

# Annual Environmental Report 2015

<b>Agglomeration Name:</b>	<b>Carlanstown</b>
<b>Licence Register No.</b>	<b>D0488-01</b>



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## Section 1. Executive Summary and Introduction to the 2015 AER

### 1.1 Summary Report on 2015

This Annual Environmental Report has been prepared for **D0488-01, Carlanstown**, in County **Meath**, in accordance with the requirements of the wastewater discharge licence for the agglomeration.

The specified report included in this AER is as follows:

- Sewer Integrity Assessment

The agglomeration is served by a wastewater treatment plant with a Design PE of 820. The treatment process includes the following:-

- Preliminary Treatment (Screening)
- Secondary Treatment (Diffused Aeration)
- Nutrient Removal (Dosing of Ferric Sulphate to achieve phosphate removal)

The final effluent from the Primary Discharge Point was non-compliant with the Emission Limit Values in 2015.

The following parameters exceeded the emission limit values in 2015:-

- BOD (mg/l)
- COD (mg/l) (2 samples above the ELV and therefore not a fail)
- TSS (mg/l)
- Ortho P (mg/l)
- Ammonia  $\text{NH}_3$  (mg/l)

99,755kgs sludge as dry solids was removed from the wastewater treatment plant in 2015 as dewatered sludge cake. Sludge was transferred to Farganstown Wastewater Treatment Plant.

There were no major capital or operational changes undertaken in 2015.

An Annual Statement of Measures is included in the Appendix 7.1.

## Section 2. Monitoring Reports Summary

### 2.1 Summary report on monthly influent monitoring

**Table 2.1 Influent Monitoring Summary**

2.1.1 Monthly Influent Monitoring	BOD (mg / l)	COD (mg / l)	SS (mg / l)	TP (mg / l)	TN (mg / l)	Hydraulic Loading (m <sup>3</sup> /d)	Organic Loading (PE/Day)
Number of Samples	11	11	11	11	10	0	0
Annual Max.	1117.512	4104	4364	25.6	159	973.08	1,627
Annual Mean	251.93	607.37	397.57	8.62	70.61	116.30	624.08

#### Significance of results

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2

The annual maximum hydraulic loading is greater than the peak Treatment Plant Capacity as detailed further in Section 3.2.

The annual mean organic loading is less than the Treatment Plant Capacity as detailed further in Section 3.2.

The annual maximum organic loading is greater than the Treatment Plant Capacity as detailed further in Section 3.2.

## 2.2 Discharges from the agglomeration

**Table 2.2 - Effluent Monitoring**

<b>2.2.1 Effluent Monitoring Summary</b>	<b>BOD (mg/l)</b>	<b>COD (mg/l)</b>	<b>TSS (mg/l)</b>	<b>Total P (mg/l)</b>	<b>Ortho P (mg/l)</b>	<b>Total N (mg/l)</b>	<b>Ammonia NH<sub>3</sub> (mg/l)</b>
<b>WWDL ELV (Schedule A) where applicable</b>	25	125	35		2		5
<b>ELV with Condition 2 Interpretation included</b>	50	250	87.5		2.4		6
<b>Number of sample results</b>	10	10	10	9	10	9	9
<b>Number of sample results above WWDL ELV</b>	2	2	4		2		5
<b>Number of sample results above ELV with Condition 2 Interpretation</b>	1	0	2		2		4
<b>Annual Mean (for parameters where a mean ELV applies)</b>	19.78	82.17	35.78	1.04	0.86	36.98	11.00
<b>Overall Compliance (Pass/Fail)</b>	Fail	Pass	Fail		Fail		Fail

### Significance of results

The WWTP was non-compliant with the ELV's set in the wastewater discharge licence. There were 9 samples non-compliant with the ELVs in 2015. It appears that the main cause for the failing of the wastewater treatment process in 2015 is due to the low levels of alkalinity in the influent. This has led to the nitrification of ammonium being inhibited. A lower pH has also resulted in a filamentous bloom in the plant which has caused an issue with the settlement in the final clarifier. The impact on receiving waters is assessed further in Section 2.3.

## 2.3. Ambient Monitoring Summary

**Table 2.3. Ambient Monitoring Report Summary Table**

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	EPA Feature Coding Tool code	Receiving Waters Designation (Y/N)				WFD Status	Does assessment of the ambient monitoring results indicate that the discharge is impacting on water quality?
			Bathing Water	Drinking Water	FWPM	Shellfish		
Upstream Monitoring Point	277097, 279109	aSW-1d	n/a	n/a	n/a	n/a	Poor	n/a
Downstream Monitoring Point	276474, 279249	aSW-1u	N	N	N	N	Poor	Yes

The results for the upstream and downstream monitoring are included in the Appendix 7.2.

### Significance of results

- The WWTP was non-compliant with the ELV's set in the wastewater discharge licence as detailed in Section 2.2.
- The discharge from the wastewater treatment plant does have an observable negative impact on the water quality in terms of Ammonium and Ortho-P.
- The discharge from the wastewater treatment plant is likely to be having an observable negative impact on the Water Framework Directive status. It should be noted that the WFD status both upstream and downstream of the discharge is Poor.
- Other potential causes of deterioration in water quality relevant to this area are unknown
- It is noted that consistent achievement with the ELVs would benefit the quality of the receiving water.

