

SOUTH TIPPERARY COUNTY COUNCIL



KILLENAULE

WASTEWATER DISCHARGE LICENCE

REGISTER NUMBER D0443-01

ANNUAL ENVIRONMENTAL REPORT

1st JANUARY 2011 to DECEMBER 31ST 2011

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	4
1.1 Site Information	4
1.2 Primary Discharge Point	4
1.3 Storm water overflows	5
1.4 Wastewater Treatment Plant Management	5
2.0 SUMMARY OF MONITORING REPORTS	6
2.1 Summary reports on Monthly Influent Monitoring	6
2.2 Discharges from the Agglomeration	7
2.2.1 Nutrient Removal Efficiencies	7
2.2.2 Monitoring of Primary Wastewater Discharge	10
2.3 Ambient Monitoring	11
2.4 Data Collection and reporting	12
2.5 Pollutant Release and Transfer Register - report for previous year	12
2.6 Pollutant Release and Transfer Register - report for current year	12
3.0 COMPLAINT AND INCIDENT REPORTS	13
3.1 Complaints Summary	13
3.2 Reported Incidents Summary	13
4.0 INFRASTRUCTURAL ASSESSMENT & PROGRAMME OF IMPROVEMENTS	14
4.1 Treatment Capacity	14
4.2 Storm Water Overflow and Identification Report	14
4.3 Report on progress and proposals to meet the Improvement Programme requirements	15
APPENDIX A – Summary of Effluent Data and Non Compliance tests recorded in 2011	16
APPENDIX B – AER / PRTR Emissions Data	17

List of Tables

		Page
Table 1	Wastewater treatment plant influent monitoring results.	6
Table 2	Influent BOD Calculation sheet.	7
Table 2.1	Removal Efficiencies for P and N	7
Table 3	Primary discharge point monitoring results for flows January to June 2011	8
Table 4	Primary discharge point monitoring results for flows July to December 2011	9
Table 5	Monitoring of Primary wastewater discharge point (Effluent)	10
Table 6	Ambient monitoring results – Upstream	11
Table 7	Ambient monitoring results – Downstream	11
Table 8	Complaints summary	13
Table 9	Incidents summary	13

1. INTRODUCTION

The Environmental Protection Agency on 17th September 2010 granted South Tipperary County Council a Wastewater Discharge Licence (Register No D0443-01) in respect of the agglomeration named Killenaule. One of the provisions of the licence (Condition 6.10) is that the Council submit to the Agency at the end of the year an 'Annual Environmental Report' (AER) to provide a summary of activities relevant to the discharges for that year. This is the second Annual Environmental Report (AER) for Killenaule Wastewater Treatment Plant and includes the information specified in Schedule D of the licence.

This AER has been prepared in accordance with the Environmental Protection Agency (EPA) document: - "Guidance on the Preparation & Submission of the Annual Environmental report (AER) for Waste Water Discharge Licences.

1.1 Site Information

The Killenaule Wastewater Treatment Plant is located at Killenaule, Co. Tipperary (National Grid Reference of E222507 , N146042). The sewer network is generally a combined sewer system with the more recent housing developments to the east of the village having installed separate foul and surface water systems. The sewage flows by gravity to a pumping station located within the site of the wastewater plant.

The Killenaule wastewater treatment plant is operated under a Design Build Contract (DBO) by AECOM Ltd, who were awarded the contract in 2002. The plant is designed to treat a population equivalent of 1,200 pe.

The plant operates the following process units as required, an activated sludge process, screening, grit removal, storm treatment, biological treatment (oxidation ditch), final settlement, phosphorus removal using aluminium chloride, tertiary filtration, sludge thickening and storage.

An audit of the Killenaule Wastewater Treatment Plant was also undertaken by the EPA in December 2011.

1.2 Primary Discharge Point SW1

The Primary Discharge Point SW1, discharges to the Killenaule stream at 222538E, 145960N. It should be noted that there are no secondary wastewater discharges.

1.3 Storm Water Overflows

There are 3 stormwater overflow discharge locations each of which when operational discharges to the Killenaule stream. The locations are as follows:

- SW2 located at 222536 E 146040 N – overflow from storm tank at WWTP
- SW3 located at 222515 E 146075 N – overflow from pumping station at WWTP
- SW4 located at 222401 E 146357 N – on the Ballingarry road

1.4 Wastewater Treatment Plant Management

Killenaule wastewater treatment plant is operated and managed on behalf of South Tipperary County Council by AECOM Ltd. Kingswood Drive, City west Business Campus, Dublin 24.

