SILVER HILL FARM
ESTABLISHED 1962

Silver Hill Foods, Emyvale
Co. Monaghan, Ireland
T 00353 (0) 47 87124
F 00353 (0) 47 87655
E info@silverhillfoods.com
www.silverhillfarm.ie

Niamh Connolly,
Licensing Inspector
Office of Environmental Sustainability
Environmental Protection Agency
Richview Lodge,
McCumiskey,
Clonskeagh Rd,
Dublin 14

26/08/2019

Dear Niamh,

Please find response to the request for further information

Point 1

1. It was agreed at the site visit on the 11th July, 2019 that the hydrogeological assessment and conceptual site model will be revised and updated as a condition in the licence once the pilot project is complete (also to be conditioned in the licence) taking on board the following:

   Justify why it is believed that lateral movement of treated water will be relatively insignificant given the pilot projects report recommendation to improve the surface drainage system. Demonstrate in the revised hydrogeological assessment that the lands can percolate 900mm/year of effective rainfall (treated trade effluent) with the actual annual rainfall in a relatively low permeable drumlinised landscape. Improve the conceptual site model to provide a more detailed representation of conditions at the site, including the gleyed areas and the perched watertables in the subsoil.

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Response

Silver Hill Foods have no issue with this been conditioned within the revised IED

Point 2

2. Clarify the classes of activity being carried out within the installation boundary as referred to in the First Schedule of the EPA Act 1992, as amended, and as referred to in Annex I of the Industrial Emissions Directive (2010/75/EU);

Response

Silver Hill is currently licensed under intensive agriculture (6.1) and 11.1 Recovery/ Disposal of waste. We wish to include activity code 7.4.1 and remove 11.1 .

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Point 3

3. Confirm the fuel, volumetric flow and rated thermal input (in MW) of the duty and standby boiler used to provide heat and steam for the activity on site;

Response

There are currently 2 boilers on-site

Boiler 1 is a 2 MW boiler with an LPG fuel supply

Boiler 2 is a 2.2 MW boiler with a Diesel fuel supply

Point 4

4. Submit a map with all groundwater wells (incl. upgradient and downgradient) currently on site and proposed in each drip irrigation field, incl. GW well code (GW1, GW2 etc.) with easting and northing co-ordinates;

Response

See attached Maps (attachment 1)

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Point 5

5. Submit a map with all proposed surface water monitoring points on site surrounding the drip irrigation fields, incl. upstream and downstream codes (SM1, SM2 etc.) with easting and northing co-ordinates;

Response

See attachment 1 for Maps

Point 6

6. Confirm when weekly monitoring of Orthophosphate, Total Phosphorus, Ammonia, Total Nitrogen, Suspended Solids, Toxicity, BOD and FOGs commenced for all relevant groundwater wells and relevant surface waters to assess the baseline;

Response

Sampling has commenced this week, (week beginning 12th August 2019). We have not tested for toxicity and will complete toxicity on the final effluent twice in 2019.

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Point 7

7. Due to the total diesel tank storage capacity on site provide a full Baseline Report having regard to *European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EC on industrial emissions (2014/C 136/03)* published on 6th May 2014;

Response

See attachment 2 for updated Baseline Report

Point 8

8. Submit the proposed time frame for start and completion of Wastewater Drip Irrigation System pilot project including a Gannt chart (pilot project to be completed within 3/6 months over autumn/winter but not commence before 2 months weekly baseline monitoring pre-construction available);

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Response

See attachment 3 for an updated time frame for the start and completion of the irrigation system.

Point 9

9. Resubmit a drawing of the licence boundary in red and pipework of drip irrigation system in purple;

Response

See attached Maps in attachment 1

Point 10

10. Submit a map with the pipework of the drip irrigation system mapping distances from surface waters, domestic dwellings and abstraction groundwater wells. See attachment 1

Response

The drip feed system will be installed as per the requirements of the IED license. We are awaiting detailed mapping from the selected vendor.

The drip feed system will be installed with the required buffer zones

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Area Buffer zone (m)	
Sensitive buildings (hospitals, schools and churches)	200
Dwelling houses	100
Karst features	30
Lakes and main river channels	20
Small watercourses	10
Public Roads	10
Domestic wells	50

Point 11

11. Submit a letter from the Monaghan County Council planning section stating planning is not required for the proposed drip irrigation system;

Response

We have been in communication with Helen McCourt and Adrian Hughes of Monaghan County Council in relation to the proposed drip feed irrigation system. We are waiting a response to the request that the proposed irrigation system does not require planning permission. We are of the understanding from speaking to Monaghan CoCo if the system is within the area of the proposed IED license no planning permission is required.

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Point 12

12. Submit all the NMPs associated with the organic fertiliser and sludge produced on site;

Response

See attached NMP (Attachment 4) for sludge generated onsite. The management of the duck manure is in line with Nitrates Regulations (S.I. 605 of 2017), with NMP's prepared on each farm and each farm returns a Record 3 on an annual basis to the Department of Agriculture. Silver Hill Foods also returns a record 3 to the Department of Agriculture each year for all manures.

Point 13

13. Provide details of the alarm activation system proposed to deal with emission limit value exceedances at the WWTP;

Response

Silver Hill Foods are currently working on an upgrade to the existing control system for the management of alarms on the wastewater treatment plant. A survey of the site has been completed week ending 25/08/2019. Following this a proposal will be submitted for approval with management making a decision by week ending 08/09/2019. Work on the new monitoring control system is due to commence on the week ending 22/09/2019. The works are expected to take 4 to 6 weeks and following this all tanks and sumps will be alarmed with email / text message alarms.

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Point 14

14. Confirm that the abstraction from the groundwater wells on site are registered with the EPA, and if yes provide the registration code?

Response

The site has registered the groundwater wells (Registration Number R00380).

Regards

Denise Jordan

Denise Jordan

Environmental Manager

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Attachment 1 Maps of the onsite Wells, surface water monitoring point

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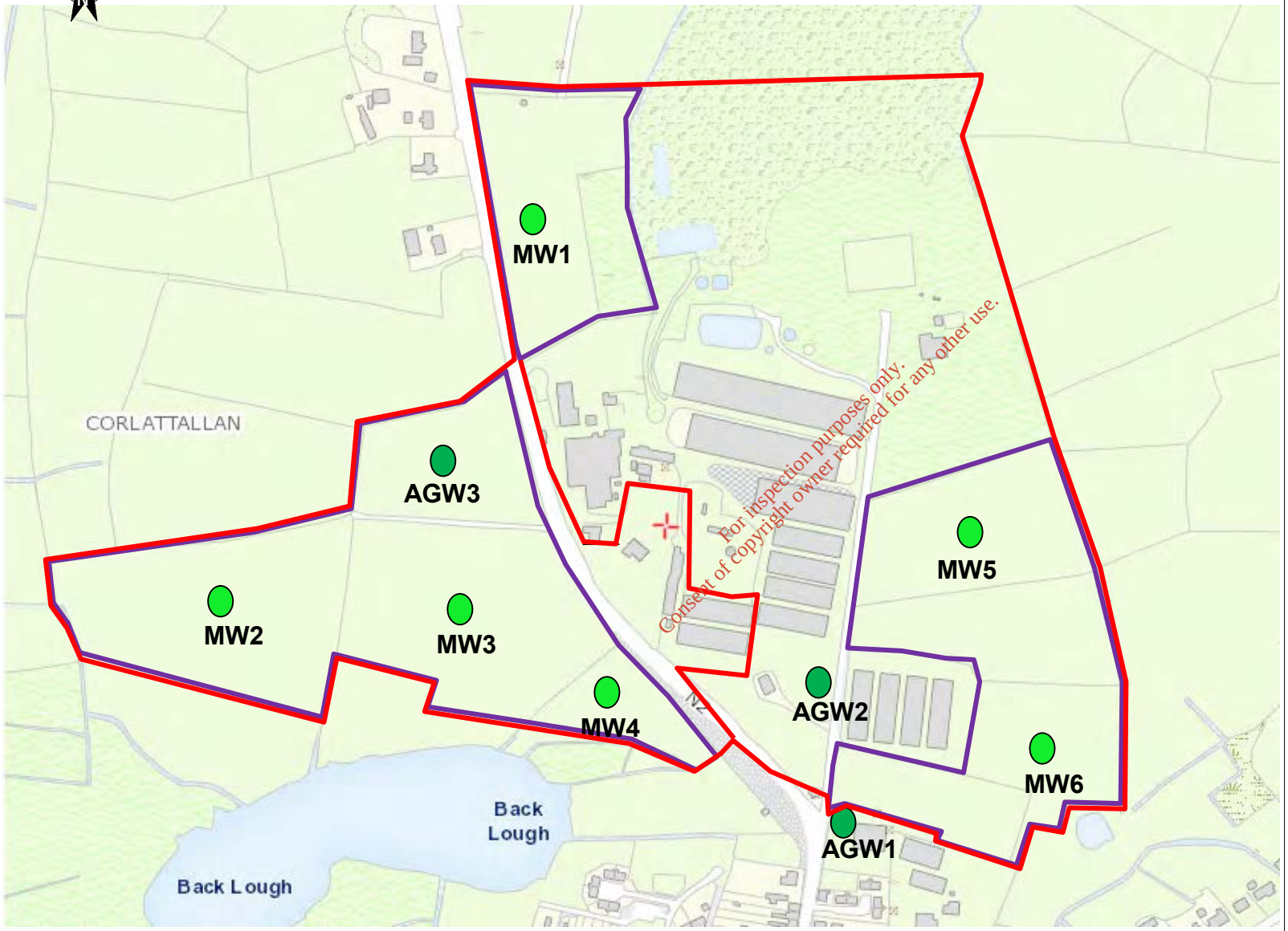


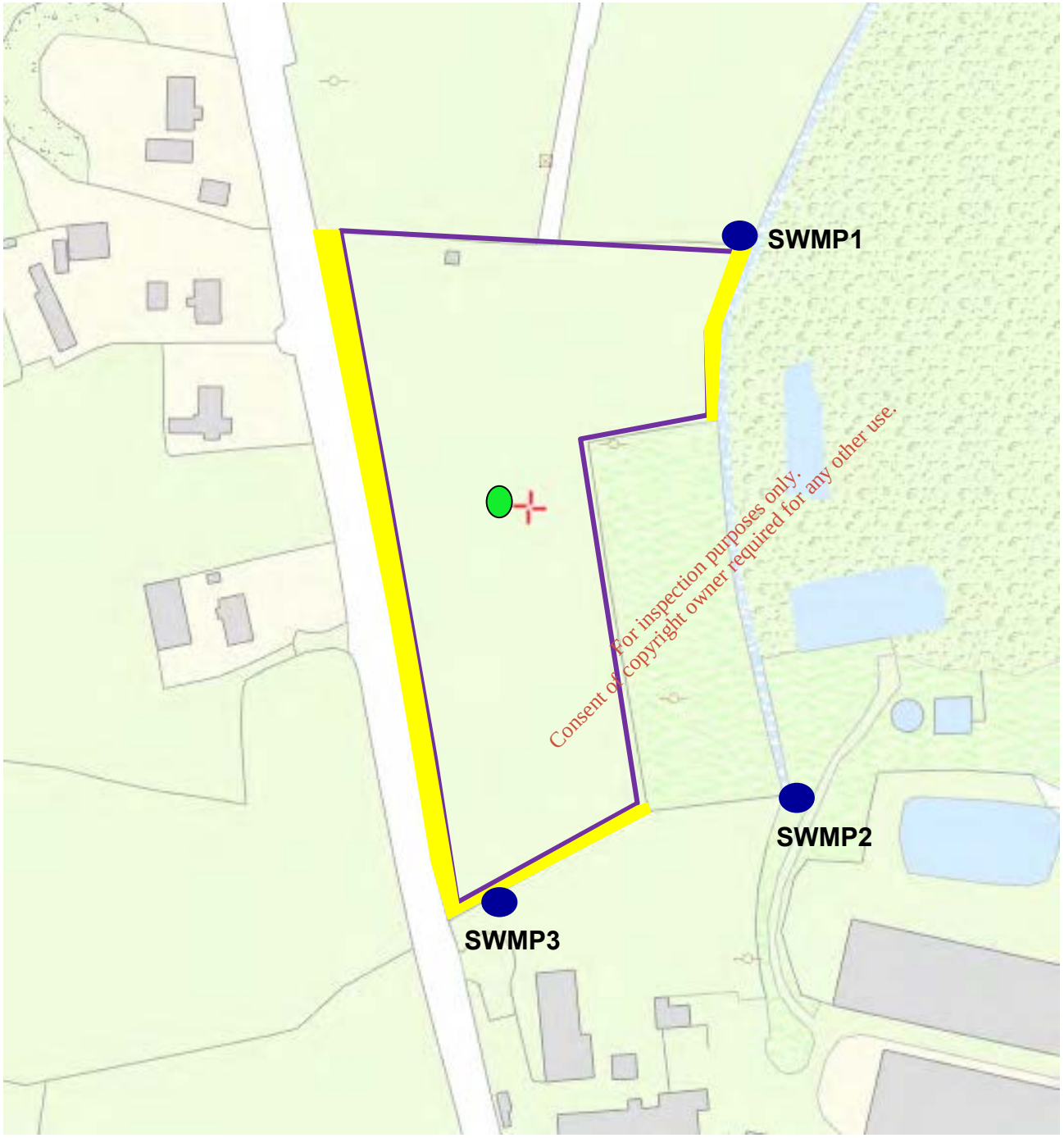
Legend

- Operating Site
- Drip irrigation site
- Groundwater Abstraction Well
- Proposed Groundwater Monitoring Well

MEHS ENVIRONMENT, HEALTH & SAFETY

Client	Silver Hill Foods
Title	Mapping
Scale. NTS	Project No. P019 042
Figure No. Figure 2	Rev. A

EPA Export 29-08-2019:03:58:24



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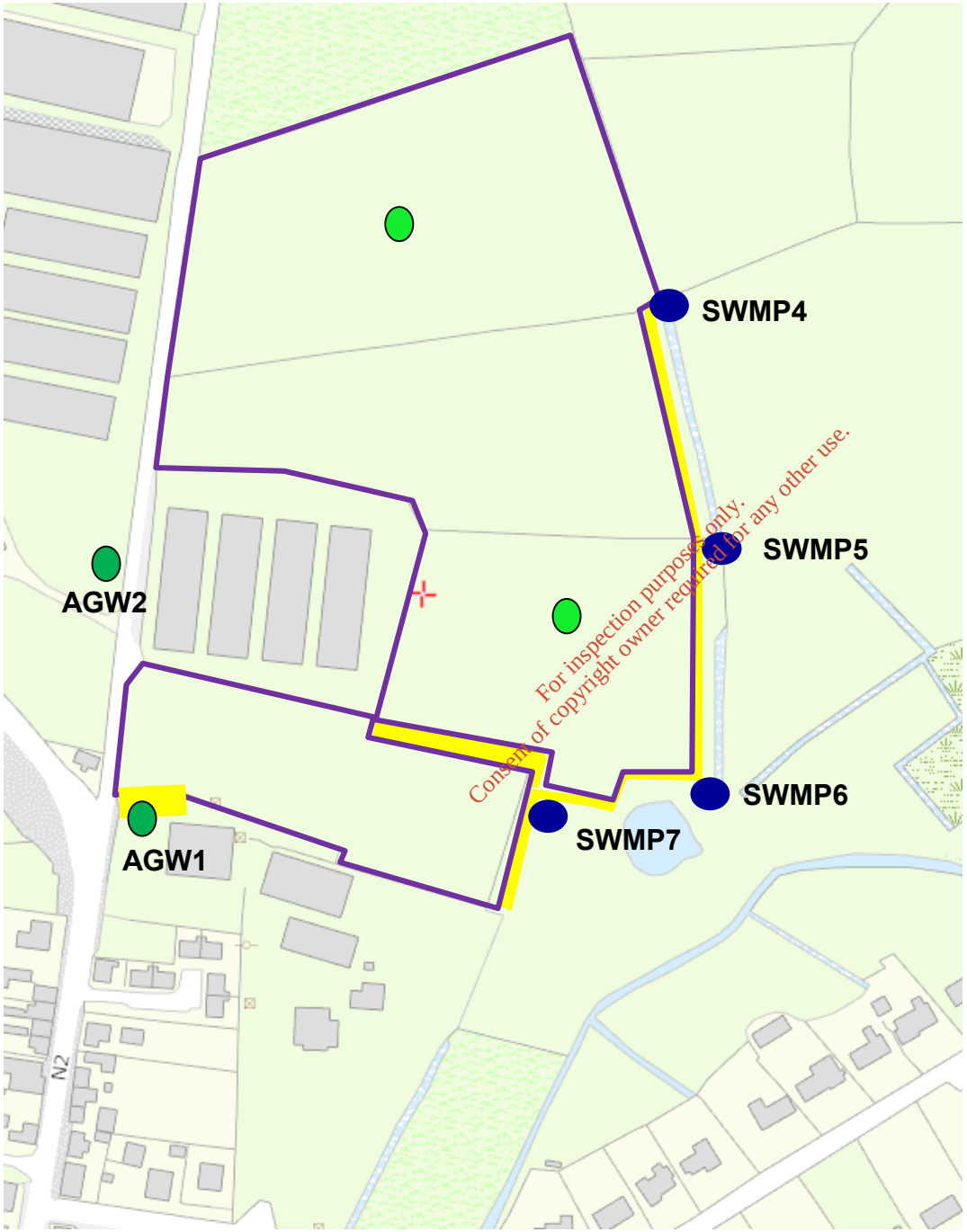
Legend

- Operating Site
- Drip irrigation site
- Buffer
- Surface water Mointoring
- Proposed Groundwater Monitoring Well

MEHS ENVIRONMENT, HEALTH & SAFETY

Client	Silver Hill Foods
Title	Mapping
Scale. NTS	Project No. P019 042
Figure No. Figure 2	Rev. A

EPA Export 29-08-2019:03:58:24



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Legend

- Operating Site
- Drip irrigation site
- Buffer
- Surface water Monitoring
- Groundwater Abstraction Well
- Proposed Groundwater Monitoring Well

MEHS ENVIRONMENT, HEALTH & SAFETY

Client	Silver Hill Foods
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Figure No. Figure 2	Rev. A

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Legend

- Operating Site
- Drip irrigation site
- Buffer
- Surface water Monitoring
- Groundwater Abstraction Well
- Proposed Groundwater Monitoring Well

MEHS ENVIRONMENT, HEALTH & SAFETY

Client	Silver Hill Foods
Title	Mapping
Scale. NTS	Project No. P019 042
Figure No. Figure 2	Rev. A

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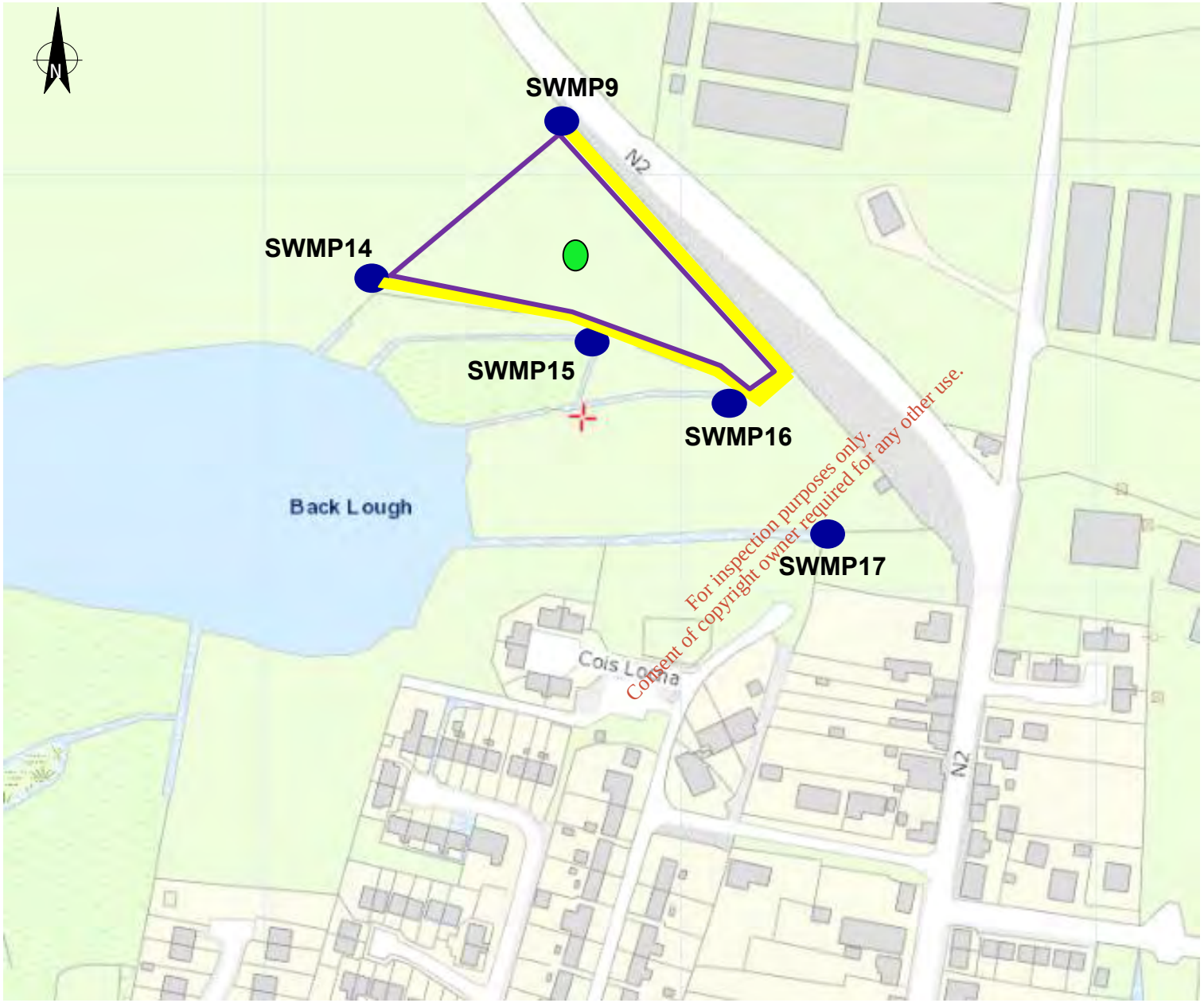

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Legend

- Operating Site
- Drip irrigation site
- Buffer
- Surface water Monitoring
- Groundwater Abstraction Well
- Proposed Groundwater Monitoring Well

MEHS ENVIRONMENT, HEALTH & SAFETY

Client	Silver Hill Foods
Title	Mapping
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Figure No. Figure 2	Rev. A

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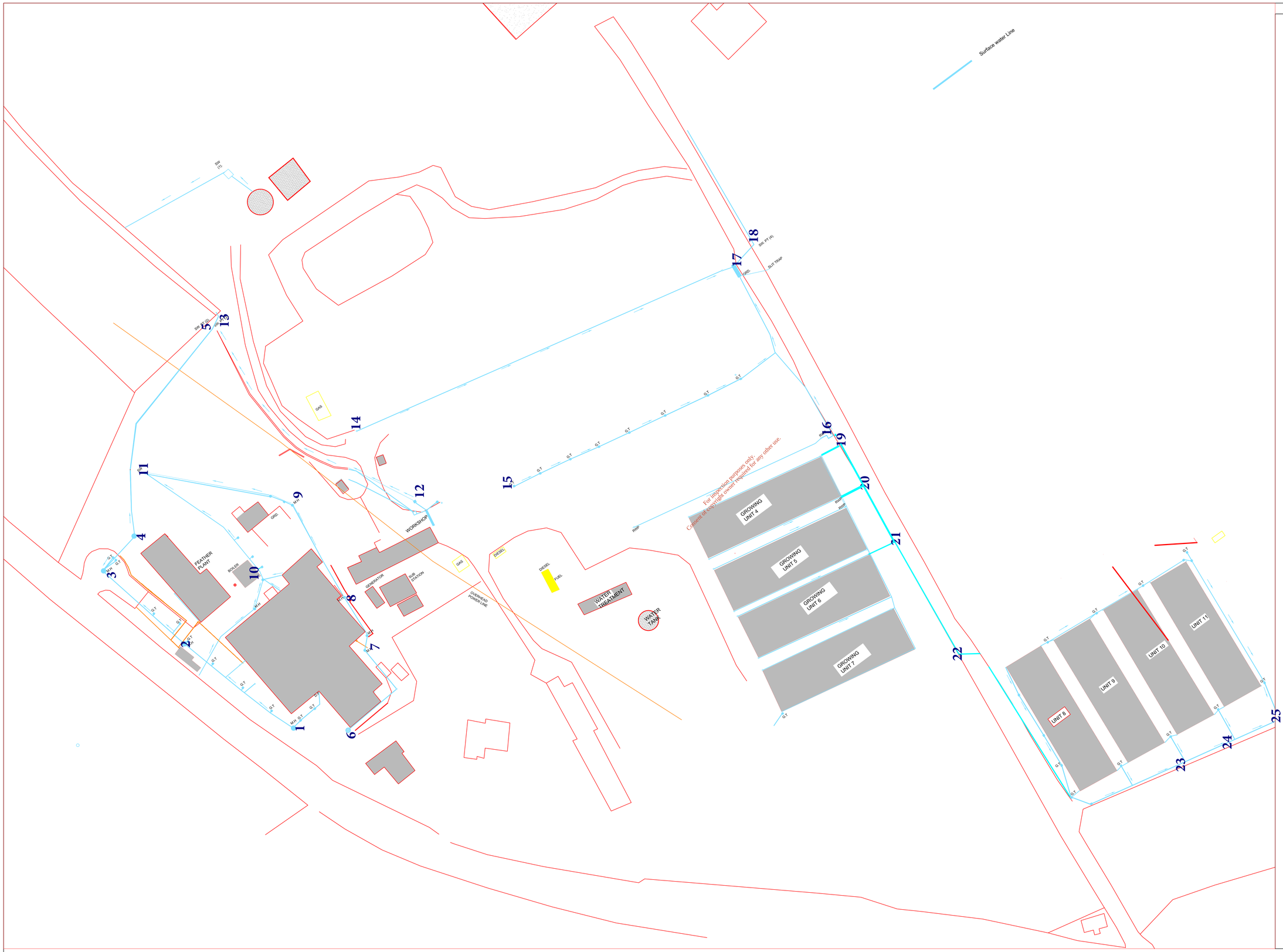

General Notes

SILVER HILL FARM
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No.	Revision/Issue	Date

Firm Name and Address

Silver Hill Duck
Emyvale
Co. Monaghan

Project Name and Address

Surface Water Monitoring
July 2017

Project	Sheet
P019-042	**1 of 1**
Date: **July 2019**	
Scale: **NTS**	

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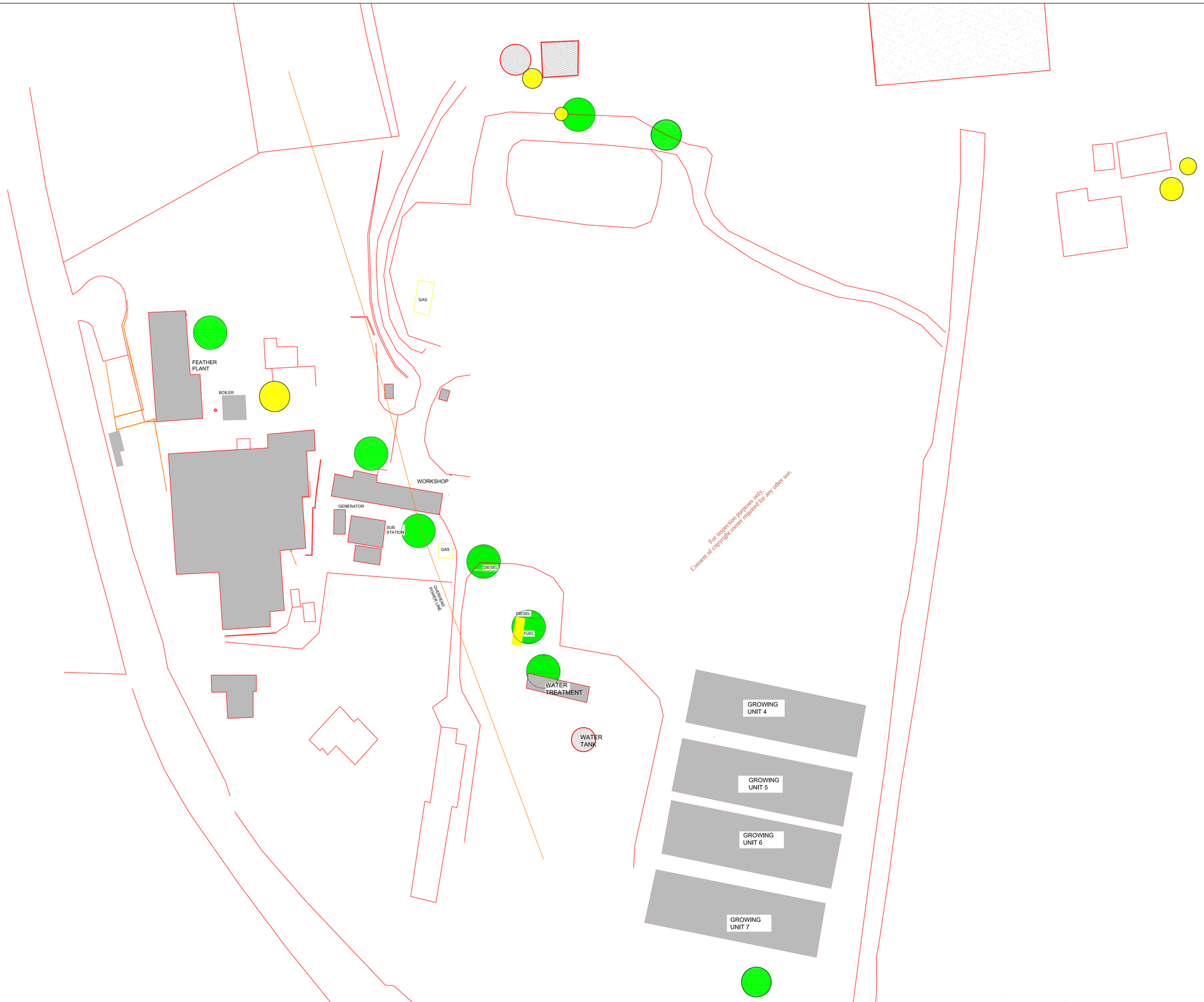

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General Notes

No.	Revision/Issue	Date

Firm Name and Address

Project Name and Address

Project	Sheet
Date	
Scale	

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General Notes

No.	Revision/Issue	Date

Firm Name and Address

Project Name and Address

Project	Sheet
Date	
Scale	

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Tank
Treatment
Aeration Basin
PO3
DAF
SU5
New Balance Tank
Contact Tank
MH2 MH1
CAR PARK
GAS
Process water Line
SKIP HOUSE
ENVIRONMENT OFFICE
CABIN
FEATHER PLANT
BOILER
CONTROL OFFICE
LABS.
WORKSHOP
GENERATOR
SUB STATION
DIESEL
FUEL
OVERHEAD POWER LINE
CABIN
CABIN
10 KV Power Line
WATER TREATMENT
MAIN OFFICE
WATER TANK
STORAGE
OPEN CHANNEL
GROWING UNIT 4
GROWING UNIT 5
GROWING UNIT 6
GROWING UNIT 7
UNIT 8
UNIT 9
UNIT 10
UNIT 11
G.T
M.H
LABS.
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General Notes

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No.	Revision/Issue	Date
1	Process Effluent Drains	4/7/19

Firm Name and Address
Silverhill Foods
Emyvale
Co. Monaghan

Project Name and Address
Process Effluent Drains

Project	Sheet
3/2019	Sheet 1 of 1
Date: 04/07/2019	
Scale: NTS	

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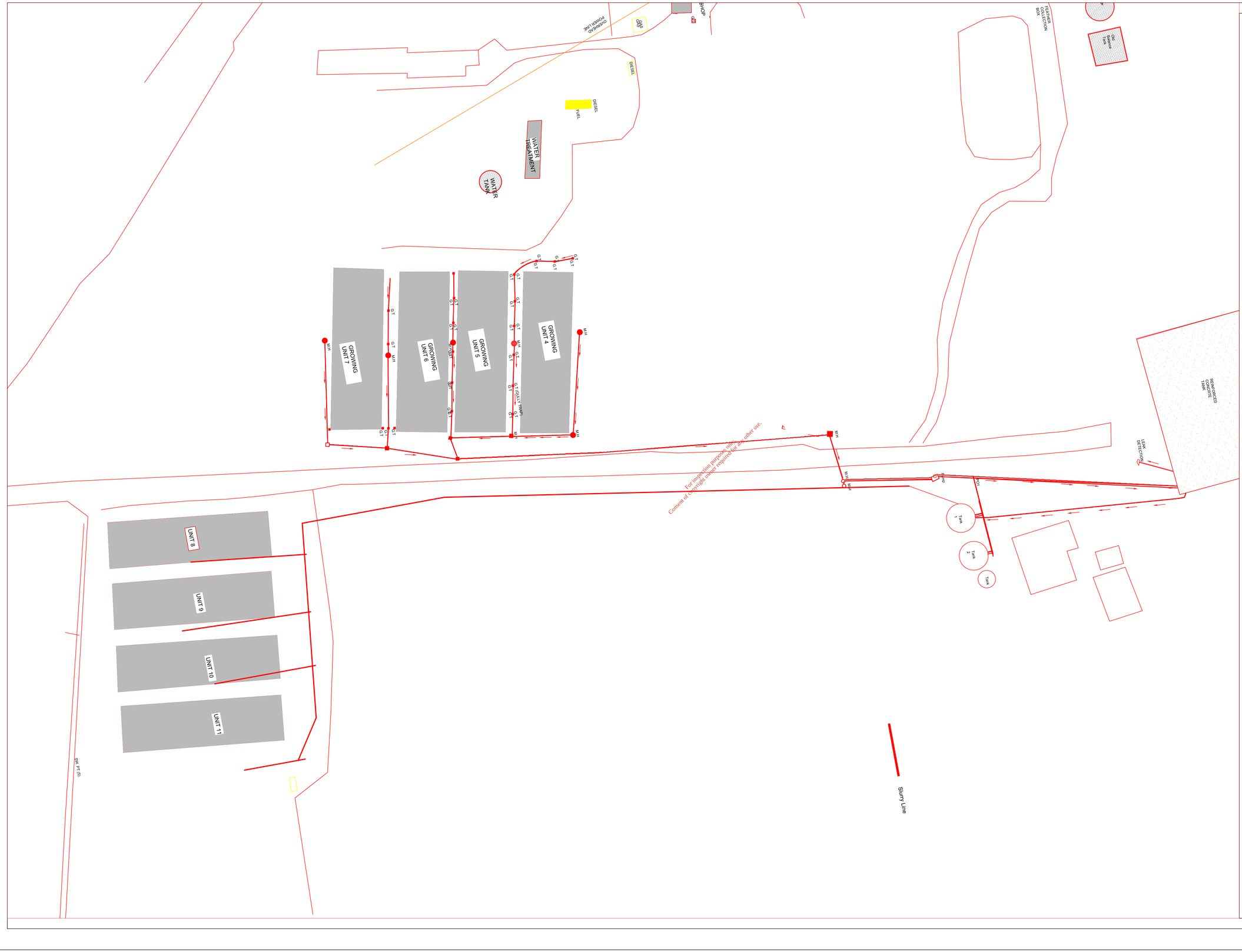

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General Notes

No.	Revision/Issue	Date

Firm Name and Address

Project Name and Address

Project	Sheet
Date	
Scale	

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Attachment 2 Revised Baseline Report by MEHS

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Telephone: 069 85896 | Email: info@mehs.ie | Website: www.mehs.ie

IE Revised License Application Baseline Report

Silver Hill Foods, Emyvale, Co. Monaghan

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Technical Report Prepared By

Trevor Montgomery, Post Grad Dip, BSc, Dip Mgmt, Dip Poll Ass & C, Cert Envn Mont, Cert HSWW, Director & EHS Consultant

OUR REFERENCE

MEHS 18/063 R03

DATE OF ISSUE

21st August 2019

Directors: T.Montgomery & M.Montgomery | **Registered in Ireland:** 519939 | **VAT:** IE 9851332D
Kantoher Business Park, Killeedy, Ballagh, Co. Limerick

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Silver Hill Foods, Emyvale, Co. Monaghan

Baseline Report

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Conclusions and recommendations contained in this Document are based on information supplied by the Client and others. Unless expressly stated otherwise, information provided by Third Parties has not been verified.

We accept no liability or responsibility whatsoever in respect of any use of or reliance upon all or part of this Document by any third party.

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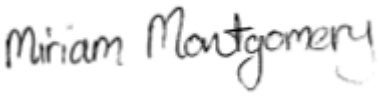
Document History

Document Reference		Original Issue Date	
MEHS 18/063 R2		12/08/2018	
Revision Level	Revision Date	Description	Sections Affected
1	08/08/2018	Draft for internal review	
2	14/08/2018	Issued to Client	
3	21/08/2019	Re-Issued to the EPA	

Record of Approval

Details	Written by	Approved by
Signature		
Name	Trevor Montgomery	Miriam Montgomery
Title	EHS Consultant	Director
Date	21/08/2019	21/08/2019

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Silver Hill Foods, Emyvale, Co. Monaghan

Baseline Report
August 2019

Contents

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1. Introduction

This baseline report has been prepared on behalf of Silver Hill Foods for an existing duck processing operation at Emyvale, Co. Monaghan for which an application for a revised Industrial Emissions (IE) Licence is currently been made to the EPA.

Where the activity involves the use, production or release of relevant hazardous substances, Section 4.8 of the Industrial Emission Licence application process requires the applicant to prepare a baseline report, having regard to the possibility of soil and groundwater contamination.

The purpose of this report is to meet the requirements of Article 22(2) of the Industrial Emissions Directive (2010/75/EU) and to determine whether or not a baseline report is required for the facility. This report has been prepared in line with the European Guidance concerning baseline reports under the aforementioned Directive for Industrial Emissions and forms part of the IE Licence application.

1.1 Background

Silver Hill Foods rear day old ducklings for c. 7 weeks at which time they are selected for slaughter and processing. The company's processing facility is adjacent to the rearing facilities and is included within the scope of this IED Licence review. Silver Hill Foods was established in 1963 on the same site. The process has been moderinised considerably in that time and capacity increased. The facility is located in a rural area on the outskirts of Emyvale village in County Monaghan. The activity employs c. 120 people, 10 involved in rearing the ducks and 60-70 involved in processing and the remainder involved in administration. Normal working hours on-site are five days a week from 06:00 to 24:00.

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An application for a Revised IE Licence is currently underway for the activity in order to comply with the EPA (Industrial Emissions) (Licensing) Regulations 2013, for the following class of Activity:

> 6.1: The rearing of poultry in installations, whether within the same complex or within 100 meters of the same complex, where the capacity exceeds 40,000 places.
>
> 11.1: The recovery or disposal of waste in a facility, within the meaning of the Act of 1996, which facility is connected or associated with another activity specified in this Schedule in respect of which a licence or revised licence under Part IV is in force or in respect of which a licence under the said Part is or will be required.

No significant changes are proposed to the operating processes, however additional environmental improvements such as an upgrade to the existing Waste Water Treatment Plant (WWTP) is proposed.

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1.2 Requirement for Baseline Report

1.2.1 European Legislation

The Industrial Emissions Directive (2010/75/EU) or 'IED' entered into force within the European Union on 6 January 2011. The IED is a recast of 7 pieces of legislation including the Integrated Pollution Prevention and Control Directive (2008/1/EC), the Waste Incineration Directive (2000/76/EC) and five other directives. The IE Directive had to be transposed into national legislation by Member States by 7 January 2013.

For industrial activities regulated by the IED, such as the activity carried out by Silver Hill Foods, Article 22(2) of Chapter II of the IED states that: "Where the activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013.

The baseline report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities.

The baseline report shall contain at least the following information:

a) Information on the present use and, where available on past uses of the site;

b) Where available, existing information on soil and groundwater measurements that reflect the state at the time the report is drawn up or, alternatively, new soil and groundwater measurements having regard to the possibility of soil and groundwater contamination by those hazardous substances to be used, produced or released by the installation concerned.

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Where information produced pursuant to other national or Union law fulfils the requirements of this paragraph, that information may be included in, or attached to, the submitted baseline report.

The Commission shall establish guidance on the content of the baseline report.

The Commission has established guidance on the content of the baseline report in the form of European Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on Industrial Emissions which has been followed in the production of this report.

1.2.2 Irish Legislation

The European Union (Industrial Emissions) Regulations 2013 (S.I. No. 138 of 2013) and resulting amendments to the Environmental Protection Agency Act 1992 give effect to Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (Recast). Section 86B of the Environmental Protection Agency Act 1992, as amended, states that:

"(1) Where an industrial emissions directive activity involves the use, production or release of

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relevant hazardous substances, and having regard to the possibility of soil and groundwater contamination at the site of an installation concerned, the Agency shall require an applicant under this Part for a licence or review of a licence or revised licence relating to the activity, including such a review by the Agency of its own volition, to furnish to the Agency a baseline report in accordance with regulations under section 89."

"(2) In relation to an installation, a baseline report shall contain the information necessary to determine the state of contamination of soil and groundwater at the time the report is drawn up in order that a quantified comparison may be made to the state of the site upon the permanent cessation (including cessation by abandonment) of the industrial emissions directive activity concerned and the applicant in preparing the baseline report shall include any information prescribed in regulations under section 89."

"(3) Notwithstanding the generality of subsection (2), a baseline report shall include at least the following information-

a) The current use and, where available, the past use of the site,

b) Any available information-

i. On soil or groundwater measurements that reflect the state of the site at the time that the baseline report is drawn up, or

ii. On new soil and groundwater measurements having regard to the possibility of soil and groundwater contamination by the hazardous substances proposed to be used, produced or released by the installation concerned."

"(4) Any information furnished to the Agency or to any other body under any enactment or rule of law or a law of the European Union, which complies with the requirements of subsection (2) or (3), may be furnished to the Agency in or with the baseline report."

"(5) For the purposes of determining the information to be contained in a baseline report under this section the Agency shall have regard to, and shall for the purposes of subsection (2), make publicly available any guidance documents published by the Commission of the European Union in accordance with Article 22(2) of the Industrial Emissions Directive."

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1.3 Scope of the Report

A number of key tasks should be undertaken to both determine whether a baseline report needs to be produced for a particular situation and in order to produce the baseline report itself. Eight stages have been identified in this process, covering the following main elements:

- Stages 1-3: to decide whether a baseline report is required;
- Stages 4-7: to determine how a baseline report has to be prepared;
- Stage 8: to determine the content of the report.

This reports intends to address the requirements of the application process and follows the requirements of the aforementioned directive and the EPA guidance on same. The key criteria for deciding if a baseline report is required or not, are detailed in the table below

Stage	Activity	Objective
1	Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.	Determine whether or not hazardous substances are used, produced or released in view of deciding on the need to prepare and submit a baseline report.
2	Identify which of the hazardous substances from Stage 1 are 'relevant hazardous substances'. Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.	To restrict further consideration to only the **relevant** hazardous substances in view of deciding on the need to prepare and submit a baseline report.
3	For each relevant hazardous substance brought forward from Stage 2, identify the actual possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of: • The quantities of each hazardous substance or groups of similar hazardous substances concerned; • How and where hazardous substances are stored, used and to be transported around the installation; • Where they pose a risk to be released; • In case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.	To identify which of the relevant hazardous substances represent a potential pollution risk at the site based on the likelihood of releases of such substances occurring. For these substances, information must be included in the baseline report.

For the purposes of this application, and to inform the baseline report screening process, Relevant hazardous substances are those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation.

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2. Stage 1- Site Activities and identification of Hazardous Substances

2.1 Current Use

Silver Hill Foods operate a duck processing operation since 1963 on the site outside Emyvale, Co. Monaghan.

Live duck from the on-site farms and outside growers are delivered to the installation by lorry in crates. The duck crates are unloaded from the lorries, by forklift, and conveyed to the manual unloading area. The ducks are removed fiom the crates and shackled on a conveyor line. The birds are firstly electrically stunned after which they are bled by cutting the blood vessels in their necks. The birds are then passed through a “scald tank” which loosens the feathers prior to mechanical plucking. After plucking the heads and tracea are removed and the outside of the birds are washed. The feet are then removed and the birds are eviscerated. The carcasses are then chilled for approximately three hours after which the carcasses are sorted and graded before distribution to the appropriate part of the processing / packaging
plant. The various processes undertaken include packaging of whole birds, butchering of the carcass into wings, fillets, part bone breasts, crowns, legs, thighs, etc.

