	<0.2	<0.2	<0.2	
Sulphate	<i>mg/l</i>	8.2	9.1	30	
Boron (total)	<i>µg/l</i>				
Beryllium (total)**	<i>µg/l</i>	<1	<1	<1	
Aluminium (total) **	<i>µg/l</i>	<50	<50	<50	
Chromium (total)**	<i>µg/l</i>	<3	<3	<3	
Manganese (total)**	<i>µg/l</i>	64.4	67.7	59.1	
Cobalt (total)**	<i>µg/l</i>	<0.5	<0.5	<0.5	
Nickel (total) **	<i>µg/l</i>	5.6	4.5	6.36	
Copper (total) **	<i>µg/l</i>	<4	<4	<4	
Zinc (total) **	<i>µg/l</i>	9.13	5.83	14.3	
Arsenic (total)**	<i>µg/l</i>	<2	3.49	3.15	
Selenium (total) **	<i>µg/l</i>	<1	<1	<1	
Silver (total) **	<i>µg/l</i>	<2	<2	<2	
Cadmium (total)**	<i>µg/l</i>	<0.5	<0.5	<0.5	
Tin (total) **	<i>µg/l</i>	<3	<3	<3	
Antimony (total)**	<i>µg/l</i>	<4	<4	<4	
Barium (total) **	<i>µg/l</i>	99.1	92.1	244	
Lead (total) **	<i>µg/l</i>	<0.5	<0.5	<0.5	
Iron (total) **	<i>mg/l</i>	0.23	0.313	0.0558	
Mercury (total)**	<i>µg/l</i>	<0.02	<0.02	<0.02	
e.Coli **	<i>cfu/100 ml</i>	1600	260	28	
Total Coliforms **	<i>cfu/100 ml</i>	2400	450	28	

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

SVOC's	2,4,5-Trichlorophenol**	$\mu\text{g/l}$	<1	<1	<1	
	2,4,6-Trichlorophenol**	$\mu\text{g/l}$	<1	<1	<1	
	2,4-Dichlorophenol**	$\mu\text{g/l}$	<1	<1	<1	
	2,4-Dimethylphenol**	$\mu\text{g/l}$	<1	<1	<1	
	2,4-Dinitrotoluene**	$\mu\text{g/l}$	<1	<1	<1	
	2,6-Dinitrotoluene**	$\mu\text{g/l}$	<1	<1	<1	
	2-Chloronaphthalene**	$\mu\text{g/l}$	<1	<1	<1	
	2-Chlorophenol**	$\mu\text{g/l}$	<1	<1	<1	
	2-Methylnaphthalene**	$\mu\text{g/l}$	<1	<1	<1	
	2-Methylphenol**	$\mu\text{g/l}$	<1	<1	<1	
	2-Nitroaniline**	$\mu\text{g/l}$	<1	<1	<1	
	2-Nitrophenol**	$\mu\text{g/l}$	<1	<1	<1	
	3-Nitroaniline**	$\mu\text{g/l}$	<1	<1	<1	
	4-Bromophenylphenylether**	$\mu\text{g/l}$	<1	<1	<1	
	4-Chloro-3-methylphenol**	$\mu\text{g/l}$	<1	<1	<1	
	4-Chloroaniline**	$\mu\text{g/l}$	<1	<1	<1	
	4-Chlorophenylphenylether**	$\mu\text{g/l}$	<1	<1	<1	
	4-Methylphenol**	$\mu\text{g/l}$	<1	<1	<1	
	4-Nitrophenol**	$\mu\text{g/l}$	<1	<1	<1	
	4-Nitroaniline**	$\mu\text{g/l}$	<1	<1	<1	
	Azobenzene**	$\mu\text{g/l}$	<1	<1	<1	
	Acenaphthylene**	$\mu\text{g/l}$	<1	<1	<1	
	Acenaphthene**	$\mu\text{g/l}$	<1	<1	<1	
	Anthracene**	$\mu\text{g/l}$	<1	<1	<1	
	Bis(2-Chloroethyl)ether**	$\mu\text{g/l}$	<1	<1	<1	
	Bis(2-chloroethoxy)methane**	$\mu\text{g/l}$	<1	<1	<1	
	Bis(2-ethylhexyl)phthalate**	$\mu\text{g/l}$	<2	<2	<2	
	Benzo(a)anthracene**	$\mu\text{g/l}$	<1	<1	<1	
Butylbenzylphthalate**	$\mu\text{g/l}$	<1	<1	<1		
Benzo(a)pyrene**	$\mu\text{g/l}$	<1	<1	<1		
Benzo(ghi)perylene**	$\mu\text{g/l}$	<1	<1	<1		
Carbazole**	$\mu\text{g/l}$	<1	<1	<1		

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

SVOC's	Chrysene**	µg/l	<1	<1	<1	
	Dibenzofuran**	µg/l	<1	<1	<1	
	n-Di-butylphthalate**	µg/l	<1	<1	<1	
	Diethyl phthalate**	µg/l	<1	<1	<1	
	Dibenzo(a,h)anthracene**	µg/l	<1	<1	<1	
	Dimethyl phthalate**	µg/l	<1	<1	<1	
	n-Di octyl phthalate**	µg/l	<1	<1	<1	
	Fluoranthene**	µg/l	<1	<1	<1	
	Flourene**	µg/l	<1	<1	<1	
	Hexachlorobenzene**	µg/l	<1	<1	<1	
	hexachlorobutadiene**	µg/l	<1	<1	<1	
	Pentachlorophenol**	µg/l	<1	<1	<1	
	Phenol**	µg/l	<1	<1	<1	
	N-nitrosodi-n-propylamine**	µg/l	<1	<1	<1	
	Hexachloroethane**	µg/l	<1	<1	<1	
	Nitrobenzene**	µg/l	<1	<1	<1	
	Naphthalene**	µg/l	<1	<1	<1	
	Isophorone**	µg/l	<1	<1	<1	
	Hexachlorocyclopentadiene**	µg/l	<1	<1	<1	
	Phenanthrene**	µg/l	<1	<1	<1	
Indenol(1,2,3-cd)pyrene**	µg/l	<1	<1	<1		
Pyrene**	µg/l	<1	<1	<1		
VOC's	Dichlorodifluoromethane**	µg/l	<1	<1	<1	
	Chloromethane**	µg/l	<1	<1	<1	
	Vinyl chloride**	µg/l	<1	<1	<1	
	Bromomethane**	µg/l	<1	<1	<1	

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

VOC's	Chloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	Trichlorofluoromethane**	$\mu\text{g/l}$	<1	<1	<1	
	1,1-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	
	Dichloromethane**	$\mu\text{g/l}$	<3	<3	<3	
	trans-1,2-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	
	1,1-Dichloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	2,2-Dichloropropane**	$\mu\text{g/l}$	<1	<1	<1	
	cis-1,2-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	
	Bromochloromethane**	$\mu\text{g/l}$	<1	<1	<1	
	Chloroform**	$\mu\text{g/l}$	<1	<1	<1	
	1,1,1-Trichloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	Carbon Tetrachloride**	$\mu\text{g/l}$	<1	<1	<1	
	1,1-Dichloropropene**	$\mu\text{g/l}$	<1	<1	<1	
	Benzene**	$\mu\text{g/l}$	<1	<1	<1	
	1,2-Dichloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	Trichloroethene**	$\mu\text{g/l}$	<1	<1	<1	
	1,2-Dichloropropane**	$\mu\text{g/l}$	<1	<1	<1	
	Dibromomethane**	$\mu\text{g/l}$	<1	<1	<1	
	Bromodichloromethane**	$\mu\text{g/l}$	<1	<1	<1	
	Toluene**	$\mu\text{g/l}$	<1	<1	<1	
	1,1,2-Trichloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	1,2-Dibromoethane**	$\mu\text{g/l}$	<1	<1	<1	
	1,1,1,2-Tetrachloroethane**	$\mu\text{g/l}$	<1	<1	<1	
	m,p-Xylene**	$\mu\text{g/l}$	<1	<1	<1	
	Styrene**	$\mu\text{g/l}$	<1	<1	<1	
	Isopropylbenzene**	$\mu\text{g/l}$	<1	<1	<1	
	n-propylbenzene**	$\mu\text{g/l}$	<1	<1	<1	
	2-Chlorotoluene**	$\mu\text{g/l}$	<1	<1	<1	
4-Chlorotoluene**	$\mu\text{g/l}$	<1	<1	<1		
1,2,4-Trimethylbenzene**	$\mu\text{g/l}$	<1	<1	<1		

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

VOC's	4-Isopropyltoluene**	$\mu\text{g/l}$	<1	<1	<1	
	1,3-Dichloropropane**	$\mu\text{g/l}$	<1	<1	<1	
	cis-1,3-Dichloropropene**	$\mu\text{g/l}$	<1	<1	<1	
	trans-1,3-Dichloropropene**	$\mu\text{g/l}$	<1	<1	<1	
	Dibromochloromethane**	$\mu\text{g/l}$	<1	<1	<1	
	Chlorobenzene**	$\mu\text{g/l}$	<1	<1	<1	
	Ethyl Benzene**	$\mu\text{g/l}$	<1	<1	<1	
	o-Xylene**	$\mu\text{g/l}$	<1	<1	<1	
	Bromofom**	$\mu\text{g/l}$	<1	<1	<1	
	1,2,3-Trichloropropane**	$\mu\text{g/l}$	<1	<1	<1	
	Bromobenzene**	$\mu\text{g/l}$	<1	<1	<1	
	Tert-Butylbenzene**	$\mu\text{g/l}$	<1	<1	<1	
	Sec-Butylbenzene**	$\mu\text{g/l}$	<1	<1	<1	
	1,3,5-Trimethylbenzene**	$\mu\text{g/l}$	<1	<1	<1	
	1,2- Dibromo-3-chloropropane**	$\mu\text{g/l}$	<1	<1	<1	
	Hexachlorobutadiene**	$\mu\text{g/l}$	<1	<1	<1	
	1,2,3-Trichlorobenzene**	$\mu\text{g/l}$	<1	<1	<1	
Tetrachloroethene**	$\mu\text{g/l}$	<1	<1	<1		
n-butylbenzene**	$\mu\text{g/l}$	<1	<1	<1		

2.0 SURFACE WATER

Surface water monitoring was conducted at weekly intervals by Drehid facility staff during the fourth quarter of 2014. Sampling took place at the three locations specified in the Waste Licence (SW6, SW5 and SW4) for weekly parameters and twice during the quarter for quarterly parameters. BOD, Ammonia and COD levels were compared to their relevant emission limit values (ELV's) and the results are displayed in Tables 2.1 (A), 2.1 (B) and 2.1(C) and Figure 3 to Figure 5.

Ammonia concentrations at the SW 6 (Settlement Lagoon) exceed two times throughout quarter 4 with results of 0.66mg/l and 0.53mg/l.

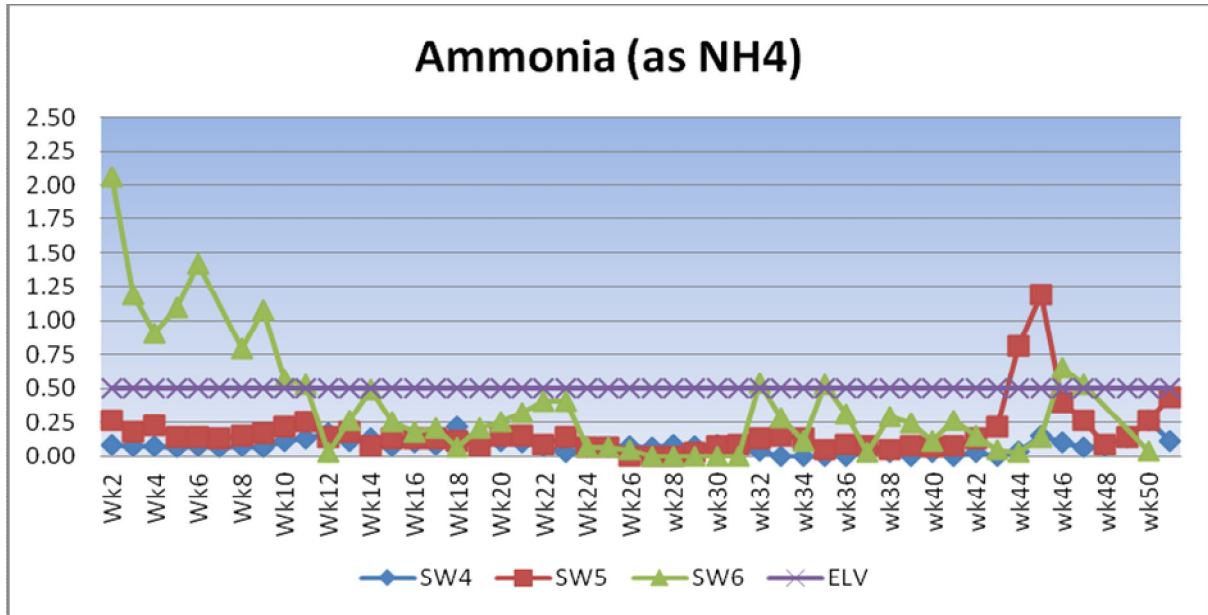


Figure 3

The ELV for Suspended Solids (35mg/l) was not exceeded at any sampling occasion at SW-6 during quarter four.

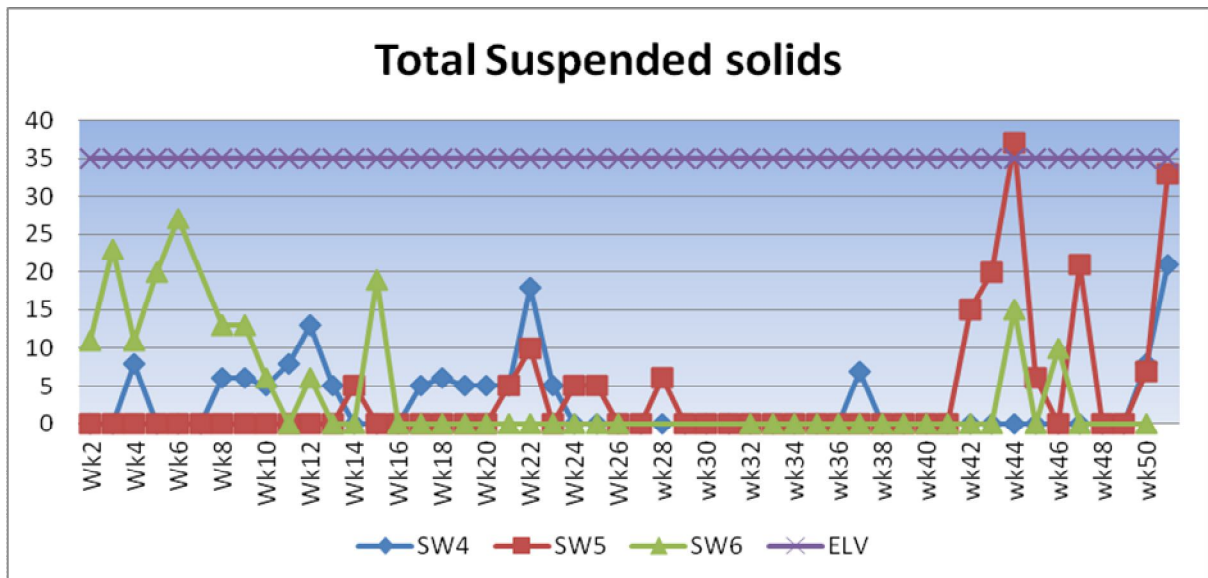


Figure 4

The ELV for BOD (25mg/l) was not exceeded at any sampling occasion at SW-6 during quarter four.

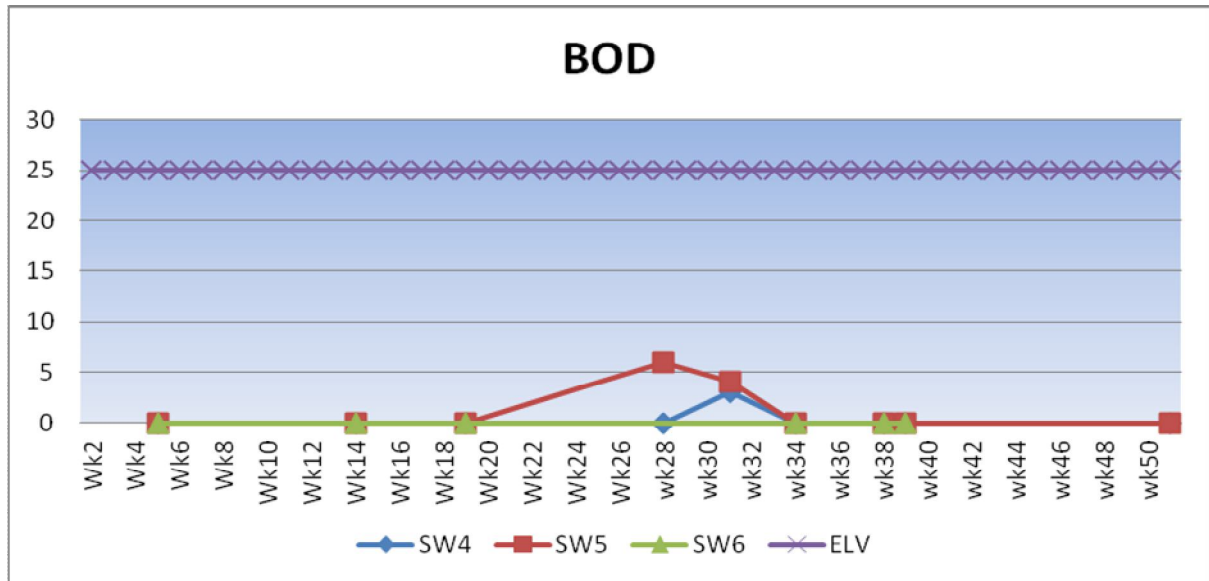


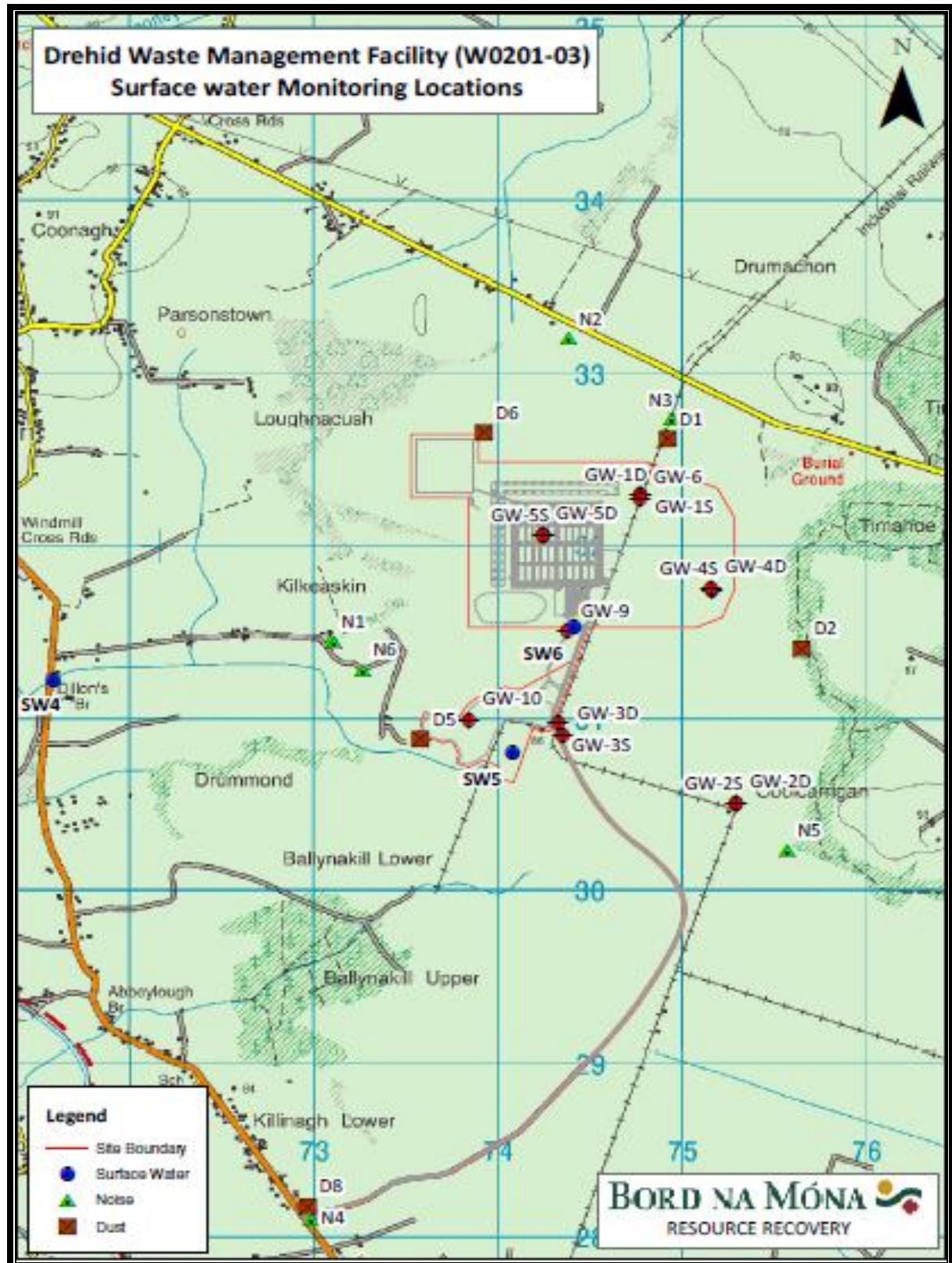
Figure 5

SW-5 is downstream of SW-6. There was two exceedences for Ammonia in quarter 4 week 44 (0.81mg/l) and week 45 (1.20mg/l). There was one suspended solids exceedence detected at SW-5 on week 44 (37mg/l). No exceedences of any remaining parameters were recorded during quarter four.

SW4 is located on the Cushaling Stream downstream of SW5. From Table 2.1 (C) we observe that no exceedences were noted during quarter four of 2014.

APPENDIX I

Monitoring Locations



APPENDIX 2

Analytical Methods

Chain of Custody

Analytical Methods

Analysis of water sampling was conducted in accordance with recognised standard methods as detailed below

ANALYSIS OF SAMPLES			
Parameter	Limit of Detection	Method	Accredited
pH (pH units)	0.1 – 14	G/05: Based on APHA 2012, 22 nd Ed, Method 4500 H+B	INAB ✓
Conductivity (µs/cm)	-	<i>In-Situ</i> Calibrated Conductivity Meter	-
Temperature (°C)	-	<i>In-Situ</i> Calibrated pH / Temperature Thermometer	-
Biochemical Oxygen Demand (BOD) (mg/l)	<2 mg/l BOD	G/04: Based on APHA, 2012, 22 nd Ed, Method 5210B.	INAB ✓
Chemical Oxygen Demand(COD)(mg/l)	10 – 1500 mg/l	G/03: Based on APHA 2012, 22 nd Edition, Method 5220D	INAB ✓
Chloride	<0.5 mg/l	G/67 Based on APHA, 2012, 22 nd Edition, Method 4500-Cl-E	INAB ✓
Ammonia-N (mg/l)	<0.02 mg/l NH ₃ -N	G/67: Based on APHA, 2012, 22 nd Ed, 4500-NH ₃ & Bluebook Ammonia in Waters 1981	INAB ✓
** Total Coliforms	<1 MPN/100ml	D/1201 MPN based on IDEXX defined substrate method	✓ (INAB)
**Faecal Coliforms	<1 CFU/100ml	D/3221	✓ (INAB)
Calcium, Magnesium, Potassium, Sodium	<0.1 mg/l	G/57: Based on EPA Method 200.8	X
Antimony, Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Zinc, Manganese, Nickel, Selenium, Silver	<2 µg/l	ICP-MS	✓ (INAB)
Aluminium, Beryllium, Tin	<2 µg/l		X
Iron	<0.1 mg/l		X
Mercury	<1 µg/l		X
Boron	<2 µg/l		X
VOC's USEPA 524.2	<10 µg/l		G/61: Based on USEPA 524.2 method
SVOCs target list (Modified US EPA 8270)	<1 µg/l	TM/143DGC-MS - following extraction with 1:1 DCM/Ethyl Acetate	X
Comb Pesticide Suite	<0.01 µg/l	GC-MS	X

Notes:

- ✓ INAB Accredited Test Method – INAB Registration Reference No. 083T.
- X Non-INAB or UKAS Accredited Test Method
- * Sub-Contracted Test – Jones Environmental, UKAS Accredited Laboratory, UK.
- G/** INAB Accredited Method, ANUA Environmental & Analytical Services Standard Operating Procedures Manual
- APHA-** American Public Health Association, Standard Methods for the Examination of Waters and Wastewaters, 22nd Edition, 2012.
- < Less than laboratory limit of detection

ACCREDITED QUALITY SYSTEM

INAB Accreditation

ANUA Environmental analytical laboratories are accredited to ISO 17025 by the National Accreditation Board (INAB). ISO 17025 accreditation ensures that the laboratory operates a quality system with technically competent staff. The laboratory has accreditation since 1997 and it is the policy of the laboratory to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

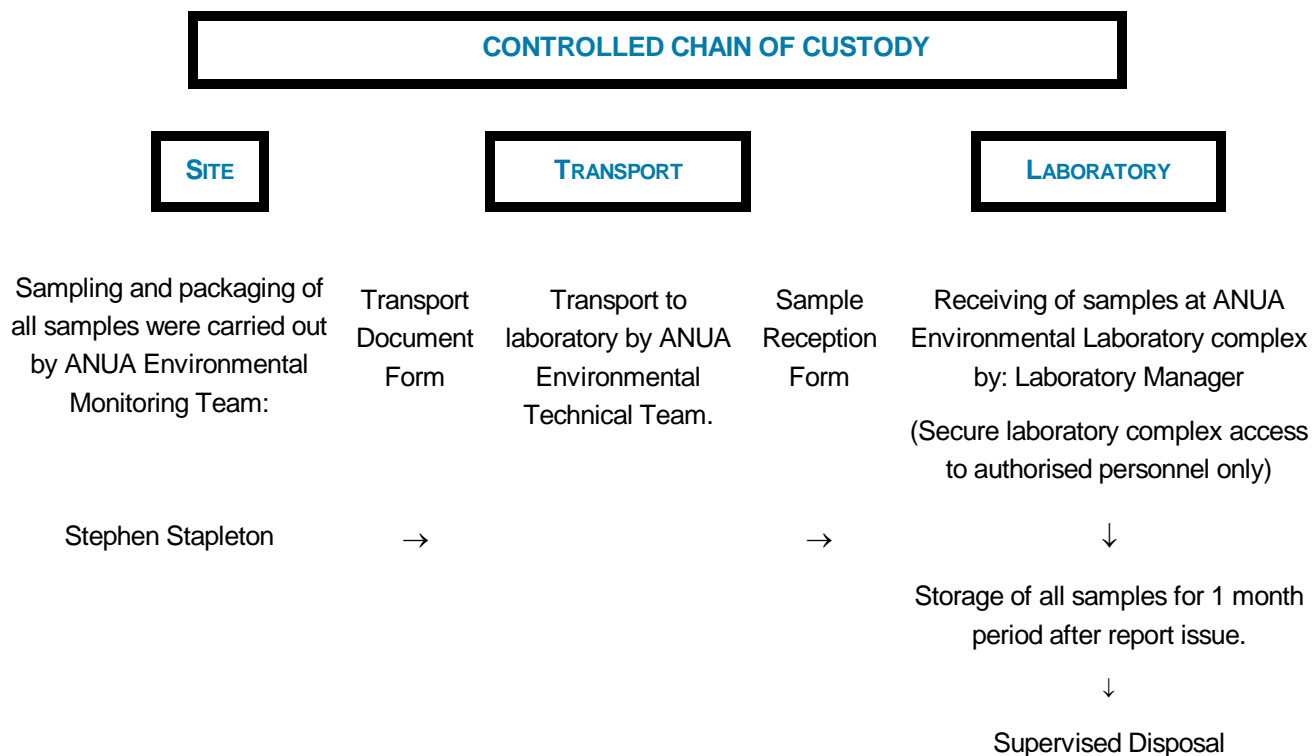
Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing the laboratory participates in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as LGC Aquacheck scheme and the EPA Intercalibration programme organised for environmental laboratories throughout Ireland. ANUA Environmental Laboratory Services & Analytical Laboratory is listed on the EPA's register of Quality Controlled Laboratories

Control Chain of Custody

As part of the Quality System in place in ANUA Environmental, measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.

Anua Environmental



QUARTER 4 2015
COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED REGISTER NO.
W0201-03

For the Attention of:	Mrs. Phoebe Dillane, Bord na Móna, Drehid Waste Management Facility, Killinagh Upper, Carbury, Co. Kildare
Site Work Completed By:	Stephen Stapleton
Prepared by:	Mr. Stephen Stapleton Environmental Scientist
Reviewed by:	Mr. Peter Coogan Environmental Team Leader
BNM File Ref:	ECS5122- Quarter 4 SW
Monitoring Date:	October, November, December 2015
Report Date:	25 th January 2015

EXECUTIVE SUMMARY

In accordance with IED Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4). Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

The ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) were not exceeded on any sampling occasion at SW-6 during Quarter 4.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. 4 no. exceedances for ammonia at SW-5 week 48 (1.08mg/l), week 49 (0.67mg/l), week 50 (0.57mg/l) and week 52 (0.54mg/l) were noted at this location during Quarter 4.

SW4 is situated at Dillons Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedences of any parameters were recorded at this location during Quarter 4.

Weekly, quarterly, and Annual (list I/II and microbiological parameters) were carried out during Quarter 4.



Mr. Stephen Stapleton
Environmental Scientist



Mr. Peter Coogan
Environmental Team Leader

1.0 **SURFACE WATER**

1.2 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-1998	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

SW6		Quarter 4													
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	7.8	7.4	7.6	7.6	7.6	7.5	7.5	7.5	7.6	7.6	7.7	7.7	7.5
Conductivity	µS/cm	-	557	524	577	534	457	476	384	483	548	609	526	432	467
BOD	mg/l	25 mg/l		<2											
Chloride	mg/l	-	19	19	20	19	18	18	13	16	20	20	19	15	30
COD	mg/l	-		75											
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	9	<5	<5	<5	20	23	21
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.08	<0.03	0.19	0.08	0.12	0.19	0.19	0.17	0.04	0.08	0.14	0.12	0.13

Note 1: No discharge from site during this week,

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

SW5		Quarter 4													
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	7.9	7.3	7.4	7.7	7.6	7.5	7.4	7.3	7.4	7.4	7.4	7.4	7.4
Conductivity	µS/cm	-	447	449	454	411	382	326	267	324	391	364	331	261	292
BOD	mg/l	25 mg/l		<2											
Chloride	mg/l	-	11	11	11	12	11	12	11	13	14	14	13	12	17
COD	mg/l	-		63											
Suspended Solids	mg/l	35 mg/l	<5	6	14	8	<5	<5	9	11	11	5	<5	8	8
Ammonia (as NH ₄)	mg/l	0.5 mg/l	<0.03	0.04	<0.03	<0.03	0.04	0.06	0.13	0.46	1.08	0.67	0.57	0.44	0.54

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 4													
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	8.1	7.6	7.7	7.7	7.6	7.6	7.5	7.5	7.6	7.5	7.5	7.6	7.5
Conductivity	µS/cm	-	608	600	608	566	531	526	464	411	485	443	427	393	423
BOD	mg/l	25 mg/l		<2											
Chloride	mg/l	-	12	12	12	14	13	12	12	14	14	14	17	21	20
COD	mg/l	-		24											
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5	6
Ammonia (as NH ₄)	mg/l	0.5 mg/l	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	0.03	0.19	0.24	0.18	0.13	0.17	0.15

Table 2.2: Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6 carried out on the 03rd of December 2015

Test Suite	Parameters	Units	SW-4	SW-5	SW-6	Limits
Microbiological	Faecal Coliform	cfu/100ml	540	32	15	-
	Total Coliforms	cfu/100ml	540	32	15	-
Comb Pesticide Suite	Dichlorvos**	µg/l	<0.01	<0.01	<0.01	-
	Mevinphos**	µg/l	<0.01	<0.01	<0.01	-
	alpha-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Diazinon**	µg/l	<0.01	<0.01	<0.01	-
	gamma-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor**	µg/l	<0.01	<0.01	<0.01	-
	Aldrin**	µg/l	<0.01	<0.01	<0.01	-
	beta-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Methyl Parathion**	µg/l	<0.01	<0.01	<0.01	-
	Malathion**	µg/l	<0.01	<0.01	<0.01	-
	Fenitrothion**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor Epoxide**	µg/l	<0.01	<0.01	<0.01	-
	Parathion**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan I**	µg/l	<0.01	<0.01	<0.01	-
	p,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Dieldrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Endrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDT**	µg/l	<0.01	<0.02	<0.02	-
	p,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Ethion**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan II**	µg/l	<0.01	<0.01	<0.01	-
p,p-DDT**	µg/l	<0.01	<0.01	<0.01	-	
o,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-	
p,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-	
Endosulfan Sulphate**	µg/l	<0.01	<0.01	<0.01	-	
Azinphos Methyl**	µg/l	<0.01	<0.01	<0.01	-	
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<1	<1	<1	-
	1,2-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,3-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,4-Dichlorobenzene**	µg/l	<1	<1	<1	-

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
Test Suite	Parameters	Units	SW-4	SW-5	SW-6	Limits
SVOC's	2,4,5-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4,6-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dimethylphenol**	µg/l	<1	<1	<1	-
	2,4-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2,6-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2-Chloronaphthalene**	µg/l	<1	<1	<1	-
	2-Chlorophenol**	µg/l	<1	<1	<1	-
	2-Methylnaphthalene**	µg/l	<1	<1	<1	-
	2-Methylphenol**	µg/l	<1	<1	<1	-
	2-Nitroaniline**	µg/l	<1	<1	<1	-
	2-Nitrophenol**	µg/l	<1	<1	<1	-
	3-Nitroaniline**	µg/l	<1	<1	<1	-
	4-Bromophenylphenylether**	µg/l	<1	<1	<1	-
	4-Chloro-3-methylphenol**	µg/l	<1	<1	<1	-
	4-Chloroaniline**	µg/l	<1	<1	<1	-
	4-Chlorophenylphenylether**	µg/l	<1	<1	<1	-
	4-Methylphenol**	µg/l	<1	<1	<1	-
	4-Nitrophenol**	µg/l	<1	<1	<1	-
	4-Nitroaniline**	µg/l	<1	<1	<1	-
	Azobenzene**	µg/l	<1	<1	<1	-
	Acenaphthylene**	µg/l	<1	<1	<1	-
	Acenaphthene**	µg/l	<1	<1	<1	-
	Anthracene**	µg/l	<1	<1	<1	-
	Bis(2-Chloroethyl)ether**	µg/l	<1	<1	<1	-
	Bis(2-chloroethoxy)methane**	µg/l	<1	<1	<1	-
	Bis(2-ethylhexyl)phthalate**	µg/l	<2	<2	<2	-
	Benzo(a)anthracene**	µg/l	<1	<1	<1	-
Butylbenzylphthalate**	µg/l	<1	<1	<1	-	
Benzo(a)pyrene**	µg/l	<1	<1	<1	-	
Benzo(ghi)perylene**	µg/l	<1	<1	<1	-	
Carbazole**	µg/l	<1	<1	<1	-	

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
Test Suite	Parameters	Units	SW-4	SW-5	SW-6	Limits
SVOC's	Chrysene**	$\mu\text{g/l}$	<1	<1	<1	-
	Dibenzofuran**	$\mu\text{g/l}$	<1	<1	<1	-
	n-Di-butylphthalate**	$\mu\text{g/l}$	<1	<1	<1	-
	Diethyl phthalate**	$\mu\text{g/l}$	<1	<1	<1	-
	Dibenzo(a,h)anthracene**	$\mu\text{g/l}$	<1	<1	<1	-
	Dimethyl phthalate**	$\mu\text{g/l}$	<1	<1	<1	-
	n-Di octyl phthalate**	$\mu\text{g/l}$	<5	<5	<1	-
	Fluoranthene**	$\mu\text{g/l}$	<1	<1	<1	-
	Flourene**	$\mu\text{g/l}$	<1	<1	<1	-
	Hexachlorobenzene**	$\mu\text{g/l}$	<1	<1	<1	-
	hexachlorobutadiene**	$\mu\text{g/l}$	<1	<1	<1	-
	Pentachlorophenol**	$\mu\text{g/l}$	<1	<1	<1	-
	Phenol**	$\mu\text{g/l}$	<1	<1	<1	-
	N-nitrosodi-n-propylamine**	$\mu\text{g/l}$	<1	<1	<1	-
	Hexachloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Nitrobenzene**	$\mu\text{g/l}$	<1	<1	<1	-
	Naphthalene**	$\mu\text{g/l}$	<1	<1	<1	-
	Isophorone**	$\mu\text{g/l}$	<1	<1	<1	-
	Hexachlorocyclopentadiene**	$\mu\text{g/l}$	<1	<1	<1	-
	Phenanthrene**	$\mu\text{g/l}$	<1	<1	<1	-
Indenol(1,2,3-cd)pyrene**	$\mu\text{g/l}$	<1	<1	<1	-	
Pyrene**	$\mu\text{g/l}$	<1	<1	<1	-	
VOC's	Dichlorodifluoromethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Chloromethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Vinyl chloride**	$\mu\text{g/l}$	<1	<1	<1	-
	Bromomethane**	$\mu\text{g/l}$	<1	<1	<1	-

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
Test Suite	Parameters	Units	SW-4	SW-5	SW-6	Limits
VOC's	Chloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Trichlorofluoromethane**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	-
	Dichloromethane**	$\mu\text{g/l}$	<3	<3	<3	-
	trans-1,2-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1-Dichloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	2,2-Dichloropropane**	$\mu\text{g/l}$	<1	<1	<1	-
	cis-1,2-Dichloroethene**	$\mu\text{g/l}$	<1	<1	<1	-
	Bromochloromethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Chloroform**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1,1-Trichloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Carbon Tetrachloride**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1-Dichloropropene**	$\mu\text{g/l}$	<1	<1	<1	-
	Benzene**	$\mu\text{g/l}$	<1	<1	<1	-
	1,2-Dichloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Trichloroethene**	$\mu\text{g/l}$	<1	<1	<1	-
	1,2-Dichloropropane**	$\mu\text{g/l}$	<1	<1	<1	-
	Dibromomethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Bromodichloromethane**	$\mu\text{g/l}$	<1	<1	<1	-
	Toluene**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1,2-Trichloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	1,2-Dibromoethane**	$\mu\text{g/l}$	<1	<1	<1	-
	1,1,1,2-Tetrachloroethane**	$\mu\text{g/l}$	<1	<1	<1	-
	m,p-Xylene**	$\mu\text{g/l}$	<1	<1	<1	-
	Styrene**	$\mu\text{g/l}$	<1	<1	<1	-
	Isopropylbenzene**	$\mu\text{g/l}$	<1	<1	<1	-
	n-propylbenzene**	$\mu\text{g/l}$	<1	<1	<1	-
2-Chlorotoluene**	$\mu\text{g/l}$	<1	<1	<1	-	
4-Chlorotoluene**	$\mu\text{g/l}$	<1	<1	<1	-	

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
Test Suite	Parameters	Units	SW-4	SW-5	SW-6	Limits
VOC's	1,2,4-Trimethylbenzene**	µg/l	<1	<1	<1	-
	4-Isopropyltoluene**	µg/l	<1	<1	<1	-
	1,3-Dichloropropane**	µg/l	<1	<1	<1	-
	cis-1,3-Dichloropropene**	µg/l	<1	<1	<1	-
	trans-1,3-Dichloropropene**	µg/l	<1	<1	<1	-
	Dibromochloromethane**	µg/l	<1	<1	<1	-
	Chlorobenzene**	µg/l	<1	<1	<1	-
	Ethyl Benzene**	µg/l	<1	<1	<1	-
	o-Xylene**	µg/l	<1	<1	<1	-
	Bromoform**	µg/l	<1	<1	<1	-
	1,2,3-Trichloropropane**	µg/l	<1	<1	<1	-
	Bromobenzene**	µg/l	<1	<1	<1	-
	Tert-Butylbenzene**	µg/l	<1	<1	<1	-
	Sec-Butylbenzene**	µg/l	<1	<1	<1	-
	1,3,5-Trimethylbenzene**	µg/l	<1	<1	<1	-
	1,2- Dibromo-3-chloropropane**	µg/l	<1	<1	<1	-
	Hexachlorobutadiene**	µg/l	<1	<1	<1	-
	1,2,3-Trichlorobenzene**	µg/l	<1	<1	<1	-
Tetrachloroethene**	µg/l	<1	<1	<1	-	
n-butylbenzene**	µg/l	<1	<1	<1	-	

2.0 SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the fourth quarter of 2015. Sampling took place at the three locations specified in the IED (SW6, SW5 and SW4) for weekly parameters and once during the quarter for quarterly parameters. BOD, Ammonia and COD levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 3 to Figure 5.

The following annual parameters were analysed on samples submitted on the 3rd of December microbiological and list I/II organics. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations. The microbiological results decreased since the previous monitoring event but are in line with previous trends for all locations.

No exceedances were noted for suspended solids or BOD during quarter 4 at SW-4, SW-5 and SW-6 monitoring locations with all remaining parameters in line with that previously detected. There were 4 no. exceedances for ammonia during quarter 4 at SW-5 week 48 (1.08mg/l), week 49 (0.67mg/l) week 50 (0.57mg/l) and week 52 (0.54mg/l) all remaining results for all locations remain below the limit of 0.5mg/l for quarter 4. The elevated Ammonia results have been shown to be localised and it is felt that it is due to natural influence from the surrounding peat following extremely high rainfall events i.e. the release of naturally occurring elevated ammonia in the peat.

These elevations were reported to the Agency as "Trigger Level Reached" as SW5 is a monitoring point and not the compliance location which is SW6.

Figures 3 to 5 below graphically display the results obtained in 2015.

