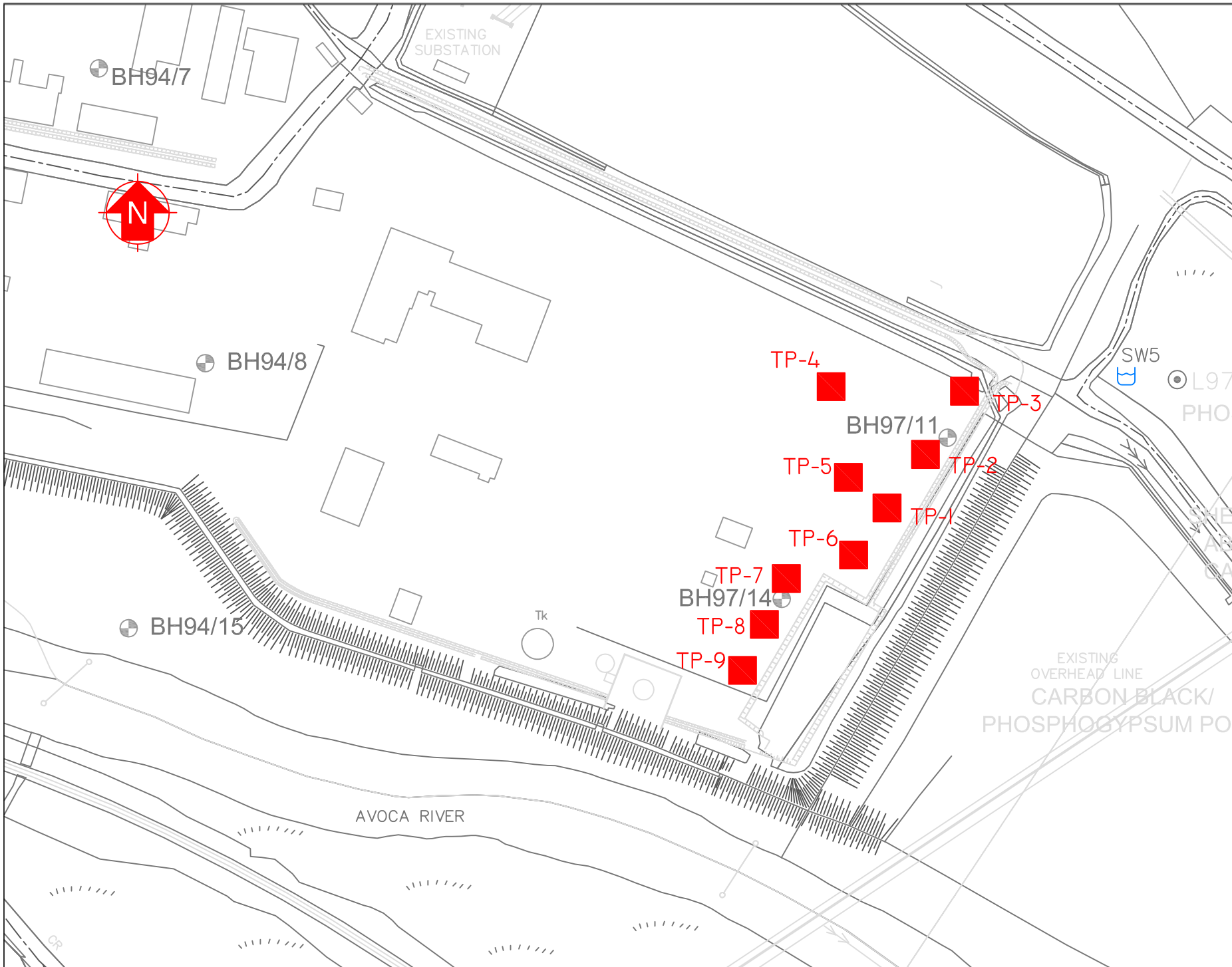


Appendix F – Site Investigation Reports



REV	DATE	DESCRIPTION	DRN	CHKD	API


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CLIENT
GROUND INVESTIGATIONS IRELAND

TITLE
TRIAL PIT LOCATIONS

SCALE	DRAWING No.	REV.

