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Our Ref: ES/MH/MMcD 5270-04-01

23 July, 2009

Mr Patrick Morris
C/O Administration
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
McCumiskey House
Richview
Clonskeagh Road
DUBLIN 14

Re: D0254-01
Ballivor Agglomeration
Notice in Accordance with Regulation 18(3)(b), Waste Water Discharge (Authorisation)
Regulations 2007 (S.I. No. 684 of 2007), dated 03 June 2009

Dear Mr Morris,

I refer to your *Notice in Accordance with Regulation 18(3)(b) Waste Water Discharge (Authorisation) Regulations 2007* which issued to Mr Gerry Boyle, Meath County Council, dated 03 June 2009, in relation to Ballivor Agglomeration (EPA Reference No. D0254-01).

The notice requested the supply of fifteen points of outstanding information, to allow Article 16 Compliance. The fifteen points of information requested and our response to each are presented below:

Directors: D.A. Downes (Chairman) L.E. Waldron (Managing Director) M.F. Garrick R.F. Tobin J. Colleran B.J. Downes S. Finlay P.J. Fogarty
D. Grehan J.P. Kelly B.M. Mulligan B. Murray C. O'Keeffe F. Renkema (Dutch) E.J. Harrigan (Company Secretary)

Associates: T. Cannon P. Cloonan D. Conneran M. Conroy T. Curran O. Downes B. Gaffney B. Gallagher B. Heaney
B. Hutchinson D. Kennedy M. McDonnell C. McGovern E. McPartlin G. Stevenson



Co. Reg. No. 42654 - Registered Office: Fairgreen House, Fairgreen Road, Galway, Ireland.

Section A: Non-Technical Summary

1. ***Update the non-technical summary to reflect the information provided in response to this notice.***

Please find appended to this correspondence an updated non-technical summary, which reflects the information provided in this response (Refer to Appendix A).

Section C: Infrastructure and Operation

2. ***Provide design discharge concentrations for the waste water treatment plant (BOD, COD, Suspended Solids, Total Nitrogen as N, Ammonia as N).***

The existing wastewater treatment plant was commissioned in 2005. The design discharge concentrations for Ballivor Wastewater Treatment Plant are as follows:

Ballivor Wastewater Treatment Plant – Design Discharge Concentrations	
Parameter	Design Discharge Concentration (mg/l)
BOD	5.0
COD	125.0*
Total Suspended Solids	5.0
Total Nitrogen (as N)	15.0
Ammonia (as N)	no concentration specified
Total Phosphorus (as P)	0.5

*COD was not a primary design consideration due to non-industrial nature of agglomeration, therefore quoted at UWWT standards

3. ***Justify your conclusion that the storm water overflow complies with the definition of a storm water overflow as per 'Procedures and Criteria for Storm Water Overflows', published by the Dept. of the Environment, 1995 as stated in Table E.1(ii), i.e. provide details of any hydraulic modelling, discharge monitoring/inspection data or design frequency of storm water overflow.***

In Section G.4 of the original application, we confirmed (as requested in the application form) that the storm water overflow complies with the definition of 'storm water overflow' as per Regulation 3 of the *Waste Water Discharge (Authorisation) Regulations, 2007*, that definition being:

"Interpretation

3.... *"storm water overflow" means a structure or device on a sewerage system designed and constructed for the purpose of relieving the system of excess flows that arise as a result of rain water or melting snow in the sewered catchment, the excess flow being discharged to receiving waters;"*

The 'Urban Waste Water Treatment Directive (91/271/EEC) – Procedures and Criteria in relation to Storm Water Overflows' document [DoEHLG, 1995] does not contain a formal definition of 'storm water overflow' hence we have not referred to any definition contained therein. However, this particular document does outline 'options following assessment' of a storm water overflow, which may include:

".....upgrading of the existing system....." and other options including *"use of storage"* and *"active control"*.

Attachment C.2 of the original application identifies the 1 nr. existing storm water overflow on the Ballivor Sewerage System. Attachment G.4 of the original application contains the recent improvements (including storm water screening and storage facilities) that have been provided to minimise storm water overflows at Ballivor, which correspond with the above options referenced in the Department publication.

Attachment C.1 details the permanent plant storm water control facilities currently in place at Ballivor. Permanent plant includes storm water screening facilities and a 495m³ stormwater holding tank. It is worth noting that the inlet works and stormwater holding tank have already been constructed to cater for a Phase 2 loading of 4,000 PE, thereby effectively providing double the Phase 1 design storage requirements.

There is currently no data available with regards to hydraulic modelling, discharge monitoring/inspection data or design discharge frequency of the storm water overflow.

4. *Submit details of the type of effluent monitoring and sampling facilities (including flow rate) provided at the waste water treatment plant.*

Influent samples are currently obtained via grab sampling techniques. Final effluent samples are currently obtained with the use of a portable composite sampler. Influent / effluent sampling is undertaken on a monthly basis at present. Continuous flow monitoring occurs at the inlet to the works.