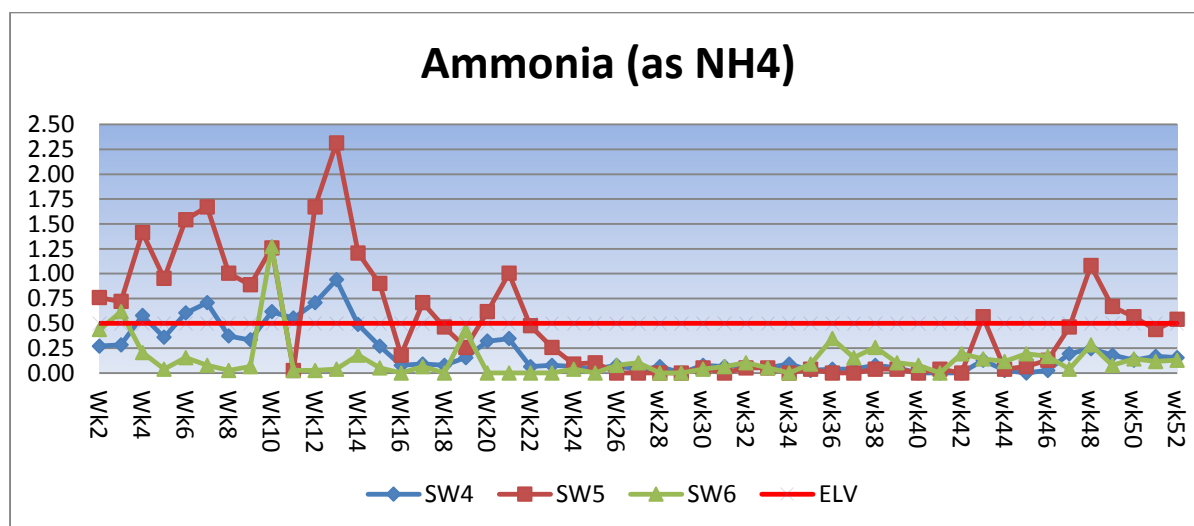


Figure 3

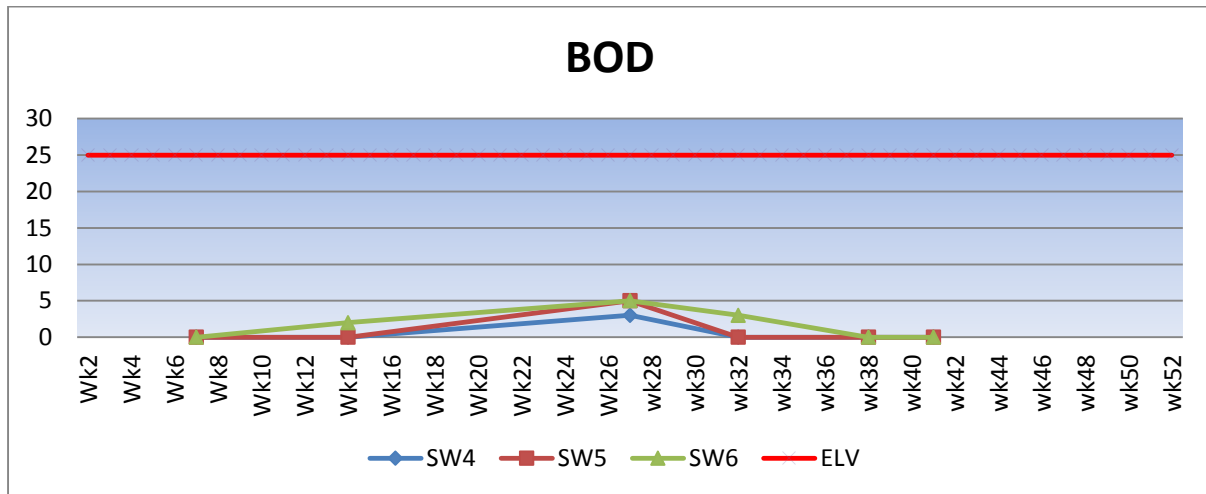


Figure 4

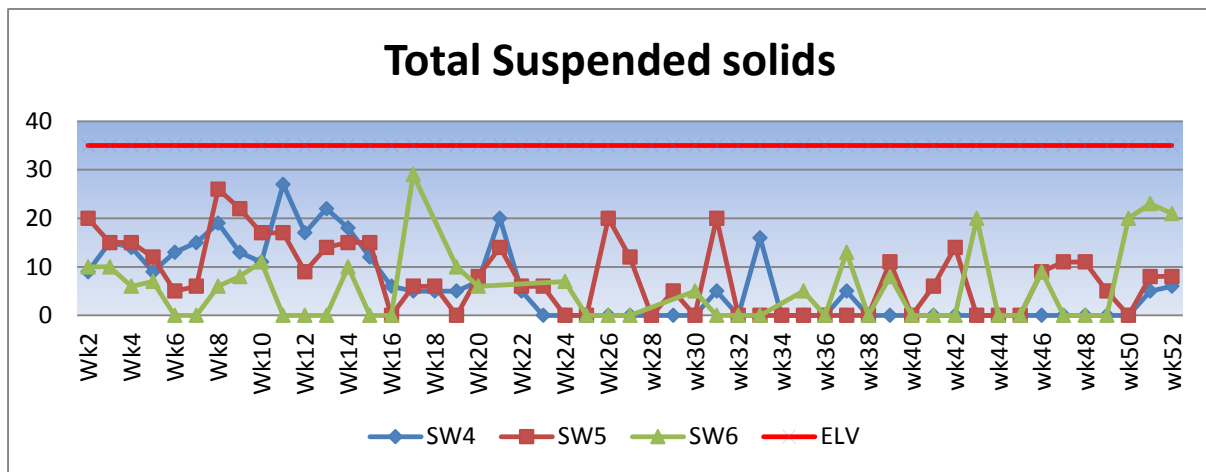
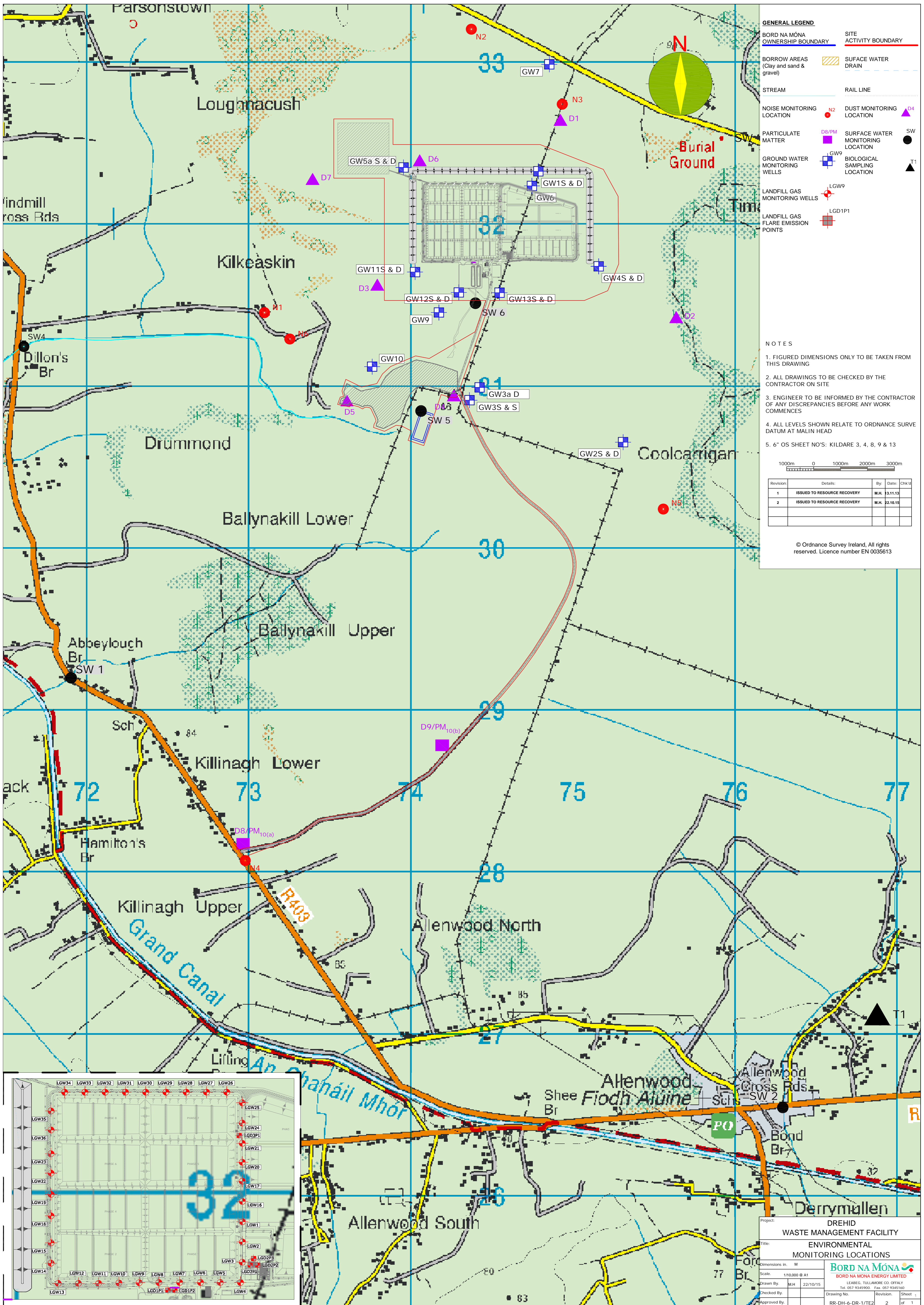


Figure 5

APPENDIX I

Monitoring Locations



GENERAL LEGEND

BORD NA MÓNA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
BORROW AREAS (Clay and sand & gravel)	SURFACE WATER DRAIN
STREAM	RAIL LINE
NOISE MONITORING LOCATION	DUST MONITORING LOCATION
PARTICULATE MATTER	SURFACE WATER MONITORING LOCATION
GROUND WATER MONITORING WELLS	BIOLOGICAL SAMPLING LOCATION
LANDFILL GAS MONITORING WELLS	LGW9
LANDFILL GAS FLARE EMISSION POINTS	LGDP1

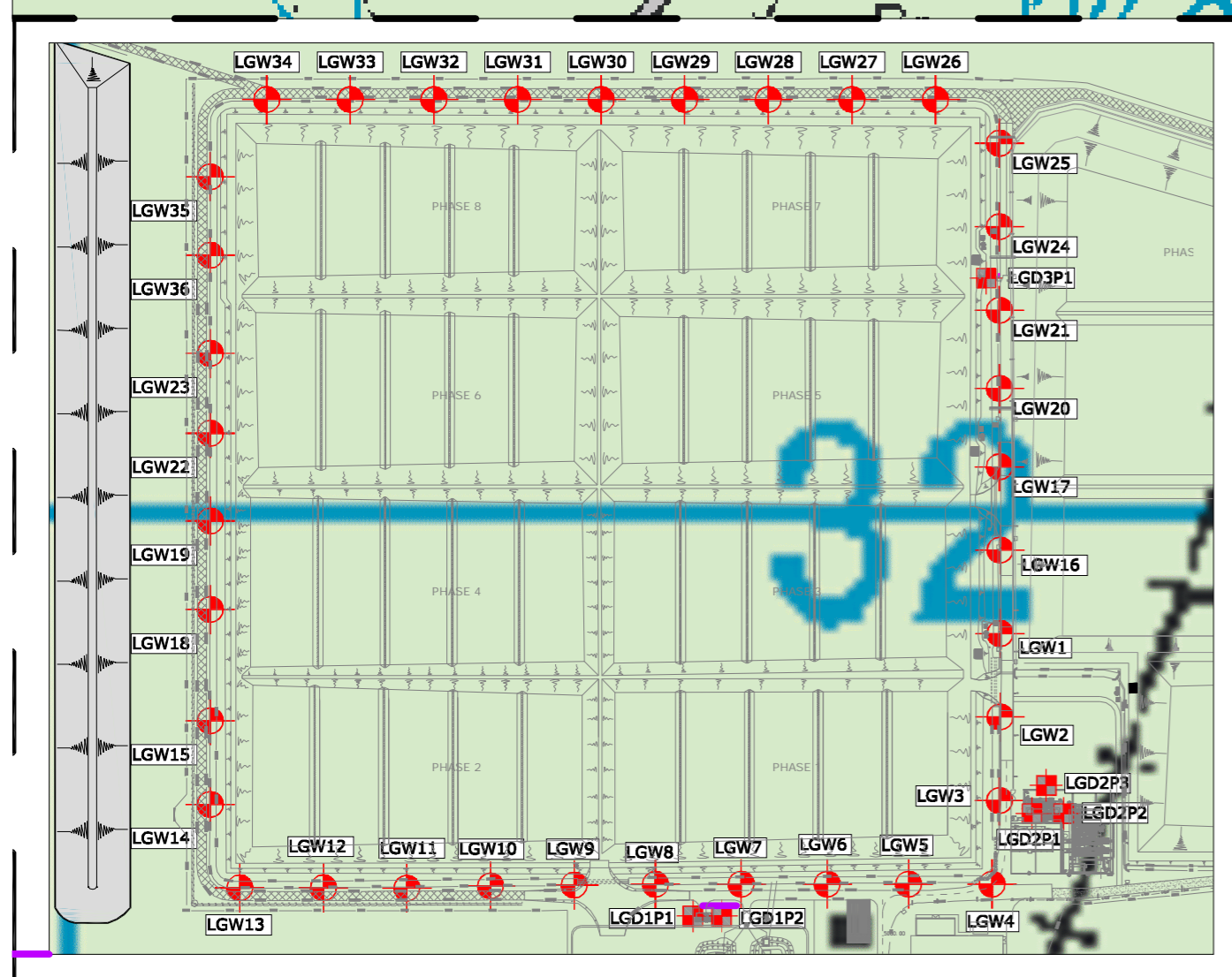
NOTES

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
- ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
- ALL LEVELS SHOWN RELATE TO ORDNANCE SURVE DATUM AT MALIN HEAD
- 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13

Scale: 1:10,000 @ A1

Revision	Details	By	Date	Chkd
1	ISSUED TO RESOURCE RECOVERY	M.H.	13.11.13	
2	ISSUED TO RESOURCE RECOVERY	M.H.	22.10.15	

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Project: DREHD WASTE MANAGEMENT FACILITY
 Title: ENVIRONMENTAL MONITORING LOCATIONS
 Dimensions in: M
 Scale: 1/10,000 @ A1
 Drawn By: M.H. 22/10/15
 Checked By:
 Approved By:
 Drawing No: RR-DH-6-DR-1/TE2
 Revision: 2
 Sheet: 1 of 1
BORD NA MÓNA
 BORD NA MÓNA ENERGY LIMITED
 LEARCO TULLAMORE CO. DUBLIN
 Tel: 057 9345900 Fax: 057 9345160

APPENDIX 2

Analytical Methods

Chain of Custody

Analytical Methods

Analysis of water sampling was conducted in accordance with recognised standard methods as detailed below

ANALYSIS OF SAMPLES			
Parameter	Limit of Detection	Method	Accredited
pH (pH units)	0.1 – 14	G/05: Based on APHA 2012, 22 nd Ed, Method 4500 H+B	INAB ✓
Conductivity (µS/cm)	0.01 µS/cm to 200.0 mS/cm	<i>In-Situ</i> Calibrated Conductivity Meter	-
Temperature (°C)	-10 to 110 °C	<i>In-Situ</i> Calibrated pH / Temperature Thermometer	-
Biochemical Oxygen Demand (BOD) (mg/l)	<2 mg/l BOD	G/04: Based on APHA, 2012, 22 nd Ed, Method 5210B.	INAB ✓
Chemical Oxygen Demand(COD)(mg/l)	10 – 1500 mg/l	G/03: Based on APHA 2012, 22 nd Edition, Method 5220D	INAB ✓
Chloride	<0.5 mg/l	G/67 Based on APHA, 2012, 22 nd Edition, Method 4500-Cl-E	INAB ✓
Ammonia-N (mg/l)	<0.02 mg/l NH ₃ -N	G/67: Based on APHA, 2012, 22 nd Ed, 4500-NH ₃ & Bluebook Ammonia in Waters 1981	INAB ✓

Notes:

- ✓ INAB Accredited Test Method – INAB Registration Reference No. 083T.
- X Non-INAB or UKAS Accredited Test Method
- * Sub-Contracted Test – Jones Environmental, UKAS Accredited Laboratory, UK.
- G/** INAB Accredited Method, BNM Environmental & Analytical Services Standard Operating Procedures Manual
- APHA-** American Public Health Association, Standard Methods for the Examination of Waters and Wastewaters, 22nd Edition, 2012.
- < Less than laboratory limit of detection

ACCREDITED QUALITY SYSTEM

INAB Accreditation

BNM Environmental analytical laboratories are accredited to ISO 17025 by the National Accreditation Board (INAB). ISO 17025 accreditation ensures that the laboratory operates a quality system with technically competent staff. The laboratory has accreditation since 1997 and it is the policy of the laboratory to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

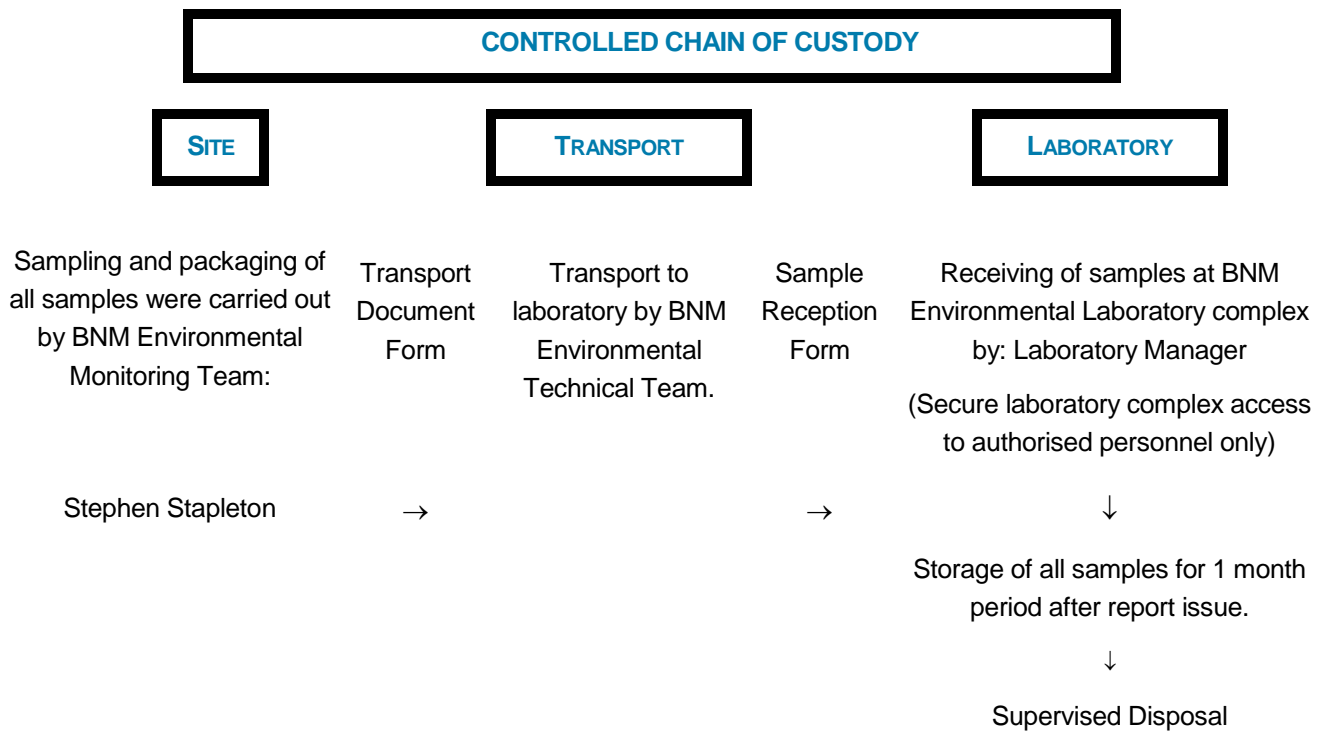
Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing the laboratory participates in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as LGC Aquacheck scheme and the EPA Intercalibration programme organised for environmental laboratories throughout Ireland. BNM Environmental Laboratory Services & Analytical Laboratory is listed on the EPA's register of Quality Controlled Laboratories

Control Chain of Custody

As part of the Quality System in place in BNM Environmental, measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.

BNM Environmental



APPENDIX 3

Lab Reports



Project Code : 15-46703
Report Date : 04-Nov-2015

Report Unique ID: 52062
Commen. Date: 02/10/2015

Customer: Charlotte Greene

C/O Stephanie Golding
Bord Na Mona
Drehid Facility
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Co. Kildare

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Stephen.Stapleton@anua.ie
Garrett.Leech@bnnm.ie
waste@bnnm.ie

P/O: 82966

Approved by : Shaunna Seavers

Sample Number : 432995

Sample Type Surface Water

Client ID: SW-4 01/10/15
Received: 01/10/2015 16:50

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	<0.02	mg/l
Chloride	*Chloride	-	12	mg/l
Conductivity	*Conductivity @ 25°C	-	607.5	µS/cm
pH	*pH	-	8.1	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l



Project Code : 15-46703

Report Unique ID: 52062

P/O: 82966

Sample Number : 432996

Sample Type Surface Water

Client ID: SW-5 01/10/15
Received: 01/10/2015 16:50

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	<0.02	mg/l
Chloride	*Chloride	-	11	mg/l
Conductivity	*Conductivity @ 25°C	-	447	µS/cm
pH	*pH	-	7.9	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l

Sample Number : 432997

Sample Type Surface Water

Client ID: SW-6 01/10/15
Received: 01/10/2015 16:50

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.06	mg/l
Chloride	*Chloride	-	19	mg/l
Conductivity	*Conductivity @ 25°C	-	557	µS/cm
pH	*pH	-	7.8	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l



Project Code : 15-46784
 Report Date : 04-Nov-2015
 Report Unique ID: 52060
 Commen. Date: 08/10/2015

Customer: Charlotte Greene
 C/O Stephanie Golding
 Bord Na Mona
 Drehid Facility
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 Co. Kildare

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P/O: 82966
 C.O.C

Approved by : Shaunna Seavers

Sample Number : 433590

Sample Type: Surface Water

Client ID: SW-4 08/10/15

Received: 08/10/2015 15:49

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	<0.02	mg/l
BOD	*BOD	<25	<2	mg/l O2
Chloride	*Chloride	-	12	mg/l
COD	*COD	-	24	mg/l O2
Conductivity	*Conductivity @ 25°C	-	600	µS/cm
pH	*pH	-	7.6	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l



Project Code : 15-46784
 Report Unique ID: 52060

P/O: 82966
 C.O.C

Sample Number : 433591

Client ID: SW-5 08/10/15

Received: 08/10/2015 15:49

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.03	mg/l
BOD	*BOD	<25	<2	mg/l O2
Chloride	*Chloride	-	11	mg/l
COD	*COD	-	63	mg/l O2
Conductivity	*Conductivity @ 25°C	-	449	µS/cm
pH	*pH	-	7.3	pH units
Suspended solids	*Suspended solids	<35	6	mg/l

Sample Number : 433592

Client ID: SW-6 08/10/15

Received: 08/10/2015 15:49

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	<0.02	mg/l
BOD	*BOD	<25	<2	mg/l O2
Chloride	*Chloride	-	19	mg/l
COD	*COD	-	75	mg/l O2
Conductivity	*Conductivity @ 25°C	-	524	µS/cm
pH	*pH	-	7.4	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l



Project Code : 15-46883
Report Date : 04-Nov-2015

Report Unique ID: 52058
Commen. Date: 15/10/2015

Customer: Charlotte Greene

C/O Stephanie Golding
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Drehid Facility
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P/O: 82966

Approved by : Shaunna Seavers

Sample Number : 434308

Sample Type: Surface Water

Client ID: SW-4 15/10/15

Received: 15/10/2015 16:37

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	608.5	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-46883

Report Unique ID: 52058

P/O: 82966

Sample Number : 434309

Sample Type: Surface Water

Client ID: SW-5 15/10/15

Received: 15/10/2015 16:37

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	454	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	14	mg/l

Sample Number : 434310

Sample Type: Surface Water

Client ID: SW-6 15/10/15

Received: 15/10/2015 16:37

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.15	mg/l
Chloride	* Chloride	-	20	mg/l
Conductivity	* Conductivity @ 25°C	-	577	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-46979
Report Date : 13-Nov-2015

Report Unique ID: 52264
Commn. Date: 23/10/2015

Customer: Charlotte Greene
C/O Stephanie Golding
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P/O: 82966



Project Code : 15-46979

Report Unique ID: 52264

P/O: 82966

Sample Number : 435113
Sample Type: Surface Water

Client ID: SW-5.23/10/15
Received: 23/10/2015 15:02

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	411	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	8	mg/l

Approved by : Shaunna Seavers

Sample Number : 435114
Sample Type: Surface Water

Client ID: SW-6.23/10/15
Received: 23/10/2015 15:02

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.06	mg/l
Chloride	* Chloride	-	19	mg/l
Conductivity	* Conductivity @ 25°C	-	534	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 435112

Client ID: SW-4.23/10/15

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	14	mg/l
Conductivity	* Conductivity @ 25°C	-	566	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47046
Report Date : 18-Nov-2015

Report Unique ID: 52343
Comment Date: 29/10/2015

Customer: Charlotte Greene

C/O Stephanie Golding
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Drehid Facility
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waste@bnm.ie

Approved by: **Roisin Kavanagh**
Team Leader

Sample Number : 435613

Sample Type: Surface Water

Client ID: sw4 29/10/15

Received: 29/10/2015 15:51 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	-	0.02	mg/l
Chloride	*Chloride	-	13	mg/l
Conductivity	*Conductivity @ 25°C	-	531	µS/cm
pH	*pH	-	7.6	pH units
Suspended solids	*Suspended solids	-	<5	mg/l



Project Code : 15-47046

Report Unique ID: 52343

Sample Number : 435614

Sample Type: Surface Water

Client ID: sw5 29/10/15

Received: 29/10/2015 15:51 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	-	0.03	mg/l
Chloride	*Chloride	-	11	mg/l
Conductivity	*Conductivity @ 25°C	-	382	µS/cm
pH	*pH	-	7.6	pH units
Suspended solids	*Suspended solids	-	<5	mg/l

Sample Number : 435615

Sample Type: Surface Water

Client ID: sw6 29/10/15

Received: 29/10/2015 15:51 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	-	0.09	mg/l
Chloride	*Chloride	-	18	mg/l
Conductivity	*Conductivity @ 25°C	-	457	µS/cm
pH	*pH	-	7.6	pH units
Suspended solids	*Suspended solids	-	<5	mg/l

Methods of Analysis

Analysis Name:

Suspended solids
Ammonia

Method:

*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D
*G/67 Based on APHA, 2012, 22nd Edition, 4500-NH3 and bluebook Ammonia in waters 1981
*G/67 Based on APHA 2012 22nd Edition Method 4500-CL⁻E
*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+B
*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

Conditions

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2. Results contained in this report relate only to the items tested.
3. All Comments concerning this report or its contents should be forwarded to the Laboratory Manager



Project Code : 15-47139
 Report Date : 20-Nov-2015
 Report Unique ID: 52372
 Comment Date: 05/11/2015

Customer: Charlotte Greene
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 Stephen.Stapleton@anua.ie
 Garrett.Leech@bnm.ie
 waste@bnm.ie

P/O: 82966

Approved by : **Laura Corrigan**

Sample Number : 436347

Sample Type: Surface Water

Client ID: SW-4 05/11/15
 Received: 05/11/2015 16:13
 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	526	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47139
 Report Unique ID: 52372

P/O: 82966

Sample Number : 436348

Sample Type: Surface Water

Client ID: SW-5 05/11/15
 Received: 05/11/2015 16:13
 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.05	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	326	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 436349

Sample Type: Surface Water

Client ID: SW-6 05/11/15
 Received: 05/11/2015 16:13
 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.15	mg/l
Chloride	* Chloride	-	18	mg/l
Conductivity	* Conductivity @ 25°C	-	476	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47189
Report Date : 14-Jan-2016

Report Unique ID: 52942
Commen. Date: 10/11/2015

Customer: Charlotte Greene
C/O Stephanie Golding
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Approved by : Shauna Seavers
Scientist

Sample Number : 436671

Sample Type: Surface Water

Client ID: SW4 10/11/15
Received: 10/11/2015 15:41

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.02	mg/l
Chloride	*Chloride	-	12	mg/l
Conductivity	*Conductivity @ 25°C	-	464	µS/cm
pH	*pH	-	7.5	pH units
Suspended solids	*Suspended solids	<35	<5	mg/l



Project Code : 15-47189

Report Unique ID: 52942

Sample Number : 436672
Sample Type: Surface Water

Client ID: SW5 10/11/15
Received: 10/11/2015 15:41

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.1	mg/l
Chloride	*Chloride	-	11	mg/l
Conductivity	*Conductivity @ 25°C	-	267	µS/cm
pH	*pH	-	7.4	pH units
Suspended solids	*Suspended solids	<35	9	mg/l

Sample Number : 436673

Sample Type: Surface Water

Client ID: SW6 10/11/15
Received: 10/11/2015 15:41

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.13	mg/l
Chloride	*Chloride	-	13	mg/l
Conductivity	*Conductivity @ 25°C	-	384	µS/cm
pH	*pH	-	7.5	pH units
Suspended solids	*Suspended solids	<35	9	mg/l

Methods of Analysis

Analysis Name:
Suspended solids
Chloride
Conductivity
pH
Ammonia

Method:
*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D
*G/67 Based on APHA, 2012, 22nd Edition, Method 4500-CL⁻E
*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B
*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+B
*G/67 Based on APHA, 2012, 22nd Edition, 4500-NH3 and bluebook, Ammonia in waters 1981

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

Conditions

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2. Results contained in this report relate only to the items tested.
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Project Code : 15-47311
Report Date : 14-Jan-2016

Report Unique ID: 52934
Commen. Date: 19/11/2015

Customer: Charlotte Greene

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Garrett.Leech@bnm.ie
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P/O: 82966

Approved by : Shauna Seavers
Scientist

Sample Number : 437654

Sample Type: Surface Water

Client ID: SW-4 19/11/15
Received: 19/11/2015 15:21

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.15	mg/l
Chloride	* Chloride	-	14	mg/l
Conductivity	* Conductivity @ 25°C	-	411	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47311

Report Unique ID: 52934

P/O: 82966

Sample Number : 437655

Sample Type: Surface Water

Client ID: SW-5 19/11/15
Received: 19/11/2015 15:21

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.36	mg/l
Chloride	* Chloride	-	13	mg/l
Conductivity	* Conductivity @ 25°C	-	324	µS/cm
pH	* pH	-	7.3	pH units
Suspended solids	* Suspended solids	<35	11	mg/l

Sample Number : 437656

Sample Type: Surface Water

Client ID: SW-6 19/11/15
Received: 19/11/2015 15:21

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.03	mg/l
Chloride	* Chloride	-	16	mg/l
Conductivity	* Conductivity @ 25°C	-	483	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47400
Report Date : 14-Jan-2016

Report Unique ID: 52932
Commen. Date: 26/11/2015

Customer: Charlotte Greene

C/O Stephanie Golding
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P/O: 82966

Approved by : Shauna Seavers
Scientist

Sample Number : 438338

Sample Type: Surface Water

Client ID: SW-4 26/11/15

Received: 26/11/2015 15:44

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.19	mg/l
Chloride	* Chloride	-	14	mg/l
Conductivity	* Conductivity @ 25°C	-	485	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l



Project Code : 15-47400

Report Unique ID: 52932

P/O: 82966

Sample Number : 438339

Sample Type: Surface Water

Client ID: SW-5 26/11/15

Received: 26/11/2015 15:44

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.84	mg/l
Chloride	* Chloride	-	14	mg/l
Conductivity	* Conductivity @ 25°C	-	391	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	11	mg/l

Sample Number : 438340

Sample Type: Surface Water

Client ID: SW-6 26/11/15

Received: 26/11/2015 15:44

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.22	mg/l
Chloride	* Chloride	-	20	mg/l
Conductivity	* Conductivity @ 25°C	-	548	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 15-47476
Report Date : 15-Dec-2015

Report Unique ID: 52544
Commen. Date: 02/12/2015

Customer: Charlotte Greene
C/O Stephanie Golding
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Approved by : Shaunna Seavers

Sample Number : 438888
Sample Type Surface Water

Client ID: SW-4 02/12/15
Received: 02/12/2015 16:15
Condition: Good

Analysis	Component	Specification	Result	Units
e.Coli**	e.Coli**	-	540	cfu/100 ml
Total Coliforms**	Total Coliforms**	-	540	cfu/100 ml

Sample Number : 438889
Sample Type Surface Water

Client ID: SW-5 02/12/15
Received: 02/12/2015 16:15
Condition: Good

Analysis	Component	Specification	Result	Units
e.Coli**	e.Coli**	-	32	cfu/100 ml
Total Coliforms**	Total Coliforms**	-	32	cfu/100 ml

Project Code : 15-47476

Report Unique ID: 52544

Sample Number : 438890
Sample Type Surface Water

Client ID: SW-6 02/12/15
Received: 02/12/2015 16:15
Condition: Good

Analysis	Component	Specification	Result	Units
e.Coli**	e.Coli**	-	15	cfu/100 ml
Total Coliforms**	Total Coliforms**	-	15	cfu/100 ml

Methods of Analysis

Analysis Name:
e.Coli**
Total Coliforms**

Method:
G/72 MPN based on IDEXX defined substrate method
MPN based on IDEXX defined substrate method

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

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Project Code : 15-47663
 Report Date : 08-Jan-2016
 Report Unique ID: 52842
 Commen. Date: 16/12/2015

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 C/O Stephanie Golding
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 waste@bnm.ie

P/O: 82966

Approved by : Shaunna Seavers

Sample Number : 440111		Client ID: SW-4 16/12/15	
Sample Type: Surface Water		Received: 16/12/2015 15:01	
Condition: Good			
Analysis	Component	Specification	Result
Ammonia	* NH3-N	<0.39	0.13 mg/l
Chloride	* Chloride	-	21 mg/l
Conductivity	* Conductivity @ 25°C	-	393 µS/cm
pH	* pH	-	7.6 pH units
Suspended solids	* Suspended solids	<35	5 mg/l



Project Code : 15-47663

Report Unique ID: 52842

P/O: 82966

Sample Number : 440112
 Client ID: SW-5 16/12/15
 Sample Type: Surface Water
 Received: 16/12/2015 15:01
 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.34	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	261	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	8	mg/l

Sample Number : 440113
 Client ID: SW-6 16/12/15
 Sample Type: Surface Water
 Received: 16/12/2015 15:01
 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.09	mg/l
Chloride	* Chloride	-	15	mg/l
Conductivity	* Conductivity @ 25°C	-	432	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	23	mg/l



Project Code : 15-47749
 Report Date : 15-Jan-2016

Report Unique ID: 52954
 Commen. Date: 22/12/2015

Customer: Charlotte Greene
 C/O Stephanie Golding
 Bord Na Mona
 Drehid Facility
 Carbury
 Co. Kildare

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Approved by: Shaunna Seavers
 Scientist

Sample Number : 440646

Sample Type: Surface Water

Client ID: SW4 22/12/15

Received: 22/12/2015 14:07

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.12	mg/l
Chloride	*Chloride	-	20	mg/l
Conductivity	*Conductivity @ 25°C	-	423	µS/cm
pH	*pH	-	7.5	pH units
Suspended solids	*Suspended solids	<35	6	mg/l



Project Code : 15-47749

Report Unique ID: 52954

Sample Number : 440647

Client ID: SW5 22/12/15

Sample Type: Surface Water

Received: 22/12/2015 14:07

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.42	mg/l
Chloride	*Chloride	-	17	mg/l
Conductivity	*Conductivity @ 25°C	-	292	µS/cm
pH	*pH	-	7.4	pH units
Suspended solids	*Suspended solids	<35	8	mg/l

Sample Number : 440648

Client ID: SW6 22/12/15

Sample Type: Surface Water

Received: 22/12/2015 14:07

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	*NH3-N	<0.39	0.10	mg/l
Chloride	*Chloride	-	30	mg/l
Conductivity	*Conductivity @ 25°C	-	467	µS/cm
pH	*pH	-	7.5	pH units
Suspended solids	*Suspended solids	<35	21	mg/l

Methods of Analysis

Analysis Name:

Suspended solids

pH

Ammonia

Chloride

Conductivity

Method:

*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D

*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+ B

*G/67 Based on APHA, 2012, 22nd Edition, 4500-NH3 and bluebook Ammonia in waters 1981

*G/67 Based on APHA 2012 22nd Edition Method 4500-CL E

*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

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2. Results contained in this report relate only to the items tested.
3. All Comments concerning this report or its contents should be forwarded to the Laboratory Manager



Project Code : 15-47487
Report Date : 25-Jan-2016

Report Unique ID: 53091
Comm. Date: 03/12/2015

Customer: Charlotte Greene
C/O Stephanie Golding
Bord Na Mona
Drehid Facility
Carbury
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C.O.C

Approved by: Shauna Seavers
Scientist

Sample Number: 438954
Sample Type: Surface Water

Client ID: SW4 03/12/15
Received: 03/12/2015 12.08
Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.14	mg/l
Chloride	* Chloride	-	14	mg/l
e.Coli	e.Coli	-	540	cfu/100 ml
Total Coliforms	Total Coliforms	-	540	cfu/100 ml
Conductivity	* Conductivity @ 25°C	-	443.5	µS/cm
Comb Pesticide suite	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l



Project Code : 15-47487

Report Unique ID: 53091

Sample Number: 438954
Sample Type: Surface Water

Client ID: SW4 03/12/15
Received: 03/12/2015 12.08
Condition: Good

Analysis	Component	Specification	Result	Units
Comb Pesticide suite	Parathion**	-	<0.01	µg/l
	o,p-DDE**	-	<0.01	µg/l
	Endosulfan I**	-	<0.01	µg/l
	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
	p,p-TDE**	-	<0.01	µg/l
	Ethion**	-	<0.01	µg/l
	Endosulfan II**	-	<0.01	µg/l
	p,p-DDT**	-	<0.01	µg/l
	o,p-Methoxychlor**	-	<0.01	µg/l
	p,p-Methoxychlor**	-	<0.01	µg/l
	Endosulfan Sulphate**	-	<0.01	µg/l
	* pH	-	<0.01	µg/l
	* pH	7.5	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
SVOCs	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	2,4,5-Trichlorophenol**	-	<1	µg/l
	2,4,6-Trichlorophenol**	-	<1	µg/l
	2,4-Dichlorophenol**	-	<1	µg/l
	2,4-Dimethylphenol**	-	<1	µg/l
	2,6-Dinitrotoluene**	-	<1	µg/l
	2-Chloronaphthalene**	-	<1	µg/l
	2-Chlorophenol**	-	<1	µg/l
	2-Methylnaphthalene**	-	<1	µg/l
	2-Methylphenol**	-	<1	µg/l
	2-Nitroaniline**	-	<1	µg/l
	2-Nitrophenol**	-	<1	µg/l
	3-Nitroaniline**	-	<1	µg/l
	4-Bromophenylether**	-	<1	µg/l
	4-Chloro-3-methylphenol**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438954	Client ID: SW4 03/12/15	Condition: Good
Sample Type: Surface Water	Received: 03/12/2015 12:08	

Analysis	Component	Specification	Result	Units
SVOCs	4-Chloroaniline**	-	<1	µg/l
	4-Chlorophenylphenylether**	-	<1	µg/l
	4-Methylphenol**	-	<1	µg/l
	4-Nitrophenol**	-	<1	µg/l
	4-Nitroaniline**	-	<1	µg/l
	Azobenzene**	-	<1	µg/l
	Acenaphthylene**	-	<1	µg/l
	Acenaphthene**	-	<1	µg/l
	Anthracene**	-	<1	µg/l
	Bis(2-Chloroethyl)ether**	-	<1	µg/l
	Bis(2-chloroethoxy)methane*	-	<1	µg/l
	* Bis(2-ethylhexyl)phthalate**	-	<2	µg/l
	Benzol(a)anthracene**	-	<1	µg/l
	Buylbenzylphthalate**	-	<1	µg/l
	Benzol(a)pyrene**	-	<1	µg/l
	Benzol(g)h)perylene**	-	<1	µg/l
	Carbazole**	-	<1	µg/l
	Chrysene**	-	<1	µg/l
	Dibenzofuran**	-	<1	µg/l
	n-Di-buylphthalate**	-	<1	µg/l
	Diethyl phthalate**	-	<1	µg/l
	Dibenzol(a,h)anthracene**	-	<1	µg/l
	Dimethyl phthalate**	-	<1	µg/l
	n-Di octyl phthalate**	-	<5	µg/l
	Fluoranthene**	-	<1	µg/l
	Flourene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosod-n-propylamine**	-	<1	µg/l
	Hexachloroethane**	-	<1	µg/l
	Nitrobenzene**	-	<1	µg/l
	Naphtthalene**	-	<1	µg/l
	Isophtorone**	-	<1	µg/l
	Hexachlorocyclopentadiene**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438954	Client ID: SW4 03/12/15	Condition: Good
Sample Type: Surface Water	Received: 03/12/2015 12:08	

Analysis	Component	Specification	Result	Units
SVOCs	Phenanthrene**	-	<1	µg/l
	Indeno(1,2,3-cd)pyrene**	-	<1	µg/l
	Pyrene**	-	<1	µg/l
USEPA VOCs	Dichlorodifluoromethane**	-	<1	µg/l
	Chloromethane**	-	<1	µg/l
	Vinyl chloride*	-	<1	µg/l
	Bromomethane**	-	<1	µg/l
	Chloroethane**	-	<1	µg/l
	Trichlorofluoromethane**	-	<1	µg/l
	1,1-Dichloroethene**	-	<1	µg/l
	Dichloromethane**	-	<3	µg/l
	trans-1,2-Dichloroethene**	-	<1	µg/l
	1,1-Dichloroethane**	-	<1	µg/l
	2,2-Dichloropropane**	-	<1	µg/l
	cis-1,2-Dichloroethene**	-	<1	µg/l
	Bromochloromethane**	-	<1	µg/l
	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
	Carbon Tetrachloride**	-	<1	µg/l
	1,1-Dichloropropane**	-	<1	µg/l
	Benzene**	-	<1	µg/l
	1,2-Dichloroethane**	-	<1	µg/l
	Trichloroethene**	-	<1	µg/l
	1,2-Dichloropropane**	-	<1	µg/l
	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
	1,2,4-Trimethylbenzene**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438954

Client ID: SW4 03/12/15

Received: 03/12/2015 12:08

Condition: Good

Sample Type: Surface Water

Analysis	Component	Specification	Result	Units
USEPA VOCs	4-Isopropyltoluene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	1,3-Dichloropropane**	-	<1	µg/l
	cis-1,3-Dichloropropene**	-	<1	µg/l
	trans-1,3-Dichloropropene**	-	<1	µg/l
	Dibromochloromethane**	-	<1	µg/l
	Chlorobenzene**	-	<1	µg/l
	Ethyl Benzene**	-	<1	µg/l
	o-Xylene**	-	<1	µg/l
	Bromoform**	-	<1	µg/l
	1,2,3-Trichloropropane**	-	<1	µg/l
	Bromobenzene**	-	<1	µg/l
	Tert-Butylbenzene**	-	<1	µg/l
	Sec-Butylbenzene**	-	<1	µg/l
	1,3,5-Trimethylbenzene**	-	<1	µg/l
	1,2-	-	<1	µg/l
	Dibromo-3-chloropropane**	-	<1	µg/l
	Hexachlorobutadiene**	-	<1	µg/l
	1,2,3-Trichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	Tetrachloroethene**	-	<1	µg/l
	n-butylbenzene**	-	<1	µg/l
	1,2,4-Trichlorobenzene**	-	<1	µg/l
	MTBE**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438955

Client ID: SW5 03/12/15

Received: 03/12/2015 12:08

Condition: Good

Sample Type: Surface Water

Analysis	Component	Specification	Result	Units
	Ammonia		0.62	mg/l
	Chloride	<0.39	14	mg/l
	e.Coli	-	32	ctu/100 ml
	Total Coliforms	-	32	ctu/100 ml
	Conductivity	-	364	µS/cm
	Comb Pesticide suite	-	<0.01	µg/l
	*NH3-N	-	<0.01	µg/l
	*Chloride	-	<0.01	µg/l
	e.Coli	-	<0.01	µg/l
	Total Coliforms	-	<0.01	µg/l
	*Conductivity @ 25°C	-	<0.01	µg/l
	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l
	Parathion**	-	<0.01	µg/l
	o,p-DDE**	-	<0.01	µg/l
	Endosulfan I**	-	<0.01	µg/l
	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
	p,p-TDE**	-	<0.01	µg/l
	Ethion**	-	<0.01	µg/l
	Endosulfan II**	-	<0.01	µg/l
	p,p-DDT**	-	<0.02	µg/l
	o,p-Methoxychlor**	-	<0.01	µg/l
	p,p-Methoxychlor**	-	<0.01	µg/l
	Endosulfan Sulphate**	-	<0.01	µg/l
	Azinphos Methyl**	-	<0.01	µg/l
pH	*pH	-	7.4	pH units
Suspended solids	*Suspended solids	<35	5	mg/l
SVOC'S	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438955 Client ID: SWS 03/12/15
 Sample Type: Surface Water Received: 03/12/2015 12:08 Condition: Good

Analysis	Component	Specification	Result	Units
SVOCs	1,3-Dichlorobenzene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	2,4,5-Trichlorophenol**	-	<1	µg/l
	2,4,6-Trichlorophenol**	-	<1	µg/l
	2,4-Dichlorophenol**	-	<1	µg/l
	2,4-Dimethylphenol**	-	<1	µg/l
	2,4-Dinitrotoluene**	-	<1	µg/l
	2,6-Dinitrotoluene**	-	<1	µg/l
	2-Chloronaphthalene**	-	<1	µg/l
	2-Chlorophenol**	-	<1	µg/l
	2-Methylnaphthalene**	-	<1	µg/l
	2-Methylphenol**	-	<1	µg/l
	2-Nitroaniline**	-	<1	µg/l
	3-Nitroaniline**	-	<1	µg/l
	4-Bromophenylphenylether**	-	<1	µg/l
	4-Chloro-3-methylphenol**	-	<1	µg/l
	4-Chloroaniline**	-	<1	µg/l
	4-Chlorophenylphenylether**	-	<1	µg/l
	4-Methylphenol**	-	<1	µg/l
	4-Nitrophenol**	-	<1	µg/l
	4-Nitroaniline**	-	<1	µg/l
	Azobenzene**	-	<1	µg/l
	Acenaphthylene**	-	<1	µg/l
	Acenaphthene**	-	<1	µg/l
	Anthracene**	-	<1	µg/l
	Bis(2-chloroethoxy)methane*	-	<1	µg/l
	Bis(2-ethylhexyl)phthalate**	-	<2	µg/l
	Benzo(a)anthracene**	-	<1	µg/l
	Buylbenzylphthalate**	-	<1	µg/l
	Benzo(a)pyrene**	-	<1	µg/l
	Benzo(g,h)perylene**	-	<1	µg/l
	Carbazole**	-	<1	µg/l
	Chrysene**	-	<1	µg/l
	Dibenzofuran**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438955 Client ID: SWS 03/12/15
 Sample Type: Surface Water Received: 03/12/2015 12:08 Condition: Good

Analysis	Component	Specification	Result	Units
SVOCs	n-D-butylphthalate**	-	<1	µg/l
	Diethyl phthalate**	-	<1	µg/l
	Dibenz(a,h)anthracene**	-	<1	µg/l
	Dimethyl phthalate**	-	<1	µg/l
	n-Di-ocyl phthalate**	-	<5	µg/l
	Fluorene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosod-n-propylamine**	-	<1	µg/l
	Hexachloroethane**	-	<1	µg/l
	Nitrobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	Isophorone**	-	<1	µg/l
	Hexachlorocyclopentadiene**	-	<1	µg/l
	Phenanthrene**	-	<1	µg/l
	Indenol(1,2,3-cd)pyrene**	-	<1	µg/l
	Pyrene**	-	<1	µg/l
	Alachlor**	-	<1	µg/l
	Dichlorodifluoromethane**	-	<1	µg/l
	Chloromethane**	-	<1	µg/l
	Vinyl chloride**	-	<1	µg/l
	Bromomethane**	-	<1	µg/l
	Chloroethane**	-	<1	µg/l
	Trichlorofluoromethane**	-	<1	µg/l
	1,1-Dichloroethene**	-	<1	µg/l
	Dichloromethane**	-	<3	µg/l
	trans-1,2-Dichloroethene**	-	<1	µg/l
	1,1-Dichloroethane**	-	<1	µg/l
	2,2-Dichloropropane**	-	<1	µg/l
	cis-1,2-Dichloroethene**	-	<1	µg/l
	Bromochloromethane**	-	<1	µg/l
	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
	Carbon Tetrachloride**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

Project Code : 15-47487

Report Unique ID: 53091

C.O.C.

C.O.C.

Sample Number : 438955

Client ID: SW5 03/12/15

Client ID: SW5 03/12/15

Sample Type: Surface Water

Received: 03/12/2015 12:08

Received: 03/12/2015 12:08

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	1,1-Dichloropropene**	-	<1	µg/l
	Benzene**	-	<1	µg/l
	1,2-Dichloroethane**	-	<1	µg/l
	Trichloroethene**	-	<1	µg/l
	1,2-Dichloropropane**	-	<1	µg/l
	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
	1,2,4-Trimethylbenzene**	-	<1	µg/l
	4-Isopropyltoluene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	1,3-Dichloropropane**	-	<1	µg/l
	cis-1,3-Dichloropropene**	-	<1	µg/l
	trans-1,3-Dichloropropene**	-	<1	µg/l
	Dibromochloromethane**	-	<1	µg/l
	Chlorobenzene**	-	<1	µg/l
Ethyl Benzene**	-	<1	µg/l	
o-Xylene**	-	<1	µg/l	
Bromoform**	-	<1	µg/l	
1,2,3-Trichloropropane**	-	<1	µg/l	
Bromobenzene**	-	<1	µg/l	
Tert-Butylbenzene**	-	<1	µg/l	
Sec-Butylbenzene**	-	<1	µg/l	
1,3,5-Trimethylbenzene**	-	<1	µg/l	
1,2-Dibromo-3-chloropropane**	-	<1	µg/l	

Sample Number : 438955

Client ID: SW5 03/12/15

Sample Type: Surface Water

Received: 03/12/2015 12:08

Received: 03/12/2015 12:08

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	Hexachlorobutadiene**	-	<1	µg/l
	1,2,3-Trichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	Tetrachloroethene**	-	<1	µg/l
	n-butylbenzene**	-	<1	µg/l
	1,2,4-Trichlorobenzene**	-	<1	µg/l
MTBE**	-	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438956	Client ID: SW6 03/12/15	Condition: Good
Sample Type: Surface Water	Received: 03/12/2015 12:08	

Analysis	Component	Specification	Result	Units
Ammonia	* NH ₃ -N	<0.39	0.06	mg/l
Chloride	* Chloride	-	20	mg/l
e.Coli	e.Coli	-	15	cfu/100 ml
Total Coliforms	Total Coliforms	-	15	cfu/100 ml
Conductivity	* Conductivity @ 25°C	-	609	µS/cm
Comb Pesticide suite	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l
	Parathion**	-	<0.01	µg/l
	o,p-DDE**	-	<0.01	µg/l
	Endosulfan I**	-	<0.01	µg/l
	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
	p,p-TDE**	-	<0.01	µg/l
	Ethion**	-	<0.01	µg/l
	Endosulfan II**	-	<0.01	µg/l
	p,p-DDT**	-	<0.02	µg/l
	o,p-Methoxychlor**	-	<0.01	µg/l
	p,p-Methoxychlor**	-	<0.01	µg/l
	Endosulfan Sulphate**	-	<0.01	µg/l
	Azinphos Methyl**	-	<0.01	µg/l
	Alpha BHC**	-	<0.01	µg/l
	Beta BHC**	-	<0.01	µg/l
	Gamma BHC**	-	<0.01	µg/l
pH	* pH	-	7.6	pH units



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438956	Client ID: SW6 03/12/15	Condition: Good
Sample Type: Surface Water	Received: 03/12/2015 12:08	

Analysis	Component	Specification	Result	Units
Suspended solids	Suspended solids	<35	<5	mg/l
SVOCs	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	2,4,5-Trichlorophenol**	-	<1	µg/l
	2,4,6-Trichlorophenol**	-	<1	µg/l
	2,4-Dichlorophenol**	-	<1	µg/l
	2,4-Dimethylphenol**	-	<1	µg/l
	2,4-Dinitrotoluene**	-	<1	µg/l
	2,6-Dinitrotoluene**	-	<1	µg/l
	2-Chloronaphthalene**	-	<1	µg/l
	2-Chlorophenol**	-	<1	µg/l
	2-Methylnaphthalene**	-	<1	µg/l
	2-Methylphenol**	-	<1	µg/l
	2-Nitroaniline**	-	<1	µg/l
	3-Nitroaniline**	-	<1	µg/l
	4-Bromophenylether**	-	<1	µg/l
	4-Chloro-3-methylphenol**	-	<1	µg/l
	4-Chloroaniline**	-	<1	µg/l
	4-Chlorophenylether**	-	<1	µg/l
	4-Methylphenol**	-	<1	µg/l
	4-Nitrophenol**	-	<1	µg/l
	4-Nitroaniline**	-	<1	µg/l
	Azobenzene**	-	<1	µg/l
	Acenaphthylene**	-	<1	µg/l
	Acenaphthene**	-	<1	µg/l
	Anthracene**	-	<1	µg/l
	Bis(2-chloroethyl)ether**	-	<1	µg/l
	Bis(2-chloroethoxy)methane*	-	<1	µg/l
	Bis(2-ethylhexyl)phthalate**	-	<2	µg/l
	Benzo(a)anthracene**	-	<1	µg/l
	Buylbenzylphthalate**	-	<1	µg/l
	Benzo(a)pyrene**	-	<1	µg/l
	Benzo(g)h)perylene**	-	<1	µg/l



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438956

Client ID: SW6 03/12/15

Sample Type: Surface Water

Received: 03/12/2015 12:08

Condition: Good

Analysis	Component	Specification	Result	Units
SVOCs	Carbazole**	-	<1	µg/l
	Chrysene**	-	<1	µg/l
	Dibenzofuran**	-	<1	µg/l
	n-Di-butylphthalate**	-	<1	µg/l
	Diethyl phthalate**	-	<1	µg/l
	Dibenzo(a,h)anthracene**	-	<1	µg/l
	Dimethyl phthalate**	-	<1	µg/l
	n-Di octyl phthalate**	-	<1	µg/l
	Fluoranthene**	-	<1	µg/l
	Flourene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosodi-n-propylamine**	-	<1	µg/l
	Hexachloroethane**	-	<1	µg/l
	Nitrobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	Isophorone**	-	<1	µg/l
	Hexachlorocyclopentadiene**	-	<1	µg/l
	Phenanthrene**	-	<1	µg/l
Indeno(1,2,3-cd)pyrene**	-	<1	µg/l	
Pyrene**	-	<1	µg/l	
Alachor**	-	<1	µg/l	
Dichlorodifluoromethane**	-	<1	µg/l	
Chloromethane**	-	<1	µg/l	
Vinyl chloride**	-	<1	µg/l	
Bromomethane**	-	<1	µg/l	
Chloroethane**	-	<1	µg/l	
Trichlorofluoromethane**	-	<1	µg/l	
1,1-Dichloroethene**	-	<1	µg/l	
Dichloromethane**	-	<3	µg/l	
trans-1,2-Dichloroethene**	-	<1	µg/l	
1,1-Dichloroethane**	-	<1	µg/l	
2,2-Dichloropropane**	-	<1	µg/l	
dis-1,2-Dichloroethene**	-	<1	µg/l	
Bromochloromethane**	-	<1	µg/l	

USEPA VOCs

Analysis	Component	Specification	Result	Units
USEPA VOCs	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
	Carbon Tetrachloride**	-	<1	µg/l
	1,1-Dichloropropene**	-	<1	µg/l
	Benzene**	-	<1	µg/l
	1,2-Dichloroethane**	-	<1	µg/l
	Trichloroethene**	-	<1	µg/l
	1,2-Dichloropropane**	-	<1	µg/l
	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
	1,2,4-Trimethylbenzene**	-	<1	µg/l
	4-Isopropyltoluene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	1,3-Dichloropropane**	-	<1	µg/l
	cis-1,3-Dichloropropene**	-	<1	µg/l
trans-1,3-Dichloropropene**	-	<1	µg/l	
Dibromochloromethane**	-	<1	µg/l	
Chlorobenzene**	-	<1	µg/l	
Ethyl Benzene**	-	<1	µg/l	
o-Xylene**	-	<1	µg/l	
Bromoform**	-	<1	µg/l	
1,2,3-Trichloropropane**	-	<1	µg/l	
Bromobenzene**	-	<1	µg/l	
tert-Butylbenzene**	-	<1	µg/l	
Sec-Butylbenzene**	-	<1	µg/l	



Project Code : 15-47487

Report Unique ID: 53091

COC

Sample Number : 438956

Client ID: SW6 03/12/15

Sample Type: Surface Water

Received: 03/12/2015 12:08

Condition: Good



Project Code : 15-47487

Report Unique ID: 53091

C O C

Sample Number : 438956 Client ID: SW6 03/12/15
 Sample Type: Surface Water Received: 03/12/2015 12:08 Condition: Good

Analysis	Component	Specification	Result	Units	
USEPA VOCs	1,3,5-Trimethylbenzene**	-	<1	µg/l	
	1,2-Dibromo-3-chloropropane**	-	<1	µg/l	
	Hexachlorobutadiene**	-	<1	µg/l	
	1,2,3-Trichlorobenzene**	-	<1	µg/l	
	1,3-Dichlorobenzene**	-	<1	µg/l	
	Tetrachloroethene**	-	<1	µg/l	
	n-butylbenzene**	-	<1	µg/l	
	1,2,4-Trichlorobenzene**	-	<1	µg/l	
	MTBE**	-	<1	µg/l	

Methods of Analysis

Analysis Name: e.Coli
 pH
 Ammonia
 Total Coliforms
 Chloride
 Conductivity
 Comb Pesticide suite
 SVOCs
 USEPA VOCs
 Suspended solids

Method:
 Based on ISO 15649-2 (2001).
 *G/05 Based on APHA 2012 22nd Edition Method 4500 H+B
 *G/67 Based on APHA 2012,22nd Edition, 4500-NH3 and bluebook Ammonia in waters 1981
 MPN based on IDEXX defined substrate method
 *G/67 Based on APHA 2012 22nd Edition Method 4500-CLTE
 *G/06 Based on APHA, 2012, 22nd Edition, Method 2910B GC-MS
 *G/19 Based on APHA, 2012, 22nd Edition, Method 2540D

Notes

* = INAB accredited test ** = subcontracted test *** = outside accredited range

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3. All Comments concerning this report or its contents should be forwarded to the Laboratory Manager

QUARTER 4 2016

**COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03**

For the Attention of:	Mrs. Phoebe Dillane, Bord na Móna, Drehid Waste Management Facility, Killinagh Upper, Carbury, Co. Kildare
Prepared by:	Mr. Daniel Behan Environmental Scientist
Reviewed by:	Mr. Stephen Stapleton Environmental Scientist
BNM File Ref:	ECS5259- Quarter 4 SW
Monitoring Date:	October/November/December 2016
Report Date:	16 th of January 2016

EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4). Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at SW-6 during Quarter 4.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at this location during Quarter 4.