## 2.4 Data collection and reporting requirements under the UWWTD

The electronic submission of data was completed on 01/01/2016

## 2.5 Pollutant Release and Transfer Register (PRTR) - report for previous year

A PRTR is not required as the agglomeration is less than 2000 PE.

## Section 3. Operational Reports Summary

### 3.1 Treatment Efficiency Report

	cBOD (kg/yr)	COD (kg/yr)	SS (kg/yr)	Total P (kg/yr)	Total N (kg/yr)
Influent mass loading (kg/year)	13,667	32,950	21,569	467	4,025
Effluent mass emission (kg/year)	596	3,094	1,492	42	1,347
% Efficiency (% reduction of influent load)	96%	91%	93%	91%	67%

### 3.2 Treatment Capacity Report

Table 3.2 - Treatment Capacity Report Summary

Hydraulic Capacity – Design / As Constructed (dry weather flow) (m <sup>3</sup> /year)	36,500
Hydraulic Capacity – Design / As Constructed (peak flow) (m <sup>3</sup> /year)	109,500
Hydraulic Capacity – Current loading (m <sup>3</sup> /year)	42,450
Hydraulic Capacity – Remaining (m <sup>3</sup> /year)	67,050
Organic Capacity - Design / As Constructed (PE)	820
Organic Capacity - Current loading (PE)	624
Organic Capacity – Remaining (PE)	196
Will the capacity be exceeded in the next three years? (Yes / No)	No
Is an upgrade or expansion of the WWTP proposed? (i.e. if on Minor Programme or CIP) (Yes/No)	No

### 3.3 Extent of Agglomeration Summary Report

In this section Irish Water is required to report on the amount of urban waste water generated within the agglomeration. It does not include any waste water collected and created in a private system and discharged to water under a Section 4 Licence issued under the Water Pollution Acts 1977 (as amended).

**Table 3.3 - Extent of Agglomeration Summary Report**

	<b>% of total load generated in the agglomeration</b>
<b>Load generated in the agglomeration that is collected in the sewer network</b>	100%
<b>Load collected in the agglomerations that enters treatment plant</b>	100%
<b>Load collected in the sewer network but discharges without treatment</b>	0%

**Load generated in the agglomeration that is collected in the sewer network** is the total load generated and collected in the municipal network within the boundary of the agglomeration.

**Load collected in the agglomerations that enters treatment plant** is that portion of the previous figure which enters the waste water treatment plant.

**Load collected but discharged without treatment** is that portion of the first figure which is discharged without treatment.

### 3.4 Complaints Summary

A summary of complaints of an environmental nature is included below.

**Table 3.4 - Complaints Summary Table**

<b>Number</b>	<b>Date &amp; Time</b>	<b>Nature of Complaint</b>	<b>Cause of Complaint</b>	<b>Actions taken to resolve issue</b>	<b>Closed (Y/N)</b>
None					



### 3.5 Reported Incidents Summary

A summary of reported incidents is included below:

**Table 3.5.1 - Summary of Incidents**

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
Non-Compliance	This exceedance relates to recorded breaches for the emission limit values for BOD & orthophosphate. On 19/02/2015, a BOD concentration of 128.4 mg/L and orthophosphate concentration of 4.53 mg/l was recorded in the Carlanstown WWTP final effluent. The final effluent BOD and orthophosphate licence permissible limit for Carlanstown WWTP	Unusually high pollutant load that entered the Carlanstown WWTP on the weekend of the 14th of February 2015.	2	Aeration levels within the aeration basin and ferric dosing rates were increased to try and address the issues	EPA, Inland Fisheries Ireland	Yes	No

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
	is 50 mg/l & 2.4 mg/l respectively.						
Non-Compliance	This exceedance report relates to the parameters ammonia and ortho-phosphate which have reportable incident levels of 6 mg/l and 2.4 mg/l respectively. On 30/04/2015 an ortho-phosphate concentration of 2.62 mg/L and an ammonia concentration of 45 mg/l was recorded in the Carlanstown WWTP final effluent.	Treatment of wastewaters in the Carlanstown plant appeared to have been completely arrested with little micro-organism activity other than nocardia in the aeration basin.	2	Immediately following the results the return pumps were placed in hand and DO concentrations altered in order to generate sufficient micro-biological reproduction to enable effective treatment of wastewater. This change in process control resulted in positive feedback of results in the days following this reportable exceedance. By May 1st the ortho-phosphate results were recorded at 0.488 mg/l with output ammonia concentrations recorded at 13.4 mg/l. Further testing of final effluent on May 5th indicated results of 0.199 mg/l ortho-phosphate and	EPA, Inland Fisheries Ireland	Yes	Yes