The main waste stream arising from the installation is trade effluent. All areas are washed regularly during production and are completely washed down overnight, after the last processing shift. Offal, bones and feathers are collected on-site and sent for rendering. Two light fuel oil boilers are operated as duty and stand-by and provide hot water and steam to the installation. The processing activities on-site involve fresh meat, no cooking activities are undertaken therefore odour emissions are limited to those associated with the waste water treatment plant and to a lesser extend live bird deliveries and offal storage.

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Emissions

The main emissions from the activity are emissions to air and water. Emissions to air are primarily boiler emissions and fugitive emissions from waste storage (offal and feathers) and the waste water treatment plant (WWTP). The main emission to water is the emission of trade effluent from the WWTP to a tributary of the River Blackwater.

2.2 Overview of Site Activities

The main production activities involved at Silver Hill Foods are:

- Intake of ducks;
- Slaughtering
- Deboning & cutting;
- Packing into vacuum packs;
- Fresh storage and cold storage of meat products;
- Dispatch of products.

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2.3 Past Use

The site was an agricultural use prior to commencement of the Silver Hill operation. Some of the older duck rearing houses have been decommissioned.

Silver Hill Foods has been convicted once for pollution of the discharge of polluting surface water and there are no known environmental legacy issues associated with the sites past or current activities.

2.4 Identification of Hazardous Substances Used, Produced or Released at the Installation

It is necessary to determine whether or not hazardous substances are used, produced or released in view of deciding on the need to prepare and submit a baseline report. The following hazardous substances have been identified as used in the day to day operations of the activity and a list of Hazardous Substances in available in Appendix A.

Material	Hazard Type	Use	Quantity on Site
Green Diesel	H226, H304, H315, H332, H351, H332, H351, H373, H411	Fuel for on-site vehicles.	1,360 Litres
Diesel for Boiler	H226, H304, H315, H332, H351, H373, H411	Fuel for boilers.	10,590 Litres
Hydraulic/Engine Oil	H226, H302, H304, H315, H332, H351, H373, H410, H411	Oil for onsite equipment	1000 Litres
Chromol (6x500ml)	No specific data	Stainless Steel cleaner	3 Litres
Eco-clin Urinal Tablets (4Kg)	H271, H302, H315, H317, H318, H319, H332, H334, H335, H400, H411	Urinal Tablets	8 Kg
Mip MA (24Kg)	H314	Cleaning detergent	48 Kg
WC Super (12x 750 ml)	H302, H314, H315, H318, H335, H400	Toilet cleaner	12Litres
P3-ansep ALU (24Kg)	H314, H318,	Cleaning disinfectant	48 Kg
P3-clint GP (22Kg)	H290, H314, H318	Floor cleaner	44 Kg
P3-manodes LI (2X5L)	No specific data available	Hand soap	20 Litres
Manosan Oxy (4x5L)	H319, H400, H410	Cleaning detergent	40 Litres
P3-topactive OKTO (20Kg)	H272, H290, H314, H335	Cleaning disinfectant	20 Kg
Topaz CL4 (1,175Kg)	H290, H314, H318, H400, H411	Foam cleaner	2,350Kg
Taxat Extra Classic (20Kg)	H271, H302, H315, H318, H319, H335, H400	Laundry detergent	40 Kg
Eco-bac Wipes (1500)	H225, H226, H319, H336	Disinfectant	10 Buckets
Triquart MS (21Kg)	H314, H400	Disinfectant	42 Kg
Trump XL (Special) (25Kg)	H314	Machine Detergent	50 Kg
Windus (12X500m)	H225, H226, H315, H319	Glass Cleaner	12 Litres

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3. Stage 2 – Identification of Relevant Hazardous Substances

3.1 Relevant Hazardous Substances

Relevant hazardous substances are those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation. Following identification of hazardous substances in stage 1, 'relevance' is defined in the following tables.

Substances that are incapable of contaminating soil or groundwater have excluded from further assessment.

3.1.1 Green Diesel/Diesel for Boilers

Criteria	Description
Substance	Diesel
Annual Usage	20,000 liters
Description of Use	Used for vehicles on site and in use on Boilers.
Mode of Transport	Road delivery
Relevant Substance	H411: Toxic to aquatic life with long lasting effects.
Potential Pathways to Ground	Uncontrolled release during delivery of diesel to the diesel tank or during re-fueling vehicles. All breaches would be contained within the bund area.
Existing Mitigation	All deliveries to site and re-fueling vehicles are closely monitored and controlled and all personnel have received the relevant training. Green diesel is stored in a 1,360 liter bunded tank, also a 10,000 liter bunded tank for diesel for the boiler 2 for which provides containment for any spillage that may occur. Training is provided in the use of the spill kits and subsequent clean up.
Probability of Release to Ground	Given the relatively low usage of green diesel on site and the relatively low quantities used, the probability of release to ground is low. The current containment measures and the existing controls mean that a containment breach or uncontrolled discharge event happening is very low. No accidental release has occurred in the past.
Consequence of Incident	If diesel entered the ground it would pose a potential risk and likely migrate to groundwater if not cleaned up immediately. Seepage over time from a soil matrix into other media (groundwater) could occur for extended timeframes.
Risk of Soil or Groundwater	The consequences of a release of green diesel is considered very low and its storage and use is well managed under the site Environmental Management System procedures. The existing containment measure and spill control measures in place in the unlikely event of a spill indicate that the risk of soil or groundwater contamination is very low

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3.1.2 Hydraulic/Engine Oil

Criteria	Description
Substance	Hydraulic/Engine Oil
Annual Usage	1400 lts
Description of Use	Used by maintenance on site.
Mode of Transport	Road delivery
Relevant Substance	H400: Very toxic to aquatic life H412: Harmful to aquatic life with long lasting effects.
Potential Pathways to Ground	Possible spillage. All breaches would be contained within the bund area or on an impermeable concrete surface.
Existing Mitigation	All deliveries to site are closely monitored and controlled and all personnel have received the relevant training. Hydraulic/Engine Oil is stored in a bunded area, which provides containment for any spillage that may occur. Training is provided in the use of the spill kits and subsequent clean up.
Probability of Release to Ground	Given the relatively low usage of Hydraulic/Engine Oil on site and the relatively low quantities used, the probability of release to ground is low. The current containment measures and the existing controls mean that a containment breach or uncontrolled discharge event happening is very low. No accidental release has occurred in the past.
Consequence of Incident	If Hydraulic/Engine Oil entered the ground it would pose a potential risk and likely migrate to groundwater if not cleaned up immediately. Seepage over time from a soil matrix into other media (groundwater) could occur for extended timeframes.
Risk of Soil or Groundwater	The consequences of a release of Hydraulic/Engine Oil is considered very low and its storage and use is well managed under the site Environmental Management System procedures. The existing containment measure and spill control measures in place in the unlikely event of a spill indicate that the risk of soil or groundwater contamination is very low

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3.1.3 Other Hazardous Substances Identified

Material	Relevant Substance?	On Site Management
Eco-clin Urinal Tablets	H411: Toxic to aquatic life with long lasting effects	**Low Risk-** Eco-clin are in tablet form and stored in a secure location and quantity stored on site is relatively low.
WC Super	H400: Very toxic to aquatic life	**Low Risk-** WC Super is stored in a bunded location and quantity stored on site is relatively low.
Manosan Oxy	H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long lasting effects	**Low Risk-** Manosan Oxy is stored in a bunded location and quantity stored on site is relatively low.
Topaz CL4	H400: Very toxic to aquatic life H411: Toxic to aquatic life with long lasting effects	**Low Risk-** Topaz CL4 is stored in a bunded location and quantity stored on site is relatively low.
Taxat Extra Classic	H400: Very toxic to aquatic life	**Low Risk-** Taxat Extra Classic is stored in a bunded location and quantity stored on site is relatively low.
Triquart MS	H400: Very toxic to aquatic life	**Low Risk-** Triquart MS is stored in a bunded location and quantity stored on site is relatively low.

The majority of the substances listed as relevant hazardous substances that are used at the installation are in liquid form and have the potential to have an effect on soil or groundwater pollution if released into the environment either in small quantities over time or in large quantities. The likelihood of the release of these substances into the environment taking into account the volumes of each substance, potential environmental effects, location and the containment measures in place is discussed in section 4.

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4. Stage 3 – Assessment of the Site-Specifc Pollution Possibility

4.1 Storage, Usage, Containment Measures and Potential Risks of Release to the Environment

All chemical substances used at the facility are stored in suitable containers and are stored within secondary containment.

Vehicle and boiler diesel is contained on site within tanks in bunded location. The bunded tanks hold a maximum of 1,360 litres of diesel. Boiler 2 uses diesel which is supplied from a 10,000 litre tank which is within a concrete bund. The entire area where the diesel tank is stored and used is covered in concrete hardstanding of good integrity and free of cracks and degradation. Both diesel bund systems have been tested in 2019 as part of the integrity testing programme.

Motor oil and hydraulic oil are stored in 220L tight head drums (one drum of each material) on site within secondary containment i.e. a bund. These drums are also off-loaded upon delivery and stored within the confines of the processing shed on concrete hardstanding in an area where potential damage to the container is minimised. When necessary, small containers of oil are filled for use in mobile plant further reducing the risk of large spills due to movement of full drums. All smaller containers are stored when not in use within the secondary containment area.

Other chemicals that are identified as hazardous are stored in relatively small quantities, in a secure bunded chemical store which is only accessible by authorised personnel. When necessary, small containers of cleaning chemicals are filled for use around the site, further reducing the risk of large spills due to movement of full drums. All smaller containers are stored when not in use within the secondary containment area.

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Spill kits suitable for the containment and clean-up of diesel, oil and chemicals is maintained on site with a documented procedure in place for dealing with potential spills of these types of materials.

4.2 Soil and Groundwater Contamination Hazards

There are no historical baseline soil and groundwater monitoring results available for the facility. There have been no pollution causing incidents at the facility which have resulted in the release of the relevant hazardous substances to soil or groundwater. A site inspection carried out on 2nd August 2018 showed no visible evidence of historical pollution to any part of the facility by the relevant hazardous substances used at the facility.

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There are a number of surface water drains located throughout the site which are directed to 4 No. Surface Water Discharge points. There are no surface water or groundwater sources in the immediate vicinity of the storage areas where diesel, hydraulic/engine oils or chemicals are stored and used. Concrete hardstanding prevents any potential spills from reaching soil or groundwater. There were no identified emissions of hazardous substances to ground or groundwater on site.

Due to the containment measures proposed, the small volumes stored and used of each substance, as well as the standard operating procedures in place at the facility, it is considered that very low risk of discharge of the substances listed to the environment and in particular to soil or groundwater exists during normal and routine operations.

It is also necessary to consider abnormal operating conditions which may give rise to pollution of soil or groundwater. Taking into account the design of the existing facility, accidents and incidents may include spillage during use of the substances or drips/spillage during the filling of the diesel oil tanks or the smaller containers used for the transfer of hydraulic/engine oil/chemicals in which case the containment measures and spill clean-up procedures will ensure that the risk of release of any hazardous substance to soil or groundwater is minimised or eliminated.

In the event of cessation of site activities, the site will be closed in accordance with the Decommissioning Management Plan (DMP) which has also been submitted with the licence application together with an Environmental Liability Risk Assessment (ELRA). This ELRA will be updated as required throughout the operational lifetime of the proposed development which will ensure that potentially polluting substances, if any, are removed from the site in a manner which does not pose significant risk of pollution to soil or groundwater.

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5. Conclusion

Based on the findings of the above screening process, there is no indication of pollution of soil and groundwater at the current site, consistent with the current land use and historic land use as an agricultural site.

- The existing facility is designed to ensure the protection of soil and groundwater. All materials handling is undertaken indoors or in bunded areas and therefore there is a relatively low risk of soil or groundwater pollution arising during normal operations.
- The quantity of the relevant substances stored on site at any one time is small.
- The design of the facility combined with good environmental management practices on-site as well as emergency response procedures will ensure that the risk of any unplanned events will be minimised.

It is apparent due to the quantities of the hazardous substances used at the installation combined with the measures taken at the existing facility to ensure that contamination of soil and groundwater do not occur including containment measures, indoor activities, concrete hard standing and an environmental management system that the likelihood of, or potential for, contamination of soil or groundwater is extremely low. It is therefore concluded that a full baseline report (stages 4 onwards in the aforementioned Guidance) is not required.

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Appendix A: List of Hazardous Substances

Article 3

Hazardous substances and mixtures and specification of hazard classes

A substance or a mixture fulfilling the criteria relating to physical hazards, health hazards or environmental hazards, laid down in Parts 2 to 5 of Annex I is hazardous and shall be classified in relation to the respective hazard classes provided for in that Annex.

Where, in Annex I, hazard classes are differentiated on the basis of the route of exposure or the nature of the effects, the substance or mixture shall be classified in accordance with such differentiation.

2.1 Explosives	H200: Unstable Explosive H201: Explosive; mass explosion hazard H202: Explosive; severe projection hazard H203: Explosive; fire, blast or projection hazard H204: Fire or projection hazard H205: May mass explode in fire
2.2. Flammable gases	H220: Extremely flammable gas H221: Flammable gas
2.3. Flammable aerosols	H222: Extremely flammable aerosol H223: Flammable aerosol
2.4. Oxidising gases	H270: May cause or intensify fire; oxidiser
2.5. Gases under pressure	H280: Contains gas under pressure; may explode if heated H280: Contains gas under pressure; may explode if heated H281: Contains refrigerated gas; may cause cryogenic burns or injury H280: Contains gas under pressure; may explode if heated
2.6. Flammable liquids	H224: Extremely flammable liquid and vapour H225: Highly flammable liquid and vapour H226: Flammable liquid and vapour
2.7. Flammable solids	H228: Flammable Solid
2.8. Self-reactive substances and mixtures	H240: Heating may cause an explosion H241: Heating may cause a fire or explosion H242: Heating may cause a fire
2.9. Pyrophoric liquids	H250: Catches fire spontaneously if exposed to air
2.10. Pyrophoric solids	H250: Catches fire spontaneously if exposed to air
2.11. Self-heating substances and mixtures	H251: Self-heating; may catch fire H252: Self-heating in large quantities; may catch fire
2.12. Substances and mixtures which in contact with water emit flammable gases	H260: In contact with water releases flammable gases which may ignite spontaneously H261: In contact with water releases flammable gases
2.13. Oxidising liquids	H271:May cause fire or explosion; strong oxidiser H272: May intensify fire; oxidiser
2.14. Oxidising solids	H271: May cause fire or explosion; strong oxidiser H272: May intensify fire; oxidiser
2.15. Organic peroxides	H240: Heating may cause an explosion H241: Heating may cause a fire or explosion H242: Heating may cause a fire
2.16. Corrosive to metals	H290: May be corrosive to metals

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Part 3: Health Hazards	
3.1. Acute toxicity	H300: Fatal if swallowed H301: Toxic if swallowed H302: Harmful if swallowed H310:Fatal in contact with skin H311: Toxic in contact with skin H312: Harmful in contact with skin H330: Fatal if inhaled H331: Toxic if inhaled H332: Harmful if inhaled
3.2. Skin corrosion/irritation	H314: Causes severe skin burns and eye damage H315: Causes skin irritation
3.3. Serious eye damage/eye irritation	H318: Causes serious eye damage H319: Causes serious eye irritation
3.4. Respiratory or skin sensitisation	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled H317: May cause an allergic skin reaction
3.5. Germ cell mutagenicity	H340: May cause genetic defects (state route of exposure if it is conclusively proven that No other routes of exposure cause the hazard) H341: Suspected of causing genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)
3.6. Carcinogenicity	H350: May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H351: Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)
3.7. Reproductive toxicity	H360: May damage fertility or the unborn child (state specific effect if known)(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H361: Suspected of damaging fertility or the unborn child (state specific effect if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H362: May cause harm to breast-fed children.
3.8. Specific target organ toxicity — single exposure	H370: Causes damage to organs (or state all organs affected, if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H371: May cause damage to organs (or state all organs affected, if known) (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H335: May cause respiratory irritation; H336: May cause drowsiness or dizziness
3.9. Specific target organ toxicity — repeated exposure	H372: Causes damage to organs (state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) H373: May cause damage to organs (state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)
3.10. Aspiration hazard	H304: May be fatal if swallowed and enters airways

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Part 4: Environmental Hazards	
4.1. Hazardous to the aquatic environment	H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long lasting effects H411: Toxic to aquatic life with long lasting effects H412: Harmful to aquatic life with long lasting effects H413: May cause long lasting harmful effects to aquatic life R50: Very toxic to aquatic organisms R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Part 5: Additional EU Hazard Class	
5.1. Hazardous to the ozone layer	EUH059: Hazardous to the Ozone Layer

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SILVER HILL FARM
ESTABLISHED 1962

Silver Hill Foods, Emyvale
Co. Monaghan, Ireland
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F 00353 (0) 47 87655
E info@silverhillfoods.com
www.silverhillfarm.ie

Attachment 3 Proposed Timeline for Drip Feed Irrigation System

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Project Schedule - Effluent Disposal Options Silver Hill Duck

	ACTIVITIES	Week 0	Week 1 - 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45
		12/08/2019	02/09/2019	09/09/2019	16/09/2019	23/09/2019	30/09/2019	07/10/2019	14/10/2019	21/10/2019	28/10/2019	04/11/2019	06/04/2020	13/04/2020	20/04/2020	27/04/2020	04/05/2020	11/05/2020	18/05/2020	25/05/2020	01/06/2020	08/06/2020
A	Programme	INSTALLATION OF SUB-SURFACE IRRIGATION SYSTEM																				
A1.0	Baseline Sampling																					
A1.1	Completed contracts																					
A1.2	Order Materials																					
A1.3	Finalise engineering of system install																					
A1.6	Final Determination Issued																					
A1.4	Delivery of systems																					
A1.5	Installation of pumping systems																					
A1.7	Installation of Feed Pipe work																					
A1.8	Installation of Storage Tank for Effluent																					
A1.9	Installation of Sub surface irrigation pipework																					
A1.10	Installation of junction boxes for filters & valves																					
A1.11	Installation of wells within each field																					
A1.12	Commissioning of system																					
A1.13	Training of Operational & maintenance staff																					

Winter install not possible

- Project Milestone
- Estimated target duration of activity
- Actual completed activity
- On-going activity

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Attachment 4 Nutrient Management Plan

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CLW Environmental Planners Ltd.

The Mews,
23 Farnham Street,
Cavan,
Co. Cavan

Phone: 049-4371447/9
Fax: 049-4371451
E-mail: info@clwenvironmental.ie

Office of Environmental Enforcement,
Environmental Protection Agency,
Regional Inspectorate,
McCumiskey House,
Richview,
Clonskeagh Road,
Dublin 14

19th July 2019

Re: I.P.C. Reg. No. P0422-02
Fertiliser Management Plan

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Dear Sir/Madame,

I refer to the customer list submitted on behalf of the above mentioned client.

The customer farms have been inspected and the fertiliser plans for farms referenced in the customer list have been completed on the basis of the most recent, N and P statement/other information such as stock numbers and REPS plan information provided by, or on behalf of, the customer farmer and/or, a combination of these where applicable, in line with the requirements of S.I. 605 of 2017.

The customer list outlines all the required summary details and any additional information required as per the I.F.A. / E.P.A. agreement will be maintained on site.

Should you require any additional information please do not hesitate to contact me, at the above number.

Yours Sincerely,

Paraic Fay B.Agr.Sc.

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C.L.W. Environmental Planners Ltd.

Silverhill Foods (Sludge). ~ CUSTOMER FARM REPORT (SUMMARY)

FARM CODE	NAME	Townlands	County	FERTILISER REQUIREMENT (TONNES)
1	[redacted]	Dernalossett, Corlattallan	Monaghan	357.1429
2		Esker,	Monaghan	446.6387
3		Killybressal, Shanco, Lisavargy, Killybreen, Dundian	Monaghan	617.1429
4				
5		Drumfurrer, Corryarbeg, Drumfernasky	Monaghan	388.6218
TOTAL				*1809.5*

Estimated Annual production 600

Capacity % 301.591

Nutrient Content as per attached Cert. Of analysis.

Sludge Nutrient content kg/ton*	**N**	**1.85**
	P	**0.35**

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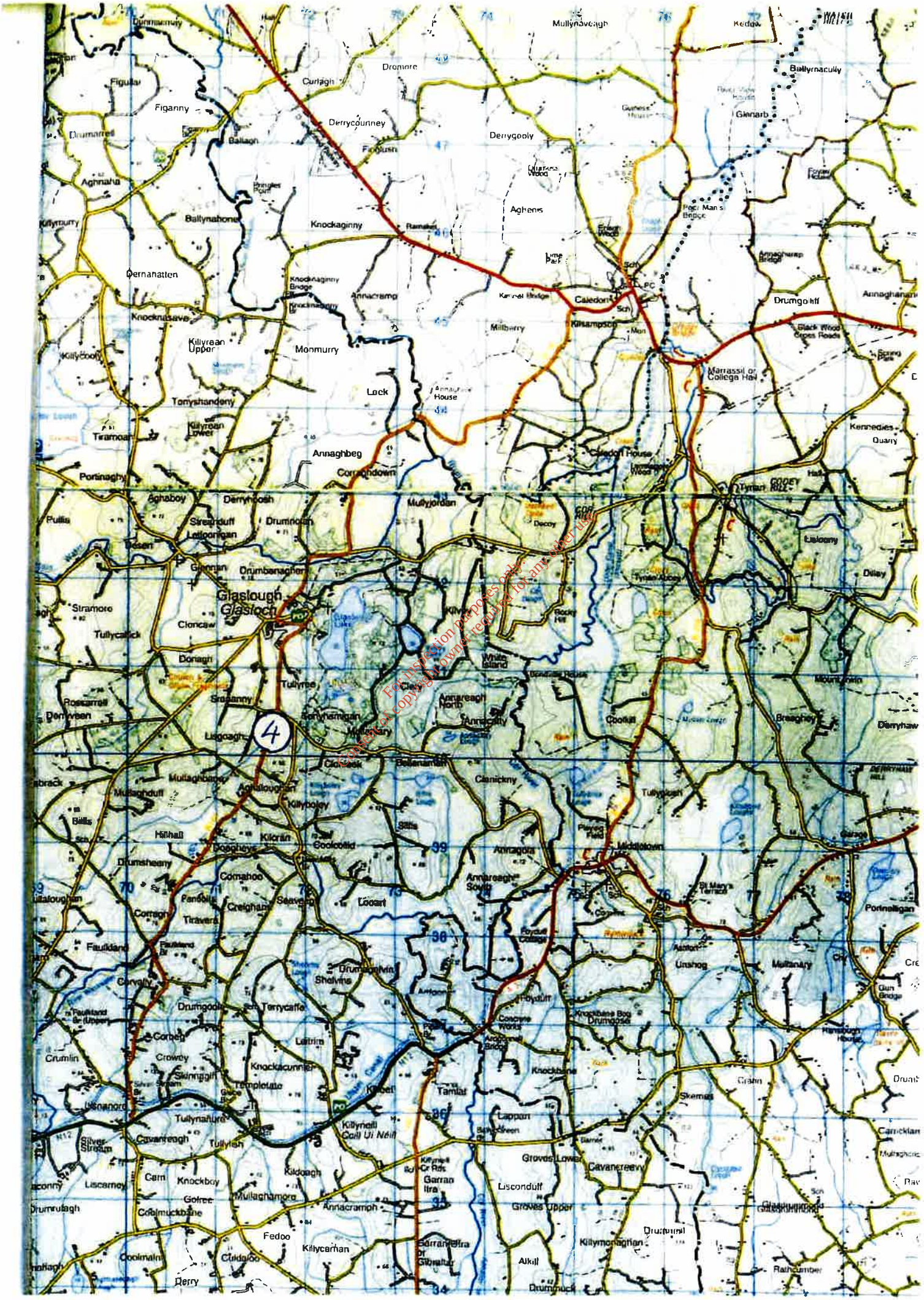

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Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 272972
Date Received: Wednesday 23 January 2019
Customer Name: David Wynne, Silver Hill Foods
Address: Hillcrest, Emyvale, Co. Monaghan
Reporting Method: Email **Email Address:** andrew@silverhillfoods.com
Sample Reference: Sludge Sample - WWTP Sludge 16/01/2019
Type of Sample: Sludge / Slurry
Condition of Sample: Satisfactory
Commencement Date: 23rd January 2019
Certificate Date: 1st February 2019

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Test	Units	Result (%)	Method	Result (mg/kg)
Moisture	%	99.34	TM2024	n/a
Dry Matter	%	0.66	TM2024	n/a
Ash	%	0.17	TM2026	n/a
Phosphorus	%	0.03	TM2036	300
Potassium	%	0.05	TM2042	500
Nitrogen	%	0.21	TM2023	2100

Unless otherwise stated results are expressed on an "as received" basis.

** = Subcontracted Test*

Signed : Martin Fulton
Analyst

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Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 272973
Date Received: Wednesday 23 January 2019
Customer Name: David Wynne, Silver Hill Foods
Address: Hillcrest, Emyvale, Co. Monaghan
Reporting Method: Email **Email Address:** andrew@silverhillfoods.com
Sample Reference: Sludge Sample - WWTP Sludge 22/01/2019
Type of Sample: Sludge / Slurry
Condition of Sample: Satisfactory
Commencement Date: 23rd January 2019
Certificate Date: 1st February 2019

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Test	Units	Result (%)	Method	Result (mg/kg)
Moisture	%	99.36	TM2024	n/a
Dry Matter	%	0.64	TM2024	n/a
Ash	%	0.14	TM2026	n/a
Phosphorus	%	0.04	TM2036	400
Potassium	%	0.07	TM2042	700
Nitrogen	%	0.17	TM2023	1700

Unless otherwise stated results are expressed on an "as received" basis.

** = Subcontracted Test*

Signed : Martin Fulton
Analyst

The Above results relate only to the sample submitted and do not guarantee the bulk of the material to be of equal quality. This Certificate of analysis shall not be reproduced except in full without the approval of the laboratory. Oldcastle Laboratories Ltd. was not responsible for sampling and cannot be held liable in respect of the use to which information is put.

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Appendix E: Sludge Press Spec

Project

RENTAL DEWATERING UNIT

Thursday, 03 June 2021

Prepared For SILVERHILL FOODS

9 comments highlighted

Adam Mackin

WATER TECNIK LTD.

WATERTECNIK
engineered wastewater solutions

Comment 1

Project Area Sludge Inlet

Connect DN50pipe from sludge holding tank to sludge feed pump.

Comment 2

Project Area Water Connection

Connect water supply to 1/2" hose tail. This water supplies the polymer makeup system and the dewater spray bars.

Comment 3

Project Area Filtrate Outlet

Connect 4" flexible hose to filtrate outlet on the drainage sump.
This filtrate should be returned to the front end of the waste water treatment process.

Comment 4

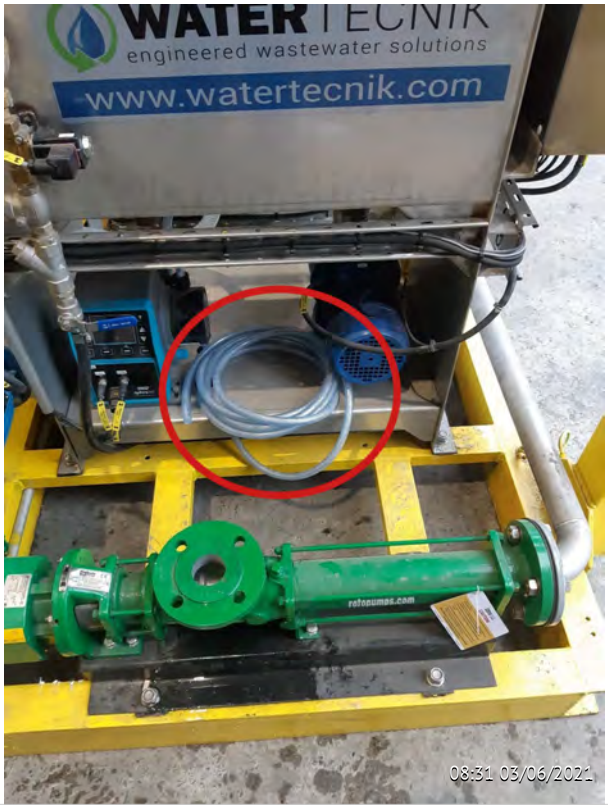
Project Area Electrical Supply

Connect a 32A 3phase, neutral and earth supply to income terminals within main control panel.
The poly control panel is supplied from main and is rewired. So doesn't need to be touched.

Comment 5

Project Area Cake Collection

The machine can discharge cake directly to a skip, or can be raised up to discharge into a trailer directly.
A screw conveyor or cake pump can also be fitted as options to transfer cake to collection vessel.



Comment 6

Project Area Polymer Concentrate

The braided PC hose shown connects from the polymer metering pump from the polymer concentrate drum.

Comment 7

Project Area Skid

Machine is skid mounted and can be lifted into place easily.
It is pre wired and piped to allow for plug and play installation.

Comment 8

Project Area Automatic On /Off Controls.

Inside the pan there is a link wire labelled "auto start".
This is in essence the on / off switch for the machine to operate in automatic mode.
This allows the operator to automatically start/stop the dewatering unit on the sludge tank level.
Site will have to bring a switch wire from a control device such as existing plc or level controller.

Comment 9

Project Area Weld Parts

Weld with welder.

Safety Data Sheet

According to Regulation (EU) No. 453/2010

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product Identifier

Product Name: CE682GB - CATIONIC POLYMER EMULSION

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use: Flocculation agent

1.3 Details of the supplier of the safety data sheet

Company name: WATER TECNIK LTD.
Address: CARRICKBRAKEN BUSINESS PARK
121 CAMLOUGH ROAD
NEWRY
BT32 3UA

Web address: www.watertecnik.com
Tel: 028 406 22439
Fax: N/A
E-mail: info@watertecnik.com

1.4 Emergency telephone number

Tel: 077 3903 4388

Section 2: Hazards identification

2.1 Classification of the substance or mixture

CLASSIFICATION ACCORDING TO REGULATION (EC) NO. 1272/2008

Hazard types	Hazard class and category codes	Hazard statements
Physical and Chemical:	Not classified	n/a
Health:	Skin Irrit.2	H315 – Causes skin irritation
	Eye Irrit.2	H319 – Causes serious eye irritation
Environmental:	Not classified	n/a

2.2 Label elements

LABELLING ACCORDING TO REGULATION (EC) NO. 1272/2008

Warning

H315 – Causes skin irritation.
H319 – Causes serious eye irritation.

P264 – Wash Affected area thoroughly after handling.
P280 – Wear protective gloves and eye protection.
P302 + P352 – IF ON SKIN: Wash with plenty of water and soap.
P332 + P313 – If skin irritation occurs: Get medical advice/attention.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 – If eye irritation persists: Get medical attention.

2.3 Other hazards

Spilled product is slippery underfoot.
This product does not contain any substance that meets the criteria for PBT or vPvB in accordance with Annex XIII of Regulation (EC) No. 1907/2006.

Section 3: Composition/Information on ingredients

3.2 Mixtures

Chemical nature: An emulsion based on cationic polyacrylamide.

HAZARDOUS INGREDIENTS ACCORDING TO REGULATION (EC) 1272/2008

Ingredient name	EC No CAS No Annex VI No REACH Reg.No	Classification (EC) No. 1272/2008	Content %
Hydrocarbons, C_{12}-C_{15}, n-alkanes, isoalkanes, cyclics, <2% aromatics	920-107-4 n/a n/a 01-2119453414-43	Asp.1: H304 EUH 066	20 - 25
Alcohols (C10-16) ethoxylated	500-182-6 68002-97-1 n/a n/a	Acute Tox.4: H302 Eye Dam.1: H318 Aquatic Chronic 3: H412	1 - 3

For full text of Hazard Statements see section 16.

Section 4: First aid measures

4.1 Description of first aid measures

Skin contact: Remove all contaminated clothing and wash before wearing again.
Wash affected area with soap and plenty of water.
If any irritation or symptoms persist, seek medical attention.

Eye contact: Remove contact lenses if worn and rinse eye with plenty of water for at least 10 minutes holding eye open.
If any irritation or symptoms persist, seek medical attention.

Ingestion: If confined to mouth, wash out with plenty of water taking care not to swallow, and seek medical advice if there is any ill effect.
If swallowed, DO NOT INDUCE VOMITING, give one or two glasses of water to drink, seek immediate medical attention and show this safety data sheet or label.

Inhalation: Move to fresh air and seek medical attention if any irritation or symptoms persist.

4.2 Most important symptoms and effects, both acute and delayed

Skin contact: Likely to cause irritation.

Eye contact: Likely to cause irritation and redness.

Ingestion: Likely to cause irritation to digestive system.

Inhalation: Likely to cause irritation to respiratory system.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically
No specific antidote known

Section 5: Firefighting measures

5.1 Extinguishing media

Use dry powder, foam or water spray.
The product is slippery underfoot therefore it is preferable not to use a water jet to avoid spreading the product.

5.2 Special hazards arising from the substance or mixture

Irritating and toxic fumes may be emitted in fire conditions
Floor is likely to be slippery underfoot.

5.3 Advice for firefighters

Wear full protective clothing and self-contained breathing apparatus.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedure

Wear suitable equipment for protection of eyes and skin.
Respiratory equipment should be worn if there is insufficient ventilation.
Take care; floor is likely to be slippery underfoot.

6.2 Environmental precautions

Prevent product from entering drains and prevent further spillage if safe to do so.
Advise local authorities if large spills cannot be contained.

6.3 Clean-up procedures

Absorb with inert absorbent material and transfer to suitable labelled container for disposal.
If only traces remain the area may then be flushed with water.

6.4 Reference to other sections

Suitable equipment for eye/face, skin and respiratory protection is quoted in section 8.
Suitable methods for disposal are quoted in section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with eyes and skin.
Do not breathe fumes.
Wear suitable equipment for protection of eyes and skin.
Respiratory equipment should be worn if the product is in the form of a spray or mist and if there is insufficient ventilation.
Avoid all sources of ignition: heat, sparks, open flame or electrostatic discharge.
Do not eat or drink in working area and wash hands after use.

7.2 Conditions for safe storage, including any incompatibilities

Store in original containers and keep well sealed.
Store in a dry well-ventilated area at normal room temperature.
Do not allow to freeze.

7.3 Specific end use

There is no specific end use in addition to that shown in section 1.

Section 8: Exposure controls/personal protection

8.1 Control parameters

WORKPLACE EXPOSURE LIMIT EH40

None of the ingredients have a workplace exposure limit

8.2 Exposure controls

Engineering controls: Ensure adequate ventilation of the working area.
Eyewash facilities should be provided in the working area.

Eye /face protection: Safety goggles (EN166).

Skin protection: Chemical resistant gloves (EN374), lightweight protective overalls and protective footwear.

Respiratory protection: Full or half mask respirator with combination filter (EN14387 type ABEK-P2).

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Off white emulsion
Odour:	Mineral oil-like
Odour threshold:	n/a
pH:	6 - 8 (aqueous solution)
Melting point/freezing point:	n/a
Boiling point or boiling range:	n/a
Flash point:	n/a
Evaporation rate:	n/a
Flammability:	n/a
Upper/lower flammability or explosive limits:	n/a
Vapour pressure:	n/a
Vapour density:	n/a
Relative density:	Approx. 1.0 g/cm^3 @20°C
Solubility:	Disperses in water
Partition coefficient: n-octanol/water:	n/a
Auto-ignition temperature:	n/a
Decomposition temperature:	n/a
Viscosity (Dynamic):	n/a
Viscosity (Kinematic):	>22.5mm^2/s (40^{o}C)
Explosive properties:	None
Oxidising properties:	None

9.2 Other information

None available

Section 10: Stability and reactivity

10.1 Reactivity

No reactivity is likely if stored and handled as prescribed.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions are likely if stored and handled as prescribed.

10.4 Conditions to avoid

Temperature extremes.
Freezing will damage the emulsion stability.

10.5 Incompatible materials

Oxidizing agents.

10.6 Hazardous decomposition products

Evolution of oxides of carbon and nitrogen is possible when exposed to excessive heat.

Section 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:	**Oral**	**Dermal**	**Inhalation**
Similar product	Rat LD50 >5000mg/kg	Rabbit LD50 >2000mg/kg	Rat LC50(4h) >20 mg/l
Hydrocarbons, C_{12}-C_{15}, n-alkanes, isoalkanes, cyclics, <2% aromatics	Rat LD50 >5000mg/kg	Rabbit LD50 >2000mg/kg	Rat LC50(4h) 5.2mg/l

Irritation:	Likely to cause irritation to eyes and skin.
Corrosivity:	Not reported.
Sensitisation:	Not reported.
Repeated dose toxicity:	Not reported.
Carcinogenity:	Not reported.
Mutagenicity:	Not reported.
Toxicity for reproduction:	Not reported.

Section 12: Ecological information

12.1 Toxicity

Aquatic toxicity:	**Fish**	**Aquatic invertebrates**	**Aquatic plants**
Similar product	Danio rerio LC50(96h) 1-10mg/l	Daphnia Magna EC50(48h) 10-100mg/l	-

12.2 Persistence and degradability

The product is not readily biodegradable.

12.3 Bioaccumulative potential

Accumulation in organisms is not expected.

12.4 Mobility in soil

Adsorption to solid soil phase is expected.

12.5 Results of PBT and vPvB assessment

Not applicable.

12.6 Other adverse effects

None known.

Section13: Disposal considerations

13.1 Waste treatment methods

Disposal of product: Must be disposed of in accordance with local and national regulations.

Disposal of packaging: Packaging should be sent for recycling or disposed of as for the product .

Section 14: Transport information

This product is not classified as dangerous for carriage by, road, sea or air.

Section 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation (EC) No. 1272/2008 on Classification, Labelling and Packaging of substances and mixtures.
Regulation (EC) No. 1907/2006 on Registration, Evaluation, Authorisation and Restriction of Chemicals.
Directive 648/2004/EC (Detergents Regulations)

15.2 Chemical safety Assessment

A Chemical Safety Assessment has not yet been carried out on this product.

Section 16: Other information

This data sheet is produced in accordance with Commission Regulation (EU) No. 453/2010 which amends Regulation (EC) No. 1907/2006.
It is revision 04 and replaces revision 03 compiled on 07/05/2015

Changes have been made to sections 2, 3, and 15.

Text for hazard statements and risk phrases not written in full in section 3:

H302 – Harmful if swallowed
H304 – May be fatal if swallowed and enters airways
H318 – Causes serious eye damage
H412 – Harmful to aquatic life with long lasting effects
EUH066 – Repeated exposure may cause skin dryness or cracking

The abbreviation n/a = not applicable or not available.

The information given in this document is based on current knowledge and experience and is given in good faith. No warranty expressed or implied is made, and data is only relevant to the use for which the product is supplied.