5. ***Provide an update of the plans to commission the sand filter, if any, and provide details of the resulting improvement in discharge concentrations (BOD, COD, Suspended Solids, Total Nitrogen as N, Ammonia as N, Total Phosphorus as P).***

The sand filter at Ballivor Wastewater Treatment Plant was temporarily decommissioned and is not operational at present due to numerous operational difficulties with some items of mechanical/electrical equipment. Ongoing investigations are being undertaken by Meath County Council, with the objective of modification of the unit in order to effectively eliminate operational issues. The Agency will be updated on progress in this regard.

6. ***Clarify (providing a timescale) whether the NEC discharge pumping station is/is planned to be in operation.***

The former NEC Semiconductors facility is no longer operational in Ballivor. The pumping plant has since been removed from the NEC Pumping Station located on the Ballivor Wastewater Treatment Plant site. Meath County Council have no future plans for this pumping station.

7. ***Clarify the arrangement for out of hours supervision of the waste water treatment plant.***

Ballivor Wastewater Treatment Plant is equipped with telemetry, which is linked back to a main server in the Meath County Council County Hall in Navan. In the event of plant failure, a text alert is sent to a nominated maintenance person, and also to a second person, in the unlikely event that there would be no response from first nominated person.

Section D: Discharges to the Aquatic Environment

8. ***Provide date(s) when all monitoring as reported in Table D.1(i)(b) and Table D.1(i)(c) was carried out.***

Monitoring on the Ballivor Primary Discharge Point, as reported on Table D.1(i)(b) and Table D.1(i)(c) of Ballivor Waste Water Discharge Licence Application was carried out on 16/01/09.

Section E: Monitoring

9. ***There was no assimilative capacity calculations submitted in the application. Provide assimilative capacity calculations (BOD, Total Nitrogen as N, Ammonia as N, Orthophosphate) for the primary discharge to the stream (known locally as the Ballivor River).***

Please refer to Appendix B and C for assimilative capacity calculations.

10. Clarify why the temperature reading was 0°C on primary, upstream and downstream monitoring.

The temperature reading was recorded as 0°C on Primary Discharge Point Monitoring (Table D.1(i)(b)), Surface Water Monitoring Downstream of Primary Discharge Point - aSW-1d (Table F.1(i)(a)) and Surface Water Monitoring Upstream of Primary Discharge Point - aSW-1u (Table F.1(i)(a)), as a default value since temperature was not recorded at the time of sampling at these locations. Ideally, the temperature reading should have been left blank, but the EPA Web Based Data Input Tool would not allow any blank inputs, so a zero (0) reading was submitted in its place.

11. Provide primary discharge monitoring data for 2009 to date. (BOD, COD, Total Suspended Solids, Total Phosphorus, Total Nitrogen, Ammonia). Provide an explanation why the Total Phosphorous concentrations in the primary discharge in 2008 were greater than the design concentration of 0.5mg/l (Attachment E.4 'Ballivor Effluent Monitoring 2008, 16 Jan 08 to 18 Dec 08').

The Primary Discharge Monitoring Data for 2009 to date is attached in Appendix D, for BOD, COD, Total Suspended Solids (TSS), Total Phosphorus (Tot P) and Total Nitrogen (Tot N). Ammonia concentrations have not been recorded to date.

As stated in *Attachment E.4 -Details of Compliance with Any Applicable Monitoring Requirements and Treatment Standards*, of the Ballivor Wastewater Discharge Licence Application, the treatment plant at Ballivor provides effluent treatment to the Urban Waste Water Treatment Regulations, 2001 standards. Phosphorus removal is also included at the plant, which was designed to bring final effluent to at most a concentration of 0.5mg/l Total Phosphorus.

This limit for Total Phosphorus concentration in the final treated effluent was exceeded on six monitoring events in 2008, with concentrations ranging from 0.8 - 2.59mg/l. The concentration limit for Phosphorus (0.5mg/l) has also been exceeded on 4 no. monitoring events for 2009, to date, (concentrations ranging from 0.862 - 2.19mg/l). (2009 Primary Discharge Monitoring Data attached in Appendix D).

Phosphorus reduction is presently achieved at the Ballivor WWTP using Dosing with Spent Pickle (high in iron salts and a waste by-product of the galvanising industry). However, it would appear that the dosing regime would need greater management and fine-tuning in order to achieve the required discharge limit of 0.5mg/l. This may involve the future use of ferric sulphate, in the place of the Spent Pickle. Meath County Council intends to set up stricter management procedure for the dosing regime at the plant, to come into effect immediately. This management procedure will include monthly monitoring of the Primary Discharge from the plant (for Total Phosphorus concentrations), to ensure Total Phosphorus concentrations in the final treated effluent are consistently below 0.5mg/l.