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
				3.96 mg/l ammonia concentrations in the final effluent sample.			
Non-Compliance	This exceedance report relates to an ammonia exceedance which has a reportable incident level of 6 mg/l. On 21/05/2015 an ammonia concentration of 12.6 mg/l was recorded in the Carlanstown WWTP final effluent.	A poor alkalinity concentration in the influent stream has inhibited the nitrification of ammonia.	1	Daily monitoring and adjusting of DO levels in the aeration tank, in order to ensure adequate oxygenation for the nitrification process to occur, is being conducted by the wastewater services unit. A flow and load survey is being conducted and assessed by Irish Water.	EPA, Inland Fisheries Ireland	Yes	No
Non-Compliance	This exceedance report relates to an ammonia exceedance which has a reportable incident level of 6 mg/l. On 19/08/2015 an ammonia concentration of	A poor alkalinity concentration in the influent stream has inhibited the nitrification of ammonia.	1	Daily monitoring and adjusting of DO levels in the aeration tank, in order to ensure adequate oxygenation for the nitrification process to occur, is being conducted by the wastewater services unit. A flow and load survey was	EPA, Inland Fisheries Ireland	Yes	No

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
	13.5 mg/l was recorded in the Carlanstown WWTP final effluent.			conducted the results of which are now being assessed by Irish Water. Indications are that the alkalinity of the influent is insufficient to maintain the nitrification of ammonia in the treatment plant and thus ammonia concentrations in the final effluent remain high.			
Non-Compliance	This exceedance report relates to an ammonia exceedance which has a reportable incident level of 6 mg/l. On 22/09/2015 an ammonia concentration of 19.9 mg/l was recorded in the Carlanstown WWTP final effluent.	A poor alkalinity concentration in the influent stream has inhibited the nitrification of ammonia.	1	Daily monitoring and adjusting of DO levels in the aeration tank, in order to ensure adequate oxygenation for the nitrification process to occur, is being conducted by the wastewater services unit. A flow and load survey was conducted the results of which are now being assessed by Irish Water. Indications are that the alkalinity of the influent is insufficient to maintain	EPA, Inland Fisheries Ireland	Yes	No

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
				the nitrification of ammonia in the treatment plant and thus ammonia concentrations in the final effluent remain high.			
Non-Compliance	This exceedance report relates to a Suspended Solids exceedance which has a reportable incident level of 87.5 mg/l; however there is a limit on the amount of ELV 1 exceedances at 2 per annum for 12 samples which was exceeded in Octobers round of testing. The ELV 1 exceedance level is 35mg/l. On 16/10/2015, a Suspended Solids concentration of 48.8 mg/l was recorded in the	A complication of filamentous blooms in the plant is the poor settleability of floc in the effluent in the clarifier.	1	A new timer has been introduced on the aeration system to introduce a period of denitrification by creating an anoxic period for 10 minutes every hour. This anoxic period will also address the filamentous issue, reduce bulking and increase the settleability of the floc in the final effluent.	EPA, Inland Fisheries Ireland	Yes	No

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
	Carlanstown WWTP final effluent.						
Non-Compliance	This exceedance report relates to a Suspended Solids exceedance which has a reportable incident level of 87.5 mg/l; however there is a limit on the amount of ELV 1 exceedances at 2 per annum for 12 samples which was exceeded in Octobers round of testing. There was a further exceedance of ELV 1 for SS in November. The ELV 1 exceedance level is 35mg/l. On 9/11/2015, a Suspended Solids concentration of 35.2 mg/l was	A complication of filamentous blooms in the plant is the poor settleability of floc in the effluent in the clarifier.	1	A new timer has been introduced on the aeration system to introduce a period of denitrification by creating an anoxic period for 10 minutes every hour. This anoxic period will also address the filamentous issue, reduce bulking and increase the settleability of the floc in the final effluent.	EPA, Inland Fisheries Ireland	Yes	Yes

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
	recorded in the Carlanstown WWTP final effluent.						

Note 1: For shellfish waters notify the Marine Institute (MI) Sea Fisheries Protection Authority (SFPA) Food Safety Authority (FSAI) and An Bord Iascaigh Mhara (BIM). This should also include any other authorities that should be contacted arising from the findings of any Licence Specific Reports also e.g. Drinking Water Abstraction Impact Risk Assessment, Fresh Water Pearl Mussel Impact Assessments etc.

**Table 3.5.2 - Summary of Overall Incidents**

<b>Number of Incidents in 2015</b>	9
<b>Number of Incidents reported to the EPA via EDEN in 2015</b>	9
<b>Explanation of any discrepancies between the two numbers above</b>	N/A

### 3.6 Sludge / Other inputs to the WWTP

There are no other inputs to the waste water treatment plant.

**Table 3.6 - Other Inputs**

Input Type	m3/year	PE/year	% of load to WWTP	Is there a leachate/sludge acceptance procedure for the WWTP? (Y/N)	Is there a dedicated leachate/sludge acceptance facility for the WWTP? (Y/N)
<b>Domestic /Septic Tank Sludge</b>	0	0	0	No	No
<b>Industrial / Commercial Sludge</b>	0	0	0	No	No
<b>Landfill Leachate (delivered by tanker)</b>	0	0	0	No	No
<b>Landfill Leachate (delivered by sewer network)</b>	0	0	0	No	No
<b>Other (specify)</b>	0	0	0	No	No

**Notes:**

1. Other Inputs include; septic tank sludge, industrial /commercial sludge, landfill leachate and any other sludge that is collected and added to the treatment plant.
2. Sludge that is added to a dedicated sludge reception facility at a waste water treatment plant not included in Table 3.6. Only include sludge which is added to the waste water treatment process stream. Enter zero where there are no inputs.