SW4 is situated at Dillons Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedances of any parameters were recorded at this location during Quarter 4.

Weekly, Quarterly and Annual sampling was carried out during Quarter 4.



Mr. Stephen Stapleton
Environmental Scientist



Mr. Shaun Russell
Environmental Scientist

1.0 **SURFACE WATER**

1.2 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

SW6	Quarter 4														
Parameter	Units	Emission Limit	wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52	Wk53
pH	pH Units	-	7.6	Note1	7.5	Note1	Note1	7.7	7.5	7.6	7.6	7.5	7.6	7.6	7.7
Conductivity	µS/cm	-	653	Note1	688	Note1	Note1	517	584	658	677	690	569	662	738
BOD	mg/l	25 mg/l		Note1		Note1	Note1	<2							
Chloride	mg/l	-	18	Note1	15	Note1	Note1	23	23	22	23	24	21	22	24
COD	mg/l	-		Note1		Note1	Note1	39							
Suspended Solids	mg/l	35 mg/l	<5	Note1	<5	Note1	Note1	<5	<5	5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.05	Note1	0.05	Note1	Note1	0.13	0.17	0.15	<0.03	<0.03	0.04	0.17	0.28

Note 1: No discharge from site during this week,

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

SW5	Quarter 4														
Parameter	Units	Emission Limit	wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52	Wk53
pH	pH Units	-	7.4	7.4	7.4	7.4	7.6	7.5	7.4	7.3	7.4	7.5	7.4	7.2	7.3
Conductivity	µS/cm	-	481	523	304	367	768	442	356	368	415	470	356	350	417
BOD	mg/l	25 mg/l						5							
Chloride	mg/l	-	12	12	8.9	10	10	11	11	12	21	11	11	11	13
COD	mg/l	-						82							
Suspended Solids	mg/l	35 mg/l	<5	7	<5	14	<5	5	6	<5	8	<5	5	6	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.15	0.09	0.08	0.10	0.23	0.21	0.13	0.18	0.26	0.32	0.22	0.17	0.14

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4	Quarter 4														
Parameter	Units	Emission Limit	wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52	Wk53
pH	pH Units	-	7.7	7.7	7.6	7.7	8	7.7	7.7	7.7	7.8	7.6	7.6	7.6	7.7
Conductivity	µS/cm	-	623	625	564	640	468	608	595	589	606	642	719	571.5	596
BOD	mg/l	25 mg/l						2							
Chloride	mg/l	-	11	12	9.7	11	12	11	14	12	21	12	11	12	12
COD	mg/l	-						52							
Suspended Solids	mg/l	35 mg/l	<5	6	<5	6	<5	<5	<5	<5	5	<5	5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.03	<0.03	0.04	<0.03	0.03	0.06	<0.03	0.13	0.05	0.05	0.09	0.09	0.06

Table 2.1 (D): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6					
Client ID		SW-4	SW-5	SW-6	Emission Limit Value
Received Date & Time		09/11/16	09/11/16	09/11/16	
Sample Type		Surface Water	Surface Water	Surface Water	
PO4-P	mg/l	<0.01	0.01	<0.01	-
Total Phosphorous	mg/l	0.07	0.08	<0.05	-
N03-N	mg/l	0.68	<0.2	0.67	-
Sulphate	mg/l	11	15	52	-
Sodium (total)	mg/l	7.89	16.6	12.6	-
Magnesium(total)	mg/l	9.48	5.49	6.17	-
Potassium (total)	mg/l	4.38	2	5.24	-
Calcium (total)	mg/l	122	83.2	89.4	-
Boron (total)	µg/l	<135	<135	<135	-
Chromium (total)	µg/l	<3	<3	<3	-
Manganese (total)	µg/l	70.8	203	10	-
Nickel (total)	µg/l	5.79	9.56	3.76	-
Copper (total)	µg/l	<4	4.24	<4	-
Zinc (total)	µg/l	5.43	5.7	<3	-
Cadmium (total)	µg/l	<0.5	<0.5	<0.5	-
Lead (total)	µg/l	<0.5	<0.5	<0.5	-
Iron (total)	mg/l	0.301	1.18	0.0427	-
Mercury (total)	µg/l	<0.02	<0.02	<0.02	-
e.Coli **	cfu/100 ml	<1	<1	<1	-
Total Coliforms **	cfu/100 ml	8	9	5	-

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
Comb Pesticide Suite	Dichlorvos**	µg/l	<0.01	<0.01	<0.01	—
	Mevinphos**	µg/l	<0.01	<0.01	<0.01	—
	alpha-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Diazinon**	µg/l	<0.01	<0.01	<0.01	—
	gamma-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Heptachlor**	µg/l	<0.01	<0.01	<0.01	—
	Aldrin**	µg/l	<0.01	<0.01	<0.01	—
	beta-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Methyl Parathion**	µg/l	<0.01	<0.01	<0.01	—
	Malathion**	µg/l	<0.01	<0.01	<0.01	—
	Fenitrothion**	µg/l	<0.01	<0.01	<0.01	—
	Heptachlor Epoxide**	µg/l	<0.01	<0.01	<0.01	—
	Parathion**	µg/l	<0.01	<0.01	<0.01	—
	o,p-DDE**	µg/l	<0.01	<0.01	<0.01	—
	Endosulfan I**	µg/l	<0.01	<0.01	<0.01	—
	p,p-DDE**	µg/l	<0.01	<0.01	<0.01	—
	Dieldrin**	µg/l	<0.01	<0.01	<0.01	—
	o,p-TDE**	µg/l	<0.01	<0.01	<0.01	—
	Endrin**	µg/l	<0.01	<0.01	<0.01	—
	o,p-DDT**	µg/l	<0.01	<0.01	<0.01	—
	p,p-TDE**	µg/l	<0.01	<0.01	<0.01	—
	Ethion**	µg/l	<0.01	<0.01	<0.01	—
	Endosulfan II**	µg/l	<0.01	<0.01	<0.01	—
	p,p-DDT**	µg/l	<0.01	<0.01	<0.01	—
	o,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	—
	p,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	—
Endosulfan Sulphate**	µg/l	<0.01	<0.01	<0.01	—	
Azinphos Methyl**	µg/l	<0.01	<0.01	<0.01	—	
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<1	<1	<1	—
	1,2-Dichlorobenzene**	µg/l	<1	<1	<1	—
	1,3-Dichlorobenzene**	µg/l	<1	<1	<1	—
	1,4-Dichlorobenzene**	µg/l	<1	<1	<1	—
	2,4,5-Trichlorophenol**	µg/l	<1	<1	<1	—
	2,4,6-Trichlorophenol**	µg/l	<1	<1	<1	—
	2,4-Dichlorophenol**	µg/l	<1	<1	<1	—
	2,4-Dimethylphenol**	µg/l	<1	<1	<1	—
	2,4-Dinitrotoluene**	µg/l	<1	<1	<1	—
	2,6-Dinitrotoluene**	µg/l	<1	<1	<1	—
	2-Chloronaphthalene**	µg/l	<1	<1	<1	—
	2-Chlorophenol**	µg/l	<1	<1	<1	—
	2-Methylnaphthalene**	µg/l	<1	<1	<1	—
	2-Methylphenol**	µg/l	<1	<1	<1	—
	2-Nitroaniline**	µg/l	<1	<1	<1	—
	2-Nitrophenol**	µg/l	<1	<1	<1	—
	3-Nitroaniline**	µg/l	<1	<1	<1	—
	4-Bromophenylphenylether**	µg/l	<1	<1	<1	—
	4-Chloro-3-methylphenol**	µg/l	<1	<1	<1	—
	4-Chloroaniline**	µg/l	<1	<1	<1	—
	4-Chlorophenylphenylether**	µg/l	<1	<1	<1	—
	4-Methylphenol**	µg/l	<1	<1	<1	—
	4-Nitrophenol**	µg/l	<1	<1	<1	—
	4-Nitroaniline**	µg/l	<1	<1	<1	—
	Azobenzene**	µg/l	<1	<1	<1	—
	Acenaphthylene**	µg/l	<1	<1	<1	—
	Acenaphthene**	µg/l	<1	<1	<1	—
	Anthracene**	µg/l	<1	<1	<1	—
	Bis(2-Chloroethyl)ether**	µg/l	<1	<1	<1	—
	Bis(2-	µg/l	<1	<1	<1	—
Bis(2-ethylhexyl)phthalate**	µg/l	<1	<1	<1	—	
Benzo(a)anthracene**	µg/l	<1	<1	<1	—	

Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
SVOC's	Butylbenzylphthalate**	µg/l	<1	<1	<1	
	Benzo(a)pyrene**	µg/l	<1	<1	<1	
	Benzo(ghi)perylene**	µg/l	<1	<1	<1	
	Carbazole**	µg/l	<1	<1	<1	
	Chrysene**	µg/l	<1	<1	<1	
	Dibenzofuran**	µg/l	<1	<1	<1	
	n-Di-butylphthalate**	µg/l	<1	<1	<1	
	Diethyl phthalate**	µg/l	<1	<1	<1	
	Dibenzo(a,h)anthracene**	µg/l	<1	<1	<1	
	Dimethyl phthalate**	µg/l	<1	<1	<1	
	n-Di octyl phthalate**	µg/l	<1	<1	<1	
	Fluoranthene**	µg/l	<1	<1	<1	
	Flourene**	µg/l	<1	<1	<1	
	Hexachlorobenzene**	µg/l	<1	<1	<1	
	hexachlorobutadiene**	µg/l	<1	<1	<1	
	Pentachlorophenol**	µg/l	<1	<1	<1	
	Phenol**	µg/l	<1	<1	<1	
	N-nitrosodi-n-propylamine**	µg/l	<1	<1	<1	
	Hexachloroethane**	µg/l	<1	<1	<1	
	Nitrobenzene**	µg/l	<1	<1	<1	
	Naphthalene**	µg/l	<1	<1	<1	
	Isophorone**	µg/l	<1	<1	<1	
	Hexachlorocyclopentadiene**	µg/l	<1	<1	<1	
Phenanthrene**	µg/l	<1	<1	<1		
Indenol(1,2,3-cd)pyrene**	µg/l	<1	<1	<1		
Pyrene**	µg/l	<1	<1	<1		
VOC's						
	Dichlorodifluoromethane**	µg/l	<1	<1	<1	
	Chloromethane**	µg/l	<1	<1	<1	
	Vinyl chloride**	µg/l	<1	<1	<1	
	Bromomethane**	µg/l	<1	<1	<1	

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the fourth quarter of 2016. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters and once during the quarter for quarterly parameters. BOD, Ammonia and COD levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 3 to Figure 5.

No exceedances were noted for Suspended Solids, Ammonia and BOD during quarter 4 at SW-4, SW-5 and SW-6 monitoring locations with all remaining parameters in line with that previously detected.

The annual parameters were analysed on samples submitted on the 9th of November. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations. The microbiological results decreased since the previous monitoring event.

The metals results showed some fluctuations since the previous monitoring event but remain in trend with previous results.

The following annual parameters have decreased since the previous annual monitoring event, Total Phosphorus, Phosphate and Nitrate.

Sulphate results fluctuated but remain in trend with previous results.

Figures 3 to 5 below graphically display the Ammonia, BOD and Suspended Solids results obtained in 2016.

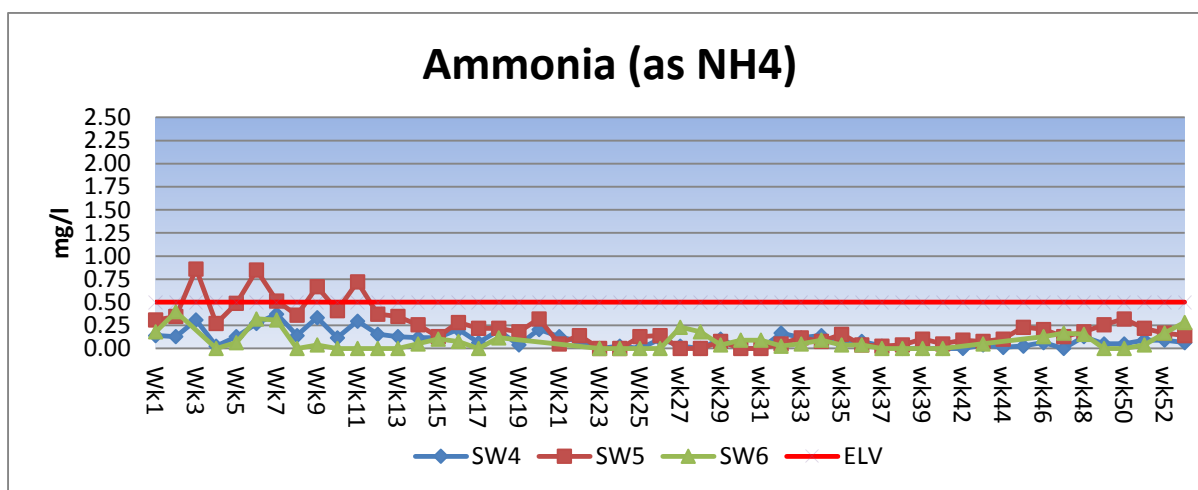


Figure 3

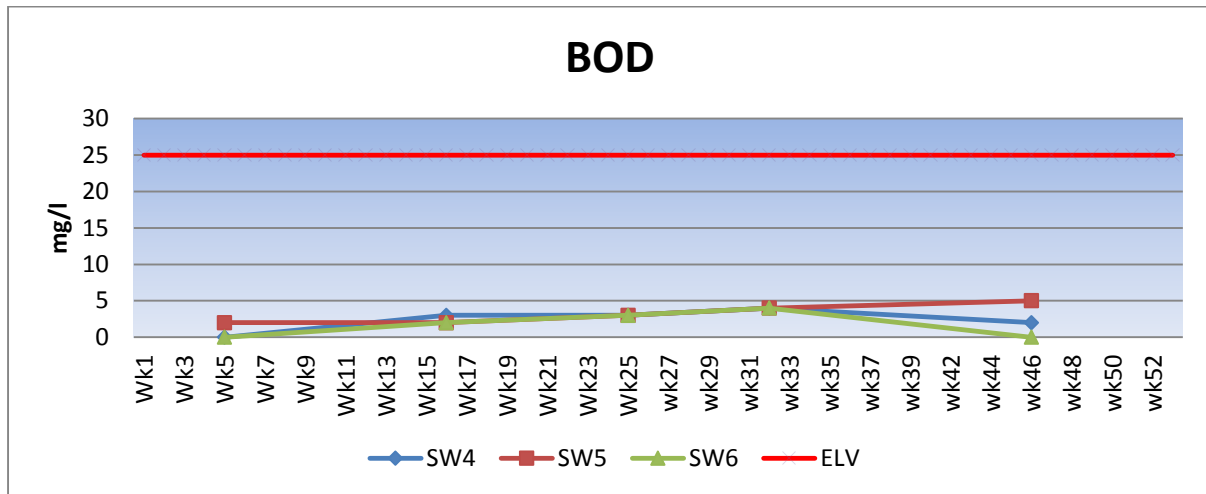


Figure 4

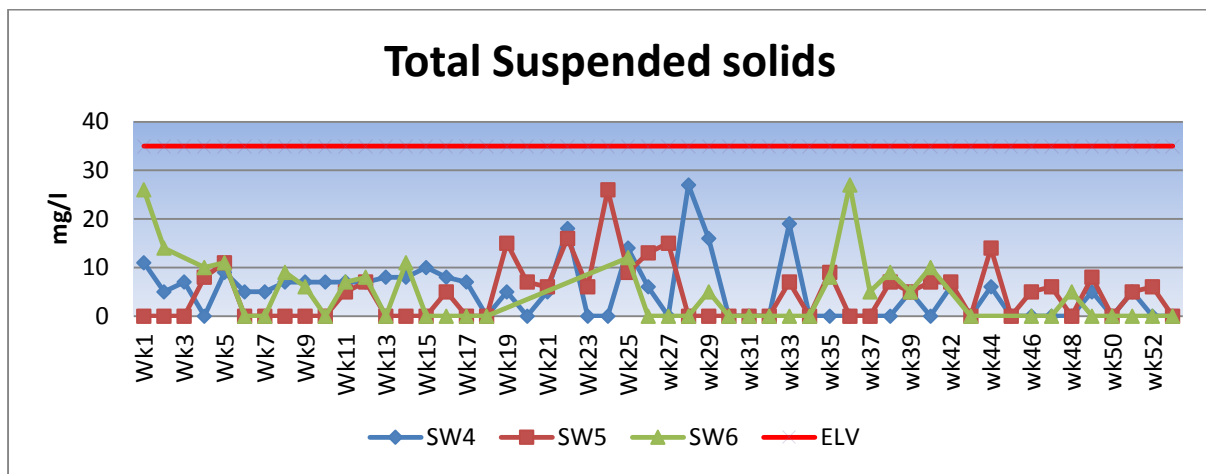
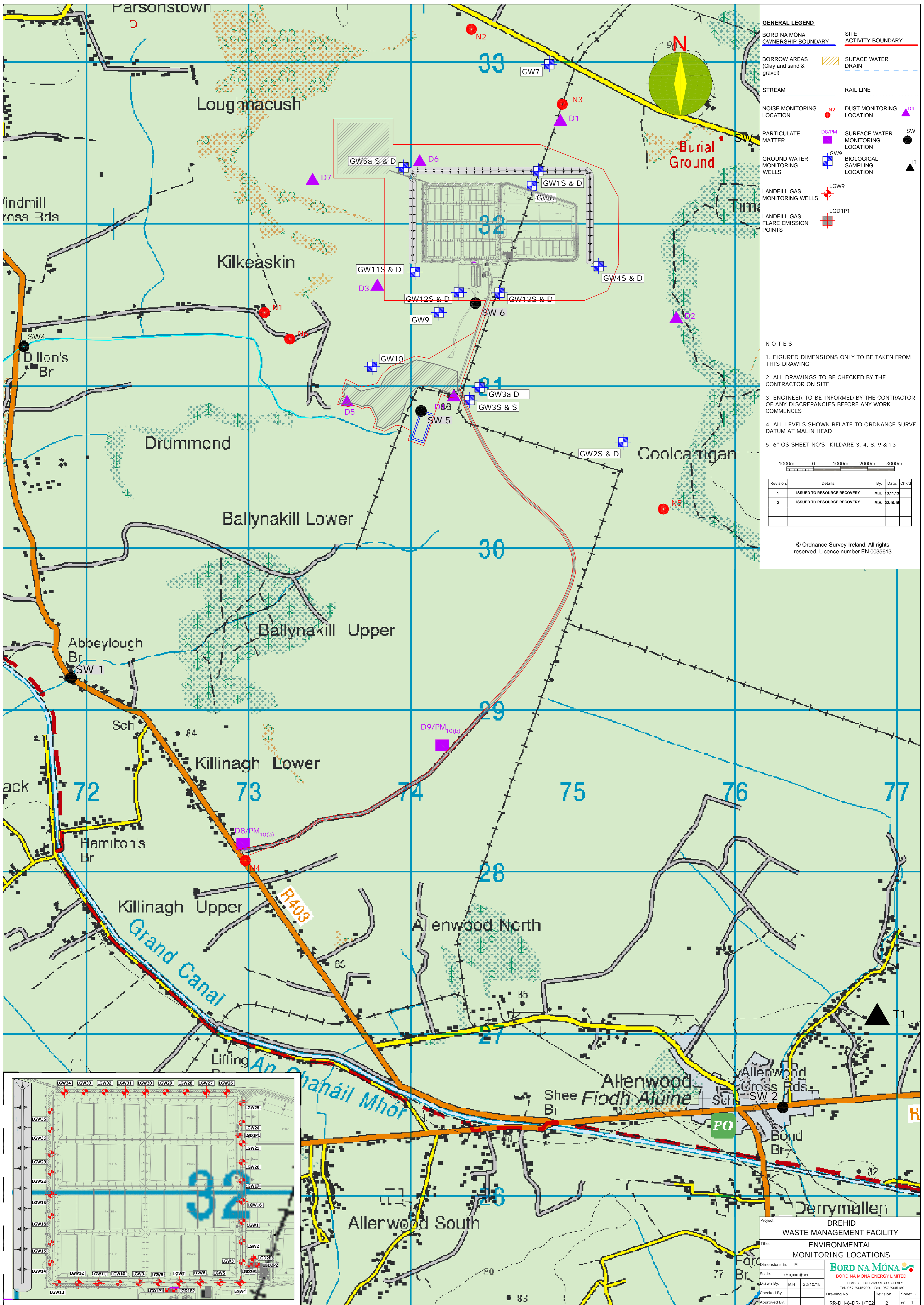


Figure 5

APPENDIX I

Monitoring Locations



GENERAL LEGEND

BORD NA MÓNA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
BORROW AREAS (Clay and sand & gravel)	SURFACE WATER DRAIN
STREAM	RAIL LINE
NOISE MONITORING LOCATION	DUST MONITORING LOCATION
PARTICULATE MATTER	SURFACE WATER MONITORING LOCATION
GROUND WATER MONITORING WELLS	BIOLOGICAL SAMPLING LOCATION
LANDFILL GAS MONITORING WELLS	
LANDFILL GAS FLARE EMISSION POINTS	

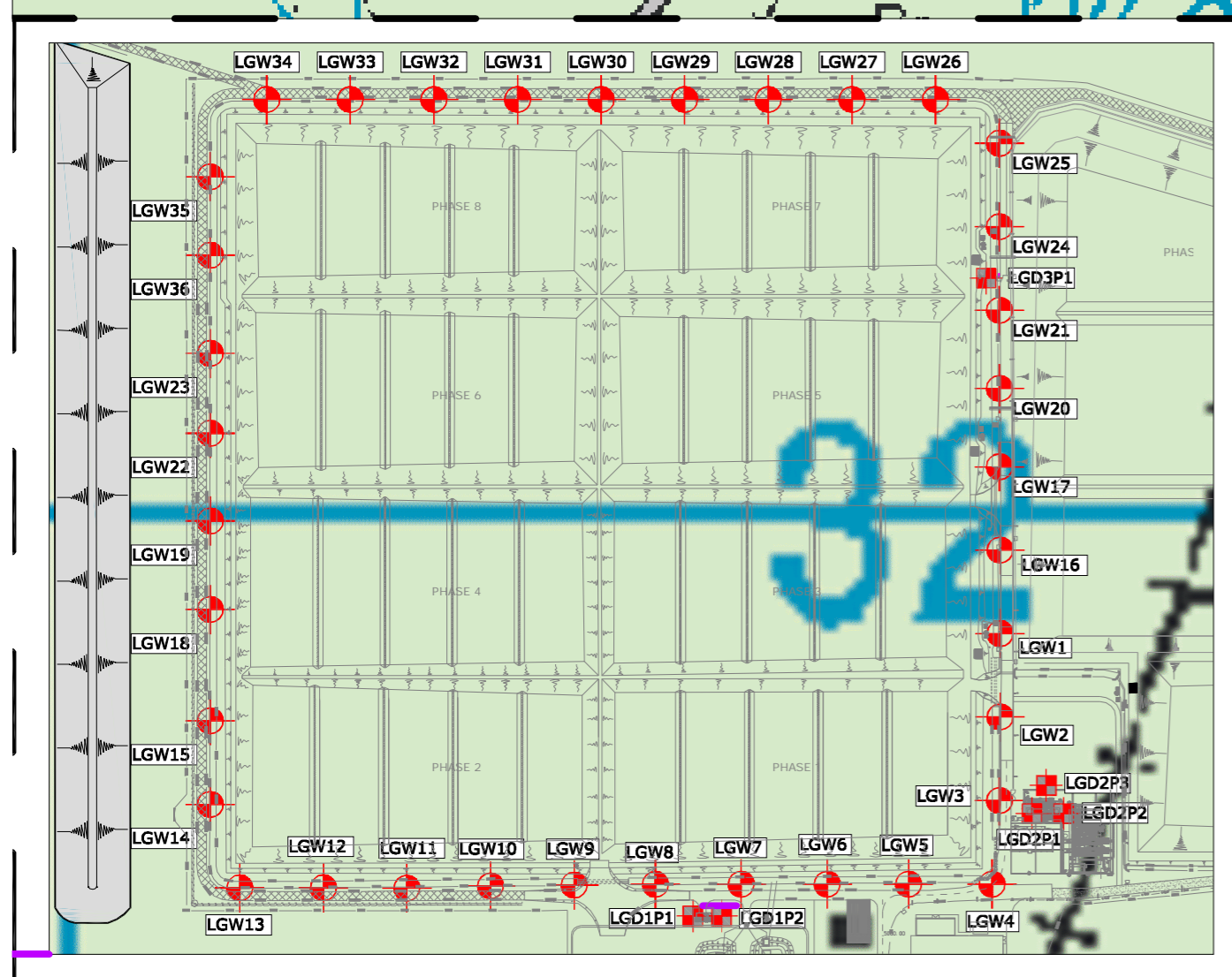
NOTES

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
- ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
- ALL LEVELS SHOWN RELATE TO ORDNANCE SURVE DATUM AT MALIN HEAD
- 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13

Scale: 1:10,000 @ A1

Revision	Details	By	Date	Chkd
1	ISSUED TO RESOURCE RECOVERY	M.H.	13.11.13	
2	ISSUED TO RESOURCE RECOVERY	M.H.	22.10.15	

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Project: DREHD WASTE MANAGEMENT FACILITY
 Title: ENVIRONMENTAL MONITORING LOCATIONS
 Scale: 1:10,000 @ A1
 Drawn By: M.H. 22/10/15
 Checked By: M.H.
 Approved By: M.H.
 Drawing No: RR-DH-6-DR-1/TE2
 Revision: 2
 Sheet: 1 of 1
BORD NA MÓNA
 BORD NA MÓNA ENERGY LIMITED
 LEARCO, TULLAMORE CO. DUBLIN
 Tel: 057 9345900 Fax: 057 9345160

APPENDIX 2

Analytical Methods

Chain of Custody

Analytical Methods

Analysis of water sampling was conducted in accordance with recognised standard methods as detailed below

ANALYSIS OF SAMPLES			
Parameter	Limit of Detection	Method	Accredited
pH (pH units)	0.1 – 14	G/05: Based on APHA 2012, 22 nd Ed, Method 4500 H+B	INAB ✓
Conductivity (µS/cm)	0.01 µS/cm to 200.0 mS/cm	<i>In-Situ</i> Calibrated Conductivity Meter	-
Temperature (°C)	-10 to 110 °C	<i>In-Situ</i> Calibrated pH / Temperature Thermometer	-
Biochemical Oxygen Demand (BOD) (mg/l)	<2 mg/l BOD	G/04: Based on APHA, 2012, 22 nd Ed, Method 5210B.	INAB ✓
Chemical Oxygen Demand(COD)(mg/l)	<10mg/l	G/03: Based on APHA 2012, 22 nd Edition, Method 5220D	INAB ✓
Chloride	<0.5 mg/l	G/67 Based on APHA, 2012, 22 nd Edition, Method 4500-Cl-E	INAB ✓
Ammonia-N (mg/l)	<0.02 mg/l NH ₃ -N	G/67: Based on APHA, 2012, 22 nd Ed, 4500-NH ₃ & Bluebook Ammonia in Waters 1981	INAB ✓

Notes:

- ✓ INAB Accredited Test Method – INAB Registration Reference No. 083T.
- X Non-INAB or UKAS Accredited Test Method
- * Sub-Contracted Test – Jones Environmental, UKAS Accredited Laboratory, UK.
- G/ INAB Accredited Method, BNM Environmental & Analytical Services Standard Operating Procedures Manual
- APHA- American Public Health Association, Standard Methods for the Examination of Waters and Wastewaters, 22nd Edition, 2012.
- < Less than laboratory limit of detection

ACCREDITED QUALITY SYSTEM

INAB Accreditation

BNM Environmental analytical laboratories are accredited to ISO 17025 by the National Accreditation Board (INAB). ISO 17025 accreditation ensures that the laboratory operates a quality system with technically competent staff. The laboratory has accreditation since 1997 and it is the policy of the laboratory to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

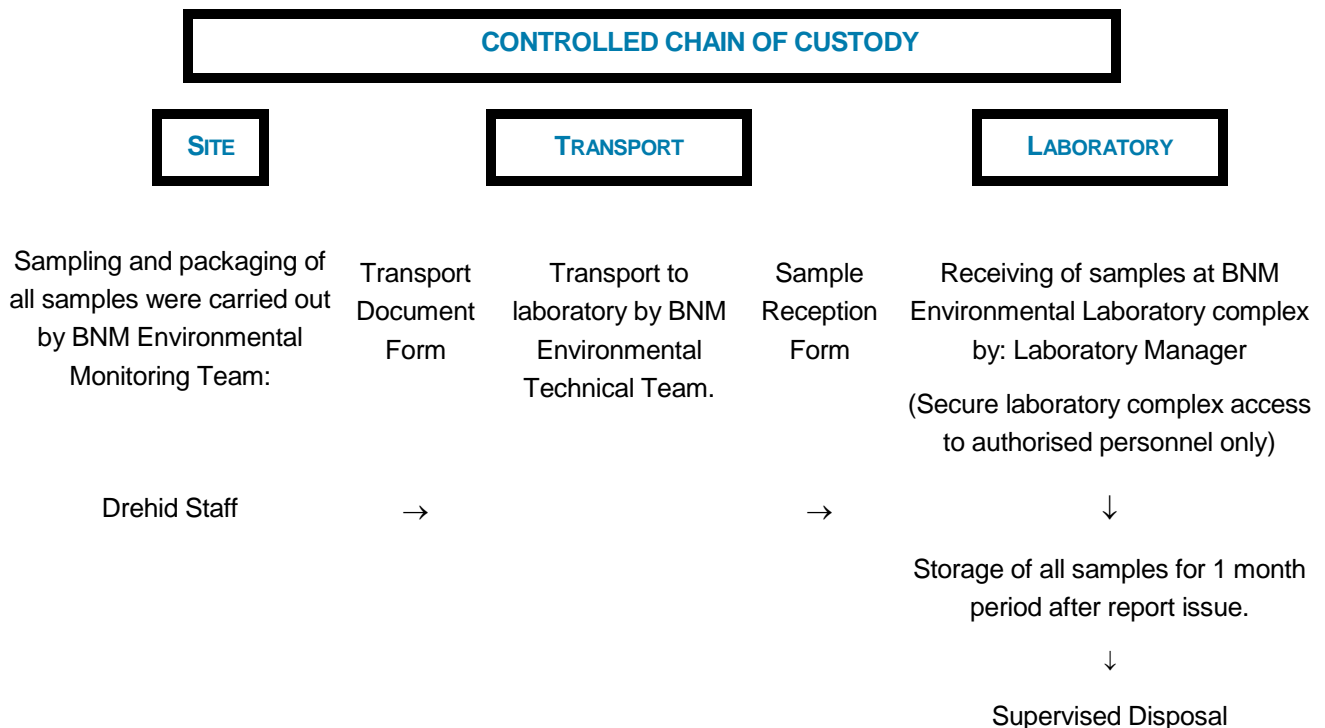
Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing the laboratory participates in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as LGC Aquacheck scheme and the EPA Intercalibration programme organised for environmental laboratories throughout Ireland. BNM Environmental Laboratory Services & Analytical Laboratory is listed on the EPA's register of Quality Controlled Laboratories

Control Chain of Custody

As part of the Quality System in place in BNM Environmental, measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.

BNM Environmental



APPENDIX 3

Lab Reports

Project Code : 16-50773

Report Unique ID: 56517

Report Date : 20-Dec-2016

Commen. Date: 05/10/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
Bord Na Mona
Drehid Facility
Carbury
Co. Kildare

Contact Details:

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Garrett.Leech@bnm.ie
compliance@bnm.ie

P/O: 82966
C.O.C.

Approved by : Maria Gladun
Scientist

Sample Number : 463884

Client ID: EPA Split W0201-SW-4 05/10/16

Sample Type: Surface Water

Received: 05/10/2016 15:55 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.02	mg/l
BOD	* BOD	<25	2	mg/l O2
Chloride	* Chloride	-	11	mg/l
COD	* COD	-	92	mg/l O2
Conductivity	* Conductivity @ 25°C	-	623	µS/cm
Anions	* Sulphate	-	11	mg/l
Orthophosphate	* P04-P	-	0.02	mg/l
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
TON as N	* TON as N	-	0.59	mg/l

Project Code : 16-50773

Report Unique ID: 56517

P/O: 82966
C.O.C.

Sample Number : 463885

Client ID: SW-5 05/10/16

Sample Type: Surface Water

Received: 05/10/2016 15:55

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.12	mg/l
BOD	* BOD	<25	6	mg/l O2
Chloride	* Chloride	-	12	mg/l
COD	* COD	-	66	mg/l O2
Conductivity	* Conductivity @ 25°C	-	481	µS/cm
Anions	* Sulphate	-	23	mg/l
Orthophosphate	* P04-P	-	0.01	mg/l
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
TON as N	* TON as N	-	0.66	mg/l

Sample Number : 463886

Client ID: EPA Split W0201-SW-6 05/10/16

Sample Type: Surface Water

Received: 05/10/2016 15:55

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.04	mg/l
BOD	* BOD	<25	2	mg/l O2
Chloride	* Chloride	-	18	mg/l
COD	* COD	-	70	mg/l O2
Conductivity	* Conductivity @ 25°C	-	653	µS/cm
Anions	* Sulphate	-	69	mg/l
Orthophosphate	* P04-P	-	<0.01	mg/l
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
TON as N	* TON as N	-	<0.20	mg/l

Project Code : 16-50870

Report Unique ID: 56004

Report Date : 28-Oct-2016

Commen. Date: 13/10/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
Bord Na Mona
Drehid Facility
Carbury
Co. Kildare

Contact Details:

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Leeanne.timony@bnm.ie
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Garrett.Leech@bnm.ie
compliance@bnm.ie

P/O: 82966
C.O.C.

Approved by : Maria Gladun
Scientist

Sample Number : 464485

Client ID: SW-4 13/10/16

Sample Type: Surface Water

Received: 13/10/2016 15:27

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	625	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	6	mg/l

Project Code : 16-50870

Report Unique ID: 56004

P/O: 82966
C.O.C.

Sample Number : 464486

Client ID: SW-5 13/10/16

Sample Type: Surface Water

Received: 13/10/2016 15:27

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.07	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	523	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	7	mg/l

Methods of Analysis

Analysis Name:

Chloride
Conductivity
pH
Suspended solids
Ammonia

Method:

*G/67 Based on APHA 2012 22nd Edition Method 4500-CL⁻E
*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B
*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+B
*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D
*G/67 Based on APHA 2012, 22nd Edition, 4500-NH₃ and bluebook Ammonia in waters 1981

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

Conditions

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Project Code : 16-50948
Report Date : 20-Dec-2016

Report Unique ID: 56511
Commen. Date: 20/10/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
Bord Na Mona
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P/O: 82966
C.O.C.

Approved by : Maria Gladun
Scientist

Sample Number : 464964 Client ID: SW-4 20/10/16
Sample Type: Surface Water Received: 20/10/2016 16:00 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.03	mg/l
Chloride	* Chloride	-	9.7	mg/l
Conductivity	* Conductivity @ 25°C	-	564	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-50948

Report Unique ID: 56511

P/O: 82966
C.O.C.

Sample Number : 464965

Client ID: SW-5 20/10/16

Sample Type: Surface Water

Received: 20/10/2016 16:00

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.06	mg/l
Chloride	* Chloride	-	8.9	mg/l
Conductivity	* Conductivity @ 25°C	-	304	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 464966

Client ID: SW-6 20/10/16

Sample Type: Surface Water

Received: 20/10/2016 16:00

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.04	mg/l
Chloride	* Chloride	-	15	mg/l
Conductivity	* Conductivity @ 25°C	-	688	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51003
Report Date : 20-Dec-2016

Report Unique ID: 56512
Commen. Date: 26/10/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
Bord Na Mona
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Leeanne.timony@bnm.ie
Stephen.Stapleton@anua.ie
Garrett.Leech@bnm.ie
compliance@bnm.ie

Approved by : Maria Gladun
Scientist

Sample Number : 465271 Client ID: SW4 26/10/16
Sample Type: Surface Water Received: 26/10/2016 15:52 Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.01	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	640	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	6	mg/l

Project Code : 16-51003

Report Unique ID: 56512

Sample Number : 465272

Client ID: SW5 26/10/16

Sample Type: Surface Water

Received: 26/10/2016 15:52

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.08	mg/l
Chloride	* Chloride	-	10	mg/l
Conductivity	* Conductivity @ 25°C	-	367	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	14	mg/l

Methods of Analysis

Analysis Name:

Suspended solids

Conductivity

Ammonia

pH

Chloride

Method:

*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D

*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B

*G/67 Based on APHA 2012, 22nd Edition, 4500-NH3 and bluebook Ammonia in waters 1981

*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+B

*G67 Based on APHA 2012 22nd Edition Method 4500-CL⁻E

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

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Project Code : 16-51107

Report Unique ID: 56507

Report Date : 20-Dec-2016

Commen. Date: 04/11/2016 00

Customer: Phoebe Dillane

C/O Stephanie Golding
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compliance@bnm.ie

Approved by : Maria Gladun
Scientist

Sample Number : 465930

Client ID: SW4 4/11/16

Sample Type: Surface Water

Received: 04/11/2016 15:53

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.02	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	468	µS/cm
pH	* pH	-	8.0	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51107

Report Unique ID: 56507

Sample Number : 465931

Client ID: SW5 4/11/16

Sample Type: Surface Water

Received: 04/11/2016 15:53

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.18	mg/l
Chloride	* Chloride	-	10	mg/l
Conductivity	* Conductivity @ 25°C	-	768	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Methods of Analysis

Analysis Name:

Ammonia
Suspended solids
Chloride
pH
Conductivity

Method:

*G/67 Based on APHA 2012, 22nd Edition, 4500-NH3 and bluebook Ammonia in waters 1981
*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D
*G/67 Based on APHA 2012 22nd Edition Method 4500-CL⁻E
*G/05 Based on APHA, 2012, 22nd Edition, Method 4500 H+B
*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

Conditions

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Project Code : 16-51163
Report Date : 21-Dec-2016

Report Unique ID: 56537
Commen. Date: 09/11/2016 00

Customer: Phoebe Dillane

C/O Stephanie Golding
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P/O: 82966
C.O.C.

Approved by : Maria Gladun
Scientist

Sample Number : 466204 Client ID: SW-4 09/11/16
Sample Type: Surface Water Received: 09/11/2016 16:42 Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.05	mg/l
BOD	* BOD	<25	2	mg/l O2
Chloride	* Chloride	-	11	mg/l
COD	* COD	-	52	mg/l O2
e.Coli**	e.Coli **	-	<1	cfu/100 ml
Total Coliforms**	Total Coliforms **	-	8	cfu/100 ml
Conductivity	* Conductivity @ 25°C	-	608	µS/cm
VOC's by GC-FID subb	Methanol**	-	<0.5	mg/l
	Acetonitrile**	-	<0.50	mg/l
	Ethanol**	-	<0.50	mg/l
	Acetone**	-	<0.50	mg/l
	Isopropanol**	-	<0.50	mg/l
Anions	* Sulphate	-	11	mg/l
Metal Scan	Mercury (total)**	-	<0.02	µg/l
Metal Scan	Aluminium (total) **	-	<50	µg/l
	Antimony (total)**	-	<4	µg/l
	Barium (total) **	-	109	µg/l

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466204

Client ID: SW-4 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Metal Scan	Beryllium (total)**	-	<1	µg/l
	Cadmium (total)**	-	<0.5	µg/l
	Calcium (total) **	-	122	mg/l
	Chromium (total)**	-	<3	µg/l
	Cobalt (total)**	-	<0.5	µg/l
	Copper (total) **	-	<4	µg/l
	Iron (total) **	-	0.301	mg/l
	Lead (total) **	-	<0.5	µg/l
	Magnesium (total)**	-	9.48	mg/l
	Manganese (total)**	-	70.8	µg/l
	Nickel (total) **	-	5.79	µg/l
	Arsenic (total)**	-	20.7	µg/l
	Boron (total) **	-	<135	µg/l
	Potassium (total) **	-	4.38	mg/l
	Selenium (total) **	-	84.2	µg/l
	Silver (total) **	-	<2	µg/l
	Sodium (total) **	-	7.89	mg/l
	Tin (total) **	-	<3	µg/l
	Zinc (total) **	-	5.43	µg/l
Nitrate as N	* N03-N	-	0.68	mg/l
Orthophosphate	* P04-P	-	<0.01	mg/l
Comb Pesticide suite	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l
	Parathion**	-	<0.01	µg/l
o,p-DDE**	-	<0.01	µg/l	
Endosulfan I**	-	<0.01	µg/l	

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466204

Client ID: SW-4 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Comb Pesticide suite	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
	p,p-TDE**	-	<0.01	µg/l
	Ethion**	-	<0.01	µg/l
	Endosulfan II**	-	<0.01	µg/l
	p,p-DDT**	-	<0.01	µg/l
	o,p-Methoxychlor**	-	<0.01	µg/l
	p,p-Methoxychlor**	-	<0.01	µg/l
	Endosulfan Sulphate**	-	<0.01	µg/l
	Azinphos Methyl**	-	<0.01	µg/l
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
SVOC'S	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	2,4,5-Trichlorophenol**	-	<1	µg/l
	2,4,6-Trichlorophenol**	-	<1	µg/l
	2,4-Dichlorophenol**	-	<1	µg/l
	2,4-Dimethylphenol**	-	<1	µg/l
	2-Chloronaphthalene**	-	<1	µg/l
	2-Chlorophenol**	-	<1	µg/l
	2-Methylnaphthalene**	-	<1	µg/l
	2-Methylphenol**	-	<1	µg/l
	2-Nitroaniline**	-	<1	µg/l
	2-Nitrophenol**	-	<1	µg/l
	3-Nitroaniline**	-	<1	µg/l
	4-Bromophenylphenylether**	-	<1	µg/l
4-Chloro-3-methylphenol**	-	<1	µg/l	
4-Chloroaniline**	-	<1	µg/l	
4-Chlorophenylphenylether**	-	<1	µg/l	
4-Methylphenol**	-	<1	µg/l	
4-Nitrophenol**	-	<1	µg/l	

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Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466204

Client ID: SW-4 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
SVOC'S	4-Nitroaniline**	-	<1	µg/l
	Azobenzene**	-	<1	µg/l
	Acenaphthene**	-	<1	µg/l
	Anthracene**	-	<1	µg/l
	Bis(2-Chloroethyl)ether**	-	<1	µg/l
	Bis(2-chloroethoxy)methane*	-	<1	µg/l
	Bis(2-ethylhexyl)phthalate**	-	<1	µg/l
	Benzo(a)anthracene**	-	<1	µg/l
	Butylbenzylphthalate**	-	<1	µg/l
	Benzo(a)pyrene**	-	<1	µg/l
	Benzo(ghi)perylene**	-	<1	µg/l
	Carbazole**	-	<1	µg/l
	Chrysene**	-	<1	µg/l
	Dibenzofuran**	-	<1	µg/l
	Diethyl phthalate**	-	<1	µg/l
	Dibenzo(a,h)anthracene**	-	<1	µg/l
	Dimethyl phthalate**	-	<1	µg/l
	Flourene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosodi-n-propylamine**	-	<1	µg/l
Hexachloroethane**	-	<1	µg/l	
Nitrobenzene**	-	<1	µg/l	
Naphthalene**	-	<1	µg/l	
Isophorone**	-	<1	µg/l	
Hexachlorocyclopentadiene**	-	<1	µg/l	
Phenanthrene**	-	<1	µg/l	
Indenol(1,2,3-cd)pyrene**	-	<1	µg/l	
Pyrene**	-	<1	µg/l	
Total Phosphorous	Total Phosphorous**	-	0.07	mg/l
USEPA VOCs	Dichlorodifluoromethane**	-	<1	µg/l
	Chloromethane**	-	<1	µg/l
	Vinyl chloride**	-	<1	µg/l

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P/O: 82966
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Sample Number : 466204

Client ID: SW-4 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	Bromomethane**	-	<1	µg/l
	Chloroethane**	-	<1	µg/l
	Trichlorofluoromethane**	-	<1	µg/l
	1,1-Dichloroethene**	-	<1	µg/l
	Dichloromethane**	-	<3	µg/l
	trans-1,2-Dichloroethene**	-	<1	µg/l
	1,1-Dichloroethane**	-	<1	µg/l
	2,2-Dichloropropane**	-	<1	µg/l
	cis-1,2-Dichloroethene**	-	<1	µg/l
	Bromochloromethane**	-	<1	µg/l
	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
	Carbon Tetrachloride**	-	<1	µg/l
	1,1-Dichloropropene**	-	<1	µg/l
	Benzene**	-	<1	µg/l
	1,2-Dichloroethane**	-	<1	µg/l
	Trichloroethene**	-	<1	µg/l
	1,2-Dichloropropane**	-	<1	µg/l
	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
1,2,4-Trimethylbenzene**	-	<1	µg/l	
4-Isopropyltoluene**	-	<1	µg/l	
1,4-Dichlorobenzene**	-	<1	µg/l	
1,2-Dichlorobenzene**	-	<1	µg/l	
Naphthalene**	-	<1	µg/l	
1,3-Dichloropropane**	-	<1	µg/l	

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P/O: 82966
C.O.C.