- 12. Provide dilution factor in stream (95-percentile flow of stream / DWF of sewage to the waste water treatment plant). Identify the measures in place or to be implemented to reduce the impact of the waste water treatment plant discharge. This should include consideration of the transfer of the discharge to a larger stream, if necessary.**

The Ballivor WWTP discharges to a stream tributary of the Stonyford River, which is situated within the Boyne River Catchment.

The closest hydrometric station to the Ballivor WWTP is Station No. 07044 Ballivor. The upstream catchment area to Ballivor Station No. 07044 is approximately 13.8km². The estimated long-term flows in the stream of the Stonyford River at the Ballivor WWTP Primary Discharge Point are as follows:

Estimated River Flow	Estimated Based on:	Flow Value
95 percentile	Flow measurements taken at hydrometric station 07044	0.004 m ³ /s.
DWF	Flow measurements taken at hydrometric station 07044	Nil m ³ /s.
50 percentile	Continuous Records from Ballivor hydrometric station 07044 (1989-2009)	0.091 m ³ /s

The magnitude and frequency of occurrence of river flows is required for various purposes. In general the above flow rates are used for the following:

Dry Weather Flow – for water abstraction for domestic and industrial use

95 percentile flow – licence conditions for effluent discharge during low flow

50 percentile flow – for average flow conditions in the river

The above flow rates are the best available estimates, as provided by the EPA Office of Environmental Assessment.

Flow emission details from the Ballivor WWTP was based on weekly flow readings recorded over a period of 8 weeks. The flow results are contained below:

Average DWF from the WWTP - **407.2 m³/d**

Average / Normal Daily flow WWTP– **498 m³/d**

By converting these flow rates from m³/d to m³/s gives the following:

Average DWF from the WWTP (based on two week survey)- **0.004713 m³/s**

Average / Normal Daily flow WWTP (based on two week survey) – **0.00576 m³/s**

The rates of flow of foul sewage are dependant on the distribution of population and on the rate at which water is used. In terms of foul flow the average flow is called the Dry Weather Flow (DWF), (not to be confused with the hydrologic Dry Weather Flow in the stream) and is the average rate of flow of domestic and industrial wastewater.

A simple assessment designed to identify the available dilution in the receiving waters at the primary discharge point from the WWTP has been carried out. The dilution effects of the receiving waters under various flow conditions on the Ballivor WWTP effluent discharge have been tabulated below. For the purpose of these calculations it has been assumed that the Wastewater Treatment Plant DWF Rate is equal to the 95 percentile low flow rate.

Flow Scenario (Final Effluent Flow / Stream Flow)	Flow – Final Effluent from Ballivor WWTP	Flow - Stream of Stonyford River	WWTP discharge as a % of Total d/s River Flow
DWF	0.0047 m³/s	Nil m³/s	100% (No dilution)
95%-tile	0.0047 m³/s	0.004 m³/s	54%
50%-tile	0.0058 m³/s	0.091 m³/s	6%

Table F1.A-1: Volumetric Contribution by WWTP Discharge to River Flows in Receiving Water

The table above indicates that under DWF conditions in the stream of the Stonyford River downstream at the primary discharge point, and recognising this is a once in 50 year drought flow, the receiving water would not have any dilution available. The DWF is the annual minimum daily mean flow with a probability of exceedance of 0.98 (i.e. with a return period of 50 years). The DWF stream flow rate is therefore an extremely unusual event, which hasn't occurred at all since the construction of the WWTP.

Due to the extremely low frequency of the DWF, interest is more often centred on low flows where pollution is a concern. The practice in relation to WWTP effluent discharges is to use the 95 percentile flow (the flow equalled or exceeded at least 95% of the time) in determining dilution rates. The table above indicated that under 95 percentile low flow conditions, it is predicted that the WWTP final effluent discharge flow accounts for 54% of the total flow in the receiving waters.

During 50 percentile flow conditions in the receiving waters, it is predicted that the WWTP final effluent discharge flow only accounts for 6% of the total flow.

