

SOUTH TIPPERARY COUNTY COUNCIL



KILLENAULE

WASTEWATER DISCHARGE LICENCE

REGISTER NUMBER D0443-01

ANNUAL ENVIRONMENTAL REPORT

1st JANUARY 2012 to DECEMBER 31ST 2012

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1.0 INTRODUCTION and EXECUTIVE SUMMARY

1.1 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 third 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 for 2012"

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 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.

1.2 Executive Summary

The Killenaule wastewater treatment plant has continued to operate effectively in this reporting period. The treatment plant is operated and managed on behalf of South Tipperary County Council by AECOM Ltd under a 20 year DBO contract agreement.

A review of the final effluent results and compliance with the Emission Limit Values set out in licence shows that there was no exceedence of the ELV for BOD which had an average effluent value of 2.17 mg/l against an ELV of 4 mg/l while Suspended Solids and COD had effluent values of 3.58mg/l and 15mg/l against ELV's of 5 mg/l and 50 mg/ l respectively. The average effluent value for Ammonia was 0.10 mg/l against an ELV of 1mg/l.

The total flow for the year was 198,237 m³ while the current flow weighted average influent BOD to the plant is 90.83 mg/l giving a current pe loading of the plant of 820 pe. This compares with a plant design of 1,200 pe.

The average flow for the year was 542 m³ /day against a plant design of 804 m³/day which indicates that the plant is operating within it's hydraulic and treatment capacities.

A review of the ambient monitoring results for upstream and downstream of SW1 indicates that the discharge is having no adverse impact on the quality of the receiving waters.

The percentage reductions shown in the treatment efficiency report summary table No 6 show that reductions of 98%, 92% and 97 % were achieved in BOD, COD and Suspended Solids respectively.

A reduction of 99% was achieved in the Ammonia levels while nutrient removal efficiencies for TP and TN were 92% and 61 % respectively.

2.0 MONITORING REPORTS SUMMARY

2.1 Summary report on monthly influent monitoring

Table 1 below is a tabular presentation of the wastewater treatment plant influent monthly monitoring results for BOD, COD, Suspended Solids, Total Nitrogen, Total Phosphorus, Ammonia (N) and pH. Also set out below is the calculation of the pe equivalent load and flow weighted average BOD load for the WWTP.

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

	Flow (m ³ /day)	BOD (mg/l)	COD (mg/l)	Suspended Solids (mg/l)	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)	Ammonia (mg/l)	pH (value)
10/01/2012	546	46	83	54	12.3	1.25	4	7.7
07/02/2012	483	76	98	79	27.7	2.85	9.9	7.7
21/03/2012	341	123	236	165	36.6	4.23	19.2	7.9
03/04/2012	260	263	426	279	37.2	5.87	24.9	7.8
01/05/2012	484	78*	206	149	17.6	2.56	8.3	7.5
12/06/2012	754	51	85	36	10.5	1.17	3.2	7.5
03/07/2012	749	31	55	24	11.7	1.32	3	7.5
08/08/2012	839	64	109	45	20.1	1.95	6.8	7.5
04/09/2012	461	102	182	62	35.7	3.7	13.9	7.6
02/10/2012	290	245	327	152	53.2	6.67	28.7	7.9
06/11/2012	668	120	235	194	29.3	3.35	12.6	7.6
11/12/2012	529	110	205	125	25.5	3.41	8.2	7.7
Average		112	187	114	26.5	3.2	11.9	7.7

Calculation of the Population Equivalent load to the WWTP

The total influent for the year 2012 was 198,237 m³ per Table No 5 below

The flow weighted averaged influent BOD as calculated per Table 2 below is 90.83 mg/l

Killenaule population equivalent was determined by the following formula:

Total Influent Flow for 2012 x flow-weighted averaged influent BOD divided by (0.06x366x1000).