2. SUMMARY OF MONITORING REPORTS

2.1 Summary report on monthly influent monitoring

Table 1 is a tabular presentation of the wastewater treatment plant influent monthly monitoring results for BOD, COD, Suspended Solids, Total Nitrogen and Total Phosphorus as required by Condition 4.14 of the Discharge Licence. Also included are influent monitoring results for Ammonia (N) and pH.

Table 1: Waste water treatment plant influent monitoring results for Killenaule WWTP.

Date	Flow	BOD	COD	SS	TN	TP	ph	Amm
11/1/2011	746	44	95	72	16.3	2.39	7.5	4.7
8/2/2011	740	32	64	33	9.9	0.92	7.5	1.8
8/3/2011	547	56	113	49	22.3	2.16	7.8	7.1
5/4/2011	289	160	333	145	56	6.8	8.1	31.2
4/5/2011	170	200	381	202	63	7.17	8.1	38.3
8/6/2011	629	185	311	234	45.4	5.77	7.5	27.7
5/7/2011	340	93	174	86	28.3	3.4	7.7	14.7
9/8/2011	257	228	524	365	26.6	5.62	7.4	13.4
6/9/2011	222	155	276	132	47.8	5.44	7.9	33.1
11/10/2011	237	150	411	195	62.4	7.44	7.8	52.5
8/11/2011	629	65	117	66	21.5	2.67	7.6	7.8
6/12/2011	247	55	92	57	9.4	1.23	7.4	2.7
Average		119	241	136	34.1	4.25	7.7	19.6

Determination of the Population Equivalent load to the WWTP

The total influent for the year 2011 was 158,875 m³ per Tables No 3 and No 4

The flow weighted averaged influent BOD as calculated per Table 2 below is 98.6 mg/l

Killenaule population equivalent was determined by the following formula:

Total Influent Flow for 2011 x flow-weighted averaged influent BOD divided by (0.06x365x1000).

Therefore the PE = (158,875 x 98.6) / (0.06 x 365 x 1000) = **715**

Table 2: Influent BOD Calculation sheet

Date	Influent Flow m ³ /day	Influent BOD mg/l	Influent BOD (Kg)
11/1/2011	746	44	32.8
8/2/2011	740	32	23.7
8/3/2011	547	56	30.6
5/4/2011	289	160	46.2
4/5/2011	170	200	34
8/6/2011	629	185	116.4
5/7/2011	340	93	31.6
9/8/2011	257	228	58.6
6/9/2011	222	155	34.4
11/10/2011	237	150	35.6
8/11/2011	629	65	40.9
6/12/2011	247	55	13.6
Total	5053 m³		498.4 Kg

The Flow weighted average BOD is $498.4 \text{ Kg} \times 1000 / 5053 \text{ m}^3 = 98.6 \text{ mg/l}$

2.2 Discharges from the agglomeration

The primary discharge point monitoring results for the parameters as set out in Schedule B.1 of the licence is presented in tabular form on the following Tables 3, 4, and 5. Tables 3 and 4 contain daily flows (m³/day)

The highest daily flow of 1403 m³ was recorded on 1/1/2011

The lowest daily flow of 97 m³/day was recorded on 17/10/2011

The average daily flow for 2011 was 435 m³ /day

The total flow for the year 2011 was 158,875 m³

2.2.1 Nutrient Removal Efficiencies

A summary of the nutrient removal efficiencies for N and P are given in Table 2.1 below. The removal efficiency was calculated at 64 % for TN and 95 % for TP based on annual average figures.