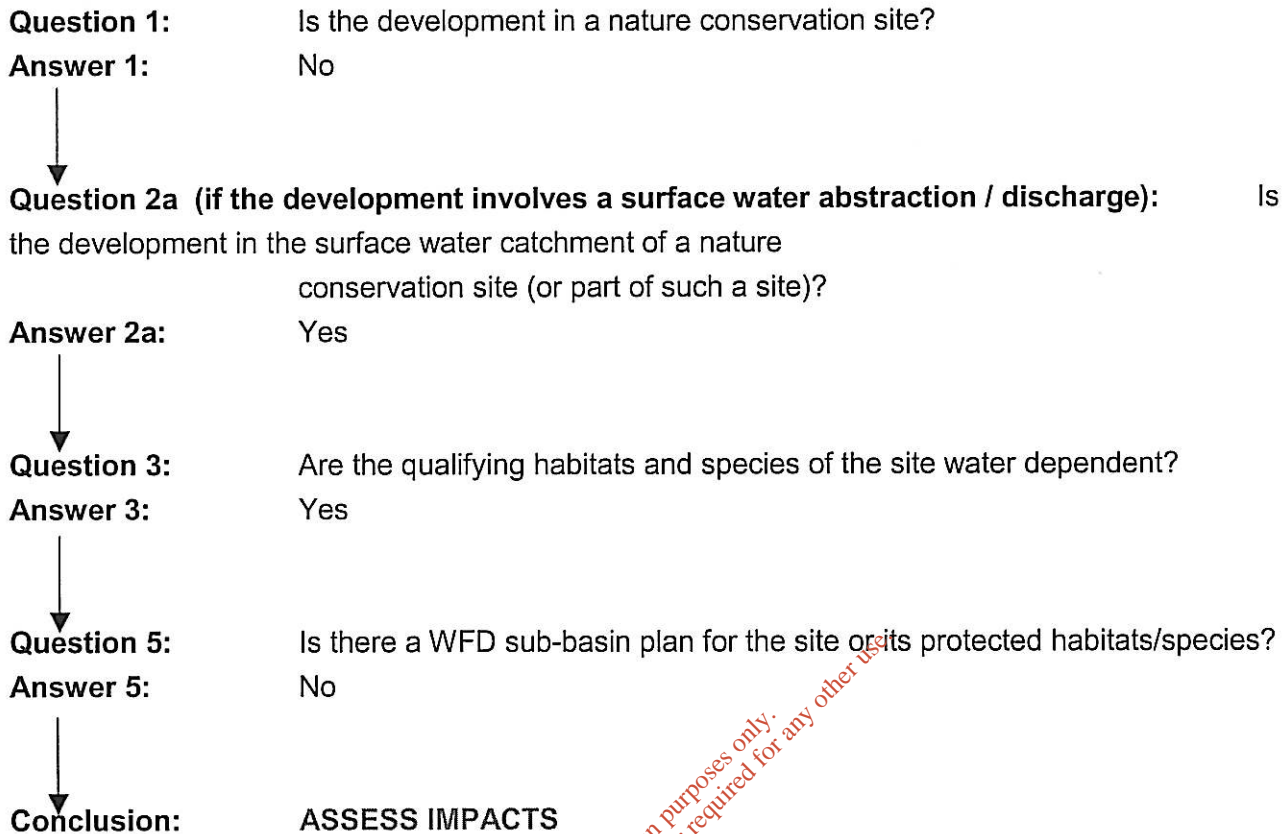
Section F: Existing Environment & Impact of the Discharge(s)

- 13. Determine if there is likely to be a significant impact from the waste water discharges (primary and storm overflows) on the Natura 2000 site (SAC). You shall use the flow diagram in Circular L/08, issued by Water Services Section, Department of Environment, Heritage and Local Government, to assist in this determination. Provide answers to each question on this flow diagram in addition to the final answer. If there is likely to be a significant impact on the Natura 2000 site, based on the flow diagram referenced above, then you must undertake an appropriate assessment. An Agency guidance note on Appropriate Assessment is available on <http://www.epa.ie/downloads/forms/lic/wwwda/>. This assessment should address the impacts of the waste water discharges and proposed mitigation measures with respect to the conservation objectives of the Natura 2000 site in the vicinity of the waste water discharges. A copy of the circular is attached.**

As discussed in Attachment F.1(H) of Ballivor Wastewater Discharge Licence Application: "The 3 no. emissions from the Ballivor Sewerage Agglomeration discharge to an unnamed stream, which is a tributary of the Stonyford River. The unnamed stream has no designation of ecological significance, but drains into the Stonyford River ca. 2km downstream, which is designated as a SAC. The existing 3 no. discharges are in existence for some time and as discussed, do not appear to be having a negative effect on the water quality of the unnamed stream, or indeed on the water quality of the Stonyford River. It is therefore not expected that the discharges are having any negative affect on the surrounding ecology (aquatic)".

As requested by the EPA, the 'Flow Diagram' in Appendix 1 of the 'Circular L8/08 - Water Services Investment and Rural Water Programmes - Protection of Natural Heritage and National Monuments', issued by Water Services Section, Department of Environment, Heritage and Local Government, was used to determine if there is likely to be a significant impact from the waste water discharges on the Nature 2000 site (i.e. Stonyford River = River Boyne and River Blackwater SAC, Site Code 002299).

Flow Diagram:



Therefore, based on the flow diagram above, there is a possibility of significant impact on the Natura 2000 site, and as such the impacts must be assessed by means of an 'Appropriate Assessment'.

The Appropriate Assessment will entail preparing a full assessment and statement of the potential direct, indirect and cumulative impacts on the Natura 2000 site and its conservation objectives. The Appropriate Assessment will also include measures to avoid or mitigate the impact.

It is proposed that a Senior Ecologist from TOBIN Consulting Engineers will complete the required Appropriate Assessment over the coming weeks, and once complete, the final report will issue to the EPA in support of the Ballivor Wastewater Discharge Licence Application.

Section G: Programme of Improvements

14. Provide an update on progress with sewer network proposed for 2010.

The upgrade and remediation of the sewer network in Ballivor is in fact now complete.