## Section 4. Infrastructure Assessments and Programme of Improvements

### 4.1 Storm water overflow identification and inspection report

The Storm Water Overflow Identification & Inspection report was submitted in the 2014 AER. A summary of the significance and operation for 2015 is included below.

**Table 4.1.1 - SWO Identification and Inspection Summary Report**

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow (High/Med/Low)	Compliance with DoEHLG criteria	No. of times activated in 2015 (No. of events)	Total volume discharged in 2015 (m <sup>3</sup> )	Total volume discharged in 2015 (P.E.)	Estimated / Measured data
SW002	276742, 279164	Yes	Low	Compliant	0	0	0	Estimated

**Table 4.1.2 - SWO Identification and Inspection Summary Report**

How much sewage was discharged via SWOs in the agglomeration in the year (m3/yr)?	0
How much sewage was discharged via SWOs in the agglomeration in the year (p.e.)?	0
What % of the total volume of sewage generated in the agglomeration was discharged via SWOs in the agglomeration in 2015?	0%
Is each SWO identified as non-compliant with DoEHLG Guidance included in the Programme of Improvements?	N/A
The SWO assessment includes the requirements of relevant WWDL Schedules (Yes/No)	Yes
Have the EPA been advised of any additional SWOs / changes to Schedules A/C under Condition 1?	N/A

## 4.2 Report on progress made and proposals being developed to meet the improvement programme requirements.

There was no Specified Improvement Programme required as per the Carlanstown Waste Water Discharge licence.

**Table 4.2.1 - Specified Improvement Programme Summary**

Specified Improvement Programmes	Licence Schedule	Licence Completion Date	Date Expired	Status of Works	% Construction Work Completed	Licensee Timeframe for Completing the Work	Comments
None	n/a	n/a	n/a	n/a	n/a	n/a	n/a

A summary of the status of any improvements identified by under Condition 5.2 is included below.

**Table 4.2.2 - Improvement Programme Summary**

Improvement Identifier / Name	Improvement Description	Improvement Source	Progress (% complete)	Expected Completion Date	Comments
None	n/a	n/a	n/a	n/a	None

**Table 4.2.3 - Sewer Integrity Risk Assessment Tool Summary**

<b>The Improvement Programme should include an assessment of the integrity of the existing wastewater works for the following:</b>	<b>Risk Assessment Rating (High, Medium, Low)</b>	<b>Risk Assessment Score</b>	<b>Specified improvements</b>	<b>Comment</b>
<b>Hydraulic Risk Assessment Score</b>	Medium	80	N/A	See Appendix 7.3
<b>Environmental Risk Assessment Score</b>	Low	5	N/A	See Appendix 7.3
<b>Structural Risk Assessment Score</b>	Medium	55	N/A	See Appendix 7.3
<b>Operation &amp; Maintenance Risk Assessment Score</b>	Low	18	N/A	See Appendix 7.3
<b>Overall Risk Score for the agglomeration</b>	Low	158	N/A	See Appendix 7.3

## Section 5. Licence Specific Reports

**Licence Specific Reports Summary Table**

Licence Specific Report	Required in this AER or outstanding from previous AER	Included in this AER / Remains outstanding	Reference to previous AER containing report or relevant section of this AER
Priority Substances Assessment	No	Yes	Appendix 7.6 of 2014 AER
Drinking Water Abstraction Point Risk Assessment	No		
Habitats Impact Assessment	No		
Shellfish Impact Assessment	No		
Pearl Mussel Report	No		
Toxicity/Leachate Management	No		
Toxicity of Final Effluent Report	No		

**Licence Specific Reports Summary of Findings**

Licence Specific Report	Recommendations in Report	Summary of Recommendations in Report	Status of Recommendations
Priority Substances Assessment	None	N/A	N/A
Drinking Water Abstraction Point Risk Assessment	N/A		
Shellfish Impact Assessment	N/A		
Pearl Mussel Report	N/A		
Toxicity/Leachate Management	N/A		
Toxicity of Final Effluent Report	N/A		
Habitats Impact Assessment	N/A		

### 5.1 Priority Substances Assessment

The Priority Substances Assessment report was submitted in the 2014 AER. A summary of the findings of this report is included below.

	Licensee self- assessment checks to determine whether all relevant information is included in the Assessment.
<b>Does the assessment use the Desk Top Study Method or Screening Analysis to determine if the discharge contains the parameters in Appendix 1 of the EPA guidance</b>	Desktop Study Method
<b>Does the assessment include a review of Trade inputs to the works?</b>	No
<b>Does the assessment include a review of other inputs to the works?</b>	No
<b>Does the report include an assessment of the significance of the results where a listed material is present in the discharge? (e.g. impact on the relevant EQS standard for the receiving water)</b>	No
<b>Does the assessment identify that priority substances may be impacting the receiving water?</b>	No
<b>Does the Improvement Programme for the agglomeration include the elimination / reduction of all priority substances identified as having an impact on receiving water quality?</b>	No
<b>Recommendations</b>	N/A
<b>Status of any improvement measures required</b>	N/A

### 5.2 Drinking Water Abstraction Point Risk Assessment

No Assessment required by the Licence.