Appendix F: Labouratory Certificates

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**1155N01**	**Analysis Number:**	**99A/130036**

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	DENISE	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150421.B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	15/04/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	15/04/2021
Sample Description:	MP1	**Date Certificate Issued:**	07/05/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	1	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	1	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	1	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	1.9	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.06	mg/l NH3-N
Total Phosphorus	ICP-MS	0.03	mg/l P
Orthophosphate	Konelab Aquakem SOP 2061	0.03	mg/l PO4
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l

Signed: WD McCall Date: 07/05/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	1155N02	Analysis Number:	99A/130037

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	DENISE	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150421.B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	15/04/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	15/04/2021
Sample Description:	MP2	**Date Certificate Issued:**	07/05/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.8	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	12	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	2	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	1	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	2.2	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.45	mg/l NH3-N
Total Phosphorus	ICP-MS	1.11	mg/l P
Orthophosphate	Konelab Aquakem SOP 2061	2.27	mg/l PO4
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l

Signed: WO McCall Date: 07/05/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	1155N03	**Analysis Number:**	99A/130038

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	DENISE	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150421.B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	15/04/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	15/04/2021
Sample Description:	MP3	**Date Certificate Issued:**	07/05/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.9	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	27	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	4	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	6	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	19.0	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.25	mg/l NH3-N
Total Phosphorus	ICP-MS	0.24	mg/l P
Orthophosphate	Konelab Aquakem SOP 2061	0.20	mg/l PO4
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l

Signed: WO McCall Date: 07/05/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**1155N04**	**Analysis Number:**	**99A/130039**

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	DENISE	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150421.B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	15/04/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	15/04/2021
Sample Description:	MP4	**Date Certificate Issued:**	07/05/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	5	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	4	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	2	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	7.8	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.07	mg/l NH3-N
Total Phosphorus	ICP-MS	0.45	mg/l P
Orthophosphate	Konelab Aquakem SOP 2061	0.1	mg/l PO4
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l

Signed: WO McCall Date: 07/05/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 8581S001

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	20/04/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	20/04/2022
Sample Description:	MP1	**Date Certificate Issued:**	28/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Conductivity	SOP 2076	515	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	9	mg/l
Total Suspended Solids	SOP 2016	6	mg/l
Ammonia Nitrogen	SOP 2057	0.16	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.45	mg/l P
Orthophosphate P	SOP 2061	0.40	mg/l P

Signed: WD McCall Date: 28/04/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 8581S002

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	20/04/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	20/04/2022
Sample Description:	MP2	**Date Certificate Issued:**	28/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.2	pH units
Conductivity	SOP 2076	684	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	11	mg/l
Total Suspended Solids	SOP 2016	10	mg/l
Ammonia Nitrogen	SOP 2057	0.14	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.38	mg/l P
Orthophosphate P	SOP 2061	0.33	mg/l P

Signed: WD McCall Date: 28/04/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 8581S003

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	20/04/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	20/04/2022
Sample Description:	MP3	**Date Certificate Issued:**	28/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.1	pH units
Conductivity	SOP 2076	730	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	15	mg/l
Total Suspended Solids	SOP 2016	4	mg/l
Ammonia Nitrogen	SOP 2057	0.13	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.15	mg/l P
Orthophosphate P	SOP 2061	0.12	mg/l P

Signed: WD McCall Date: 28/04/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: **8583S001**

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	20/04/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	20/04/2022
Sample Description:	MP4	**Date Certificate Issued:**	28/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Conductivity	SOP 2076	556	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	37	mg/l
Total Suspended Solids	SOP 2016	6	mg/l
Ammonia Nitrogen	SOP 2057	0.21	mg/l NH_3-N
Total Phosphorus	SOP 2126	1.82	mg/l P
Orthophosphate P	SOP 2061	1.64	mg/l P

Signed: WD McCall Date: 28/04/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.2751

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Phone: 059 9721022 **Email: reception@iaslabs.ie** **Web: www.iaslabs.ie**

December's SW's

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4961S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	171221.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	17/12/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	17/12/2021
Sample Description:	MP1	**Date Certificate Issued:**	23/12/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.7	pH units
Biochemical Oxygen Demand	SOP 2006	1	mg/l
Chemical Oxygen Demand	SOP 2005	12	mg/l
Total Suspended Solids	SOP 2016	23	mg/l
Total Nitrogen	SOP 2075	3.1	mg/l
Ammonia Nitrogen	SOP 2057	0.09	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.10	mg/l P
Orthophosphate P	SOP 2061	0.03	mg/l P
Conductivity	SOP 2076	367	µS/cm 20°C

Signed: WD McCall Date: 23/12/2021

Wendy McCall - Laboratory Manager

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Phone: 059 9721022 Email: reception@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4961S002

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	171221.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	17/12/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	17/12/2021
Sample Description:	MP2	**Date Certificate Issued:**	23/12/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Biochemical Oxygen Demand	SOP 2006	3	mg/l
Chemical Oxygen Demand	SOP 2005	14	mg/l
Total Suspended Solids	SOP 2016	12	mg/l
Total Nitrogen	SOP 2075	1.8	mg/l
Ammonia Nitrogen	SOP 2057	0.30	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.45	mg/l P
Orthophosphate P	SOP 2061	0.46	mg/l P
Conductivity	SOP 2076	772	µS/cm 20°C

Signed: WD McCall Date: 23/12/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4961S003

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	171221.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	17/12/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	17/12/2021
Sample Description:	MP3	**Date Certificate Issued:**	23/12/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.7	pH units
Biochemical Oxygen Demand	SOP 2006	4	mg/l
Chemical Oxygen Demand	SOP 2005	20	mg/l
Total Suspended Solids	SOP 2016	9	mg/l
Total Nitrogen*	SOP 2075	53.0	mg/l
Ammonia Nitrogen	SOP 2057	0.16	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.33	mg/l P
Orthophosphate P	SOP 2061	0.18	mg/l P
Conductivity	SOP 2076	1134	µS/cm 20°C

Signed: WD McCall Date: 23/12/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4961S004

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	171221.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	17/12/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	17/12/2021
Sample Description:	MP4	**Date Certificate Issued:**	23/12/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.3	pH units
Biochemical Oxygen Demand	SOP 2006	4	mg/l
Chemical Oxygen Demand	SOP 2005	28	mg/l
Total Suspended Solids	SOP 2016	3	mg/l
Total Nitrogen	SOP 2075	8.7	mg/l
Ammonia Nitrogen	SOP 2057	0.72	mg/l NH_3-N
Total Phosphorus	SOP 2125	1.28	mg/l P
Orthophosphate P	SOP 2061	1.17	mg/l P
Conductivity	SOP 2076	773	µS/cm 20°C

Signed: WD McCall Date: 23/12/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 6642S001

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	MP 1	**Date Certificate Issued:**	28/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.6	pH units
Conductivity	SOP 2076	493	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	18	mg/l
Total Suspended Solids	SOP 2016	5	mg/l
Ammonia Nitrogen	SOP 2057	0.04	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.04	mg/l P
Orthophosphate P	SOP 2061	0.02	mg/l P

Signed: WD McCall Date: 28/02/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 6642S002

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	MP 2	**Date Certificate Issued:**	28/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Conductivity	SOP 2076	745	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	13	mg/l
Total Suspended Solids	SOP 2016	9	mg/l
Ammonia Nitrogen	SOP 2057	0.13	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.57	mg/l P
Orthophosphate P	SOP 2061	0.44	mg/l P

Signed: WD McCall Date: 28/02/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 6642S003

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	MP 3	**Date Certificate Issued:**	28/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Conductivity	SOP 2076	792	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	13	mg/l
Total Suspended Solids	SOP 2016	8	mg/l
Ammonia Nitrogen	SOP 2057	0.29	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.88	mg/l P
Orthophosphate P	SOP 2061	0.70	mg/l P

Signed: WD McCall Date: 28/02/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 6642S004

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	MP 4	**Date Certificate Issued:**	28/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Conductivity	SOP 2076	550	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	37	mg/l
Total Suspended Solids	SOP 2016	11	mg/l
Ammonia Nitrogen	SOP 2057	0.16	mg/l NH_3-N
Total Phosphorus	SOP 2126	1.71	mg/l P
Orthophosphate P	SOP 2061	1.35	mg/l P

Signed: WD McCall Date: 28/02/2022

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	**3751N01**	**Analysis Number:**	**99A/131259**

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	290721B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	29/07/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	29/07/2021
Sample Description:	28/07/21 MP1	**Date Certificate Issued:**	11/08/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Conductivity	Electrometry SOP 2076	859	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	25	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	12	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	5	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	4.0	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	1.70	mg/l NH3-N
Total Phosphorus	ICP-MS	0.61	mg/l P
P Orthophosphate	Konelab Aquakem SOP 2061	0.35	mg/l P

Signed: WD McCall Date: 11/08/2021

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Independent Analytical Supplies

Test Report

Lab Report Number:	**3751N02**	**Analysis Number:**	**99A/131260**

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	290721B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	29/07/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	29/07/2021
Sample Description:	28/07/21 MP2	**Date Certificate Issued:**	10/08/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Conductivity	Electrometry SOP 2076	918	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	20	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	11	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	3	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	3.7	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	1.80	mg/l NH3-N
Total Phosphorus*	ICP-MS	1.08	mg/l P
P Orthophosphate	Konelab Aquakem SOP 2061	0.85	mg/l P

Signed: WD McCall Date: 10/08/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	3751N03	**Analysis Number:**	99A/131261

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	290721B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	29/07/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	29/07/2021
Sample Description:	28/07/21 MP3	**Date Certificate Issued:**	10/08/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	**8.1**	pH units
Conductivity	Electrometry SOP 2076	1061	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	20	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	17	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	3	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	5.8	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.93	mg/l NH3-N
Total Phosphorus*	ICP-MS	1.02	mg/l P
P Orthophosphate	Konelab Aquakem SOP 2061	2.12	mg/l P

Signed: WD McCall Date: 10/08/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	3751N04	Analysis Number:	99A/131262

Customer ID:	SILV.H1	**Analysis Type:**	Misc. Tests (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	290721B/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	29/07/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	29/07/2021
Sample Description:	28/07/21 MP4	**Date Certificate Issued:**	10/08/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.6	pH units
Conductivity	Electrometry SOP 2076	1238	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	40	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	30	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	7	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	2.9	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	1.46	mg/l NH3-N
Total Phosphorus*	ICP-MS	4.15	mg/l P
P Orthophosphate	Konelab Aquakem SOP 2061	2.76	mg/l P

Signed: WO McCall Date: 10/08/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2573N01**	**Analysis Number:**	**SILVER 1/6**

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S1/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	10/06/2021
Sample Reference:	SURFACE	**Date Analysis Commenced:**	10/06/2021
Sample Description:	MP 1	**Date Certificate Issued:**	21/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.6	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<2	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	1	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	10	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	1.3	mg/l
Total Phosphorus	ICP-MS	0.13	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.13	mg/l NH3-N
P Orthophosphate	Konelab Aquakem SOP 2061	0.083	mg/l P
Conductivity*	Electrometry SOP 2076	1220	µS/cm 20°C

Signed: WO McCall Date: 21/06/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	**2573N02**	**Analysis Number:**	**SILVER 1/7**

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S1/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	10/06/2021
Sample Reference:	SURFACE	**Date Analysis Commenced:**	10/06/2021
Sample Description:	MP 2	**Date Certificate Issued:**	21/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.9	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<2	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	1	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	33	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	2.5	mg/l
Total Phosphorus	ICP-MS	1.52	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.17	mg/l NH3-N
P Orthophosphate	Konelab Aquakem SOP 2061	1.87	mg/l P
Conductivity	Electrometry SOP 2076	1765	µS/cm 20°C

Signed: WO McCall Date: 21/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2573N03**	**Analysis Number:**	**SILVER 1/8**

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S1/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	10/06/2021
Sample Reference:	SURFACE	**Date Analysis Commenced:**	10/06/2021
Sample Description:	MP 3	**Date Certificate Issued:**	21/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	2	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	<1	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	7	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	1.5	mg/l
Total Phosphorus	ICP-MS	0.34	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.10	mg/l NH3-N
P Orthophosphate	Konelab Aquakem SOP 2061	0.08	mg/l P
Conductivity	Electrometry SOP 2076	1161	µS/cm 20°C

Signed: WO McCall Date: 21/06/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	2573N04	**Analysis Number:**	SILVER 1/9

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S1/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	10/06/2021
Sample Reference:	SURFACE	**Date Analysis Commenced:**	10/06/2021
Sample Description:	MP 4	**Date Certificate Issued:**	21/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.6	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<1	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	**<1**	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	**16**	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	2.1	mg/l
Total Phosphorus	ICP-MS	0.38	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
Ammonia Nitrogen	Konelab Aquakem SOP 2057	0.05	mg/l NH3-N
P Orthophosphate	Konelab Aquakem SOP 2061	0.097	mg/l P
Conductivity	Electrometry SOP 2076	1107	µS/cm 20°C

Signed: WO McCall Date: 21/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 7798S001

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	230322.A
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	23/03/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	23/03/2022
Sample Description:	MP1	**Date Certificate Issued:**	14/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Conductivity	SOP 2076	430	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	10	mg/l
Total Suspended Solids	SOP 2016	3	mg/l
Ammonia Nitrogen	SOP 2057	0.39	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.49	mg/l P
Orthophosphate P	SOP 2061	0.43	mg/l P

Signed: WD McCall Date: 14/04/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 7798S002

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	230322.A
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	23/03/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	23/03/2022
Sample Description:	MP2	**Date Certificate Issued:**	14/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.0	pH units
Conductivity	SOP 2076	830	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	14	mg/l
Total Suspended Solids	SOP 2016	11	mg/l
Ammonia Nitrogen	SOP 2057	0.32	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.59	mg/l P
Orthophosphate P	SOP 2061	0.40	mg/l P

Signed: WD McCall Date: 14/04/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 7798S003

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	230322.A
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	23/03/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	23/03/2022
Sample Description:	MP3	**Date Certificate Issued:**	14/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.2	pH units
Conductivity	SOP 2076	815	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	12	mg/l
Total Suspended Solids	SOP 2016	7	mg/l
Ammonia Nitrogen	SOP 2057	0.32	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.48	mg/l P
Orthophosphate P	SOP 2061	0.31	mg/l P

Signed: WD McCall Date: 14/04/2022

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 7798S004

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	230322.A
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	23/03/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	23/03/2022
Sample Description:	MP4	**Date Certificate Issued:**	14/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Conductivity	SOP 2076	978	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	26	mg/l
Total Suspended Solids	SOP 2016	10	mg/l
Ammonia Nitrogen	SOP 2057	0.36	mg/l NH_3-N
Total Phosphorus	SOP 2126	1.06	mg/l P
Orthophosphate P	SOP 2061	0.77	mg/l P

Signed: WD McCall Date: 14/04/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9121S001

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	110522H
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	05/05/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	05/05/2022
Sample Description:	MP1	**Date Certificate Issued:**	20/05/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.8	pH units
Conductivity	SOP 2076	337	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	46	mg/l
Total Suspended Solids	SOP 2016	72	mg/l
Ammonia Nitrogen	SOP 2057	0.17	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.17	mg/l P
Orthophosphate P	SOP 2061	0.16	mg/l P

Signed: WD McCall Date: 20/05/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9121S002

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	110522H
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	05/05/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	05/05/2022
Sample Description:	MP2	**Date Certificate Issued:**	20/05/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.2	pH units
Conductivity	SOP 2076	502	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	20	mg/l
Total Suspended Solids	SOP 2016	56	mg/l
Ammonia Nitrogen	SOP 2057	0.16	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.25	mg/l P
Orthophosphate P	SOP 2061	0.16	mg/l P

Signed: WD McCall Date: 20/05/2022

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 9121S003

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	110522H
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	05/05/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	05/05/2022
Sample Description:	MP3	**Date Certificate Issued:**	20/05/2022

Parameter	Method	Result	Unit
pH	SOP 2004	8.0	pH units
Conductivity	SOP 2076	429	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	22	mg/l
Total Suspended Solids	SOP 2016	60	mg/l
Ammonia Nitrogen	SOP 2057	0.17	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.21	mg/l P
Orthophosphate P	SOP 2061	0.10	mg/l P

Signed: WD McCall Date: 20/05/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9121S004

Customer ID:	SILV.H1	**Analysis Type:**	SILVER 3 SW (SILVER 3)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	110522H
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	05/05/2022
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	05/05/2022
Sample Description:	MP4	**Date Certificate Issued:**	20/05/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Conductivity	SOP 2076	597	µS/cm 20°C
Chemical Oxygen Demand	SOP 2005	30	mg/l
Total Suspended Solids	SOP 2016	6	mg/l
Ammonia Nitrogen	SOP 2057	0.30	mg/l NH_3-N
Total Phosphorus	SOP 2126	1.81	mg/l P
Orthophosphate P	SOP 2061	1.47	mg/l P

Signed: WD McCall Date: 20/05/2022

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	2094N01	Analysis Number:	SILVER 1/1

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	210521.A/5
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	21/05/2021
Sample Reference:	SURFACE WATER/WASH WATER	**Date Analysis Commenced:**	21/05/2021
Sample Description:	MP 1	**Date Certificate Issued:**	03/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.0	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	5	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	1	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	2	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	1.7	mg/l
Ammonia	Konelab Aquakem SOP 2057	0.06	mg/l NH3
Total Phosphorus	ICP-MS	0.11	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
P Orthophosphate	Konelab Aquakem SOP 2061	0.077	mg/l P

Signed: WD McCall Date: 03/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	2094N02	Analysis Number:	SILVER 1/2

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	210521.A/5
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	21/05/2021
Sample Reference:	SURFACE WATER/WASH WATER	**Date Analysis Commenced:**	21/05/2021
Sample Description:	MP 2	**Date Certificate Issued:**	03/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.7	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	35	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	9	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	10	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	0.8	mg/l
Ammonia	Konelab Aquakem SOP 2057	0.02	mg/l NH3
Total Phosphorus	ICP-MS	0.76	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
P Orthophosphate	Konelab Aquakem SOP 2061	0.32	mg/l P

Signed: WD McCall Date: 03/06/2021

Wendy McCall - Laboratory Manager

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Test Report

Lab Report Number:	**2094N03**	**Analysis Number:**	**SILVER 1/3**

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	210521.A/5
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	21/05/2021
Sample Reference:	SURFACE WATER/WASH WATER	**Date Analysis Commenced:**	21/05/2021
Sample Description:	MP 3	**Date Certificate Issued:**	03/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	8.2	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	20	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	2	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	6	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	2.2	mg/l
Ammonia	Konelab Aquakem SOP 2057	0.33	mg/l NH3
Total Phosphorus	ICP-MS	0.23	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
P Orthophosphate	Konelab Aquakem SOP 2061	0.10	mg/l P

Signed: WD McCall Date: 03/06/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number:	2094N04	Analysis Number:	SILVER 1/4

Customer ID:	SILV.H1	**Analysis Type:**	SILVER HILL 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Courier
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	210521.A/5
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Surface Water	**Date Sample Received:**	21/05/2021
Sample Reference:	SURFACE WATER/WASH WATER	**Date Analysis Commenced:**	21/05/2021
Sample Description:	MP 4	**Date Certificate Issued:**	03/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.6	pH units
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	17	mg/l
Biochemical Oxygen Demand	Oxygen Meter SOP 2006	3	mg/l
Total Suspended Solids	Gravimetric/Dry @ 105°C SOP 2016	1	mg/l
Total Nitrogen	Digestion/Colourimetry SOP 2075	**1.8**	mg/l
Ammonia	Konelab Aquakem SOP 2057	0.18	mg/l NH3
Total Phosphorus	ICP-MS	0.17	mg/l P
Oils, Fats, Grease [by NVM]*^	Subcontracted	<0.60	mg/l
P Orthophosphate	Konelab Aquakem SOP 2061	0.097	mg/l P

Signed: WD McCall Date: 03/06/2021

Wendy McCall - Laboratory Manager

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Novembers SLI's

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 3790S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	111121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	11/11/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	11/11/2021
Sample Description:	MP 1	**Date Certificate Issued:**	19/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.6	pH units
Biochemical Oxygen Demand	SOP 2006	1	mg/l
Chemical Oxygen Demand	SOP 2005	8	mg/l
Total Suspended Solids	SOP 2016	5	mg/l
Total Nitrogen	SOP 2075	1.9	mg/l
Ammonia Nitrogen	SOP 2057	0.04	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.04	mg/l P
Orthophosphate P	SOP 2061	0.04	mg/l P
Conductivity	SOP 2076	342	µS/cm 20°C

Signed: WD McCall Date: 19/11/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 3790S002

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	111121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	11/11/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	11/11/2021
Sample Description:	MP 2	**Date Certificate Issued:**	19/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	8.2	pH units
Biochemical Oxygen Demand	SOP 2006	3	mg/l
Chemical Oxygen Demand	SOP 2005	17	mg/l
Total Suspended Solids	SOP 2016	13	mg/l
Total Nitrogen	SOP 2075	3.1	mg/l
Ammonia Nitrogen	SOP 2057	0.75	mg/l NH_3-N
Total Phosphorus*	SOP 2125	2.11	mg/l P
Orthophosphate P	SOP 2061	1.64	mg/l P
Conductivity	SOP 2076	700	µS/cm 20°C

Signed: WD McCall Date: 19/11/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 3790S003

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	111121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	11/11/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	11/11/2021
Sample Description:	MP 3	**Date Certificate Issued:**	19/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.8	pH units
Biochemical Oxygen Demand	SOP 2006	2	mg/l
Chemical Oxygen Demand	SOP 2005	17	mg/l
Total Suspended Solids	SOP 2016	12	mg/l
Total Nitrogen	SOP 2075	19.1	mg/l
Ammonia Nitrogen	SOP 2057	0.11	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.51	mg/l P
Orthophosphate P	SOP 2061	0.37	mg/l P
Conductivity	SOP 2076	1025	µS/cm 20°C

Signed: WD McCall Date: 19/11/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 3790S004

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	111121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	11/11/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	11/11/2021
Sample Description:	MP 4	**Date Certificate Issued:**	19/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Biochemical Oxygen Demand	SOP 2006	4	mg/l
Chemical Oxygen Demand	SOP 2005	36	mg/l
Total Suspended Solids	SOP 2016	4	mg/l
Total Nitrogen	SOP 2075	5.6	mg/l
Ammonia Nitrogen	SOP 2057	1.32	mg/l NH_3-N
Total Phosphorus	SOP 2125	1.73	mg/l P
Orthophosphate P	SOP 2061	1.48	mg/l P
Conductivity	SOP 2076	797	µS/cm 20°C

Signed: WD McCall Date: 19/11/2021

Wendy McCall - Laboratory Manager

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Octobers SW's

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Test Report

Lab Report Number: 3013S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	141021.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	14/10/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	14/10/2021
Sample Description:	MP1	**Date Certificate Issued:**	09/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.8	pH units
Biochemical Oxygen Demand	SOP 2006	1	mg/l
Chemical Oxygen Demand	SOP 2005	10	mg/l
Total Suspended Solids	SOP 2016	2	mg/l
Total Nitrogen	SOP 2075	2.1	mg/l
Ammonia Nitrogen	SOP 2057	0.05	mg/l NH_3-N
Total Phosphorus*^	Subcontracted	<0.12	mg/l P
Orthophosphate P	SOP 2061	0.01	mg/l P
Conductivity	SOP 2076	376	µS/cm 20°C

Signed: WD McCall Date: 09/11/2021

Wendy McCall - Laboratory Manager

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Test Report

Lab Report Number: 3013S002

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	141021.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	14/10/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	14/10/2021
Sample Description:	MP2	**Date Certificate Issued:**	09/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	8.3	pH units
Biochemical Oxygen Demand	SOP 2006	4	mg/l
Chemical Oxygen Demand	SOP 2005	16	mg/l
Total Suspended Solids	SOP 2016	13	mg/l
Total Nitrogen	SOP 2075	2.0	mg/l
Ammonia Nitrogen	SOP 2057	0.56	mg/l NH_3-N
Total Phosphorus*^	Subcontracted	<0.12	mg/l P
Orthophosphate P	SOP 2061	1.03	mg/l P
Conductivity	SOP 2076	982	µS/cm 20°C

Signed: WD McCall Date: 09/11/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 3013S003

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	141021.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	14/10/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	14/10/2021
Sample Description:	MP3	**Date Certificate Issued:**	09/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Biochemical Oxygen Demand	SOP 2006	4	mg/l
Chemical Oxygen Demand	SOP 2005	20	mg/l
Total Suspended Solids	SOP 2016	6	mg/l
Total Nitrogen	SOP 2075	18.7	mg/l
Ammonia Nitrogen	SOP 2057	0.08	mg/l NH_3-N
Total Phosphorus*^	Subcontracted	1.42	mg/l P
Orthophosphate P	SOP 2061	1.14	mg/l P
Conductivity	SOP 2076	1163	µS/cm 20°C

Signed: WD McCall Date: 09/11/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 3013S004

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	141021.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	14/10/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	14/10/2021
Sample Description:	MP4	**Date Certificate Issued:**	09/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.4	pH units
Biochemical Oxygen Demand	SOP 2006	6	mg/l
Chemical Oxygen Demand	SOP 2005	40	mg/l
Total Suspended Solids	SOP 2016	2	mg/l
Total Nitrogen	SOP 2075	5.3	mg/l
Ammonia Nitrogen	SOP 2057	1.17	mg/l NH_3-N
Total Phosphorus*^	Subcontracted	2.08	mg/l P
Orthophosphate P	SOP 2061	1.83	mg/l P
Conductivity	SOP 2076	1019	µS/cm 20°C

Signed: WD McCall Date: 09/11/2021

Wendy McCall - Laboratory Manager

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Test Report

Lab Report Number: 1965S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090921.D
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/09/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/09/2021
Sample Description:	MP1	**Date Certificate Issued:**	23/09/2021

Parameter	Method	Result	Unit
pH	SOP 2004	9.1	pH units
Biochemical Oxygen Demand	SOP 2006	3	mg/l
Chemical Oxygen Demand	SOP 2005	18	mg/l
Total Suspended Solids	SOP 2016	71	mg/l
Total Nitrogen	SOP 2075	2.9	mg/l
Ammonia Nitrogen	SOP 2057	0.45	mg/l NH_3-N
Total Phosphorus	SOP 2125	1.09	mg/l P
Orthophosphate P	SOP 2061	0.76	mg/l P
Conductivity*	SOP 2076	2830	µS/cm 20°C

Signed: WD McCall Date: 23/09/2021

Wendy McCall - Laboratory Manager

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Test Report

Lab Report Number: **1965S002**

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090921.D
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/09/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/09/2021
Sample Description:	MP2	**Date Certificate Issued:**	23/09/2021

Parameter	Method	Result	Unit
pH	SOP 2004	8.0	pH units
Biochemical Oxygen Demand	SOP 2006	2	mg/l
Chemical Oxygen Demand	SOP 2005	16	mg/l
Total Suspended Solids	SOP 2016	24	mg/l
Total Nitrogen	SOP 2075	4.6	mg/l
Ammonia Nitrogen	SOP 2057	0.80	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.75	mg/l P
Orthophosphate P	SOP 2061	0.47	mg/l P
Conductivity	SOP 2076	707	µS/cm 20°C

Signed: WD McCall Date: 23/09/2021

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: **1965S003**

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090921.D
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/09/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/09/2021
Sample Description:	MP3	**Date Certificate Issued:**	23/09/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.9	pH units
Biochemical Oxygen Demand	SOP 2006	2	mg/l
Chemical Oxygen Demand	SOP 2005	18	mg/l
Total Suspended Solids	SOP 2016	8	mg/l
Total Nitrogen	SOP 2075	12.5	mg/l
Ammonia Nitrogen	SOP 2057	0.35	mg/l NH_3-N
Total Phosphorus	SOP 2125	0.63	mg/l P
Orthophosphate P	SOP 2061	0.47	mg/l P
Conductivity	SOP 2076	1287	µS/cm 20°C

Signed: W McCall Date: 23/09/2021

Wendy McCall - Laboratory Manager

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Test Report

Lab Report Number: 1965S004

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 SURFACE WATER (SILVE
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090921.D
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	SURFACE WATER	**Date Sample Received:**	09/09/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	09/09/2021
Sample Description:	MP4	**Date Certificate Issued:**	23/09/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.5	pH units
Biochemical Oxygen Demand	SOP 2006	6	mg/l
Chemical Oxygen Demand	SOP 2005	33	mg/l
Total Suspended Solids	SOP 2016	4	mg/l
Total Nitrogen	SOP 2075	4.1	mg/l
Ammonia Nitrogen	SOP 2057	1.67	mg/l NH_3-N
Total Phosphorus	SOP 2125	1.82	mg/l P
Orthophosphate P	SOP 2061	1.48	mg/l P
Conductivity	SOP 2076	1247	µS/cm 20°C

Signed: WD McCall Date: 23/09/2021

Wendy McCall - Laboratory Manager

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April's Wells

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 8588S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	20/04/2022
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	20/04/2022
Sample Description:	MGW 1	**Date Certificate Issued:**	28/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.3	pH units
Conductivity*	SOP 2076	773	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	<1	mg/l
Total Ammonia*	Calculation	1.50	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.50	mg/l
Total Phosphorus	SOP 2126	0.02	mg/l P
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.01	mg/l P
Nitrite Nitrogen	SOP 2059	<0.01	mg/l NO_2-N
Total Oxidised Nitrogen	SOP 2058	<0.50	mg/l N
E. Coli*	SOP 2090	0	MPN/100ml
Total coliforms*	SOP 2090	0	MPN/100ml

Signed: W McCall Date: 28/04/2022

Wendy McCall - Laboratory Manager

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August Well's

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 1048S001

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	050821.B
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	DRINKING WATER	**Date Sample Received:**	05/08/2021
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	05/08/2021
Sample Description:	DEEP WELL AUGUST 04.08.21 12PM	**Date Certificate Issued:**	10/08/2021

Parameter	Method	Result	Unit	Drinking Water Regulations SI122 of 2014 Parametric Values
Chemical Oxygen Demand	SOP 2005	16	mg/l	-
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N	-
Total Ammonia*	Calculation	2.10	mg/l NH_3-N	-
Total Nitrogen	SOP 2075	1.2	mg/l	-
Phosphorus	SOP 2125	0.03	mg/l	-
Orthophosphate P	SOP 2061	0.02	mg/l P	-
pH	SOP 2004	7.2	pH units	-
Conductivity	SOP 2076	783	µS/cm 20°C	-
Total coliforms*	SOP 2090	39.9	MPN/100ml	-
E. Coli*	SOP 2090	21.3	MPN/100ml	-

Please note the sample was received outside of the recommended stability time of 24 hours from sampling therefore results for the microbiological parameters may be compromised.

Signed: WD McCall Date: 10/08/2021

Wendy McCall - Laboratory Manager

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December's Well's

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4961S005

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	171221.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	17/12/2021
Sample Reference:	SURFACE WATER	**Date Analysis Commenced:**	17/12/2021
Sample Description:	MGW1 BOREHOLE	**Date Certificate Issued:**	23/12/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	772	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	15	mg/l
Total Ammonia*	Calculation	1.75	mg/l NH_3-N
Total Nitrogen	SOP 2075	1.0	mg/l
Total Phosphorus	SOP 2125	0.02	mg/l P
Orthophosphate P	SOP 2061	0.01	mg/l P
Nitrate	SOP 2060	<2.2	mg/l NO_3

Signed: WD McCall Date: 23/12/2021

Wendy McCall - Laboratory Manager

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Phone: 059 9721022 Email: reception@iaslabs.ie Web: www.iaslabs.ie

February's Well's

Independent Analytical Supplies

Test Report

Lab Report Number: 6644S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	09/02/2022
Sample Description:	MGW 1	**Date Certificate Issued:**	28/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	789	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	7	mg/l
Total Ammonia*	Calculation	1.48	mg/l NH_3-N
Total Nitrogen	SOP 2075	0.6	mg/l
Total Phosphorus	SOP 2126	0.02	mg/l P
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.01	mg/l P
E. Coli*^	Subcontracted	0	MPN/100ml
Total Coliforms*^	Subcontracted	8	MPN/100ml

Signed: WD McCall Date: 28/02/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 6645S001

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	DRINKING WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	AGW 1	**Date Certificate Issued:**	07/03/2022

Parameter	Method	Result	Unit	Drinking Water 2014 Parametric Values
pH	SOP 2004	7.5	pH units	6.5<pH<9.5
Conductivity	SOP 2076	809	µS/cm 20°C	2500
Chemical Oxygen Demand	SOP 2005	3	mg/l	-
Nitrate	SOP 2060	<2.2	mg/l NO_3	-
Total Ammonia*	Calculation	1.01	mg/l NH_3-N	-
Total Nitrogen	SOP 2075	0.5	mg/l	-
Phosphorus	SOP 2126	<0.01	mg/l	-
Orthophosphate	SOP 2061	<0.01	mg/l PO_4	-
Total Coliforms	SOP 2090	0	MPN/100ml	0
E. Coli	SOP 2090	0	MPN/100ml	0

Please note the sample was received outside of the recommended stability time of 24 hours from sampling therefore results for the microbiological parameters may be compromised.

Signed: WD McCall Date: 07/03/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: **6645S002**

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090222.S
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	DRINKING WATER	**Date Sample Received:**	09/02/2022
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	09/02/2022
Sample Description:	AGW 3	**Date Certificate Issued:**	07/03/2022

Parameter	Method	Result	Unit	Drinking Water 2014 Parametric Values
pH	SOP 2004	7.1	pH units	6.5<pH<9.5
Conductivity	SOP 2076	738	µS/cm 20°C	2500
Chemical Oxygen Demand	SOP 2005	3	mg/l	-
Nitrate	SOP 2060	<2.2	mg/l NO_3	-
Total Ammonia*	Calculation	0.50	mg/l NH_3-N	-
Total Nitrogen	SOP 2075	<0.5	mg/l	-
Phosphorus	SOP 2126	<0.01	mg/l	-
Orthophosphate	SOP 2061	<0.01	mg/l PO_4	-
Total Coliforms	SOP 2090	0	MPN/100ml	0
E. Coli	SOP 2090	0	MPN/100ml	0

Please note the sample was received outside of the recommended stability time of 24 hours from sampling therefore results for the microbiological parameters may be compromised.

Signed: WD McCall Date: 07/03/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

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January's Wells

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 5691S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	190122.E1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	19/01/2022
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	19/01/2022
Sample Description:	AGW 1	**Date Certificate Issued:**	02/02/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	742	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	8	mg/l
Total Ammonia*	Calculation	1.63	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.5	mg/l
Total Phosphorus	SOP 2125	0.02	mg/l P
Total Coliforms*	SOP 2090	0	MPN/100ml
E. Coli*	SOP 2090	0	MPN/100ml
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.01	mg/l P

Signed: WD McCall Date: 02/02/2022

Wendy McCall - Laboratory Manager

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July Wells

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	3455N01	**Analysis Number:**	SILVER 2/15

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150721.S/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	15/07/2021
Sample Reference:	T:9AM 14.07.21	**Date Analysis Commenced:**	15/07/2021
Sample Description:	JULYS SAMPLE	**Date Certificate Issued:**	23/07/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.1	pH units
Conductivity	Electrometry SOP 2076	771	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	17	mg/l
Total Ammonia*	Calculation	2.03	mg/l NH3-N
Total Nitrogen	Digestion/Colourimetry SOP 2075	**1.0**	mg/l
Total Phosphorus	ICP-MS	<0.01	mg/l P
Total Coliforms*	Quanti-tray SOP 2090	69.6	MPN/100ml
E. Coli*	Quanti-tray SOP 2090	56.5	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N
P Orthophosphate	Konelab Aquakem SOP 2061	<0.01	mg/l P

Signed: WD McCall Date: 23/07/2021

Wendy McCall - Laboratory Manager

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Junes Wells 2021

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	3455N02	Analysis Number:	SILVER 2/16

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	150721.S/4
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	15/07/2021
Sample Reference:	T:9AM 14.07.21	**Date Analysis Commenced:**	15/07/2021
Sample Description:	JUNES SAMPLE	**Date Certificate Issued:**	23/07/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.1	pH units
Conductivity	Electrometry SOP 2076	773	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	14	mg/l
Total Ammonia*	Calculation	1.0	mg/l NH3-N
Total Nitrogen	Digestion/Colourimetry SOP 2075	0.9	mg/l
Total Phosphorus	ICP-MS	<0.01	mg/l P
Total Coliforms*	Quanti-tray SOP 2090	33.2	MPN/100ml
E. Coli*	Quanti-tray SOP 2090	25.3	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N
P Orthophosphate	Konelab Aquakem SOP 2061	<0.01	mg/l P

Signed: WD McCall Date: 23/07/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Interim Report

Lab Report Number:	**2575N04**	**Analysis Number:**	**SILVER 2/12**

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S2/8
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	10/06/2021
Sample Reference:	WELL WATER / EFFLEUNT	**Date Analysis Commenced:**	10/06/2021
Sample Description:	AGW 3 JUNE	**Date Certificate Issued:**	17/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.1	pH units
Conductivity	Electrometry SOP 2076	705	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<1	mg/l
Total Ammonia*	Calculation	0.21	mg/l NH3-N
Total Coliforms	Quanti-tray SOP 2090	0	MPN/100ml
E. Coli	Quanti-tray SOP 2090	0	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N
P Orthophosphate	Konelab Aquakem SOP 2061	<0.01	mg/l P

Signed: WD McCall Date: 17/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Interim Report

Lab Report Number:	2575N03	Analysis Number:	SILVER 2/11

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S2/8
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	10/06/2021
Sample Reference:	WELL WATER / EFFLEUNT	**Date Analysis Commenced:**	10/06/2021
Sample Description:	AGW 1 JUNE	**Date Certificate Issued:**	17/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.5	pH units
Conductivity	Electrometry SOP 2076	758	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<1	mg/l
Total Ammonia*	Calculation	1.18	mg/l NH3-N
Total Coliforms	Quanti-tray SOP 2090	0	MPN/100ml
E. Coli	Quanti-tray SOP 2090	0	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N
P Orthophosphate	Konelab Aquakem SOP 2061	0.08	mg/l P

Signed: WD McCall Date: 17/06/2021

Wendy McCall - Laboratory Manager

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Marchs Well's

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 7801S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	230322.A
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	23/03/2022
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	23/03/2022
Sample Description:	MGW 1	**Date Certificate Issued:**	29/03/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	819	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	9	mg/l
Total Ammonia*	Calculation	1.53	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.5	mg/l
Total Phosphorus	SOP 2126	0.02	mg/l P
Total Coliforms*	SOP 2090	0	MPN/100ml
E. Coli*	SOP 2090	0	MPN/100ml
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.01	mg/l P

Signed: WD McCall Date: 29/03/2022

Wendy McCall - Laboratory Manager

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May's Wells 2021

IAS LABORATORIES

Independent Analytical Supplies

Interim Report

Lab Report Number:	**2575N01**	**Analysis Number:**	**SILVER 2/9**

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S2/8
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	10/06/2021
Sample Reference:	WELL WATER / EFFLEUNT	**Date Analysis Commenced:**	10/06/2021
Sample Description:	AGW 1 MAY	**Date Certificate Issued:**	17/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.5	pH units
Conductivity	Electrometry SOP 2076	751	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<1	mg/l
Total Ammonia*	Calculation	1.05	mg/l NH3-N
Total Coliforms	Quanti-tray SOP 2090	0	MPN/100ml
E. Coli	Quanti-tray SOP 2090	0	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N

Signed: WD McCall Date: 17/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Interim Report

Lab Report Number:	**2575N02**	**Analysis Number:**	**SILVER 2/10**

Customer ID:	SILV.H1	**Analysis Type:**	WELL WATER (SILVER 2)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	Customer
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	100621.S2/8
Address:	EMYVALE CO MONAGHAN	**Sample Condition:**	Acceptable
Sample Type:	Water	**Date Sample Received:**	10/06/2021
Sample Reference:	WELL WATER / EFFLEUNT	**Date Analysis Commenced:**	10/06/2021
Sample Description:	AGW 3 MAY	**Date Certificate Issued:**	17/06/2021

Parameter	Method	Result	Unit
pH	Electrometry SOP 2004	7.1	pH units
Conductivity	Electrometry SOP 2076	699	µS/cm 20°C
Chemical Oxygen Demand	Microdigestion and Colourimetry SOP 2005	<1	mg/l
Total Ammonia*	Calculation	0.23	mg/l NH3-N
Total Coliforms	Quanti-tray SOP 2090	0	MPN/100ml
E. Coli	Quanti-tray SOP 2090	0	MPN/100ml
Nitrate Nitrogen	Konelab Aquakem SOP 2060	<0.50	mg/l NO3-N
P Orthophosphate	Konelab Aquakem SOP 2061	<0.01	mg/l P

Signed: WD McCall Date: 17/06/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9451S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	250522E
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	25/05/2022
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	25/05/2022
Sample Description:	AGW1	**Date Certificate Issued:**	03/06/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.5	pH units
Conductivity*	SOP 2076	864	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	25	mg/l
Total Ammonia*	Calculation	0.95	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.5	mg/l
Total Phosphorus	SOP 2126	0.01	mg/l P
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	<0.01	mg/l P
Nitrite Nitrogen	SOP 2059	0.01	mg/l NO_2-N
Total Oxidised Nitrogen	SOP 2058	<0.50	mg/l N
E. Coli*	SOP 2090	0	MPN/100ml
Total coliforms*	SOP 2090	0	MPN/100ml

Signed: WD McCall Date: 03/06/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9451S002

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	250522E
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	25/05/2022
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	25/05/2022
Sample Description:	AGW3	**Date Certificate Issued:**	03/06/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.2	pH units
Conductivity*	SOP 2076	784	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	15	mg/l
Total Ammonia*	Calculation	0.55	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.5	mg/l
Total Phosphorus	SOP 2126	<0.01	mg/l P
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	<0.01	mg/l P
Nitrite Nitrogen	SOP 2059	0.01	mg/l NO_2-N
Total Oxidised Nitrogen	SOP 2058	<0.50	mg/l N
E. Coli*	SOP 2090	0	MPN/100ml
Total coliforms*	SOP 2090	0	MPN/100ml

Signed: WD McCall Date: 03/06/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

IAS Laboratories, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co Carlow, R21 YX99

Phone: 059 9721022 Email: reception@iaslabs.ie Web: www.iaslabs.ie

May's Well's 2022

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 9122S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	110522H
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	05/05/2022
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	05/05/2022
Sample Description:	MGW 1	**Date Certificate Issued:**	20/05/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	806	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	11	mg/l
Total Ammonia*	Calculation	1.53	mg/l NH_3-N
Total Nitrogen	SOP 2075	<0.50	mg/l
Total Phosphorus	SOP 2126	0.02	mg/l P
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.02	mg/l P
Nitrite Nitrogen	SOP 2059	<0.01	mg/l NO_2-N
Total Oxidised Nitrogen	SOP 2058	<0.50	mg/l N

Signed: W McCall Date: 20/05/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.2751

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November Well

MGW1 tested in house

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4075S001

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	191121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	DRINKING WATER	**Date Sample Received:**	19/11/2021
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	19/11/2021
Sample Description:	AGW 1	**Date Certificate Issued:**	30/11/2021

Parameter	Method	Result	Unit	Drinking Water 2014 Parametric Values
pH	SOP 2004	7.2	pH units	6.5<pH<9.5
Conductivity	SOP 2076	694	µS/cm 20°C	2500
Chemical Oxygen Demand	SOP 2005	11	mg/l	-
Nitrate	SOP 2060	<2.2	mg/l NO_3	50
Total Ammonia*	Calculation	0.50	mg/l NH_3-N	-
Total Nitrogen	SOP 2075	0.6	mg/l	-
Phosphorus	SOP 2125	0.01	mg/l	-
Orthophosphate	SOP 2061	<0.01	mg/l PO_4	-

Signed: WD McCall Date: 30/11/2021

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 4075S002

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	191121.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	DRINKING WATER	**Date Sample Received:**	19/11/2021
Sample Reference:	WELL WATER	**Date Analysis Commenced:**	19/11/2021
Sample Description:	AGW 3	**Date Certificate Issued:**	30/11/2021

Parameter	Method	Result	Unit	Drinking Water 2014 Parametric Values
pH	SOP 2004	7.5	pH units	6.5<pH<9.5
Conductivity	SOP 2076	893	µS/cm 20°C	2500
Chemical Oxygen Demand	SOP 2005	56	mg/l	-
Nitrate	SOP 2060	<2.2	mg/l NO_3	50
Total Ammonia*	Calculation	0.93	mg/l NH_3-N	-
Total Nitrogen	SOP 2075	0.9	mg/l	-
Phosphorus	SOP 2125	0.01	mg/l	-
Orthophosphate	SOP 2061	0.01	mg/l PO_4	-

Signed: WD McCall Date: 30/11/2021

Wendy McCall - Laboratory Manager

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October Well 2021

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 3014S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	141021.S1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	14/10/2021
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	14/10/2021
Sample Description:	T:10AM 10:00AM MW1	**Date Certificate Issued:**	09/11/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.1	pH units
Conductivity*	SOP 2076	788	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	6	mg/l
Total Ammonia*	Calculation	1.38	mg/l NH_3-N
Total Nitrogen	SOP 2075	0.5	mg/l
Total Phosphorus*^	Subcontracted	<0.12	mg/l P
Total Coliforms*	SOP 2090	0	MPN/100ml
E. Coli*	SOP 2090	0	MPN/100ml
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.01	mg/l P

Signed: W McCall Date: 09/11/2021

Wendy McCall - Laboratory Manager

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September Well 2021

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 1966S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 2 GROUNDWATER (SILVER
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	090921.D
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	GROUND WATER	**Date Sample Received:**	09/09/2021
Sample Reference:	BOREHOLE	**Date Analysis Commenced:**	09/09/2021
Sample Description:	MGW 1	**Date Certificate Issued:**	23/09/2021

Parameter	Method	Result	Unit
pH	SOP 2004	7.0	pH units
Conductivity*	SOP 2076	839	µS/cm 20°C
Chemical Oxygen Demand*	SOP 2005	7	mg/l
Total Ammonia*	Calculation	2.82	mg/l NH_3-N
Total Nitrogen	SOP 2075	2.8	mg/l
Total Phosphorus	SOP 2125	0.02	mg/l P
Total Coliforms*	SOP 2090	17.1	MPN/100ml
E. Coli*	SOP 2090	6.3	MPN/100ml
Nitrate Nitrogen	SOP 2060	<0.50	mg/l NO_3-N
Orthophosphate P	SOP 2061	0.03	mg/l P

Signed: WO McCall Date: 23/09/2021

Wendy McCall - Laboratory Manager

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Appendix G: Detailed Drip Irrigation Montoring System Results

Emyvale, Co. Monaghan, H18 FK10
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Effluent Pilot Report – Contents

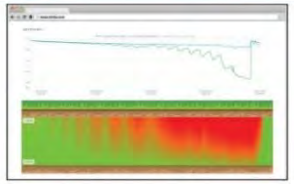
Root Sense

Viridix Technology

Root Sense, a component in NaanDanJain AgTech solutions, that helps farmers irrigate in the most optimized way.
The Root Sense sensor technology collects highly accurate data relating to the root zone water potential and the micro-climate. This data is collected in real time and is crunched by an algorithm that highlights every important event and displays it on the mobile app and website. This provides the user with vital insights and alerts with action recommendations.

WEB ANALYTICS

- Easy-to-use web user interface.
- View of history of the soil water potential.
- Soil cross section diagram helps you understand the water potential at multiple depths.
- Full satellite view of all your fields.



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bringing water to life
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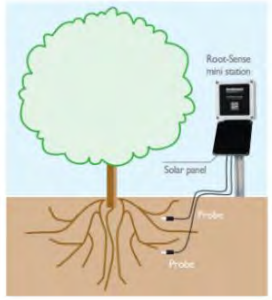
SENSE – ANALYZE – RECOMMEND

ROOT SENSE MINI-STATION

- Highly accurate, low maintenance and reliable precision irrigation system.
- One Root Sense mini-station has two soil probes for the measurement of the soil temperature and the water potential at two different depths, up to 200 cm, and also an air temperature sensor to measure the micro-climate.
- The probes can be installed horizontally for optimal contact with the soil and roots, or vertically like tensiometers.
- The Root-Sense works in any soil, crop and water types.
- No need for ongoing calibration or maintenance.



Because the system is so cost-effective, growers/farmers can place a large number of stations. This allows them to match the precise irrigation according to the variation between plots.

Root Sense - Technical Specifications

Water potential range	0 – 120 centibar
Number of water potential sensors	Up to 2
Maximum depth	Up to 200 cm
Operating Temperature	2-50°c
Probe cable length	3 m
Accuracy	±0.5 centibar
Sensor dimensions	120 x 28 x 28 mm
Resolution	0.1 centibar
Sampling time	3 min

ONLINE DATA LOGGER

- Always online, cellular 3G/2G connected logger.
- Robust, agricultural grade IP 68 data logger.
- Internal 4400 mAh battery works without sun for 6 months.
- Adjustable 2w solar panel - 1 hour of sun per day will fully charge the battery.
- 120 cm aluminum poll for easy and flexible installation.
- QR code for quick data reading with mobile phone.

Data Logger - Technical Specifications

Communication	Cellular 3G/2G
Solar panel	2w
Operating temperature	2-50°c
Poll height	120 cm
Measurement transmission time	Real time experience
IP 68	✔
Bands	Band VIII (900 MHz)
	Band I (2100 MHz)
UE Class	Class A
Power Class	Class 3 (24 dBm) for all band
Internal battery	4400 mAh

MOBILE APP

- The system analyzes the data provided by the sensors and gives easy-to-understand actionable insights.
- Facilitates easy installation through a simple scan of QR code.
- Receives stress and weather alerts in real time.
- Analyzes irrigation data over time.
- Monitors all the fields in the farm.