Section H: Declaration:

- 15. Complete Section H: Declaration and scan the signed declaration for electronic submission.**

The 'Section H - Signed Declaration' from the Ballivor Agglomeration - Wastewater Discharge Licence Application, is attached in Appendix E, with an electronic copy attached on the CD which accompanies this submission.

Advice Note:

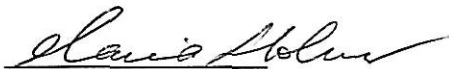
In the case where any drawings already submitted are subject to revision consequent on this request, a revised drawing should be prepared in each case. It is not sufficient to annotate the original drawing with a textual correction. Where such revised drawings are submitted, provide a list of drawing titles, drawing numbers and revision status, which correlates the revised drawings with the superseded versions.

No drawings from the original Ballivor Waste Water Discharge Licence were revised in the completion of this response, nor were any new drawings issued.

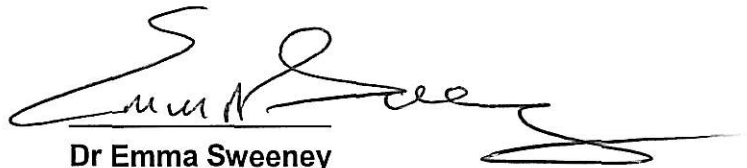
I do hope the above adequately deals with the outstanding information required by the EPA's *Notice in Accordance with Regulation 18(3)(b) Waste Water Discharge (Authorisation) Regulations 2007*, dated 03 June 2009.

Should you require any additional information, or further clarification, please feel free to contact the undersigned.

Yours sincerely,



Ms Maria Holmes
Engineer



Dr Emma Sweeney
Senior Environmental Scientist

cc. Mr Gerry Boyle, Meath County Council

APPENDIX A

(Updated Non-Technical Summary)

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NON-TECHNICAL SUMMARY

(Revision B)

Meath County Council, County Hall, Navan, County Meath is making an application to the Environmental Protection Agency (the Agency), in accordance with the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) for a Waste Water Discharge Licence, authorising the waste water discharges from the Ballivor Waste Water Treatment Works, serving the agglomeration of: Ballivor, County Meath.

Under Schedule 2 of the above regulations, the prescribed date for submission of Waste Water Discharge Licence Applications for agglomerations (with discharges with a population equivalent of between 1,001 - 2,000 pe) is 28 February 2009. The Ballivor Agglomeration falls under this category, presently serving a population equivalent of 1,792P.E, with a projected possible loading of 1,986P.E by the year 2015.

The agglomeration is currently served by the Ballivor Waste Water Treatment Plant, Kilballivor, Ballivor, County Meath (Grid Reference 269027E, 253820N), as shown on Drawing No. 5270-2680. Ballivor WWTP is located to the south-east of Ballivor Agglomeration and was upgraded and commissioned in 2006, treating municipal waste water from Ballivor Town. This plant has a design capacity of 2,000 P.E and was designed and constructed to provide for a possible Phase 2 expansion to 4000P.E, should same be required in the future. Ballivor Waste Water Treatment Plant utilises biological processes in conjunction with physical settlement, and nutrient removal to provide treatment to incoming waste water for compliance with the relevant legislative effluent treatment standards. as shown on Drawing no. 5270-2688 & 5270-2689.

The plant is required to meet Urban Waste Water Treatment Regulations, 2001 Standards, however the design discharge concentrations for Ballivor Wastewater Treatment Plant are as follows:

Ballivor Wastewater Treatment Plant – Design Discharge Concentrations	
Parameter	Design Discharge Concentration (mg/l)
BOD	5.0
COD	125.0*
Total Suspended Solids	5.0
Total Nitrogen (as N)	15.0
Ammonia (as N)	no concentration specified
Total Phosphorus (as P)	0.5

*COD was not a primary design consideration due to non-industrial nature of agglomeration, therefore quoted at UWWT standards

The existing treatment works is supervised during the hours of 8.00 – 16.00 Monday to Friday and 10.00 – 12.00 at Weekends. The Plant is equipped with telemetry, which is linked back to a main server in the Meath County Council County Hall in Navan. In the event of plant failure, a text alert is sent to a nominated maintenance person, and also to a second person, in the unlikely event that there would be no response from first nominated person.

Ballivor Agglomeration has 3 no. existing discharge points: a Primary Discharge Point (SW1), at location 269053E - 253834N, which discharges into a tributary of the Stonyford River, as shown on Drawing No. 5270-2684, a Secondary Discharge Point (SW-2) at location 269048E - 253837N (= emergency overflow from NEC discharge lift station), which discharges into a tributary of the Stonyford River, as shown on Drawing No. 5270-2685 and a Storm Water Overflow Discharge Point (SW3), at location 269071E - 253830N, which discharges into a tributary of the Stonyford River, as shown on Drawing no. 5270-2686.