### 5.3 Shellfish Impact Assessment Report

No Assessment required by the Licence.

### 5.4 Toxicity / Leachate Management

No Assessment required by the Licence.

### 5.5 Toxicity of the Final Effluent Report

No Assessment required by the Licence.

### 5.6 Pearl Mussel Measures Report

No Assessment required by the Licence.

### 5.7 Habitats Impact Assessment Report

No Assessment required by the Licence.

## Section 6. Certification and Sign Off

**Table 6.1 - Summary of AER Contents**

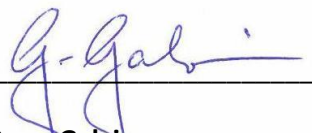
Does the AER include an executive summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Is there a need to advise the EPA for consideration of a technical amendment / review of the licence?	No
List reason e.g. additional SWO identified	N/A
Is there a need to request/advise the EPA of any modifications to the existing WWDL? Refer to Condition 1.7 (changes to works/discharges) & Condition 4 (changes to monitoring location, frequency etc.)	No
List reason e.g. failure to complete specified works within dates specified in the licence, changes to monitoring requirements	N/A
Have these processes commenced? (i.e. Request for Technical Amendment / Licence Review / Change Request)	N/A
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER?	N/A
List outstanding reports	

### Declaration by Irish Water

The AER contains the following:

- Introduction and background to 2015 AER.
- Monitoring Reports Summary.
- Operational Reports Summary.
- Infrastructural Assessment and Programme of Improvements.
- Licence specific reports
- Certification and Sign Off
- Appendices

I certify that the information given in this Annual Environmental Report is truthful, accurate and complete:

Signed:  Date: 09/02/2016

**Gerry Galvin**  
Chief Technical Advisor

## **Section 7. Appendix**

Appendix 7.1 – Annual Statement of Measures

Appendix 7.2 - Ambient Monitoring

Appendix 7.3 – Sewer Integrity Tool Output

## **Appendix 7.1:**

### **Annual Statement of Measures**

In 2016, Irish Water and Meath County Council will be carrying out further investigations at the Carlanstown WWTP, to determine whether the wastewater process ultimately requires alkalinity dosing.



## Appendix 7.2

### Ambient Monitoring Results

Carlanstown Ambient Monitoring		NH <sub>4</sub>	Ortho P	D.O	D.O	pH	BOD	Total N
		(mg/l)	(mg/l)	(mg/l)	(% Sat)		(mg/l)	(mg/l)
05/05/2015	U/S	0.023	0.032	10.56		7.78	1.78	2.13
04/06/2015	U/S	0.02	0.045	11.43	108.80%	8.02	2.28	7.58
12/08/2015	U/S	0.026	0.067	10.11	109.60%	7.94	1.43	2.21
27/08/2015	U/S	0.049	0.088	9.85	107.80%	7.79	2.56	1.95
Mean		0.0295	0.058	10.4875	108.73%	7.8825	2.0125	3.4675
95%ile		0.04555	0.08485	11.2995	109.52%	8.008	2.518	6.7745

Carlanstown Ambient Monitoring		NH <sub>4</sub>	Ortho P	D.O	D.O	pH	BOD	Total N
		(mg/l)	(mg/l)	(mg/l)	(% Sat)		(mg/l)	(mg/l)
05/05/2015	D/S	0.046	0.046	9.89		7.62	1.92	2.19
04/06/2015	D/S	0.036	0.063	11.25	107.10%	7.98	1.99	1.81
12/08/2015	D/S	0.044	0.072	9.18	99.30%	7.9	1.55	2.03
27/08/2015	D/S	0.072	0.101	8.95	98.80%	7.68	2.59	2.08
Mean		0.0495	0.0705	9.8175	101.73%	7.795	2.0125	2.0275
95%ile		0.0681	0.09665	11.046	106.32%	7.968	2.5	2.1735