MGE has selected the NDJ Root Sense probe technology of which by using its two underground probe system can with pre-set parameters (set by MGE Consultants) can detect and alert to underground water build up. The system works of centre bar technology and with its solar panelled computer system installed on site it allows a real time view of what and how dispersed water is behaving underground. The onsite computer will send an alert/message based on the metric and parameters set out by MGE and working in conjunction with the water table samples and site assessment.

DAB Pump

MGE has selected a pump delivering a flow of 65 m^3/h at 6.5 bar. This pump is sufficiently large to handle the total flow of 480 m^3 per day across the entire 14.6 ha, so fully prepared for the planned expansion. The type of pump is a multi-stage centrifugal DAB NKV 65/3 T,

as can be seen on the image below.

DAB NKV 32/5-2 T pump

IQ4

Modular Multi-Site Central Control

The IQ4 Platform offers state-of-the-art monitoring, programming and control features in an easy to learn user interface. IQ4 provides advanced water management features saving money and time. IQ4 is available in a Cloud-based version.

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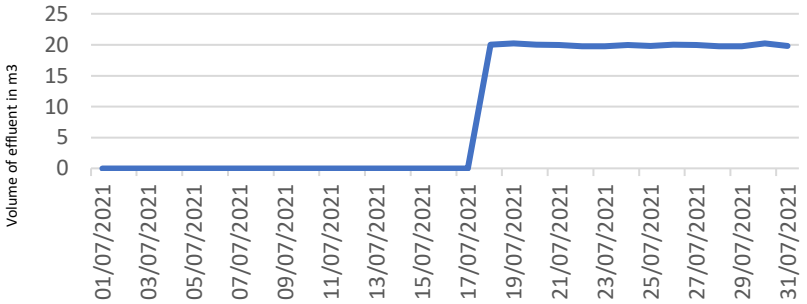
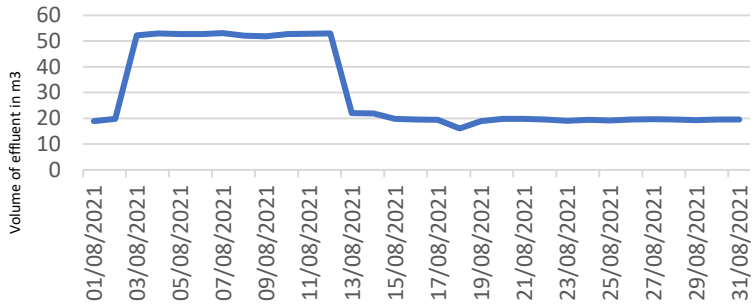
Effluent Pilot Report – Pumping Overview Jul – Dec

July Field m3



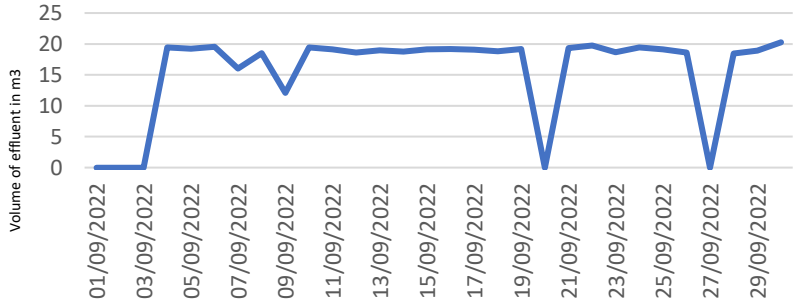
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 10m3 / Pause /. Zone 2 Open Valve 22mins, Estimated Pump Volume 10m3) and controlled total volume of 20m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 301.31m3
- All visual data supports the probe data that the system from the 17/07/2021 – 31/07/2021 pumped 301.31m3 with no signs of puddling / surface water / air pollution.

August Field m3



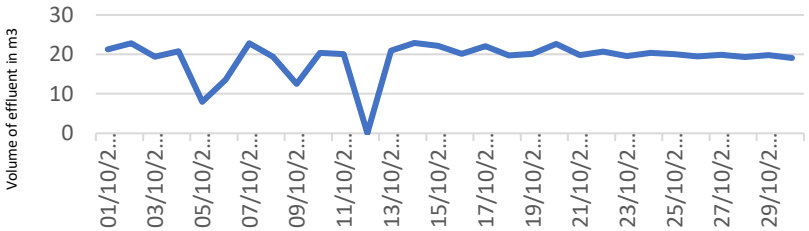
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times as of 03/08/2021 (Zone 1 Open valve = 38mins, Estimated Pump Volume 22m3 / Pause /. Zone 2 Open Valve 46mins, Estimated Pump Volume 24m3) and controlled total volume of 46m3.
- System start time: 11:30am
- System finish time: 12:54pm
- Effluent Pumped 935.72m3
- On the 03/08/2021 the system underwent volume tests to find the true saturation level (max saturation level) of the pilot, from the 03/08/2021 – 12/08/2021 we increased the pumping volume to an Estimated pump volume of 46m3 with a actual reported volume average of 51m3

September Field m3



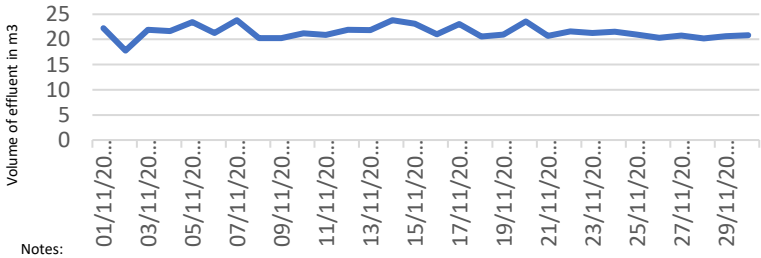
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times as of 03/09/2021 (Zone 1 Open valve = 28mins, Estimated Pump Volume 10m3 / Pause /. Zone 2 Open Valve 20mins, Estimated Pump Volume 10m3) and controlled total volume of 20m3.
- System was set with a Cycle and Soak function / Cycle = 4mins (pumped time) Soak = 10mins (non pump time)
- System start time: 11:30am
- System finish time: 14:18pm
- Root Sense Probes active and successfully collecting data from the 14/07/2021
- From 01/09 – 03/09 – System was switched off due to maintenance on field including flush valve change over, Damaged Pipe line on line 57, recompression of dug up lines.
- Effluent Pumped 486.22m3

October Field m3



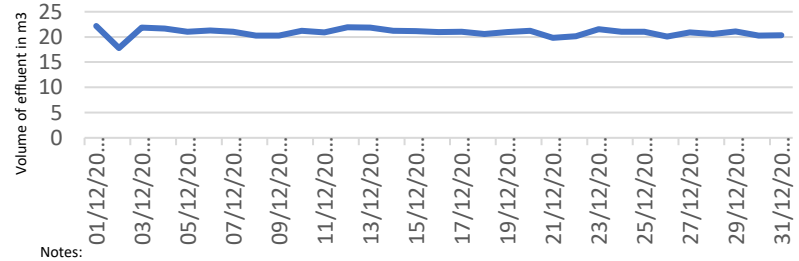
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times as of 03/09/2021 (Zone 1 Open valve = 28mins, Estimated Pump Volume 10m3 / Pause /. Zone 2 Open Valve 20mins, Estimated Pump Volume 10m3) and controlled total volume of 20m3.
- System was set with a Cycle and Soak function / Cycle = 4mins (pumped time) Soak = 10mins (non pump time)
- System start time: 11:30am
- System finish time: 14:18pm
- 05/10/2021 – Emergency pump switch off. Valve box 1 had blown out due to a build up off pressure via manual turning off of valves and non release of air in system. Valve bypass installed by GS Agri Services to aid pump switch on.
- 12/10/2021 – System switch off 24 hours for re-installation of Valve box 1.

November Field m3



Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times as of 03/09/2021 (Zone 1 Open valve = 28mins, Estimated Pump Volume 10m3 / Pause /. Zone 2 Open Valve 20mins, Estimated Pump Volume 10m3) and controlled total volume of 20m3.
- System was set with a Cycle and Soak function / Cycle = 4mins (pumped time) Soak = 10mins (non pump time)
- System start time: 11:30am
- System finish time: 14:18pm
- Effluent Pumped 579.119m3
- On 23-25/11/2021- we found that the 3g cartridge installed in the pump was not transmitting back to IQ4 and therefore no pumping data was available. Controller alarm activated due to -/+ 10% estimate pump volume not reached, manual pressure tests at valves identified pump still pumping.

December Field m3



Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times as of 03/09/2021 (Zone 1 Open valve = 28mins, Estimated Pump Volume 10m3 / Pause /. Zone 2 Open Valve 20mins, Estimated Pump Volume 10m3) and controlled total volume of 20m3.
- System was set with a Cycle and Soak function / Cycle = 4mins (pumped time) Soak = 10mins (non pump time)
- System start time: 11:30am
- System finish time: 14:18pm
- Effluent Pumped 646.29m3
- 21/12/2021 – Heavy surface water found on line 56,57,58 at the northern part of the field, visual signs of road run off but we are concerned by ironized water/ oil pan.
- 21/11/2021 – Zone 2 switched of over Christmas period to access surface water dispersal without pumping.

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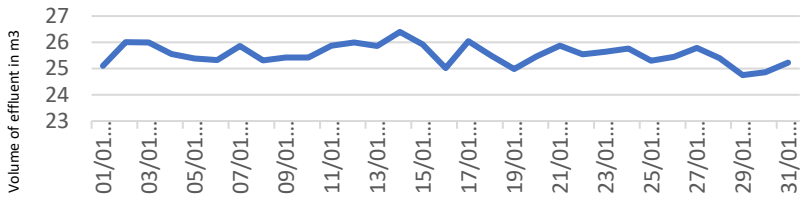
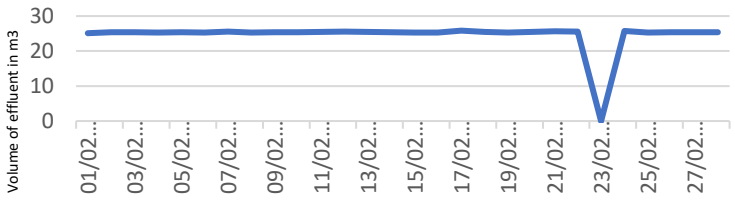
Effluent Pilot Report – Pumping Overview Jan– May

Jan Field m3



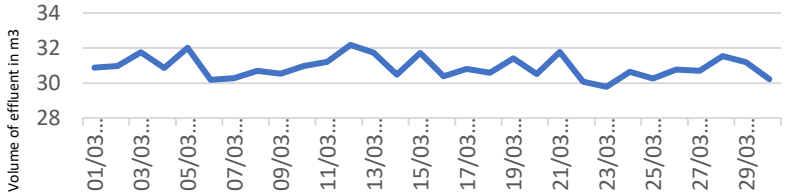
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 20m3 / Pause /. Zone 2 Open Valve 8mins, Estimated Pump Volume 5m3) and controlled total volume of 25m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 791.31m3

Feb Field m3



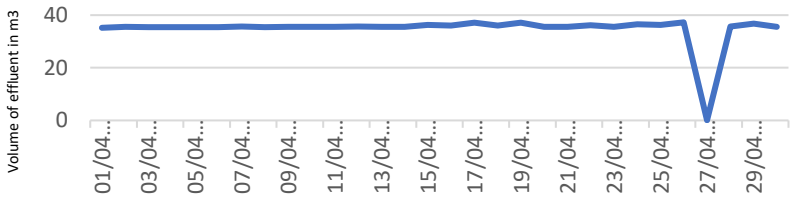
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 20m3 / Pause /. Zone 2 Open Valve 8mins, Estimated Pump Volume 5m3) and controlled total volume of 25m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 685.23m3
- On the 23/02/22 Visual signs of ponding on lower level of line 12, system switch off to investigate and prevent further saturation.

March Field m3



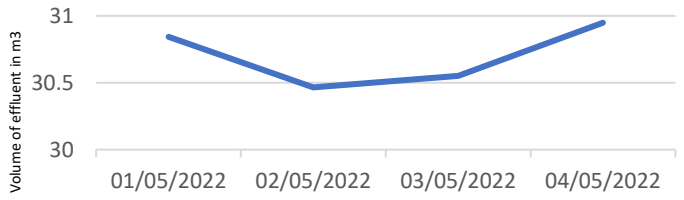
Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 20m3 / Pause /. Zone 2 Open Valve 16mins, Estimated Pump Volume 10m3) and controlled total volume of 30m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 958.32m3

April Field m3



Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 20m3 / Pause /. Zone 2 Open Valve 24mins, Estimated Pump Volume 15m3) and controlled total volume of 35m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 1039.40m3
- On the 27/02/22 Visual signs of ponding on lower level of line 12, system switch off to investigate and prevent further saturation, potential connection to pre-existing underground drainage leaking pipe (not system).

May Field m3



Notes:
- System was switched on Saturday 17/07/2021 and data is only available from this period on.
- Pipeline installed at 50cm under surface
- System was set with programmed pumping times (Zone 1 Open valve = 18mins, Estimated Pump Volume 20m3 / Pause /. Zone 2 Open Valve 14mins, Estimated Pump Volume 15m3) and controlled total volume of 35m3.
- System start time: 11:30am
- System finish time: 12:11pm
- Effluent Pumped 112.87m3
- Pilot licence finished 04/04/22

OVERVIEW:

7079m3 EFFLUENT PUMPED (July – May)

10m3 / 15m3 / 20m3 / 25m2 / 30m2 / 35m2 / 40m2 PUMP TESTING MONTHLY RANGES

2 x PUMP SWITCH OFF (DUE TO VISUAL PONDING)

1 x PUMP SWICTH OFF (FACTORY MAINTENANCE)

1 x PUMP SWITCH OFF (DAMAGED VALVE BOX)

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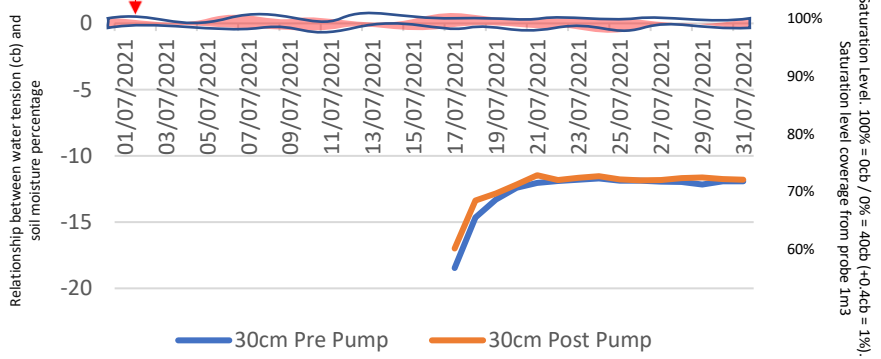
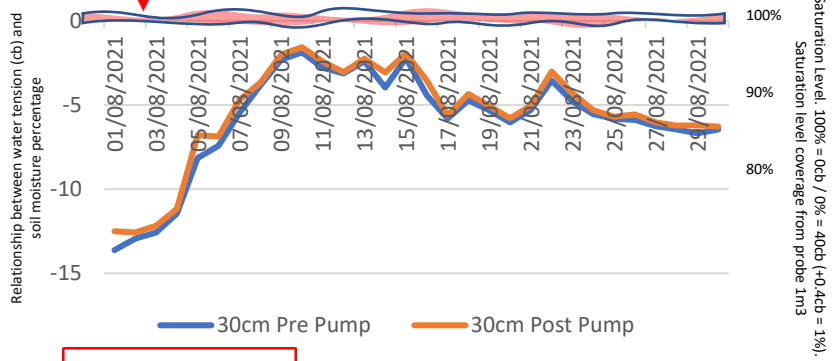
Effluent Pilot Report – Moisture Probe Overview – May

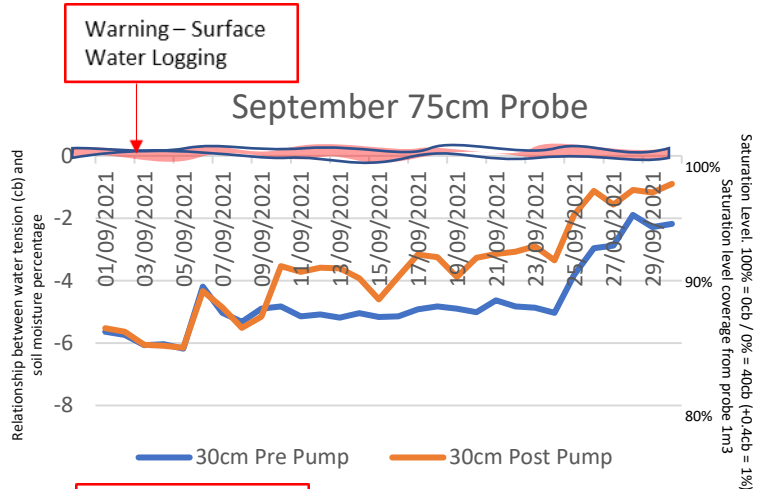
Warning – Surface Water Logging



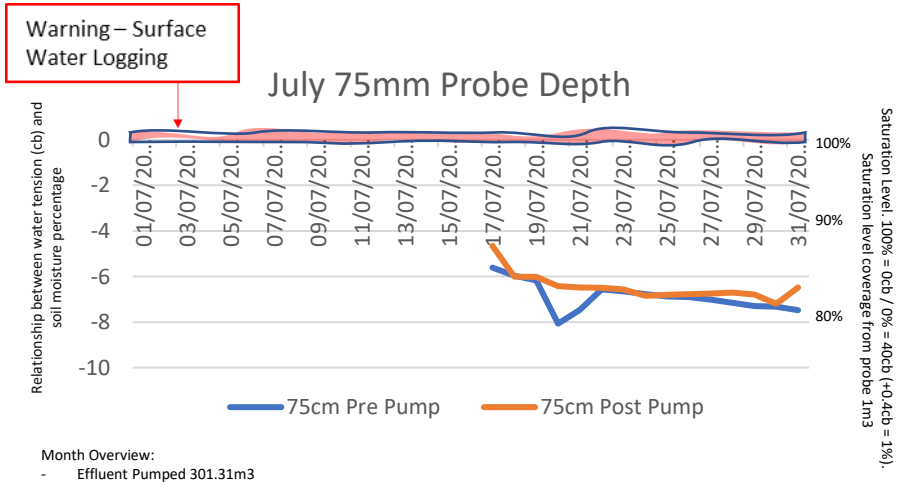
Warning – Surface Water Logging



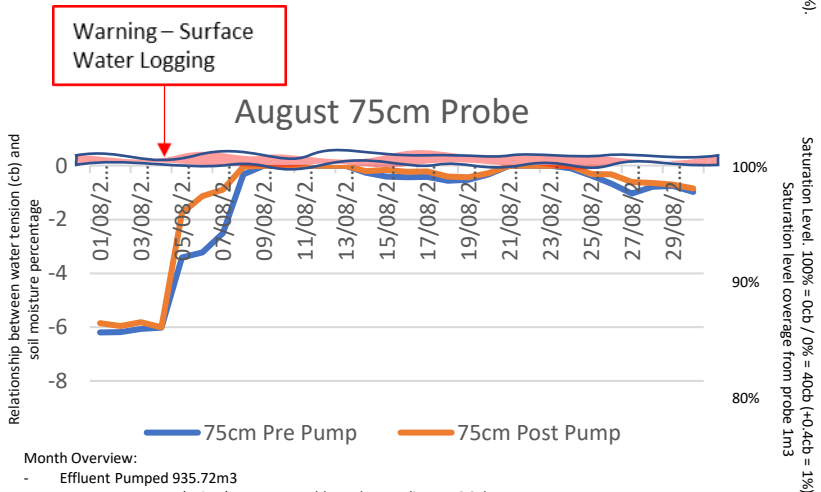
Warning – Surface Water Logging



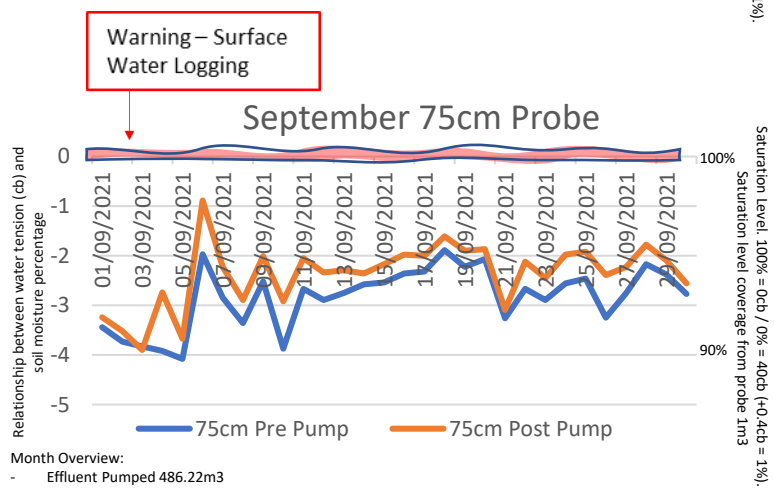
Warning – Surface Water Logging



Warning – Surface Water Logging



Warning – Surface Water Logging



Month Overview:
- Effluent Pumped 301.31m3
- Lowest Pre-Pump (Driest) 75mm Monthly Probe Reading = -8.0cb
- Highest Pre-Pump (Highest Saturation Level) 75mm Monthly Probe Reading = -7.48
- Lowest Post Pump (Driest) 75mm Monthly Probe Reading = -7.12cb
- Highest Post-Pump (Highest Saturation Level) 75mm Monthly Probe Reading = -6.02

Conclusion/Summary –
As expected we can see a clear spike in data from switch on, we would expect to see the 75mm probe (below drip line) to register moisture within 60mins of pump switch on of which can be seen in the detailed data (diagram page 1).
Data (diagram 2, page 2) shows pre-pumped (Blue Line) consistently sits below Post-Pumped Data (Orange line) of which shows that the Effluent is dispersing due to the increase in registered moisture after pumping (CB).
Prior to the 48 hour switch on the Pre-Pumped data (Blue Line) from 19/07/2021 – 31/07/2021 show a consistent downward trajectory supporting the findings that the effluent is dispersing through the sediment layers.

Month Overview:
- Effluent Pumped 935.72m3
- Lowest Pre-Pump (Driest) 75mm Monthly Probe Reading = -6.2cb
- Highest Pre-Pump (Highest Saturation Level) 75mm Monthly Probe Reading = -0.0
- Lowest Post Pump (Driest) 35mm Monthly Probe Reading = -13.65cb
- Highest Post-Pump (Highest Saturation Level) 35mm Monthly Probe Reading = -1.88

Conclusion/Summary –
On the 03/08/2021 the system underwent volume tests to find the true saturation level (max saturation level) of the pilot, from the 03/08/2021 – 12/08/2021 we increased the pumping volume to an Estimated pump volume of 46m3.
As expected with a increased pumped volume we start to see a sharp incline from the 30cm probes from the 03/08/21 – 12/08/2021 with the probes registering their highest percentage of saturation to date. We also in relation see that the 75cm probe data from 03/08/21 – 12/08/2021 showing a sharp incline with the probe being fully saturated from the 08/08/21 – 13/08/2021. Further testing is required to understand if the average volume of 51m3 being pumped in 1:24mins is too much volume for the land or the time of which it is pumped is too short.

Month Overview:
- Effluent Pumped 486.22m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -4.08cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -1.61
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -6.1cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -1.12

Conclusion/Summary –
Following testing from August the system was reset back to 20m3 per day but with alterations to pumping programme. Pump time brought forward due to testing variation in day time temperature and humidity rates, with clear signs of moisture on ground in zone 2 we programmed the system with a cycle and soak feature to allow time periods between pumping to support/aid dispersals rates. On the 09.09.22 the system had a safety switch off at 12:37pm with an alarm alerting the system to a power surge /lightening. Th system is built with a safety temperature switch off system to prevent the pump and computer being damaged.
On the 20.09.22 System was switch off due to Silver Duck maintenance and reconnection of tank to factory.

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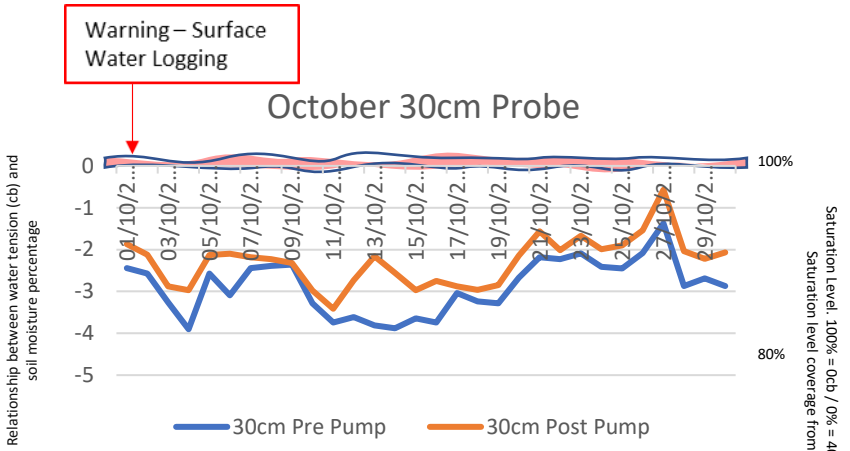
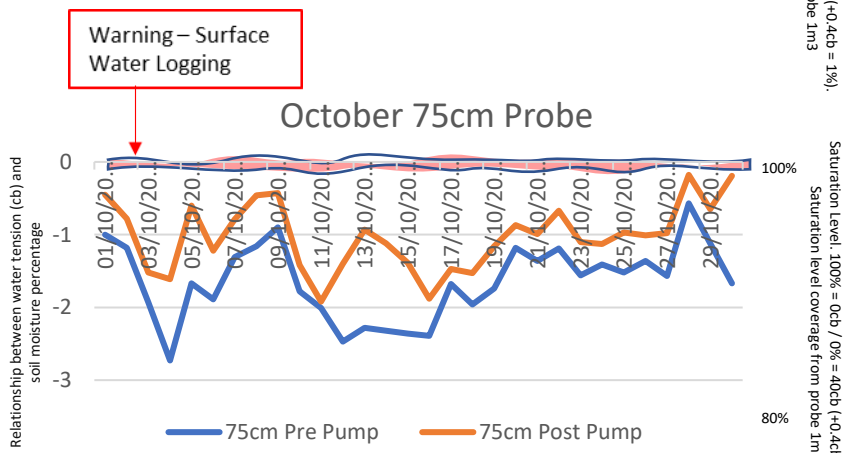
Effluent Pilot Report – Moisture Probe Overview Jan– May

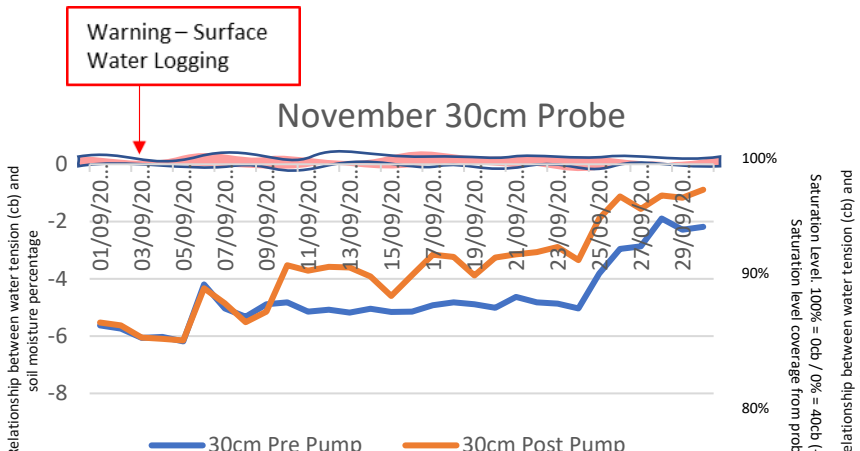


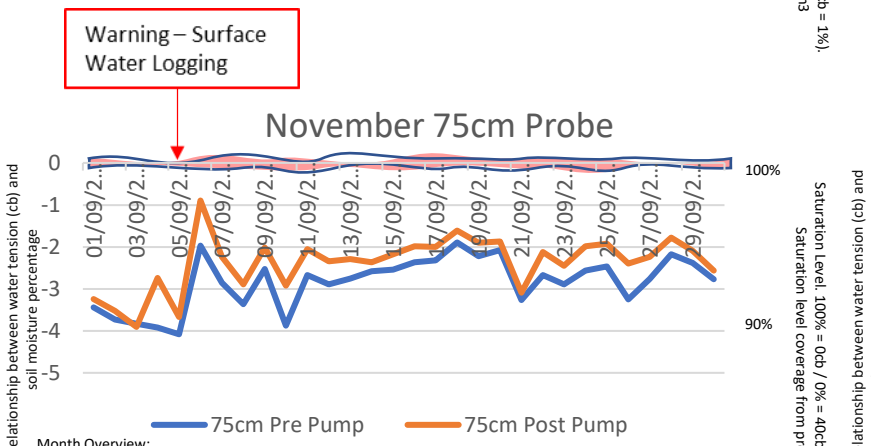


Month Overview:
- Effluent Pumped 527.808m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -3.41cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -0.57
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -2.47cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -0.43

Conclusion/Summary –

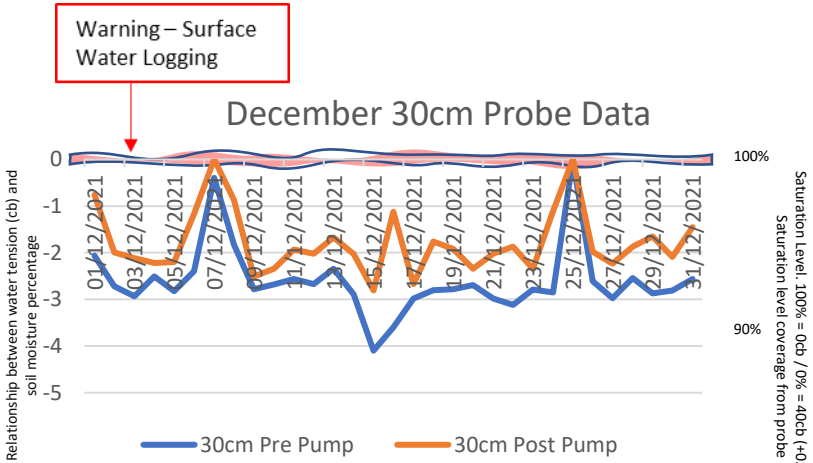
As expected we can see a clear downward trend in data from 02/10/2021 -04/10/2021 as the pump was switch off, we would expect to see the 75mm probe and 35cm to show very little difference of which is clear to see. Throughout the entire month and as seen on Diagram 1 and 2 (Pre-Pump and Post-Pump –Blue and Orange lines) we clearly see the system and land dispersing the effluent effectively. We see the registration of the effluent being pump at 11:30am, we see the Orange line spike on a daily basis to show the effluent has reached both probes (35cm and 75cm), we then see with no overlap the Post probe (blue) decreasing in registration showing the effluent moving through the land and dispersing. To support the data and definition that the system is working effectively and efficiently we can look at data collected (without external factors – Rain, leaks) from the 04/10/22 to 26/10/22 we have an average Pre pump 35cm reading of -3.48cb with the highest being -3.88 and the lowest of -2.44. This data tells us that we have a differential of 11% (high) and 40% (low) from our average meaning the land is very stable and consistent in acceptance of the effluent and dispersal of the effluent.

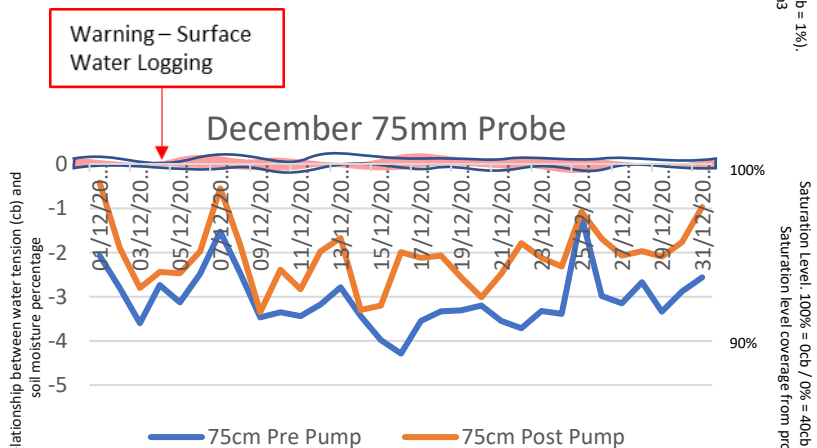




Month Overview:
- Effluent Pumped 579.119m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -4.01cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -0.79
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -6.01cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -0.48
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.22cb
- Highest Post-Pump (Highest Saturation Level) 15cm Monthly Probe Reading = -0.0

Throughout the entire month and as seen on Diagram 1 and 2 (Pre-Pump and Post-Pump –Blue and Orange lines) we clearly see the system and land dispersing the effluent effectively. We see the registration of the effluent being pump at 11:30am, we see the Orange line spike on a daily basis to show the effluent has reached both probes (35cm and 75cm), we then see with no overlap the Post probe (blue) decreasing in registration showing the effluent moving through the land and dispersing. We do see form the data that the saturation levels in the land show a continuous upward trend meaning that the pilot area is reaching its max capacity when adding additional factors such as rain and surface water. We are unable to map the effect of road run off as we are unable to estimate the additional volumes of water, we strongly advise Silver Hill seek advise from drainage specialist and the council in regards to the additional rain water entering the pilot field. We have an isolated incident on the 08/11/2021 of which is explained by an additional over pump of 1.98m3 in zone 1 and 0.56m3 of rain.





Month Overview:
- Effluent Pumped 579.119m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -4.4cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -0.69
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -4.1cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -0.0
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.12cb
- Highest Post-Pump (Highest Saturation Level) 15cm Monthly Probe Reading = -0.0

On 14/12/2021 – We found additional road run off water entering the valve box in zone 2, perforated holes required to drain out surface water.
21/12/2021 – Heavy surface water found on line 56,57,58 at the northern part of the field, visual signs of road run off but we are concerned by ironized water/ oil pan.
21/11/2021 – Zone 2 switched of over Christmas period to access surface water dispersal without pumping.

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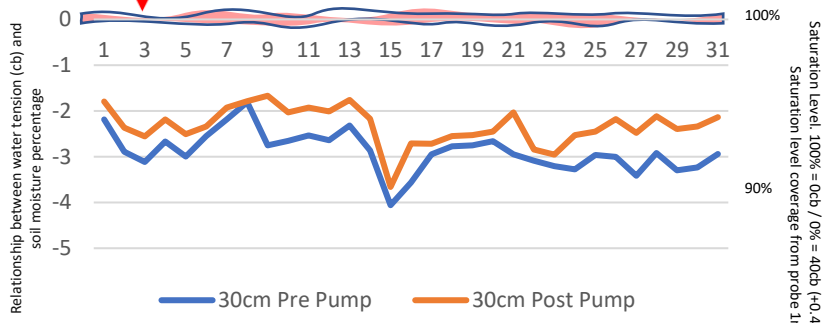
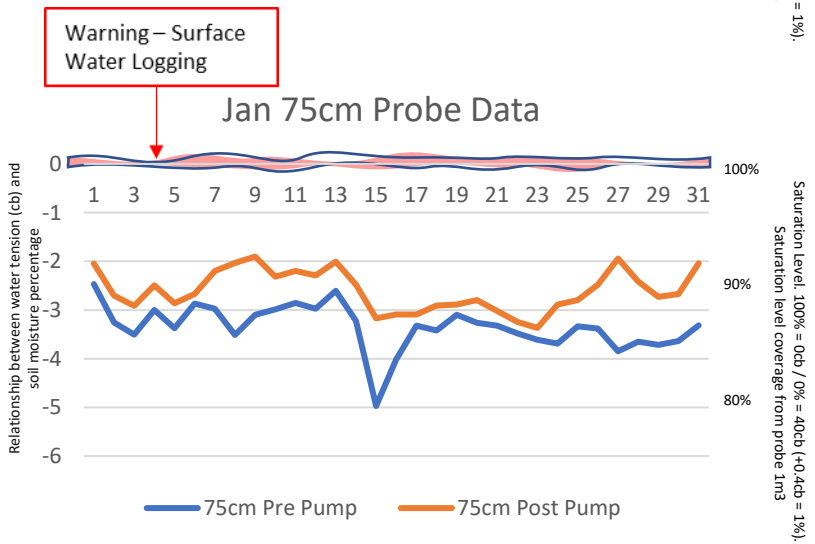
Effluent Pilot Report – Moisture Probe Overview Jan– May

Warning – Surface Water Logging



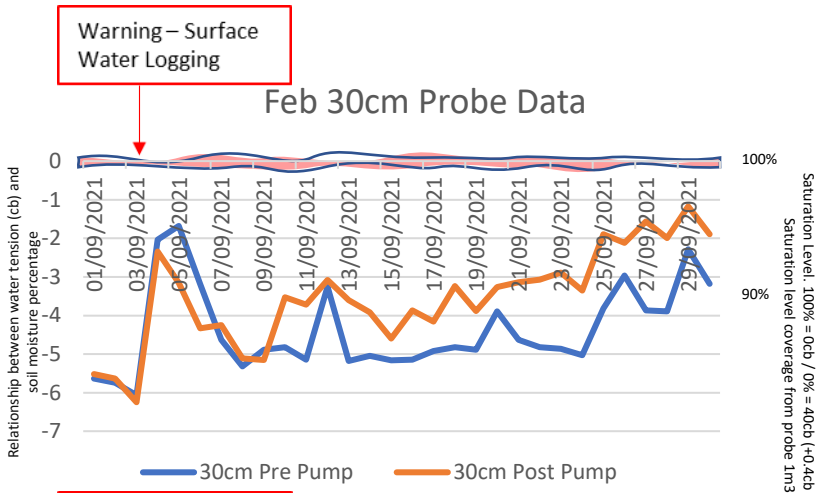
Month Overview:
- Effluent Pumped 791.31m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -4.98cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -2.32
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -3.37cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -0.0
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.12cb
- Highest Post-Pump (Highest Saturation Level) 15cm Monthly Probe Reading = -0.0

Warning – Surface Water Logging

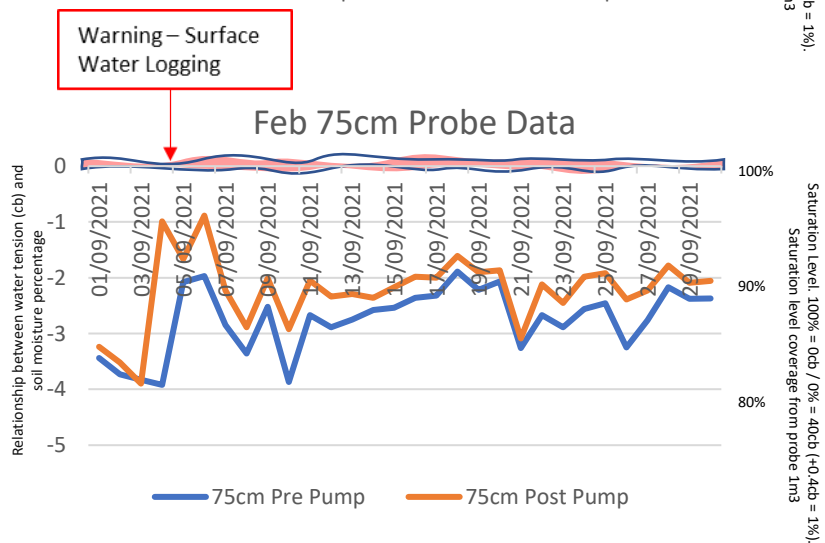


Month Overview:
- Effluent Pumped 658.23m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -4.0cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -0.89
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.86cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -3.86
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.12cb
- Highest Post-Pump (Highest Saturation Level) 15cm Monthly Probe Reading = -0.0

Warning – Surface Water Logging

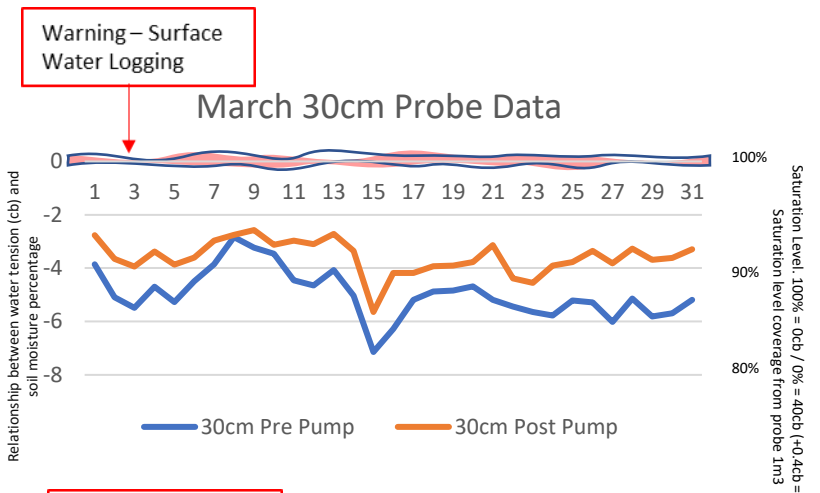


Warning – Surface Water Logging

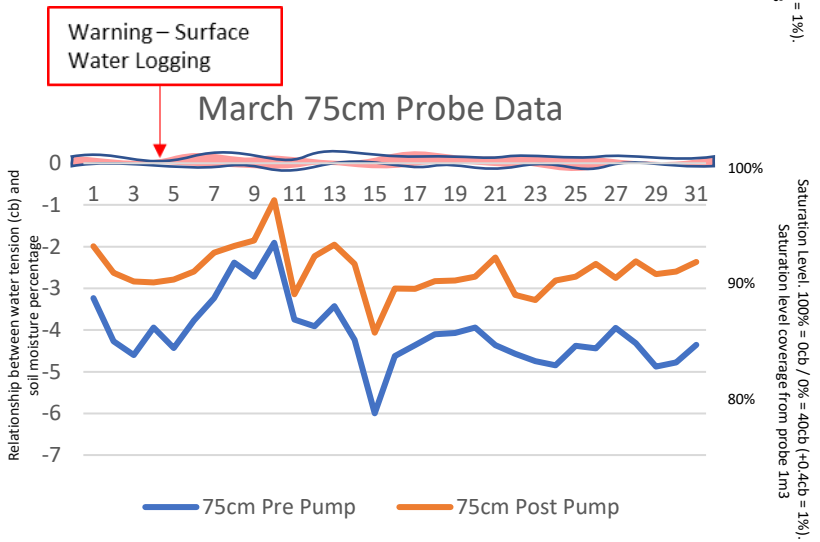


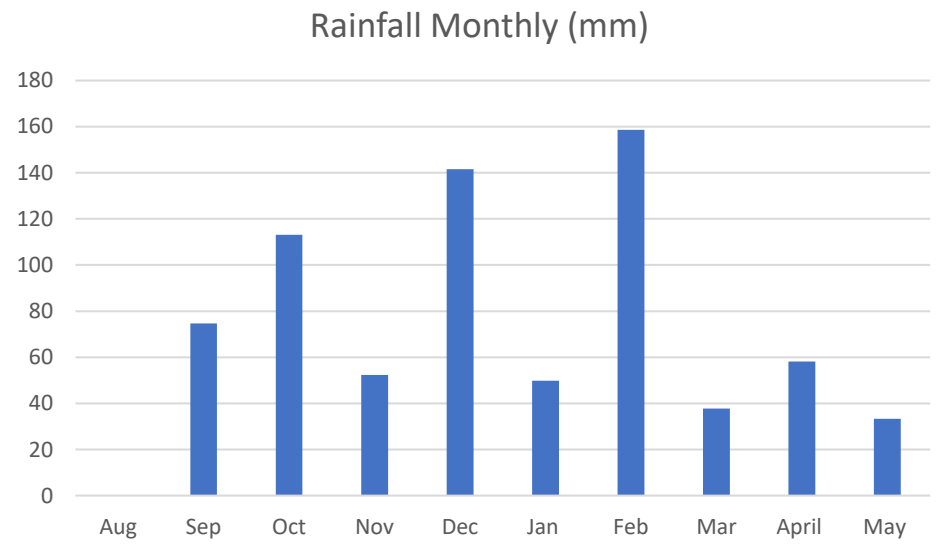
Month Overview:
- Effluent Pumped 958.32m3
- Lowest Pre-Pump (Driest) 75cm Monthly Probe Reading = -6.1cb
- Highest Pre-Pump (Highest Saturation Level) 75cm Monthly Probe Reading = -1.89
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -4.1cb
- Highest Post-Pump (Highest Saturation Level) 35cm Monthly Probe Reading = -0.79
- Lowest Post Pump (Driest) 35cm Monthly Probe Reading = -1.12cb
- Highest Post-Pump (Highest Saturation Level) 15cm Monthly Probe Reading = -0.0