Based on Effluent (Primary Discharge Point) Analysis presented on Tables D.1(i)(b) & D.1(i)(c) of this application and on the analysis of water upstream and downstream of the Primary Discharge Point (Tables F.1(i)(a) & F.1(i)(b), of this application), it is concluded that none of the substances listed in Annex X of the Water Framework Directive (2000/60/EC) or any of the Relevant Pollutants listed in Annex VIII of the Water Framework Directive (2000/60/EC) are being discharged from the waste water works or are seen to be present in the receiving water environment downstream of a discharge from the works, at concentrations above the standards set in the Water Quality (Dangerous Substances) Regulations, 2001 (S.I. 12 of 2001).

The emissions from the agglomeration are not expected to have any significant impact on the surrounding environment:

- The 3 no. emissions from the Ballivor Sewerage Agglomeration discharge to an unnamed stream, which is a tributary of the Stonyford River. The unnamed stream has no designation of ecological significance, but drains into the Stonyford River ca. 2km downstream, which is designated as a SAC. The existing 3 no. discharges are in existence for some time and do not appear to be having a negative effect on the water quality of the unnamed stream, or indeed on the water quality of the Stonyford River. It is therefore not expected that the discharges are having any negative affect on the surrounding ecology (aquatic).
- There are no emissions to ground/groundwater from the Ballivor Sewerage Agglomeration. Therefore any impact on ground/groundwater is unexpected.
- The results of water quality analysis presented in Tables F.1(i)(a) & F.1(i)(b) of this application show that there is little or no difference in water quality between the sampling location upstream of the emission points (aSW1u) and the sampling location downstream of the emission points (aSW1d).
- The EPA monitor water quality in the Stonyford River at stations upstream and downstream of the unnamed streams confluence with the Stonyford River. The closest EPA station in the Stonyford River upstream of the agglomeration (unnamed streams confluence with the Stonyford River) has a most recent Q-Value rating of Q4 (= good water quality, unpolluted) as does the closest EPA station downstream of the agglomeration. This is another indication that the effluent discharges from the Ballivor Agglomeration are not having a negative impact on the Stonyford River.
- There are 3 no. Meath County Council Drinking Water Abstraction Points from the River Boyne (Trim, Kilcarn & Roughgrange) located ca. 20.45km, 33.8km & 56.8km downstream (respectively) of the Ballivor Agglomeration Primary Discharge Point. This new WWTP, including phosphorous removal offers greater protection to the downstream water abstraction points.

Once the Waste Water Discharge Licence is issued for Ballivor Agglomeration, the 'Programme for Environmental Monitoring' is proposed to continue in much the same way as it has done for the last 2 years. This will involve monitoring of the Influent to the Waste Water Treatment Plant and the Effluent from the Waste Water Treatment Plant (i.e. Primary Discharge Point) on a monthly basis for the following parameters: BOD, COD, Total Suspended Solids (TSS), Total Phosphorus as P, Orthophosphate as P & Total Nitrogen as N.

The Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) also requests water sampling of the aquatic environment into which the Primary and Secondary Discharges occur, in order to monitor the impact of the discharges on the ambient environment.

For the last number of years, the County Council have carried out monthly monitoring in the Stonyford River (upstream and downstream of the unnamed streams confluence with the Stonyford River), at the EPA Station Locations 07S020100 and 07S020400, as shown on Drawing No. 5270-2695. This sampling includes analysis for: Dissolved Oxygen (DO), Temperature, pH, Electrical Conductivity, BOD, Suspended Solids, Ammonia, Total Organic Nitrogen, Nitrate, Chloride, Alkalinity, Hardness, Colour, Copper & Zinc.

It is proposed in this application to replace the monitoring at the EPA station locations (in the Stonyford River) with monitoring locations upstream and downstream of the discharge points within the unnamed stream (i.e. before it drains into the Stonyford River). The proposed monitoring locations aSW1u and aSW1d, are shown on Drawing No. 5270-2695.

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APPENDIX B

(Waste Assimilative Calculations)

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Ballivor Sewerage Scheme - Assimilative Capacity

1.0 Mass Balance Approach

The available waste assimilative capacity of the receiving water body was calculated using the mass balance approach. The equation used in the calculations is:

$$WAC = (C_{MAX} - C_{BACK}) * Q$$

Where:

WAC Waste Assimilative Capacity

C_{max} Receiving water's maximum permissible concentration of a substance (mg/l)

C_{back} Receiving water's background upstream concentration of a substance (mg/l)

Q Flow rate in the receiving waters (m^3/s)

The flow conditions used in the calculation of assimilative capacity are dependent on the particular water quality parameter being analysed. The EPA recommends the following receiving water flow conditions to be used in the analysis of the following parameters:

Receiving Water Flow	Parameter
Dry Weather Flow	Toxic substances
Median Flow	Ortho-phosphate (PO_4)
95 percentile	Other substances (BOD, Ammonia as N,)

Source: EPA: Waste Water Discharge Licensing Application Guidance Note

A conversion factor is applied to the Mass Balance Formula so as to express the WAC in units of kg / day.