Sample Number : 466204

Client ID: SW-4 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	cis-1,3-Dichloropropene**	-	<1	µg/l
	trans-1,3-Dichloropropene**	-	<1	µg/l
	Dibromochloromethane**	-	<1	µg/l
	Chlorobenzene**	-	<1	µg/l
	Ethyl Benzene**	-	<1	µg/l
	o-Xylene**	-	<1	µg/l
	Bromoform**	-	<1	µg/l
	1,2,3-Trichloropropane**	-	<1	µg/l
	Bromobenzene**	-	<1	µg/l
	Tert-Butylbenzene**	-	<1	µg/l
	Sec-Butylbenzene**	-	<1	µg/l
	1,3,5-Trimethylbenzene**	-	<1	µg/l
	1,2-	-	<1	µg/l
	Dibromo-3-chloropropane**	-	<1	µg/l
	Hexachlorobutadiene**	-	<1	µg/l
	1,2,3-Trichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l
	Tetrachloroethene**	-	<1	µg/l
	n-butylbenzene**	-	<1	µg/l
	1,2,4-Trichlorobenzene**	-	<1	µg/l
MTBE**	-	<1	µg/l	

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P/O: 82966
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Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.16	mg/l
BOD	* BOD	<25	5	mg/l O2
Chloride	* Chloride	-	11	mg/l
COD	* COD	-	82	mg/l O2
e.Coli**	e.Coli **	-	<1	cfu/100 ml
Total Coliforms**	Total Coliforms **	-	9	cfu/100 ml
Conductivity	* Conductivity @ 25°C	-	442	µS/cm
VOC's by GC-FID subb	Methanol**	-	<0.5	mg/l
	Acetonitrile**	-	<0.50	mg/l
	Ethanol**	-	<0.50	mg/l
	Acetone**	-	<0.50	mg/l
	Isopropanol**	-	<0.50	mg/l
Anions	* Sulphate	-	15	mg/l
Metal Scan	Mercury (total)**	-	<0.02	µg/l
Metal Scan	Aluminium (total) **	-	<50	µg/l
	Antimony (total)**	-	<4	µg/l
	Barium (total) **	-	81.7	µg/l
	Beryllium (total)**	-	<1	µg/l
	Cadmium (total)**	-	<0.5	µg/l
	Calcium (total) **	-	83.2	mg/l
	Chromium (total)**	-	<3	µg/l
	Cobalt (total)**	-	<0.5	µg/l
	Copper (total) **	-	4.24	µg/l
	Iron (total) **	-	1.18	mg/l
	Lead (total) **	-	<0.5	µg/l
	Magnesium (total)**	-	5.49	mg/l
	Manganese (total)**	-	203	µg/l
	Nickel (total) **	-	9.56	µg/l
	Mercury (total)**	-	<0.02	µg/l
	Arsenic (total)**	-	6.7	µg/l
	Boron (total) **	-	<135	µg/l
	Potassium (total) **	-	2	mg/l
	Selenium (total) **	-	1.63	µg/l
	Silver (total) **	-	<2	µg/l
	Sodium (total) **	-	16.6	mg/l
	Tin (total) **	-	<3	µg/l

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P/O: 82966
C.O.C.

Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Metal Scan	Zinc (total) **	-	5.7	µg/l
Nitrate as N	* N03-N	-	<0.2	mg/l
Orthophosphate	* P04-P	-	0.01	mg/l
Comb Pesticide suite	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l
	Parathion**	-	<0.01	µg/l
	o,p-DDE**	-	<0.01	µg/l
	Endosulfan I**	-	<0.01	µg/l
	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
p,p-TDE**	-	<0.01	µg/l	
Ethion**	-	<0.01	µg/l	
Endosulfan II**	-	<0.01	µg/l	
p,p-DDT**	-	<0.01	µg/l	
o,p-Methoxychlor**	-	<0.01	µg/l	
p,p-Methoxychlor**	-	<0.01	µg/l	
Endosulfan Sulphate**	-	<0.01	µg/l	
Azinphos Methyl**	-	<0.01	µg/l	
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	5	mg/l
SVOC'S	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l

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Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units	
SVOC'S	1,4-Dichlorobenzene**	-	<1	µg/l	
	2,4,5-Trichlorophenol**	-	<1	µg/l	
	2,4,6-Trichlorophenol**	-	<1	µg/l	
	2,4-Dichlorophenol**	-	<1	µg/l	
	2,4-Dimethylphenol**	-	<1	µg/l	
	2-Chloronaphthalene**	-	<1	µg/l	
	2-Chlorophenol**	-	<1	µg/l	
	2-Methylnaphthalene**	-	<1	µg/l	
	2-Methylphenol**	-	<1	µg/l	
	2-Nitroaniline**	-	<1	µg/l	
	2-Nitrophenol**	-	<1	µg/l	
	3-Nitroaniline**	-	<1	µg/l	
	4-Bromophenylphenylether**	-	<1	µg/l	
	4-Chloro-3-methylphenol**	-	<1	µg/l	
	4-Chloroaniline**	-	<1	µg/l	
	4-Chlorophenylphenylether**	-	<1	µg/l	
	4-Methylphenol**	-	<1	µg/l	
	4-Nitrophenol**	-	<1	µg/l	
	4-Nitroaniline**	-	<1	µg/l	
	Azobenzene**	-	<1	µg/l	
	Acenaphthene**	-	<1	µg/l	
	Anthracene**	-	<1	µg/l	
	Bis(2-Chloroethyl)ether**	-	<1	µg/l	
	Bis(2-chloroethoxy)methane*	-	<1	µg/l	
	*				
	Bis(2-ethylhexyl)phthalate**	-	<1	µg/l	
	Benzo(a)anthracene**	-	<1	µg/l	
	Butylbenzylphthalate**	-	<1	µg/l	
	Benzo(a)pyrene**	-	<1	µg/l	
	Benzo(ghi)perylene**	-	<1	µg/l	
	Carbazole**	-	<1	µg/l	
	Chrysene**	-	<1	µg/l	
Dibenzofuran**	-	<1	µg/l		
Diethyl phthalate**	-	<1	µg/l		
Dibenzo(a,h)anthracene**	-	<1	µg/l		
Dimethyl phthalate**	-	<1	µg/l		

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P/O: 82966
C.O.C.

Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
SVOC'S	Flourene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosodi-n-propylamine**	-	<1	µg/l
	Hexachloroethane**	-	<1	µg/l
	Nitrobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	Isophorone**	-	<1	µg/l
	Hexachlorocyclopentadiene**	-	<1	µg/l
	Phenanthrene**	-	<1	µg/l
	Indenol(1,2,3-cd)pyrene**	-	<1	µg/l
	Pyrene**	-	<1	µg/l
	Total Phosphorous	Total Phosphorous**	-	0.08
USEPA VOCs	Dichlorodifluoromethane**	-	<1	µg/l
	Chloromethane**	-	<1	µg/l
	Vinyl chloride**	-	<1	µg/l
	Bromomethane**	-	<1	µg/l
	Chloroethane**	-	<1	µg/l
	Trichlorofluoromethane**	-	<1	µg/l
	1,1-Dichloroethene**	-	<1	µg/l
	Dichloromethane**	-	<3	µg/l
	trans-1,2-Dichloroethene**	-	<1	µg/l
	1,1-Dichloroethane**	-	<1	µg/l
	2,2-Dichloropropane**	-	<1	µg/l
	cis-1,2-Dichloroethene**	-	<1	µg/l
	Bromochloromethane**	-	<1	µg/l
	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
Carbon Tetrachloride**	-	<1	µg/l	
1,1-Dichloropropene**	-	<1	µg/l	
Benzene**	-	<1	µg/l	
1,2-Dichloroethane**	-	<1	µg/l	
Trichloroethene**	-	<1	µg/l	
1,2-Dichloropropane**	-	<1	µg/l	

Project Code : 16-51163

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P/O: 82966
C.O.C.

Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
	1,2,4-Trimethylbenzene**	-	<1	µg/l
	4-Isopropyltoluene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	1,3-Dichloropropane**	-	<1	µg/l
	cis-1,3-Dichloropropene**	-	<1	µg/l
	trans-1,3-Dichloropropene**	-	<1	µg/l
	Dibromochloromethane**	-	<1	µg/l
	Chlorobenzene**	-	<1	µg/l
	Ethyl Benzene**	-	<1	µg/l
	o-Xylene**	-	<1	µg/l
	Bromoform**	-	<1	µg/l
	1,2,3-Trichloropropane**	-	<1	µg/l
	Bromobenzene**	-	<1	µg/l
	Tert-Butylbenzene**	-	<1	µg/l
	Sec-Butylbenzene**	-	<1	µg/l
	1,3,5-Trimethylbenzene**	-	<1	µg/l
	1,2-	-	<1	µg/l
	Dibromo-3-chloropropane**	-	<1	µg/l
	Hexachlorobutadiene**	-	<1	µg/l
1,2,3-Trichlorobenzene**	-	<1	µg/l	
1,3-Dichlorobenzene**	-	<1	µg/l	
Tetrachloroethene**	-	<1	µg/l	

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P/O: 82966
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Sample Number : 466205

Client ID: SW-5 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
USEPA VOCs	n-butylbenzene**	-	<1	µg/l
	1,2,4-Trichlorobenzene**	-	<1	µg/l
	MTBE**	-	<1	µg/l

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.10	mg/l
BOD	* BOD	<25	<2	mg/l O2
Chloride	* Chloride	-	23	mg/l
COD	* COD	-	39	mg/l O2
e.Coli**	e.Coli **	-	<1	cfu/100 ml
Total Coliforms**	Total Coliforms **	-	5	cfu/100 ml
Conductivity	* Conductivity @ 25°C	-	517	µS/cm
VOC's by GC-FID subb	Methanol**	-	<0.5	mg/l
	Acetonitrile**	-	<0.50	mg/l
	Ethanol**	-	<0.50	mg/l
	Acetone**	-	<0.50	mg/l
	Isopropanol**	-	<0.50	mg/l
Anions	* Sulphate	-	52	mg/l
Metal Scan	Mercury (total)**	-	<0.02	µg/l
Metal Scan	Aluminium (total) **	-	<50	µg/l
	Antimony (total)**	-	<4	µg/l
	Barium (total) **	-	75.1	µg/l
	Beryllium (total)**	-	<1	µg/l
	Cadmium (total)**	-	<0.5	µg/l
	Calcium (total) **	-	89.4	mg/l
	Chromium (total)**	-	<3	µg/l
	Cobalt (total)**	-	<0.5	µg/l
	Copper (total) **	-	<4	µg/l
	Iron (total) **	-	0.0427	mg/l
	Lead (total) **	-	<0.5	µg/l
	Magnesium (total)**	-	6.17	mg/l
	Manganese (total)**	-	10	µg/l
	Nickel (total) **	-	3.76	µg/l
	Mercury (total)**	-	<0.02	µg/l
	Arsenic (total)**	-	4.15	µg/l
	Boron (total) **	-	<135	µg/l
	Potassium (total) **	-	5.24	mg/l
	Selenium (total) **	-	6.23	µg/l
	Silver (total) **	-	<2	µg/l
	Sodium (total) **	-	12.6	mg/l
	Tin (total) **	-	<3	µg/l

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
Metal Scan	Zinc (total) **	-	<3	µg/l
Nitrate as N	* N03-N	-	0.67	mg/l
Orthophosphate	* P04-P	-	<0.01	mg/l
Comb Pesticide suite	Dichlorvos**	-	<0.01	µg/l
	Mevinphos**	-	<0.01	µg/l
	alpha-HCH/Lindane**	-	<0.01	µg/l
	Diazinon**	-	<0.01	µg/l
	gamma-HCH/Lindane**	-	<0.01	µg/l
	Heptachlor**	-	<0.01	µg/l
	Aldrin**	-	<0.01	µg/l
	beta-HCH/Lindane**	-	<0.01	µg/l
	Methyl Parathion**	-	<0.01	µg/l
	Malathion**	-	<0.01	µg/l
	Fenitrothion**	-	<0.01	µg/l
	Heptachlor Epoxide**	-	<0.01	µg/l
	Parathion**	-	<0.01	µg/l
	o,p-DDE**	-	<0.01	µg/l
	Endosulfan I**	-	<0.01	µg/l
	p,p-DDE**	-	<0.01	µg/l
	Dieldrin**	-	<0.01	µg/l
	o,p-TDE**	-	<0.01	µg/l
	Endrin**	-	<0.01	µg/l
	o,p-DDT**	-	<0.01	µg/l
p,p-TDE**	-	<0.01	µg/l	
Ethion**	-	<0.01	µg/l	
Endosulfan II**	-	<0.01	µg/l	
p,p-DDT**	-	<0.01	µg/l	
o,p-Methoxychlor**	-	<0.01	µg/l	
p,p-Methoxychlor**	-	<0.01	µg/l	
Endosulfan Sulphate**	-	<0.01	µg/l	
Azinphos Methyl**	-	<0.01	µg/l	
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l
SVOC'S	1,2,4-Trichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	1,3-Dichlorobenzene**	-	<1	µg/l

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
SVOC'S	1,4-Dichlorobenzene**	-	<1	µg/l
	2,4,5-Trichlorophenol**	-	<1	µg/l
	2,4,6-Trichlorophenol**	-	<1	µg/l
	2,4-Dichlorophenol**	-	<1	µg/l
	2,4-Dimethylphenol**	-	<1	µg/l
	2-Chloronaphthalene**	-	<1	µg/l
	2-Chlorophenol**	-	<1	µg/l
	2-Methylnaphthalene**	-	<1	µg/l
	2-Methylphenol**	-	<1	µg/l
	2-Nitroaniline**	-	<1	µg/l
	2-Nitrophenol**	-	<1	µg/l
	3-Nitroaniline**	-	<1	µg/l
	4-Bromophenylphenylether**	-	<1	µg/l
	4-Chloro-3-methylphenol**	-	<1	µg/l
	4-Chloroaniline**	-	<1	µg/l
	4-Chlorophenylphenylether**	-	<1	µg/l
	4-Methylphenol**	-	<1	µg/l
	4-Nitrophenol**	-	<1	µg/l
	4-Nitroaniline**	-	<1	µg/l
	Azobenzene**	-	<1	µg/l
	Acenaphthene**	-	<1	µg/l
	Anthracene**	-	<1	µg/l
	Bis(2-Chloroethyl)ether**	-	<1	µg/l
	Bis(2-chloroethoxy)methane*	-	<1	µg/l
	Bis(2-ethylhexyl)phthalate**	-	<1	µg/l
	Benzo(a)anthracene**	-	<1	µg/l
	Butylbenzylphthalate**	-	<1	µg/l
	Benzo(a)pyrene**	-	<1	µg/l
	Benzo(ghi)perylene**	-	<1	µg/l
	Carbazole**	-	<1	µg/l
Chrysene**	-	<1	µg/l	
Dibenzofuran**	-	<1	µg/l	
Diethyl phthalate**	-	<1	µg/l	
Dibenzo(a,h)anthracene**	-	<1	µg/l	
Dimethyl phthalate**	-	<1	µg/l	

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
SVOC'S	Flourene**	-	<1	µg/l
	Hexachlorobenzene**	-	<1	µg/l
	hexachlorobutadiene**	-	<1	µg/l
	Pentachlorophenol**	-	<1	µg/l
	Phenol**	-	<1	µg/l
	N-nitrosodi-n-propylamine**	-	<1	µg/l
	Hexachloroethane**	-	<1	µg/l
	Nitrobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	Isophorone**	-	<1	µg/l
	Hexachlorocyclopentadiene**	-	<1	µg/l
	Phenanthrene**	-	<1	µg/l
	Indenol(1,2,3-cd)pyrene**	-	<1	µg/l
	Pyrene**	-	<1	µg/l
	Total Phosphorous	Total Phosphorous**	-	<0.05
USEPA VOCs	Dichlorodifluoromethane**	-	<1	µg/l
	Chloromethane**	-	<1	µg/l
	Vinyl chloride**	-	<1	µg/l
	Bromomethane**	-	<1	µg/l
	Chloroethane**	-	<1	µg/l
	Trichlorofluoromethane**	-	<1	µg/l
	1,1-Dichloroethene**	-	<1	µg/l
	Dichloromethane**	-	<3	µg/l
	trans-1,2-Dichloroethene**	-	<1	µg/l
	1,1-Dichloroethane**	-	<1	µg/l
	2,2-Dichloropropane**	-	<1	µg/l
	cis-1,2-Dichloroethene**	-	<1	µg/l
	Bromochloromethane**	-	<1	µg/l
	Chloroform**	-	<1	µg/l
	1,1,1-Trichloroethane**	-	<1	µg/l
	Carbon Tetrachloride**	-	<1	µg/l
	1,1-Dichloropropene**	-	<1	µg/l
Benzene**	-	<1	µg/l	
1,2-Dichloroethane**	-	<1	µg/l	
Trichloroethene**	-	<1	µg/l	
1,2-Dichloropropane**	-	<1	µg/l	

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	Dibromomethane**	-	<1	µg/l
	Bromodichloromethane**	-	<1	µg/l
	Toluene**	-	<1	µg/l
	1,1,2-Trichloroethane**	-	<1	µg/l
	1,2-Dibromoethane**	-	<1	µg/l
	1,1,1,2-Tetrachloroethane**	-	<1	µg/l
	m,p-Xylene**	-	<1	µg/l
	Styrene**	-	<1	µg/l
	Isopropylbenzene**	-	<1	µg/l
	n-propylbenzene**	-	<1	µg/l
	2-Chlorotoluene**	-	<1	µg/l
	4-Chlorotoluene**	-	<1	µg/l
	1,2,4-Trimethylbenzene**	-	<1	µg/l
	4-Isopropyltoluene**	-	<1	µg/l
	1,4-Dichlorobenzene**	-	<1	µg/l
	1,2-Dichlorobenzene**	-	<1	µg/l
	Naphthalene**	-	<1	µg/l
	1,3-Dichloropropane**	-	<1	µg/l
	cis-1,3-Dichloropropene**	-	<1	µg/l
	trans-1,3-Dichloropropene**	-	<1	µg/l
	Dibromochloromethane**	-	<1	µg/l
	Chlorobenzene**	-	<1	µg/l
	Ethyl Benzene**	-	<1	µg/l
	o-Xylene**	-	<1	µg/l
	Bromoform**	-	<1	µg/l
	1,2,3-Trichloropropane**	-	<1	µg/l
	Bromobenzene**	-	<1	µg/l
	Tert-Butylbenzene**	-	<1	µg/l
	Sec-Butylbenzene**	-	<1	µg/l
	1,3,5-Trimethylbenzene**	-	<1	µg/l
	1,2-	-	<1	µg/l
	Dibromo-3-chloropropane**	-	<1	µg/l
	Hexachlorobutadiene**	-	<1	µg/l
1,2,3-Trichlorobenzene**	-	<1	µg/l	
1,3-Dichlorobenzene**	-	<1	µg/l	
Tetrachloroethene**	-	<1	µg/l	

Project Code : 16-51163

Report Unique ID: 56537

P/O: 82966
C.O.C.

Sample Number : 466206

Client ID: SW-6 09/11/16

Sample Type: Surface Water

Received: 09/11/2016 16:42

Condition: Good

Analysis	Component	Specification	Result	Units
USEPA VOCs	n-butylbenzene**	-	<1	µg/l
	1,2,4-Trichlorobenzene**	-	<1	µg/l
	MTBE**	-	<1	µg/l

Methods of Analysis

Analysis Name:

Comb Pesticide suite
Conductivity
e.Coli**
Nitrate as N
Metal Scan
COD
Suspended solids
pH
Anions
SVOC'S
VOC's by GC-FID subb
Total Phosphorous
Orthophosphate
BOD
Ammonia
USEPA VOCs
Chloride
Total Coliforms**

Method:

GC-MS
*G/06 Based on APHA, 2012, 22nd Edition, Method 2510B
G/72 MPN based on IDEXX defined substrate method
*G/67 Based on APHA 2012,22nd Edition,4500-N02B colorimetric method
ICPMS- Based on EPA Method 200.8 - Subbed
*G/03: Based on APHA, 2012, 22nd Edition, Method 5220D
*G/19 Based on APHA, 2012, 22nd Edition, Method 2540D
*G/05 Based on APHA,2012,22nd Edition,Method 4500 H+B
G/39 Based on APHA 2012, 22nd Edition, Method 4110B

Based on Standard Methods**
*G/67 Based on APHA,2012,22nd Edition,4500-P.E. Ascorbic Acid Method
Subbed: Based on APHA, 2012, 22nd Edition, Method 5210B. TCMP Nitrification inhibition.
*G/67 Based on APHA 2012,22nd Edition,4500-NH3 and bluebook Ammonia in waters 1981

*G67 Based on APHA 2012 22nd Edition Method 4500-CL⁻E
MPN based on IDEXX defined substrate method

Notes

* = INAB accredited test

** = subcontracted test

*** = outside accredited range

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2. Results contained in this report relate only to the items tested.
3. All Comments concerning this report or its contents should be forwarded to the Laboratory Manager

Project Code : 16-51257

Report Unique ID: 56514

Report Date : 20-Dec-2016

Commen. Date: 17/11/2016 00

Customer: Phoebe Dillane

C/O Stephanie Golding
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Drehid Facility
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Co. Kildare

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Approved by : Maria Gladun
Scientist

Sample Number : 466863

Client ID: SW4 17/11/16

Sample Type: Surface Water

Received: 17/11/2016 15:45

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	14	mg/l
Conductivity	* Conductivity @ 25°C	-	595	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51257

Report Unique ID: 56514

Sample Number : 466864

Client ID: SW5 17/11/16

Sample Type: Surface Water

Received: 17/11/2016 15:45

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.10	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	356	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	6	mg/l

Sample Number : 466865

Client ID: SW6 17/11/16

Sample Type: Surface Water

Received: 17/11/2016 15:45

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.13	mg/l
Chloride	* Chloride	-	23	mg/l
Conductivity	* Conductivity @ 25°C	-	584	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51343
Report Date : 20-Dec-2016

Report Unique ID: 56515
Commen. Date: 25/11/2016 00

Customer: Phoebe Dillane

C/O Stephanie Golding
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P/O: 82966
C.O.C.

Approved by : Maria Gladun
Scientist

Sample Number : 467366

Client ID: SW-4 25/11/16

Sample Type: Surface Water

Received: 25/11/2016 13:39

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.10	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	589	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51343

Report Unique ID: 56515

P/O: 82966
C.O.C.

Sample Number : 467367

Client ID: SW-5 25/11/16

Sample Type: Surface Water

Received: 25/11/2016 13:39

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.14	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	368	µS/cm
pH	* pH	-	7.3	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 467368

Client ID: SW-6 25/11/16

Sample Type: Surface Water

Received: 25/11/2016 13:39

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.12	mg/l
Chloride	* Chloride	-	22	mg/l
Conductivity	* Conductivity @ 25°C	-	658	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	5	mg/l

Project Code : 16-51421

Report Unique ID: 56751 / 2

Report Date : 13-Jan-2017

Commen. Date: 02/12/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
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Approved by : Maria Gladun
Scientist

Sample Number : 467864

Client ID: SW-4 01/12/16

Sample Type: Surface Water

Received: 01/12/2016 16:56

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.04	mg/l
Chloride	* Chloride	-	21	mg/l
Conductivity	* Conductivity @ 25°C	-	606	µS/cm
pH	* pH	-	7.8	pH units
Suspended solids	* Suspended solids	<35	5	mg/l

Project Code : 16-51421

Report Unique ID: 56751 / 2

Sample Number : 467865

Client ID: SW-5 01/12/16

Sample Type: Surface Water

Received: 01/12/2016 16:56

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.20	mg/l
Chloride	* Chloride	-	21	mg/l
Conductivity	* Conductivity @ 25°C	-	415	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	8	mg/l

Sample Number : 467866

Client ID: SW-6 01/12/16

Sample Type: Surface Water

Received: 01/12/2016 16:56

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	23	mg/l
Conductivity	* Conductivity @ 25°C	-	677.5	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51501

Report Unique ID: 56630

Report Date : 04-Jan-2017

Commen. Date: 09/12/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
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P/O: 82966
C.O.C.

Approved by : Roisin Kavanagh
Team Leader

Sample Number : 468402

Client ID: SW-4 08/12/16

Sample Type: Surface Water

Received: 09/12/2016 10:01

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.04	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	642	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51501

Report Unique ID: 56630

P/O: 82966
C.O.C.

Sample Number : 468403

Client ID: SW-5 08/12/16

Sample Type: Surface Water

Received: 09/12/2016 10:01

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.25	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	470	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 468404

Client ID: SW-6 08/12/16

Sample Type: Surface Water

Received: 09/12/2016 10:01

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	<0.02	mg/l
Chloride	* Chloride	-	24	mg/l
Conductivity	* Conductivity @ 25°C	-	690	µS/cm
pH	* pH	-	7.5	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51600

Report Unique ID: 56631

Report Date : 04-Jan-2017

Commen. Date: 16/12/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
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Approved by : Roisin Kavanagh
Team Leader

Sample Number : 468877

Client ID: SW-4 15/12/16

Sample Type: Surface Water

Received: 15/12/2016 16:24

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.07	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	719	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	5	mg/l

Project Code : 16-51600

Report Unique ID: 56631

Sample Number : 468878

Client ID: SW-5 15/12/16

Sample Type: Surface Water

Received: 15/12/2016 16:24

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.17	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	376	µS/cm
pH	* pH	-	7.4	pH units
Suspended solids	* Suspended solids	<35	5	mg/l

Sample Number : 468879

Client ID: SW-6 15/12/16

Sample Type: Surface Water

Received: 15/12/2016 16:24

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.03	mg/l
Chloride	* Chloride	-	21	mg/l
Conductivity	* Conductivity @ 25°C	-	569	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51646

Report Unique ID: 56632

Report Date : 04-Jan-2017

Commen. Date: 21/12/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
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P/O: 82966
C.O.C.

Approved by : Roisin Kavanagh
Team Leader

Sample Number : 469183

Client ID: SW-4 20/12/16

Sample Type: Surface Water

Received: 20/12/2016 18:08

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.07	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	571.5	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51646

Report Unique ID: 56632

P/O: 82966
C.O.C.

Sample Number : 469184

Client ID: SW-5 20/12/16

Sample Type: Surface Water

Received: 20/12/2016 18:08

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.13	mg/l
Chloride	* Chloride	-	11	mg/l
Conductivity	* Conductivity @ 25°C	-	350	µS/cm
pH	* pH	-	7.2	pH units
Suspended solids	* Suspended solids	<35	6	mg/l

Sample Number : 469185

Client ID: SW-6 20/12/16

Sample Type: Surface Water

Received: 20/12/2016 18:08

Condition: Good

<i>Analysis</i>	<i>Component</i>	<i>Specification</i>	<i>Result</i>	<i>Units</i>
Ammonia	* NH3-N	<0.39	0.13	mg/l
Chloride	* Chloride	-	22	mg/l
Conductivity	* Conductivity @ 25°C	-	662	µS/cm
pH	* pH	-	7.6	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51721
Report Date : 13-Jan-2017

Report Unique ID: 56750
Commen. Date: 30/12/2016 01

Customer: Phoebe Dillane

C/O Stephanie Golding
Bord Na Mona
Drehid Facility
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Approved by : Roisin Kavanagh
Team Leader

Sample Number : 469597

Client ID: SW4 30/12/16

Sample Type: Surface Water

Received: 30/12/2016 14:13

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.05	mg/l
Chloride	* Chloride	-	12	mg/l
Conductivity	* Conductivity @ 25°C	-	596	µS/cm
pH	* pH	-	7.7	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Project Code : 16-51721

Report Unique ID: 56750

Sample Number : 469598

Client ID: SW5 30/12/16

Sample Type: Surface Water

Received: 30/12/2016 14:13

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.11	mg/l
Chloride	* Chloride	-	13	mg/l
Conductivity	* Conductivity @ 25°C	-	417	µS/cm
pH	* pH	-	7.3	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

Sample Number : 469599

Client ID: SW6 30/12/16

Sample Type: Surface Water

Received: 30/12/2016 14:13

Condition: Good

Analysis	Component	Specification	Result	Units
Ammonia	* NH3-N	<0.39	0.22	mg/l
Chloride	* Chloride	-	24	mg/l
Conductivity	* Conductivity @ 25°C	-	738	µS/cm
pH	* pH	-	7.8	pH units
Suspended solids	* Suspended solids	<35	<5	mg/l

QUARTER 4 2017
COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03

For the Attention of: Mrs. Phoebe Dillane,
Bord na Móna,
Drehid Waste Management Facility,
Killinagh Upper,
Carbury,
Co. Kildare

Prepared by: Mr. Stephen Stapleton
Environmental Scientist

Signed 

Reviewed by: Mr. Peter Coogan
Environmental Team Leader

Signed 

BNM File Ref: ECS5328- Quarter 4 SW

Monitoring Date: October/November/December 2017

Report Date: 1st February 2018

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EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4). Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at SW-6 during Quarter 4.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at this location during Quarter 4.

SW4 is situated at Dillons Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedances of any parameters were recorded at this location during Quarter 4.

Weekly, Quarterly and Annual sampling was carried out during Quarter 4.

1.0 **SURFACE WATER**

1.1 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

SW6	Quarter 4														
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	7.5	7.6	7.6	7.2	7.6	7.5	7.7	7.4	8.4	7.7	7.6	7.6	7.6
Conductivity	µS/cm	-	602	611	620	553	649	601	598	335	596	680	646	659	605
BOD	mg/l	25 mg/l			<2				<2						
Chloride	mg/l	-	15	15	16	13	14	15	15	13	15	16	22	24	16
COD	mg/l	-			24				20						
Suspended Solids	mg/l	35 mg/l	<5	14	<5	8	5	6	<5	7	<5	<5	14	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.03	0.14	<0.03	0.03	0.03	0.04	0.06	0.27	<0.03	<0.03	0.04	0.03	<0.03

Note 1: No discharge from site during this week,

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

SW5	Quarter 4														
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	7.5	7.8	7.5	7	7.5	7.4	7.4	7.3	7.9	7.3	7.2	7.2	7.3
Conductivity	µS/cm	-	429	556	514	369	494	592	431	300	375	453	381	408	375
BOD	mg/l	25 mg/l			<2				<2						
Chloride	mg/l	-	11	14	13	13	14	14	13	12	12	13	12	12	12
COD	mg/l	-			53				103						
Suspended Solids	mg/l	35 mg/l	5	<5	<5	9	8	<5	<5	5	5	7	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.27	0.36	0.09	0.10	0.08	0.14	0.05	0.15	0.22	0.23	0.17	0.19	0.18

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 4													
Parameter	Units	Emission Limit	wk40	wk41	wk42	wk43	wk44	wk45	wk46	wk47	wk48	wk49	wk50	wk51	wk52
pH	pH Units	-	8.0	7.70	7.5	7.4	7.6	7.6	7.7	7.4	8.3	7.6	7.5	7.5	7.5
Conductivity	µS/cm	-	591	626	610	616	583	642	597.5	412	534	594	627	562	538
BOD	mg/l	25 mg/l			<2				<2						
Chloride	mg/l	-	11	13	12	16	12	12	12	17	14	14	23	14	13
COD	mg/l	-			38				73						
Suspended Solids	mg/l	35 mg/l	7	6	<5	5	<5	<5	<5	<5	<5	5	7	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.03	0.03	<0.03	<0.03	0.05	0.06	<0.03	0.13	0.09	0.05	0.06	<0.03	0.05

Table 2.2 (A): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6					
Client ID		SW-4	SW-5	SW-6	Emission Limit Value
Received Date & Time		16/11/17	16/11/17	16/11/17	
Sample Type		Surface Water	Surface Water	Surface Water	
PO4-P	mg/l	0.02	<0.01	<0.01	-
Total Phosphorous	mg/l	<0.05	<0.05	<0.05	-
N03-N	mg/l	1.2	1.2	2	-
Sulphate	mg/l	17	22	45	-
Sodium (total)	mg/l	7.37	8.32	13.8	-
Magnesium(total)	mg/l	7.07	4.87	6.57	-
Potassium (total)	mg/l	<2	<2	<2	-
Calcium (total)	mg/l	101	71.6	101	-
Boron (total)	µg/l	<135	<135	<135	-
Chromium (total)	µg/l	<3	<3	6.32	-
Manganese (total)	µg/l	44.9	42.5	5.79	-
Nickel (total)	µg/l	3.8	3.76	5.81	-
Copper (total)	µg/l	<4	<4	<4	-
Zinc (total)	µg/l	3.93	7.03	11.1	-
Cadmium (total)	µg/l	<2	<2	<2	-
Lead (total)	µg/l	<2	<2	<2	-
Iron (total)	mg/l	0.468	0.821	<0.1	-
Mercury (total)	µg/l	<1	<1	<1	-
e.Coli **	cfu/100 ml	410	73	<1	-
Total Coliforms **	cfu/100 ml	410	73	<1	-

Table 2.2 (B): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

		SW-4	SW-5	SW-6		
Comb Pesticide Suite	Dichlorvos**	µg/l	<0.01	<0.01	<0.01	—
	Mevinphos**	µg/l	<0.01	<0.01	<0.01	—
	alpha-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Diazinon**	µg/l	<0.01	<0.01	<0.01	—
	gamma-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Heptachlor**	µg/l	<0.01	<0.01	<0.01	—
	Aldrin**	µg/l	<0.01	<0.01	<0.01	—
	beta-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	—
	Methyl Parathion**	µg/l	<0.01	<0.01	<0.01	—
	Malathion**	µg/l	<0.01	<0.01	<0.01	—
	Fenitrothion**	µg/l	<0.01	<0.01	<0.01	—
	Heptachlor Epoxide**	µg/l	<0.01	<0.01	<0.01	—
	Parathion**	µg/l	<0.01	<0.01	<0.01	—
	o,p-DDE**	µg/l	<0.01	<0.01	<0.01	—
	Endosulfan I**	µg/l	<0.01	<0.01	<0.01	—
	p,p-DDE**	µg/l	<0.01	<0.01	<0.01	—
	Dieldrin**	µg/l	<0.01	<0.01	<0.01	—
	o,p-TDE**	µg/l	<0.01	<0.01	<0.01	—
	Endrin**	µg/l	<0.01	<0.01	<0.01	—
	o,p-DDT**	µg/l	<0.01	<0.01	<0.01	—
	p,p-TDE**	µg/l	<0.01	<0.01	<0.01	—
	Ethion**	µg/l	<0.01	<0.01	<0.01	—
	Endosulfan II**	µg/l	<0.01	<0.01	<0.01	—
	p,p-DDT**	µg/l	<0.01	<0.01	<0.01	—
	o,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	—
	p,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	—
Endosulfan Sulphate**	µg/l	<0.01	<0.01	<0.01	—	
Azinphos Methyl**	µg/l	<0.01	<0.01	<0.01	—	
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<1	<1	<1	—
	1,2-Dichlorobenzene**	µg/l	<1	<1	<1	—
	1,3-Dichlorobenzene**	µg/l	<1	<1	<1	—
	1,4-Dichlorobenzene**	µg/l	<1	<1	<1	—
	2,4,5-Trichlorophenol**	µg/l	<1	<4	<1	—
	2,4,6-Trichlorophenol**	µg/l	<1	<4	<1	—
	2,4-Dichlorophenol**	µg/l	<1	<4	<1	—
	2,4-Dimethylphenol**	µg/l	<1	<4	<1	—
	2,4-Dinitrotoluene**	µg/l	<1	<4	<1	—
	2,6-Dinitrotoluene**	µg/l	<1	<4	<1	—
	2-Chloronaphthalene**	µg/l	<1	<4	<1	—
	2-Chlorophenol**	µg/l	<1	<4	<1	—
	2-Methylnaphthalene**	µg/l	<1	<4	<1	—
	2-Methylphenol**	µg/l	<1	<4	<1	—
	2-Nitroaniline**	µg/l	<1	<4	<1	—
	2-Nitrophenol**	µg/l	<1	<4	<1	—
	3-Nitroaniline**	µg/l	<1	<4	<1	—
	4-Bromophenylphenylether**	µg/l	<1	<4	<1	—
	4-Chloro-3-methylphenol**	µg/l	<1	<4	<1	—
	4-Chloroaniline**	µg/l	<1	<4	<1	—
	4-Chlorophenylphenylether**	µg/l	<1	<4	<1	—
	4-Methylphenol**	µg/l	<1	<4	<1	—
	4-Nitrophenol**	µg/l	<1	<4	<1	—
	4-Nitroaniline**	µg/l	<1	<4	<1	—
	Azobenzene**	µg/l	<1	<4	<1	—
	Acenaphthylene**	µg/l	<1	<4	<1	—
	Acenaphthene**	µg/l	<1	<4	<1	—
	Anthracene**	µg/l	<1	<4	<1	—
	Bis(2-Chloroethyl)ether**	µg/l	<1	<4	<1	—
	Bis(2-	µg/l	<1	<4	<1	—
Bis(2-ethylhexyl)phthalate**	µg/l	<2	<8	<2	—	
Benzo(a)anthracene**	µg/l	<1	<4	<1	—	

Table 2.2 (C): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
			SW-4	SW-5	SW-6	
			Butylbenzylphthalate**	µg/l	<1	<4
Benzo(a)pyrene**	µg/l	<1	<4	<1		
Benzo(ghi)perylene**	µg/l	<1	<4	<1		
Carbazole**	µg/l	<1	<4	<1		
Chrysene**	µg/l	<1	<4	<1		
Dibenzofuran**	µg/l	<1	<4	<1		
n-Di-butylphthalate**	µg/l	<1	<4	<1		
Diethyl phthalate**	µg/l	<1	<4	<1		
Dibenzo(a,h)anthracene**	µg/l	<1	<4	<1		
Dimethyl phthalate**	µg/l	<1	<4	<1		
n-Di octyl phthalate**	µg/l	<5	<20	<5		
Fluoranthene**	µg/l	<1	<4	<1		
Flourene**	µg/l	<1	<4	<1		
Hexachlorobenzene**	µg/l	<1	<4	<1		
hexachlorobutadiene**	µg/l	<1	<4	<1		
Pentachlorophenol**	µg/l	<1	<4	<1		
Phenol**	µg/l	<1	<4	<1		
N-nitrosodi-n-propylamine**	µg/l	<1	<4	<1		
Hexachloroethane**	µg/l	<1	<4	<1		
Nitrobenzene**	µg/l	<1	<4	<1		
Naphthalene**	µg/l	<1	<1	<1		
Isophorone**	µg/l	<1	<4	<1		
Hexachlorocyclopentadiene**	µg/l	<1	<4	<1		
Phenanthrene**	µg/l	<1	<4	<1		
Indenol(1,2,3-cd)pyrene**	µg/l	<1	<4	<1		
Pyrene**	µg/l	<1	<4	<1		
VOC's						
	Dichloromethane**	µg/l	<3	<3	<3	
	All other VOC as Per USEPA List**	µg/l	<1	<1	<1	

The daily on site reading at the surface water lagoon for quarter 4 are detailed in Table 2.3 A, B and C below.

Table 2.3 (A): Daily on site readings				
Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (μS/cm)
01/10/2017	Clear, no odour*	3.7	8.9	682
02/10/2017	Clear, no odour*	3.7	8.8	684
03/10/2017	Clear, no odour*	3.7	8.7	672
04/10/2017	Clear, no odour*	3.6	8.4	673
05/10/2017	Clear, no odour*	3.6	8.6	672
06/10/2017	Clear, no odour*	3.6	8.1	650
07/10/2017	Clear, no odour*	3.5	7.9	673
08/10/2017	Clear, no odour*	3.6	7.6	666
09/10/2017	Clear, no odour*	3.7	8.4	649
10/10/2017	Clear, no odour*	3.7	8.7	660
11/10/2017	Clear, no odour*	3.7	10.3	654
12/10/2017	Clear, no odour*	3.6	8.9	623
13/10/2017	Clear, no odour*	3.6	8.7	618
14/10/2017	Clear, no odour*	3.6	9.5	623
15/10/2017	Clear, no odour*	3.6	9.7	637
16/10/2017	Clear, no odour*	3.7	10.1	630
17/10/2017	Clear, no odour*	3.7	9.8	635
18/10/2017	Clear, no odour*	3.7	9.7	634
19/10/2017	Clear, no odour*	3.8	9.8	621
20/10/2017	Clear, no odour*	3.8	9.2	627
21/10/2017	Clear, no odour*	3.9	9.8	622
22/10/2017	Clear, no odour*	3.9	8.9	643
23/10/2017	Clear, no odour*	3.9	8.3	636
24/10/2017	Clear, no odour*	3.9	8.4	638
25/10/2017	Clear, no odour*	3.8	9	637
26/10/2017	Clear, no odour*	3.8	9.8	665
27/10/2017	Clear, no odour*	3.8	9.8	665
28/10/2017	Clear, no odour*	3.8	7.6	667
29/10/2017	Clear, no odour*	3.8	5.5	663
30/10/2017	Clear, no odour*	3.7	6.7	664
31/10/2017	Clear, no odour*	3.8	5.2	673

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (B): Daily on site readings

Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity ($\mu\text{S/cm}$)
01/11/2017	Clear, no odour*	3.8	5.9	672
02/11/2017	Clear, no odour*	3.8	6.1	678
03/11/2017	Clear, no odour*	3.8	5.8	675
04/11/2017	Clear, no odour*	3.9	6.4	672
05/11/2017	Clear, no odour*	3.9	6.1	669
06/11/2017	Clear, no odour*	3.9	10.8	644
07/11/2017	Clear, no odour*	4.0	11.2	646
08/11/2017	Clear, no odour*	4.0	10.6	643
09/11/2017	Clear, no odour*	4.0	10.9	638
10/11/2017	Clear, no odour*	3.9	9.9	636
11/11/2017	Clear, no odour*	3.9	9.6	635
12/11/2017	Clear, no odour*	3.9	11.4	634
13/11/2017	Clear, no odour*	3.9	12.3	638
14/11/2017	Clear, no odour*	3.8	11.8	636
15/11/2017	Clear, no odour*	3.8	10.7	635
16/11/2017	Clear, no odour*	3..8	8.9	643
17/11/2017	Clear, no odour*	3.7	8.1	640
18/11/2017	Clear, no odour*	3.6	7.4	638
19/11/2017	Clear, no odour*	3.6	7.3	639
20/11/2017	Clear, no odour*	3.6	7.2	632
21/11/2017	Clear, no odour*	3.5	7.1	630
22/11/2017	Clear, no odour*	3.4	7.1	629
23/11/2017	Clear, no odour*	3.5	6.9	656
24/11/2017	Clear, no odour*	3.5	7.1	667
25/11/2017	Clear, no odour*	3.4	7.2	671
26/11/2017	Clear, no odour*	3.4	7.5	659
27/11/2017	Clear, no odour*	3.5	7.7	659
28/11/2017	Clear, no odour*	3.5	8.0	661
29/11/2017	Clear, no odour*	3.6	8.1	667
30/11/2017	Clear, no odour*	3.6	8.2	663

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (C): Daily on site readings				
Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (μS/cm)
01/12/2017	Clear, no odour*	3.6	8.2	651
02/12/2017	Clear, no odour*	3.6	8.3	644
03/12/2017	Clear, no odour*	3.7	8.1	653
04/12/2017	Clear, no odour*	3.8	7.7	660
05/12/2017	Clear, no odour*	3.9	7.6	665
06/12/2017	Clear, no odour*	4.0	7.5	667
07/12/2017	Clear, no odour*	4.0	8.1	665
08/12/2017	Clear, no odour*	4.1	8.2	670
09/12/2017	Clear, no odour*	4.0	8.0	671
10/12/2017	Clear, no odour*	3.7	7.9	675
11/12/2017	Clear, no odour*	3.6	7.6	669
12/12/2017	Clear, no odour*	3.5	7.5	672
13/12/2017	Clear, no odour*	3.4	7.6	681
14/12/2017	Clear, no odour*	3.4	7.7	681
15/12/2017	Clear, no odour*	3.4	7.6	671
16/12/2017	Clear, no odour*	3.5	7.6	638
17/12/2017	Clear, no odour*	3.6	7.5	635
18/12/2017	Clear, no odour*	3.6	7.4	628
19/12/2017	Clear, no odour*	3.6	7.3	623
20/12/2017	Clear, no odour*	3.6	7.2	621
21/12/2017	Clear, no odour*	3.6	7.1	574
22/12/2017	Clear, no odour*	3.6	7.2	559
23/12/2017	Clear, no odour*	3.7	7.3	552
24/12/2017	Clear, no odour*	3.5	7.3	666
25/12/2017	Clear, no odour*	3.6	7.4	664
26/12/2017	Clear, no odour*	3.8	7.3	678
27/12/2017	Clear, no odour*	3.8	7.5	650
28/12/2017	Clear, no odour*	3.9	7.4	614
29/12/2017	Clear, no odour*	4.0	7.6	623
30/12/2017	Clear, no odour*	4.0	7.9	609
31/12/2017	Clear, no odour*	3.8	8.0	608

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the fourth quarter of 2017. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters, once during the quarter for quarterly parameters and once during the quarter for annual parameters. BOD, Ammonia and COD levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 3 to Figure 5.

No exceedances were noted for Suspended Solids, Ammonia and BOD during quarter 4 at SW-4, SW-5 and SW-6 monitoring locations with remaining parameters in line with that previously detected.

The annual parameters were analysed on samples submitted on the 16th of November. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations. The microbiological results increased since the previous monitoring event at SW4 and SW5. E. coli and Total Coliforms were not detected at the discharge location (SW6).

The metals results showed some fluctuations since the previous monitoring event but remain in trend with previous results.

Figures 3 to 5 below graphically display the Ammonia, BOD and Suspended Solids results obtained in 2017.