Warning – Surface Water Logging



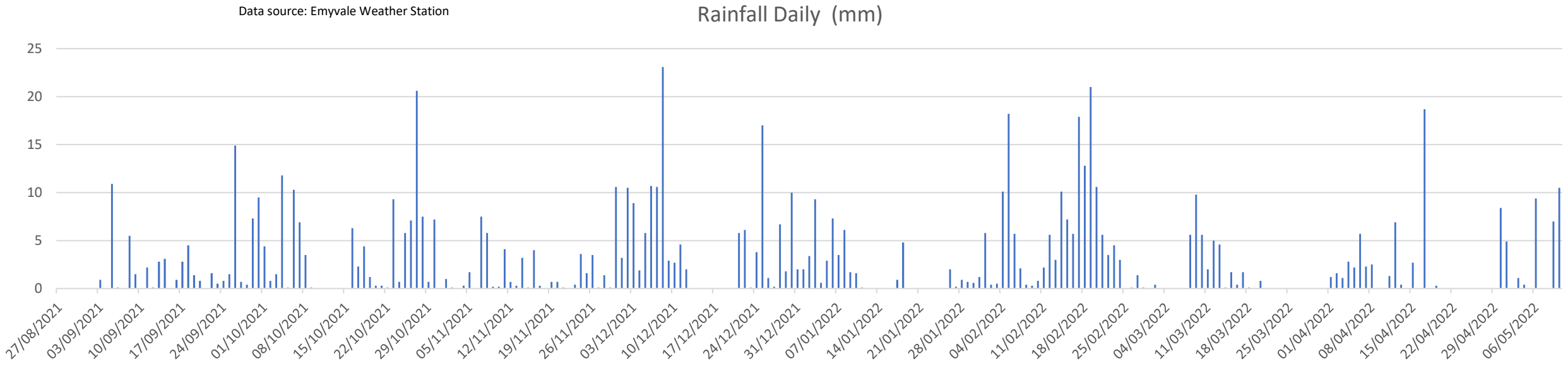
Warning – Surface Water Logging





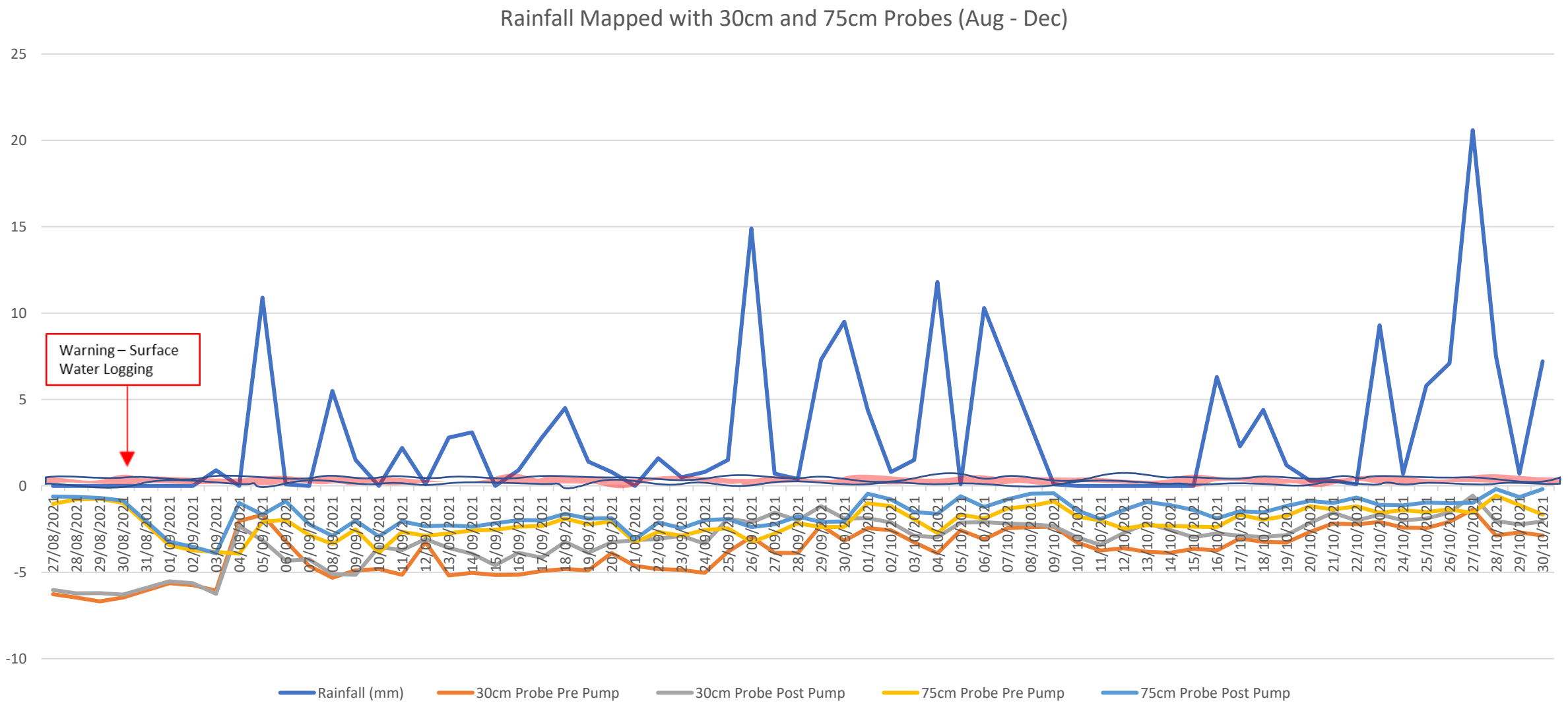
Data source: Emyvale Weather Station

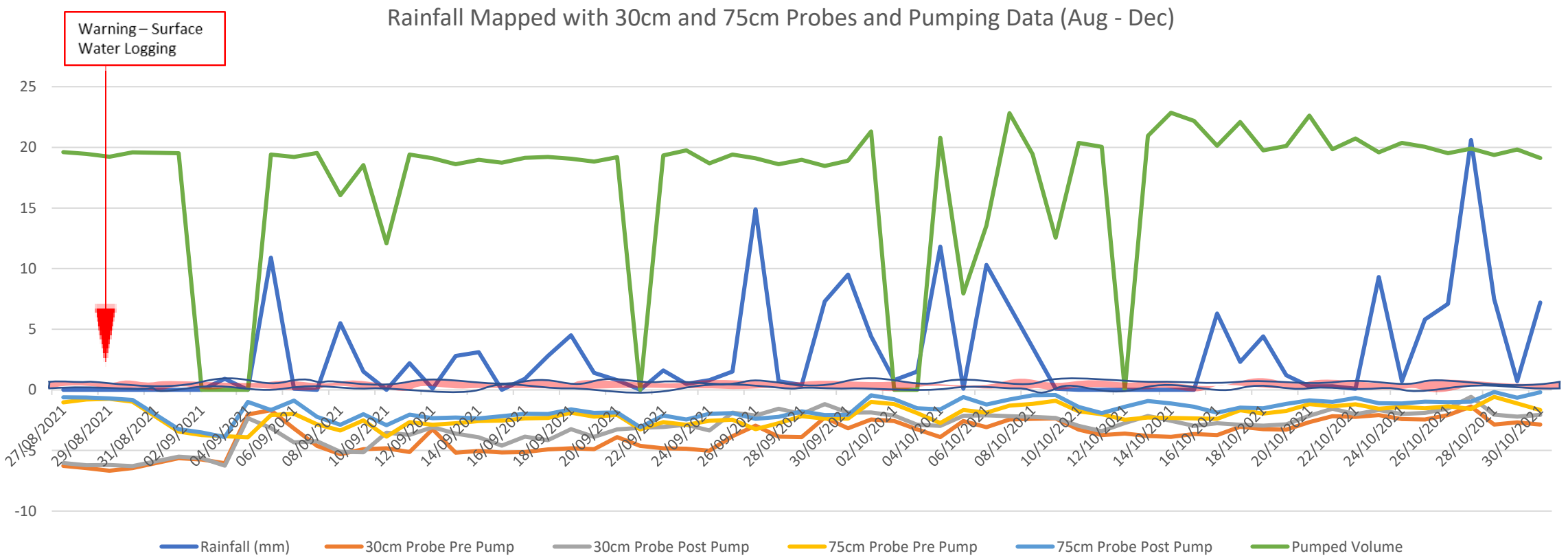
Total Rainfall (Pilot Testing Phase) – 774.2mm
Highest Monthly Rainfall – 158mm
Lowest Monthly Rainfall – 38mm
Average Monthly Rainfall – 86mm
Average 2021/22 vs 2020 – 86mm Vs 68mm

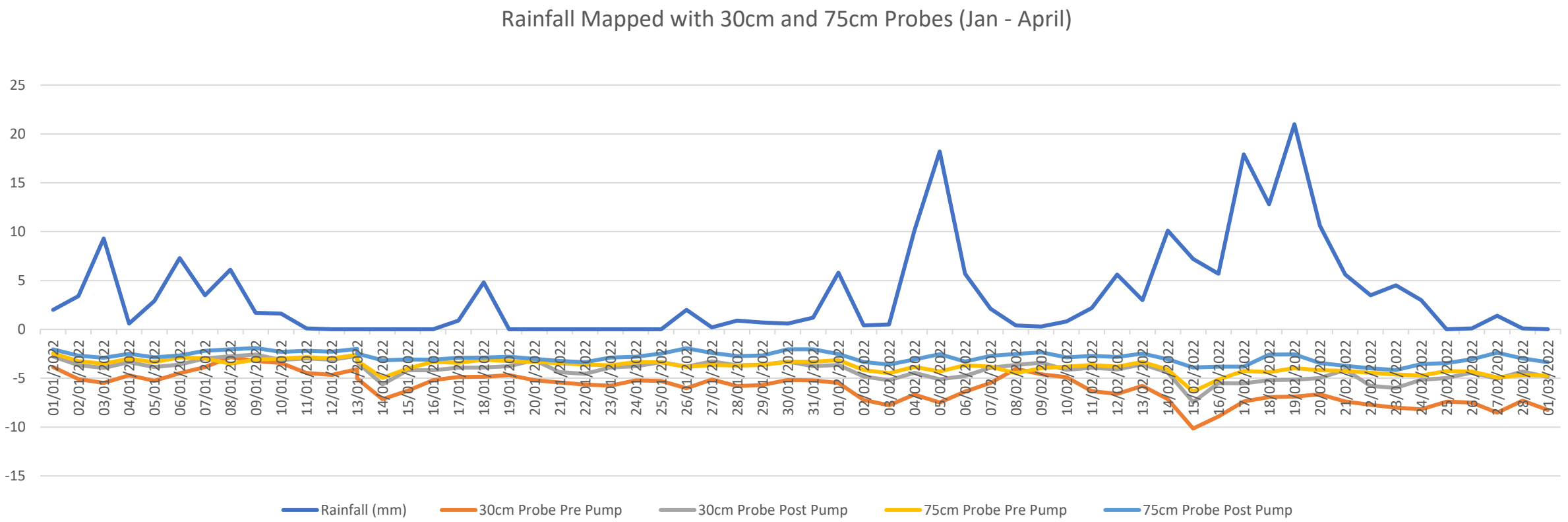


Data source: Emyvale Weather Station

Effluent Pilot Report – Rainfall Data Overview Mapped with Probe Data Aug– Dec




Rainfall Mapped with 30cm and 75cm Probes and Pumping Data (Aug - Dec)
Warning – Surface Water Logging
25
20
15
10
5
0
-5
-10
27/08/2021
29/08/2021
31/08/2021
02/09/2021
04/09/2021
06/09/2021
08/09/2021
10/09/2021
12/09/2021
14/09/2021
16/09/2021
18/09/2021
20/09/2021
22/09/2021
24/09/2021
26/09/2021
28/09/2021
30/09/2021
02/10/2021
04/10/2021
06/10/2021
08/10/2021
10/10/2021
12/10/2021
14/10/2021
16/10/2021
18/10/2021
20/10/2021
22/10/2021
24/10/2021
26/10/2021
28/10/2021
30/10/2021
Rainfall (mm)
30cm Probe Pre Pump
30cm Probe Post Pump
75cm Probe Pre Pump
75cm Probe Post Pump
Pumped Volume


Rainfall Mapped with 30cm and 75cm Probes (Jan - April)
25
20
15
10
5
0
-5
-10
-15
01/01/2022
02/01/2022
03/01/2022
04/01/2022
05/01/2022
06/01/2022
07/01/2022
08/01/2022
09/01/2022
10/01/2022
11/01/2022
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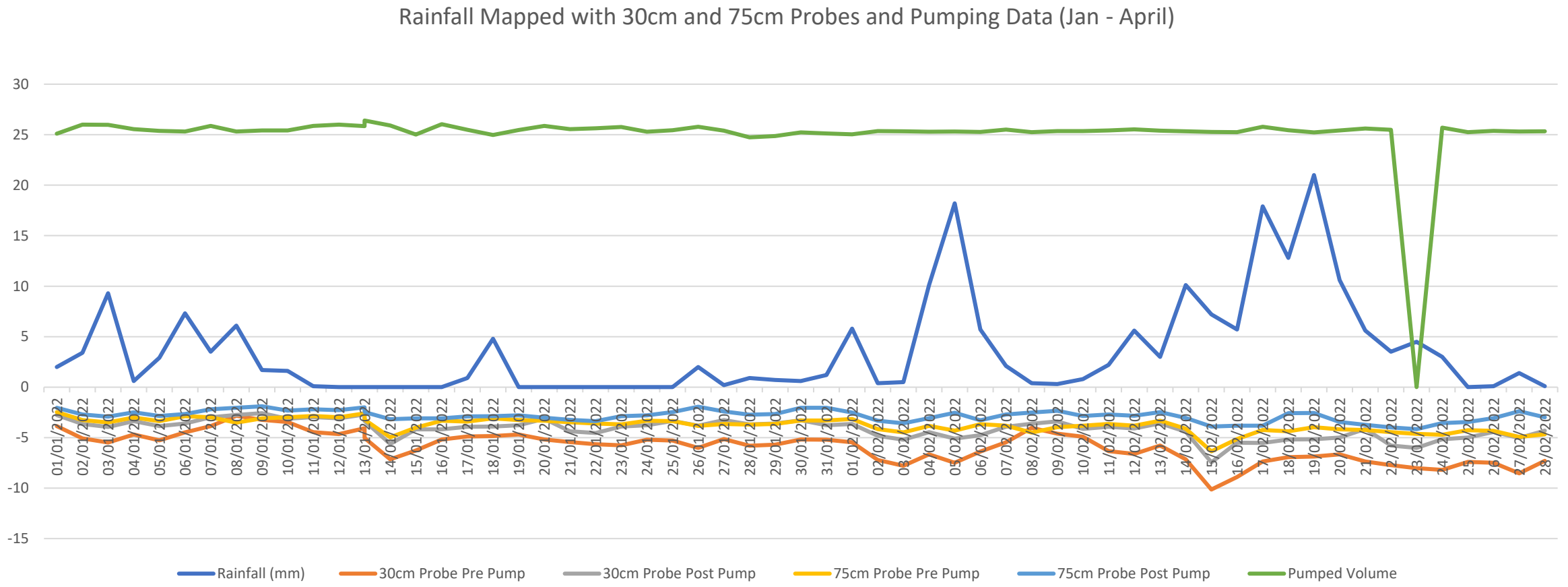
16/02/2022
17/02/2022
18/02/2022
19/02/2022
20/02/2022
21/02/2022
22/02/2022
23/02/2022
24/02/2022
25/02/2022
26/02/2022
27/02/2022
28/02/2022
01/03/2022
Rainfall (mm)
30cm Probe Pre Pump
30cm Probe Post Pump
75cm Probe Pre Pump
75cm Probe Post Pump


Rainfall Mapped with 30cm and 75cm Probes and Pumping Data (Jan - April)
30
25
20
15
10
5
0
-5
-10
-15
Rainfall (mm)
30cm Probe Pre Pump
30cm Probe Post Pump
75cm Probe Pre Pump
75cm Probe Post Pump
Pumped Volume

We conclude the result's shown above by overviewing the concern areas and scope for works set out to us by Silver Hill Foods and Rowan Consulting whilst cross referencing against the Pilot scheme licence certified by the EPA.

Pumping
Remit
- System is to control volumes of treated effluent
- System is to pump a daily controlled volume of max 48m3/Day
- System is to provide real time pumping data via reports
- System is to provide control of pumping volumes in the case of external factors effecting pumping abilities
- System to have override controls and alerts

Conclusion
- System is to control volumes of treated effluent – System is controlled via an intuitive onsite (manual) and online computer with accurate flow and volume control levels. The system at no point throughout the Pilot pumped above the licenced volume, all pumping volume are calculated and input into the system by a Bosta specialist and we experienced 3 system alerts for under pumping (all registered in data above with reason/explanation) and 1 alert for over pump (system is programmed to switch off when the over pump volume is 2.5% of daily programmed pumping volume, eradicating unlicenced effluent pumping volumes entering the field).
- System is to pump a daily controlled volume of max 48m3/Day – Data found in section 3 and 4 of the report shows controlled pumped volumes inside the licence agreement and matching the programmed volumes intended.
- System is to provide real time pumping data via reports – The Rainbird Iq4 online portal features live pumping data and data is available in PDF as an export file or as a Excel as an export file. Data can be visually seen live on either PC, Mobile or at the pump station. All data reports in report are pulled form he iQ4 software system.
- System is to provide control of pumping volumes in the case of external factors effecting pumping abilities – All reports show the system working within the controlled parameters set with only 4 non programmed events. These events where controlled by the safety feature of "Over" and "Under" pumping where by the system shuts down if the pumping is registered at 2.5% above programmed volumes and alerts (direct to mobile) when the system under pumps by the same percentage. As seen in the report the system is protected against Power surge with automatic switch off (1 x event registered in report), lighting strike as armed with lighting rods for decoders in valve boxes. Low flow / run dry protection against effluent blockage at source – to prevent damage to pump seal body.

Ponding / Surface Water
Remit
- System to control effluent by eradicating the possibility of surface ponding
- System to provide proof of effluent dispersal through land

Conclusion
- System to control effluent by eradicating the possibility of surface ponding – The designed system is a fully enclosed and protected from external factors (Tank – Filtration – Pump – Subsurface Drip Line), so from tank to subsurface drip line No effluent can escape the system eliminating the possibility of ground or air pollution from the treated effluent in transport. The effluent is purposely pumped 60cm under the ground and we can categorically verify that the system has Not caused ponding or surface water. We can be confident in this statement via the presentation of the moisture probe data in section 5,6,7 whereby at no point has the probes at 30cm been fully saturated in effluent or breaching the "Warning Surface Water" level set out in the parameters of the CB registration of moisture.
- System to provide proof of effluent dispersal through land - Throughout the entire Pilot and as seen in section 5,6,7 of this report Diagram 1 and 2 (Pre-Pump and Post-Pump –Blue and Orange lines) we clearly see the system and land dispersing the effluent effectively. We see the registration of the effluent being pump at 11:30am, we see the Orange line spike on a daily basis to show the effluent has reached both probes (35cm and 75cm), we then see with no overlap the Post probe (blue) decreasing in registration showing the effluent moving through the land and dispersing. To support the data and definition that the system is working effectively and efficiently we can look at an example of data collected (without external factors – Rain, leaks) from the 04/10/22 to 26/10/22 (found section 6) we have an average Pre pump 35cm reading of -3.48cb with the highest being -3.88 and the lowest of -2.44. This data tells us that we have a differential of 11% (high) and 40% (low) from our average meaning the land is very stable and consistent in acceptance of the effluent and dispersal of the effluent on average , but with a low level of 40% shows us that the system does need artificial rain intelligence to prevent isolated incidents that cause the higher low percentage. With the detailed probe data we are able to identify the isolated day / days and use when programming for the expansion. It is worth highlighting that at no point did the probes register above ground water caused by over pumping.

Overall Conclusion
- We are very pleased with the detailed results provided in this report and the outcome from the pilot scheme. We have clearly displayed that the system has been successful in its purpose in providing a intuitive, modernised effluent control package that will eradicate the need for Silver Hill to use the stream as they main source of effluent dispersal whilst not causing damage to the land, preventing air pollution and stopping surface water build up. We look forward to installing the expansion upon the renewal of the licence for extending the system to manage and maintain all of Silver Hills effluent on a daily basis.

Appendix H: Daily Inspection Log and Photo’s

All photos available here:

https://silverhillfarm-my.sharepoint.com/personal/environment_silverhillduck_com/_layouts/15/onedrive.aspx?ga=1&id=%2Fpersonal%2Fenvironment%5Fsilverhillduck%5Fcom%2FDocuments%2FSilver%20Hill%20Foods%20Site%20Visit%20Response%20%28SV24031%29%2FDaily%20Log%20of%20Photos%20%28Drip%20Irrigation%29%2FDaily%20Log%20of%20Photos

Date	Evidence of Ponding?	Photo Evidence Ref.
03/08/2021	No	Day 1
04/08/2021	No	Day 2
05/08/2021	No	Day 3
06/08/2021	No	Day 4
09/08/2021	No	Day 7
10/08/2021	No	Day 8
11/08/2021	No	Day 9
12/08/2021	No	Day 10
13/08/2021	No	Day 11
16/08/2021	No	Day 14
17/08/2021	No	Day 15
18/08/2021	No	Day 16
19/08/2021	No	Day 17
20/08/2021	No	Day 18
22/08/2021	No	Day 21
23/08/2021	No	Day 22
24/08/2021	No	Day 23
25/08/2021	No	Day 24
26/08/2021	No	Day 25
27/08/2021	No	Day 28
30/08/2021	No	Day 29
31/08/2021	No	Day 30
01/09/2021	No	Day 31
02/09/2021	No	Day 32
03/09/2021	No	Day 35
06/09/2021	No	Day 36
07/09/2021	No	Day 37
08/09/2021	No	Day 38
09/09/2021	No	Day 39
10/09/2021	No	Day 42
13/09/2021	No	Day 43
14/09/2021	No	Day 44
15/09/2021	No	Day 45
16/09/2021	No	Day 46
17/09/2021	No	Day 49
20/09/2021	No	Day 50
21/09/2021	No	Day 51
22/09/2021	No	Day 52
23/09/2021	No	Day 53
24/09/2021	No	Day 56
27/09/2021	Yes (19mm of rainfall, small pond bottom of	Day 57

	Line 8, zone 1 rested for 24 hours)	
28/09/2021	No	Day 58

Date	Evidence of Ponding?	Photo Evidence Ref.
29/09/2021	No	Day 59
30/09/2021	No	Day 60
01/10/2021	No	Day 63
04/10/2021	No	Day 64
05/10/2021	No	Day 65
06/10/2021	No	Day 66
07/10/2021	No	Day 67
08/10/2021	No	Day 70
11/10/2021	No	Day 71
12/10/2021	No	Day 72
13/10/2021	No	Day 73
14/10/2021	No	Day 74
15/10/2021	No	Day 75
18/10/2021	No	Day 77
19/10/2021	No	Day 78
20/10/2021	No	Day 79
21/10/2021	No	Day 80
22/10/2021	No	Day 81
26/10/2021	No	Day 84
27/10/2021	No	Day 85
28/10/2021	No	Day 86
29/10/2021	No	Day 87
01/11/2021	No	Day 90
02/11/2021	No	Day 91
03/11/2021	No	Day 92
04/11/2021	No	Day 93
05/11/2021	No	Day 94
08/11/2021	No	Day 97
09/11/2021	No	Day 98
10/11/2021	No	Day 99
11/11/2021	No	Day 100
12/11/2021	No	Day 111
15/11/2021	No	Day 104
16/11/2021	No	Day 105
17/11/2021	No	Day 106
18/11/2021	No	Day 107
19/11/2021	No	Day 108
22/11/2021	No	Day 111
23/11/2021	No	Day 112
24/11/2021	No	Day 113
25/11/2021	No	Day 114
26/11/2021	No	Day 115

Date	Evidence of Ponding?	Photo Evidence Ref.
29/11/2021	No	Day 118
30/11/2021	No	Day 119
01/12/2021	No	Day 120
02/12/2021	No	Day 121
03/12/2021	No	Day 122
06/12/2021	No	Day 125
07/12/2021	No	Day 126
08/12/2021	No	Day 127
09/12/2021	No	Day 128
10/12/2021	No	Day 129
13/12/2021	No	Day 132
14/12/2021	No	Day 133
15/12/2021	No	Day 134
16/12/2021	No	Day 135
17/12/2021	No	Day 136
20/12/2021	No	Day 139
21/12/2021	Yes (Soft / Moist near entrance of field, Zone 1 rested)	Day 140
22/12/2021	No	Day 141
23/12/2021	No	Day 142
28/12/2021	No	Day 147
29/12/2021	No	Day 148
30/12/2021	No	Day 149
04/01/2022	No	Day 154
05/01/2022	No	Day 155
06/01/2022	No	Day 156
07/01/2022	No	Day 157
10/01/2022	No	Day 160
11/01/2022	No	Day 161
12/01/2022	No	Day 162
13/01/2022	No	Day 163
14/01/2022	No	Day 164
17/01/2022	No	Day 167
18/01/2022	No	Day 168
19/01/2022	No	Day 169
20/01/2022	No	Day 170
21/01/2022	No	Day 171
24/01/2022	No	Day 174
25/01/2022	No	Day 175
26/01/2022	No	Day 176
27/01/2022	No	Day 177

28/01/2022	No	Day 178

Date	Evidence of Ponding?	Photo Evidence Ref.
31/01/2022	No	Day 181
01/02/2022	No	Day 182
02/02/2022	No	Day 183
03/02/2022	No	Day 184
04/02/2022	No	Day 185
07/02/2022	No	Day 188
08/02/2022	No	Day 189
09/02/2022	No	Day 190
10/02/2022	No	Day 191
11/02/2022	No	Day 192
14/02/2022	No	Day 195
15/02/2022	No	Day 196
16/02/2022	No	Day 197
17/02/2022	No	Day 198
18/02/2022	No	Day 199
21/02/2022	No	Day 202
22/02/2022	No	Day 203
23/02/2022	Yes (small pond at bottom of line 12, system was switched off for 24 hours and re-examined and found to be dry)	Day 204
24/02/2022	No	Day 205
25/02/2022	No	Day 206
28/02/2022	No	Day 209
01/03/2022	No	Day 210
02/03/2022	No	Day 211
03/03/2022	No	Day 212
04/03/2022	No	Day 213
07/03/2022	No	Day 216
08/03/2022	No	Day 217
09/03/2022	No	Day 218
10/03/2022	No	Day 219
11/03/2022	No	Day 220
14/03/2022	No	Day 223
15/03/2022	No	Day 224
16/03/2022	No	Day 225
21/03/2022	No	Day 230
22/03/2022	No	Day 231
23/03/2022	No	Day 232
24/03/2022	No	Day 233

25/03/2022	No	Day 234
28/03/2022	No	Day 237
29/03/2022	No	Day 238
30/03/2022	No	Day 239
31/03/2022	No	Day 240

Date	Evidence of Ponding?	Photo Evidence Ref.
01/04/2022	No	Day 241
04/04/2022	No	Day 244
05/04/2022	No	Day 245
06/04/2022	No	Day 246
07/04/2022	No	Day 247
08/04/2022	No	Day 248
11/04/2022	No	Day 251
12/04/2022	No	Day 252
13/04/2022	No	Day 253
14/04/2022	No	Day 254
15/04/2022	No	Day 255
19/04/2022	No	Day 259
20/04/2022	No	Day 260
21/04/2022	No	Day 261
22/04/2022	No	Day 262
25/04/2022	No	Day 265
26/04/2022	No	Day 266
27/04/2022	Yes (Zone 1 - bottom of line 12, field was rested for 24 hours)	Day 267
28/04/2022	No	Day 268
29/04/2022	No	Day 269
02/05/2022	No	Day 272
03/05/2022	No	Day 273

Appendix 6.2:MEHS (2022) Hydrological & Hydrogeological Qualitative Risk Assessment

HYDROLOGICAL & HYDROGEOLOGICAL QUALITATIVE RISK ASSESSMENT FOR SUB-SURFACE IRRIGATION SYSTEM PLOT 1 - 9 AT SILVER HILL DUCK, EMYVALE, CO. MONAGHAN

Technical Report Prepared For

Denise Jordan
Environmental
Manager
Silver Hill Duck

Technical Report Prepared By

Trevor Montgomery
EHS Consultant &

Our Reference

TM/22/102R02

Date of Issue

26th October 2022

Document History

Document Reference		Original Issue Date	
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Revision Level	Revision Date	Description	Sections Affected
R02	23/10/2022	Update from Info from Monaghan CC	All
R03	01/11/2022	Update from discussions with IFI, MCC	All

Record of Approval

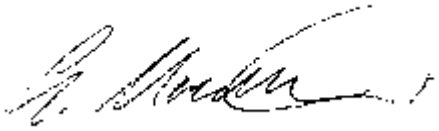
Details	Written by	Approved by
Signature		
Name	Trevor Montgomery	Guy Meredith
Title	EHS Consultant & Director	Engineer
Date	1 November 2022	1 November 2022

Table of Contents

1.0 INTRODUCTION

1.1 Site Location & Hydrological Setting

Silver Hill Foods operates a poultry processing facility at the site. The facility operates under an Industrial Emissions (IE) licence (register number P0422-03), which was granted by the Environmental Protection Agency (EPA) in March 2021. Process effluent from the facility is treated in an on-site wastewater treatment plant. Effluent from the wastewater treatment plant currently discharges to an unnamed stream located in the northern area of the facility. This unnamed stream discharges to the Corlattallan Stream (as referred to in all previous reports, now named Knockakirwan on EPA mapping) approximately 1.2 km northeast of the facility and the Corlattallan Stream in turn discharges to the river Blackwater approximately 5.6 km northeast of the facility.

Figure 1-1 below shows a summary of these locations.

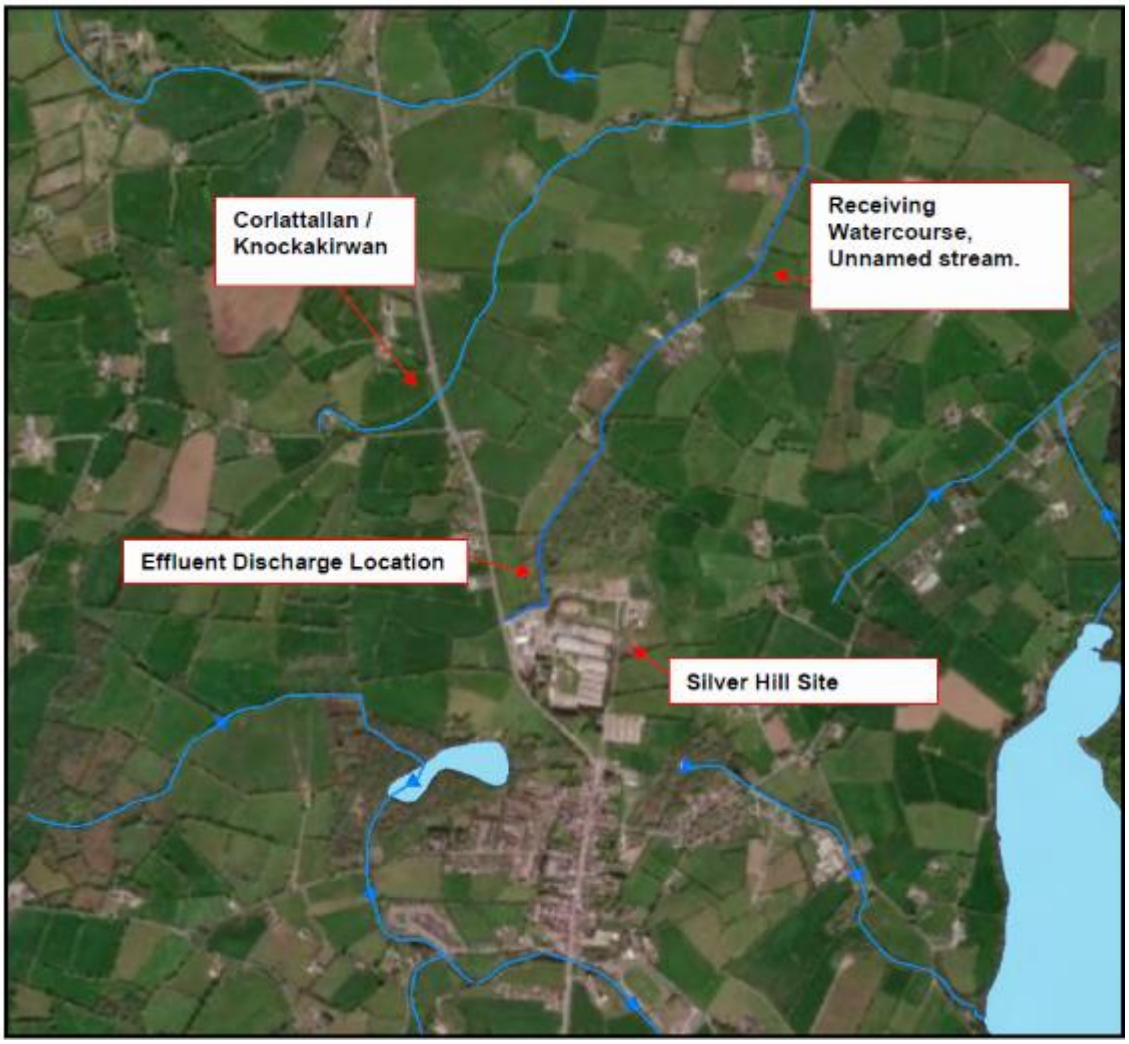


Figure 1.1 Site Location (Grid Reference H 67505 44703) (Source Rowan Eng Con Report SIL0002-5)

Due to a possible lack of assimilative capacity in the unnamed stream and in the Corlattallan Stream all options to disperse the effluent generated on site were examined which included:

- Piping the effluent to the river Blackwater (north and east of the site)
- Increase the flow in the existing discharge via dilution
- Constructed wetland
- Discharge to sewer to Emyvale WWTP
- Transportation to off-site Wastewater Treatment Plant
- Construction of a storage tank near the river Blackwater and transport treated effluent to storage tank.
- Surface irrigation.
- Sub-surface irrigation

Following extensive review by the Client, consultants and the EPA it was decided that sub-surface irrigation was the most sustainable option for the future of Silver Hill Duck. The IE license issued by the EPA includes the sub-surface irrigation for the disposable of treated effluent. The EPA license issued in 2021 (P0422-03) required that a pilot system to be installed to demonstrate the operability of the system. A report has been submitted to the EPA for approval to implement the whole system.

The Silver Hills Foods facility is located in a rural area of Co. Monaghan on the northern outskirts of the town of Emyvale. The N2 Dublin to Derry Road runs approximately north-south adjacent to the western boundary of the site. The main production area is occupied mainly by buildings and internal roadways. The wastewater treatment plant and a slurry storage tank are located in a low-lying area north-east of the main production area. To the east, south and west of the site are areas of pasture. To the north of the site is an area of scrub beyond which is pasture. Much of the pasture that borders the site is owned by Silver Hill Foods.

It is proposed to install the drip irrigation system across 9 plots:

Plot 1 gradient sloping in a south easterly direction and has an average topographical level of 64m AOD (Malin Head) with a high of 69 m AOD and a low of 59m AOD. To the south is the poultry processing plant and to the west is the N2 road. To the east and north is agricultural land. Surface water emerging from the plot will be sampled at surface monitoring points 1, 2 3 & 3A.

Plot 2 is sloping to the southwest with a high of 81 m and a low of 49 m. The plot is surrounded by agricultural land with forestry on the south. There are no drainage streams around the plot. Surface water emerging from the plot will be sampled at

surface monitoring points 10, 11 & 12.

Plot 3 is relatively flat with a max of 81 m and a low of 75 m and it is sloping in a easterly direction. To the south, west and north is agriculture land and the N2 road to the east. Surface water emerging from the plot will be sampled at surface monitoring points 1, 8 & 13. The trial holes dug for the Gyosyntec Report in 2017 show the plot may have poor percolation and the plot will have 3 soil moisture meters. The soil moisture sensor allows the system to control the soil humidity continuously. When the soil moisture sensor's probe detects that the soil has reached the desired level of humidity, the irrigation system will switch itself off. So, over-watering is prevented, and surface water runoff is prevented and surface and ground water is protected.

Plot 4 is sloping to the east and south with a high of 82 m and a low of 59 m. To the north and west is agriculture land, the N2 road to the east and forestry to the south. Surface water emerging from the plot will be sampled at surface monitoring points 9, 10 & 14. The trial holes show the plot may have poor percolation and the plot will have 3 soil moisture meters installed. Effective irrigation of the effluent is monitored by the soil moisture sensor and it allows the system to control the soil humidity continuously within a plot. When the soil moisture sensor's probe detects that the soil has reached the desired level of humidity, the irrigation system will switch itself off for that Zone within a plot. Therefore over-watering is prevented, and surface and ground water is protected.

Plot 5 is relative flat on the eastern side with the elevation between 58 and 60 meters. And sloping to Buck lough in a south easterly direction with a high of 67 m to 60 m. The plot is bounded by agricultural land to the north and west, the N2 to the east and forestry to the south. Surface water emerging from the plot will be sampled at surface monitoring points 14, 15 & 16. The area of Plot 5 contains a Critical Source Area (CSA). Critical sources areas are areas that deliver a disproportionally high amount of pollutants compared to other areas of a water body or sub-catchment, and represent the areas with the highest risk of impacting a water body. In order to determine where critical source areas are located, we need to determine the hydro(geo) logical susceptibility of the water body and also the nutrient loadings applied to that water body. Silver Hill Foods have proposed a management plan for the reduction of P will be implemented with the irrigation system. The soil samples taken in 2022 for testing showed the soils present were silty clay loam.

Plot 6 is sloping to the east with a high of 70 m and a low of 60 m. The plot is bounded by agricultural land to the north, east and south by agricultural land and to the west the rear access road to the WWTP. Surface water emerging from the plot will be sampled at surface monitoring points 4. The area of Plot 6 contains a Critical Source Area (CSA). Critical sources areas are areas that deliver a disproportionally high amount of pollutants compared to other areas of a water body or sub-catchment, and represent the areas with the highest risk of impacting a water body. In order to determine where critical source areas are located, we need to determine the hydro(geo) logical susceptibility of the water body and also the nutrient loadings applied to that water body. Silver Hill Foods have proposed a management plan for the reduction of P will be implemented with the irrigation system.

Plot 7 gradient is shallow slope in a south easterly direction and has an average topographical level of 60m with a high of 64 m and a low of 54m. To the south and west are poultry houses to the west east and north is agriculture land. There is a drainage stream to the south of Pilot 7, which joins a stream which is discharged at Surface Water Monitoring Point 5. Surface water emerging from the plot will be sampled at surface monitoring points 5.

Plot 8 gradient is a shallow slope to the southeast with a high of 61 m and a low of 53 m. The plot is bounded by agricultural land to the north, east and south and to the west are decommissioned poultry houses. Surface water emerging from the plot will be sampled at surface monitoring points 5, 6 & 7.

Plot 9 gradient is flat with a high of 62 m and a low of 60 m. The plot is bounded by agricultural land to the east and northwest, poultry houses to the north, to the south a shop and agricultural buildings and to the WWTP rear access road to the west. Surface water emerging from the plot will be sampled at surface monitoring points 6 & 7.

The trial holes show plots 3,4.6 & 7 may have poor percolation and the plot will have 3 soil moisture meters installed. Effective irrigation of the effluent is monitored by the soil moisture sensor and it allows the system to control the soil humidity continuously within a plot. When the soil moisture sensor's probe detects that the soil has reached the desired level of humidity, the irrigation system will switch itself off for that Zone within a plot. Therefore over-watering is prevented, and surface and ground water is protected.

The irrigation system in the 9 plots at Silver Hill Foods and the monitoring of Soil,

Surface and Ground water will form a management plan for the reduction of N & P in the land employed. This plan will involve four-step process:

Assessment – Silver Hill Foods have reviewed and evaluates the land and practices in place.

Plan Development – Silver Hill Foods have formulated a Plan that

I. No slurries or fertiliser will be applied to the land,
II. No livestock will be present on the land and
III. 2 Cuts of Silage will be removed per year
IV. Soil testing will be conducted to demonstrate reduction of P.

Plan Implementation – once the irrigation system is installed, the implementation of the plan will commence.

Verification – The monitoring of the soil, surface, soil and ground water will be conducted as agreed with Monaghan CoCo, IFI and the EPA. The results will be reported annually.

1.1 Objective of Report

The scope of this desk top review is to assess the potential for any likely significant impacts on receiving waters during construction or post development of the Sub-surface Irrigation System (Plots 1 to 9). The assessment considers the likely impact on water body status in the absence of taking account of any measures intended to avoid or reduce harmful effects of the proposed project (i.e., mitigation measures).

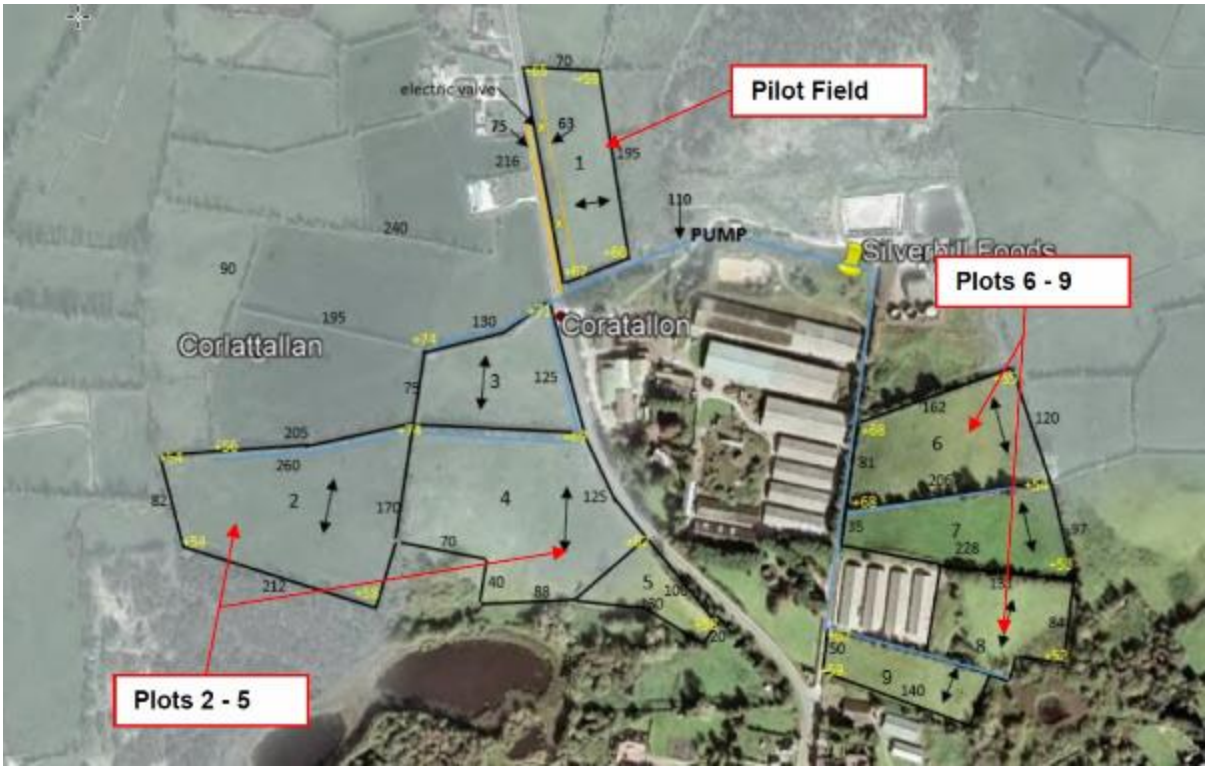


Figure 1.2 Site Location and location of Irrigation Plots. (Source Bosta UK)

In particular, this review considers the likely impact of construction run-off and domestic sewage from the proposed development on water quality and overall water body status within Mountain Water River, River Blackwater and Natura 2000 sites. The assessment relies on information regarding construction and design provided in this report.