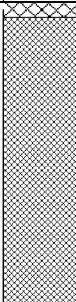
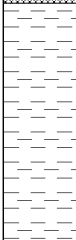

TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP1

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (mOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TARMAC Gravel, sand and cobbles FILL		0.05						
Grey firm CLAY		1.00						
Brown soft sandy SILT End of Trial pit at 2.50 m		1.80						
		2						
		3						
		4						

Remarks:
 Stability:
 Water:
 Remarks: Perched water on top of clay layer at 1.0m
 Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 2.50





TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP3

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TARMAC Gravel, sand and cobbles FILL		0.05						
Stiff grey CLAY		1.20				∇ 0.90	19/03/2015	
End of Trial pit at 1.50 m		1.50						
		2						
		3						
		4						

Remarks:

Stability:
 Water: Groundwater encountered at 0.9m
 Remarks: Digging stopped due to presence of water as risk of breaking services under water
 Trial pit backfilled on completion

KEY

B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:

Depth: -
 1.50



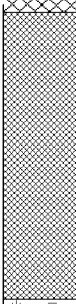

TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP4

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
TARMAC Gravel, sand and cobbles FILL		0.05						
Soft grey SILT End of Trial pit at 1.50 m		1.00 1.50						

Remarks:
 Stability:
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY
 B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 1.50





TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP5

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
GRAVEL								
Concrete and steel - refusal		0.30 0.40						
End of Trial pit at 0.40 m								
		1						
		2						
		3						
		4						

Remarks:
 Stability:
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY
 B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 0.40



TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP7

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
gravel <hr style="border-top: 1px solid black;"/> Concrete and steel - refusal End of Trial pit at 0.50 m	 	0.40 0.50 1 2 3 4						

Remarks:
 Stability:
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY
 B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 0.50



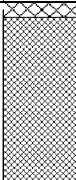


TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP8

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
<p>TARMAC</p> <p>sandy gravelly clay FILL</p>		0.05						
<p>grey soft to firm SILT</p>		0.60						
<p>End of Trial pit at 2.60 m</p>		2.60						

Remarks:
 Stability:
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY
 B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 2.60




TRIAL PIT RECORD

Project Name: WWTP

Hole ID: TP9

Client:
 Consultant: Byrne Looby Partners
 Location: Arklow
 Date: 19/03/2015
 Excavator used: Tracked Excavator

Co-ordinates: -
 -
 Elevation: -
 Project no. 4867-02-15
 Logged by: B Sexton

Strata Description	Legend	Depth	Level (MOD)	Samples / tests			Water Depth	Date
				Type	Depth	Result		
GRAVEL <hr style="border-top: 1px solid black;"/> CONCRETE and steel - refusal End of Trial pit at 0.50 m		0.40 0.50 1 2 3 4						

Remarks:
 Stability:
 Water: No groundwater encountered
 Remarks: Trial pit backfilled on completion

KEY
 B Bulk disturbed sample.
 D Small disturbed sample
 U Undisturbed sample

Dimensions:
 Depth: -
 0.50




Parameter	Unit	TP-1	TP-3	TP-6	TP-8	Inert Landfill	Non-Hazardous Landfill	Hazardous Landfill
	Depth (m)	1.50	0.50	0.50	1.50			
Antimony	mg/kg	0.06	<0.02	<0.02	<0.02	0.06	0.7	5
Arsenic	mg/kg	0.304	<0.025	<0.025	0.235	0.5	2	25
Cadmium	mg/kg	0.006	<0.005	<0.005	<0.005	0.04	1	5
Copper	mg/kg	0.24	<0.07	<0.07	<0.07	2	50	100
Chromium	mg/kg	0.030	<0.015	<0.015	0.029	0.5	10	70
Lead	mg/kg	0.05	<0.05	<0.05	0.11	0.5	10	50
Nickel	mg/kg	0.03	<0.02	<0.02	0.03	0.4	10	40
Molybdenum	mg/kg	<0.02	<0.02	0.03	<0.02	0.5	10	30
Selenium	mg/kg	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7
Zinc	mg/kg	0.07	<0.03	<0.03	0.09	4	50	200
Mercury	mg/kg	0.0017	<0.0001	0.0003	0.0011	0.01	0.2	2
Barium	mg/kg	0.08	0.04	0.05	0.15	20	100	300
Chloride	mg/kg	26	<3	<3	7	800	15,000	25,000
Fluoride	mg/kg	<3	<3	<3	<3	10	150	500
Sulphate*	mg/kg	98.0	56.0	14.9	422.9	1000*	20,000	50,000
Dissolved Organic Carbon	mg/kg	320	<20	30	130	500	800	1,000
Total Dissolved Solids	mg/kg	670	210	210	560	4,000	60,000	100,000
Phenols	mg/kg	<0.1	<0.1	<0.1	<0.1	1	NE	NE
Total Organic Carbon	%	2.24	0.09	0.17	0.85	3**	NE	NE
Benzene	mg/kg	<0.005	<0.005	<0.005	<0.005	6	NE	NE
Toluene	mg/kg	<0.005	<0.005	<0.005	<0.005	6	NE	NE
Ethylbenzene	mg/kg	<0.005	<0.005	<0.005	<0.005	6	NE	NE
o-Xylene	mg/kg	<0.005	<0.005	<0.005	<0.005	6	NE	NE
x-Xylene	mg/kg	<0.005	<0.005	<0.005	<0.005	6	NE	NE
Total BTEX	mg/kg	<0.025	<0.025	<0.025	<0.025	6	NE	NE
PCB Total of 7	mg/kg	<0.035	<0.035	<0.035	<0.035	1	NE	NE
Naphthalene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Acenaphthylene	mg/kg	<0.03	<0.03	<0.03	<0.03	NE	NE	NE
Acenaphthene	mg/kg	<0.05	<0.05	<0.05	<0.05	NE	NE	NE
Fluorene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Phenanthrene	mg/kg	<0.03	<0.03	<0.03	<0.03	NE	NE	NE
Anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Fluoranthene	mg/kg	<0.03	<0.03	<0.03	<0.03	NE	NE	NE
Pyrene	mg/kg	<0.03	<0.03	<0.03	<0.03	NE	NE	NE
Benzo(a)anthracene	mg/kg	<0.06	<0.06	<0.06	<0.06	NE	NE	NE
Chrysene	mg/kg	<0.02	0.02	0.02	<0.02	NE	NE	NE
Benzo(b)+Benzo(k)fluoranthene	mg/kg	<0.07	<0.07	<0.07	<0.07	NE	NE	NE
Benzo(a)pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Indeno(123cd)pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Benzo(ghi)perylene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Coronene	mg/kg	<0.04	<0.04	<0.04	<0.04	NE	NE	NE
Total 17 PAH's	mg/kg	<0.64	<0.64	<0.64	<0.64	NE	NE	NE
Mineral Oil	mg/kg	<45	<45	<45	<45	500	NE	NE