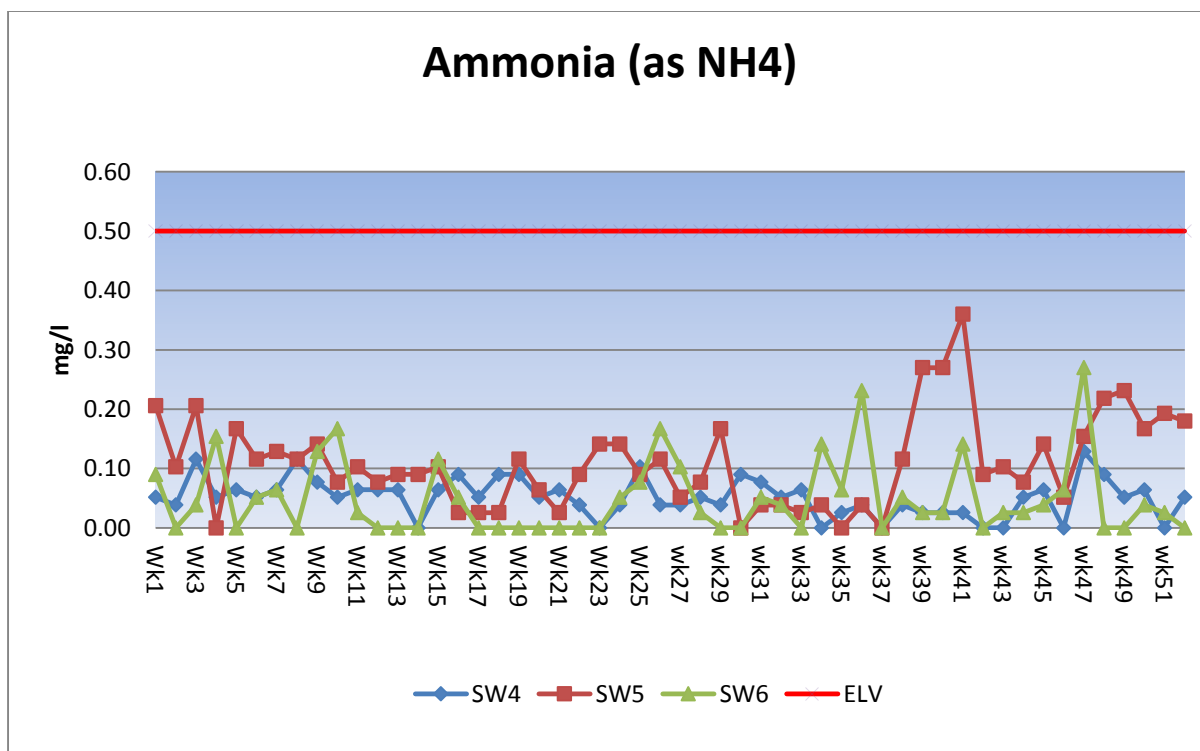


Figure 3

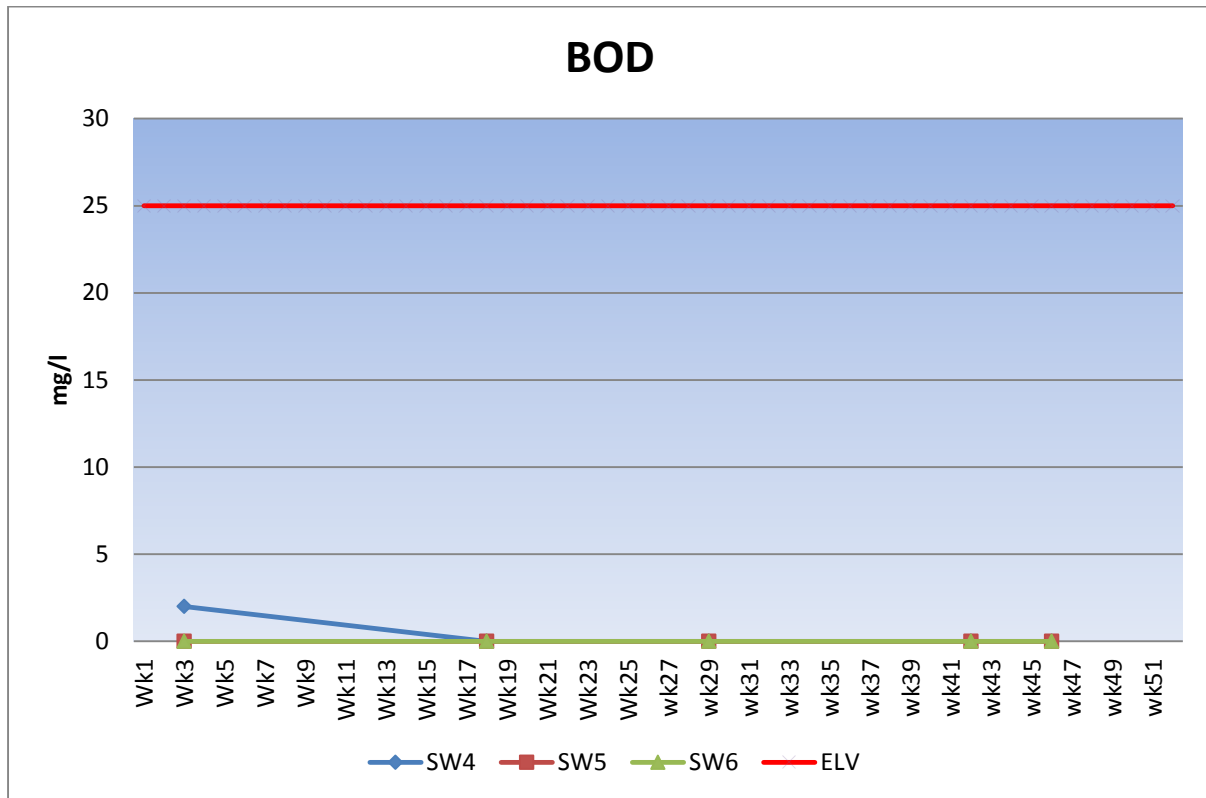


Figure 4

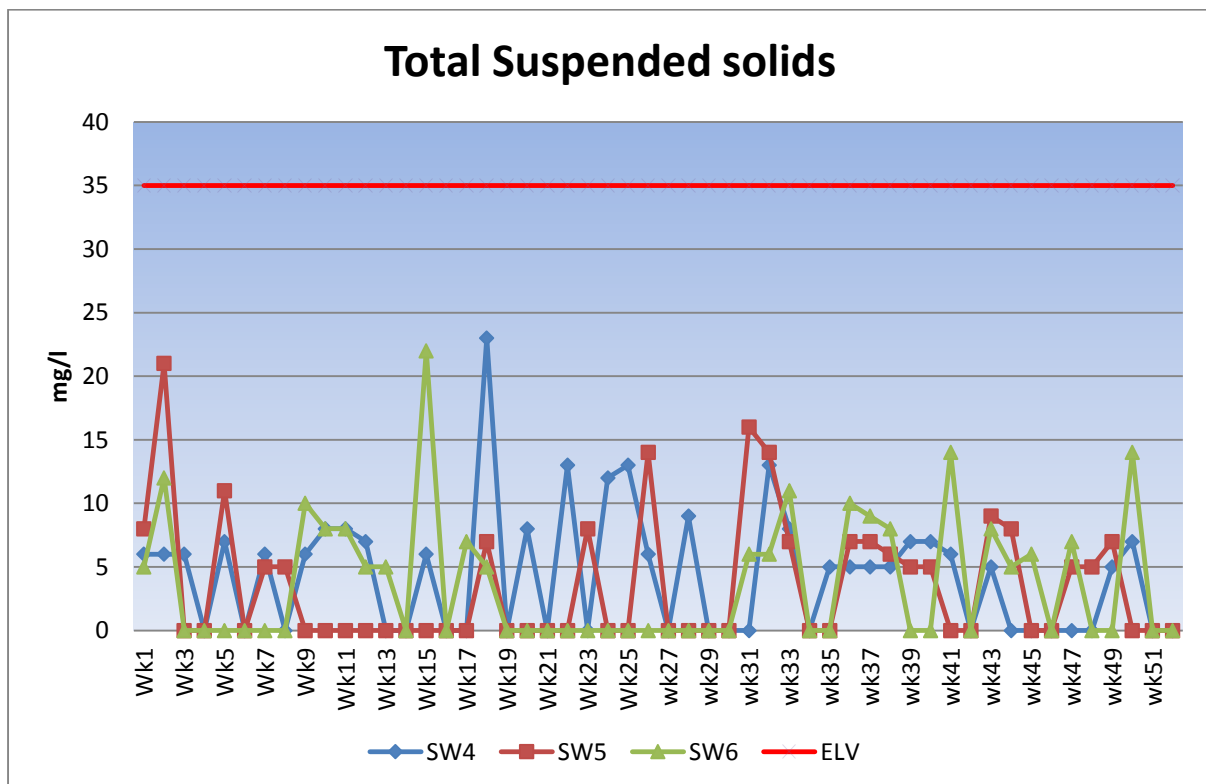
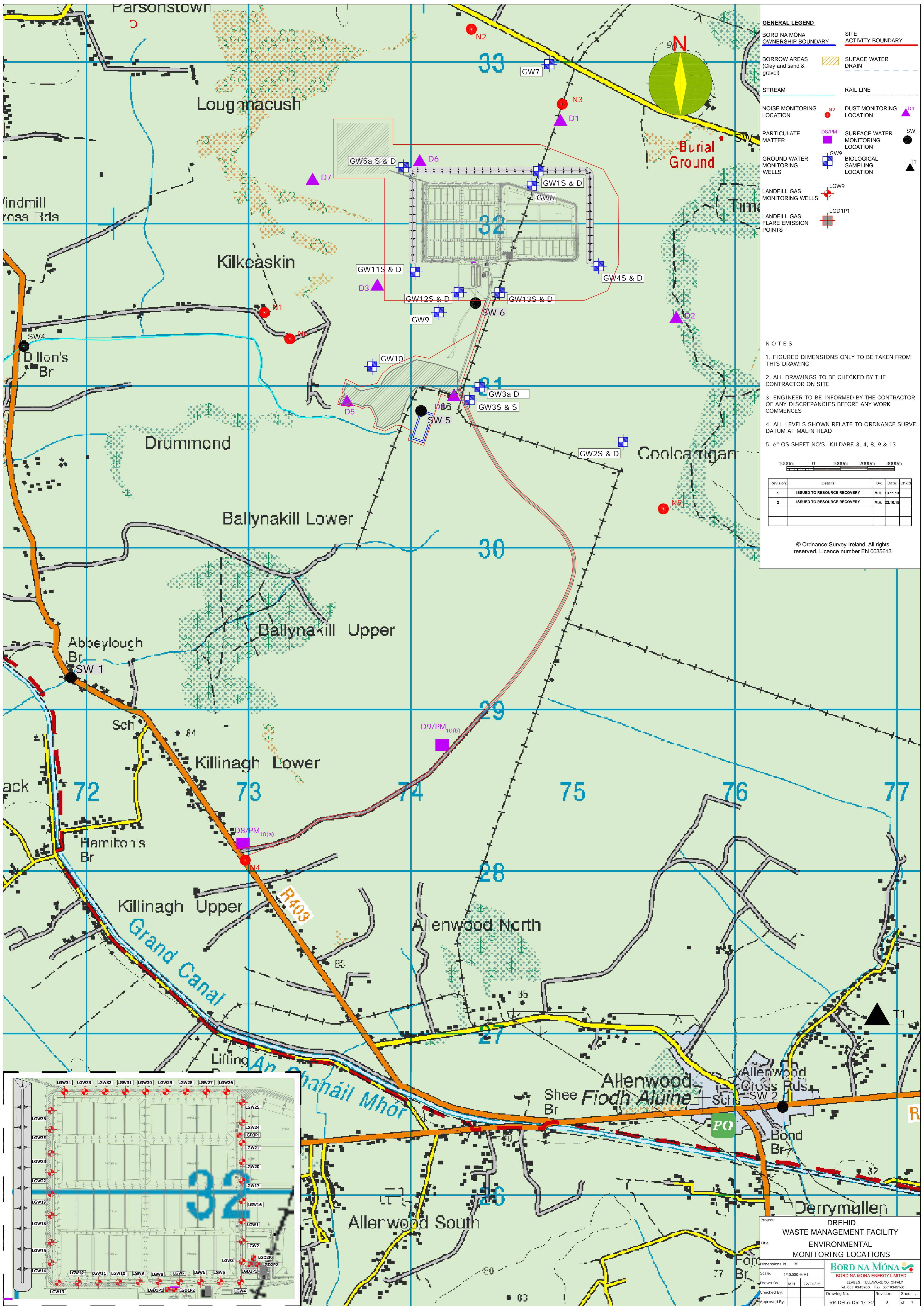


Figure 5

APPENDIX I

Monitoring Locations



GENERAL LEGEND

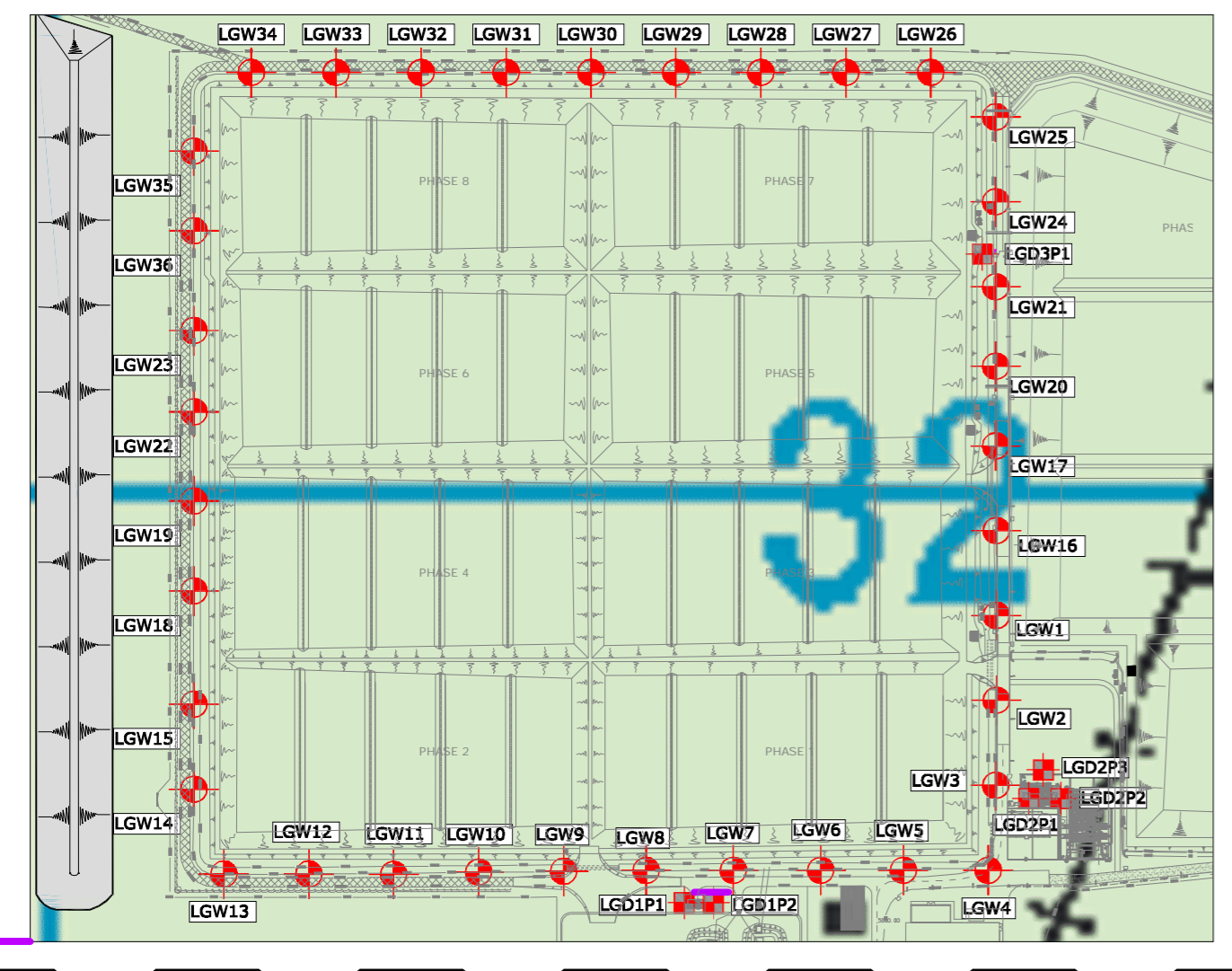
BORD NA MÓNA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
BORROW AREAS (Clay and sand & gravel)	SURFACE WATER DRAIN
STREAM	RAIL LINE
NOISE MONITORING LOCATION	DUST MONITORING LOCATION
PARTICULATE MATTER	SURFACE WATER MONITORING LOCATION
GROUND WATER MONITORING WELLS	BIOLOGICAL SAMPLING LOCATION
LANDFILL GAS MONITORING WELLS	LGW9
LANDFILL GAS FLARE EMISSION POINTS	LGD1P1

- NOTES**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 - ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVE DATUM AT MALIN HEAD
 - 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13

Scale: 1000m 0 1000m 2000m 3000m

Revision	Details	By	Date	Chkd
1	ISSUED TO RESOURCE RECOVERY	M.H.	13.11.13	
2	ISSUED TO RESOURCE RECOVERY	M.H.	22.10.15	

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Project: DREHD WASTE MANAGEMENT FACILITY
 Title: ENVIRONMENTAL MONITORING LOCATIONS
 Dimensions in: M
 Scale: 1/10,000 @ A1
 Drawn By: M.H. 22/10/15
 Checked By: M.H.
 Approved By: M.H.
 Drawing No: RR-DH-6-DR-1/TE2
 Revision: 2
 Sheet: 1 of 1
BORD NA MÓNA
 BORD NA MÓNA ENERGY LIMITED
 LEARCO TULLAMORE CO. DUBLIN
 Tel: 057 9345900 Fax: 057 9345160

APPENDIX 2

Analytical Methods

Chain of Custody

Analytical Methods

Analysis of water sampling was conducted in accordance with recognised standard methods as detailed below

ANALYSIS OF SAMPLES			
Parameter	Limit of Detection	Method	Accredited
pH (pH units)	0.1 – 14	G/05: Based on APHA 2012, 22 nd Ed, Method 4500 H+B	INAB ✓
Conductivity (µs/cm)	-	<i>In-Situ</i> Calibrated Conductivity Meter	-
Temperature (°C)	-	<i>In-Situ</i> Calibrated pH / Temperature Thermometer	-
Biochemical Oxygen Demand (BOD) (mg/l)	<2 mg/l BOD	G/04: Based on APHA, 2012, 22 nd Ed, Method 5210B.	INAB ✓
Chemical Oxygen Demand(COD)(mg/l)	10 – 1500 mg/l	G/03: Based on APHA 2012, 22 nd Edition, Method 5220D	INAB ✓
Chloride	<0.5 mg/l	G/67 Based on APHA, 2012, 22 nd Edition, Method 4500-Cl-E	INAB ✓
Ammonia-N (mg/l)	<0.02 mg/l NH ₃ -N	G/67: Based on APHA, 2012, 22 nd Ed, 4500-NH ₃ & Bluebook Ammonia in Waters 1981	INAB ✓
** Total Coliforms	<1 MPN/100ml	D/1201 MPN based on IDEXX defined substrate method	INAB ✓
**Faecal Coliforms	<1 CFU/100ml	D/3221	INAB ✓
**Calcium, Magnesium, Potassium, Sodium	<0.1 mg/l	G/57: Based on EPA Method 200.8	X
**Antimony, Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Zinc, Manganese, Nickel, Selenium, Silver	<2 µg/l	ICP-MS	X
**Aluminium, Beryllium, Tin	<2 µg/l		X
**Iron	<0.1 mg/l		X
**Mercury	<1 µg/l		X
Boron	<2 µg/l		X
**VOC's USEPA 524.2	<10 µg/l	G/61: Based on USEPA 524.2 method	✓ (UKAS)
**SVOCs target list (Modified US EPA 8270)	<1 µg/l	TM/143DGC-MS - following extraction with 1:1 DCM/Ethyl Acetate	X
**Comb Pesticide Suite	<0.01 µg/l	GC-MS	X

Notes:

G: INAB Accredited Method, Bord na Móna Technical Analytical Services Standard Operating Procedures Manual.

APHA – American Public Health Association, Standard Methods for the Examination of Waters and Waste Waters, 22nd Edition, 2012.

** Subcontracted test

✓ – INAB Accredited Test Method – INAB Registration Reference No. 083T.

X – None Accredited Test Method

ACCREDITED QUALITY SYSTEM

INAB Accreditation

BNM Environmental analytical laboratories are accredited to ISO 17025 by the National Accreditation Board (INAB). ISO 17025 accreditation ensures that the laboratory operates a quality system with technically competent staff. The laboratory has accreditation since 1997 and it is the policy of the laboratory to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

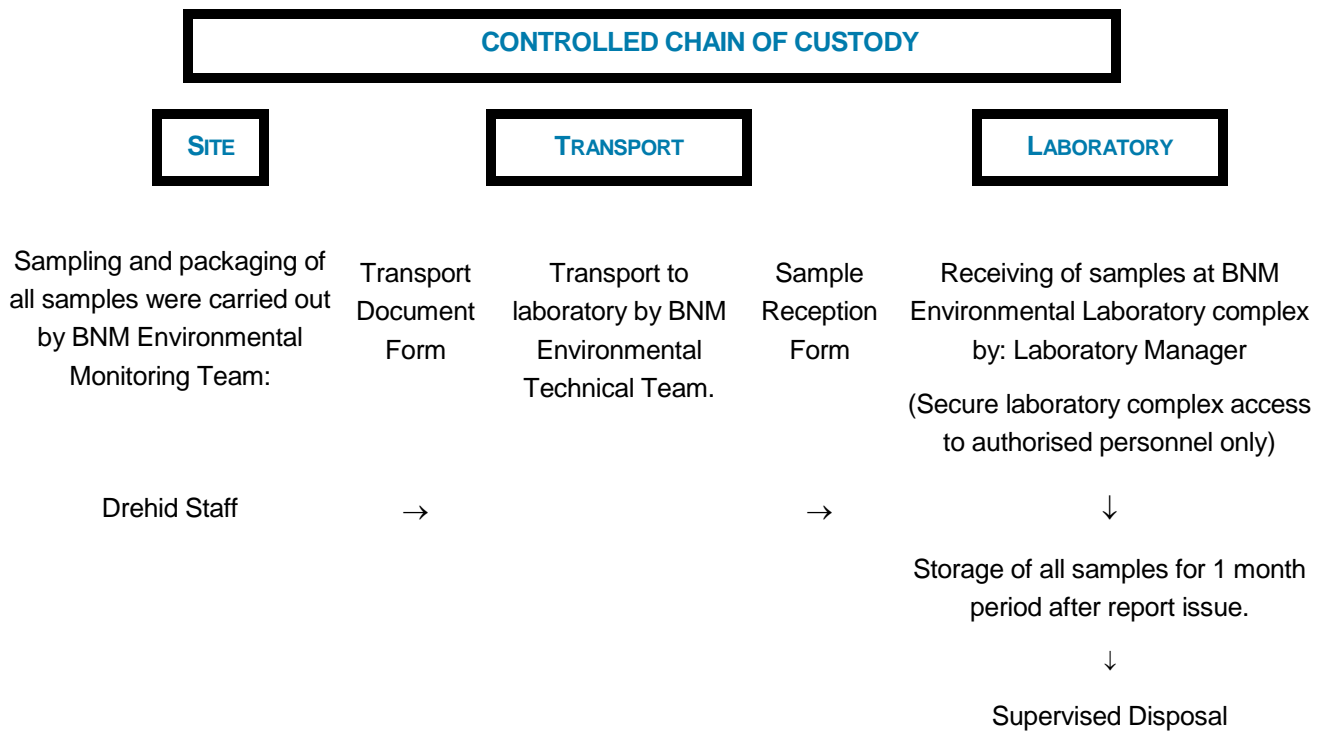
Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing the laboratory participates in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as LGC Aquacheck scheme and the EPA Intercalibration programme organised for environmental laboratories throughout Ireland. BNM Environmental Laboratory Services & Analytical Laboratory is listed on the EPA's register of Quality Controlled Laboratories

Control Chain of Custody

As part of the Quality System in place in BNM Environmental, measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.

BNM Environmental




QUARTER 3 2018
COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03

For the Attention of: Ms. Phoebe Dillane,
Bord na Móna,
Drehid Waste Management Facility,
Killinagh Upper,
Carbury,
Co. Kildare

Prepared by: Mr. Stephen Stapleton
Environmental Scientist

Signed  _____

Reviewed by: Mr. Peter Coogan
Environmental Team Leader

Signed  _____

BNM File Ref: ECS5425- Quarter 3 SW

Monitoring Date: July/August/September 2018

Report Date: 2nd November 2018

EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4) during quarter 3 and these were analysed for weekly parameters and once during the quarter for quarterly and annual parameters. Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at SW-6 during Quarter 3. SW-6 is the outfall from the Integrated Constructed Wetland and is the licenced discharge location for the site.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at this location during Quarter 3.

SW4 is situated at Dillons Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedances of any parameters were recorded at this location during Quarter 3.

Weekly, Quarterly and Annual sampling was carried out during Quarter 3.

1.0 **SURFACE WATER**

1.1 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

SW6		Quarter 3													
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.7	7.5	7.6	7.6	7.6	7.7	7.6	7.7	7.5	7.6	7.6	7.6	7.5
Conductivity	µS/cm	-	522	518	522	529	534	526	524	514	525	556	553	590	591
BOD	mg/l	25 mg/l	-	-	-	-	-	-	-	<2	-	-	-	-	-
Chloride	mg/l	-	15	16	15	15	19	21	18	14	14	16	30	22	24
COD	mg/l	-	-	-	-	-	-	-	-	14	-	-	-	-	-
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	0.03	0.03	0.09	0.03	<0.03	<0.03	<0.03

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

SW5		Quarter 3													
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.9	7.6	7.7	7.8	7.7	7.6	7.5	7.6	7.7	7.5	7.7	7.5	7.5
Conductivity	µS/cm	-	510	504	507	498	503	514	519	498	493	525	553	559	558.5
BOD	mg/l	25 mg/l	-	-	-	-	-	-	-	<2	-	-	-	-	-
Chloride	mg/l	-	16	16	17	15	17	20	17	13	14	16	22	21	22
COD	mg/l	-	-	-	-	-	-	-	-	17	-	-	-	-	-
Suspended Solids	mg/l	35 mg/l	<5	<5	7	<5	<5	<5	12	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.06	0.04	0.05	<0.03	0.06	0.15	0.04	0.04	0.13	<0.03	<0.03	<0.03	0.03

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 3													
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.8	7.6	7.7	7.7	7.8	7.7	7.7	7.8	7.7	7.6	7.7	7.5	7.7
Conductivity	µS/cm	-	536	532	522	524	515	525	527.5	522	500	524	542	549.5	551
BOD	mg/l	25 mg/l	-	-	-	-	-	-	-	<2	-	-	-	-	-
Chloride	mg/l	-	14	14	14	13	16	16	17	13	12	13	21	20	18
COD	mg/l	-	-	-	-	-	-	-	-	18	-	-	-	-	-
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.05	0.04	0.04	0.04	0.06	0.04	<0.03	0.05	0.09	0.03	<0.03	<0.03	<0.03

Table 2.2 (A): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6					
Client ID		SW-4	SW-5	SW-6	Emission Limit Value
Received Date & Time		21-08-18 16:07	21-08-18 16:07	21-08-18 16:07	
Sample Type		Surface Water	Surface Water	Surface Water	
PO4-P	mg/l	0.03	<0.01	<0.01	-
Total Phosphorous	mg/l	<0.05	<0.05	<0.05	-
N03-N	mg/l	<0.2	0.28	0.6	-
Sulphate	mg/l	14	19	23	-
Sodium (total)	mg/l	11.7	13.7	15	-
Magnesium(total)	mg/l	6.71	6.92	7.13	-
Potassium (total)	mg/l	1.37	1.28	1.28	-
Calcium (total)	mg/l	49.1	42.1	46	-
Boron (total)	µg/l	<20	<20	<20	-
Chromium (total)	µg/l	<3	<3	<3	-
Manganese (total)	µg/l	105	84.2	44.2	-
Nickel (total)	µg/l	2.14	2.11	3	-
Copper (total)	µg/l	<1	<1	<1	-
Zinc (total)	µg/l	<5	<5	5.24	-
Cadmium (total)	µg/l	<0.5	<0.5	<0.5	-
Lead (total)	µg/l	<1	<1	<1	-
Iron (total)	mg/l	0.265	0.145	0.0911	-
Mercury (total)	µg/l	<0.02	<0.02	<0.02	-

Table 2.2 (B): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
			SW-4	SW-5	SW-6	ELV
Comb Pesticide Suite	Dichlorvos**	µg/l	<0.01	<0.01	<0.01	-
	Mevinphos**	µg/l	<0.01	<0.01	<0.01	-
	alpha-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Diazinon**	µg/l	<0.01	<0.01	<0.01	-
	gamma-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor**	µg/l	<0.01	<0.01	<0.01	-
	Aldrin**	µg/l	<0.01	<0.01	<0.01	-
	beta-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Methyl Parathion**	µg/l	<0.01	<0.01	<0.01	-
	Malathion**	µg/l	<0.01	<0.01	<0.01	-
	Fenitrothion**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor Epoxide**	µg/l	<0.01	<0.01	<0.01	-
	Parathion**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan I**	µg/l	<0.01	<0.01	<0.01	-
	p,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Dieldrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Endrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDT**	µg/l	<0.01	<0.01	<0.01	-
	p,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Ethion**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan II**	µg/l	<0.01	<0.01	<0.01	-
	p,p-DDT**	µg/l	<0.01	<0.01	<0.01	-
	o,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-
	p,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan Sulphate**	µg/l	<0.01	<0.01	<0.01	-
	Azinphos Methyl**	µg/l	<0.01	<0.01	<0.01	-
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<1	<1	<1	-
	1,2-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,3-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,4-Dichlorobenzene**	µg/l	<1	<1	<1	-
	2,4,5-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4,6-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dimethylphenol**	µg/l	<1	<1	<1	-
	2,4-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2,6-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2-Chloronaphthalene**	µg/l	<1	<1	<1	-
	2-Chlorophenol**	µg/l	<1	<1	<1	-
	2-Methylnaphthalene**	µg/l	<1	<1	<1	-
	2-Methylphenol**	µg/l	<1	<1	<1	-
	2-Nitroaniline**	µg/l	<1	<1	<1	-
	2-Nitrophenol**	µg/l	<1	<1	<1	-
	3-Nitroaniline**	µg/l	<1	<1	<1	-
	4-Bromophenylphenylether**	µg/l	<1	<1	<1	-
	4-Chloro-3-methylphenol**	µg/l	<1	<1	<1	-
	4-Chloroaniline**	µg/l	<1	<1	<1	-
	4-Chlorophenylphenylether**	µg/l	<1	<1	<1	-
	4-Methylphenol**	µg/l	<1	<1	<1	-
	4-Nitrophenol**	µg/l	<1	<1	<1	-
	4-Nitroaniline**	µg/l	<1	<1	<1	-
	Azobenzene**	µg/l	<1	<1	<1	-
	Acenaphthylene**	µg/l	<1	<1	<1	-
	Acenaphthene**	µg/l	<1	<1	<1	-
	Anthracene**	µg/l	<1	<1	<1	-
	Bis(2-Chloroethyl)ether**	µg/l	<1	<1	<1	-
	Bis(2-	µg/l	<1	<1	<1	-
Bis(2-ethylhexyl)phthalate**	µg/l	<2	<2	<2	-	
Benzo(a)anthracene**	µg/l	<1	<1	<1	-	

Table 2.2 (C): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
			SW-4	SW-5	SW-6	ELV
			Butylbenzylphthalate**	µg/l	<1	<1
Benzo(a)pyrene**	µg/l	<1	<1	<1	-	
Benzo(ghi)perylene**	µg/l	<1	<1	<1	-	
Carbazole**	µg/l	<1	<1	<1	-	
Chrysene**	µg/l	<1	<1	<1	-	
Dibenzofuran**	µg/l	<1	<1	<1	-	
n-Di-butylphthalate**	µg/l	<1	<1	<1	-	
Diethyl phthalate**	µg/l	<1	<1	<1	-	
Dibenzo(a,h)anthracene**	µg/l	<1	<1	<1	-	
Dimethyl phthalate**	µg/l	<1	<1	<1	-	
n-Di octyl phthalate**	µg/l	<5	<5	<5	-	
Fluoranthene**	µg/l	<1	<1	<1	-	
Flourene**	µg/l	<1	<1	<1	-	
Hexachlorobenzene**	µg/l	<1	<1	<1	-	
hexachlorobutadiene**	µg/l	<1	<1	<1	-	
Pentachlorophenol**	µg/l	<1	<1	<1	-	
Phenol**	µg/l	<1	<1	<1	-	
N-nitrosodi-n-propylamine**	µg/l	<1	<1	<1	-	
Hexachloroethane**	µg/l	<1	<1	<1	-	
Nitrobenzene**	µg/l	<1	<1	<1	-	
Naphthalene**	µg/l	<1	<1	<1	-	
Isophorone**	µg/l	<1	<1	<1	-	
Hexachlorocyclopentadiene**	µg/l	<1	<1	<1	-	
Phenanthrene**	µg/l	<1	<1	<1	-	
Indenol(1,2,3-cd)pyrene**	µg/l	<1	<1	<1	-	
Pyrene**	µg/l	<1	<1	<1	-	
VOC's	Dichloromethane**	µg/l	<3	<3	<3	-
	All other VOC as Per USEPA List**	µg/l	<1	<1	<1	-

The daily on site reading at the outlet from the sedimentation lagoons for quarter 3 are detailed in Table 2.3 A, B and C below.

Table 2.3 (A): Daily on site readings				
Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (μS/cm)
01/07/2018	Clear, no odour*	3.9	6.3	464
02/07/2018	Clear, no odour*	3.9	5.9	460
03/07/2018	Clear, no odour*	3.9	6.2	459
04/07/2018	Clear, no odour*	3.8	5.9	453
05/07/2018	Clear, no odour*	3.8	5.8	476
06/07/2018	Clear, no odour*	3.9	7.2	450
07/07/2018	Clear, no odour*	3.9	6.1	463
08/07/2018	Clear, no odour*	3.9	6.4	460
09/07/2018	Clear, no odour*	3.9	6.4	460
10/07/2018	Clear, no odour*	3.9	6.4	452
11/07/2018	Clear, no odour*	3.8	6.6	461
12/07/2018	Clear, no odour*	3.8	6.0	454
13/07/2018	Clear, no odour*	3.8	6.0	462
14/07/2018	Clear, no odour*	3.9	6.1	456
15/07/2018	Clear, no odour*	3.9	6.6	444
16/07/2018	Clear, no odour*	3.8	5.5	446
17/07/2018	Clear, no odour*	3.8	5.8	442
18/07/2018	Clear, no odour*	3.8	6.0	438
19/07/2018	Clear, no odour*	3.8	6.1	423
20/07/2018	Clear, no odour*	3.7	6.0	419
21/07/2018	Clear, no odour*	3.8	5.8	440
22/07/2018	Clear, no odour*	3.8	6.5	440
23/07/2018	Clear, no odour*	3.8	6.1	439
24/07/2018	Clear, no odour*	3.7	6.9	426
25/07/2018	Clear, no odour*	3.7	7.1	433
26/07/2018	Clear, no odour*	3.8	6.0	428
27/07/2018	Clear, no odour*	3.9	4.8	429
28/07/2018	Clear, no odour*	3.9	4.7	418
29/07/2018	Clear, no odour*	3.9	6.7	409
30/07/2018	Clear, no odour*	3.9	5.4	422

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (B): Daily on site readings

Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (μ S/cm)
01/08/2018	Clear, no odour*	3.9	4.9	417
02/08/2018	Clear, no odour*	3.9	4.8	415
03/08/2018	Clear, no odour*	4.0	5.6	419
04/08/2018	Clear, no odour*	4.1	6.9	409
05/08/2018	Clear, no odour*	4.1	6.9	422
06/08/2018	Clear, no odour*	4.1	6.8	415
07/08/2018	Clear, no odour*	4.0	6.4	418
08/08/2018	Clear, no odour*	4.0	6.2	413
09/08/2018	No flow	4.0	0	461
10/08/2018	Clear, no odour*	4.1	7.5	391
11/08/2018	Clear, no odour*	4.2	7.9	405
12/08/2018	Clear, no odour*	4.1	7.9	405
13/08/2018	Clear, no odour*	4.1	7.9	412
14/08/2018	Clear, no odour*	4.0	6.8	406
15/08/2018	Clear, no odour*	3.9	5.9	412
16/08/2018	Clear, no odour*	3.9	5.9	408
17/08/2018	Clear, no odour*	3.8	6.4	409
18/08/2018	Clear, no odour*	3.9	5.2	420
19/08/2018	Clear, no odour*	3.9	6.2	426
20/08/2018	Clear, no odour*	3.8	6.8	424
21/08/2018	Clear, no odour*	3.9	7.4	438
22/08/2018	Clear, no odour*	3.9	6.9	419
23/08/2018	Clear, no odour*	3.9	6.6	430
24/08/2018	Clear, no odour*	3.9	5.7	441
25/08/2018	Clear, no odour*	3.9	5.4	449
26/08/2018	Clear, no odour*	4.0	5.6	451
27/08/2018	Clear, no odour*	4.2	5.0	452
28/08/2018	Clear, no odour*	4.3	5.9	450
29/08/2018	Clear, no odour*	4.2	5.7	452
30/08/2018	Clear, no odour*	4.2	5.6	451
31/08/2018	Clear, no odour*	4.1	5.7	449

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (C): Daily on site readings

Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity ($\mu\text{S/cm}$)
01/09/2018	Clear, no odour*	4.0	6.2	463
02/09/2018	Clear, no odour*	3.9	5.9	453
03/09/2018	Clear, no odour*	3.9	6.5	458
04/09/2018	Clear, no odour*	3.9	6.3	461
05/09/2018	Clear, no odour*	3.9	5.9	467
06/09/2018	Clear, no odour*	3.8	6.7	462
07/09/2018	Clear, no odour*	3.4	6.2	480
08/09/2018	Clear, no odour*	3.4	5.2	480
09/09/2018	Clear, no odour*	3.3	5.1	479
10/09/2018	Clear, no odour*	3.4	4.6	459
11/09/2018	Clear, no odour*	3.3	4.5	457
12/09/2018	Clear, no odour*	3.3	4.2	469
13/09/2018	Clear, no odour*	3.4	4.1	474
14/09/2018	Clear, no odour*	3.4	3.9	479
15/09/2018	Clear, no odour*	3.4	4.1	481
16/09/2018	Clear, no odour*	3.3	4.6	486
17/09/2018	Clear, no odour*	3.4	4.3	492
18/09/2018	Clear, no odour*	3.3	4.1	494
19/09/2018	Clear, no odour*	3.4	4.5	485
20/09/2018	Clear, no odour*	3.5	4.6	484
21/09/2018	Clear, no odour*	3.4	4.6	484
22/09/2018	Clear, no odour*	3.4	4.5	493
23/09/2018	Clear, no odour*	3.4	4.4	497
24/09/2018	Clear, no odour*	3.3	4.8	496
25/09/2018	Clear, no odour*	3.3	4.8	499
26/09/2018	Clear, no odour*	3.3	4.9	503
27/09/2018	Clear, no odour*	3.3	5.0	502
28/09/2018	Clear, no odour*	3.4	5.4	512
29/09/2018	Clear, no odour*	3.4	5.2	508
30/09/2018	Clear, no odour*	3.4	5.2	503

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the third quarter of 2018. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters, once during the quarter for quarterly parameters and once during the quarter for annual parameters. BOD, Ammonia and Suspended Solids levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 3 to Figure 5.

No exceedances were noted for Suspended Solids, Ammonia and BOD during quarter 3 at monitoring locations SW-4, SW-5 and SW-6 with all remaining parameters in line with that previously detected.

The annual parameters with the exception of microbiological where analysed on samples submitted on the 21st of August. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations. The microbiological will be taken during quarter 4.

The metals results showed some fluctuations since the previous monitoring event but remain in trend with previous results.

Figures 3 to 5 below graphically display the Ammonia, BOD and Suspended Solids results obtained in first three quarters of 2018.

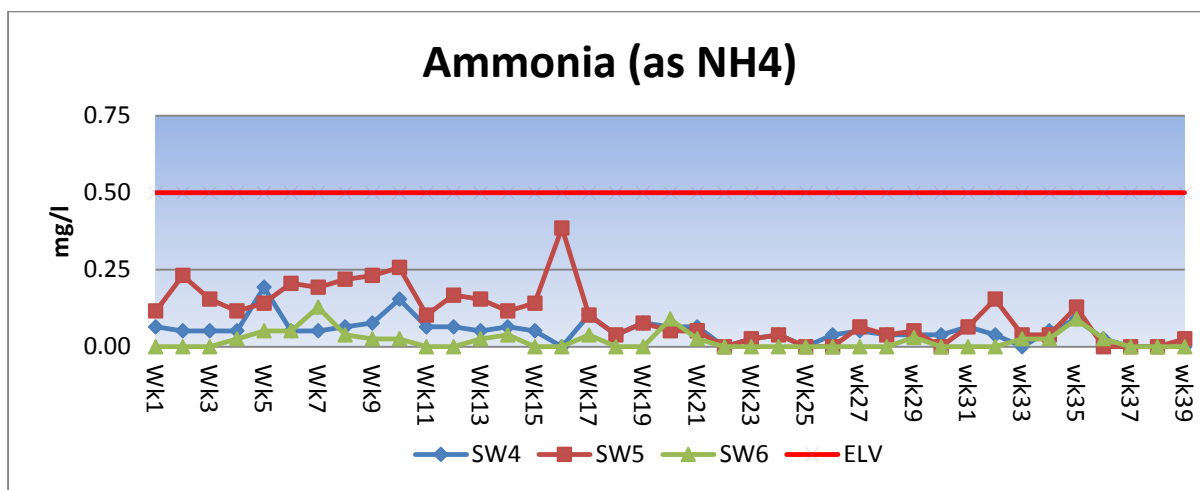


Figure 3

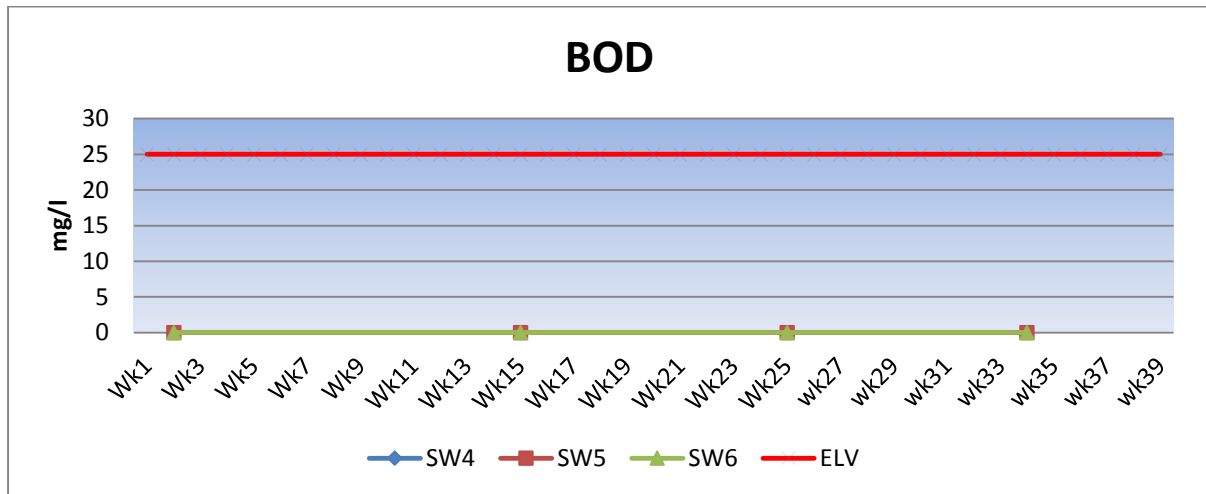


Figure 4

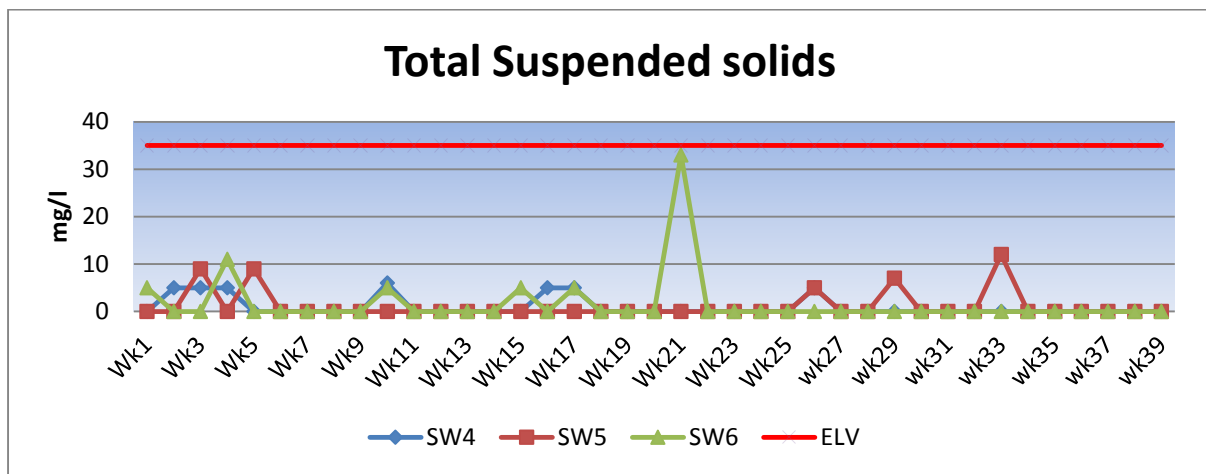
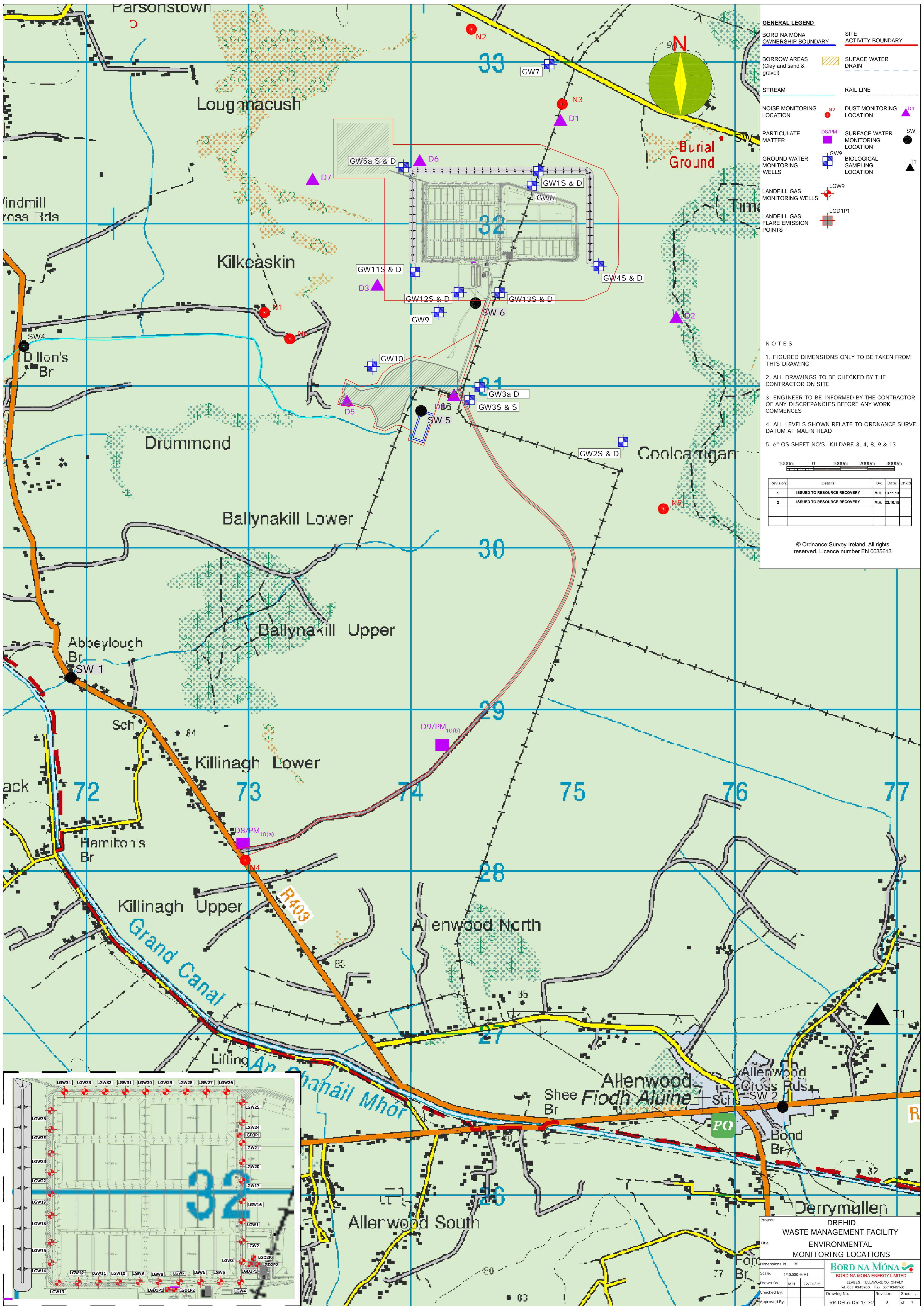