Therefore the pe = (198,237 x 90.83) / (0.06 x 366 x 1000) = **820**

Table 2: Calculation of the Flow weighted average BOD for 2012

Sample Date	Flow (m3/day)	cBOD 5d with nitrification inhib (mg/l)	BOD (kg/d)
10/01/2012	546	46	25.116
07/02/2012	483	76	36.708
21/03/2012	341	123	41.943
03/04/2012	260	263	68.38
01/05/2012	484	78	37.752
12/06/2012	754	51	38.454
03/07/2012	749	31	23.219
08/08/2012	839	64	53.696
04/09/2012	461	102	47.022
02/10/2012	290	245	71.05
06/11/2012	668	120	80.16
11/12/2012	529	110	58.19
Total	6404		581.69

The Flow weighted average BOD is $581.69 \text{ Kg} \times 1000 / 6404 \text{ m}^3 = \mathbf{90.83 \text{ mg/l}}$

2.2 Discharges from the agglomeration

Presented below in Tables 3 and 4 are the primary discharge point monitoring effluent results for the parameters as set out in Schedule B of the licence and a summary of the effluent monitoring and overall compliance with the licence Emission Limit Values (ELV's).

Table 3 : Tabular presentation of the wastewater treatment plant effluent monitoring results with the associated Emission Limit Values (ELV's).

Date	Flow out m3/day	BOD mg/l	COD mg/l	S S mg/l	T N mg/l	Total P mg/l	Ortho P mg/l	Ammonia mg/l as N	Nitrate mg/l as N	Cond @ 25C uS/cm	pH value	Nitrite Mg/l as N
ELV		4 mg/l	50mg/l	5 mg/l	n/a	n/a	0.5 mg/l	1 mg/l	n/a	n/a	6 to 9	n/a
10/01/2012	546	2	15	6	10	0.66	0.5	0.1	9.9	444	8	0.5
07/02/2012	483	4	15	3	9.7	0.08	0.04	0.1	9.8	563	7.7	0.5
21/03/2012	341	2	15	3	14.8	0.36	0.31	0.1	14.9	516	7.6	0.5
03/04/2012	260	2	15	3	9.3	0.31	0.26	0.1	8.7	590	7.8	0.5
01/05/2012	484	2	15	4	14.1	0.22	0.16	0.1	12.7	512	7.8	0.5
12/06/2012	754	2	15	3	8.3	0.13	0.11	0.1	7.9	470	8	0.5
03/07/2012	749	2	15	3	6	0.14	0.11	0.1	5.7	373	7.8	0.5
08/08/2012	839	2	15	3	9.9	0.43	0.34	0.1	9	484	7.8	0.5
04/09/2012	461	2	15	3	10	0.2	0.18	0.1	10.1	490	7.9	0.5
02/10/2012	290	2	15	4	18.3	0.24	0.17	0.1	16.5	525	7.8	0.5
06/11/2012	668	2	15	3	7.6	0.13	0.07	0.1	7.3	430	7.7	0.5
11/12/2012	529	2	15	5	7.2	0.1	0.1	0.1	7.1	451	7.8	0.17
Average		2.17	15.00	3.58	10.43	0.25	0.20	0.10	9.97	487.33	7.81	0.47

Table 4: Summary of the Effluent Monitoring and Compliance

	BOD	COD	SS	TN	Ortho P	Ammonia	pH
WWDL ELV	4 mg/l	50 mg/l	5 mg/l	n/a	0.5 mg/l	1 mg/l	6 to 9
No of sample results	12	12	12	12	12	12	12
No of sample results above ELV	0	0	1	0	0	0	0
Annual Mean	2.17	15	3.58	n/a	0.20	0.1	7.81
Overall Compliance	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Table 5: Killenaule WWTP Primary discharge point flow recordings (m3/day) for 2012 as required under Schedule B (Monitoring) of the discharge licence.