Conversion Factor:

$$\frac{(mg)(m^3)}{(l)(s)} \text{ to } \frac{kg}{day} = \frac{60 * 60 * 24}{1000} = 86.4$$

2.0 Relevant Documentation

The documentation used in the calculation of waste assimilative capacity of receiving waters were as follows:

- 'Parameters of Water Quality – Interpretation and Standards' [EPA, 2001].
- 'S.I No. 258 of 1998 – Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998' (setting the maximum concentration of Ortho-phosphate that may be present in the receiving waters).

- Meath County Council released a report in 2006 entitled '*Phosphorus Regulations Implementation Report 2006*' which was prepared in accordance with the requirements of the *S.I. No. 258 of 1998 – Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998*.

3.0 Existing Water Quality

Section F presents surface water monitoring results from a once-off sampling event (undertaken as part of the licence application process) at a location upstream and downstream from the primary discharge point on the stream tributary of the Stonyford River.

Appendix C to this document contains waste assimilative calculations, based insofar as possible on the above monitoring data.

4.0 Discharge Effluent Quality from the Ballivor WWTP

Meath County Council has carried out monitoring of effluent discharge from the WWTP on a monthly basis over the last number of years and the results from these samples are contained in Section E4 of the Ballivor Waste Water Discharge Licence Application.

5.0 Hydrometric Data

The existing Ballivor WWTP discharges to a stream tributary of the Stonyford River. The estimates of 95%-tile, 50%-tile and DWF for this stream are provided in the main text to this correspondence.

6.0 Maximum Permissible Concentrations of Various Parameters for the stream of the Stonyford River

The stream of the Stonyford River has no designation of ecological significance, but drains into the Stonyford River, which is designated as an SAC.

With reference to the Eastern River Basin District – Draft River Basin Management Plan, the stream of the Stonyford River or the Stonyford River itself is not designated as Salmonid Water under the Freshwater Fish Directive (78/659/EEC).

The following maximum permissible concentrations therefore apply to the receiving water:

Substance	Maximum Permissible Concentration	Reference Document
BOD	≤5 mg/l	European Communities (Quality of Salmonid Waters) Regulations, 1998 (S.I No. 293 of 1988)
Total Nitrogen (N)		No Applicable Surface Water Standard for Total Nitrogen (N)
Ammonia	1 mg/l	European Communities (Quality of Salmonid Waters) Regulations, 1998 (S.I No. 293 of 1988)
Ortho-phosphate	0.03 mg/l	S.I No. 258 of 1998 – Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998

On the one off sampling event undertaken on this stream on January 16th 2009, concentrations of BOD, ammonia and ortho-phosphate were at or below the maximum permissible concentrations, at locations both the upstream and downstream of Ballivor WWTP primary discharge point.

7.0 Assimilative Capacity Calculations

The following sections provide a summary of the assimilative capacity calculations of BOD, Ammonia and Orthophosphate for the stream tributary of the Stonyford River in the location of the primary discharge outfall. Upstream background monitoring data was utilised in the calculations.

7.1 Available WAC of the stream tributary of the River Stonyford for BOD

The WAC equation for calculating BOD concentrations is:

$$WAC = (C_{\max} - C_{\text{back}}) \times Q_{95} \times 86.4 \text{ kg BOD/day}$$

$$WAC = (5 - 2) \times 0.004 \times 86.4 \text{ kg BOD/day}$$

$$WAC = 1.04 \text{ kg BOD/day}$$

At a WWTP discharge of 407.203 m³/d (existing DWF effluent discharge) together with the design discharge concentration of BOD emitted from the WWTP of 5 mg/l, the total discharge BOD concentration to the Stream of the Stonyford River is:

$$407,203 \text{ l/d} \times 5 \text{ mg/l} = 2,036,015 \text{ mg/d} = 2.036 \text{ kg/d}$$

7.2 Available WAC of the stream of the Stonyford River for Total Nitrogen, N

The development of WAC calculations relating to Total Nitrogen (as N) were not possible as there is no applicable surface water standard for Total Nitrogen (N).

In terms of input of Total Nitrogen arising from the primary discharge, at a WWTP discharge of 407.203 m³/d (existing DWF effluent discharge) together with the design discharge concentration of Total Nitrogen emitted from the WWTP of 15 mg/l, the total discharge Total Nitrogen concentration to the stream tributary of the Stonyford River is:

$$407,203 \text{ l/d} \times 15 \text{ mg/l} = 6,108,045 \text{ mg/d} = 6.108 \text{ kg/d}$$

7.3 Available WAC of the stream of the Stonyford River for Ammonia, N

The WAC equation for calculating Ammonia concentrations is:

$$\text{WAC} = (C_{\text{max}} - C_{\text{back}}) \times Q_{95} \times 86.4 \text{ kg N /day}$$

$$\text{WAC} = (1 - 0.2) \times 0.004 \times 86.4 \text{ kg N /day}$$

$$\text{WAC} = 0.280 \text{ kg N /day}$$

There are currently no design discharge concentrations for Ammonia relating to the waste water treatment plant. The existing DWF effluent discharge has been estimated at 407.203 m³/d. The level of ammonia (as N) recorded in the primary effluent on January 16th 2009 was 3.6mg/l N.