This report is prepared by *Trevor Montgomery* (BSc, Post Grad Evn). Trevor is an environmental consultant with over 25 years' experience in water resource management and impact assessment. He has a Degree and Post Graduate Diploma in Environmental Science and has provided services on water related environmental and planning issues to both public and private sector bodies. He is qualified as a *competent person* as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons, www.igi.ie). Trevor's specialist area of expertise is water resource management, hydrological assessment, wastewater treatment and environmental impact assessment.

1.2 Description of Drainage

There is no direct discharge to an open stream/river proposed as part of this development.

The nearest surface water receptor is the Mountain River Stream (IE_EA_03_0400) which lies 200 m to the south of the proposed development site (refer Figure 1.1 above). The area is part of the river Bann catchment and the Mountain River Steam sub-catchment Mountain Water 03M_01). The direct hydraulic linkage between the proposed development and these water bodies is broken due to the fact that soil moisture meters would prevent flooding.

The Sub-surface Irrigation system is an effluent disposal technique designed to disperse effluent at a low application rate over a large area. Currently Plot 1 the Pilot System has been installed with plans to install the remaining plots (2 to 9) in the spring / summer of 2023.

The system is ploughed into the ground at centres between 200 mm and 600 mm apart. The smaller the centres the more disperse the effluent application. The Pilot system installed in Plot 1 showed there was no difference between the 200- and 400-mm centres as shown in Figure 1.3.

It is planned to install a groundwater monitoring wells, pore water monitoring wells and surface water monitoring points as shown in Figure 1.4(A to D) as part of the drip irrigation expansion.

The proposal for the sub-surface irrigation system is to install a number of monitoring wells, soil pore water wells and surface water monitoring points to ensure complete monitoring of all strata which the sub-surface irrigation system could have an impact on.

In addition, moisture monitors will be installed to ensure no ponding occurs during the application of the treated effluent. The system has the ability to switch from one zone to another when soil moisture levels are not acceptable.

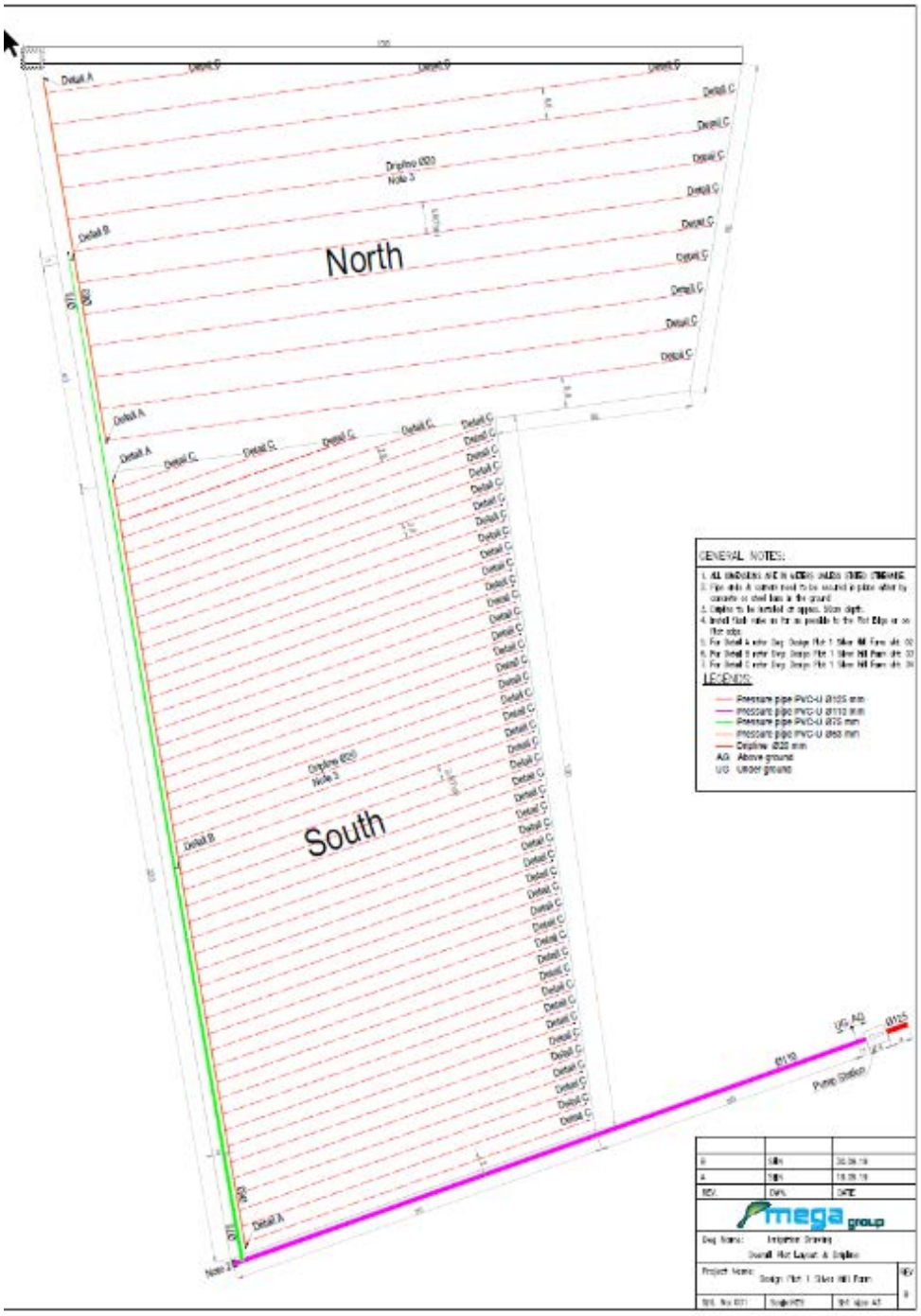
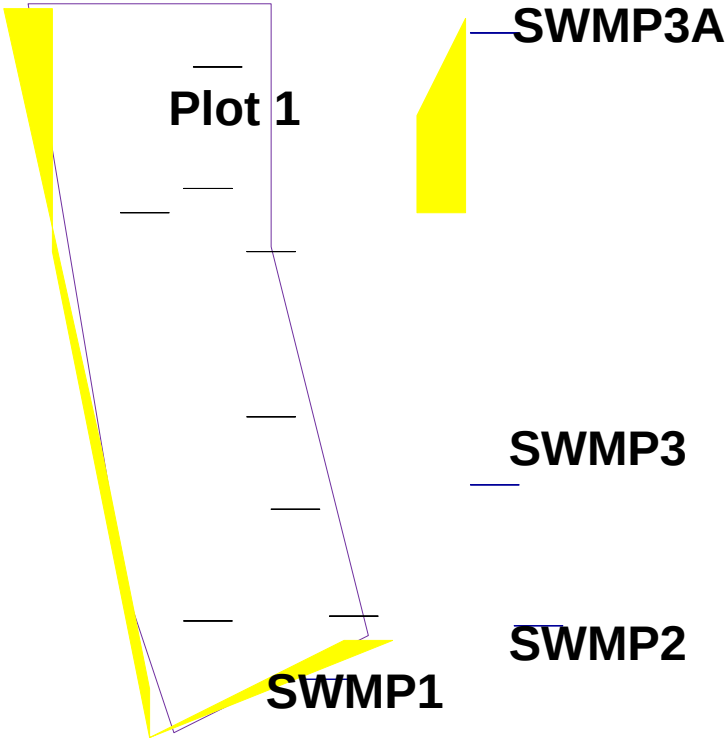
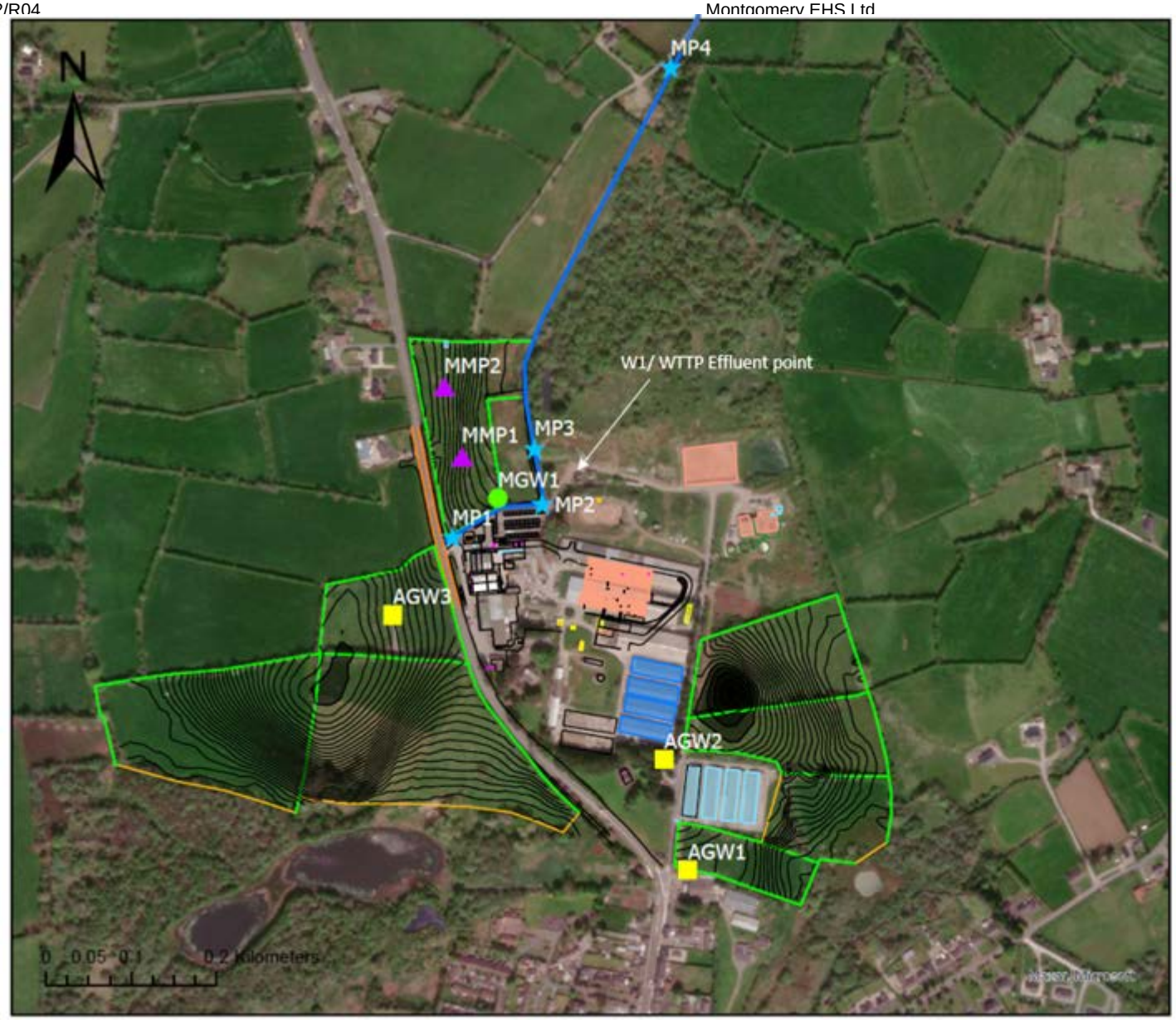


Figure 1.3 Layout of Pilot System in Plot 1. (Source Bosta UK)


SWMP3A
Plot 1
SWMP3
SWMP2
SWMP1



Legend

- Groundwater Monitoring Well
- Drip Irrigation Monitoring System
- Surface Water Sampling Points
- Groundwater Abstraction Bore
- Unnamed Stream
- Ground Level Contours

Title: Monitoring/ Sampling Locations
Client: Silverhill Foods
Scale: 1:6:000 @ A4
Date: 06/07/2022

Rowan Engineering Consultants Ltd
Unit 14,
Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie

Figure 1.4A Monitoring Points for Surface, Ground and Pore Water in Plot 1

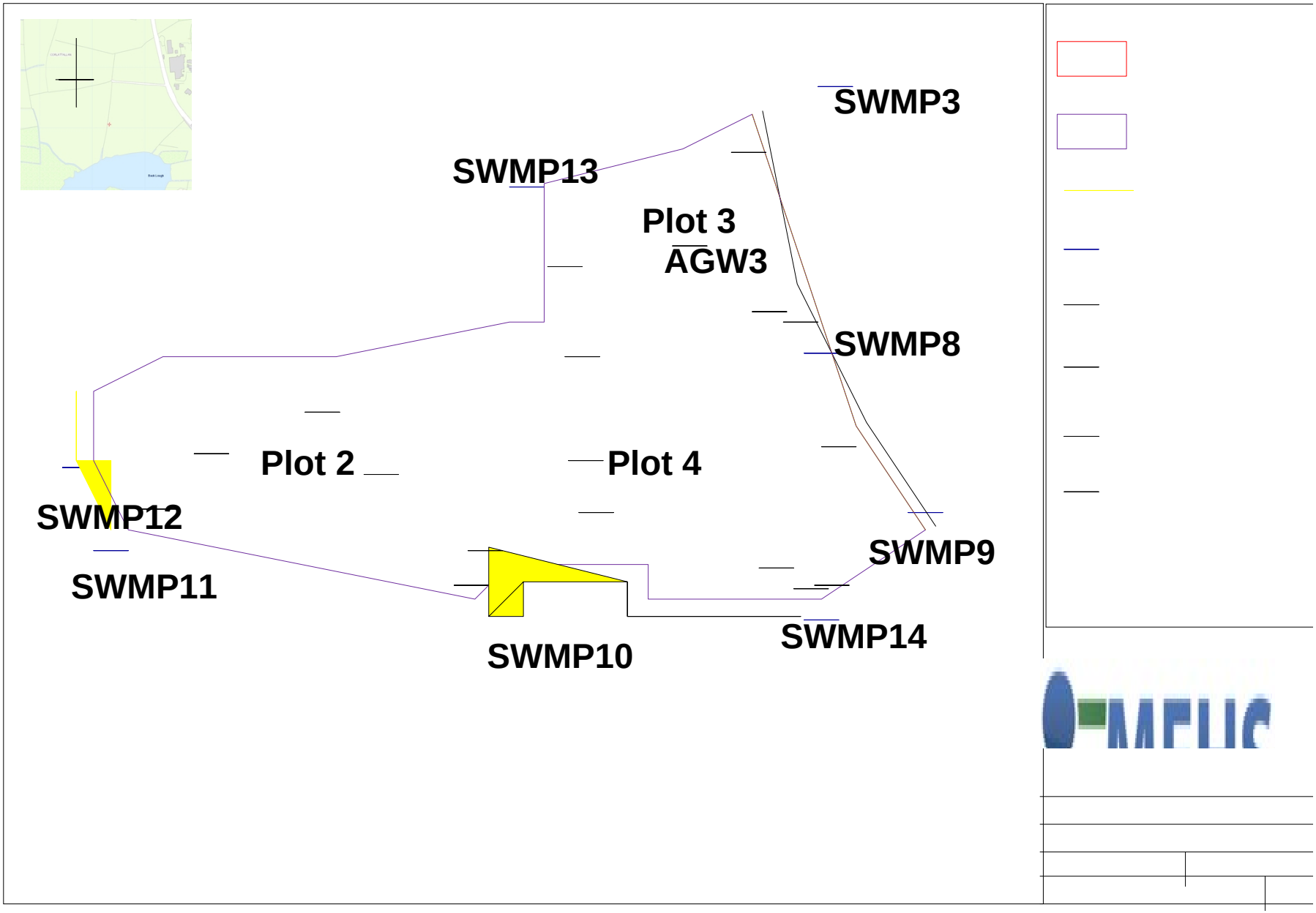


Figure 1.4B Proposed Monitoring Points for Surface, Ground and Pore Water in Plot 2-4

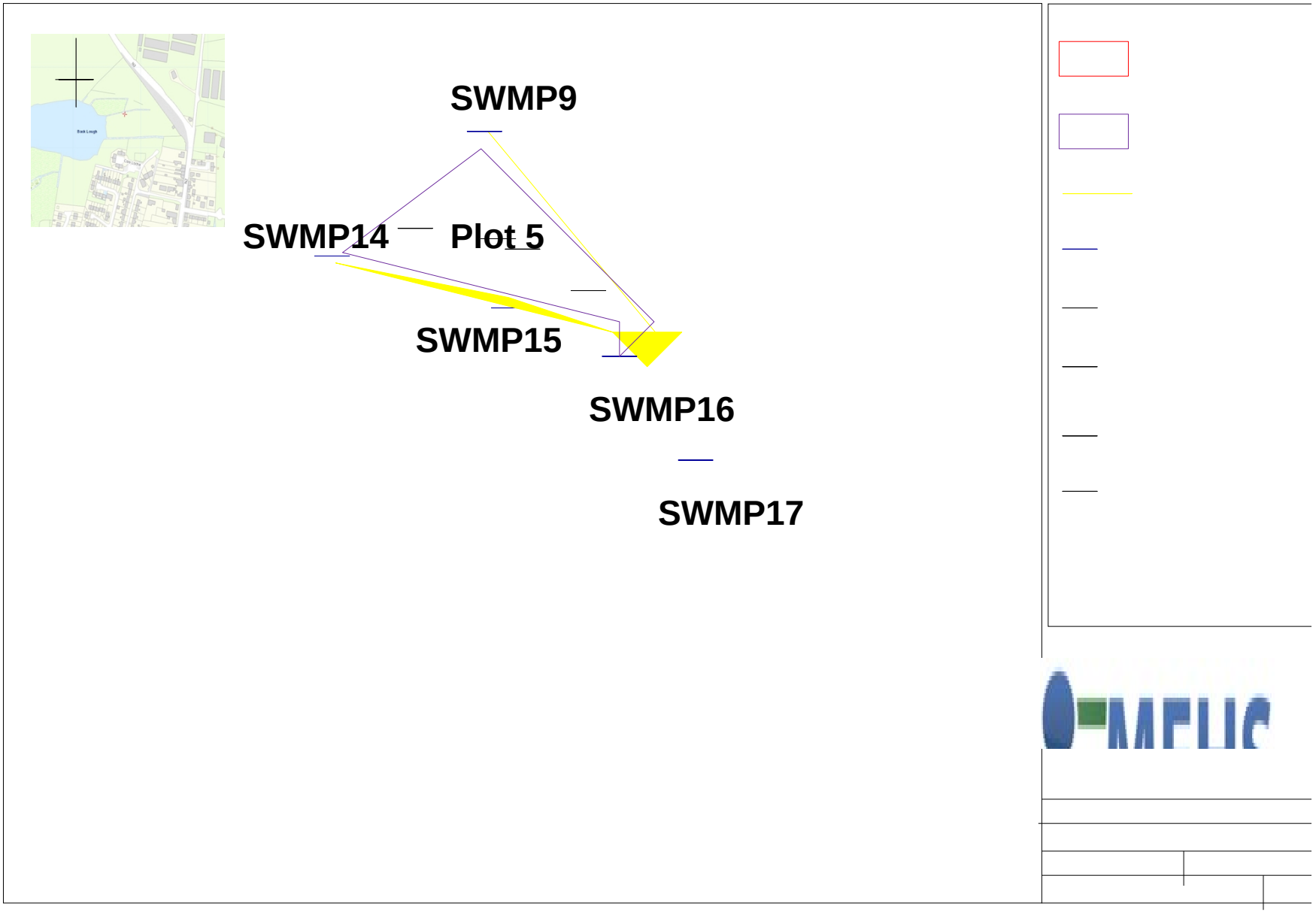


Figure 1.4C Proposed Monitoring Points for Surface, Ground and Pore Water in Plot 5

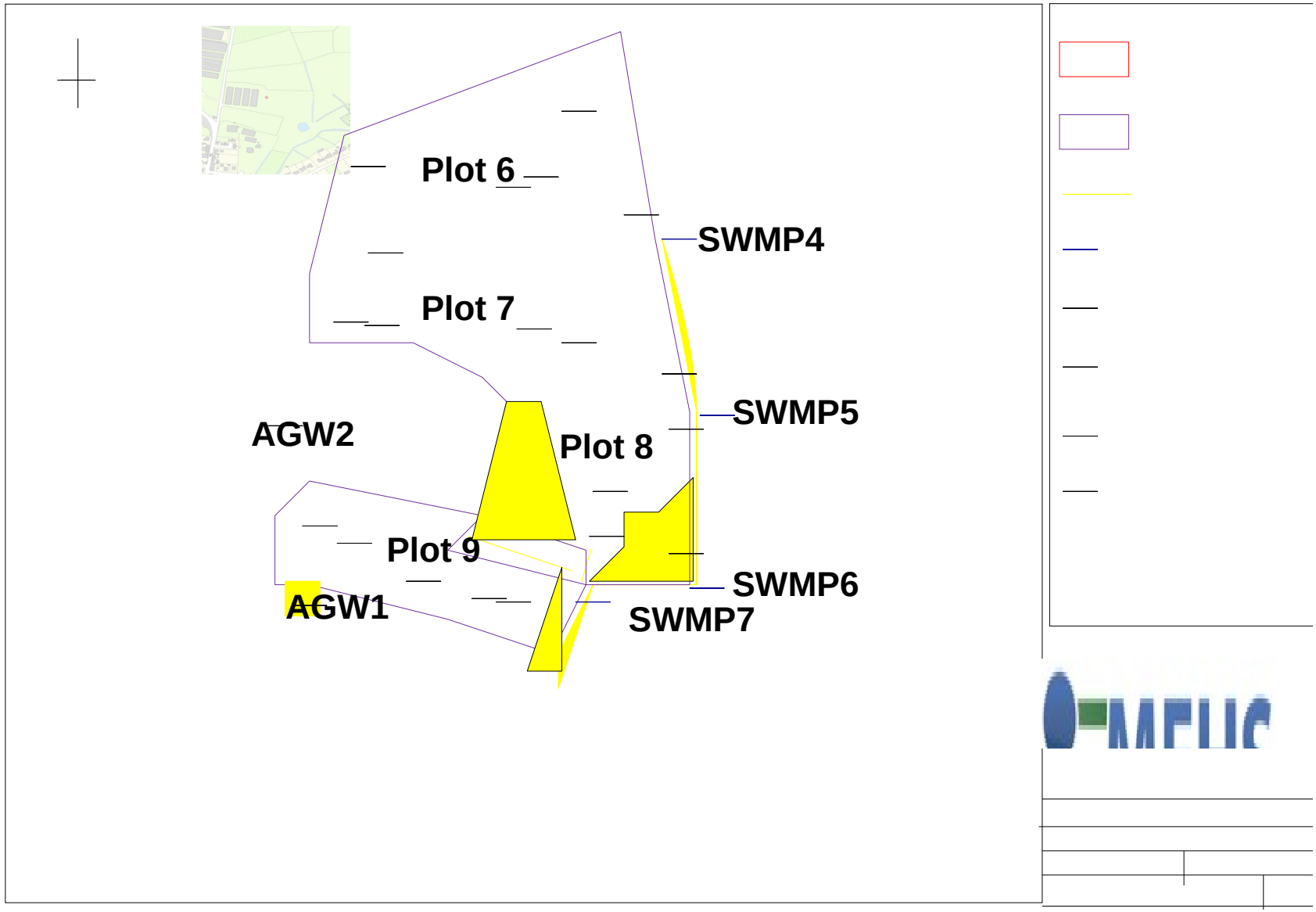


Figure 1.4D Proposed Monitoring Points for Surface, Ground and Pore Water in Plot 6 – 9

2.0 ASSESSMENT OF BASELINE WATER QUALITY, RIVER FLOW AND WATER BODY STATUS

A reliable Conceptual Site Model (CSM) requires an understanding of the existing hydrological and hydrogeological setting. This is described below for the proposed development site and surrounding hydrological and hydrogeological environs.

2.1 Hydrological Catchment Description

The site is located in the Neagh Bann River Basin District, within the Lough Neagh & Lower Bann WFD catchment. According to the EPA GIS map viewer, a number of water bodies occur in close proximity to the subject site. The closest water body is Buck Lough c.290m southwest of the site. Other water bodies include Emy Lough stream c.565m southeast, Killybressal stream c.544m west, Corlattallan stream / Knockakirwan stream c.808m north and the Mountain Water River which runs through the village of Emyvale c.820m south. The most predominant and widely known water body feature of the region is Emy Lough, situated c.1,340m east of the subject site. Groundwater flow at the site is predicted to be towards the southeast.

The National Parks and Wildlife Service's online map viewer was consulted, and two designated sites were identified within 15km of the subject property, which are listed below:

- Slieve Beagh Special Protection Area (SPA) 004167, c.11.2km west
- Eshbrack Bog Natural Heritage Area (NHA) 001603, c.12.4km west

The proposed development site lies within the River Bann Catchment. The nearby Slieve Beagh Special Protection Area (SPA) 004167 (11.2km west) and Eshbrack Bog Natural Heritage Area (NHA) 001603 (12.4km west). The Environmental Protection Agency (EPA, 2019) on-line mapping presents the available water quality status information for water bodies in Ireland. The river Bann has an WFD status of '*Good*'. The river Bann (IE_EA_003_0300) waterbody has a WFD risk score of '*At risk of not achieving good status*'. The most recent surface water quality data for the Mountain Water Stream (2010-2019) indicate that they are '*Unpolluted*'. Under the 2019 '*Trophic Status Assessment Scheme'* classification of the EPA, '*Unpolluted*' means there have been no breaches of the EPA's threshold values for nutrient enrichment, accelerated plant growth, or disturbance of the level of dissolved oxygen normally present.

2.1.1 Pollutant Impact Potential (PIP) maps

The assessment conducted has examined the Pollutant Impact Potential maps developed by the EPA. The maps are intended to help focus on the areas and sources that might be impacting water quality. They indicate the areas with potential for diffuse P and diffuse N losses to water. The maps, including flow paths and delivery points can be used however to target measures to prevent or limit Nitrogen and Phosphorus losses. The information in this map has been integrated into the Figure 1.4 (A to D) with buffer areas selected

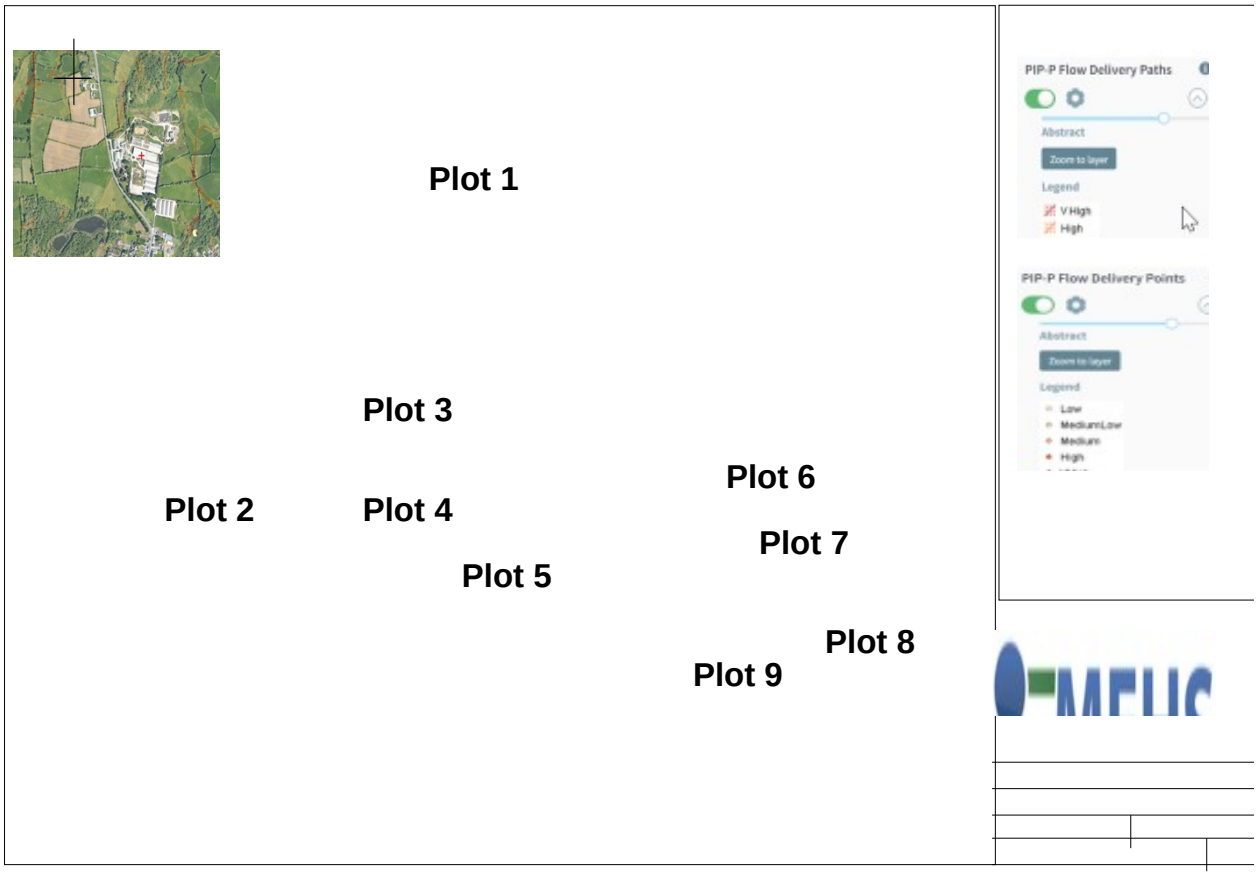


Figure 2.1 Pollutant Impact Potential (PIP) maps (site location indicated, red dot) (Source Catchments.ie)

2.2 Aquifer Description & Superficial Deposits

According to the Geological Survey of Ireland (GSI) data viewer, topsoil underlying the subject site is classified as made ground, the topsoil type underlying the agricultural grasslands bordering the site is described as fine loamy drift with siliceous stones. The subsoil is classified as till derived from Devonian and Carboniferous sandstones. Bedrock beneath the site is composed of the localised Carrickaness Sandstone Formation.

2.2.1 Source Protection Zones and Wells

The GSI data viewer indicates that the subject site is not located within a source protection zone and there are no source protection zones within 5km. The closest source protection zone is the SO Monaghan PWS c.6.9km south. A number of groundwater wells (boreholes) occur within c.450m south and west of the site

- Ref. 2633NWW154,
- Ref. 2633NWW155,
- Ref. 2633NWW217,
- Ref. 2633NWW104,
- Ref. 2633NWW102,
- Ref. 2633NWW103,
- Ref. 2633NWW105 and
- Ref. 2633NWW214).

The GSI also classifies the principal aquifer types in Ireland as:

- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Rkd - Regionally Important Aquifer (karstified diffuse)

The GSI national aquifer map of Ireland indicates the subject site is underlain with a locally Important Aquifer (Lm) - Bedrock which is Generally Moderately Productive.

The groundwater is within the Aughnacloy WFD Groundwater Body classified as a productive fissured bedrock.

2.2.2 Groundwater Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. The GSI (2019) guidance presently classifies the bedrock aquifer vulnerability in the region of the subject site as '*Low*' which indicates a general overburden depth potential of >10m, indicating a natural protection of the aquifer by low permeability alluvial/glacial clays. The aquifer vulnerability class in the region of the site is presented as Insert 2.2 below.

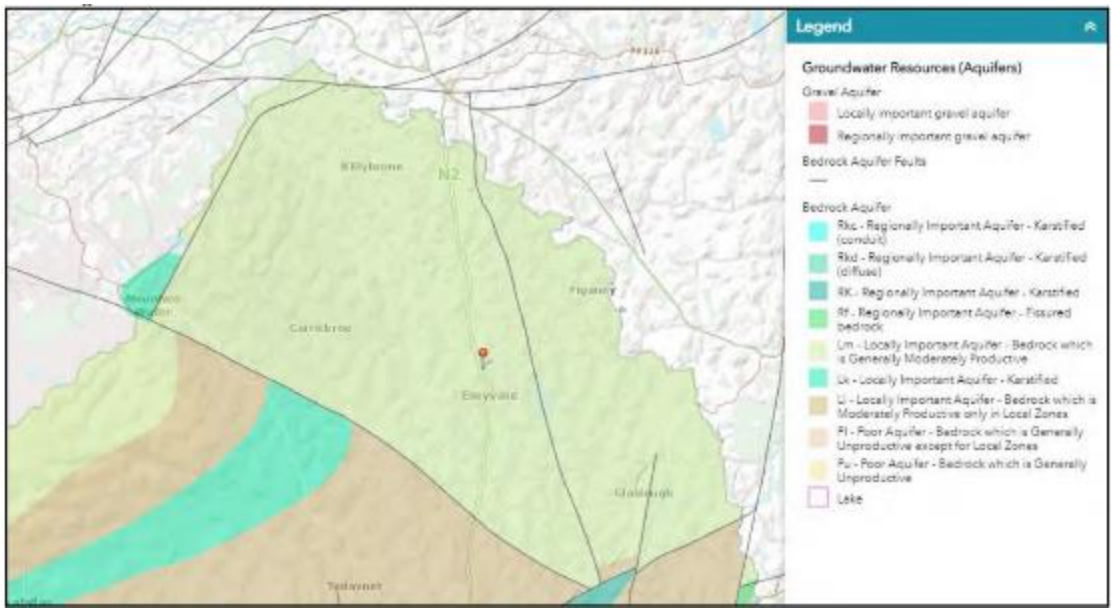


Figure 2.2 Aquifer Vulnerability (site location indicated, red dot) (Source Rowan Eng Con Report SIL0002-5)

On the basis of the ‘Low Vulnerability’ classification the potential for any leakage of oil etc to ground to migrate horizontally or vertically to the underlying bedrock is considered to be relatively low.

3.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors.

3.1 Assessment of Plausible Sources

Potential sources during both the construction and operational phases are considered. For the purposes of undertaking the potential of any hydrological/ hydrogeological S-P-R linkages, all potential sources of contamination areconsidered *without taking account of* any measures intended to avoid or reduce harmful effects of the proposed project (mitigation measures) i.e., a worst-case scenario. Construction sources (short-term) and operational sources (long-term) areconsidered below.

Construction Phase

The following sources are considered plausible for the proposed construction site:

(i) Leakage may occur from construction site equipment. There will be no bulk fuel tank storage for re-fuelling the site. Fuel is delivered to site every few days and all plant is filled directly. There is no storage of fuel in general. At most, there may be some small amounts of fuel (less than 100L) stored in bunded containers for small plant such as consaws, compressors etc. As a worst-case scenario an unmitigated leak of 300 litres is considered. This would be a single short-term event.

(ii) Use of wet cement is a requirement during construction. Run-off water from recent cemented areas can result in highly alkaline water with high pH. As this would only occur during particular phases of work this is again considered as a single short-term event rather than an ongoing event.

(iii) Construction requires soil excavation and removal. Unmitigated run-off could contain a high concentration of suspended solids during earthworks. This could be considered an intermittent short-term event, i.e., if adequate mitigation measures were not incorporated in the Construction Management Plan (CMP). Removal of soil will also result in long term improvement in local water quality due to removal of historically contaminated soil.

Operational Phase

The following sources are considered plausible post construction:

(i) The proposed development will result in the installation of a sub-surface irrigation system. This system will allow treat effluent which has been filtered via a 120-micron filter.

(ii) The effluent is tested on a daily basis to ensure compliance with the IE license limits (see Table 3.2 below)

(iii) The effluent will be applied at 3 litres per m^2 per day and Table 3.3 shows the total and usable area for each plot and the volume of effluent to be applied to each plot.

(iv) The use of soil moisture meters will be used to ensure that ponding and surface water runoff does not occur. The site has 3 options as listed below in the event that the ground becomes saturated, it is unlikely that all plots will become saturated at the same time. The zones system will allow irrigation in areas that are not saturated while other areas may be saturated

- The site has more than 25 days storage on-site at 480 m^3/day
- The site has a sewer discharge connection for 230 m^3/day to the sewer
- The site has an agreement to tanker 250 m^3/day to Monaghan Town WWTP.

(v) The areas will be inspected daily to check for any ponding as required in 6.3.3 of the licenses

"A visual inspection of the drip irrigation lands shall be carried out daily. If ponding is evident in an area, discharge of treated effluent to that specific area shall cease. A log of such inspections, including photographs, shall be maintained".

(vi) Regular analysis of surface, groundwater and soil pore water will be carried out to ensure environmental strata are not affected. Table 3.1 below shows the related sampling required to be conducted as a part of the IE License (Reg No. 422-03)

(vii) 2 Cuts of Silage will remove from the plots and no fertiliser application or livestock.

Table 3.1 Sampling requirements of the IE License

Samp le	**Number of Locations**	**Sampling Frequency**	**Test Required**
Surface Water associated with the Irrigation system	16	Daily Visual Inspection Monthly	COD, BOD, Ammonia, Orthophospahte,
Groundwater	9	Quarterly	Water level, PH, Conductivity COD, Nitrate, Total Ammonia, Total Nitrogen, Total Phosphorus, Orthophosphate, Faecal coliforms, Total coliform
Soil	1 Soil composite sample per Ha	3 years	Nitrogen, Phosphorus, Potassium, pH
Surface Water Monitoring	4	Daily Visual Inspection Annual Q Values	PH, Conductivity, COD, Suspended Solids, Ammonia, Orthophosphate

Table 3.2 IE License Reg No. 422-03, Schedule B: Emission Limits B.2 Emissions to Water/Ground

Parameter	**Emission Limit Value**
Temperature	25oC (max)
pH	6 – 9
Toxicity	5 TU
BOD	10 mg/l
COD	100 mg/l
Total Suspended Solids	15 mg/l
Total Nitrogen	15 mg/l
Ammonia	0.8 mg/l
Total Phosphorus	2 mg/l
Orthophosphate	0.5 mg/l
Oils, Fats & Grease	5 mg/l

Table 3.3 Plot Area and Irrigation volumes

Plot	**Total Area (Ha)**	**Usable Irrigation Area (Ha)**	**Volume (M3/day) of effluent (@ 3l/m2/day)**
1	1.93	1.55	52.7
2	3.32	3.15	107.1
3	1.45	1.29	43.9
4	2.71	2.48	84.3
5	0.57	0.37	12.6
6	1.96	1.79	60.9
7	1.52	1.39	47.3
8	1.16	0.57	19.4

9	1.03	0.92	31.3
Total	**15.65**	**13.51**	**459.3**

3.2 Assessment of Pathways

The following pathways have been considered within this assessment with impact assessment presented in Section 3.4:

(i) Vertical migration to the underlying limestone aquifer (Ll) is minimised due to the recorded alluvial clays (Low Vulnerability) present at the site providing protection from any localised diesel/ fuel oil spills during either construction or operational phases. The site is underlain by (generally low permeability) limestone with poor connectivity of fractures, which the Geological Survey of Ireland classifies as a *locally Important (Ll),*

(ii) There is no 'direct' hydrological or hydrogeological linkage for construction or operational run-off or any small hydrocarbon leaks from the site to the Mountain River Stream or the River Bann located farther down-gradient. However, an 'indirect pathway' does exist through the offsite storm water network which ultimately discharges to Mountain River Stream following treatment at via interceptors on-site.

(iii) There is no 'direct' pathway for foul sewage to any receiving water body (as identified above). There is however an 'indirect pathway' through the sewer which ultimately discharges to the Irish Water WWTP at Emyvale prior to final discharge to Mountain River Stream post treatment.

3.3 Assessment of Receptors

The receptors considered in this assessment include the following:

(iv) Underlying limestone bedrock aquifer.

(v) Mountain Water Stream, Blackwater River & River Bann.

3.4 Assessment of Source Pathway Receptor Linkages

Table 3.3 below summarises the plausible pollutant linkages (S-P-R) considered as part of the assessment and a review of the assessed risk is also summarised below.

The clayey overburden thickness/ and a general lack of fracture connectivity associated with limestone beneath the site will minimise the rate of off-site migration for any indirect discharges to ground at the site.

Should any silt-laden stormwater from construction manage to enter the public stormwater sewer i.e., without on-site mitigation, the suspended solids will naturally settle within the drainage pipes by the time the stormwater reaches any open water.

Standard mitigation e.g., use of a silt buster or similar to allow settlement of any silt laden stormwater during construction will be incorporated into the construction plan design to minimise any impacts on stormwater drains. In the event of a [theoretical] 300 litre [worst case scenario used] hydrocarbon leak fully discharging to the stormwater system during low flow conditions without mitigation (on site interceptoror treatment at Emyvale WWTP), there is a low potential for some impact above water quality objectives as outlined in S.I. No. 272 of 2009/ Surface Water Amendment Regs SI No. 386 of 2015 in Mountain Water Stream prior to dilution. However, with the presence of an oil/ petrol interceptor, there is no likely impact above statutory thresholds. Based on the possible loading of any hazardous material during construction and operation there is subsequently no potential for impact on the Mountain River Stream, River Blackwater and the River Bann water quality status from an accidental discharge to stormwater drain.

Domestic effluent discharge will be discharge to the Emyvale WWTP operated by Irish Water, collected in the public sewer and treated at Irish Water's WWTP at Emyvale prior to treated discharge to the Mountain Water River. This WWTP is required to operate under an EPA licence (D0346-01) and to meet environmental legislative requirements. The discharge of domestic effluent from Silver Hill Duck to Emyvale WWTP would not impact on the overall water quality within Mountain Water River or the River Bann and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive). This assessment is supported by hydrodynamic and chemical modelling within the river Bann catchment including Mountain Water River which has shown that there is significant dilution for contaminants of concern (DIN and MRP) available quite close to the outfall for the treatment plant (D0346-01 2021 AER). Recent water quality assessment of River Bann also shows that River Bann on the whole, currently has the following:

- Of the 27 river waterbodies, 14 are At Risk of not meeting their WFD objectives.
- One out of six lake waterbodies are At Risk of not meeting their WFD objectives.
- One out of 11 groundwater bodies are a At Risk. (EPA, 2019).

The assessment has also considered the effect of cumulative events, such as release of sediment-laden water combined with a hydrocarbon leak on site. As there is adequate assimilation and dilution between the site and River Bann and the nearby SACs/ pNHAs, it is concluded that no perceptible impact on water quality would occur. It can also be concluded that the cumulative or in-combination effects of effluent arising from the proposed development with that of other developments discharging to Emyvale WWTP will not be significant having regard to the size of the

calculated discharge from the proposal.

Source-Pathway-Receptor

The conventional 'source-pathway-receptor' model for environmental management is useful when applying the risk concept to groundwater protection and vulnerability:

Source:

The source is the development and activity that pose a threat to groundwater. A key consideration in assessing the source is the type of contaminant, the contaminant loading, the potential hydraulic loading associated with the contaminant release, and potential the depth of release. The potential point of release of contaminants for effluent disposal activities such as sub-surface irrigation, 0.5 m below ground. The point of release is a critical reference point for groundwater vulnerability assessment and mapping.

Receptor:

The receptor is the water (groundwater & surface water) which must be protected. Wells and groundwater dependent ecosystems are obviously potential targets, but in the Irish Groundwater Protection Scheme the groundwater in the aquifer below a site is also a target in its own right. Vulnerability assessments relate to groundwater in the uppermost bedrock or sand & gravel aquifer below a site. This is a fundamental concept which underpins all the issues outlined here. Other targets that occur down-gradient of the site (e.g., wells) are important considerations in the overall risk assessment.

Pathway:

The pathway includes everything between the source and the receptor. It is from the point of release of contaminants through geological materials and layers to the groundwater and surface water receptors. The pathway is determined by the groundwater vulnerability.

Table 3.3 Source – Pathway – Receptor pollutant linkages

Source	Pathway	Receptor	Potential effect	Management controls
Treated Effluent Discharge to sub-surface	Direct contact, ingestion and inhalation	Livestock	Toxic, hazardous to health	No livestock will be allowed on the irrigation plots (1 to 9).
	Uptake via plants and ingestion			
	Direct contact and ingestion	Humans (operator)	The effluent is not toxic, carcinogenic or hazardous to health	The effluent will be tested for chemical, biological and toxicity as required by the IE License.
	Uptake via plants and ingestion of produce	Humans (bystanders)		
	Uptake via livestock and ingestion of silage	Humans (consumers)		
	Plant uptake	Crops	Reduction in crop yield and quality due to phytotoxicity, plant die-back, detrimental conditions to plant growth and so on	The silage will be tested to check for digestibility and N, P & K analysis
	Leaching from soil to	Groundwater	Groundwater contamination –	As the application rate of 3 litres/m^2/day of is low and this will be spread out over 24 hours the risk of ponding is minimized.

<table>
<tr>
<td></td>
<td>groundwater and vertical migration through the unsaturated zone</td>
<td></td>
<td>deterioration of quality, impact on potable water resource requiring treatment or closure of source of supply (borehole, well or spring)</td>
<td>Table 3.2 is a summary of the investigation of the Trial Holes (15 of) conducted over the 9 Irrigation Plots and the data from the Geosyntec - Report (Attachment 1).