Table 2.1 Removal Efficiencies for P and N

Annual Average Influent TN (mg/l)	Annual Average Effluent TN (mg/l)	Removal Efficiency %
34.1 mg/l	12.4 mg/l	64%
Annual Average Influent TP (mg/l)	Annual Average Effluent TP (mg/l)	Removal Efficiency
4.25 mg/l	0.21 mg/l	95%

Table 3: Primary discharge point daily monitoring results as set out in Schedule B.1 of the licence for Flow (m3/day) for the months of January to June 2011

Day	January	February	March	April	May	June
1	1403	310	433	258	289	269
2	203	246	513	321	289	247
3	204	295	494	275	126	294
4	298	479	409	276	170	344
5	396	624	593	289	404	343
6	397	625	594	394	497	135
7	383	589	337	270	564	320
8	553	740	547	254	492	629
9	524	739	488	302	491	539
10	525	797	342	227	449	509
11	746	708	397	228	392	499
12	660	864	515	191	427	499
13	724	854	516	351	371	317
14	631	655	182	377	505	409
15	886	755	599	362	504	301
16	732	767	271	377	321	231
17	731	737	211	378	457	488
18	758	694	212	202	444	430
19	780	860	269	358	446	429
20	683	655	269	231	346	164
21	714	655	177	216	212	249
22	510	598	297	301	598	397
23	345	700	266	208	305	290
24	346	681	293	209	419	317
25	362	607	212	335	280	681
26	371	638	273	133	463	479
27	328	604	189	212	420	479
28	292	605	190	245	540	323
29	303		224	212	271	313
30	304		267	240	271	258
31	196		361		429	

Table 4: Primary discharge point daily monitoring results as set out in Schedule B.1 of the licence for Flow (m3/day) for the months of July to December 2011.

Day	July	August	September	October	November	December
1	280	258	156	599	258	838
2	230	219	164	599	620	804
3	229	275	344	374	836	892
4	180	269	345	487	738	740
5	340	259	115	405	814	739
6	428	334	222	407	813	836
7	422	334	225	378	566	789
8	563	152	270	314	629	797
9	747	257	225	314	599	780
10	747	253	409	210	536	863
11	425	427	260	237	386	863
12	377	221	260	302	726	621
13	150	237	206	115	725	813
14	475	190	188	208	556	807
15	636	189	200	261	583	817
16	759	241	237	260	466	845
17	758	191	215	97	875	846
18	269	176	293	250	414	844
19	540	164	292	211	844	655
20	268	240	263	190	681	729
21	281	122	235	191	680	704
22	489	124	244	202	730	723
23	435	163	210	340	708	721
24	434	163	283	707	791	917
25	208	220	343	714	759	637
26	436	173	344	866	814	638
27	264	183	274	741	814	577
28	320	183	247	700	558	659
29	254	124	305	555	674	645
30	259	159	158	556	828	694
31	258	149		706		809

2.2.2 Monitoring of Primary Wastewater Discharge SW1

Table 5 below shows the results for the parameters BOD, COD, Suspended Solids, TN, TP, FOG, Ortho P, Ammonia (N), Nitrate, Nitrite, Conductivity and pH in accordance with Schedule B1 of the Discharge Licence

The discharge monitoring results demonstrate that the wastewater treatment plant is operating well and within the Discharge limits as set out in Schedule A1 of the licence, taking into account the maximum number of ELV exceedences allowable per Schedule B2.

Table 5 Monitoring of the Primary Wastewater Discharge SW1

	BOD mg/l	COD mg/l	SS mg/l	TN mg/l	TP mg/l	FOG mg/l	Ortho P mg/l	Amm mg/l	Nitrate mg/l	Nitrite mg/l	Condt uS/cm	pH
11/1/2011	2	15	5	9.8	0.07	NT	0.04	0.1	9.8	0.5	524	7.6
8/2/2011	2	18	9	6.7	0.25	NT	0.11	0.1	6.5	0.5	405	7.9
8/3/2011	2	15	5	12.6	0.14	10	0.1	0.1	13.2	0.5	536	7.7
5/4/2011	2	15	5	11.7	0.25	10	0.18	0.1	11.8	0.5	572	7.7
4/5/2011	2	19	5	12.8	0.15	NT	0.13	0.1	13.1	0.5	633	7.7
8/6/2011	2	15	5	9.1	0.39	NT	0.33	0.1	9.5	0.5	613	7.7
5/7/2011	2	15	5	13.9	0.34	NT	0.30	0.1	14.3	0.5	602	7.8
9/8/2011	2	15	5	18.8	0.42	NT	0.38	0.1	19.4	0.5	597	7.7
6/9/2011	2	15	3	18.0	0.15	NT	0.13	0.1	18.5	0.5	607	7.6
11/10/2011	2	15	3	18.4	0.12	NT	0.08	0.1	18.1	0.5	574	7.8
8/11/2011	2	15	5	9.3	0.15	NT	0.09	0.1	10.0	0.5	441	7.7
6/12/2011	2	15	3	7.5	0.13	5	0.04	0.1	7.1	0.5	408	7.7
Average	2	15.6	4.8	12.4	0.21	8.3	0.16	0.1	12.6	0.5	543	7.7

Comment:

An analysis of the results and compliance with licence requirements are given in Appendix A of this AER. On the 8/2/2011 the Suspended Solids exceeded the ELV set out in the licence. This was likely due to transient operational works at the plant.