$$407,203 \text{ l/d} \times 3.6 \text{ mg/l} = 1,465,930 \text{ mg/d} = 1.466 \text{ kg/d}$$

7.4 Available WAC of the stream of the Stonyford River for Orthophosphate

From WAC calculations (refer to Appendix C), it appears that the background concentration of Orthophosphate (based only on one off sampling event) for this stream is already at the maximum permissible concentration of 0.03 mg/l.

There are currently no design discharge concentrations for Orthophosphate relating to the existing plant. The existing DWF effluent discharge has been estimated at 407.203 m³/d. The level of orthophosphate recorded in the primary effluent on January 16th 2009 was 0.63mg/l P.

$$407,203 \text{ l/d} \times 0.63 \text{ mg/l} = 256,538 \text{ mg/d} = 0.257 \text{ kg/d}$$

There are currently no design discharge concentrations for orthophosphate relating to the Ballivor plant, however the design discharge concentration for Total Phosphorus has been set at 0.5mg/l.

7.0 Summary of Results and Conclusion

A summary of the Assimilative Capacity calculations is tabulated below:

Parameter	WAC
BOD	1.04kg BOD/day
Total Nitrogen (N)	WAC not possible due to lack of Quality Standard
Ammonia	0.28 kg N/day
Ortho-phosphate	Upstream background = max. permissible

The low Waste Assimilative Capacity values above can be attributed to the 95 percentile low flow conditions in the Ballivor River. Considering the extremely stringent design discharge concentrations, which were applied to the existing Ballivor Wastewater Treatment Plant, it is evident that the 95 percentile low flow conditions were given due consideration in the original design of the plant.

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APPENDIX C

(Waste Assimilative Design Spreadsheets)

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Upstream Sampling Results							
Sampling Carried out by:	Date	Location	Method	BOD u/s (mg/l)	Total Nitrogen (mg/l N)	Ammonia (mg/l N)	Orthophosphate (mg/l P)
Tobin Consulting Engineers	16/01/2009	aSW-1u	Grab	< 2.00	3	< 0.20	0.03
Total	Total Median			2.000	3.000	0.200	0.030
	Total Mean			2.000	3.000	0.200	0.030

Hydrometric Data	
River Flow	Value
DWF	0
95%-tile	0.004
50%-tile	0.091

Maximum Permissible Concentration of a Parameter for the Surface Water Body		
Substance	Maximum Permissible Concentration	Reference Document
BOD	5.00 mg/l	European Communities (Quality of Salmonid Waters) Regulations, 1998 (S.I No. 293 of 1988)
Total Nitrogen (N)		No Applicable Surface Water Standard for Total Nitrogen (N)
Ammonia	1.00 mg/l	European Communities (Quality of Salmonid Waters) Regulations, 1998 (S.I No. 293 of 1988)
Ortho-phosphate	0.03 mg/l	S.I No. 258 of 1998 – Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998

Waste Assimilative Capacity Formula

$$WAC = (C_{MAX} - C_{BCK}) * Q$$

Conversion Factor	86.4
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Waste Assimilative Capacity	
BOD	1.04 kg/day
TOTAL NITROGEN	
AMMONIA	0.28 kg/day
ORTHO-PHOSHPATE	0.00 kg/day

no standard available

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APPENDIX D
(Primary Discharge Monitoring Data for 2009)

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BALLIVOR 'EFFLUENT' MONITORING 2009				
Date 2009	22-Jan-09	13-Mar-09	29-Apr-09	30-Jun-09
Parameter	Eff	Eff	Eff	Eff
BOD mg/l	8.1	6.35	1.14	1.1
COD mg/l	73.4	22.1	36.7	51.9
TSS mg/l	20	6	8	9.5
Tot P mg/l	1.48	0.862	2.18	2.19
Tot N mg/l	13.8	13	14.8	19.5

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APPENDIX E

(Section H - Signed Declaration)

(From Original Ballivor Waste Water Discharge Licence Application)

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SECTION H: DECLARATION


Declaration

I hereby make application for a waste water discharge licence/revised licence, pursuant to the provisions of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

I certify that the information given in this application is truthful, accurate and complete.

I give consent to the EPA to copy this application for its own use and to make it available for inspection and copying by the public, both in the form of paper files available for inspection at EPA and local authority offices, and via the EPA's website.

This consent relates to this application itself and to any further information or submission, whether provided by me as Applicant, any person acting on the Applicant's behalf, or any other person.

Signed by : 
(on behalf of the organisation)

Date : 17/02/09

Print signature name: EUGENE CUMMINS

Position in organisation: DIRECTOR OF SERVICES, INFRASTRUCTURE

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