Figure 5

APPENDIX I

Monitoring Locations



GENERAL LEGEND

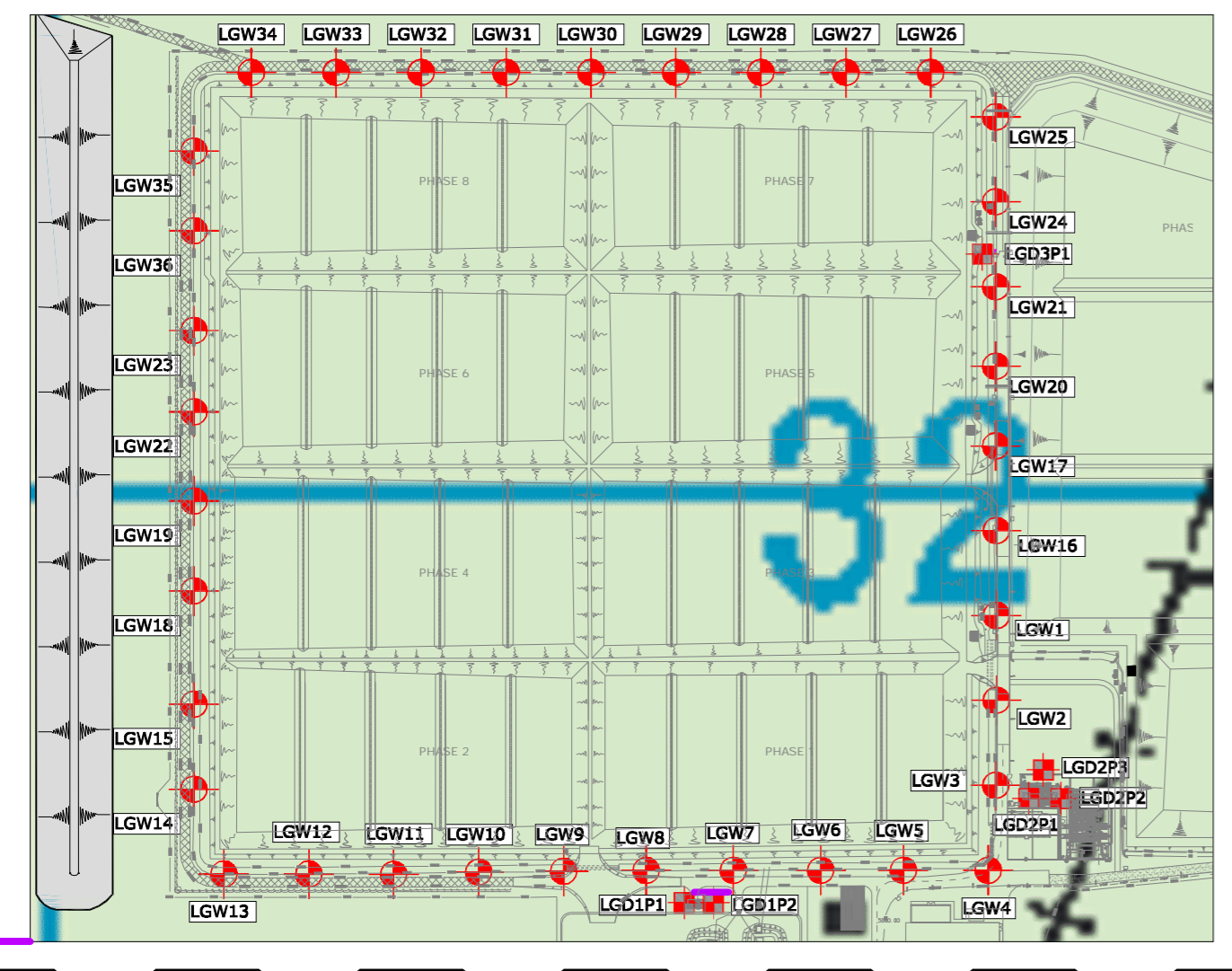
BORD NA MÓNA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
BORROW AREAS (Clay and sand & gravel)	SURFACE WATER DRAIN
STREAM	RAIL LINE
NOISE MONITORING LOCATION	DUST MONITORING LOCATION
PARTICULATE MATTER	SURFACE WATER MONITORING LOCATION
GROUND WATER MONITORING WELLS	BIOLOGICAL SAMPLING LOCATION
LANDFILL GAS MONITORING WELLS	LGW9
LANDFILL GAS FLARE EMISSION POINTS	LGD1P1

- NOTES**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 - ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVE DATUM AT MALIN HEAD
 - 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13

1000m 0 1000m 2000m 3000m

Revision	Details	By	Date	Chkd
1	ISSUED TO RESOURCE RECOVERY	M.H.	13.11.13	
2	ISSUED TO RESOURCE RECOVERY	M.H.	22.10.15	

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Project: DREHD WASTE MANAGEMENT FACILITY
 Title: ENVIRONMENTAL MONITORING LOCATIONS
 Dimensions in: M
 Scale: 1/10,000 @ A1
 Drawn By: M.H. 22/10/15
 Checked By:
 Approved By:
 Drawing No: RR-DH-6-DR-1/TE2
 Revision: 2
 Sheet: 1 of 1
BORD NA MÓNA
 BORD NA MÓNA ENERGY LIMITED
 LEARCO TULLAMORE CO. DUBLIN
 Tel: 057 9345900 Fax: 057 9345160

APPENDIX 2

Analytical Methods

Chain of Custody

Analytical Methods

Analysis of water sampling was conducted in accordance with recognised standard methods as detailed below

ANALYSIS OF SAMPLES			
Parameter	Limit of Detection	Method	Accredited
pH (pH units)	0.1 – 14	G/05: Based on APHA 2012, 22 nd Ed, Method 4500 H+B	INAB ✓
Conductivity (µs/cm)	-	<i>In-Situ</i> Calibrated Conductivity Meter	-
Temperature (°C)	-	<i>In-Situ</i> Calibrated pH / Temperature Thermometer	-
Biochemical Oxygen Demand (BOD) (mg/l)	<2 mg/l BOD	G/04: Based on APHA, 2012, 22 nd Ed, Method 5210B.	INAB ✓
Chemical Oxygen Demand(COD)(mg/l)	10 – 1500 mg/l	G/03: Based on APHA 2012, 22 nd Edition, Method 5220D	INAB ✓
Chloride Sulphate Phosphate Nitrate	<0.5 mg/l <5 mg/l <0.16mg/l <0.04mg/l	G/39: Ion Chromatography	INAB ✓
Total Phosphorus	<0.5mg/l	G/23Based on APHA-2012, 22 nd Edition, Method 4500-PB, and Method 4500 PB for digestion. (G/23)	INAB ✓
Ammonia-N (mg/l)	<0.02 mg/l NH ₃ -N	G/67: Based on APHA, 2012, 22 nd Ed,4500-NH ₃ & Bluebook Ammonia in Waters 1981	INAB ✓
Suspended Solids (mg/l) ^{Note 1}	<5 mg/l dried residue	G/19: Based on APHA, 2012, 22 nd Edition, Method 2540D.	INAB ✓
** Total Coliforms	<1 MPN/100ml	D/1201 MPN based on IDEXX defined substrate method	INAB ✓
**Faecal Coliforms	<1 CFU/100ml	D/3221	INAB ✓
**Total Metals by ICPMS2	various	TM152 Method 3125B, AWWA/APHA, 20 th Ed. 1999	✓ (UKAS)
**VOC's USEPA 524.2	<10 µg/l	G/61: Based on USEPA 524.2 method	✓ (UKAS)
**SVOCs target list (Modified US EPA 8270)	<1 µg/l	TM/143DGC-MS - following extraction with 1:1 DCM/Ethyl Acetate	X
**Comb Pesticide Suite	<0.01 µg/l	GC-MS	X

Notes:

G: INAB Accredited Method, Bord na Móna Technical Analytical Services Standard Operating Procedures Manual.

APHA – American Public Health Association, Standard Methods for the Examination of Waters and Waste Waters, 22nd Edition, 2012.

** Subcontracted test

✓ – INAB Accredited Test Method – INAB [Registration Reference No. 083T](#).

X – None Accredited Test Method

ACCREDITED QUALITY SYSTEM

INAB Accreditation

BNM Environmental analytical laboratories are accredited to ISO 17025 by the National Accreditation Board (INAB). ISO 17025 accreditation ensures that the laboratory operates a quality system with technically competent staff. The laboratory has accreditation since 1997 and it is the policy of the laboratory to achieve and maintain a high standard of quality consistent with client's requirements in all aspects of the work carried out within the laboratory.

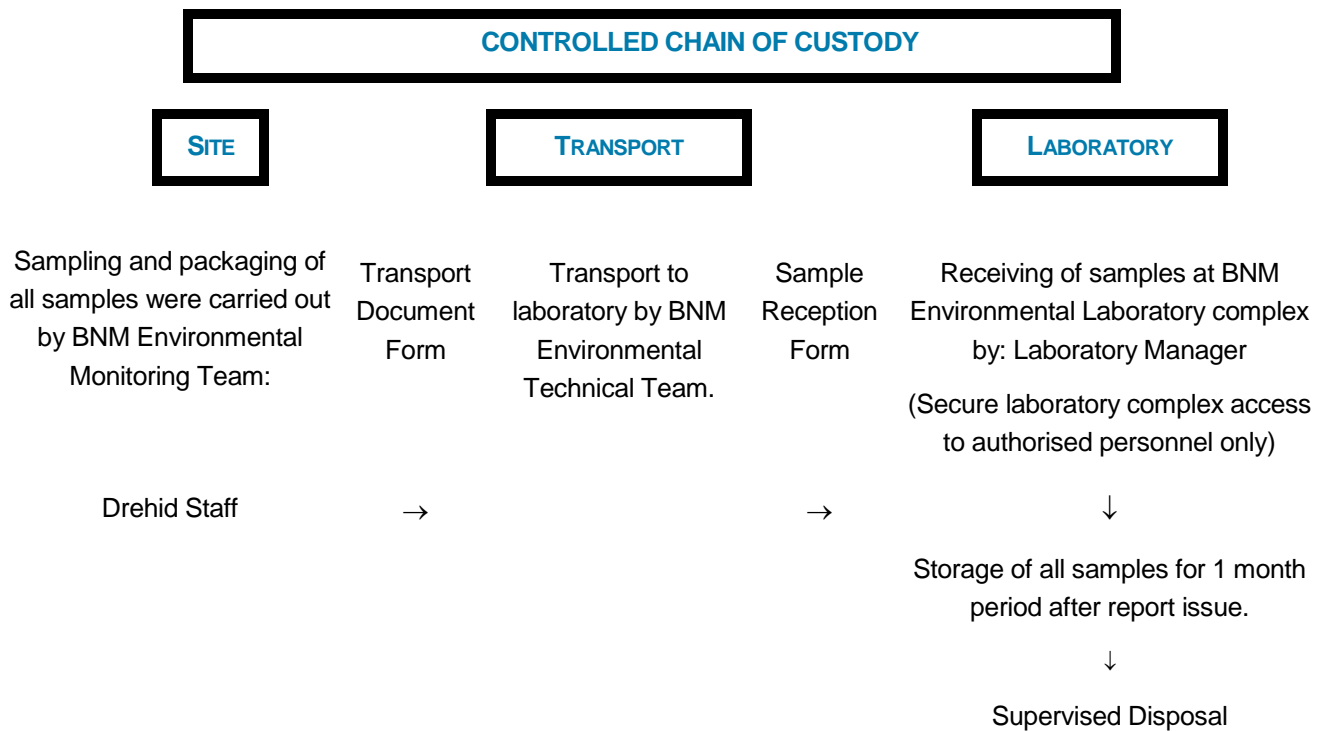
Interlaboratory Proficiency Schemes

To ensure the accuracy of the analytical testing the laboratory participates in several external proficiency schemes. The ongoing competence of the laboratory and its staff is assessed by participation in various inter-laboratory proficiency testing schemes, such as LGC Aquacheck scheme and the EPA Intercalibration programme organised for environmental laboratories throughout Ireland. BNM Environmental Laboratory Services & Analytical Laboratory is listed on the EPA's register of Quality Controlled Laboratories

Control Chain of Custody

As part of the Quality System in place in BNM Environmental, measures are taken to ensure controlled chain of custody. An outline of the chain of custody is given below.

BNM Environmental



QUARTER 3 2019

COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03

Prepared by:

Mrs. Phoebe Dillane
Environmental Compliance Officer

Signed _____



BNM File Ref:

Quarterly 3 Surface Water 2019

Monitoring Date:

23rd July 2019

Report Date:

29th October 2019

EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4) during quarter 3 and these were analysed for weekly parameters and once during the quarter for quarterly and annual parameters. Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surfacewater:

There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at SW-6 during Quarter 3. SW-6 is the outfall from the Integrated Constructed Wetland and is the licenced discharge location for the site.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at this location during Quarter 3.

SW4 is situated at Dillon's Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedances of any parameters were recorded at this location during Quarter 3.

Weekly, Quarterly and Annual sampling was carried out during Quarter 3 with the exception of microbial analysis which will be carried out during Quarter 4 2019.

1.0 **SURFACE WATER**

1.1 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6																
SW6	Quarter 3															
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39	
pH	pH Units	-	7.5	No Discharge	No Discharge	7.5	7.4	7.5	7.7	7.7	7.6	7.4	7.6	No Discharge	7.6	
Conductivity	µS/cm	-	635			621	518	483	421	484	571	547	491		465	
BOD	mg/l	25 mg/l	<2													
Chloride	mg/l	-	21.0			30.0	28.0	26.7	21.8	21.3	23.6	23.9	23.5		22	
COD	mg/l	-				52										
Suspended Solids	mg/l	35 mg/l	<5			<5	<5	7.3	<5	<5	<5	<5	<5		<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.04			<0.02	0.02	0.02	0.05	0.02	0.04	0.06	0.02		0.03	

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5															
SW5	Quarter 3														
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.7	7.7	7.7	7.6	7.5	7.6	7.6	7.6	7.4	7.4	7.5	7.4	7.5
Conductivity	µS/cm	-	580	591	582	539	518	445	380	387	660	439	438	442	365
BOD	mg/l	25 mg/l				<2									
Chloride	mg/l	-	13	12	13	15	20	23.5	18.8	17.6	17.1	15.7	16.1	17.2	16.5
COD	mg/l	-				63									
Suspended Solids	mg/l	35 mg/l	<5	7	5	<5	12	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.09	0.06	0.05	0.05	0.06	0.06	0.05	0.04	0.12	0.10	0.05	0.04	0.04

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 3													
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.8	7.8	7.9	7.8	7.8	7.7
Conductivity	µS/cm	-	580	584	573	564	553	479	420	450	508	527	515	512	545
BOD	mg/l	25 mg/l				<2									
Chloride	mg/l	-	12	12	12	14	14	17.2	16.5	15	14.6	14.1	15.5	15	13.4
COD	mg/l	-				45									
Suspended Solids	mg/l	35 mg/l	<5	8	12	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.06	0.05	0.05	0.06	0.08	0.06	0.04	0.08	0.06	0.05	0.05	0.04	0.04

Table 2.2 (A): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6					
Client ID		SW-4	SW-5	SW-6	Emission Limit Value
Sampling Date		23-07-19	23-07-19	23-07-19	
Sample Type		Surface Water	Surface Water	Surface Water	
PO4-P	mg/l	<0.16	<0.16	<0.16	-
Total Phosphorous	mg/l	0.07	0.09	0.07	-
N03-N	mg/l	0.22	<0.045	<0.045	-
Sulphate	mg/l	15	20	90	-
Sodium (total)	mg/l	9.89	12.8	30.2	-
Magnesium(total)	mg/l	7.72	6.85	8.39	-
Potassium (total)	mg/l	1.9	0.884	2.52	-
Calcium (total)	mg/l	119	106	101	-
Boron (total)	µg/l	<20	<20	24.5	-
Chromium (total)	µg/l	6.49	7.22	6.6	-
Manganese (total)	µg/l	162	114	70.8	-
Nickel (total)	µg/l	2.96	2.48	3.88	-
Copper (total)	µg/l	<1	<1	2.34	-
Zinc (total)	µg/l	<5	<5	<5	-
Cadmium (total)	µg/l	<0.5	<0.5	<0.5	-
Lead (total)	µg/l	<1	<1	<1	-
Iron (total)	mg/l	0.415	0.405	0.155	-
Mercury (total)	µg/l	<0.02	<0.02	<0.02	-

Table 2.2 (B): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
			SW-4	SW-5	SW-6	ELV
Comb Pesticide Suite	Dichlorvos**	µg/l	<0.01	<0.01	<0.01	-
	Mevinphos**	µg/l	<0.01	<0.01	<0.01	-
	alpha-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Diazinon**	µg/l	<0.01	<0.01	<0.01	-
	gamma-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor**	µg/l	<0.01	<0.01	<0.01	-
	Aldrin**	µg/l	<0.01	<0.01	<0.01	-
	beta-HCH/Lindane**	µg/l	<0.01	<0.01	<0.01	-
	Methyl Parathion**	µg/l	<0.01	<0.01	<0.01	-
	Malathion**	µg/l	<0.01	<0.01	<0.01	-
	Fenitrothion**	µg/l	<0.01	<0.01	<0.01	-
	Heptachlor Epoxide**	µg/l	<0.01	<0.01	<0.01	-
	Parathion**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan I**	µg/l	<0.01	<0.01	<0.01	-
	p,p-DDE**	µg/l	<0.01	<0.01	<0.01	-
	Dieldrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Endrin**	µg/l	<0.01	<0.01	<0.01	-
	o,p-DDT**	µg/l	<0.01	<0.01	<0.01	-
	p,p-TDE**	µg/l	<0.01	<0.01	<0.01	-
	Ethion**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan II**	µg/l	<0.02	<0.02	<0.02	-
	p,p-DDT**	µg/l	<0.01	<0.01	<0.01	-
	o,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-
	p,p-Methoxychlor**	µg/l	<0.01	<0.01	<0.01	-
	Endosulfan Sulphate**	µg/l	<0.02	<0.02	<0.02	-
	Azinphos Methyl**	µg/l	<0.02	<0.02	<0.02	-
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<1	<1	<1	-
	1,2-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,3-Dichlorobenzene**	µg/l	<1	<1	<1	-
	1,4-Dichlorobenzene**	µg/l	<1	<1	<1	-
	2,4,5-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4,6-Trichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dichlorophenol**	µg/l	<1	<1	<1	-
	2,4-Dimethylphenol**	µg/l	<1	<1	<1	-
	2,4-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2,6-Dinitrotoluene**	µg/l	<1	<1	<1	-
	2-Chloronaphthalene**	µg/l	<1	<1	<1	-
	2-Chlorophenol**	µg/l	<1	<1	<1	-
	2-Methylnaphthalene**	µg/l	<1	<1	<1	-
	2-Methylphenol**	µg/l	<1	<1	<1	-
	2-Nitroaniline**	µg/l	<1	<1	<1	-
	2-Nitrophenol**	µg/l	<1	<1	<1	-
	3-Nitroaniline**	µg/l	<1	<1	<1	-
	4-Bromophenylphenylether**	µg/l	<1	<1	<1	-
	4-Chloro-3-methylphenol**	µg/l	<1	<1	<1	-
	4-Chloroaniline**	µg/l	<1	<1	<1	-
	4-Chlorophenylphenylether**	µg/l	<1	<1	<1	-
	4-Methylphenol**	µg/l	<1	<1	<1	-
	4-Nitrophenol**	µg/l	<1	<1	<1	-
	4-Nitroaniline**	µg/l	<1	<1	<1	-
	Azobenzene**	µg/l	<1	<1	<1	-
	Acenaphthylene**	µg/l	<1	<1	<1	-
	Acenaphthene**	µg/l	<1	<1	<1	-
	Anthracene**	µg/l	<1	<1	<1	-
	Bis(2-Chloroethyl)ether**	µg/l	<1	<1	<1	-
	Bis(2-	µg/l	<1	<1	<1	-
Bis(2-ethylhexyl)phthalate**	µg/l	<2	<2	<2	-	
Benzo(a)anthracene**	µg/l	<1	<1	<1	-	

Table 2.2 (C): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
			SW-4	SW-5	SW-6	ELV
			Butylbenzylphthalate**	µg/l	<1	<1
Benzo(a)pyrene**	µg/l	<1	<1	<1	-	
Benzo(ghi)perylene**	µg/l	<1	<1	<1	-	
Carbazole**	µg/l	<1	<1	<1	-	
Chrysene**	µg/l	<1	<1	<1	-	
Dibenzofuran**	µg/l	<1	<1	<1	-	
n-Di-butylphthalate**	µg/l	<1	<1	<1	-	
Diethyl phthalate**	µg/l	<1	<1	<1	-	
Dibenzo(a,h)anthracene**	µg/l	<1	<1	<1	-	
Dimethyl phthalate**	µg/l	<1	<1	<1	-	
n-Di octyl phthalate**	µg/l	<5	<5	<5	-	
Fluoranthene**	µg/l	<1	<1	<1	-	
Flourene**	µg/l	<1	<1	<1	-	
Hexachlorobenzene**	µg/l	<1	<1	<1	-	
hexachlorobutadiene**	µg/l	<1	<1	<1	-	
Pentachlorophenol**	µg/l	<1	<1	<1	-	
Phenol**	µg/l	<1	<1	<1	-	
N-nitrosodi-n-propylamine**	µg/l	<1	<1	<1	-	
Hexachloroethane**	µg/l	<1	<1	<1	-	
Nitrobenzene**	µg/l	<1	<1	<1	-	
Naphthalene**	µg/l	<1	<1	<1	-	
Isophorone**	µg/l	<1	<1	<1	-	
Hexachlorocyclopentadiene**	µg/l	<1	<1	<1	-	
Phenanthrene**	µg/l	<1	<1	<1	-	
Indenol(1,2,3-cd)pyrene**	µg/l	<1	<1	<1	-	
Pyrene**	µg/l	<1	<1	<1	-	
VOC's	Dichloromethane**	µg/l	<3	<3	<3	-
	All other VOC as Per USEPA List**	µg/l	<1	<1	<1	-

The daily on site reading at the outlet from the sedimentation lagoons for quarter 3 are detailed in Table 2.3 A, B and C below.

Table 2.3 (A): Daily on site readings				
Date	Visual Inspection/O odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (µS/cm)
01/07/2019	Clear, no odour*	3.4	6.2	582
02/07/2019	Clear, no odour*	3.39	4.5	545
03/07/2019	Clear, no odour*	3.4	6.3	568
04/07/2019	Clear, no odour*	3.37	6.4	567
05/07/2019	Clear, no odour*	3.38	6.0	561
06/07/2019	Clear, no odour*	3.38	7	559
07/07/2019	Clear, no odour*	3.37	7.2	560
08/07/2019	Clear, no odour*	3.37	7.4	553
09/07/2019	Clear, no odour*	3.37	7.5	553
10/07/2019	Clear, no odour*	3.35	7.1	556
11/07/2019	Clear, no odour*	3.38	7.1	434
12/07/2019	Clear, no odour*	3.39	8.7	543
13/07/2019	Clear, no odour*	3.38	8.7	548
14/07/2019	Clear, no odour*	3.38	8.7	558
15/07/2019	Clear, no odour*	3.37	8.7	545
16/07/2019	Clear, no odour*	3.37	8.6	523
17/07/2019	Clear, no odour*	3.39	8.3	549
18/07/2019	Clear, no odour*	3.38	8.7	525
19/07/2019	Clear, no odour*	3.37	8.5	545
20/07/2019	Clear, no odour*	3.42	8.1	531
21/07/2019	Clear, no odour*	3.45	8	548
22/07/2019	Clear, no odour*	3.5	8.6	534
23/07/2019	Clear, no odour*	3.48	8.9	490
24/07/2019	Clear, no odour*	3.46	8	438
25/07/2019	Clear, no odour*	3.47	6.3	363
26/07/2019	Clear, no odour*	3.48	8.8	386
27/07/2019	Clear, no odour*	3.48	8.1	385
28/07/2019	Clear, no odour*	3.5	8	386
29/07/2019	Clear, no odour*	3.47	8	404
30/07/2019	Clear, no odour*	3.45	8	421
31/07/2019	Clear, no odour*	3.49	8.7	419

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (B): Daily on site readings				
Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity (μ S/cm)
01/08/2019	Clear, no odour*	3.46	8.1	416
02/08/2019	Clear, no odour*	3.45	4.7	439
03/08/2019	Clear, no odour*	3.45	4.8	474
04/08/2019	Clear, no odour*	3.45	5	433
05/08/2019	Clear, no odour*	3.46	4.8	462
06/08/2019	Clear, no odour*	3.46	5.6	526
07/08/2019	Clear, no odour*	3.46	5.9	451
08/08/2019	Clear, no odour*	3.45	5.4	357
09/08/2019	Clear, no odour*	3.49	5.7	309
10/08/2019	Clear, no odour*	3.52	4.8	362
11/08/2019	Clear, no odour*	3.6	5.1	450
12/08/2019	Clear, no odour*	3.58	5.1	391
13/08/2019	Clear, no odour*	3.57	5.8	389
14/08/2019	Clear, no odour*	3.55	5.7	409
15/08/2019	Clear, no odour*	3.49	5.8	349
16/08/2019	Clear, no odour*	3.55	4.9	398
17/08/2019	Clear, no odour*	3.57	7	419
18/08/2019	Clear, no odour*	3.58	6.1	378
19/08/2019	Clear, no odour*	3.6	5.6	402
20/08/2019	Clear, no odour*	3.64	5.9	438
21/08/2019	Clear, no odour*	3.58	5.6	389
22/08/2019	Clear, no odour*	3.67	4.8	487
23/08/2019	Clear, no odour*	3.64	4.9	508
24/08/2019	Clear, no odour*	3.6	5.9	496
25/08/2019	Clear, no odour*	3.57	7	477
26/08/2019	Clear, no odour*	3.47	4.7	525
27/08/2019	Clear, no odour*	3.46	5.1	524
28/08/2019	Clear, no odour*	3.42	4.9	451
29/08/2019	Clear, no odour*	3.42	4.8	529
30/08/2019	Clear, no odour*	3.41	6.1	539
31/08/2019	Clear, no odour*	3.4	7.1	587

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3 (C): Daily on site readings

Date	Visual Inspection/Odour	Lagoon Level (mtrs)	Dissolved Oxygen (mg/l)	Electrical Conductivity ($\mu\text{S/cm}$)
01/09/2019	Clear, no odour*	3.4	6.9	418
02/09/2019	Clear, no odour*	3.39	4.5	393
03/09/2019	Clear, no odour*	3.4	4.6	396
04/09/2019	Clear, no odour*	3.38	4.7	389
05/09/2019	Clear, no odour*	3.37	4.6	380
06/09/2019	Clear, no odour*	3.43	5.8	558
07/09/2019	Clear, no odour*	3.42	5.7	507
08/09/2019	Clear, no odour*	3.41	6.1	569
09/09/2019	Clear, no odour*	3.42	5.8	393
10/09/2019	Clear, no odour*	3.41	4.8	390
11/09/2019	Clear, no odour*	3.39	4.8	400
12/09/2019	Clear, no odour*	3.39	4.8	412
13/09/2019	Clear, no odour*	3.46	5.6	542
14/09/2019	Clear, no odour*	3.44	5.1	458
15/09/2019	Clear, no odour*	3.43	5.3	386
16/09/2019	Clear, no odour*	3.41	5.5	367
17/09/2019	Clear, no odour*	3.4	4.7	383
18/09/2019	Clear, no odour*	3.39	4.6	386
19/09/2019	Clear, no odour*	3.39	5	356
20/09/2019	Clear, no odour*	3.41	5.3	477
21/09/2019	Clear, no odour*	3.43	4.8	523
22/09/2019	Clear, no odour*	3.48	5.1	554
23/09/2019	Clear, no odour*	3.5	5.4	397
24/09/2019	Clear, no odour*	3.5	5.7	394
25/09/2019	Clear, no odour*	3.52	5.6	461
26/09/2019	Clear, no odour*	3.49	4.8	446
27/09/2019	Clear, no odour*	3.49	4.7	461
28/09/2019	Clear, no odour*	3.53	4.7	481
29/09/2019	Clear, no odour*	3.58	4.9	817
30/09/2019	Clear, no odour*	3.63	4.7	481

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the third quarter of 2019. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters, once during the quarter for quarterly parameters and once during the quarter for annual parameters. BOD, Ammonia and Suspended Solids levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 3 to Figure 5.

No exceedances were noted for Suspended Solids, Ammonia and BOD during quarter 3 at monitoring locations SW-4, SW-5 and SW-6 with all remaining parameters in line with that previously detected.

The annual parameters with the exception of microbiological were analysed on samples submitted on the 23rd July 2019. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations. The microbiological will be taken during quarter 4.

The metals results showed some fluctuations since the previous monitoring event but remain in trend with previous results.

Figures 3 to 5 below graphically display the Ammonia, BOD and Suspended Solids results obtained in the first three quarters of 2019.

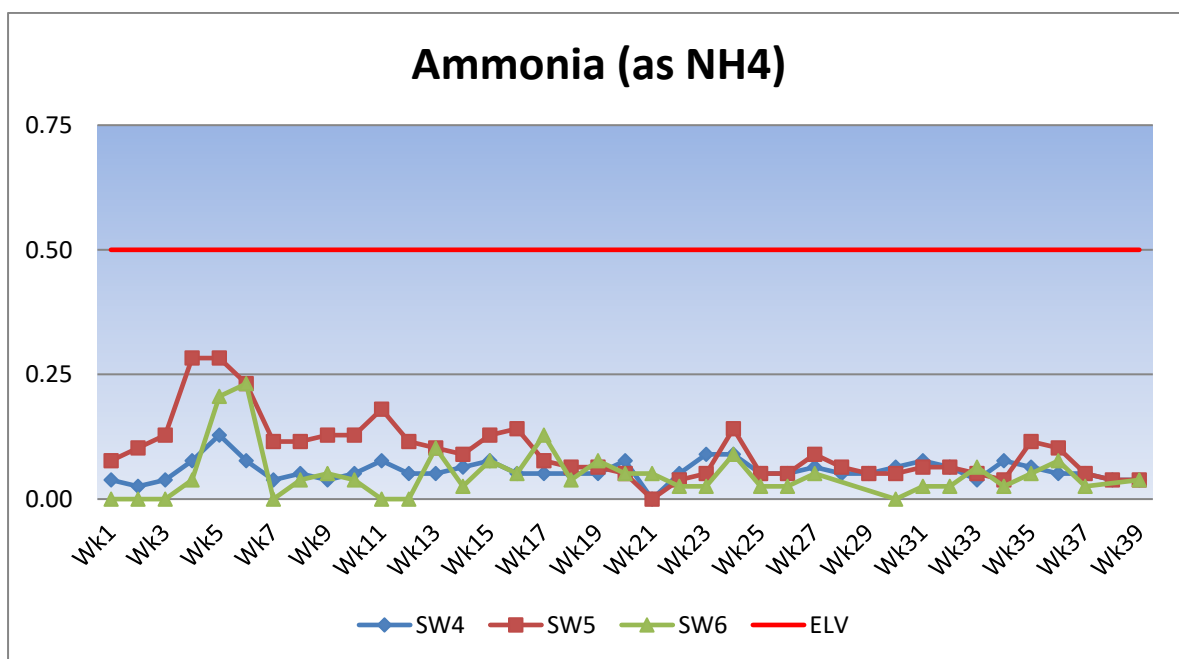


Figure 3

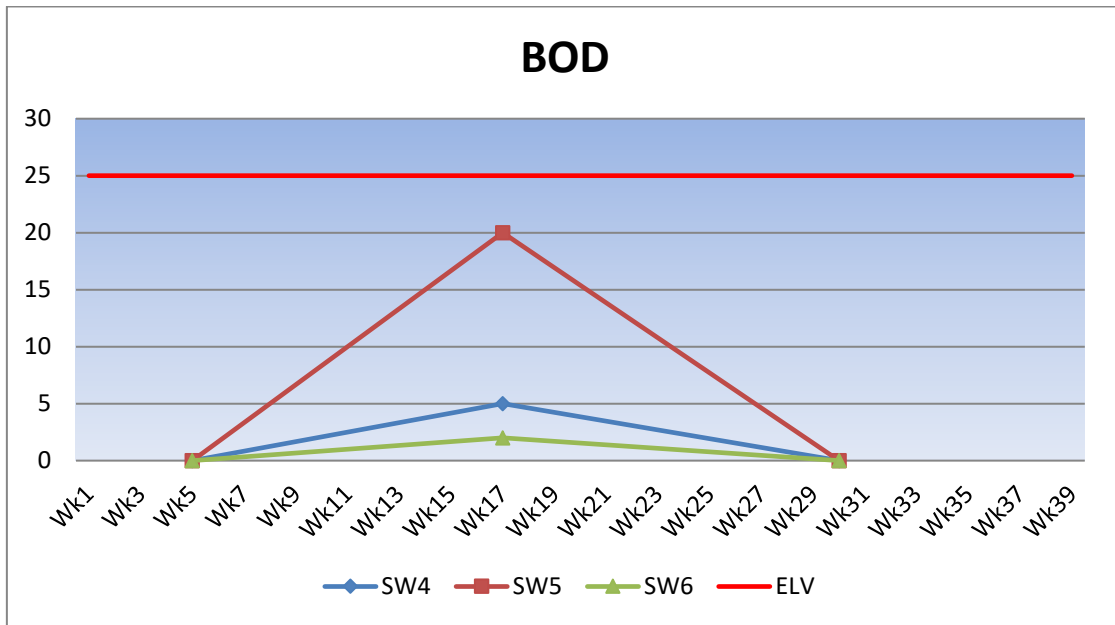


Figure 4

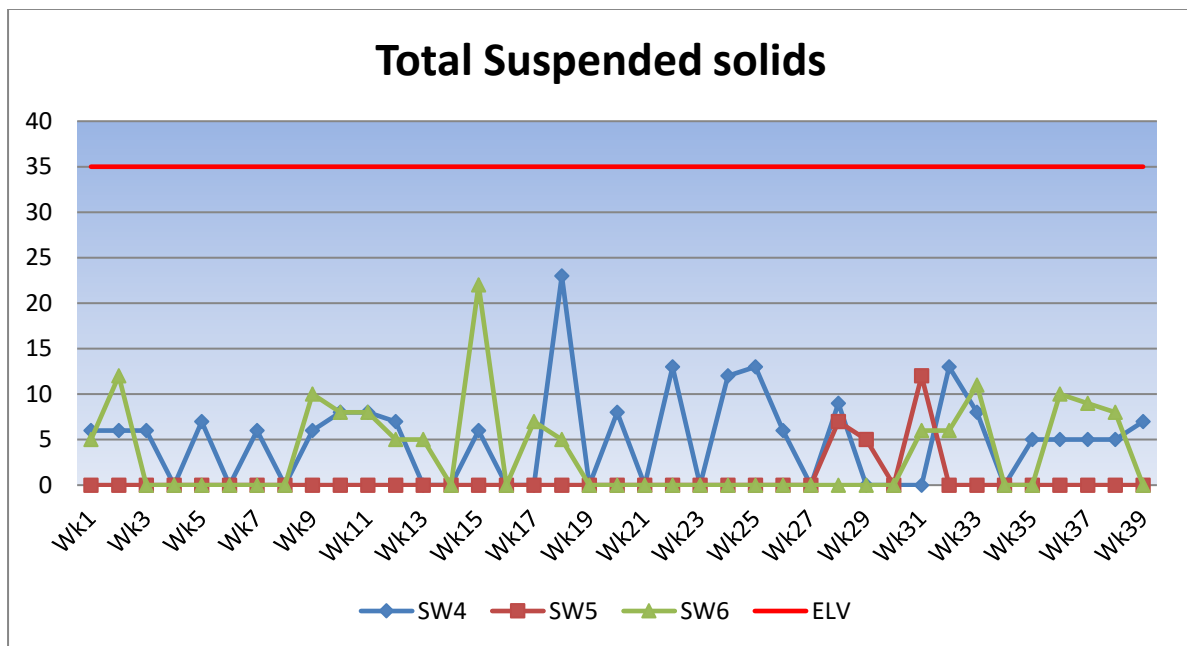
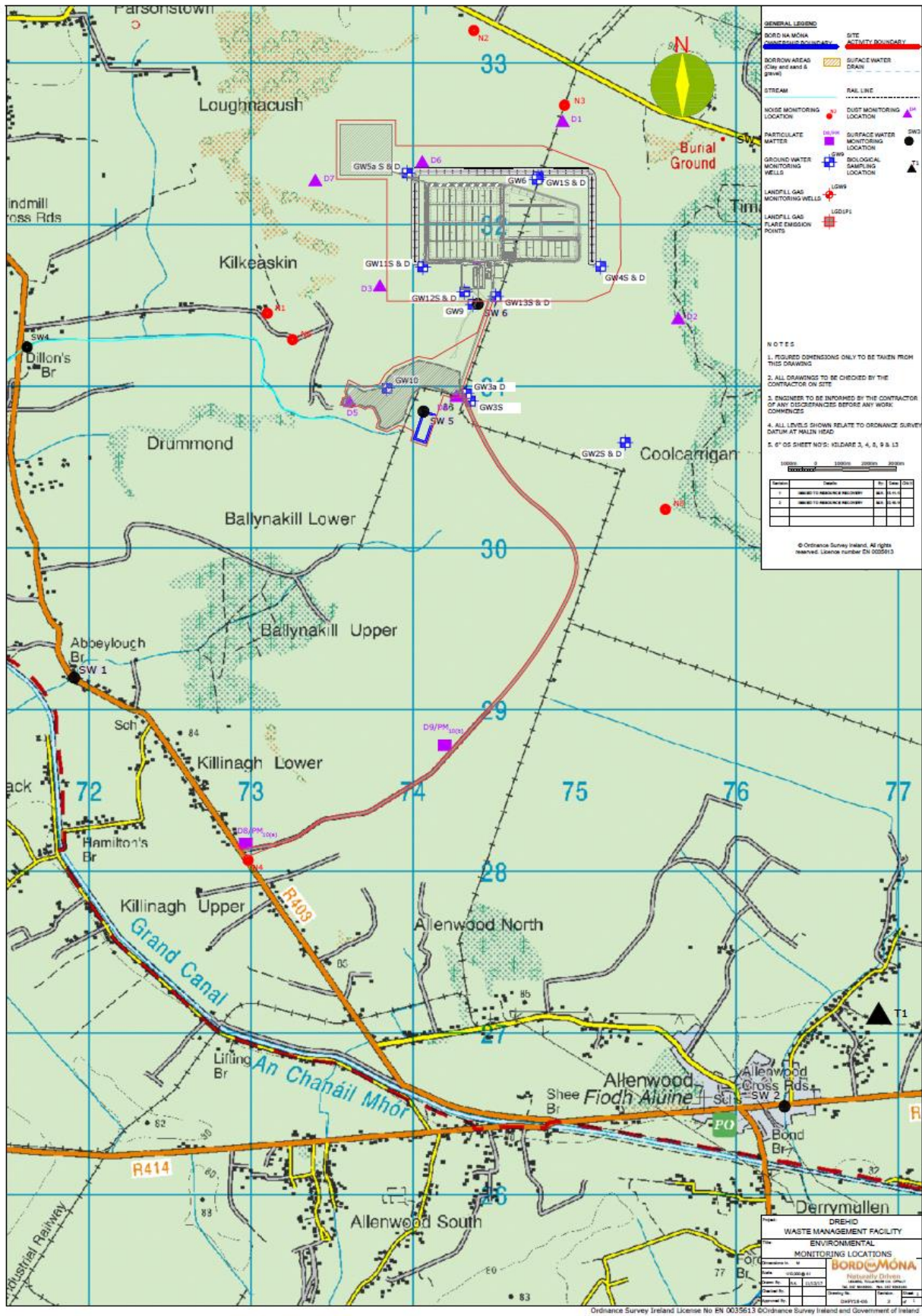


Figure 5

APPENDIX I

Monitoring Locations



QUARTER 3 (ANNUAL) 2020
COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03

Prepared by:

Mr. Donal Marron
Environmental Consultant

Signed: 

BNM File Ref:

Quarter 3 (Annual) Surface Water 2020

Monitoring Date (Annual):

28th September 2019

Report Date:

19th October 2020

Marron Environmental

60 Seapoint
Dunbur Road,
Wicklow,
Co. Wicklow

EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4) during Quarter 3 and these were analysed for weekly parameters and once during the quarter for quarterly and annual parameters. Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surface Water:

Quarterly and Annual sampling was carried out on 28/09/20 (wk 39) during Quarter 3.

There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at SW-6 during Quarter 3. SW-6 is the outfall from the Integrated Constructed Wetland and is the licenced discharge location for the site.

SW5 is located at the outfall of the old Bord na Mona Bogs works sedimentation ponds which is situated at the headwaters of the Cushaling river, 1km downstream and southwest of SW6. There were no exceedances of the ELV for Ammonia (0.5mg/l), Suspended Solids (35mg/l) and BOD (25mg/l) at this location during Quarter 3.

SW4 is situated at Dillon's Bridge on the Cushaling River, 2.25km downstream of SW5. No exceedances of any parameters were recorded at this location during Quarter 3.

1.0 **SURFACE WATER**

1.1 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

Quarter 3 2020															
SW6															
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.7	7.8	7.5	7.8	7.6	7.6	7.7	7.8	8.0	7.9	7.9	7.8	7.9
Conductivity	µS/cm	-	438	473	491	494	478	509	543	549	567	596	559	547	528
BOD	mg/l	25 mg/l													1
Chloride	mg/l	-	22.1	18.3	21.2	20.4	17.3	17.3	18.9	18.3	20.1	17.9	16.1	17	16
COD	mg/l	-													19
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH4)	mg/l	0.5 mg/l	<0.03	0.04	0.04	0.04	0.06	0.03	0.05	0.13	0.08	0.10	0.04	0.13	0.15

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

Quarter 3 2020															
SW5															
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.4	7.6	7.6	7.6	7.4	7.5	7.4	7.5	7.5	7.5	7.5	7.6	7.6
Conductivity	µS/cm	-	410	484	457	453	492	511	428	475	504	493	530	542	531
BOD	mg/l	25 mg/l													2
Chloride	mg/l	-	20.6	19.9	19	22.6	19.8	20	18.1	18.9	20	18.7	18.9	19.2	18.7
COD	mg/l	-													50
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	6.4	5.2	<5	<5	<5	<5	5.6
Ammonia (as NH4)	mg/l	0.5 mg/l	0.15	0.13	0.09	0.33	0.10	0.10	0.22	0.18	0.17	0.15	0.14	0.14	0.18

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 3 2020													
Parameter	Units	Emission Limit	wk27	wk28	wk29	wk30	wk31	wk32	wk33	wk34	wk35	wk36	wk37	wk38	wk39
pH	pH Units	-	7.7	7.8	7.8	7.7	7.7	7.7	7.6	7.5	7.6	7.7	7.8	7.7	7.9
Conductivity	µS/cm	-	440	464	470	433	486	499	471	519	527	541	551	558	552
BOD	mg/l	25 mg/l													2
Chloride	mg/l	-	18.2	18	17.8	20	18.1	17.9	14.9	15	17.3	16.4	17.1	18.2	17.1
COD	mg/l	-													46
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	<5	<5	<5	5.2	7.6	<5	<5	<5	<5	<5
Ammonia (as NH4)	mg/l	0.5 mg/l	0.09	0.05	0.05	0.06	0.09	0.05	0.08	0.15	0.06	0.08	0.06	0.05	0.17

Table 2.2(A): Results of Annual Parameter Analysis at SW4, SW5 & SW6					
Client ID	N/A	SW-4	SW-5	SW-6	Emission Limit Value
Sampling Date	N/A	28/09/20	28/09/20	28/09/20	
Sample Type	N/A	Surface Water	Surface Water	Surface Water	
Ortho-Phosphate as P	mg/l	<0.03	<0.03	<0.03	-
Total Phosphorous	mg/l	0.05	0.05	<0.05	-
N03-N	mg/l	9.8	<4	<4	-
Sulphate	mg/l	27.5	40.1	43	-
Sodium (total)	mg/l	10	11	14	-
Magnesium(total)	mg/l	8	7	8	-
Potassium (total)	mg/l	2	1	1	-
Calcium (total)	mg/l	127	112	113	-
Boron (total)	µg/l	<10	10	20	-
Chromium (total)	µg/l	<1	2	1	-
Manganese (total)	µg/l	<2	28	<2	-
Nickel (total)	µg/l	<1	3	2	-
Copper (total)	µg/l	<1	2	2	-
Zinc (total)	µg/l	3	4	3	-
Cadmium (total)	µg/l	0.09	<0.02	<0.02	-
Lead (total)	µg/l	<1	<1	<1	-
Iron (total)	mg/l	0.18	0.38	0.01	-
Mercury (total)	µg/l	<0.03	<0.03	<0.03	-
Coliforms	Cfu/100ml	>100	11	24	-
E.Coli	Cfu/100ml	>100	3	27	-

Table 2.2 (B): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6

		Units	SW4	SW5	SW6	
SVOC's	1,2,4-Trichlorobenzene**	µg/l	<25	<25	<25	-
	1,2-Dichlorobenzene**	µg/l	<25	<25	<25	-
	1,3-Dichlorobenzene**	µg/l	<25	<25	<25	-
	1,4-Dichlorobenzene**	µg/l	<25	<25	<25	-
	2,4,5-Trichlorophenol**	µg/l	<100	<100	<100	-
	2,4,6-Trichlorophenol**	µg/l	<100	<100	<100	-
	2,4-Dichlorophenol**	µg/l	<100	<100	<100	-
	2,4-Dimethylphenol**	µg/l	<100	<100	<100	-
	2,4-Dinitrophenol	µg/l	<50	<50	<50	-
	2,4-Dinitrotoluene**	µg/l	<25	<25	<25	-
	2,6-Dinitrotoluene**	µg/l	<25	<25	<25	-
	2-Chloronaphthalene**	µg/l	<100	<100	<100	-
	2-Chlorophenol**	µg/l	<100	<100	<100	-
	2-Methylnaphthalene**	µg/l	<10	<10	<10	-
	2-Methylphenol**	µg/l	<25	<25	<25	-
	2-Nitroaniline**	µg/l	<25	<25	<25	-
	2-Nitrophenol**	µg/l	<100	<100	<100	-
	3-Nitroaniline**	µg/l	<25	<25	<25	-
	4-Bromophenylphenylether**	µg/l	<25	<25	<25	-
	4-Chloro-3-methylphenol**	µg/l	<25	<25	<25	-
	4-Chloroaniline**	µg/l	<25	<25	<25	-
	4-Chlorophenylphenylether**	µg/l	<25	<25	<25	-
	3 & 4-Methylphenol**	µg/l	<100	<100	<100	-
	4-Nitrophenol**	µg/l	<250	<250	<250	-
	4-Nitroaniline**	µg/l	<25	<25	<25	-
	Azobenzene**	µg/l	<50	<50	<50	-
	Acenaphthylene**	µg/l	<10	<10	<10	-
	Acenaphthene**	µg/l	<10	<10	<10	-
	Anthracene**	µg/l	<10	<10	<10	-
	Bis(2-Chloroethyl)ether**	µg/l	<25	<25	<25	-
	Bis(2-chloroethoxy)methane**	µg/l	<25	<25	<25	-
	Bis(2-ethylhexyl)phthalate**	µg/l	<25	<25	<25	-
	Benzo(a)anthracene**	µg/l	<10	<10	<10	-
	Butylbenzylphthalate**	µg/l	<25	<25	<25	-
	Benzo(a)pyrene**	µg/l	<10	<10	<10	-
	Benzo(ghi)perylene**	µg/l	<10	<10	<10	-
	Carbazole**	µg/l	<50	<50	<50	-
	Chrysene**	µg/l	<10	<10	<10	-
	Dibenzofuran**	µg/l	<25	<25	<25	-
	n-Di-butylphthalate**	µg/l	<25	<25	<25	-
	Diethyl phthalate**	µg/l	<25	<25	<25	-
	Dibenzo(a,h)anthracene**	µg/l	<10	<10	<10	-
	Dimethyl phthalate**	µg/l	<25	<25	<25	-
n-Di octyl phthalate**	µg/l	<10	<10	<10	-	
Fluoranthene**	µg/l	<10	<10	<10	-	
Flourene**	µg/l	<10	<10	<10	-	
Hexachlorobenzene**	µg/l	<25	<25	<25	-	
hexachlorobutadiene**	µg/l	<25	<25	<25	-	
Pentachlorophenol**	µg/l	<250	<250	<250	-	
Phenol**	µg/l	<100	<100	<100	-	
N-nitrosodi-n-propylamine**	µg/l	<25	<25	<25	-	
Hexachloroethane**	µg/l	<25	<25	<25	-	
Nitrobenzene**	µg/l	<25	<25	<25	-	
Naphthalene**	µg/l	<10	<10	<10	-	
Isophorone**	µg/l	<25	<25	<25	-	
Hexachlorocyclopentadiene**	µg/l	<25	<25	<25	-	
Phenanthrene**	µg/l	<10	<10	<10	-	
Indenol(1,2,3-cd)pyrene**	µg/l	<10	<10	<10	-	
Pyrene**	µg/l	<10	<10	<10	-	
VOC's	All VOCs as Per USEPA List**	µg/l	<5	<5	<5	-

The daily on site reading at the outlet from the sedimentation lagoons for Quarter 3 are detailed in Table 2.3 A, B and C below.