The distance the bedrock across the 9 Plots is a minimum of 1.5 meters and the depth to groundwater water varies from 0.8 to greater than 1.7 meters. The plots have all good soils for irrigation of high-quality effluent with crumb and friable soils allowing for dispersible of the effluent. There are 5 soil types across the plots as shown below:
<table>
<tr><th>Soil Types</th><th>Trail Holes</th></tr>
<tr><td>Silty clay loam</td><td>1, 2, 9, 10, 11, 15</td></tr>
<tr><td>Gravelly clay loam</td><td>3</td></tr>
<tr><td>Silty loam</td><td>4, 8, 14</td></tr>
<tr><td>Sandy silty loam</td><td>5, 6, 7, 12</td></tr>
<tr><td>Very sandy loam</td><td>13</td></tr>
</table>

The topsoil cover depth ranges from 250 mm to 600 mm and has no pathways to surface or ground water.

The well logs for AGW3 shows that the over burden is 27 metres (Section 5.2) and at Trial Holes 1 – 15, the over burden was greater than 1.5 m this will further minimise the risk to groundwater.

As show in Figure 1.4 (A to D) has buffer areas where there is a risk to surface or ground water and these are based on the Pollution Impact Potential Maps produced by the EPA as shown in Figure 2.1.</td>
</tr>
</table>

				The irrigation plots vegetation cover will be used for silage production. No livestock will be allowed on the land and no fertiliser will be applied. The use of the land for two cut of silage per year will produce 9 tonne of silage per year (Attachment 2). On an Index 3 the Phosphorus requirement is 30 Kg/Ha/Year. If we assume that 25% of the Phosphorus required for Index 3 will be removed by Silage cutting. We proposed that for the production of 9 tonne of silage per Ha (over 2 cuts) will remove at least 7.5 kgs of Phosphorus per year. In attachment 4 by Teagasc presentation "Phosphorus Loss Risk & Mitigation from Agricultural Landscapes" slide 7 shows that soils Index rating can be reduced. The existing soil mapping shows that the plot is between Index 2 and 4 over the next 3 to 5 years as part of the planned management strategy of sub-surface irrigation, no fertiliser or livestock and 2 cuts of silage the indexing of all plots will reduced.
				The Application of 3 litres/m2/day will result at the maximum volume of 10,095 l/Ha/year. At a Total Phosphorus of 0.1 mg/l (0.0001 kg/m3) will result in 1.095 kgs of Phosphorus been applied per year. The cutting of silage (2 cuts) will remove 7.5 kg of P/y/Ha, therefore a reduction of 6.405 kg of Phosphorus will take place per year per Hectare.
				The automated irrigation system will allow for controlled application of the treated effluent, and this prevent ponding via integrated soil water monitoring.

				In the event of ponding in a Plot, the effluent will be diverted to storage. The site has over 30 days storage on-site (@ 480 m^3/day) with the effluent lagoon (12,000 m^3) and final effluent storage tank (535 m^3).
				Presence of various monitoring equipment such as soil water level monitors, soil pore water wells, groundwater monitoring wells (9 off) and surface water monitoring points (16 off) will ensure that no negative impact on groundwater will occur.
				The daily inspection of the land to ensure that no leakage occurs on the system as part of the current license conditions. Logs of such inspections will be available for inspection by EPA, Monaghan CC & IFI.
				The grass within each plot will be cut short prior to installation of the drip feed system which will aid in the inspection of the system upon installation. The system will be pressurised in small sections to ensure the integrity of the system.
				A nutrient Management Plan will be complied each year as part of the IE License, and this will monitor the reduction in Phosphate as part of the no Fertiliser/Livestock and cutting silage twice per year.
				The list of raw materials on-site as submitted to the EPA does not include any chemicals potentially presenting a risk to soils and the agricultural food chain and many include PTEs, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins and furans, veterinary medicines and pesticides.

<table>
<tr><th>Source</th><th>Pathway</th><th>Receptor</th><th>Potential effect</th><th>Management controls</th></tr>
<tr><td rowspan="2">Treated Effluent Discharge to sub-surface</td><td rowspan="2">Surface run off and lateral migration within groundwater</td><td rowspan="2">Surface Water</td><td rowspan="2">Surface water contamination – deterioration of water quality, sediment loading</td><td>As the application rate of 3 litres/m2/day of is low and this will be spread out over 24 hours will minimise the risk to surface water.</td></tr>
<tr><td>Table 3.2 is a summary of the investigation of the Trial Holes (15 of) conducted over the 9 Irrigation Plots and the data from the Geosyntec - Report (Attachment 1).

The distance the bedrock across the 9 Plots is a minimum of 1.5 meters and the depth to groundwater water varies from 0.8 to greater than 1.7 meters. The plots have all good soils for irrigation of high-quality effluent with crumb and friable soils allowing for dispersible of the effluent. There are 5 soil types across the plots as shown below:
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The topsoil cover depth ranges from 250 mm to 600 mm and has no pathways to surface or ground water.

The well logs for AGW3 shows that the over burden is 27 metres (Section 5.2) and at Trial Holes 1 – 15, the over burden was greater than 1.5 m this will further minimise the risk to groundwater.

As show in Figure 1.4 (A to D) has buffer areas where there is a risk to surface or ground water and these are based on the Pollution Impact Potential Maps produced by the EPA as shown in Figure 2.1.</td></tr>
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				The irrigation plots vegetation cover will be used for silage production. No livestock will be allowed on the land and no fertiliser will be applied. The use of the land for two cut of silage per year will produce 9 tonne of silage per year (Attachment 2). On Index 3 lands the Phosphorus requirement is 30 Kg/Ha/Year. If we assume that 25% of the Phosphorus required for Index 3 will be removed by Silage cutting, we proposed that for the production of 9 tonne of silage per Ha (over 2 cuts) will remove at least 7.5 kgs of Phosphorus per year. In attachment 4 by Teagasc presentation "Phosphorus Loss Risk & Mitigation from Agricultural Landscapes" slide 7 shows that soils Index rating can be reduced. The existing soil mapping shows that the plot is between Index 2 and 4 over the next 3 to 5 years as part of the planned management strategy of sub-surface irrigation, no fertiliser or livestock and 2 cuts of silage the indexing of all plots will reduced.
				The daily inspection of the land to ensure that no leakage occurs on the system as part of the current license conditions. Logs of such inspections will be available for inspection by EPA, Monaghan CC & IFI.
				In all plots the grass will be cut short prior to installation of the drip feed system. This will aid in the inspection of the system upon installation. The system will be pressurised in small sections to ensure the integrity of the system.
				The automated irrigation system will allow for controlled application of the treated effluent, and this prevent ponding via integrated soil water monitoring.

				The Application of 3 litres/m2/day will result at the maximum volume of 10,095 l/Ha/m3 annually. At a Total Phosphorus of 0.1 mg/l (0.0001 kg/m3) in the treated effluent will result in 1.095 kgs of Phosphorus been applied per year per Hectare. The cutting of silage (2 cuts) will remove 7.5 kg of P/y/Ha, therefore a reduction of 6.405 kg of Phosphorus will take place per Hectare.
				The automated irrigation system will allow for controlled application of the treated effluent, and this prevent ponding via integrated soil water monitoring.
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				A nutrient Management Plan will be complied each year as part of the IE License, and this will monitor the reduction in Phosphate as part of the no Fertiliser/Livestock and cutting silage twice per year.
				The list of raw materials on-site as submitted to the EPA does not include any chemicals potentially presenting a risk to soils and the agricultural food chain and many include PTEs, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins and furans, veterinary medicines and pesticides.

Source	**Pathway**	**Receptor**	**Potential effect**	**Management controls**

Treated Effluent Discharge to sub-surface	Migration of effluent to adjacent sites, direct contact and uptake via soil vertebrate and invertebrate followed by transmission through the ecological food web	Ecological designation/ wildlife	Harm to protected sites and species through indirect contamination of sites adjacent to spreading area	The monitoring of Ground, Soil and Surface water will ensure that no migration of effluent takes place

Table 3.2 Summary of Trial Hole Investigations

Plot	Trail Holes	Average P_{100}	Topsoil Depth (mm)	Soil/Subsoil Texture & Classification	Soil Structure	Density / Compactness	Colour	Preferential flow paths	Depth from ground surface to groundwater (m)	Depth to Bedrock (m)	Risk to Surface Water from effluent Irrigation	Risk to Groundwater from effluent Irrigation
1	1	107	400	Silty clay loam	Crumb	Friable	Brown	Rootlets to 250 mm	1.1	> 1.5	Low	Low
	2	259	300	Silty clay loam	Crumb	Friable	Brown	Rootlets to 250 mm	1.2	> 1.5	Low	Low
	3	117	300	Gravelly clay loam	Crumb	Friable	Yellow Brown	Rootlets to 250 mm	0.85	> 1.5	Low	Low
2	12	160	400	Sandy silty loam	Crumb	Friable	Brown	Rootlets to 250 mm	1.3	> 1.5	Low	Low
	13	118	300	Very sandy loam	Crumb	Friable	Brown	Rootlets to 250 mm	> 1.5	> 1.5	Low	Low
3	10	199	350	Silty clay loam	Crumb	Friable	Light brown	Rootlets to 400 mm	1.1	> 1.5	Low	Low
	11	> 389	200	Silty clay loam	Crumb	Friable	Dark Brown	Rootlets to 250 mm	1.1	> 1.5	Low	Low
4	14	> 389	300	Silty loam	Crumb	Friable	Brown	Rootlets to 250 mm	1.4	> 1.5	Low	Low
5	15	89	400	Silty clay loam	Crumb	Friable	black	Rootlets to 250 mm	> 1.5	> 1.5	Low	Low
6	4	111	350	Silty loam	Crumb	Friable	Brown	Rootlets to 300 mm	> 1.7	> 1.7	Low	Low
	5	> 450	400	Sandy silty loam	Crumb	Friable	Brown	Rootlets to 300 mm	1.2	1.5	Low	Low

7	6	265	400	Sandy silty loam	Crumb	Friable	Brown	Rootlets to 300 mm	1.2	1.5	Low	Low
8	7	118	250	Sandy silty loam	Crumb	Friable	Brown	Rootlets to 300 mm	0.9	> 1.5	Low	Low
9	8	120	600	Silty loam	Crumb	Friable	Dark Brown	Rootlets to 300 mm	> 1.5	> 1.5	Low	Low
	9	132	400	Silty clay loam	Crumb	Friable	Brown	Rootlets to 300 mm	0.85	> 1.5	Low	Low

4.0 CONCLUSIONS

A conceptual site model (CSM) has been prepared following a desk top review of the site and surrounding environs. Based on this CSM, plausible Source-Pathway-Receptor linkages have been assessed assuming an absence of any measures intended to avoid or reduce harmful effects of the proposed project (i.e., mitigation measures) in place at the proposed development site.

There are direct links via watercourses and drainage channels on site but mitigation measures will be implemented to break these linkages It is concluded that there is also no impact from the additional discharge from the proposed development through the combined public [foul and stormwater] sewer network which could result in any change to the current water regime (water quality or quantity).

The EPA have licensed Silver Hill Duck to employ a number of irrigation plots, these will have grassland vegetation cover will be used for silage production. No livestock will be allowed on the land and no fertiliser will be applied. The use of the land for two cut of silage per year will produce an estimate 9 tonne of silage per year (Attachment 2). On Index 3 land, the Phosphorus requirement is 30 Kg/Ha/Year and we have assumed for a conservative calculation that 25% of the Phosphorus required for Index 3 will be removed by Silage cutting. We proposed that for the production of 9 tonne of silage per Ha (over 2 cuts) will remove at least 7.5 kgs of Phosphorus per year. In attachment 4 by Teagasc presentation "Phosphorus Loss Risk & Mitigation from Agricultural Landscapes" slide 7 shows that soils Index rating can be reduced by no application of fertiliser or no livestock.

Finally, and in line with good practice, appropriate and effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the proposed development. These specific measures will provide further protection to the receiving soil and water environments. However, the protection of downstream European sites is in no way reliant on these measures.

5.0 REFERENCES

EPA, (2019). Environmental Protection Agency. Available on-line at: https://gis.epa.ie/EPAMaps/ [Accessed: 15-10-2022].

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GSI, (2019). Geological Survey of Ireland; Available on-line at: http://www.gsi.ie [Accessed: 15-10-2022].

NPWS, (2019). National Parks & Wildlife Service. Available on-line at: http://webgis.npws.ie/npwsviewer/ [Accessed: 15-10-2022].

Geo Engineering Services Report prepared by CS Consulting Group (August 2019)
Rowan Engineering Consultants - SIL0002-5 Hydrogeological Assessment Report, 2022

Attachments

Attachment 1 Geosyntec Report Hydrogeological Assessment of Proposed Drip Irrigation System, August 2017.

Attachment 2 Making Silage, Padraig O'Kiely, Teagasc

Attachment 3 Fertiliser Advice for Grass Establishment, Mark Plunkett, Johnstown Castle, Research Center, April 2020

Attachment 4 Phosphorus Loss Risk & Mitigation from Agricultural Landscapes. David P. Wall, Teagasc, Johnstown Castle, Co Wexford

Appendix 7.1: Flood Risk Assessment

Rowan

Site Specific Flood Risk Assessment

Silver Hill Foods

Client Ref: SIL0002-1

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Report Sign Off

REVISION	DATE	ORIGNATOR	REVIEWER
Draft	20 August 2020	ID	N/A
Final	18 December 2020	ID	CF
REV 02	18 August 2022	JM	EG
REV 03	08 November	JM	EG

1. Introduction

Rowan Engineering Consultants Ltd (Rowan) were requested by Silver Hill Foods to undertake a Site-Specific Flood Risk Assessment (SSFRA) for a site development project at their operations in Emyvale, Co. Monaghan.

The purpose of this SSFRA is to assess the potential flood risk to the proposed development site and to assess the potential impact that the development may have on the hydrological regime of the area.

Quoted ground levels or estimated flood levels relate to Ordnance Datum unless stated otherwise.

This flood risk assessment study has been undertaken in consideration of the following guidance document:

'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009.

Please refer to Appendix 1 for the proposed site layout.

Rowan undertook a survey of the site area and surrounding catchment on 13rd August 2020.

2. Understanding Flood Risk

Flood risk is the damage that may be expected to occur at a given location arising from flooding. It is a combination of the likelihood or probability of flood occurrence, the degree of flooding and the impacts or damage that the flooding would cause. It is typically expressed in terms of the quantity of damage expected to occur over a certain time period.

2.1 Probability of Flooding

The likelihood or probability of a flood event is classified by its Annual Exceedance Probability (AEP) or return period in years. For example, a 1% AEP flood event has a 1 in a 100 chance of occurring in any given years. Table 1 below shows the conversion between return periods and annual exceedance probabilities

Return Period (Years)	Annual Exceedance Probability (%) (AEP)
2	50
10	10
50	2
100	1
200	0.5
1000	0.1

Table 1: Conversion between return periods and annual exceedance probabilities

2.2 Consequences of Flooding

The consequences of flooding depends on the hazards caused by the flooding, (the depth of the water, speed of flow, rate on onset, duration, wave-action effects and water quality) and the vulnerability of the receptors (type of development, nature e.g. age-structure, of the population, presence and reliability of mitigation measures).

The Planning System and Flood Risk Management provides three vulnerability categories, based on the type of development, which are summarised as:

- **High Vulnerability:** This includes residential properties, essential infrastructure and emergency services facilities.
- **Less Vulnerable:** This includes retail and commercial and local transport infrastructure.
- **Water Compatible:** This includes open space, outdoor recreation and associated infrastructure such as changing rooms.

3. Subject Site Description

3.1 General

The proposed development is located within a rural area on the outskirts of Emyvale, within the townland of Corlattallan Co. Monaghan. The site is bounded in all directions by agricultural land, with the N2 roadway running along the south-western boundary.

The main site area is approximately c. 40 Ha and the location is illustrated in Figures 1 & 2 below.

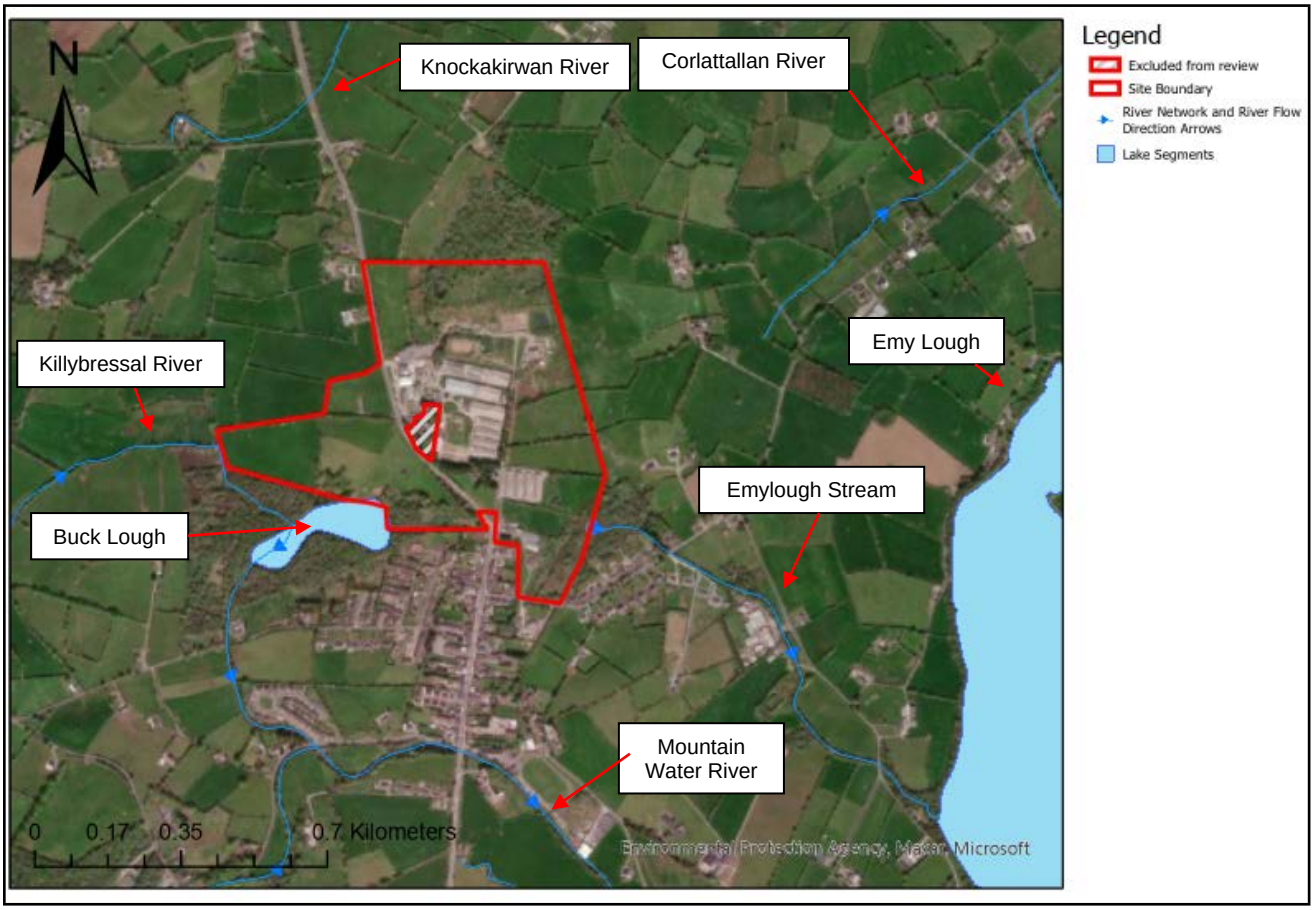


Figure 1: Site location and water course

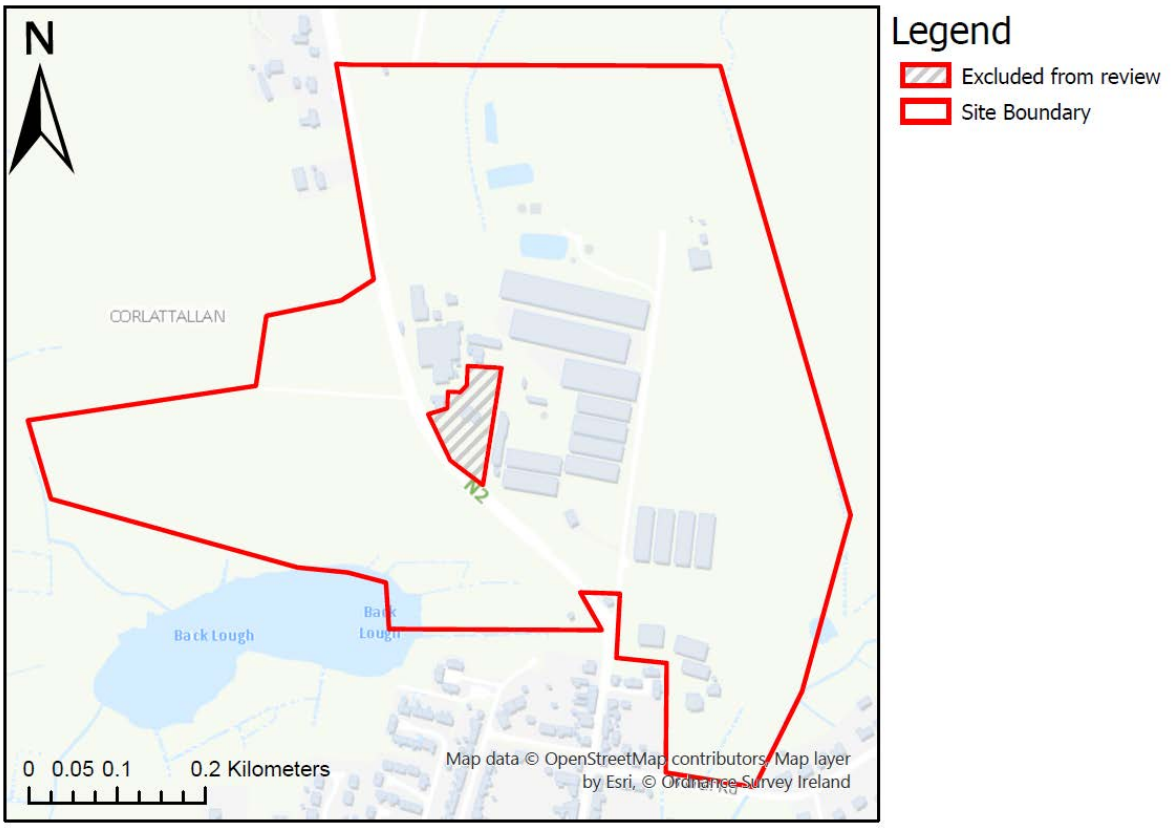


Figure 2 Site layout

3.3 Local Hydrology, Land Use & Existing Drainage

On the day of site survey, the proposed development site appeared to be well drained and free from any standing water. The majority of the proposed development site has existing buildings in place.

The most immediate hydrological features in the general vicinity of the subject site are Buck Lough c.170m southwest, Emylough Stream c.270m southeast and the Killybressal River c.350m southwest. Other water features in the vicinity are the Corlattallan River c.480m east, Knockakirwan River 570m northwest, Mountain Water River c.670m south and Emy Lough 1km east.

Secondary hydrological features in the vicinity of the site include a series of agricultural drainage channels and ditches along the external hedgerow and treeline boundaries in the surrounding fields.

Figures 3-5 below, illustrates the existing site and the Buck Lough and Emy Lough.

Figure 3: Image of existing site

Figure 4: Image of Buck Lock – southwest of the subject site

Figure 5: Image of the Buck Lough in the foreground and Emy Lough in the background

3.2 Existing Topography Levels at Site

The existing site appears raised relative to the most parts of the surrounding landscape, with elevations noted at approximately between 54m above OD (along the north-eastern boundary) and 81m above OD (along the western boundary).

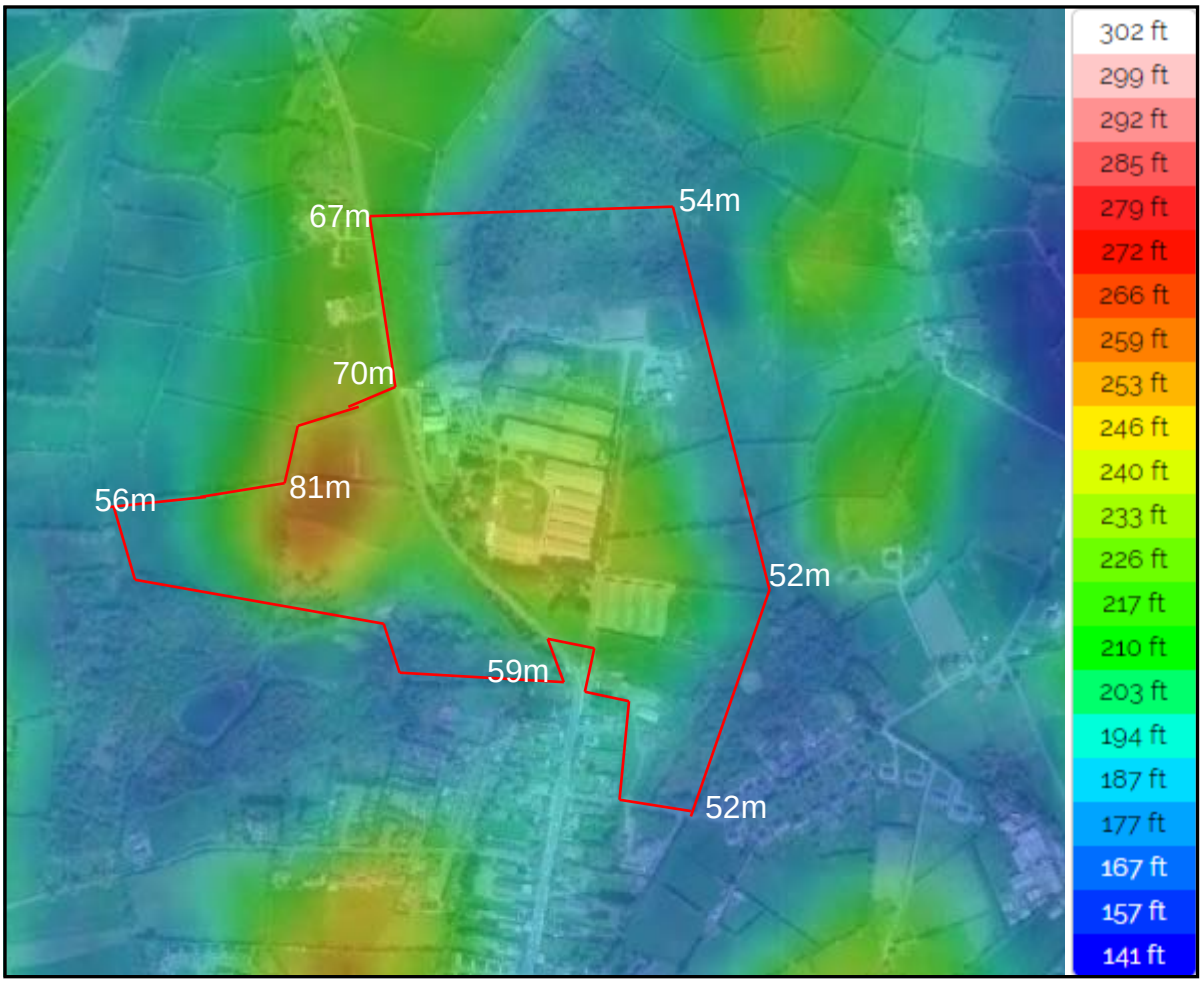


Figure 7: Topographic map (https://en-ie.topographic-map.com)

4. Initial Flood Risk Assessment

The flood risk assessment for the site is undertaken in three principle stages; Screening, Scoping and Assessing. Before these steps can commence, the possible flooding mechanisms are firstly reviewed.

4.1 Possible Flooding Mechanisms

Table 2 below, summarises the possible flooding mechanisms in consideration of the subject site:

Source/Pathway	Significant?	Comment/Reason
Tidal/Coastal	No	The site is not at a coastal location.
Fluvial	Possible	The Emy Lough stream flows approximately 280m beyond the south-eastern boundary and appeared free flowing on the day of the inspection. Buck Lough is c.170m beyond the south-western boundary of the site, however the elevation is c.15m lower than the subject site. There are also a number of drainage channels and ditches in the vicinity of the site.
Pluvial (Urban Drainage)	No	There is no significant urban drainage infrastructure in the vicinity of the site.
Pluvial (Overland Flow)	Possible	The majority of the site is elevated relative to the surrounding area with the exception of the land to the west, which rises to a peak of c.80m above OD. Overland flow may be possible in extreme events.
Surcharge/Blockage	Possible	There is a land drain along the north-eastern boundary of the site where the onsite surface water is directed to.
Groundwater	Possible	It is noted that there are c.3 No. wells/springs with the vicinity of the subject site (GSI ID 2633NWW217, 2633NWW155 & 2633NWW154).

Table 2: Possible Flooding Mechanisms in Consideration of the Subject Site

The primary potential flood risk to the site can be attributed to a pluvial flood event from the adjacent lands to the west.

Secondary flood risk can be attributed to the occurrence of potential pluvial flooding within the lower lying areas of the site, i.e. along the north-eastern boundary.

In accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities - DOEHLG 2009' these potential flood risks are analysed in the subsequent 'Screening Assessment' and 'Assessment of Flood Risk' section of this report.

5. Screening Assessment

The purpose of the screening assessment is to establish the level of flood risk that may or may not exist for the site and to collate and assess existing current and/or historical information and data which may indicate the level or extent of any flood risk.

If there is a potential flood risk issue, then the flood risk assessment procedure should move to 'Step 2 – Scoping Assessment' or if no potential flood risk is identified from the screening stage then the overall flood risk assessment can end at 'Step 1'.

The following information and data was collated as part of the flood risk screening assessment for this particular site.

5.1 OPW/EPA/Local Authority Hydrometric Data

Existing sources of OPW, EPA and local authority hydrometric data were investigated. As illustrated in Figure 8 below, this assessment has determined that there are several hydrometric gauging stations in the general vicinity of the proposed development site, with active gauging stations located on the Mountain Water River.

Figure 8: Hydrometric Gauging Stations

Gauging Stations 03057 (Emyvale Weir) and 03100 (Derrynashallog) are located on the Mountain Water River and are registered as active staff gauges and record either water level and/or flow data.

Gauging Stations 03052 (Emyvale (Tully) and 03059 (Drumully Bridge) are also located on the Mountain Water River but are registered as an inactive staff gauge.

Gauging Station 03056 (Killycooly) is located on the river as water flows out of Emy Lough.

Each of the above mentioned gauging stations are either registered as inactive or are located at considerable lower elevations than the proposed site and are therefore considered to be unsuitable for the purposes of estimating potential extreme flood levels in the vicinity of the proposed development site.

5.2 OPW CFRAM Flood Mapping

The Eastern CFRAM study commenced in June 2011 and ran until the end of 2016. The study involved detailed hydraulic modelling of rivers, their tributaries and tidal flooding to develop and implement flood risk management plans, where required. The OPW released the final Plans on the OPW's Flood Maps (www.floodinfo.ie) website.

Figure 9 below, illustrates an extract from the CFRAM flood map in the vicinity of the site and shows that there is no risk of Fluvial, Pluvial or Coastal flooding identified within the subject site boundary, there appears to be no flood risk identified across the subject site.

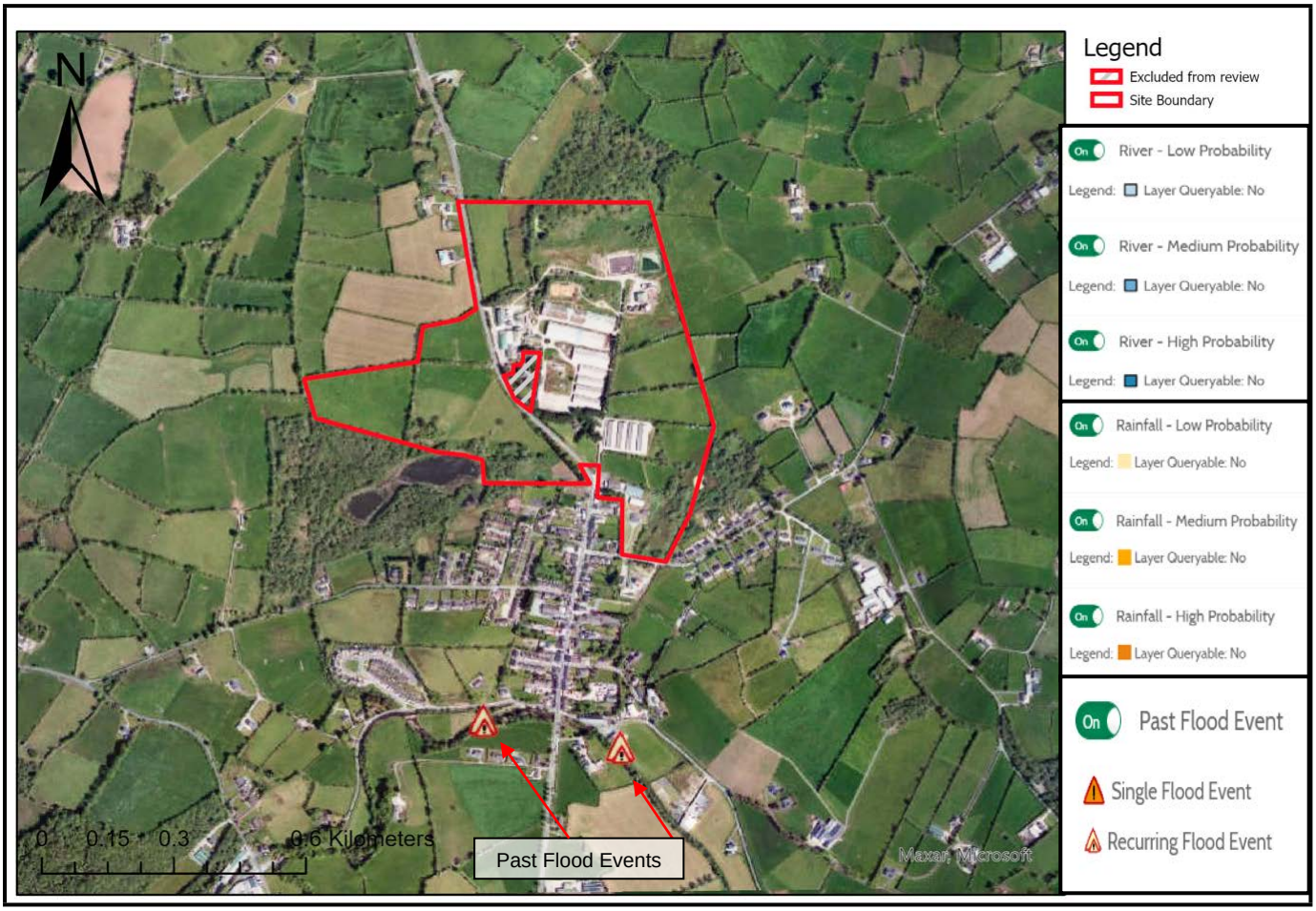


Figure 9: CFRAM Mapping

There are 2No. recurring flood events recorded within 1km of the subject site, the nearest historical flood events are summarised in the Table 3 below:

Name	Details	Distance from site
Mountain Emyvale	**Recurring**	c.670m southwest
Mountain Emyvale	**Recurring**	c.815m southeast

Table 3. Summary of the nearest historical flood events.

5.3 OPW PFRA Flood Mapping

Pluvial flooding is usually associated with high intensity rainfall and inadequate stormwater drainage systems. Pluvial flooding events are generally short-term and dissipate within hours of a rainfall event. Pluvial flooding was reviewed by the OPW during a National Preliminary Flood Risk Assessment (PFRA) study published in 2011.

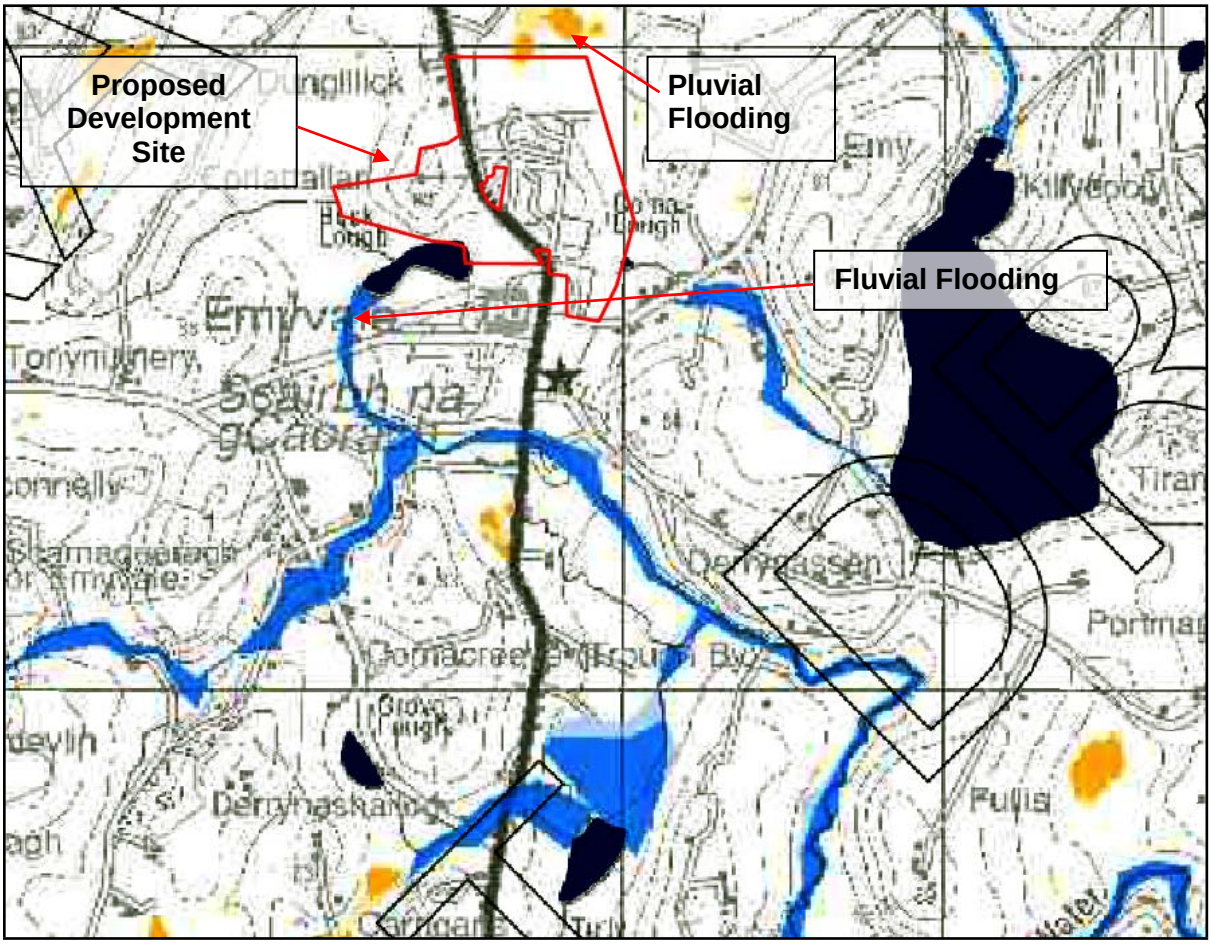


Figure 10: PFRA Mapping

The OPW PFRA Flood Mapping shows that the existing site and proposed development is not within an area at risk of pluvial flooding. Also, after completing the site walkover, there appears to be minimal to low risk of pluvial flooding as the site is raised relative to the immediate surrounding lands.

5.4 OPW Flood Maps Website

The OPW Flood Maps Website (www.floodmaps.ie) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences in the vicinity of the subject development site. Figure 11 below, illustrates mapping from the Flood Maps website in the vicinity of the site.

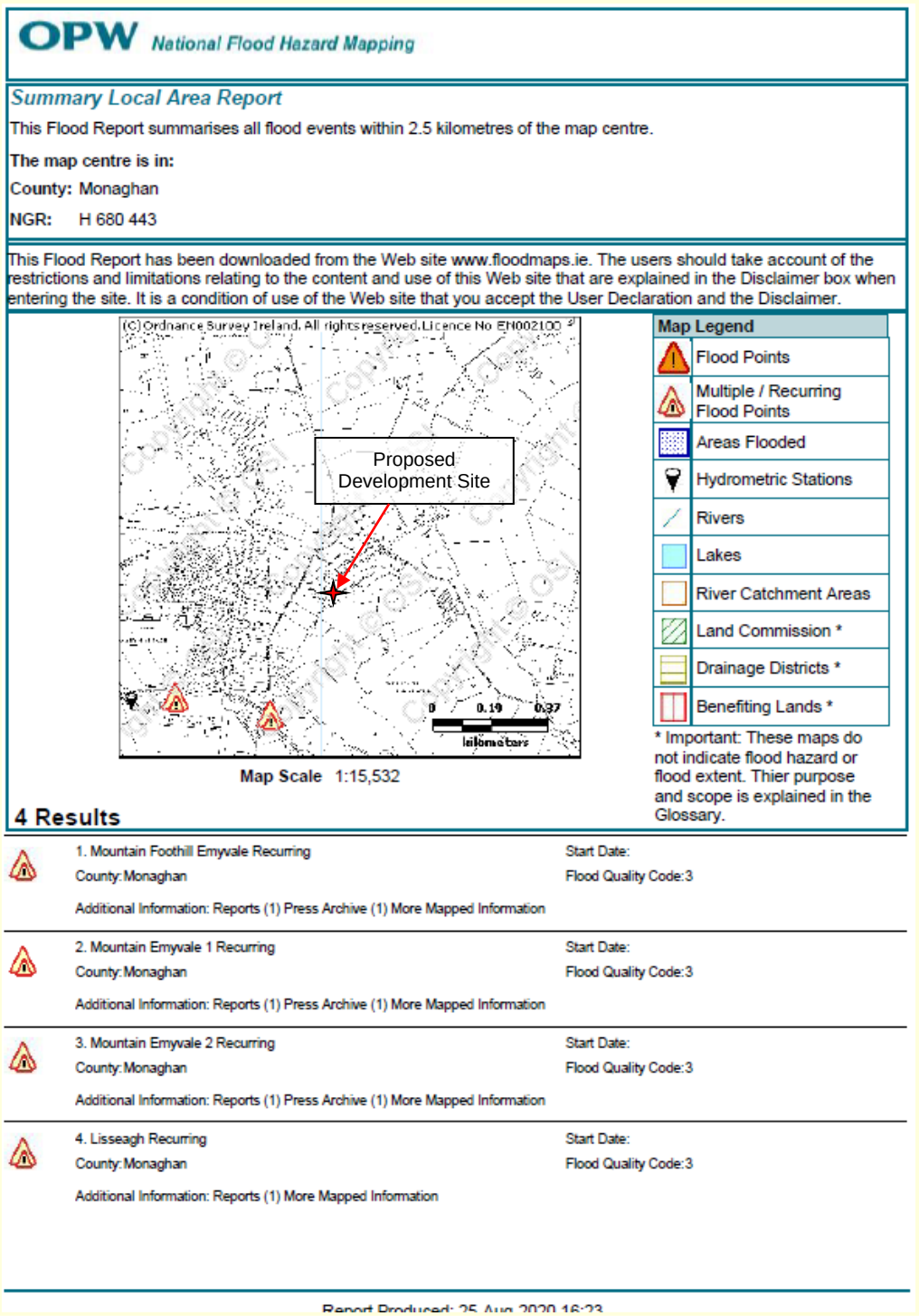


Figure 11: OPW Flood Maps

Figure 11 above, indicates that there are 2No. recurring flood events recorded within 1km of the subject site.

5.4 Ordnance Survey Historic Mapping

Available historic mapping for the area were consulted, as this can provide evidence of historical flooding incidences or occurrences. The maps that were consulted were the OSI 6-inch historical map (1836), and the OSI 6-inch Cassini map (c.1937-1950), the OSI 25-inch black and white map was unavailable for the subject site.

Figures 12-14 below, illustrates the historic mapping for the area of the subject site.