## **Appendix 7.3**

### **Sewer Integrity Tool Output**

Section 2.1 Hydraulic Risk Assessment					
Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
2.1	<u>Has a Hydraulic Performance Assessment been undertaken for the Sewer Network (e.g., Computer Model or other Engineering Design or Design Review)?</u>	No	40		If the answer is <b>No</b> assess the need and cost benefit of developing a computer model or engineering design assessment of the Sewer Network and complete Query 2.12. If the answer is <b>Yes</b> proceed to Queries 2.1.1 to 2.1.4 inclusive
2.1.1	If Answer to Query 2.1 is Yes, what % of the Network is covered by the hydraulic assessment?	N/A	0		The % coverage of the Network by the Hydraulic Assessment can be estimated by the area assessed against the area served by the Network. ENTER "N/A" IF COMPUTER MODEL or DESIGN DOES NOT EXIST. DO NOT LEAVE BLANK OR ENTER "0".
2.1.2	How many years has it been since the completion of the hydraulic assessment?	N/A	0		Select N/A response if no design assessment or design exists.
2.1.3	Are the outcomes of the Hydraulic Assessment being implemented?	N/A	0		Select N/A response if no design assessment or design exists.
2.1.4	How many years has it been since the outcomes of the hydraulic assessment have been implemented?	N/A	0		Select N/A response if no hydraulic performance assessment or design exists. For ongoing works select "less than 5".
2.2	<u>Has a Dynamic Computer Model been used to Assess the Hydraulic Performance of the Sewer Network?</u>	No	10		Computer Model means a Hydroworks/Infoworks Model, Micro-Drainage Model or equivalent.
2.3	<u>Has a Manhole Survey been undertaken in accordance with WRc Documentation "Model Contract Document for Manhole Location Surveys and the Production of Record Maps"?</u>	No	10		If the answer is <b>No</b> assess the need and cost benefit of undertaking a Manhole Survey and complete Query 2.12. If the answer is <b>Yes</b> proceed to Query 2.2.1
2.3.1	If yes, how many years has it been since the survey was undertaken or updated?	more than 10	0		Select N/A if no Manhole Survey has been undertaken. Enter N/A value for Confidence Grade if Prompt Box is "N/A"
2.4	<u>Has a Flow Survey been undertaken in accordance with WRc Documentation "A Guide to Short Term Flow Surveys of Sewer Systems" and "Contract Documents for Short Term Sewer Flows"?</u>	Yes	0		If the answer is <b>No</b> assess the need and cost benefit of undertaking a Flow Monitoring Survey and complete Query 2.12. If answer is <b>Yes</b> Proceed to Query 2.5
2.5	<u>What was this Flow Survey Information Used for?</u>				
2.5.1	To Determine the extent of Problematic Sewer Catchments	N/A	0		Select N/A if no Flow Survey has been undertaken.
2.5.2	To Verify a Computer or Mathematical Model of the Network	N/A	0		Select N/A if no Flow Survey has been undertaken.
2.6	<u>Have Performance Criteria been developed to determine the short, medium or long term capacity of the sewer network?</u>	No	10		If the answer is <b>No</b> assess the Future Needs of the Sewer Network and complete Query 2.12. If the answer is <b>Yes</b> proceed to Query 2.8
2.7	<u>How many flood events resulting from surcharge in the network have occurred in the past 3 years?</u>	None	0		Flood events in this context means water/sewage backing up from the Network causing flooding of properties or causing disruption of traffic
2.8	<u>Are there deficiencies in performance criteria within the sewer network?</u>	N/A	0		If the answer is <b>No</b> , Proceed to Query 2.10 and complete Query 2.12. If the answer is <b>Yes</b> proceed to Query 2.9
2.9	<u>Have the causes of these deficiencies in the Performance Criteria been identified and rectified?</u>	N/A	0		If the answer is <b>No</b> , consider further examination of the hydraulic model (if available) and complete Query 2.12. If the answer is <b>Yes</b> proceed to Query 2.10
2.10	<u>Can the Hydraulic Assessment (defined in Query 2.1 above) be used to determine the benefit of reducing the contributory Impermeable Areas or extent of surface water contributions</u>	N/A	0		If the answer is <b>No</b> , consider further development of the Hydraulic Assessment (or model if available) and complete Query 2.12. If the answer is <b>Yes</b> proceed to Query 2.11
2.11	<u>Has an Impermeable Area Survey been carried out for the agglomeration or parts of the agglomeration?</u>	No	10		If the answer is <b>No</b> , consider the need and cost benefit of undertaking an Impermeable Survey for parts of the agglomeration which are under hydraulic pressure and complete Query 2.12.
<b>Total Risk Assessment Score (RAS)</b>			<b>80</b>		
2.12	<u>Prepare Assessment of Needs &amp; Sewer Upgrade Implementation Plan</u>	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents			
2.13	In the AER provide Summary of Proposed Works or Direction to be taken to improve hydraulic efficiency				