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1	809	788	345	178	484	307	662.5	657	673	205	463	816
2	842	723	326	177	673	436	662.5	607	673	290	477	678
3	351	701	486	260	747	840	749	698	479	316	562	678
4	792	744	312	184	630	840	757	491	461	273	562	683
5	761	573.5	312	266	576	478	720	861	385	361	365	761
6	809	573.5	284	307	576	695	728	861	463	328	668	656
7	855.5	483	339	349.7	679	827	901	416	340	328	640	709
8	855.5	455	346	349.7	469	642	901	839	377	322	615	828.5
9	820	417	606	349.7	674	851	350	550	305	343	825	828.5
10	546	420	414	167	615	772	693	466	305	311	634	565
11	710	698	312	492	738	772	705	600.5	736	583	607.5	529
12	530	538	312	296	668	754	671	600.5	493	812	607.5	629
13	543	538	360	316	668	767	695	566	490	1001	683	606
14	438	629	279	294	585	782	657	813	323	624.5	696	621
15	406	631	235	294	586	732	687	777	369	624.5	787	563.5
16	406	654	281	220	453	818.5	687	563	270	696	793	563.5
17	398	637	531.5	395	383	818.5	717	705	270	739	575.5	591
18	394	592.5	531.5	496	412	641	731	776	365	622	575.5	604
19	266	592.5	252.5	381	405	804	672	776	277	711	689	575
20	424	320	252.5	285	405	782	596	531	303	674.5	833	641
21	418	366	341	549	246	774	527	585	282	674.5	789	658
22	318.5	415	506	301	305	777	440	495	358	626	902	859.5
23	318.5	562	424	301	345	854	440	102	230.5	657	685	859.5
24	390	400	362	310	237	749.5	404	409	230.5	645	860	529
25	323	407	362	294	262	749.5	667	381	453	596	860	926
26	543	388	177	440	291	709	377	381	541	517	677	926
27	773	388	284	425	291	674	354	154	369	487	707	452
28	631	374	286	335.5	209	777	466	713	330	487	775	778
29	683.5	350	295	335.5	257	820	466	737	395	454	861	729
30	683.5		251	364	247	955	166	775	776	213	659	796
31	782		357		380		344	776	395	529		797
	17820	15358	10762	9712	14496	22198	18593	18662	12717	16050	20433	21436

Total	198237
Min	102
Max	1001
Ave	542

2.3 Treatment Efficiency Report

Presented below in Table 6 is a summary of the efficiency of the treatment process including information for all the parameters specified in the licence.

Table 6: Treatment Efficiency Report Summary Table

	cBOD	COD	SS	TN	TP	Ammonia
Influent Mass Loading (Kg/day)	60.7	101	62	14.36	1.73	6.45
Effluent Mass Loading (Kg/day)	1.18	8.13	1.94	5.65	0.14	0.05
% Efficiency Reduction	98%	92%	97%	61%	92%	99%

2.4 Treatment Capacity Report

Presented below in Table 7 is a summary of the current and remaining treatment capacity of the treatment process.

Table7 : Treatment Capacity Report Summary Table

Hydraulic Capacity – Design	804 m ³ /day @ 3dwf
Hydraulic Capacity – Current Loading	542 m ³ /day
Hydraulic Capacity – Remaining	262 m ³ /day
Organic Capacity – Design (pe)	1,200 pe
Organic Capacity – Current Loading (pe)	820 pe
Organic Capacity – Remaining (pe)	380 pe
Will the capacity be exceeded in the next 3 years	No

2.5 Ambient monitoring summary

The ambient monitoring results for the parameters as set out in Schedule B of the licence is presented in table No 8 (Upstream) and table No 9 (Downstream) below. Also presented in Table 10 is a summary of the ambient monitoring. The monitoring results indicate that the discharge is not having any significant impact on the quality of the receiving water.

Table 8: Ambient monitoring at aSW-I U upstream of SW I (222487E 146121N)

Station Name	Date	Amm mg/l as N	BOD mg/l O2	D O mg/l O2	Ortho P (mg/l)	pH (value)	Temp deg C	TN (mg/l)
U\S WWTP	27/03/2012	0.5418	3.46	351	10.74	0.1	8.07	12.2
U\S WWTP	27/06/2012	0.3686	5.87	NT	AR	0.16	7.712	15.5
U\S WWTP	13/09/2012	0.0716	0.46	AR	9.65	0.05	7.93	15
U\S WWTP	11/12/2012	0.07	0.92	367	12.2	0.03	7.75	5.2
U\S WWTP	Average Value	0.26	2.68	359.00	10.86	0.09	7.87	11.98
U\S WWTP	Maximum Value	0.54	5.87	374.00	12.20	0.16	8.07	3.80
	95% Percentile	0.52	5.51	366.20	12.05	0.15	8.05	15.43

Table 9: Ambient monitoring at aSW-Id downstream of SW I (222587E 145960N)