2.3 Ambient monitoring summary

The ambient monitoring results for the parameters as set out in **Schedule B.3** of the licence is presented in table No 6 (Upstream) and table No 7 (Downstream)

Table 6 Ambient monitoring at aSW-I U upstream of SW I (222487E 146121N)

SampleDate	Ammonia(N)	BOD	Dissolved Oxygen	Ortho-phosphate	pH
	mg/l as N	mg/l	mg/l	mg/l as P	
25/01/2011	0.05	1.44	NT	0.037	8.06
29/03/2011	0.02	2.26	10.52	0.028	7.65
23/08/2011	0.05	1.14	8.61	0.0409	7.58

Table 7 Ambient monitoring at aSW-Id downstream of SW I (222587E 145960N)

SampleDate	Ammonia(N)	BOD	Dissolved Oxygen	Ortho-phosphate	pH
25/01/2011	0.06	1.2	10.2	0.034	7.65
29/03/2011	0.03	2.68	10.42	0.029	7.61
23/08/2011	0.061	1.44	8.5	0.049	7.31

Small Stream Risk Score Assessment

SSRS Score Upstream 3.2

SSRS Score Downstream 3.2

2.4 Data and reporting requirements under the Urban Waste Water Treatment Directive

It is confirmed that the annual urban wastewater information for agglomerations and treatment plants with a population equivalent greater than 500 for the year 2011 was submitted to the EPA in electronic form in 2011.

2.5 Pollutant Release and Transfer Register (PRTR) – Report for previous year (2011)

This information has been submitted electronically to the EPA.

Both the AER/PRTR Emissions Data information (i.e all relevant worksheets including the Facility ID and Activities sheet) has been printed out and included in this section of the AER -see Appendix B attached.

2.6 Pollutant Release and Transfer Register (PRTR) – Report for current year.

This requirement is covered under the electronic submission in 2.5 above and no further details are included as part of this AER.

3.0 Complaint and Incident Reports

3.1 Complaints summary

There were no complaints of an environmental nature related to the discharge to water from the Killenaule Wastewater Treatment plant in 2011.

Table 8: Complaints

Date and Time	Name of Complainant	Nature of Complaint	Response to Complaint	Closed (Y/N)
None	None	None	None	N/A

3.2 Reported Incidents Summary

There was no recorded incident in relation to the Killenaule Wastewater Treatment facility in 2011.

Table 9: Incidents Summary

Date and Time	Incident Description	Authorities Contacted	Corrective Action	Closed (Y/N)
None	None	None	None	N/A

4.0 Infrastructural Assessments and Programme of Improvements

4.1 Treatment capacity

The total influent flow for the year 2011 was 158,875 m³ per Tables No3 and No 4

The flow-weighted averaged influent BOD as calculated per Table 2 is 98.6 mg/l

The Killenaule population equivalent was determined at 715 pe, while the design pe for the plant is 1,200 pe. This demonstrates that the plant is operating within its treatment and design capacity at present.

4.2 Report on Storm Water overflow identification and inspection.

The operation of the storm water overflows (SWOs) was assessed under the criteria set out in Section 4 of the Urban Waste Water Treatment Directive (91/271/EEC) – Procedures and Criteria in relation to Storm Water Overflows. The following criteria were assessed.

1. Causes significant visual or aesthetic impact and public complaints

The storm water overflows SW 2 and SW 3 are located within the treatment plant site and do not cause a visual or aesthetic impact or public complaint issue. SW 4 is located on the western side of the bridge on the Ballingarry road (R691) and similarly does not create a visual or aesthetic or public complaint issue.

2. Causes deterioration in water quality in the receiving water

The storm water overflows do not cause any deterioration of water quality in the receiving water.

3. Gives rise to failure in meeting the requirements of National Regulations on foot of EU Directives (Bathing Water etc):

The receiving water is not a designated bathing area.