Section 3.1 Environmental Risk Assessment					
Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
3.1	<u>What Environmental or Discharge Quality Data is available with regard to the sewer network ?</u>	up-to-date electronic or paper database exists	0		Select N/A if no discharges, secondary discharges or overflows from network; if discharges do exist complete Query 3.12
3.1.1	<u>Do trade effluents discharge to the sewer network?</u>	No	0		If the answer is <b>No</b> , proceed to Query 3.1.2. If the answer is <b>Yes</b> , Proceed to Query 3.2
3.1.2	<u>Are there Storm Water Overflows within the network ?</u>	No	0		If the answer is <b>No</b> , proceed to Query 3.1.3. If the answer is <b>Yes</b> , Proceed to Query 3.3
3.1.3	<u>Are there Secondary Discharges within the network (excluding Emergency Overflows at Pump Stations)?</u>	No	0		If the answer is <b>No</b> , proceed to Query 3.1.4.
3.1.4	<u>Is there any evidence that exfiltration is occurring from the network ?</u>	No	0		If the answer is <b>No</b> , does all wastewater enter a wastewater treatment plant (insert summary details in the AER)? If <b>Yes</b> , Proceed to Query 3.6
3.2	<u>If Answer to Query 3.1.1 is "Yes", what % of trade effluents have a licence to Discharge to the Public Sewer ?</u>	N/A	0		Select N/A if answer to Query 3.1.1 is <b>No</b> . If not all trade effluents are licenced, Local Authority should consider issuing and controlling such discharges under the appropriate Legislation.
3.2.1	<u>Are all licenced trade Discharges compliant with their relevant licence and associated conditions</u>	N/A	0		Answer N/A if none of the trade effluents are licenced. Answer No if this information is unknown. If the answer is <b>Unknown</b> or <b>No</b> , consider issuing a direction to the relevant Licencees. If the answer is <b>Yes</b> , no further action is needed.
3.2.2	<u>If Answer to Query 3.2.1 is "No", state what % of Trade Discharges are NOT compliant with their relevant licence and associated conditions (where that non-compliance led to enforcement action)</u>	0 - 10%	5		Select <b>N/A</b> if answer to Query 3.2.1 is <b>Yes</b> . If N/A is selected as answer to Query 3.2.2
3.3	<u>In accordance with the DoEHLG paper "Procedures &amp; Criteria in relation to Storm Water Overflows", what % of storm water overflows in the system have been classified for their significance?</u>	N/A	0		If the answer is <b>No</b> , consider a review of each discharge within the sewer network complete and Query 3.11. If the answer is <b>Yes</b> , proceed to Query 3. 6
3.4	<u>Have samples from any Secondary Discharges within the system been analysed ?</u>	N/A	0		Select N/A if no secondary discharges in system. If the answer to Query 3.4 is <b>No</b> , consider examining the quality of each secondary discharge within the sewer network complete Query 3.11. If the answer is <b>Yes</b> , proceed to Query
3.5	<u>What percentage of discharges from the system are known to cause environmental pollution of the receiving waters ?</u>	N/A	0		If the answer is greater than 50% then detail, in the AER, the Improvement Programme necessary to reduce this percentage.
3.6	<u>In relation to possible exfiltration has a risk analysis of ground water contamination or pollution been undertaken ?</u>	N/A	0		Select N/A if answer to Query 3.1.4 is <b>No</b> . If the answer is <b>No</b> , consider undertaking ground water risk analysis and complete Query 3.12 If the answer is <b>Yes</b> , proceed to Query 3.6
3.6.1	<u>If Answer to Query 3.6 is "Yes", have any groundwater aquifers been identified in the area of the Network and/or Discharge Points?</u>	N/A	0		Select <b>N/A</b> if no risk analysis of groundwater contamination has been undertaken.
3.6.2	<u>If Answer to Query 3.6.1 is "Yes", state the classification of groundwater aquifer identified in the area?</u>	N/A	0		Select <b>N/A</b> if no risk analysis of groundwater contamination has been undertaken.
3.6.3	<u>In relation to Query 3.6.1, is the aquifer used as a source for Public, Private or Group Water Supply Schemes?</u>	N/A	0		Select <b>N/A</b> if no risk analysis of groundwater contamination has been undertaken.
3.7	<u>Has an Impact Assessment of each Storm Water Overflow been undertaken in accordance with the DoEHLG paper "Procedures &amp; Criteria in relation to Storm Water Overflows" including setting performance criteria?</u>	Yes	0		If the answer is <b>No</b> , consider assessing the risk category of the receiving waters. If the answer is <b>Yes</b> , proceed to Query 3.8 and provide summary details of the assessment in the AER.
3.8	<u>What percentage of storm water overflows comply with the performance criteria referred to in Query 3.7?</u>	0 - 10%	0		Select <b>N/A</b> if answer to Query 3.7 is <b>No</b> or if there are no SWOs in system. ( <b>Risk Score is locked at 0 if no SWOs in system is stated in Agglomeration Details</b> )
3.9	<u>Have the causes of these Capacity Deficiencies (storm water overflows &amp; Secondary Discharges) been identified ?</u>	N/A	0		Select <b>N/A</b> if answer to Query 3.7 is <b>No</b> or if there are no SWOs in system. If the answer to Query 3.9 is <b>No</b> , consider further examination of the environmental
Total Risk Assessment Score (RAS)			5		
3.10	<u>Prepare Assessment of Needs &amp; Sewer Upgrade Implementation Plan</u>	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents			
3.11	Provide Summary Details (in the AER) of records upstream and downstream of licenced discharges with regard to Environmental Performance of the network. These details can be included as part of the AER submitted for the agglomeration.				