Station Name	Date	Amm (mg/l)	BOD (mg/l)	D O (mg/l)	O-phos (mg/l)	pH (value)	Temp deg C	TN (mg/l)
D\S WWTP	27/03/2012	0.1414	2.05	374	9.81	0.11	7.74	11.6
D\S WWTP	27/06/2012	0.317	2.42	NT	AR	0.12	7.692	17.4
D\S WWTP	13/09/2012	1.2128	1.37	AR	8.66	0.1	7.53	15.1
D\S WWTP	11/12/2012	0.07	1.17	373	11.71	0.03	7.441	6.1
D\S WWTP	Average Value	0.44	1.75	373.50	10.06	0.09	7.60	12.55
D\S WWTP	Maximum Value	1.21	2.42	374.00	11.71	0.12	7.74	17.40
D\S WWTP	95% Percentile	1.08	2.36	373.95	11.52	0.12	7.73	17.06

Small Stream Risk Score Assessment:

SSRS Score Upstream

3.2

SSRS Score Downstream

3.2

2.6 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 2012 was submitted to the EPA in electronic form in 2012.

2.7 Pollutant Release and Transfer Register (PRTR)

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 AER.

-see Appendix A attached.

3.0 OPERATIONAL REPORTS SUMMARY.

3.1 Complaints summary

There were no complaints of an environmental nature related to the discharge to water from the Killeanule Wastewater treatment Plant in 2012.

Table 11: Complaints

Number	Date and Time	Nature of Complaint	Cause of Complaint	Actions taken to resolve issue	Closed (Y/N)
N/A	N/A	None	None	N/A	N/A

3.2 Reported Incidents Summary

There was no recorded incidents in relation to the Killeanule Wastewater Treatment Plant in 2012.

Table 12: Incidents Summary

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

Table 13: A summary of the incident details as required in the EPA reporting guidelines is set out below

No of Incidents in 2012	None
Number of Incidents reported to the EPA via EDEN in 2012.	None
Explanation of any discrepancies between the Two numbers above.	N/A

4.0 INFRASTRUCTURAL ASSESSMENT & PROGRAMME OF IMPROVEMENTS

4.1 Report on Storm Water overflow identification and inspection.

This report was submitted to the Agency (EPA) in the 2011 AER submission.

Presented below in Table 14 is the SWO Identification and Inspection Summary Report.

Table 14: SWO Identification and Inspection Summary Report Table

Is each SWO Identified as non complaint with DoEHLG included in the Programme of Improvements	No SWO Identified as non-complaint
Does the SWO assessment include the requirements of Schedule A3 and C3	No Improvement works specified in the Licence
Has the EPA been advised of any additional SWO's / changes to Schedule CE and A4 under Condition 1.7	No additional SWO's / changes to Schedule C3 and A4 under Condition 1.7 required or identified.

4.2 Report on progress made and proposals to meet the Improvement Programme Requirements

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.

Some further investigations were 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.

4.3 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 2012 in relation to this requirement.

A summary of the issue is set out as follows.

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.

4.4 Sewer Integrity Risk Assessment

A sewer integrity risk assessment will be carried out on the Killenaule Agglomeration following further investigation of the network in 2013 as outlined above. This assessment will be submitted to the Agency as part of the AER due in 2014.

5.0 ENVIRONMENTAL LIABILITY AND FINANCIAL PROVISIONS

5.1 Environmental Liabilities and Financial Charges

The licensee has in place funding to meet the financial charges associated with the monitoring and enforcement costs payable to the Agency (EPA). These payments are made on an annual basis. The current annual cost for the Killenaule Agglomeration is €2,968.

Financial provisions in relation to underwriting of potential costs for remedial actions in the event of accidents or other Environmental Liabilities will need to be assessed by the Local Authority.

6.0 RISK BASED ASSESSMENTS (Priority Substances)

6.1 Priority Substances Assessments

The requirement for a risk based assessment to identify the possible presence of priority substances is not specifically set out in the Discharge Licence. However the Licensee has prepared and submitted to the Agency (EPA) the PRTR report for 2012 – see attached Appendix A.

7.0 CERTIFICATION & SIGN OFF

I certify that this Annual Environmental Report (AER) for the reporting year 2012 for the Waste Water Discharge Licence No D0443-01 in respect of the Killenaule Agglomeration is representative and accurate.

Signed:

Dated:

Mr Jimmy Harney

Acting Director of Services

Environment and Water Services

South Tipperary County Council

APPENDIX A

AER /PRTR Emissions Data