Table 2.3A July 2020

Date	Visual Inspection/Odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/07/2020	Clear, no odour*	3.53	8.5	319
02/07/2020	Clear, no odour*	3.74	8.4	401
03/07/2020	Clear, no odour*	3.77	7.4	435
04/07/2020	Clear, no odour*	3.73	8.1	396
05/07/2020	Clear, no odour*	3.68	7.7	391
06/07/2020	Clear, no odour*	3.64	7.8	399
07/07/2020	Clear, no odour*	3.64	8.9	398
08/07/2020	Clear, no odour*	3.81	7.1	539
09/07/2020	Clear, no odour*	3.82	7.1	543
10/07/2020	Clear, no odour*	3.80	8.9	433
11/07/2020	Clear, no odour*	3.74	9.4	440
12/07/2020	Clear, no odour*	3.69	9.5	512
13/07/2020	Clear, no odour*	3.63	9.2	464
14/07/2020	Clear, no odour*	3.68	9.9	468
15/07/2020	Clear, no odour*	3.63	8.7	463
16/07/2020	Clear, no odour*	3.58	9.3	468
17/07/2020	Clear, no odour*	3.55	10.0	459
18/07/2020	Clear, no odour*	3.53	10.0	461
19/07/2020	Clear, no odour*	3.51	9.6	453
20/07/2020	Clear, no odour*	3.50	10.9	424
21/07/2020	Clear, no odour*	3.50	10.4	448
22/07/2020	Clear, no odour*	3.50	10.0	449
23/07/2020	Clear, no odour*	3.50	9.2	447
24/07/2020	Clear, no odour*	3.50	10.4	430
25/07/2020	Clear, no odour*	3.52	8.5	431
26/07/2020	Clear, no odour*	3.54	8.0	416
27/07/2020	Clear, no odour*	3.55	7.6	406
28/07/2020	Clear, no odour*	3.66	7.6	422
29/07/2020	Clear, no odour*	3.63	8	422
30/07/2020	Clear, no odour*	3.65	6.2	490
31/07/2020	Clear, no odour*	3.67	6.9	424

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3B August 2020

Date	Visual Inspection/Odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/08/2020	Clear, no odour*	3.69	8.8	487
02/08/2020	Clear, no odour*	3.69	6.1	508
03/08/2020	Clear, no odour*	3.71	7.2	496
04/08/2020	Clear, no odour*	3.72	6	519
05/08/2020	Clear, no odour*	3.64	6.1	445
06/08/2020	Clear, no odour*	3.62	6.5	437
07/08/2020	Clear, no odour*	3.58	6	446
08/08/2020	Clear, no odour*	3.57	6.7	439
09/08/2020	Clear, no odour*	3.56	7.3	427
10/08/2020	Clear, no odour*	3.55	6.5	433
11/08/2020	Clear, no odour*	3.58	6.1	453
12/08/2020	Clear, no odour*	3.55	7	445
13/08/2020	Clear, no odour*	3.55	6.4	450
14/08/2020	Clear, no odour*	3.55	6.3	460
15/08/2020	Clear, no odour*	3.53	6	458
16/08/2020	Clear, no odour*	3.51	6.1	469
17/08/2020	Clear, no odour*	3.49	5.8	474
18/08/2020	Clear, no odour*	3.76	5.5	529
19/08/2020	Clear, no odour*	3.78	5.5	534
20/08/2020	Clear, no odour*	3.80	4.8	552
21/08/2020	Clear, no odour*	3.80	4.9	527
22/08/2020	Clear, no odour*	3.75	5.3	549
23/08/2020	Clear, no odour*	3.70	5.4	489
24/08/2020	Clear, no odour*	3.66	6.1	499
25/08/2020	Clear, no odour*	3.76	5.9	529
26/08/2020	Clear, no odour*	4.09	5.6	583
27/08/2020	Clear, no odour*	3.96	6.0	557
28/08/2020	Clear, no odour*	3.90	5.8	550
29/08/2020	Clear, no odour*	3.83	6.4	503
30/08/2020	Clear, no odour*	3.75	6.6	500
31/08/2020	Clear, no odour*	3.63	7.5	514

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3C September 2020

Date	Visual Inspection/Odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/09/2020	Clear, no odour*	3.56	7.1	502
02/09/2020	Clear, no odour*	3.56	6.7	505
03/09/2020	Clear, no odour*	3.73	6.1	548
04/09/2020	Clear, no odour*	3.62	6.9	502
05/09/2020	Clear, no odour*	3.60	6.3	502
06/09/2020	Clear, no odour*	3.57	5.6	518
07/09/2020	Clear, no odour*	3.54	6.1	500
08/09/2020	Clear, no odour*	3.63	8.1	528
09/09/2020	Clear, no odour*	3.56	8.0	510
10/09/2020	Clear, no odour*	3.51	8.0	510
11/09/2020	Clear, no odour*	3.49	8.0	502
12/09/2020	Clear, no odour*	3.46	8.1	505
13/09/2020	Clear, no odour*	3.44	8.1	499
14/09/2020	Clear, no odour*	3.42	8.1	509
15/09/2020	Clear, no odour*	3.43	8.1	513
16/09/2020	Clear, no odour*	3.43	8.0	511
17/09/2020	Clear, no odour*	3.41	8.0	519
18/09/2020	Clear, no odour*	3.42	8.0	523
19/09/2020	Clear, no odour*	3.41	8.0	527
20/09/2020	Clear, no odour*	3.39	8.1	516
21/09/2020	Clear, no odour*	3.38	8.1	516
22/09/2020	Clear, no odour*	3.40	8.1	519
23/09/2020	Clear, no odour*	3.40	8.0	528
24/09/2020	Clear, no odour*	3.39	8.0	513
25/09/2020	Clear, no odour*	3.40	8.0	515
26/09/2020	Clear, no odour*	3.41	8.0	506
27/09/2020	Clear, no odour*	3.39	8.1	509
28/09/2020	Clear, no odour*	3.38	8.0	505
29/09/2020	Clear, no odour*	3.38	8.0	503
30/09/2020	Clear, no odour*	3.40	8.1	501

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the third quarter of 2020. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters, once during the quarter for quarterly parameters and once during the quarter for annual parameters. BOD, Ammonia and Suspended Solids levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 1 to Figure 3.

No exceedances were noted for Suspended Solids, Ammonia and BOD during Quarter 3 at monitoring locations SW-4, SW-5 and SW-6 with all remaining parameters in line with that previously detected.

The annual parameters were analysed on samples submitted on the 28th September 2020. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations.

The metals results showed some minor fluctuations since the previous monitoring event but remain in trend with previous results.

Figures 1 to 3 below graphically display the Ammonia, BOD and Suspended Solids results obtained in the first three quarters of 2020.

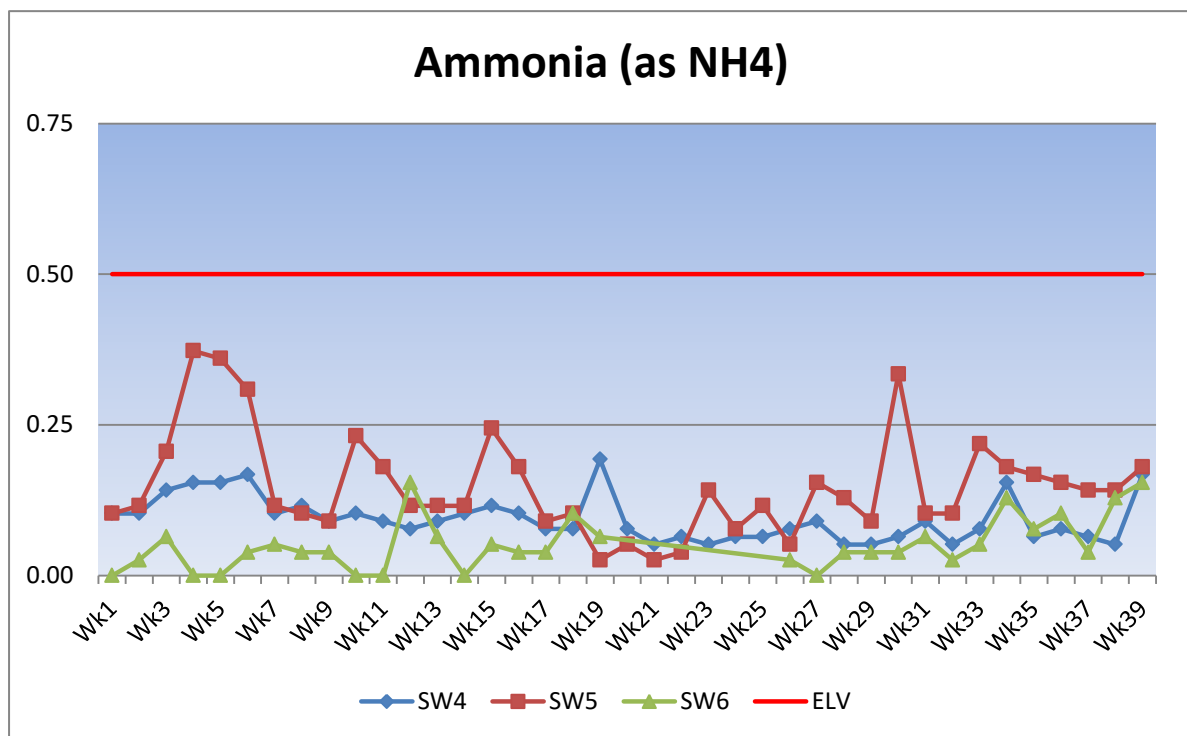


Figure 1

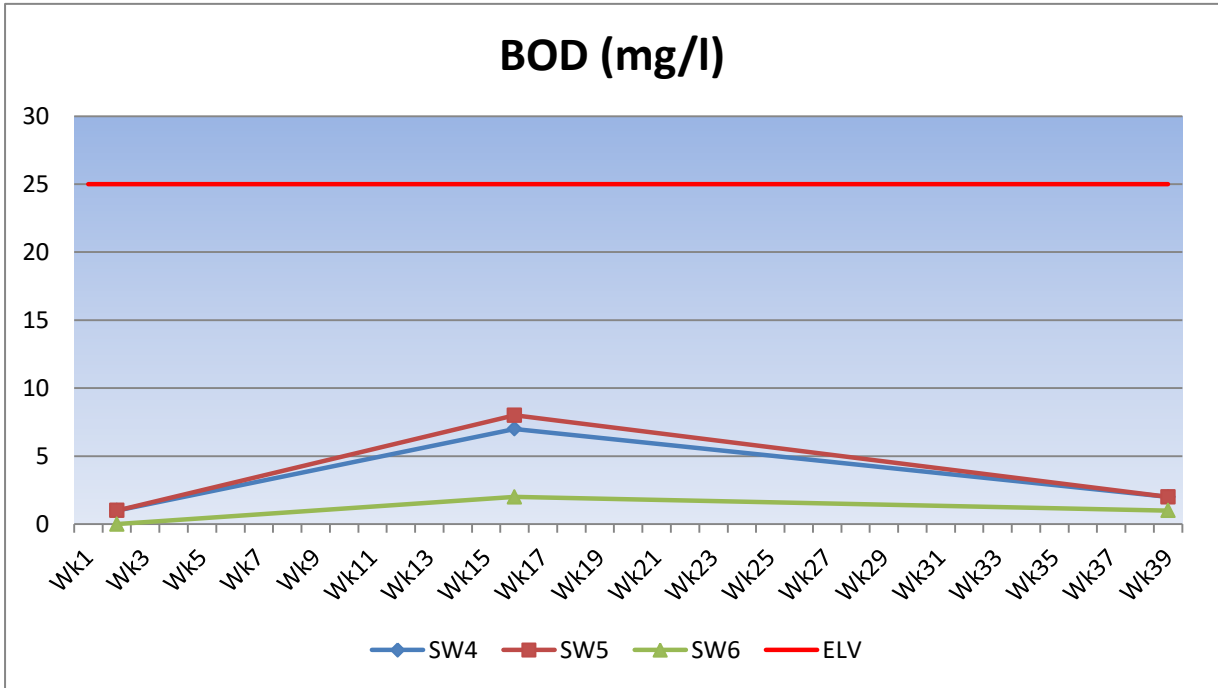


Figure 2

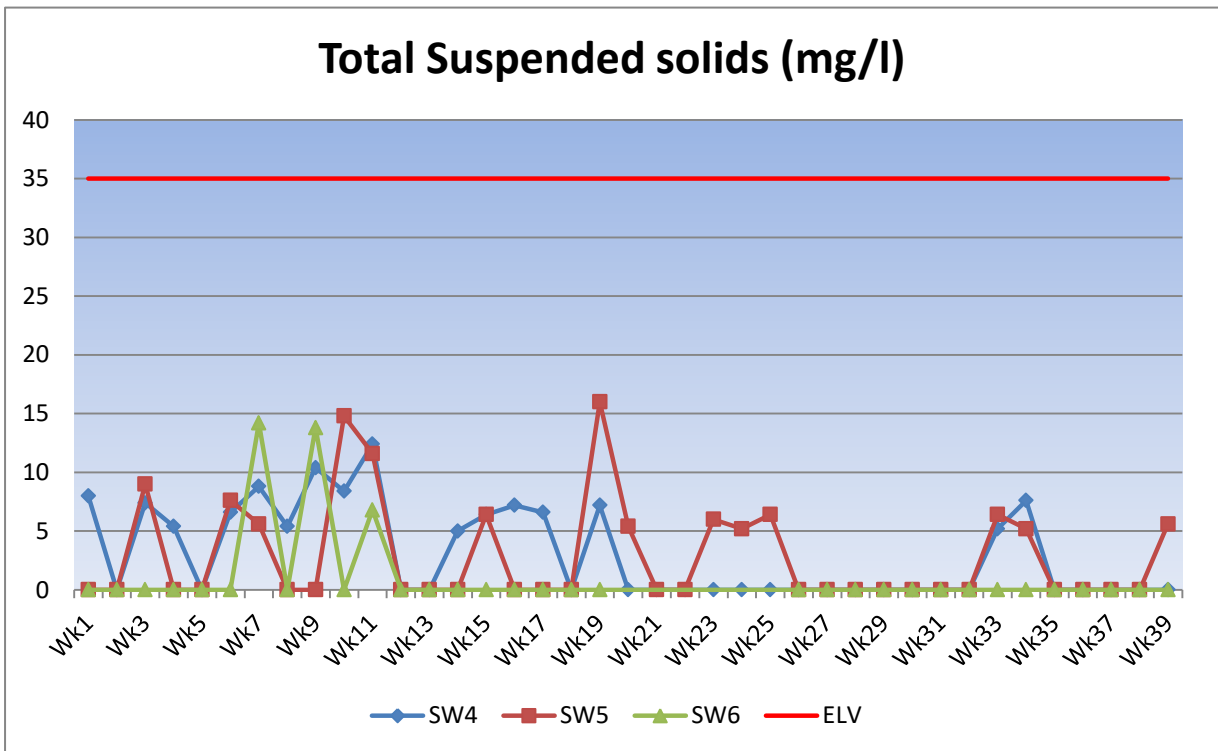
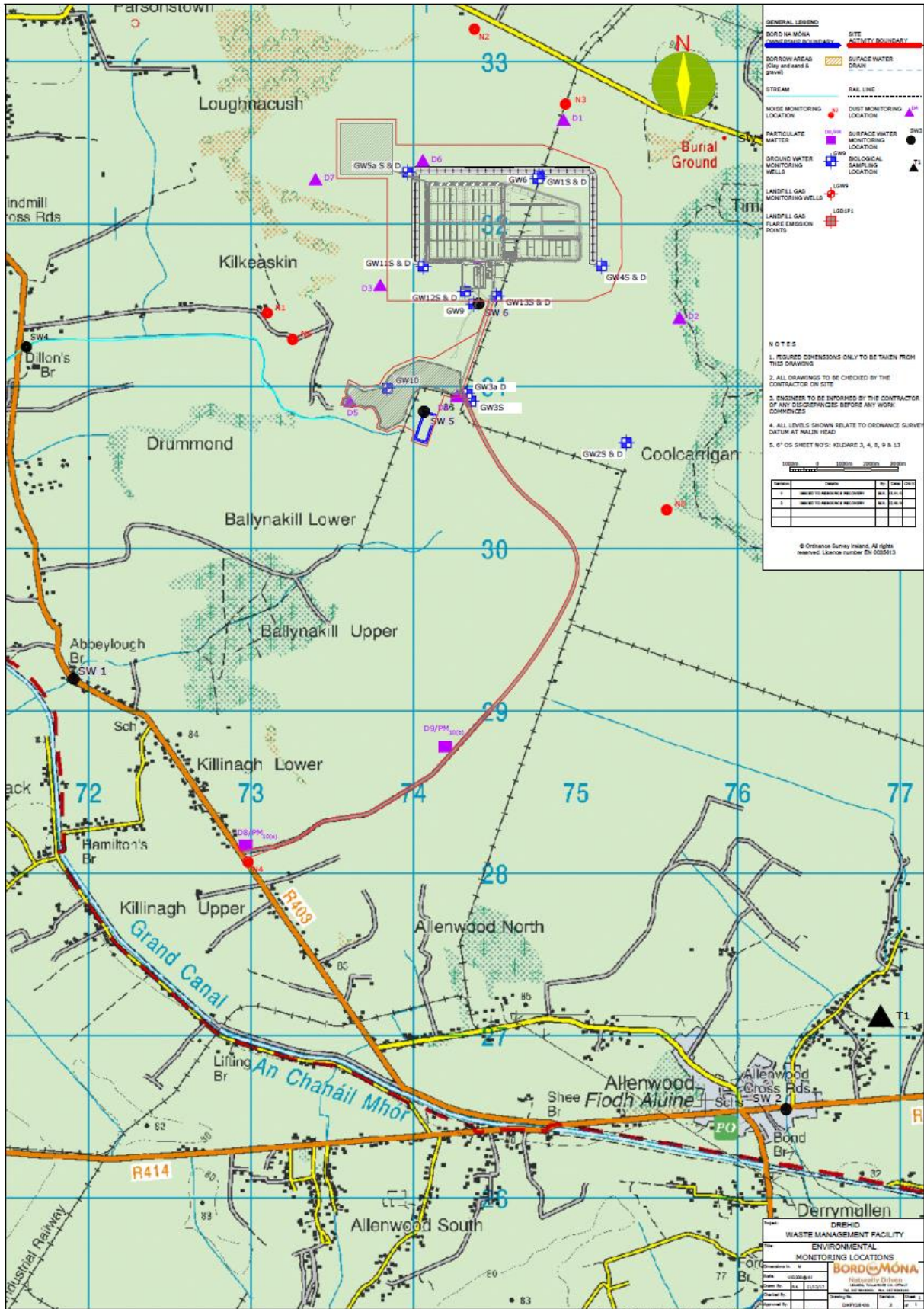


Figure 3

APPENDIX I

Monitoring Locations





Report Status: **Final Report**
 Date of Issue: **09-Oct-2020**
 Report Number: **980090**
 Project: **1-200928-18277**
 Page 1 of 2

Attention:
 Client: **BNM Drehid**
 Address: Main Street
 Newbridge
 Co. Kildare

Order Number: 3068395

Disclaimer

Results in this report relate only to the items tested.
 Reports may not be reproduced in full without the approval of **Advanced Laboratory Testing**.
 Results reported as cfu/cm² are calculated based on information supplied by the relevant customer regarding the specific area swabbed.
 * beside the method or lack of INAB symbol signifies that **Advanced Laboratory Testing** are not INAB accredited for this method.
 Samples are retained post analysis for a period of 10 days. Samples are stored frozen by default except in the case of M&S requirements.
 Unless otherwise stated as a Test Certificate comment, samples were received in a satisfactory condition.

ALT ID: 2440113 **Date Received:** 28/09/2020 **Date Tested:** 29/09/2020
INAB P9 Classification: Other waters
Client ID: SW4

Test	Result	Unit(s)	Method	Technique
Ammonia	0.13	mg/l NH3-N	ECTM001B	GALLERY AUTOANALYSER
Chloride	17.1	mg/l Cl	ECTM001C	GALLERY AUTOANALYSER
Nitrate	9.8	mg/l NO3	ECTM001	GALLERY AUTOANALYSER
Sulphate	27.5	mg/L SO4	ECTM001G	GALLERY AUTOANALYSER
Orthophosphate	<0.03	mg/L P	ECTM001F	GALLERY AUTOANALYSER
Conductivity	552	uS/cm @20 °C	ECTM002	Method 2510, 22nd Edition, APHA, 2012
Suspended Solids	<5	mg/L	ECTM003	Method 2540, 22nd Edition, APHA, 2012
BOD with ATU	2	mg/L O2	ECTM004	HACH (LDO®)
COD	46	mg/L O2	ECTM005	APHA, Method 5220 -D, 22nd Edition, 2012
pH	7.9		ECTM007	PH USING ORION STAR A 211
Total Phosphorous	0.05	mg/L P	ECTM008	HACH Method 8190

The results in this report were authorised by:

Authorized Signatory **Title**
 Denis Kent **Technical Manager - Chemistry**

**ENVIRONMENTAL CHEMISTRY TEST CERTIFICATE**

Report Status: **Final Report**
 Date of Issue: **09-Oct-2020**
 Report Number: **980090**
 Project: **1-200928-18277**
 Page 2 of 2

Client: **BNM Drehid**
 Order Number: 3068395

ALT ID: 2440114 **Date Received:** 28/09/2020 **Date Tested:** 29/09/2020

INAB P9 Classification: Other waters
Client ID: SW5

Test	Result	Unit(s)	Method	Technique
Ammonia	0.14	mg/l NH3-N	ECTM001B	GALLERY AUTOANALYSER
Chloride	18.7	mg/l Cl	ECTM001C	GALLERY AUTOANALYSER
Nitrate	<4	mg/l NO3	ECTM001	GALLERY AUTOANALYSER
Sulphate	40.1	mg/L SO4	ECTM001G	GALLERY AUTOANALYSER
Orthophosphate	<0.03	mg/L P	ECTM001F	GALLERY AUTOANALYSER
Conductivity	531	uS/cm @20 °C	ECTM002	Method 2510, 22nd Edition, APHA, 2012
Suspended Solids	5.6	mg/L	ECTM003	Method 2540, 22nd Edition, APHA, 2012
BOD with ATU	2	mg/L O2	ECTM004	HACH (LDO®)
COD	50	mg/L O2	ECTM005	APHA, Method 5220 -D, 22nd Edition, 2012
pH	7.6		ECTM007	PH USING ORION STAR A 211
Total Phosphorous	0.05	mg/L P	ECTM008	HACH Method 8190

ALT ID: 2440115 **Date Received:** 28/09/2020 **Date Tested:** 29/09/2020

INAB P9 Classification: Other waters
Client ID: SW6

Test	Result	Unit(s)	Method	Technique
Ammonia	0.12	mg/l NH3-N	ECTM001B	GALLERY AUTOANALYSER
Chloride	16.3	mg/l Cl	ECTM001C	GALLERY AUTOANALYSER
Nitrate	<4	mg/l NO3	ECTM001	GALLERY AUTOANALYSER
Sulphate	43.0	mg/L SO4	ECTM001G	GALLERY AUTOANALYSER
Orthophosphate	<0.03	mg/L P	ECTM001F	GALLERY AUTOANALYSER
Conductivity	528	uS/cm @20 °C	ECTM002	Method 2510, 22nd Edition, APHA, 2012
Suspended Solids	<5	mg/L	ECTM003	Method 2540, 22nd Edition, APHA, 2012
BOD with ATU	1	mg/L O2	ECTM004	HACH (LDO®)
COD	19	mg/L O2	ECTM005	APHA, Method 5220 -D, 22nd Edition, 2012
pH	7.9		ECTM007	PH USING ORION STAR A 211
Total Phosphorous	<0.05	mg/L P	ECTM008	HACH Method 8190

The results in this report were authorised by:

Authorized Signatory **Title**
 Denis Kent **Technical Manager - Chemistry**



SOCOTEC

Environmental Chemistry
SOCOTEC UK
Ashby Rd, Bretby,
Burton-on-Trent, UK
DE15 0YZ

Certificate of Analysis

Project No: 20092034

Client: Advanced Laboratory Testing
Ltd (ALT)

Quote Number: BEC200911822

Project Reference: Water Analysis

Site Name: Water Analysis

Contact: Michael Kennedy

Address: Boxer House
Unit 4
Newbridge Industrial Estate
Newbridge

Post Code: Co. Kildar

E-Mail: michaelkennedy@altesting.ie

Phone No: (086) 384 4846

Number of Samples Received: 1

Date Received: 30/09/2020

Analysis Date: 07/10/2020

Date Issued: 07/10/2020

Job Status: Complete

Report Type: Final Version 01

This report supersedes any versions previously issued by the laboratory

Account Manager
Laura Moore

Authorised by the Operations Manager
Becky Batham



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Samples Analysed

<u>Sample Reference</u>	<u>Text ID</u>	<u>Sample Date</u>	<u>Sample Type</u>	<u>Sample Description</u>
2440135 SW4	20092034-001		WATER	Unclassified Liquid



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U	0.003*
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U	0.00009*
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Cobalt as Co	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Manganese as Mn	ICPMSW (Dissolved)	0.002	mg/l	U	<0.002*
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U	<0.00003*
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U	0.004*
Silver as Ag	ICPMSSQ (Dissolved)	0.002	mg/l	N	<0.002
Tin as Sn	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U	0.003*
Aluminium as Al	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.01*
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.08*
Beryllium as Be	ICPWATVAR (Dissolved)	0.01	mg/l	N	<0.01
Boron as B	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.01*
Calcium as Ca	ICPWATVAR (Dissolved)	1	mg/l	U	127*
Iron as Fe	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.18*
Magnesium as Mg	ICPWATVAR (Dissolved)	1	mg/l	U	8*
Potassium as K	ICPWATVAR (Dissolved)	1	mg/l	U	2*
Sodium as Na	ICPWATVAR (Dissolved)	1	mg/l	U	10*
1,2,4-Trichlorobenzene	SVOCSW	0.005	mg/l	N	<0.025
1,2-Dichlorobenzene	SVOCSW	0.005	mg/l	N	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
1,3-Dichlorobenzene	SVOC SW	0.005	mg/l	N	<0.025
1,4-Dichlorobenzene	SVOC SW	0.005	mg/l	N	<0.025
1-Methylnaphthalene	SVOC SW	0.002	mg/l	N	<0.010
2,4,5-Trichlorophenol	SVOC SW	0.02	mg/l	N	<0.100
2,4,6-Trichlorophenol	SVOC SW	0.02	mg/l	N	<0.100
2,4-Dichlorophenol	SVOC SW	0.02	mg/l	N	<0.100
2,4-Dimethylphenol	SVOC SW	0.02	mg/l	N	<0.100
2,4-Dinitrophenol	SVOC SW	0.01	mg/l	N	<0.050
2,4-Dinitrotoluene	SVOC SW	0.005	mg/l	N	<0.025
2,6-Dinitrotoluene	SVOC SW	0.005	mg/l	N	<0.025
2-Chloronaphthalene	SVOC SW	0.002	mg/l	N	<0.010
2-Chlorophenol	SVOC SW	0.02	mg/l	N	<0.100
2-Methylnaphthalene	SVOC SW	0.002	mg/l	N	<0.010
2-Methylphenol	SVOC SW	0.005	mg/l	N	<0.025
2-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025
2-Nitrophenol	SVOC SW	0.02	mg/l	N	<0.100
3- & 4-Methylphenol	SVOC SW	0.02	mg/l	N	<0.100
3-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025
4,6-Dinitro-2-methylphenol	SVOC SW	0.05	mg/l	N	<0.250
4-Bromophenyl-phenylether	SVOC SW	0.005	mg/l	N	<0.025
4-Chloro-3-methylphenol	SVOC SW	0.005	mg/l	N	<0.025
4-Chloroaniline	SVOC SW	0.005	mg/l	N	<0.025
4-Chlorophenol	SVOC SW	0.02	mg/l	N	<0.100
4-Chlorophenyl-phenylether	SVOC SW	0.005	mg/l	N	<0.025
4-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
4-Nitrophenol	SVOC SW	0.05	mg/l	N	<0.250
Acenaphthene	SVOC SW	0.002	mg/l	N	<0.010
Acenaphthylene	SVOC SW	0.002	mg/l	N	<0.010
Anthracene	SVOC SW	0.002	mg/l	N	<0.010
Azobenzene	SVOC SW	0.01	mg/l	N	<0.050
Benzo[a]anthracene	SVOC SW	0.002	mg/l	N	<0.010
Benzo[a]pyrene	SVOC SW	0.002	mg/l	N	<0.010
Benzo[b]fluoranthene	SVOC SW	0.002	mg/l	N	<0.010
Benzo[g,h,i]perylene	SVOC SW	0.002	mg/l	N	<0.010
Benzo[k]fluoranthene	SVOC SW	0.002	mg/l	N	<0.010
Benzoic Acid	SVOC SW	0.1	mg/l	N	<0.500
Benzyl alcohol	SVOC SW	0.005	mg/l	N	<0.025
Biphenyl	SVOC SW	0.002	mg/l	N	<0.010
bis(2-Chloroethoxy)methane	SVOC SW	0.005	mg/l	N	<0.025
bis(2-Chloroethyl)ether	SVOC SW	0.005	mg/l	N	<0.025
bis(2-Chloroisopropyl)ether	SVOC SW	0.005	mg/l	N	<0.025
bis(2-Ethylhexyl)phthalate	SVOC SW	0.005	mg/l	N	<0.025
Butylbenzylphthalate	SVOC SW	0.005	mg/l	N	<0.025
Carbazole	SVOC SW	0.01	mg/l	N	<0.050
Chrysene	SVOC SW	0.002	mg/l	N	<0.010
Coronene	SVOC SW	0.05	mg/l	N	<0.250
Dibenzo[a,h]anthracene	SVOC SW	0.002	mg/l	N	<0.010
Dibenzofuran	SVOC SW	0.005	mg/l	N	<0.025
Diethylphthalate	SVOC SW	0.005	mg/l	N	<0.025
Dimethylphthalate	SVOC SW	0.005	mg/l	N	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
Di-n-butylphthalate	SVOC SW	0.005	mg/l	N	<0.025
Di-n-octylphthalate	SVOC SW	0.002	mg/l	N	<0.010
Diphenyl ether	SVOC SW	0.002	mg/l	N	<0.010
Fluoranthene	SVOC SW	0.002	mg/l	N	<0.010
Fluorene	SVOC SW	0.002	mg/l	N	<0.010
Hexachlorobenzene	SVOC SW	0.005	mg/l	N	<0.025
Hexachlorobutadiene	SVOC SW	0.005	mg/l	N	<0.025
Hexachlorocyclopentadiene	SVOC SW	0.005	mg/l	N	<0.025
Hexachloroethane	SVOC SW	0.005	mg/l	N	<0.025
Indeno[1,2,3-cd]pyrene	SVOC SW	0.002	mg/l	N	<0.010
Isophorone	SVOC SW	0.005	mg/l	N	<0.025
Naphthalene	SVOC SW	0.002	mg/l	N	<0.010
Nitrobenzene	SVOC SW	0.005	mg/l	N	<0.025
N-Nitroso-di-n-propylamine	SVOC SW	0.005	mg/l	N	<0.025
N-Nitrosodiphenylamine	SVOC SW	0.005	mg/l	N	<0.025
Pentachlorophenol	SVOC SW	0.05	mg/l	N	<0.250
Phenanthrene	SVOC SW	0.002	mg/l	N	<0.010
Phenol	SVOC SW	0.02	mg/l	N	<0.100
Pyrene	SVOC SW	0.002	mg/l	N	<0.010
1,1,1,2-Tetrachloroethane	VOCHSAW	1	µg/l	U	<1*
1,1,1-Trichloroethane	VOCHSAW	1	µg/l	U	<1*
1,1,2,2-Tetrachloroethane	VOCHSAW	1	µg/l	N	<1
1,1,2-Trichloroethane	VOCHSAW	1	µg/l	U	<1*
1,1-Dichloroethane	VOCHSAW	1	µg/l	U	<1*
1,1-Dichloroethene	VOCHSAW	1	µg/l	U	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
1,1-Dichloropropene	VOCHSAW	1	µg/l	U	<1*
1,2,3-Trichlorobenzene	VOCHSAW	5	µg/l	U	<5*
1,2,3-Trichloropropane	VOCHSAW	1	µg/l	U	<1*
1,2,4-Trichlorobenzene	VOCHSAW	5	µg/l	U	<5*
1,2,4-Trimethylbenzene	VOCHSAW	1	µg/l	U	<1*
1,2-Dibromo-3-chloropropane	VOCHSAW	5	µg/l	U	<5*
1,2-Dibromoethane	VOCHSAW	1	µg/l	U	<1*
1,2-Dichlorobenzene	VOCHSAW	5	µg/l	U	<5*
1,2-Dichloroethane	VOCHSAW	1	µg/l	U	<1*
1,2-Dichloropropane	VOCHSAW	1	µg/l	U	<1*
1,3,5-Trimethylbenzene	VOCHSAW	1	µg/l	U	<1*
1,3-Dichlorobenzene	VOCHSAW	1	µg/l	U	<1*
1,3-Dichloropropane	VOCHSAW	1	µg/l	N	<1
1,4-Dichlorobenzene	VOCHSAW	1	µg/l	U	<1*
2,2-Dichloropropane	VOCHSAW	1	µg/l	N	<1
2-Chlorotoluene	VOCHSAW	1	µg/l	U	<1*
4-Chlorotoluene	VOCHSAW	1	µg/l	U	<1*
Benzene	VOCHSAW	1	µg/l	U	<1*
Bromobenzene	VOCHSAW	1	µg/l	U	<1*
Bromochloromethane	VOCHSAW	1	µg/l	U	<1*
Bromodichloromethane	VOCHSAW	1	µg/l	U	<1*
Bromoform	VOCHSAW	1	µg/l	U	<1*
Bromomethane	VOCHSAW	5	µg/l	N	<5
Carbon Tetrachloride	VOCHSAW	1	µg/l	U	<1*
Chlorobenzene	VOCHSAW	1	µg/l	U	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
Chloroethane	VOCHSAW	5	µg/l	U	<5*
Chloroform	VOCHSAW	5	µg/l	U	<5*
Chloromethane	VOCHSAW	1	µg/l	U	<1*
cis 1,2-Dichloroethene	VOCHSAW	5	µg/l	U	<5*
cis 1,3-Dichloropropene	VOCHSAW	1	µg/l	N	<1
Dibromochloromethane	VOCHSAW	1	µg/l	U	<1*
Dibromomethane	VOCHSAW	1	µg/l	U	<1*
Dichlorodifluoromethane	VOCHSAW	1	µg/l	N	<1
Ethylbenzene	VOCHSAW	1	µg/l	U	<1*
Hexachlorobutadiene	VOCHSAW	5	µg/l	U	<5*
iso-Propylbenzene	VOCHSAW	1	µg/l	U	<1*
m and p-Xylene	VOCHSAW	1	µg/l	U	<1*
MTBE	VOCHSAW	1	µg/l	N	<1
Naphthalene	VOCHSAW	5	µg/l	U	<5*
n-Butylbenzene	VOCHSAW	1	µg/l	U	<1*
o-Xylene	VOCHSAW	1	µg/l	U	<1*
p-Isopropyltoluene	VOCHSAW	1	µg/l	U	<1*
Propylbenzene	VOCHSAW	1	µg/l	U	<1*
sec-Butylbenzene	VOCHSAW	1	µg/l	U	<1*
Styrene	VOCHSAW	1	µg/l	U	<1*
tert-Butylbenzene	VOCHSAW	1	µg/l	U	<1*
Tetrachloroethene	VOCHSAW	5	µg/l	U	<5*
Toluene	VOCHSAW	1	µg/l	U	<1*
trans 1,2-Dichloroethene	VOCHSAW	1	µg/l	U	<1*
trans 1,3-Dichloropropene	VOCHSAW	1	µg/l	U	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Analysis Results

Project ID	20092034
Sample ID	001
Customer ID	2440135 SW4
Sample Type	WATER
Sampling Date	

Analysis	Method Code	MDL	Units	Accred	
Trichloroethene	VOCHSAW	5	µg/l	U	<5*
Trichlorofluoromethane	VOCHSAW	1	µg/l	U	<1*
Vinyl Chloride	VOCHSAW	1	µg/l	U	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

<u>Deviating Sample Report</u>			Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time	Handling Time
Sample Reference	Text ID	Reported Name							
2440135 SW4	20092034-001	ICPMSSQ (Dissolved)					✓	✓	
2440135 SW4	20092034-001	ICPMSW (Dissolved)					✓	✓	
2440135 SW4	20092034-001	ICPWATVAR (Dissolved)					✓	✓	
2440135 SW4	20092034-001	SVOCSW					✓	✓	

Analysis Method

Analysis

ICPMSSQ (Dissolved)
 ICPMSW (Dissolved)
 ICPWATVAR (Dissolved)
 SVOCSW
 VOCHSAW

Analysis Type

METALS
 METALS
 METALS
 ORGANIC
 ORGANIC

Analysis Method

Unfiltered
 Unfiltered
 Unfiltered
 Unfiltered
 Unfiltered



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092034

Date Issued: 07/10/2020

Additional Information

This report refers to samples as received, and SOCOTEC Uk Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

In the accreditation column of analysis report the codes are as follows:

- U = UKAS accredited analysis
- M = MCERT accredited analysis
- N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 105° c

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full and with approval from the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

- IS = Insufficient Sample to complete analysis
- NA = Sample is not amenable for the required analysis
- ND = Results cannot be determined

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the Subcontracted lab for information regarding any deviancies for this analysis.

End of Certificate of Analysis



SOCOTEC

Environmental Chemistry
SOCOTEC UK
Ashby Rd, Bretby,
Burton-on-Trent, UK
DE15 0YZ

Certificate of Analysis

Project No: 20092036

Client: Advanced Laboratory Testing
Ltd (ALT)

Quote Number: BEC200911822

Project Reference: Water Analysis

Site Name: Water Analysis

Contact: Michael Kennedy

Address: Boxer House
Unit 4
Newbridge Industrial Estate
Newbridge

Post Code: Co. Kildar

E-Mail: michaelkennedy@altesting.ie

Phone No: (086) 384 4846

Number of Samples Received: 2

Date Received: 30/09/2020

Analysis Date: 07/10/2020

Date Issued: 07/10/2020

Job Status: Complete

Report Type: Final Version 01

This report supersedes any versions previously issued by the laboratory

Account Manager
Laura Moore

Authorised by the Operations Manager
Becky Batham



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Samples Analysed

<u>Sample Reference</u>	<u>Text ID</u>	<u>Sample Date</u>	<u>Sample Type</u>	<u>Sample Description</u>
2440136 SW5	20092036-001		WATER	Unclassified Liquid
2440137 SW6	20092036-002		WATER	Unclassified Liquid



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		

Analysis	Method Code	MDL	Units	Accred		
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*	<0.001*
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U	0.002*	0.002*
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U	<0.00002*	<0.00002*
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U	0.002*	0.001*
Cobalt as Co	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*	<0.001*
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U	0.002*	0.002*
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*	<0.001*
Manganese as Mn	ICPMSW (Dissolved)	0.002	mg/l	U	0.028*	<0.002*
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U	<0.00003*	<0.00003*
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U	0.003*	0.002*
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*	<0.001*
Silver as Ag	ICPMSSQ (Dissolved)	0.002	mg/l	N	<0.002	<0.002
Tin as Sn	ICPMSW (Dissolved)	0.001	mg/l	U	<0.001*	<0.001*
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U	0.004*	0.003*
Aluminium as Al	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.02*	0.01*
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.09*	0.13*
Beryllium as Be	ICPWATVAR (Dissolved)	0.01	mg/l	N	<0.01	<0.01
Boron as B	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.01*	0.02*
Calcium as Ca	ICPWATVAR (Dissolved)	1	mg/l	U	112*	113*
Iron as Fe	ICPWATVAR (Dissolved)	0.01	mg/l	U	0.38*	0.01*
Magnesium as Mg	ICPWATVAR (Dissolved)	1	mg/l	U	7*	8*
Potassium as K	ICPWATVAR (Dissolved)	1	mg/l	U	1*	1*
Sodium as Na	ICPWATVAR (Dissolved)	1	mg/l	U	11*	14*
1,2,4-Trichlorobenzene	SVOCSW	0.005	mg/l	N	<0.025	<0.025
1,2-Dichlorobenzene	SVOCSW	0.005	mg/l	N	<0.025	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		

Analysis	Method Code	MDL	Units	Accred		
1,3-Dichlorobenzene	SVOC SW	0.005	mg/l	N	<0.025	<0.025
1,4-Dichlorobenzene	SVOC SW	0.005	mg/l	N	<0.025	<0.025
1-Methylnaphthalene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
2,4,5-Trichlorophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
2,4,6-Trichlorophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
2,4-Dichlorophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
2,4-Dimethylphenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
2,4-Dinitrophenol	SVOC SW	0.01	mg/l	N	<0.050	<0.050
2,4-Dinitrotoluene	SVOC SW	0.005	mg/l	N	<0.025	<0.025
2,6-Dinitrotoluene	SVOC SW	0.005	mg/l	N	<0.025	<0.025
2-Chloronaphthalene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
2-Chlorophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
2-Methylnaphthalene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
2-Methylphenol	SVOC SW	0.005	mg/l	N	<0.025	<0.025
2-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025	<0.025
2-Nitrophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
3- & 4-Methylphenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
3-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025	<0.025
4,6-Dinitro-2-methylphenol	SVOC SW	0.05	mg/l	N	<0.250	<0.250
4-Bromophenyl-phenylether	SVOC SW	0.005	mg/l	N	<0.025	<0.025
4-Chloro-3-methylphenol	SVOC SW	0.005	mg/l	N	<0.025	<0.025
4-Chloroaniline	SVOC SW	0.005	mg/l	N	<0.025	<0.025
4-Chlorophenol	SVOC SW	0.02	mg/l	N	<0.100	<0.100
4-Chlorophenyl-phenylether	SVOC SW	0.005	mg/l	N	<0.025	<0.025
4-Nitroaniline	SVOC SW	0.005	mg/l	N	<0.025	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		

Analysis	Method Code	MDL	Units	Accred		
4-Nitrophenol	SVOC SW	0.05	mg/l	N	<0.250	<0.250
Acenaphthene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Acenaphthylene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Anthracene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Azobenzene	SVOC SW	0.01	mg/l	N	<0.050	<0.050
Benzo[a]anthracene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Benzo[a]pyrene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Benzo[b]fluoranthene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Benzo[g,h,i]perylene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Benzo[k]fluoranthene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Benzoic Acid	SVOC SW	0.1	mg/l	N	<0.500	<0.500
Benzyl alcohol	SVOC SW	0.005	mg/l	N	<0.025	<0.025
Biphenyl	SVOC SW	0.002	mg/l	N	<0.010	<0.010
bis(2-Chloroethoxy)methane	SVOC SW	0.005	mg/l	N	<0.025	<0.025
bis(2-Chloroethyl)ether	SVOC SW	0.005	mg/l	N	<0.025	<0.025
bis(2-Chloroisopropyl)ether	SVOC SW	0.005	mg/l	N	<0.025	<0.025
bis(2-Ethylhexyl)phthalate	SVOC SW	0.005	mg/l	N	<0.025	<0.025
Butylbenzylphthalate	SVOC SW	0.005	mg/l	N	<0.025	<0.025
Carbazole	SVOC SW	0.01	mg/l	N	<0.050	<0.050
Chrysene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Coronene	SVOC SW	0.05	mg/l	N	<0.250	<0.250
Dibenzo[a,h]anthracene	SVOC SW	0.002	mg/l	N	<0.010	<0.010
Dibenzofuran	SVOC SW	0.005	mg/l	N	<0.025	<0.025
Diethylphthalate	SVOC SW	0.005	mg/l	N	<0.025	<0.025
Dimethylphthalate	SVOC SW	0.005	mg/l	N	<0.025	<0.025



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		

Analysis	Method Code	MDL	Units	Accred		
Di-n-butylphthalate	SVOC	0.005	mg/l	N	<0.025	<0.025
Di-n-octylphthalate	SVOC	0.002	mg/l	N	<0.010	<0.010
Diphenyl ether	SVOC	0.002	mg/l	N	<0.010	<0.010
Fluoranthene	SVOC	0.002	mg/l	N	<0.010	<0.010
Fluorene	SVOC	0.002	mg/l	N	<0.010	<0.010
Hexachlorobenzene	SVOC	0.005	mg/l	N	<0.025	<0.025
Hexachlorobutadiene	SVOC	0.005	mg/l	N	<0.025	<0.025
Hexachlorocyclopentadiene	SVOC	0.005	mg/l	N	<0.025	<0.025
Hexachloroethane	SVOC	0.005	mg/l	N	<0.025	<0.025
Indeno[1,2,3-cd]pyrene	SVOC	0.002	mg/l	N	<0.010	<0.010
Isophorone	SVOC	0.005	mg/l	N	<0.025	<0.025
Naphthalene	SVOC	0.002	mg/l	N	<0.010	<0.010
Nitrobenzene	SVOC	0.005	mg/l	N	<0.025	<0.025
N-Nitroso-di-n-propylamine	SVOC	0.005	mg/l	N	<0.025	<0.025
N-Nitrosodiphenylamine	SVOC	0.005	mg/l	N	<0.025	<0.025
Pentachlorophenol	SVOC	0.05	mg/l	N	<0.250	<0.250
Phenanthrene	SVOC	0.002	mg/l	N	<0.010	<0.010
Phenol	SVOC	0.02	mg/l	N	<0.100	<0.100
Pyrene	SVOC	0.002	mg/l	N	<0.010	<0.010
1,1,1,2-Tetrachloroethane	VOCS	1	µg/l	U	<1*	<1*
1,1,1-Trichloroethane	VOCS	1	µg/l	U	<1*	<1*
1,1,2,2-Tetrachloroethane	VOCS	1	µg/l	N	<1	<1
1,1,2-Trichloroethane	VOCS	1	µg/l	U	<1*	<1*
1,1-Dichloroethane	VOCS	1	µg/l	U	<1*	<1*
1,1-Dichloroethene	VOCS	1	µg/l	U	<1*	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		

Analysis	Method Code	MDL	Units	Accred		
1,1-Dichloropropene	VOCHSAW	1	µg/l	U	<1*	<1*
1,2,3-Trichlorobenzene	VOCHSAW	5	µg/l	U	<5*	<5*
1,2,3-Trichloropropane	VOCHSAW	1	µg/l	U	<1*	<1*
1,2,4-Trichlorobenzene	VOCHSAW	5	µg/l	U	<5*	<5*
1,2,4-Trimethylbenzene	VOCHSAW	1	µg/l	U	<1*	<1*
1,2-Dibromo-3-chloropropane	VOCHSAW	5	µg/l	U	<5*	<5*
1,2-Dibromoethane	VOCHSAW	1	µg/l	U	<1*	<1*
1,2-Dichlorobenzene	VOCHSAW	5	µg/l	U	<5*	<5*
1,2-Dichloroethane	VOCHSAW	1	µg/l	U	<1*	<1*
1,2-Dichloropropane	VOCHSAW	1	µg/l	U	<1*	<1*
1,3,5-Trimethylbenzene	VOCHSAW	1	µg/l	U	<1*	<1*
1,3-Dichlorobenzene	VOCHSAW	1	µg/l	U	<1*	<1*
1,3-Dichloropropane	VOCHSAW	1	µg/l	N	<1	<1
1,4-Dichlorobenzene	VOCHSAW	1	µg/l	U	<1*	<1*
2,2-Dichloropropane	VOCHSAW	1	µg/l	N	<1	<1
2-Chlorotoluene	VOCHSAW	1	µg/l	U	<1*	<1*
4-Chlorotoluene	VOCHSAW	1	µg/l	U	<1*	<1*
Benzene	VOCHSAW	1	µg/l	U	<1*	<1*
Bromobenzene	VOCHSAW	1	µg/l	U	<1*	<1*
Bromochloromethane	VOCHSAW	1	µg/l	U	<1*	<1*
Bromodichloromethane	VOCHSAW	1	µg/l	U	<1*	<1*
Bromoform	VOCHSAW	1	µg/l	U	<1*	<1*
Bromomethane	VOCHSAW	5	µg/l	N	<5	<5
Carbon Tetrachloride	VOCHSAW	1	µg/l	U	<1*	<1*
Chlorobenzene	VOCHSAW	1	µg/l	U	<1*	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Analysis	Method Code	MDL	Units	Accred	Project ID		
					20092036		
					Sample ID	001	002
					Customer ID	2440136 SW5	2440137 SW6
					Sample Type	WATER	WATER
					Sampling Date		
Chloroethane	VOCHSAW	5	µg/l	U		<5*	<5*
Chloroform	VOCHSAW	5	µg/l	U		<5*	<5*
Chloromethane	VOCHSAW	1	µg/l	U		<1*	<1*
cis 1,2-Dichloroethene	VOCHSAW	5	µg/l	U		<5*	<5*
cis 1,3-Dichloropropene	VOCHSAW	1	µg/l	N		<1	<1
Dibromochloromethane	VOCHSAW	1	µg/l	U		<1*	<1*
Dibromomethane	VOCHSAW	1	µg/l	U		<1*	<1*
Dichlorodifluoromethane	VOCHSAW	1	µg/l	N		<1	<1
Ethylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
Hexachlorobutadiene	VOCHSAW	5	µg/l	U		<5*	<5*
iso-Propylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
m and p-Xylene	VOCHSAW	1	µg/l	U		<1*	<1*
MTBE	VOCHSAW	1	µg/l	N		<1	<1
Naphthalene	VOCHSAW	5	µg/l	U		<5*	<5*
n-Butylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
o-Xylene	VOCHSAW	1	µg/l	U		<1*	<1*
p-Isopropyltoluene	VOCHSAW	1	µg/l	U		<1*	<1*
Propylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
sec-Butylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
Styrene	VOCHSAW	1	µg/l	U		<1*	<1*
tert-Butylbenzene	VOCHSAW	1	µg/l	U		<1*	<1*
Tetrachloroethene	VOCHSAW	5	µg/l	U		<5*	<5*
Toluene	VOCHSAW	1	µg/l	U		<1*	<1*
trans 1,2-Dichloroethene	VOCHSAW	1	µg/l	U		<1*	<1*
trans 1,3-Dichloropropene	VOCHSAW	1	µg/l	U		<1*	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Analysis Results

Project ID	20092036	
Sample ID	001	002
Customer ID	2440136 SW5	2440137 SW6
Sample Type	WATER	WATER
Sampling Date		
Accred		

Analysis	Method Code	MDL	Units	Accred		
Trichloroethene	VOCHSAW	5	µg/l	U	<5*	<5*
Trichlorofluoromethane	VOCHSAW	1	µg/l	U	<1*	<1*
Vinyl Chloride	VOCHSAW	1	µg/l	U	<1*	<1*



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

<u>Deviating Sample Report</u>			Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time	Handling Time
Sample Reference	Text ID	Reported Name							
2440136 SW5	20092036-001	ICPMSSQ (Dissolved)					✓	✓	
2440136 SW5	20092036-001	ICPMSW (Dissolved)					✓	✓	
2440136 SW5	20092036-001	ICPWATVAR (Dissolved)					✓	✓	
2440136 SW5	20092036-001	SVOCSW					✓	✓	
2440136 SW5	20092036-001	VOCHSAW					✓	✓	
2440137 SW6	20092036-002	ICPMSSQ (Dissolved)					✓	✓	
2440137 SW6	20092036-002	ICPMSW (Dissolved)					✓	✓	
2440137 SW6	20092036-002	ICPWATVAR (Dissolved)					✓	✓	
2440137 SW6	20092036-002	SVOCSW					✓	✓	

Analysis Method

Analysis

ICPMSSQ (Dissolved)
 ICPMSW (Dissolved)
 ICPWATVAR (Dissolved)
 SVOCSW
 VOCHSAW

Analysis Type

METALS
 METALS
 METALS
 ORGANIC
 ORGANIC

Analysis Method

Unfiltered
 Unfiltered
 Unfiltered
 Unfiltered
 Unfiltered



Client: Advanced Laboratory Testing Ltd (ALT)

Project Name: Water Analysis

Project No: 20092036

Date Issued: 07/10/2020

Additional Information

This report refers to samples as received, and SOCOTEC Uk Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

In the accreditation column of analysis report the codes are as follows:

- U = UKAS accredited analysis
- M = MCERT accredited analysis
- N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 105° c

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full and with approval from the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

- IS = Insufficient Sample to complete analysis
- NA = Sample is not amenable for the required analysis
- ND = Results cannot be determined

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the Subcontracted lab for information regarding any deviancies for this analysis.