4. Operates in dry weather

The storm water overflow system does not operate in dry weather flow conditions.

5.0 Report on progress made and proposals being developed to meet the Improvement

Programme requirements (Infiltration Assessment).

The discharge licence under Schedule C and Condition 5 requires an assessment and plan for Implementation of Improvement works in relation to infiltration.

In 2011 Water Services undertook an assessment and survey of the foul and storm sewer network in part of the agglomeration. This concentrated in the north and west of the village where problems with infiltration had been identified previously. It also included a survey and assessment within a number of housing developments in the area.

The survey identified infiltration to the network in both the foul and storm sewers.

Initial findings would indicate that there is a need to undertake works to fully separate the foul and storm networks along with works to eliminate infiltration by ground water.

Further investigations are required to be carried in 2012 on the network.

It is the intention of Water Services to develop and finalise a plan of improvement works in relation to infiltration and seek funding for same to ensure implementation and completion of such works by December 2015 as required by the licence.

6.0 Report on measures taken to address the supplementary measures for the sub-basin water body

Killenaule

Water Services corresponded with the Agency (EPA) in July 2010 in relation to this requirement.

The supplementary measures set out in the River Basin Management Plan for the SERBD required that STCC investigate the need for tertiary treatment or for a relocation of the outfall.

Tertiary treatment has been installed at the Killenaule WWTP plant. This tertiary treatment includes upflow moving bed sand filtration and chemical phosphorus removal facilities.

The report to the Agency (EPA) concluded that there was no advantage to relocating the outfall further downstream of the Clashawley river and relocating the discharge to a point downstream of the confluence of the two branches of the Clashawley as it was cost prohibitive and has potential to impact

on the Lower River Suir cSAC. It was therefore considered unfeasible to relocate the outfall and it is proposed therefore that the existing outfall point remain unchanged.

In this regard it is noted that biological assessments carried out by the EPA indicate that there has been no significant deterioration in Q values at station 16C01100 (1.0km downstream of Killenaule).

The enhanced level of treatment at Killenaule, combined with continued operation of the wastewater treatment plant to the high standard demonstrated in the results in this AER report and continued strict adherence to the Urban Waste Water Treatment Regulations standards will continue to ensure that the plant does not have any significant environmental impacts on the existing receiving water.

Appendix A

Summary of Killenaule Effluent Data and Non compliant tests recorded in 2011

Sample From Effluent		Ammonia mg/l as N	Suspended Solids mg/l	cBOD 5d with nitrification inhib mg/l	Chemical Oxygen Demand mg/l	pH Value pH unit	Total Phosphorus (as P) mg/l	Soluble Reactive Phosphorus (as P) mg/l	Total Nitrogen (as N) mg/l
elv		1	5	4	50	6-9		0.5	
Killenaule	11/01/2011	0.1	<5	<2	<15	7.6	0.07	0.04	9.8
Killenaule	08/02/2011	0.1	9	2	18	7.9	0.25	0.11	6.7
Killenaule	08/03/2011	0.1	<5	<2	<15	7.7	0.14	0.1	12.6
Killenaule	05/04/2011	0.1	<5	<2	15	7.7	0.25	0.18	11.7
Killenaule	04/05/2011	0.1	<5	<2	19	7.7	0.15	0.13	12.8
Killenaule	08/06/2011	0.1	<5	<2	<15	7.7	0.39	0.33	9.1
Killenaule	05/07/2011	0.1	<5	<2	<15	7.8	0.34	0.3	13.9
Killenaule	09/08/2011	0.1	<5	<2	<15	7.7	0.42	0.38	18.8
Killenaule	06/09/2011	0.1	<3	<2	<15	7.6	0.15	0.13	18
Killenaule	11/10/2011	0.1	<3	<2	<15	7.8	0.12	0.08	18.4
Killenaule	08/11/2011	0.1	5	<2	<15	7.7	0.15	0.09	9.3
Killenaule	06/12/2011	0.1	<3	<2	<15	7.7	0.13	0.04	7.5
No Tests		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Maximum		0.1	9.0	2.0	19.0	7.9	0.42	0.38	18.8
Average Value		0.1	4.8	2.0	15.6	7.7	0.2	0.16	12.4
No samples Failing		0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Compliance with licence		Yes	yes	yes	yes	yes	n/a	yes	n/a