Section 4.1 Structural Risk Assessment					
Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
4.1	<u>Has a CCTV Survey been undertaken in accordance with WRc Documentation "Model Contract Document for Sewer Condition Inspections" and "Manual of Sewer Condition Classification" ?</u>	Yes	0		If the answer is <b>No</b> assess the need and benefit of undertaking CCTV Survey. If <b>Yes</b> Proceed to Query 4.2
4.1.1	How many years has it been since the completion of the CCTV Survey?	less than 5	0		If no CCTV has been undertaken, select "N/A" response
4.2	<u>What was this CCTV Survey information Used for?</u>	Determine full extent of Sewer Rehab Works to be undertaken within Network	0		Select N/A if answer to Query 4.1 is NO.
4.3	<u>Has the CCTV Survey been used to Assess the Structural Condition of the Sewer Network or targeted sections of the Sewer Network?</u>	Yes	0		If no CCTV has been undertaken, select "No" response If the answer is <b>No</b> assess the need and benefit of undertaking an assessment of the Structural Condition of the Sewer Network. If the answer is <b>Yes</b> proceed to Q
4.4	<u>Have Performance Criteria been developed to determine the short, medium or long term structural condition of the sewer network ?</u>	No	5		If the answer is <b>No</b> , enter "unknown" in response to Queries 4.4.1 to 4.4.5; consider assessing the Future Needs of the Sewer Network. If the answer is <b>Yes</b> proceed to Queries 4
4.4.1	What % of the Total Sewer Length contains Collapsed or Imminent Collapse of Sewers (Grade 5)	0%	0		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 5 collapse, include the total length of that sewer in calculating the %. If information is not available type "Unknown" into Prompt Box
4.4.2	What % of Total Sewer Length contains Sewers Likely to Collapse (Grade 4)	0%	0		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 4 condition, include the total length of that sewer in calculating the %. If information is not available type "Unknown" into Prompt Box
4.4.3	What % of Total Sewer Length contains sewers with Further Possible Deterioration (Grade 3)	0%	0		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 3 deterioration, include the total length of that sewer in calculating the %. If information is not available type "Unknown" into Prompt Box
4.4.4	What % of Total Sewer Length contains sewers with Minimal Collapse (Grade 2)	0%	5		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 2 feature, include the total length of that sewer in calculating the %. If information is not available type "Unknown" into Prompt Box
4.4.5	What % of Total Sewer Length contains sewers of Acceptable Structural Condition (Grade 1)	100%	0		Insert Percentage of Overall Network Length. If information is not available type "Unknown" into Prompt Box
If all % lengths are known, Check Total Length = 100%		100%	5		If answers to Queries 4.4.1, 4.4.2 or 4.4.3 are above a set level, the RAS for Query 4 is automatically set at the maximum of 140.
4.5	<u>What % of the deficiencies, as detailed in Items 4.4.1, 4.4.2 and 4.4.3, have been rectified ?</u>	N/A	35		Select N/A if answer to Query 4.4 is <b>No</b> . If the answer is <b>No</b> , Proceed to Query 4.6 If the answer is <b>Yes</b> , what monitoring is in place to ensure continued acceptance of structural condition? Proceed to Query 4.7
4.6	<u>Have the causes of the Structural Deficiencies (Grades 3, 4 and 5) been identified or is there a Preventative Maintenance Programme in place?</u>	No	10		If the answer is <b>No</b> , consider further examination of the sewer network, the structural loading conditions, gradients and possible H <sub>2</sub> S Formation. If <b>Yes</b> completed Query 4.7
Total Risk Assessment Score (RAS)			55		
4.7	<u>Prepare Assessment of Needs &amp; Sewer Rehabilitation Implementation Plan</u>	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents			



Section 5.1 O&M Risk Assessment					
Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
5.1	<u>Are complaints of an environmental nature recorded and held in a central database?</u>	Yes	0		Consider setting up Central Database for Complaints
5.2	<u>Is there an emergency response procedure in place?</u>	Yes	0		Consider setting up target response times for dealing with Complaints
5.3	<u>What has been the highest frequency of flooding in the network due to hydraulic inadequacy, over the past 5 years?</u>	None	0		Refers to flooding from the Network only, not natural flooding from rivers/streams/high tides. Select the highest number of events in any 12 month period.
5.4	<u>What has been the highest frequency of flooding in the network due to operational causes over the past 5 years?</u>	Once/yr	4		Refers to flooding from the Network only, not natural flooding from rivers/streams/high tides. Select the highest number of events in any 12 month period.
5.5	<u>What has been the highest frequency of surcharging of critical sewers in the network, over the past 5 years?</u>	Once/yr	2		Select the highest number of events in any 12 month period.
5.6	<u>What has been the highest frequency of reportable incidents in the network, over the past 5 years?</u>	None	0		Select the highest number of events in any 12 month period.
5.7	<u>What has been the highest frequency of reportable incidents due to discharges, for whatever reason, from Pumping Station Emergency Overflows in the network, over the past 5 years?</u>	None	0		Select the highest number of events at any given Pumping Station in any 12 month period.
5.8	<u>What has been the highest frequency of blockages in sewers in the network over the past 5 years?</u>	0.05 - 0.1/km/yr	12		Select the highest number of events per km of sewer network in any 12 month period.
5.9	<u>What has been the highest frequency of collapses in sewers in the network over the past 5 years?</u>	None	0		Select the highest number of events in any 12 month period.
5.10	<u>What has been the highest frequency of bursts in rising mains in the network over the past 5 years?</u>	None	0		Select the highest number of events in any 12 month period.
Total Risk Assessment Score (RAS)			18		
5.11	<u>Prepare Up Dated Operational and Maintenance Plan</u>				

Section 6.1 Summary of Risk Assessment Scores				
Element	Risk Assessment Score	Risk Category	% Risk Score	Maximum Risk Score
Section 2.1 Hydraulic Risk Assessment	80	Medium Risk	53%	150
Section 3.1 Environmental Risk Assessment	5	Low Risk	1%	500
Section 4.1 Structural Risk Assessment	55	Medium Risk	37%	150
Section 5.1 O&M Risk Assessment	18	Low Risk	9%	200
<b>Total RAS for Network</b>	<b>158</b>	<b>Low Risk</b>	<b>16%</b>	<b>1000</b>