End of Certificate of Analysis

QUARTER 4 (ANNUAL) 2022
COMPLIANCE REPORT OF SURFACE WATER
MONITORING AT THE BORD NA MÓNA DREHID
WASTE MANAGEMENT FACILITY, CO. KILDARE
IN COMPLIANCE WITH IED LICENCE REGISTER
No. W0201-03

Prepared by:

Mr. Donal Marron
Environmental Consultant

Signed: 

BNM File Ref:

Quarter 4 (Annual) Surface Water 2022

Monitoring Date (Annual):

26th October 2022

Report Date:

08th February 2023

Marron Environmental

60 Seapoint
Dunbur Road,
Wicklow,
Co. Wicklow

EXECUTIVE SUMMARY

In accordance with IED licence Register No. W0201-03, Drehid Waste Management Facility is required to carry out weekly surface water monitoring at its site at Drehid / Killinagh, County Kildare.

Surface water sampling took place at the three locations specified in the IED (SW6, SW5 and SW4) during Quarter 4 and these were analysed for weekly parameters and once during the quarter for quarterly and annual parameters. Surface water samples were obtained using standard methodology, transported to the lab under a controlled chain of custody and analysed for parameters as described in Appendix II of this report.

Surface Water:

Quarterly and Annual sampling was carried out on 26/10/22 (wk44) during Quarter 4.

The results indicated all weekly parameters were below the emission limit values for the quarter.

The annual parameters were analysed on samples submitted on the 26th October 2022. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations.

The metals results showed some minor fluctuations since the previous monitoring events but generally remain in trend with previous results.

1.0 **SURFACE WATER**

1.1 **Surface Water Monitoring Locations**

The Surface Water sampling locations are described in Table 1.1 and shown on the Surface Water Location Map contained in Appendix 1.

TABLE 1.1: LOCATION OF SURFACE WATER SAMPLING STATIONS	
Map Reference No.	Location
SW-6	Outfall of Constructed Wetland
SW-5	SW5 is situated at the outfall of the old Bord na Mona works Settlement Ponds (c. 1Km downstream of SW6 and at the headwaters of the Cushaling river)
SW-4	SW4 is located on the Cushaling river at Dillons Bridge (c.2.2Km downstream of SW5)

1.2 **Methodology**

Grab samples of surface water were extracted in accordance with the following standards;

TABLE 1.2 SAMPLING PROCEDURE AND GUIDANCE	
ISO Standard	Description
ISO 5667-1-2006	<i>Guidance on the design of sampling programmes and sampling techniques</i>
ISO 5667-3-2012	<i>Guidance on sample preservation and handling</i>
ISO 5667-14-2014	<i>Guidance on quality assurance of environmental sampling & handling</i>
ISO 5667-6-2005	<i>Guidance on sampling rivers & streams</i>

2.0 Surface Water Results

TABLE 2.1 (A): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW6

Quarter 4 2022														
SW6														
Parameter	Units	Emission Limit	Wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52
pH	pH Units	-	7.5	7.6	7.7	7.89	7.8	7.8	8	7.8	7.9	7.8	8.0	7.8
Conductivity	µS/cm	-	559	627	637	636	701	425	680	699	701	669	674	649
BOD	mg/l	25 mg/l				2								
Chloride	mg/l	-	30.3	26	26	20.6	19.2	20.2	20	19.3	18.7	20	23.2	22
COD	mg/l	-				30								
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	0.16	<5	<5	<5	5.4	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.04	0.10	0.05	0.17	0.06	0.05	0.04	0.05	0.06	0.06	0.48	0.04

TABLE 2.1 (B): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW5

Quarter 4 2022														
SW5														
Parameter	Units	Emission Limit	Wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52
pH	pH Units	-	7.8	7.3	7.4	7.8	7.2	7	7.8	7.2	7.1	7.2	7.3	7.6
Conductivity	µS/cm	-	463	380	376	477	355	402	378	381	442	395	468	555
BOD	mg/l	25 mg/l				2								
Chloride	mg/l	-	16.6	14.6	14.8	14.2	14.4	16.9	16.4	15	17	15.9	17	19.6
COD	mg/l	-				102								
Suspended Solids	mg/l	35 mg/l	7.2	9.8	28.2	0.17	14.2	<5	<5	17.8	<5	5.6	5.1	6
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.23	0.17	0.17	0.18	0.10	0.15	0.13	0.15	0.23	0.26	0.31	0.35

TABLE 2.1 (C): RESULTS OF CHEMICAL ANALYSIS OF SURFACE WATER AT SW4

SW4		Quarter 4 2022												
Parameter	Units	Emission Limit	Wk41	Wk42	Wk43	Wk44	Wk45	Wk46	Wk47	Wk48	Wk49	Wk50	Wk51	Wk52
pH	pH Units	-	7.6	7.4	7.5	7.97	7.2	7.3	7.2	7.3	7.3	7.4	7.7	7.7
Conductivity	µS/cm	-	486	469	483	570	477	487	469	494	503	479	508	523
BOD	mg/l	25 mg/l				1								
Chloride	mg/l	-	17.4	15.6	15.8	14.4	21.5	16.4	16.3	15.7	17.2	16.2	16.7	16.7
COD	mg/l	-				94								
Suspended Solids	mg/l	35 mg/l	<5	<5	<5	0.06	<5	<5	<5	<5	<5	<5	<5	<5
Ammonia (as NH ₄)	mg/l	0.5 mg/l	0.03	0.06	0.04	0.064	0.06	0.05	0.04	0.09	0.07		0.13	0.15

Table 2.2(A): Results of Annual Parameter Analysis at SW4, SW5 & SW6					
Client ID	N/A	SW-4	SW-5	SW-6	Emission Limit Value
Sampling Date	N/A	26/10/22	26/10/22	26/10/22	
Sample Type	N/A	Surface Water	Surface Water	Surface Water	
Ortho-Phosphate as P	mg/l	0.16	<0.06	<0.06	-
Total Phosphorous	mg/l	0.024	0.018	0.035	-
N03-N	mg/l	7.3	4.1	2.2	-
Sulphate	mg/l	49.6	58.7	73.4	-
Sodium (total)	mg/l	9.4	11.7	22.3	-
Magnesium(total)	mg/l	7.6	6.2	8.8	-
Potassium (total)	mg/l	2.3	1.2	3.7	-
Calcium (total)	mg/l	110.4	90.9	118.7	-
Boron (total)	µg/l	16	18	28	-
Chromium (total)	µg/l	<1.5	<1.5	<1.5	-
Manganese (total)	µg/l	46	50	105	-
Nickel (total)	µg/l	2	3	<2	-
Copper (total)	µg/l	<7	<7	<7	-
Zinc (total)	µg/l	110	4	3	-
Cadmium (total)	µg/l	<0.5	<0.5	<0.5	-
Lead (total)	µg/l	<5	<5	<5	-
Iron (total)	mg/l	0.394	0.529	0.047	-
Mercury (total)	µg/l	<1	<1	<1	-
Coliforms	Cfu/100ml	>100	65	>100	-
E.Coli	Cfu/100ml	>100	55	35	-

Table 2.2 (B): Results of Annual Parameter Chemical Analysis at SW4, SW5 & SW6						
		Units	SW4	SW5	SW6	Limit
VOC's	All VOCs as Per USEPA List	$\mu\text{g/l}$	<MDL	<MDL	<MDL	-
SVOC's	All SVOCs as Per USEPA List	$\mu\text{g/l}$	<MDL	<MDL	<MDL	-

<MDL = Less than Method Detection Limit (See Appendix 2 for details)

The daily on site reading at the outlet from the sedimentation lagoons for Quarter 4 are detailed in Table 2.3 A, B and C below.

Table 2.3A October 2022

Date	Visual Inspection/O odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/10/2022	Clear, no odour*	3.58	5.7	574
02/10/2022	Clear, no odour*	3.60	6.0	605
03/10/2022	Clear, no odour*	3.63	4.5	595
04/10/2022	Clear, no odour*	3.62	5.9	605
05/10/2022	Clear, no odour*	3.64	5.9	605
06/10/2022	Clear, no odour*	3.84	6.1	645
07/10/2022	Clear, no odour*	3.91	6.5	658
08/10/2022	Clear, no odour*	3.93	5.7	657
09/10/2022	Clear, no odour*	3.97	6.0	666
10/10/2022	Clear, no odour*	4.02	6.5	676
11/10/2022	Clear, no odour*	4.06	6.3	670
12/10/2022	Clear, no odour*	4.02	6.5	687
13/10/2022	Clear, no odour*	3.97	6.3	697
14/10/2022	Clear, no odour*	3.94	6.5	698
15/10/2022	Clear, no odour*	3.95	6.7	699
16/10/2022	Clear, no odour*	3.97	6.8	689
17/10/2022	Clear, no odour*	3.99	7.0	698
18/10/2022	Clear, no odour*	4.05	7.5	684
19/10/2022	Clear, no odour*	4.06	7.6	684
20/10/2022	Clear, no odour*	4.10	7.3	690
21/10/2022	Clear, no odour*	4.15	7.2	678
22/10/2022	Clear, no odour*	4.19	6.7	686
23/10/2022	Clear, no odour*	4.24	6.9	694
24/10/2022	Clear, no odour*	4.29	6.4	687
25/10/2022	Clear, no odour*	4.20	6.8	685
26/10/2022	Clear, no odour*	4.14	7.0	652
27/10/2022	Clear, no odour*	4.13	6.8	685
28/10/2022	Clear, no odour*	4.15	6.7	684
29/10/2022	Clear, no odour*	4.18	6.2	682
30/10/2022	Clear, no odour*	4.19	6.3	639
31/10/2022	Clear, no odour*	4.16	6.4	642

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3B November 2022

Date	Visual Inspection/Odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/11/2022	Clear, no odour*	4.27	6.1	625
02/11/2022	Clear, no odour*	4.34	5.9	619
03/11/2022	Clear, no odour*	4.35	6.5	645
04/11/2022	Clear, no odour*	4.32	6.7	642
05/11/2022	Clear, no odour*	4.29	6.9	638
06/11/2022	Clear, no odour*	4.25	7.1	630
07/11/2022	Clear, no odour*	4.22	7.2	619
08/11/2022	Clear, no odour*	4.18	7.2	654
09/11/2022	Clear, no odour*	4.14	7.4	639
10/11/2022	Clear, no odour*	4.12	7.3	637
11/11/2022	Clear, no odour*	4.10	7.1	634
12/11/2022	Clear, no odour*	4.08	6.9	650
13/11/2022	Clear, no odour*	4.12	7.2	635
14/11/2022	Clear, no odour*	4.15	7.2	616
15/11/2022	Clear, no odour*	4.23	7.1	634
16/11/2022	Clear, no odour*	4.22	7.0	637
17/11/2022	Clear, no odour*	4.18	7.2	648
18/11/2022	Clear, no odour*	4.12	7.5	639
19/11/2022	Clear, no odour*	4.09	7.6	642
20/11/2022	Clear, no odour*	4.07	7.6	639
21/11/2022	Clear, no odour*	4.05	7.8	653
22/11/2022	Clear, no odour*	4.16	7.9	631
23/11/2022	Clear, no odour*	4.17	7.9	631
24/11/2022	Clear, no odour*	4.20	8.1	628
25/11/2022	Clear, no odour*	4.27	8.0	614
26/11/2022	Clear, no odour*	4.22	8.1	634
27/11/2022	Clear, no odour*	4.14	8.2	632
28/11/2022	Clear, no odour*	4.06	8.2	638
29/11/2022	Clear, no odour*	4.00	8.4	639
30/11/2022	Clear, no odour*	3.96	8.2	637

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

Table 2.3C December 2022

Date	Visual Inspection/O odour	Lagoon Level (m)	Dissolved Oxygen (mg/l O ₂)	Electrical Conductivity (µS/cm)
01/12/2022	Clear, no odour*	3.89	8.4	632
02/12/2022	Clear, no odour*	3.85	8.4	633
03/12/2022	Clear, no odour*	3.83	8.2	631
04/12/2022	Clear, no odour*	3.82	8.2	620
05/12/2022	Clear, no odour*	3.81	8.1	616
06/12/2022	Clear, no odour*	3.87	8.0	620
07/12/2022	Clear, no odour*	3.89	8.1	630
08/12/2022	Clear, no odour*	3.87	8.2	642
09/12/2022	Clear, no odour*	3.84	8.2	616
10/12/2022	Clear, no odour*	3.81	8.3	615
11/12/2022	Clear, no odour*	3.78	8.3	625
12/12/2022	Clear, no odour*	3.75	8.4	635
13/12/2022	Clear, no odour*	3.72	8.8	636
14/12/2022	Clear, no odour*	3.70	8.7	653
15/12/2022	Clear, no odour*	3.68	9.2	671
16/12/2022	Clear, no odour*	3.67	9.1	678
17/12/2022	Clear, no odour*	3.63	8.9	684
18/12/2022	Clear, no odour*	3.62	9.0	654
19/12/2022	Clear, no odour*	3.59	8.1	634
20/12/2022	Clear, no odour*	3.68	8.2	661
21/12/2022	Clear, no odour*	3.75	6.8	680
22/12/2022	Clear, no odour*	3.81	7.3	686
23/12/2022	Clear, no odour*	3.88	6.0	679
24/12/2022	Clear, no odour*	3.86	9.3	653
25/12/2022	Clear, no odour*	3.84	8.8	615
26/12/2022	Clear, no odour*	3.88	9.0	618
27/12/2022	Clear, no odour*	3.99	8.8	628
28/12/2022	Clear, no odour*	4.22	8.7	609
29/12/2022	Clear, no odour*	4.18	8.5	631
30/12/2022	Clear, no odour*	4.15	8.4	625
31/12/2022	Clear, no odour*	4.13	8.4	607

* As recorded on WIF 5.1 - Daily Site Inspection Checksheet

SURFACE WATER

The surface water monitoring was conducted at weekly intervals by Drehid facility staff during the fourth quarter of 2022. Sampling took place at the three locations specified in the IED licence (SW6, SW5 and SW4) for weekly parameters, once during the quarter for quarterly parameters and once during the quarter for annual parameters. BOD, Ammonia and Suspended Solids levels were compared to their relevant Emission Limit Values (ELV's) and the results are shown in Tables 2.1 (A), 2.1 (B) and 2.1(C) and represented graphically in Figure 1 to Figure 3.

The results indicated all weekly parameters were below the emission limit values for the quarter.

The annual parameters were analysed on samples submitted on the 26th October 2022. The results for the organics were below the laboratory limit of detection for all parameters at all sampling locations.

The metals results showed some minor fluctuations since the previous monitoring events but generally remain in trend with previous results.

Figures 1 to 3 below graphically display the weekly Ammonia, BOD and Suspended Solids results obtained for 2022.

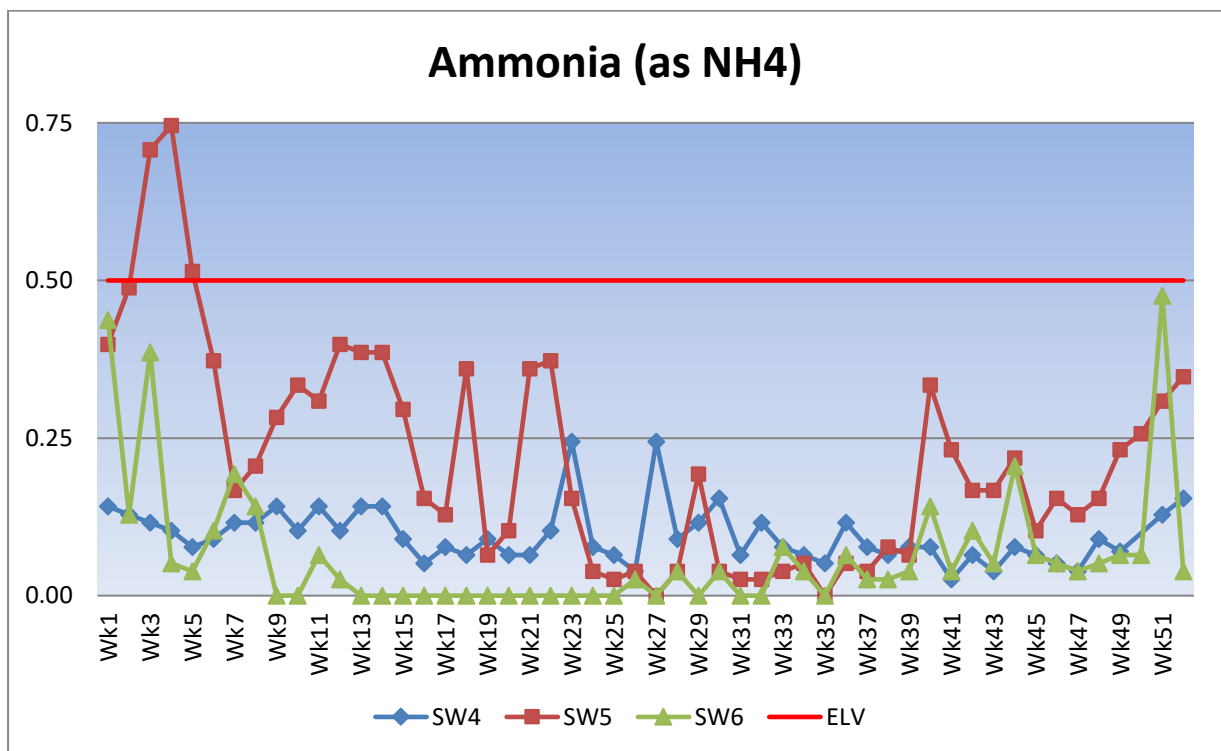


Figure 1

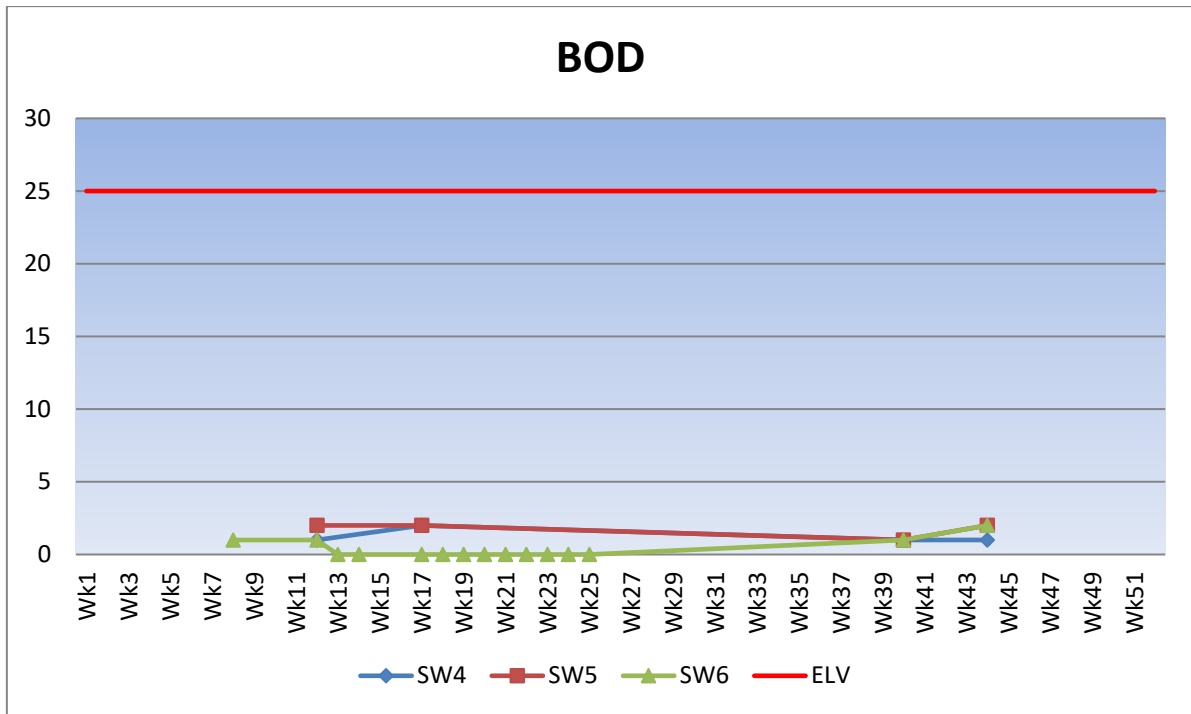


Figure 2

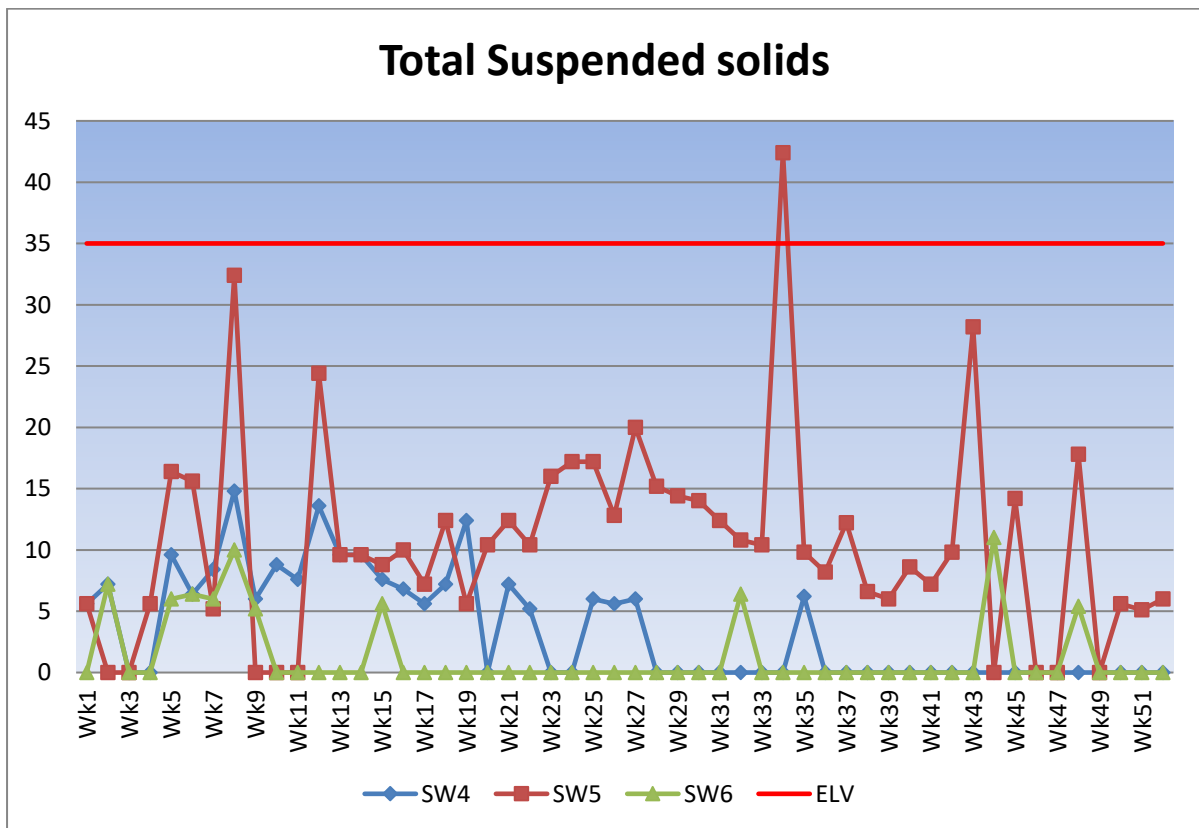


Figure 3

APPENDIX I

Monitoring Locations

Appendix 2

Laboratory Results

Marron Environmental
60 Seapoint
Dunbur Road
Wicklow
Co Wicklow
Ireland
A67 F761



Attention : Donal Marron
Date : 11th November, 2022
Your reference : J154
Our reference : Test Report 22/17700 Batch 1
Location : Drehid
Date samples received : 27th October, 2022
Status : Final Report
Issue : 1

Twenty four samples were received for analysis on 27th October, 2022 of which twenty four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022			
Dissolved Arsenic	-	-	-	-	-	-	-	-	-	-	<2.5	ug/l	TM30/PM14
Dissolved Arsenic #	6.0	77.1	3.1	85.7	41.9	45.8	94.1	70.4	74.2	192.2	<2.5	ug/l	TM30/PM14
Dissolved Boron	74	<12	70	<12	<12	12	<12	<12	<12	<12	<12	ug/l	TM30/PM14
Dissolved Cadmium	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Calcium	-	-	-	-	-	-	-	-	-	-	<0.2	mg/l	TM30/PM14
Dissolved Calcium #	205.2	167.2	135.4	124.6	43.9	43.8	120.4	79.1	256.1 ^{AB}	144.4	<0.2	mg/l	TM30/PM14
Total Dissolved Chromium	-	-	-	-	-	-	-	-	-	-	<1.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper	-	-	-	-	-	-	-	-	-	-	<7	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	TM30/PM14
Total Dissolved Iron	-	-	-	-	-	-	-	-	-	-	<20	ug/l	TM30/PM14
Total Dissolved Iron #	3931	11567 ^{AB}	3385	13591 ^{AB}	1814	1903	12691 ^{AB}	11543 ^{AB}	35853 ^{AB}	16464 ^{AB}	<20	ug/l	TM30/PM14
Dissolved Lead	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Magnesium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Magnesium #	30.2	10.3	27.4	7.8	8.3	7.7	12.7	12.2	4.7	3.7	<0.1	mg/l	TM30/PM14
Dissolved Manganese	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM30/PM14
Dissolved Manganese #	430	267	376	276	103	167	303	156	502	241	<2	ug/l	TM30/PM14
Dissolved Mercury	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM30/PM14
Dissolved Nickel #	3	23	12	16	4	8	6	8	30	61	<2	ug/l	TM30/PM14
Dissolved Potassium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Potassium #	0.6	1.1	0.7	1.4	0.5	0.6	1.9	1.7	1.5	1.1	<0.1	mg/l	TM30/PM14
Dissolved Sodium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Sodium #	9.2	8.9	7.5	16.0	10.2	10.1	11.2	12.3	10.8	9.0	<0.1	mg/l	TM30/PM14
Dissolved Zinc	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM30/PM14
Dissolved Zinc #	8	7	6	9	3	3	7	16	7	6	<3	ug/l	TM30/PM14
Total Phosphorus	64	92	64	73	63	67	223	168	207	197	<5	ug/l	TM30/PM14
EPH (C8-C40) #	-	-	-	-	<10	<10	-	-	-	-	<10	ug/l	TM5/PM30
Fluoride	-	-	-	-	-	-	-	-	-	-	<0.3	mg/l	TM173/PM0
Sulphate as SO4	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	122.0	52.6	46.1	<0.5	<0.5	<0.5	<0.5	<0.5	13.4	<0.5	<0.5	mg/l	TM38/PM0
Chloride	-	-	-	-	-	-	-	-	-	-	<0.3	mg/l	TM38/PM0
Chloride #	13.5	11.0	10.3	14.1	11.4	11.5	12.6	12.1	10.4	9.9	<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	14.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/l	TM38/PM0
Ortho Phosphate as PO4	-	-	-	-	-	-	-	-	-	-	<0.06	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	mg/l	TM38/PM0
Total Oxidised Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.2	mg/l	TM38/PM0

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022			
Total Cyanide	-	-	-	-	-	-	-	-	-	-	<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	2.28	5.65	1.47	1.99	0.41	0.60	7.00	3.31	6.22	7.60	<0.03	mg/l	TM38/PM0
COD (Settled)	-	-	-	-	-	-	-	-	-	-	<7	mg/l	TM57/PM0
COD (Settled) #	-	-	-	-	-	-	-	-	-	-	<7	mg/l	TM57/PM0
Electrical Conductivity @25C	-	-	-	-	-	-	-	-	-	-	<2	uS/cm	TM76/PM0
Electrical Conductivity @25C #	1096	872	804	687	309	314	706	522	1081	738	<2	uS/cm	TM76/PM0
pH	-	-	-	-	-	-	-	-	-	-	<0.01	pH units	TM73/PM0
pH #	7.32	7.51	7.27	7.56	8.01	8.01	7.57	7.79	7.08	7.52	<0.01	pH units	TM73/PM0
Total Suspended Solids #	-	-	-	-	-	-	-	-	-	-	<10	mg/l	TM37/PM0

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022			
Dissolved Arsenic	-	-	-	-	-	-	-	-	-	-	<2.5	ug/l	TM30/PM14
Dissolved Arsenic #	227.2	5.9	4.1	116.9	152.9	174.1	19.9	<2.5	6.7	6.7	<2.5	ug/l	TM30/PM14
Dissolved Boron	<12	<12	<12	<12	<12	14	<12	15	<12	<12	<12	ug/l	TM30/PM14
Dissolved Cadmium	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Calcium	-	-	-	-	-	-	-	-	-	-	<0.2	mg/l	TM30/PM14
Dissolved Calcium #	67.1	86.4	114.1	151.6	122.8	47.6	30.2	112.9	37.4	59.4	<0.2	mg/l	TM30/PM14
Total Dissolved Chromium	-	-	-	-	-	-	-	-	-	-	<1.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	1.8	2.2	<1.5	<1.5	<1.5	<1.5	1.7	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper	-	-	-	-	-	-	-	-	-	-	<7	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	TM30/PM14
Total Dissolved Iron	-	-	-	-	-	-	-	-	-	-	<20	ug/l	TM30/PM14
Total Dissolved Iron #	5975	1915	2336	14429 ^{AB}	12104 ^{AB}	1560	1155	2553	822	1022	<20	ug/l	TM30/PM14
Dissolved Lead	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Magnesium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Magnesium #	9.5	5.3	8.7	5.9	9.4	4.8	8.1	8.4	9.2	16.1	<0.1	mg/l	TM30/PM14
Dissolved Manganese	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM30/PM14
Dissolved Manganese #	44	202	146	281	359	44	88	377	336	340	<2	ug/l	TM30/PM14
Dissolved Mercury	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM30/PM14
Dissolved Nickel #	23	4	3	31	45	6	5	<2	4	8	<2	ug/l	TM30/PM14
Dissolved Potassium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Potassium #	1.5	0.7	0.7	1.8	2.1	1.1	1.0	0.8	0.8	1.1	<0.1	mg/l	TM30/PM14
Dissolved Sodium	-	-	-	-	-	-	-	-	-	-	<0.1	mg/l	TM30/PM14
Dissolved Sodium #	10.6	14.3	6.4	9.2	12.1	15.4	16.2	16.0	10.2	10.4	<0.1	mg/l	TM30/PM14
Dissolved Zinc	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM30/PM14
Dissolved Zinc #	33	6	5	6	12	3	8	<3	15	12	<3	ug/l	TM30/PM14
Total Phosphorus	127	111	45	171	217	404	128	143	34	149	<5	ug/l	TM30/PM14
EPH (C8-C40) #	-	<10	<10	-	-	-	-	-	-	-	<10	ug/l	TM5/PM30
Fluoride	-	-	-	-	-	-	-	-	-	-	<0.3	mg/l	TM173/PM0
Sulphate as SO4	-	-	-	-	-	-	-	-	-	-	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	<0.5	21.3	<0.5	1.2	<0.5	<0.5	<0.5	36.0	10.1	1.5	<0.5	mg/l	TM38/PM0
Chloride	-	-	-	-	-	-	-	-	-	-	<0.3	mg/l	TM38/PM0
Chloride #	11.4	17.4	8.9	12.2	12.2	9.9	10.2	18.3	12.5	9.5	<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/l	TM38/PM0
Ortho Phosphate as PO4	-	-	-	-	-	-	-	-	-	-	<0.06	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	0.22	0.07	<0.06	<0.06	<0.06	<0.06	0.12	0.07	<0.06	<0.06	mg/l	TM38/PM0
Total Oxidised Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.2	mg/l	TM38/PM0

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022			
Total Cyanide	-	-	-	-	-	-	-	-	-	-	<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	5.78	1.60	2.55	9.28	8.11	5.86	2.13	0.85	0.75	1.23	<0.03	mg/l	TM38/PM0
COD (Settled)	-	-	-	-	-	-	-	-	-	-	<7	mg/l	TM57/PM0
COD (Settled) #	-	-	-	-	-	-	-	-	-	-	<7	mg/l	TM57/PM0
Electrical Conductivity @25C	-	-	-	-	-	-	-	-	-	-	<2	uS/cm	TM76/PM0
Electrical Conductivity @25C #	467	492	604	819	717	367	293	659	329	439	<2	uS/cm	TM76/PM0
pH	-	-	-	-	-	-	-	-	-	-	<0.01	pH units	TM73/PM0
pH #	8.01	7.65	7.48	7.76	7.67	7.96	8.20	7.65	7.83	8.09	<0.01	pH units	TM73/PM0
Total Suspended Solids #	-	-	-	-	-	-	-	-	-	-	<10	mg/l	TM37/PM0

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

SVOC Report : Liquid

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Chlorophenol #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2-Methylphenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	<1	27	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	<1	5	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Chloronaphthalene #	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1	<1 ⁺	<1	<1	<1	<1	ug/l	TM16/PM30
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Naphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Naphthalene #	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1	<1 ⁺	<1	<1	<1	<1	ug/l	TM16/PM30
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Acenaphthene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Fluorene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Fluorene #	<0.5 ⁺	<0.5 ⁺	<0.5 ⁺	<0.5 ⁺	<0.5 ⁺	<0.5	<0.5 ⁺	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Phenanthrene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Fluoranthene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Pyrene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Chrysene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Di-n-butyl phthalate	-	-	-	-	-	-	-	-	-	-	<1.5	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Diethyl phthalate	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Diethyl phthalate #	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1 ⁺	<1	<1 ⁺	<1	<1	<1	<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

SVOC Report : Liquid

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,2-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2,4-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Bromophenylphenylether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Azobenzene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Carbazole	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Hexachlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachlorobutadiene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachloroethane	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Isophorone	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Nitrobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Nitrobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	122	115	115	124	121	101	134 ^{SV}	110	105	109	<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	117	116	114	124	121	110	124	122	118	116	<0	%	TM16/PM30

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

SVOC Report : Liquid

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Chlorophenol #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2-Methylphenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Chloronaphthalene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Naphthalene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Acenaphthene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Fluorene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Phenanthrene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Fluoranthene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Pyrene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Chrysene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Di-n-butyl phthalate	-	-	-	-	-	-	-	-	-	-	<1.5	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Diethyl phthalate	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

SVOC Report : Liquid

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,2-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
2,4-Dinitrotoluene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Bromophenylphenylether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Azobenzene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Carbazole	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Dibenzofuran	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Hexachlorobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachlorobutadiene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Hexachloroethane	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Isophorone	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM16/PM30
Nitrobenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM16/PM30
Nitrobenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	102	109	99	107	99	109	110	108	109	108	<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	108	114	107	119	114	112	120	118	120	115	<0	%	TM16/PM30

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

VOC Report : Liquid

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Chloromethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

VOC Report : Liquid

EMT Sample No.	1-5	6-10	11-15	16-20	21-26	27-32	33-37	38-42	43-47	48-52	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW1S	GW1D	GW2S	GW2D	GW3S	GW3D	GW4S	GW4D	GW5AS	GW5AD			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
VOC MS Continued													
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	92	102	100	99	99	102	95	97	105	99	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	91	99	97	95	95	100	94	106	107	102	<0	%	TM15/PM10

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Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

VOC Report : Liquid

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Chloromethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride	-	-	-	-	-	-	-	-	-	-	<0.1	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene	-	-	-	-	-	-	-	-	-	-	<0.5	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene	-	-	-	-	-	-	-	-	-	-	<5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Marron Environmental
Reference: J154
Location: Drehid
Contact: Donal Marron
EMT Job No: 22/17700

VOC Report : Liquid

EMT Sample No.	53-57	58-63	64-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104	Please see attached notes for all abbreviations and acronyms		
Sample ID	GW6	GW9	GW10	GW11S	GW11D	GW12S	GW12D	GW13S	GW13D	PW1			
Depth													
COC No / misc													
Containers	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G	V H H N P G			
Sample Date	25/10/2022	26/10/2022	25/10/2022	25/10/2022	25/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022	26/10/2022			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	27/10/2022	LOD/LOR	Units	Method No.
VOC MS Continued													
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
m/p-Xylene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene	-	-	-	-	-	-	-	-	-	-	<1	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene	-	-	-	-	-	-	-	-	-	-	<2	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	107	112	113	107	108	108	92	93	94	95	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	108	112	112	109	109	110	93	95	97	98	<0	%	TM15/PM10

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Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/17700

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x5 Dilution
AC	x20 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/17700

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM37	Modified method - TSS: USEPA 160.2 (1963), EN612:2009 and APHA 512W 2540D:1999 22nd Edition; VSS: USEPA 1684 (Jan 2001), USEPA 160.4 (1971) and SMEWW 2540E:1999 22nd Edition. Gravimetric determination of Total Suspended Solids (TSS) and Volatile Suspended Solids (VSS). Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed at 105°C for TSS and 550°C for VSS.	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			

EMT Job No: 22/17700

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometrically.	PM0	No preparation is required.				
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometrically.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				

Client: Drihid Waste Management
Primary Contact:
Address: Drehid Waste Management, Drehid, Co Kildare

Order Number: 3082510

Sample Number: ALT ID 3542997 **Date Received:** 26/10/2022 **Date Tested:** 26/10/2022
INAB P9 Classification: Water - Bacteriological condition of environmental waters
Sample Description: SW4

Test	Result	Unit(s)	Method	Standard Reference
Confirmed Coliforms	>100	cfu/100mL	MTM025	MDW (2016)- Part 4
Confirmed Escherichia coli	>100	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Coliforms	>100	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Escherichia coli	>100	cfu/100mL	MTM025	MDW (2016)- Part 4

Sample Number: ALT ID 3542998 **Date Received:** 26/10/2022 **Date Tested:** 26/10/2022
INAB P9 Classification: Water - Bacteriological condition of environmental waters
Sample Description: SW5

Test	Result	Unit(s)	Method	Standard Reference
Confirmed Coliforms	65	cfu/100mL	MTM025	MDW (2016)- Part 4
Confirmed Escherichia coli	55	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Coliforms	65	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Escherichia coli	65	cfu/100mL	MTM025	MDW (2016)- Part 4

Sample Number: ALT ID 3542999 **Date Received:** 26/10/2022 **Date Tested:** 26/10/2022
INAB P9 Classification: Water - Bacteriological condition of environmental waters
Sample Description: SW6

Test	Result	Unit(s)	Method	Standard Reference
Confirmed Coliforms	>100	cfu/100mL	MTM025	MDW (2016)- Part 4
Confirmed Escherichia coli	35	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Coliforms	>100	cfu/100mL	MTM025	MDW (2016)- Part 4
Presumptive Escherichia coli	>100	cfu/100mL	MTM025	MDW (2016)- Part 4

The results in this report were authorised by:



Ana Raluca
Microbiologist

Samples tested at: ALT Biological Testing Laboratory, Unit 4 Newbridge Industrial Estate, Newbridge, Co.Kildare Ireland.



Report Status: **Final Report**
Date of Issue: **28-Oct-2022**
Report Number: **1491337**
Project: **1-221026-15099**
Page 2 of 2
Order Number: 3082510

Client: **Drihid Waste Management**

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Results reported as cfu/cm² are calculated based on information supplied by the relevant customer regarding the specific area swabbed.

* beside the method or lack of INAB symbol signifies that **Advanced Laboratory Testing** are not INAB accredited for this method.

Samples are retained post analysis for a period of 10 days. Samples are stored frozen by default except in the case of RSA requirements.

Unless otherwise stated as a Test Certificate comment, samples were received in a satisfactory condition.

Sampling including the date and time swabs are taken at source and area swabbed is outside the activities of ALT-MxNS and Scope of INAB Accreditation.

Environmental swab samples should ideally be tested within 4 hours of being taken at source or within a maximum of 24 hours.

Swabs which are tested after 24 hours of being taken at source will result in a detrimental effect on results.

If the date and time which swabs are sampled is not referenced when submitting paperwork, ALT-MxNS will not be able to determine if swabs have been tested within the allocated 24 hour window nor the effect on results.

The results in this report were authorised by:



Ana Raluca
Microbiologist

Samples tested at: ALT Biological Testing Laboratory, Unit 4 Newbridge Industrial Estate, Newbridge, Co.Kildare Ireland.



Client: Drihid Waste Management Order Number: 3082510
Primary Contact:
Address: Drihid Waste Management, Drihid, Co Kildare

Sample Number: ALT ID 3543006 **Date Received:** 26/10/2022 **Date Tested:** 27/10/2022
INAB P9 Classification: Trade wastes
Sample Description: SW4

Test	Result	Unit(s)	Method	Technique
BOD with ATU	1	mg/L O2	ECTM004	HACH (LDO®)

Sample Number: ALT ID 3543007 **Date Received:** 26/10/2022 **Date Tested:** 27/10/2022
INAB P9 Classification: Trade wastes
Sample Description: SW5

Test	Result	Unit(s)	Method	Technique
BOD with ATU	2	mg/L O2	ECTM004	HACH (LDO®)

Sample Number: ALT ID 3543008 **Date Received:** 26/10/2022 **Date Tested:** 27/10/2022
INAB P9 Classification: Trade wastes
Sample Description: SW6

Test	Result	Unit(s)	Method	Technique
BOD with ATU	2	mg/L O2	ECTM004	HACH (LDO®)

Sample Number: ALT ID 3543009 **Date Received:** 26/10/2022 **Date Tested:** 27/10/2022
INAB P9 Classification: Trade wastes
Sample Description: LEACHATE

Test	Result	Unit(s)	Method	Technique
BOD with ATU	163	mg/L O2	ECTM004	HACH (LDO®)

The results in this report were authorised by:



Chiara Lou Baczynski
Laboratory Manager - Environmental & Allergen

Samples tested at: ALT Chemical Testing Laboratory, Unit T, M7 Business Park, Newhall, Naas, Co. Kildare, Ireland.



Report Status: **Final Report**
Date of Issue: **09-Nov-2022**
Report Number: **1497740**
Project: **1-221026-15100**
Page 2 of 2
Order Number: 3082510

Client: **Drihid Waste Management**

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Results reported as cfu/cm² are calculated based on information supplied by the relevant customer regarding the specific area swabbed.

* beside the method or lack of INAB symbol signifies that **Advanced Laboratory Testing** are not INAB accredited for this method.

Samples are retained post analysis for a period of 10 days. Samples are stored frozen by default except in the case of RSA requirements.

Unless otherwise stated as a Test Certificate comment, samples were received in a satisfactory condition.

Sampling including the date and time swabs are taken at source and area swabbed is outside the activities of ALT-MxNS and Scope of INAB Accreditation.

Environmental swab samples should ideally be tested within 4 hours of being taken at source or within a maximum of 24 hours.

Swabs which are tested after 24 hours of being taken at source will result in a detrimental effect on results.

If the date and time which swabs are sampled is not referenced when submitting paperwork, ALT-MxNS will not be able to determine if swabs have been tested within the allocated 24 hour window nor the effect on results.

The results in this report were authorised by:



Chiara Lou Baczynski
Laboratory Manager - Environmental & Allergen

Samples tested at: ALT Chemical Testing Laboratory, Unit T, M7 Business Park,
Newhall, Naas, Co. Kildare, Ireland.