NE - Not Established

* - sulphate level exceeding inert waste limit may be considered as complying if the TDS value does not exceed 6,000mg/kg at L/S = 10l/kg.

** - a higher limit may be accepted provided the DOC values of 500mg/kg is achieved

Approx 270m from Ferrybank

Project No: 1337-12	Log of Borehole: BH 203-01	
Project: Arklow Sewerage Scheme, Contract 6		
Client: Wicklow County Council	Position: E=325300.624 N=173473.24	
Engineer: Byrne Looby Partners	Elevation (mOAD): 1.931m	

Depth	Symbol	Description	Elevation (mOAD)	Installation	Sample Depth	Sample Type	Standard Penetration Test					Remarks	Observations
							SPT ("N" Blows)						
							10	30	50	70	90		
0		Ground Surface	1.93										
0		TOPSOIL	1.73			B							
0.5		Probably loose, brown, fine to coarse SAND and GRAVEL with medium cobble content. [MADE GROUND]	1.13			B							
1		Loose, grey, clayey, sandy, fine to coarse GRAVEL containing domestic waste. [MADE GROUND]				B							
1.2						B						SPT at 1.20m - 1,1,1,1,2,2	
1.7						B						SPT at 1.70m - 1,1,2,1,2,1	
2.2						B						SPT at 2.20m - 1,1,-,1,2,1	
2.7						B						SPT at 2.70m - 1,1,1,2,1,2	
3			-1.27			B							
3.7		Medium dense, brown, fine to coarse SAND and GRAVEL. [GLACIAL]				S						SPT at 3.70m - 1,1,1,2,2,3	
4.2						B						SPT at 4.20m - 1,-,2,3,3,4	
4.7						B						SPT at 4.70m - 1,2,2,4,3,4	
5.2						B						SPT at 5.20m - 1,2,4,8,17,21 for 65mm	
6.8			-4.67			B							
6.8		Medium dense, brown, fine to coarse SAND. [GLACIAL]				D						SPT at 6.80m - 2,3,4,4,7,8	
8.3						B						SPT at 8.30m - 2,4,4,6,8,7	
9.8			-8.07			B						SPT at 9.80m - 2,3,4,5,6,7	
10		End of Borehole				B							Groundwater seepage encountered at 10.00m b.g.l

Bore Method: Shell and Auger	Whiteford Geoservices Ltd	Equipment: Dando 2000
Bore Date: 05-09-12	Straid House	Logged by: DA
Hole Size: 150mm	2 Main Street, Straid	Checked by: GF
Scale: Not to Scale	Ballyclare, BT39 9NE	Sheet: 1 of 1