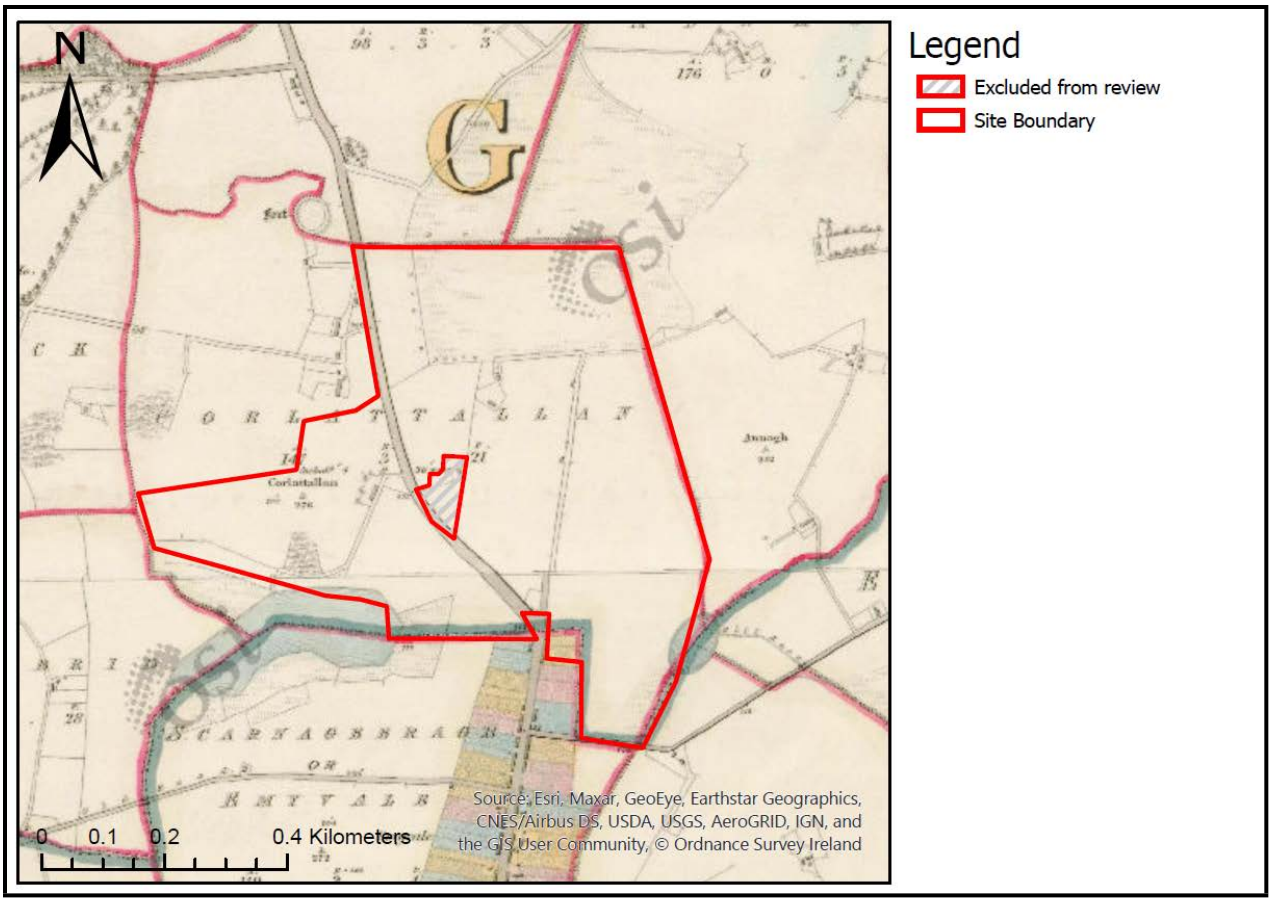


Figure 12: OSI Historic 6 Inch (surveyed in 1837-1845) (OSI Licence 0073512)
****Please note that the boundary demarcated is an approximate.***

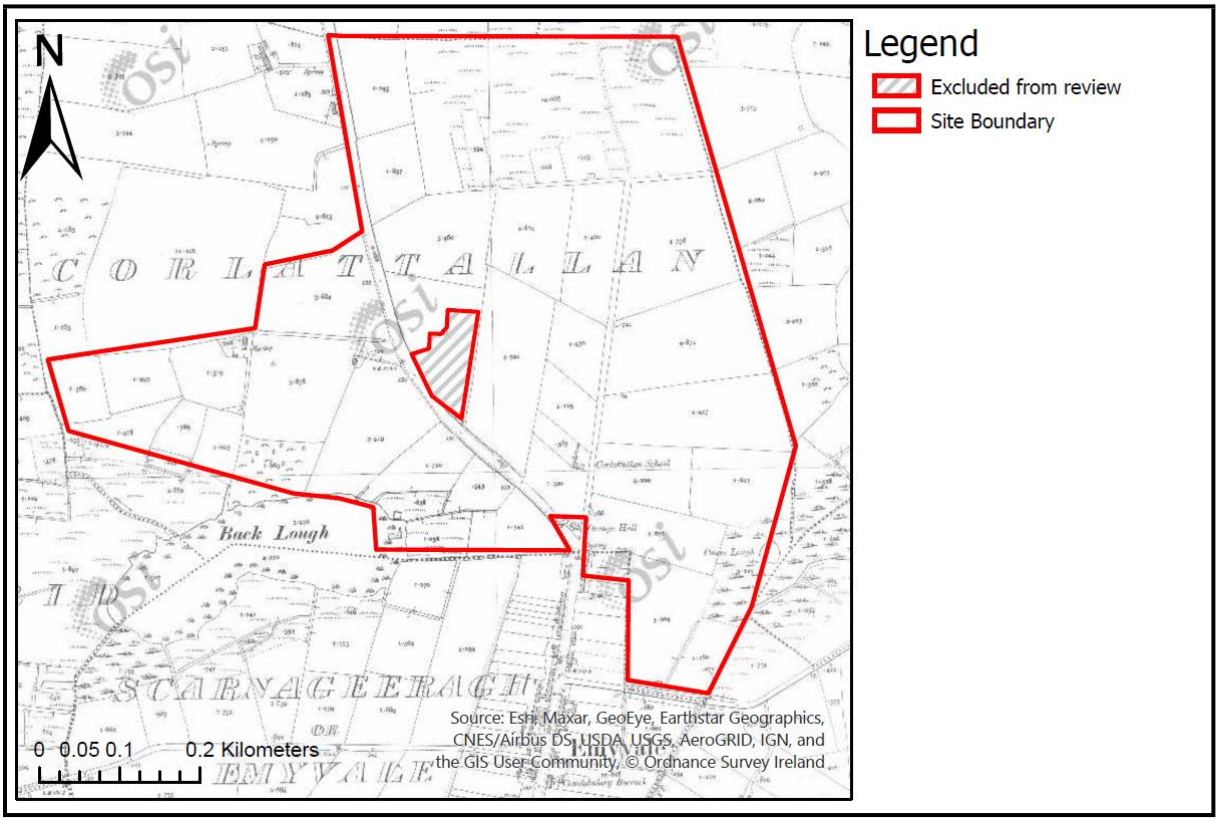


Figure 13: OSI Historic 25 Inch (surveyed in 1904-1910) (OSI Licence 0073512)
****Please note that the boundary demarcated is an approximate.***

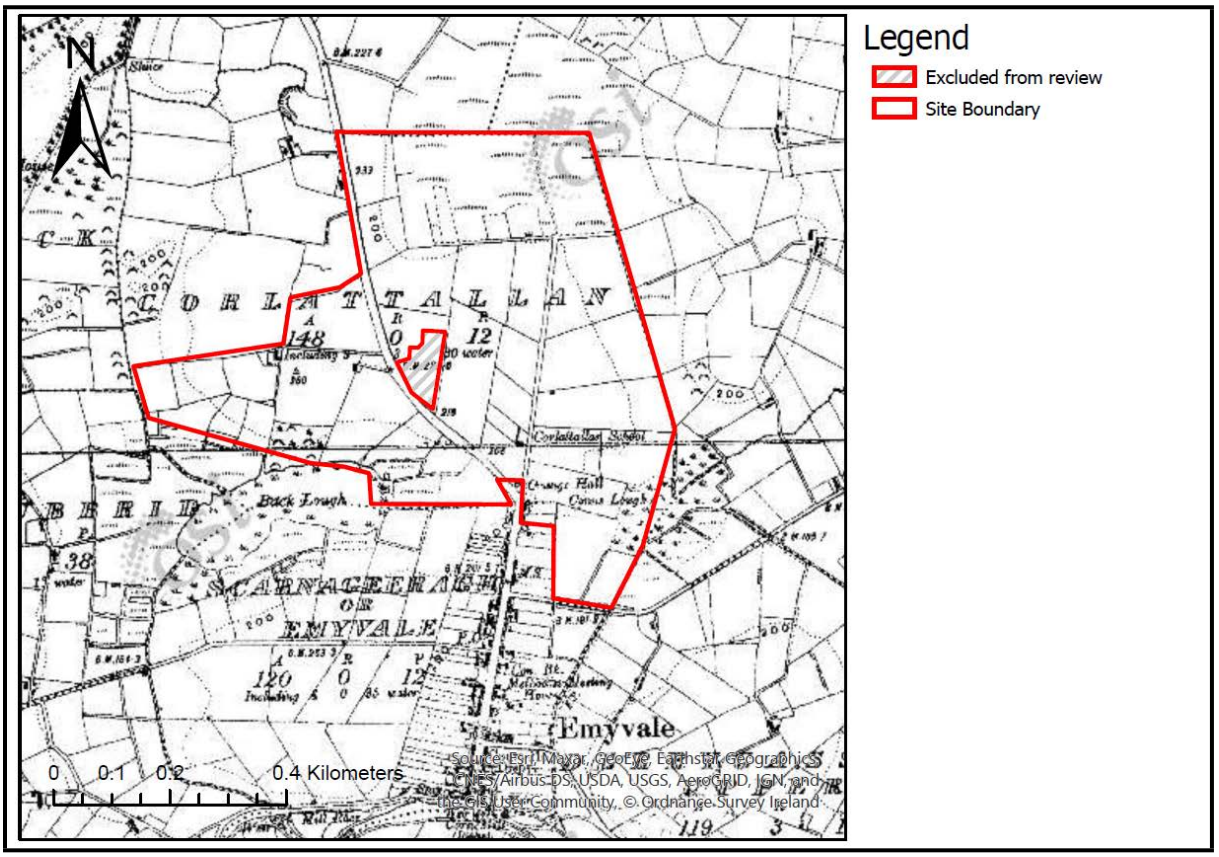


Figure 14: Cassini Historic 6 Inch (Surveyed in 1937-50) (OSI Licence 0073512)
****Please note that the boundary demarcated is an approximate.***

The historic 6-inch, 25-inch and Cassini OSI mapping do not indicate any historical or anecdotal instances of flooding within the boundary areas of the site.

5.5 Geological Survey of Ireland Mapping

The alluvium deposit maps of the Geological Survey of Ireland (GSI) were consulted to assess the extent of alluvium deposits in the vicinity of the subject site. Alluvium deposits can be an indicator of areas that have flooded in the recent geological past. Figure 15 below, illustrates the GSI River Basin District sub-soils mapping for the general area of the site.

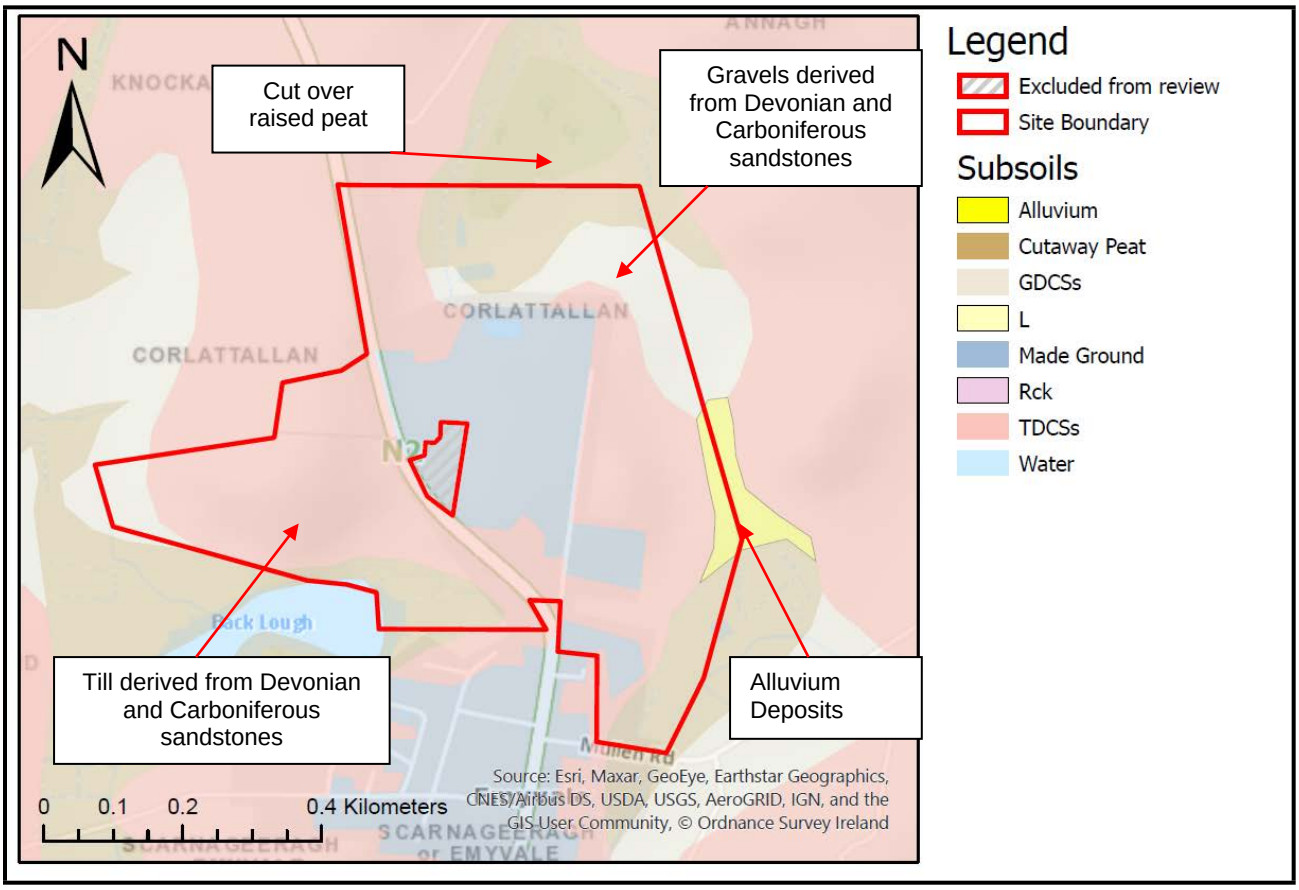


Figure 15: GSI Subsoil Mapping

Figure 15 above, indicates that the site is underlain by Gravels and Till derived from Limestones (GDCSs). No alluvium deposits are mapped within the site boundary, which suggests there is no history of flooding in the recent geological past, however Alluvium deposits were observed c.85m southeast of the site.

6. Scoping Assessment

The purpose of the scoping stage is to identify possible flood risks and to implement the necessary level of detail and assessment to assess these possible risks, and to ensure these can be adequately addressed in the flood risk assessment. The scoping exercise should also identify that sufficient quantitative information is already available to complete a flood risk assessment appropriate to the scale and nature of the development.

In consideration of the information collated as part of the screening exercise, and the availability of other information and data specific to the area of the subject site, it is considered that sufficient quantitative information to complete an appropriate flood risk assessment for the subject site can be derived from the information collated as part of the screening exercise alone.

In particular, the screening exercise indicates that sufficient quantitative data and information in relation to extreme fluvial flood events can be acquired from the OPW CFRAMS and PFRA flood maps and data for the area, together with other information and data acquired as part of the screening exercise.

The particular flood risk to the subject site is assessed in the subsequent ‘Assessing Flood Risk’ stage of this study.

7. Assessing Flood Risk

The information and data acquired and collated as part of this screening exercise indicates that the site would not be at risk of direct flood inundation in a 1 in 1000 (0.1% probability flood event) fluvial flood event in the nearby water courses.

The Eastern CFRAM study commenced in June 2011 and ran until the end of 2016. The study involved detailed hydraulic modelling of rivers, their tributaries and tidal flooding to develop and implement flood risk management plans, where required. The OPW released the final Plans on the OPW's Flood Maps (www.floodinfo.ie) website. After consulting the CFRAM maps, there is no evidence of Fluvial, Pluvial or Tidal flood risk within the immediate vicinity of the subject site.

The OPW Flood Maps have recorded 2No. recurring flood events c.670m southwest and 815m southeast of the subject site, however the subject site is quite elevated from these flood locations and this combined with the CFRAM flood mapping documented in figure 9 would suggest that the subject site is unlikely to flood.

During the site inspection undertaken by Rowan Engineering Consultants Ltd, areas of lower lying lands, drainage channels and ditches were observed. As the subject site is slightly elevated from its immediate surroundings, it is considered unlikely that the site would be a flood discharge location if a flooding event occurred within these lands or within the immediate surroundings.

The proposed construction and redevelopment at this site in Emyvale, Co. Monaghan is not expected to significantly increase the rate of discharge from the current development run-off rate.

Based on the assessment and findings of this Site-Specific Flood Risk Assessment, the flood risk to the subject site is **LOW.**

8. Subject Site in the Context of the Guidelines

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in consideration of flood risk to a particular development site.

Flood Zone 'A' – where the probability of flooding from rivers and watercourses is the highest (greater than 1% or 1 in 100 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'B' – where the probability of flooding from rivers and watercourses is moderate (between 0.1% or 1 in 1000 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'C' – where the probability of flooding from rivers and watercourses is low or negligible (less than 0.1% of 1 in 1000 year for both river and watercourse and coastal flooding). Flood Zone 'C' covers all areas that are not in Zones 'A' or 'B'.

The 'Planning System and Flood Risk Management Guidelines' list the planning implications for each flood zone, as summarised below:

Zone A – High Probability of Flooding. Most types of development would not be considered in this zone. Development in this zone should be only be considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the 'Planning System and Flood Risk Management Guidelines' justification test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space and outdoor sports and reaction would be considered appropriate in this zone.

Zone B – Moderate Probability of Flooding. Highly vulnerable development such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses, strategic transport and utilities infrastructure would generally be considered inappropriate in this zone, unless the requirements of the justification test can be met. Less vulnerable development such as retail, commercial and industrial uses and recreational facilities might be considered appropriate in this zone.

In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone 'C' and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to the development can be adequately managed and that development in this zone will not adversely affect adjacent lands and properties.

Zone C – Low to Negligible Probability of Flooding. Development in this zone is appropriate from a flood risk perspective. Developments in this zone are generally not considered at risk of fluvial flooding and would not adversely affect adjacent lands and properties from a flood risk perspective. Based on the assessment, analysis and findings of this Site Specific Flood Risk Assessment, and in the context of 'The Planning System & Flood Risk Management Guidelines – 2009' the subject site falls within Flood Zone 'C'. Development of the site is

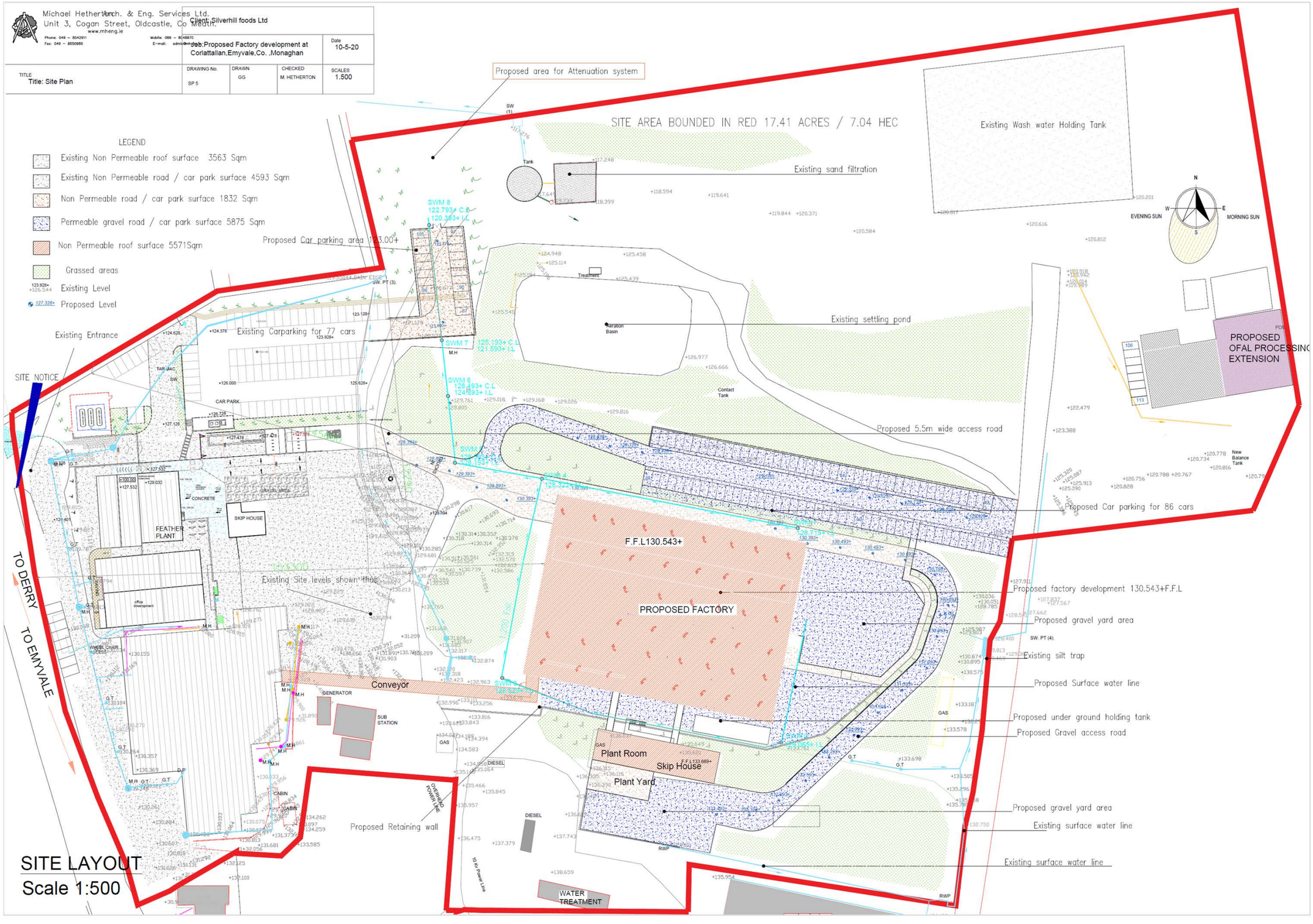
therefore considered appropriate from a flood risk perspective, and not subject to the requirements of The Justification Test.

9. Summary Conclusions

The proposed development at Silver Hill Foods at Emyvale, Co. Monaghan. In consideration of the findings of this site-specific flood risk assessment and analysis the following conclusions are made in respect of the existing development: -

- *A Site-Specific Flood Risk (SSFRA) assessment appropriate to the type and scale of development and in accordance with 'The Planning System and Flood Risk Management Guidelines – DoEHLG - 2009' has been undertaken.*
- *The area of the proposed development has been screened, scoped and assessed for flood risk in accordance with the above guidelines.*
- *The current OPW CFRAM flood maps (www.floodinfo.ie) for the area do not indicate any flood zones as mapped within or adjacent to the boundary of the site.*
- *The OPW PFRA flood mapping does not indicate any flood zones as mapped within or adjacent to the boundary of the site.*
- *In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009', the site falls within Flood Zone 'C', and is therefore appropriate from a flood risk perspective.*
- *Overall the flood risk to the site is **LOW.***

Appendix A: Site Plan & Layout



Appendix 7.2: MEHS (2022) Biological Sampling Report

Silverhill Foods
Blackwater Tributaries
Biological Q-Sampling Report

Prepared for Silverhill Foods July 2022

JOB NUMBER: SHF 22-69			
Version	**Originated**	**Checked**	**Date**
Draft For Comment	**Trevor Montgomery**	**Guy Meredith**	**29th July 2022**
Final	**Trevor Montgomery**	**Guy Meredith**	**30th July 2022**

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1.0 Water Quality Assessment

1.1 Introduction

Montgomery EHS (MEHS) were contracted by Silverhill Foods to conduct a biological Q sampling report on the discharge stream for the Final Effluent and two downstream sites of the tributary of the Blackwater River. These surveys were commissioned as part of the ecological works prepared to establish baseline biological water quality. The site has a IED license (P0422-03) and discharges from the Wastewater Treatment Plant to the W1 (SW1) which is called Corlattalan Stream and drains to the Ulster Blackwater.

Baseline water quality was collected specifically from the main channel of the Corlattalan Stream and on the following selected sites.

The biological water quality collected would provide baseline readings against which future water quality targets could be gauged. These values should not deteriorate as a result of works associated with the project. According to the Water Framework Directive (2000/60/EEC) target 'good status' i.e. Q4 is required in all Irish Rivers.

The biological water quality data was collected by Trevor Montgomery of MEHS during base flow water conditions between the 29th July 2022.

1.1 Background

The River Blackwater or Ulster Blackwater is a river mainly in County Armagh and County Tyrone, Northern Ireland. It also forms part of the border between the United Kingdom and the Republic of Ireland, flowing between Counties Tyrone and Monaghan, intersecting into County Monaghan briefly. Its source is to the north of Fivemiletown, County Tyrone. The river divides County Armagh from County Tyrone and also divides County Tyrone from County Monaghan.

The river enters Lough Neagh west of Derrywarragh Island and is navigable from Maghery to Blackwatertown. The small Maghery Canal enters the Blackwater south of Derrywarragh Island. Nearby, a small jetty area with a slipway is the site of the former Maghery ferry. Approximately 4 km from Maghery ferry is the entrance to the river 200m beyond Bond's Bridge. Just past it, on the east bank, is a large country house estate called The Argory, donated to the National Trust by the MacGeough-Bond family. The Callan River joins the Blackwater 1.6 km upstream. Further on, at a bend on the east bank, is the entrance to the first lock of the Ulster Canal. Just upstream, Charlemont Bridge joins the village of Charlemont on the east bank and The Moy on the west.[1]

The Blackwater's length is 91.3 km (56.75 mi). If the Blackwater's flow is measured through its path through the 30 km (19 mi) Lough Neagh and onwards to the sea via the 64.4 km (40ml) Lower Bann, the total length is 186.3 km (115.75 mi). This makes the Blackwater–Neagh–Bann the longest natural stream flow in Ulster and is longer than the Munster Blackwater.

The site is located in catachment Number 5 in the River Blackwater (Catchment No. GBNI1NB030308201)

1.2 Statement of Authority

Trevor Montgomery, BSc is an environmental consultant who specialises in freshwater and fisheries ecology, in addition to informing engineering solutions for construction works on rivers, including site improvement and rehabilitation. He has twenty years professional experience and has surveyed over 100 different Irish rivers and lakes. Trevor's expertise includes aquatic invertebrate and macrophyte studies in addition to fisheries quantification in a variety of surface water habitats. He routinely undertakes physiochemical water quality monitoring and biological quantification of receiving waters based on macro-invertebrate species composition using a number of biotic indices systems, including but not limited to PSYM, and Q-Analysis. Trevor has worked on multi-million euro infrastructural projects, undertaken IPC / IED licensing reports, acted as an consultant on construction works and conducted numerous fisheries and ecological studies in support of a wide range of developments. He has also worked on ecological design for habitat creation projects, construction environmental management plans, method statements and site rehabilitation.

1.3 Methodology

Macro-invertebrate samples were collected on the Corlattalan Stream which is a tributary of the River Blackwater on the 29th July 2022 (see Figure 1.1 below). Where possible the macro-invertebrate sampling stations were situated in the vicinity good access, given the selection of the sampling sites also depended on the presence of riffle/ glide habitat from which samples could be collected.

Macro invertebrate samples were collected by 'kick' sampling for approximately 2.5 minutes in the faster flowing areas (riffles) of the river using a standard hand net (250 mm width, mesh size 500 micron). The kick sample was taken moving across the riffle zone and also involved washing large rocks from the riffle zone to ensure a full representation of the species composition from this micro-habitat type. Collected samples were elutriated, refrigerated and identified live within 24 hours of each site visit. The samples were identified using a Nikon SMZ 1000 stereo microscope and numerous Freshwater Biological Association invertebrate keys. Live sorting of invertebrates facilitates improved detection of small cryptic prey items. Identified samples were then fixed in 70% ethanol in the laboratory. Invertebrate taxa were identified to species level where possible. The relative proportions of taxonomic groups were recorded based on the EPA categories (i.e. 8 categories ranging from present to excessive) (Appendix I of Toner et al., 2005).

Table 1.1 Location of macro-invertebrate sampling locations on the Corlattalan Stream

Site No.	River Name	Location	GPS Co-ordinates
Site 1	Corlattalan Stream	Silverhill Foods	H 67562 44827
Site 2	Corlattalan Stream	Access via road	H 67718 45292
Site 3	Corlattalan Stream	At Bridge	H 68294 46195

Plate 1 – Nikon SMZ1000 microscope with LED lighting used in the identification of samples

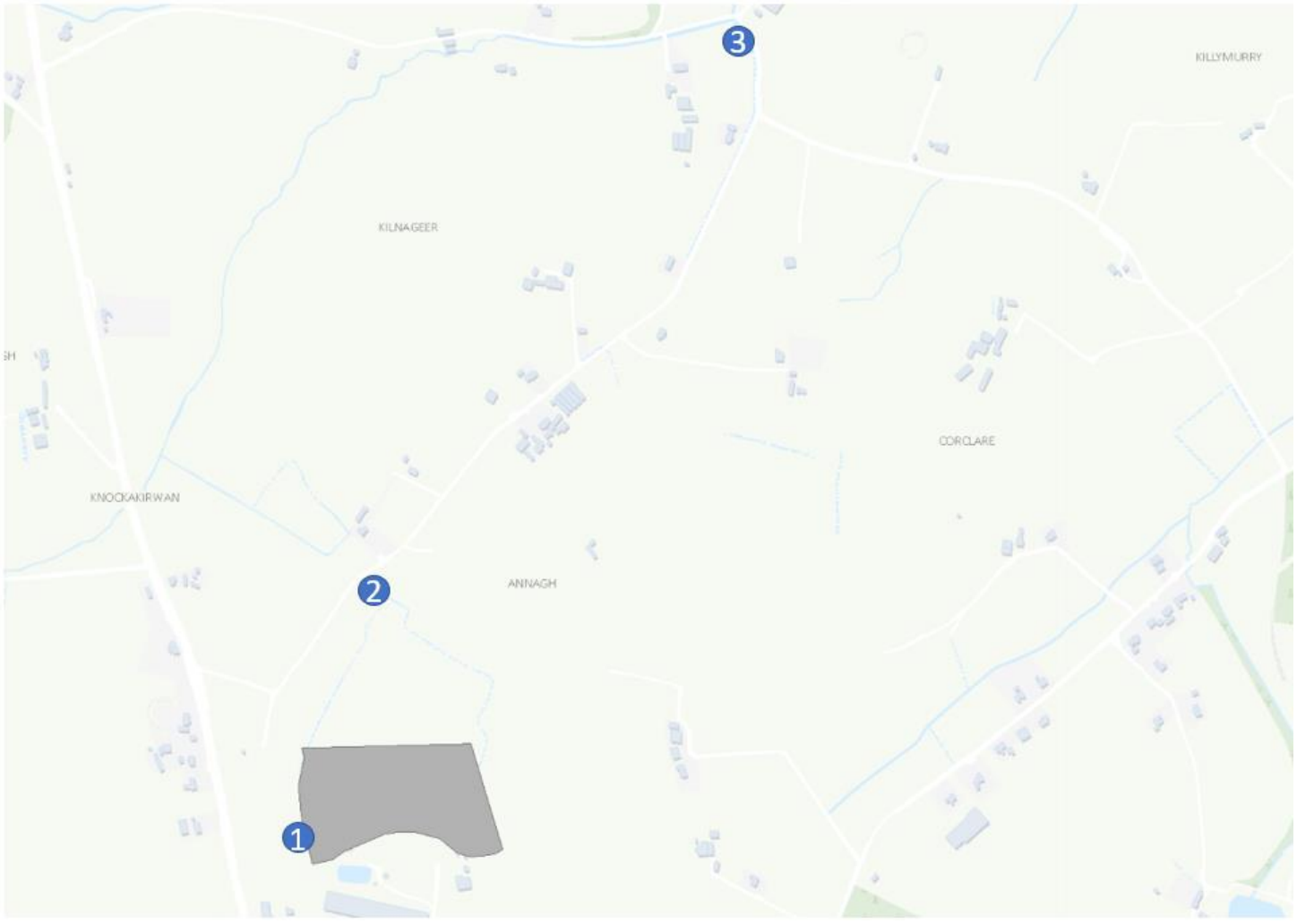

Figure 1.1 - Location of Water Quality Sampling Sites

2.0 Results

2.1 Existing Water Quality Records

There are no EPA, the biological water quality on the Corlattalan Stream. Biological water quality data for the other tributaries of the Blackwater is the Mountain stream and the water quality of six sites on the Corlattalan stream was assessed as ranging from Q3-5. However, under the South West River Basin District Management Plan, the water quality of the Mountain stream is designated as poor and it is an objective to restore this water body to good status. No other biological water quality data is available for the selected tributaries in the survey.

2.2 2022 Water Quality Data (this report)

Biological water quality data as prescribed by the Environmental Protection Agency (EPA; Toner et al. 2005), group invertebrates into classes whereby very pollution intolerant species are denoted class A, and species with greater pollution tolerance fall into successive classes (B through E respectively). As such the presence or absence of these groups and their relative abundances facilitates an assessment of biological river health. Our results are discussed in this context in order to interpret potential changes in the river community composition. See Figure 1.1 above for locations and Figure 1.2 below for a summary of the findings for each of the sites surveyed (i.e. sites 1-3). Table 1.1 list all of the species recorded and show by colour separation the EPA taxonomic classes as prescribed above.

Sites 1-3 were located on the main channel of the Corlattalan Stream. The furthest upstream sample (i.e. site 3) was located downstream of the Blackwater River. The composition of the sample had low numbers of pollution intolerant class A invertebrates, an absence of class B invertebrates (also pollution intolerant), and a dominance of class C invertebrates (more pollution tolerant).

The class A invertebrates included four stonefly species, a three specimens of Isoperla grammatica and 6 no. Amphinemura sulcicollis. The very pollution tolerant class D was also found in high numbers for two invertebrate species, the freshwater hoglouse, Asellus aquaticus and the bivalve Pisidium amnicum. The presence of small numbers of class A invertebrates and the dominance of class C, coupled with high numbers of two pollution tolerant invertebrates in class D indicated that the sample was representative of a Q3 slightly polluted site.

Site 2 immediate downstream of the Silverhill Foods site. The absence of very clean water (Class A) and clean water (Class B) invertebrates indicated lower quality water. The sample was dominated by class C (moderately pollution tolerant) invertebrate species including caseless caddis species Hydropsyche augustipennis and Oecetis ochracea. Other class C invertebrate species included the gastropod snails Planorbis planorbis and Valvata piscinalis. The presence of the class D pollution tolerant invertebrate forms representing the leech species Helobdella stagnalis and the bivalve snail Sphaerium corneum, further indicated that the sample was representative of a Q2-3 moderately polluted watercourse.

Sites 1 is immediately down stream of the Silverhill Foods WWTP discharge with surface water discharge also entering. No EPA class A or B clean water invertebrates were found present in the samples collected. The samples were dominated by class C, D and E invertebrates indicating a clear shift in the invertebrate community towards more pollution tolerant forms. These included the (class D) crustacean Asellus aquaticus in very high numbers, and class E Tubificid sp. worms and the non-biting midge species Chironomus riparius. The dominance in the sample of pollution tolerant invertebrates accounted for a Q rating of 2 (i.e. poor status).

Water quality in the Corlattalan Stream can be summarized as follows (see Figure 1.1 above for locations);

Site 1 (At Discharge)	Q2-3	Poor (Moderately polluted
Site 2 (downstream of Discharge)	Q2-3	Poor (Moderately polluted
Site 3 (prior to blackwater River	Q3	Moderate (Slightly polluted)

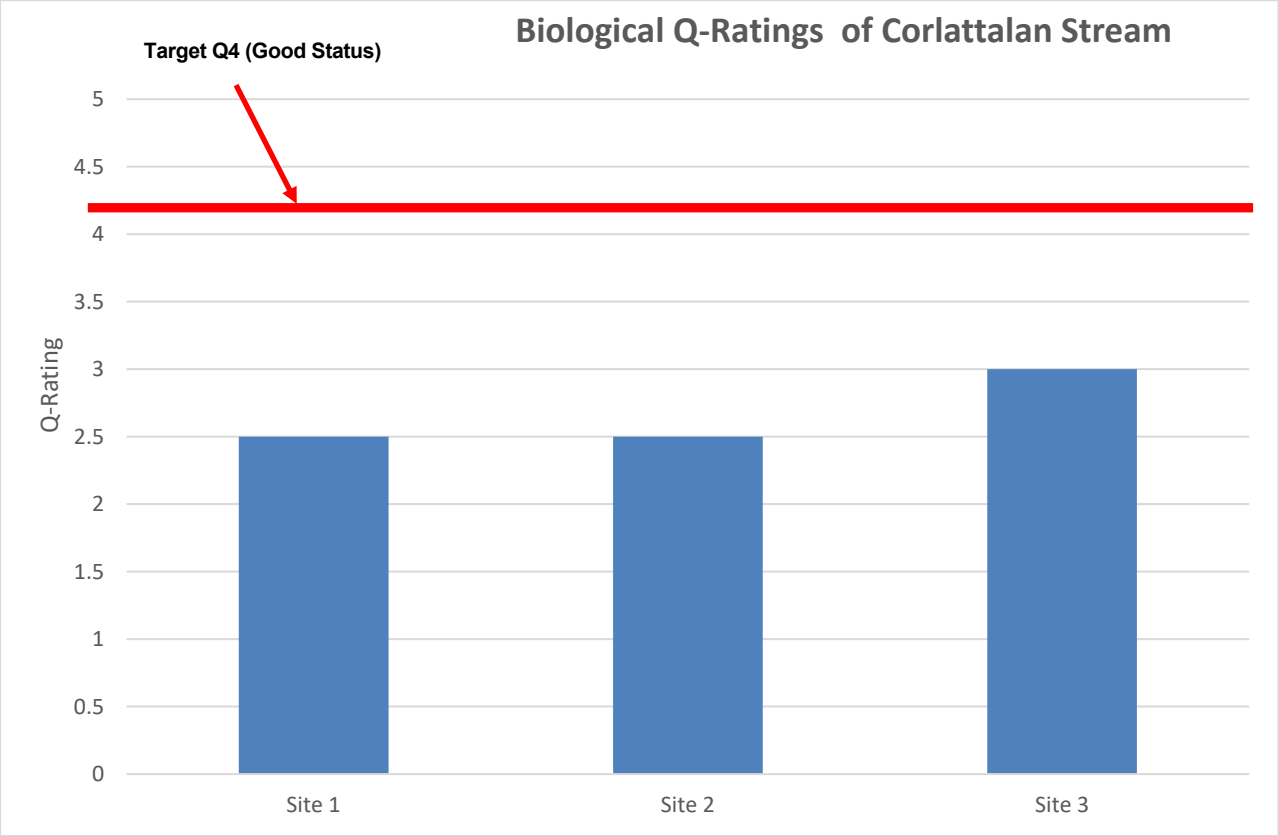

Figure 1.2 – Biological Q-Ratings on the Corlattalan Stream **– July 2022**

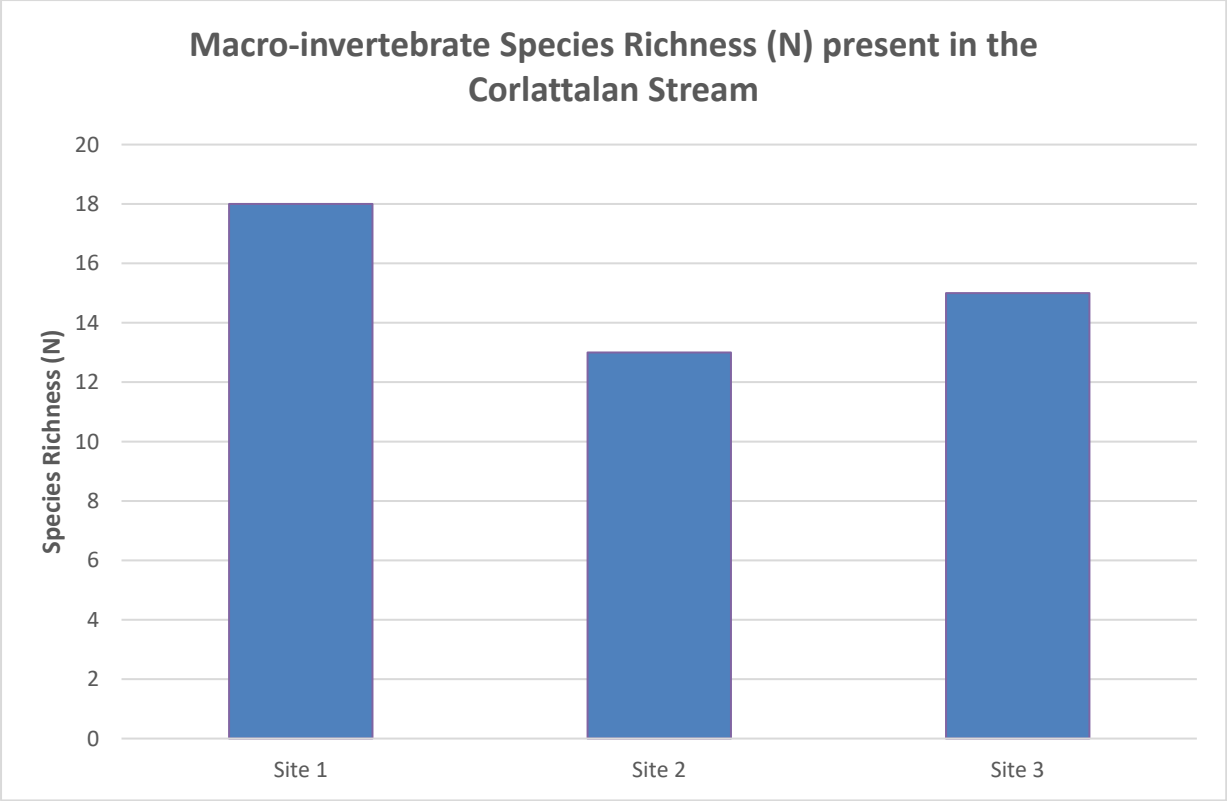

Figure 1.3 – Macro-invertebrate Species Richness (N) present in the Corlattalan Stream July 2022

Family	Species	Site 1	Site 2	Site 3	EPA Class
Heptageniidae	*Heptagenia sulphurea*		2		A
	Rhithrogena semicolorata			3	A
Nemouridae	*Amphinemura sulcicolis*				A
Taenyopterigdae	*Brachyptera risi*			4	A
Perlodidae	*Isoperla grammatica*				A
Chloroperlidae	*Chloroperla torrentium*			2	A
Limnephilidae	*Anabola nervosa*		1	2	B
Goeridae	*Silo palipes*			2	B
Seracostomatidae	*Seracosoma personatum*		2		B
Caenidae	*Caenis lactuosa*			2	C
Baetidae	*Baetis rhodani*	27	34	3	C
Ephemerellidae	*Ephemerella ignita*				C
Ryacophilidae	*Ryacophila dorsalis*				C
Hydropsychidae	*Hydropsyche siltalai*	6			C
	Hydropsyche augustipennis	11	21		C
Polycentropodidae	*Holocentropus picicornis*				C
	Polycentropus kingi	2			C
	Oecetis ochracea				C
Gammaridae	*Gammarus duebenii*	29	19	2	C
Elmidae	*Elmis aenea*	3	2		C
	Limnius volkmari	2			C
Simulidae	*Simulium sp.*	7	3	2	C
Chironomidae	*Chironominae*				C
	Spaniotoma sp.		1		C
Tipulidae	*Dicranota sp.*	1			C
Lumbricinae	*Eiseniella sp.*				C
Lymnaeidae	*Lymnaea stagnalis*		5	7	C
Valvatidae	*Valvata piscinalis*				C
Ancylidae	*Ancylus fluviatilis*	7			C
Hydrobiidae	*Hydrobia ventrosa*				C
Planorbidae	*Planorbis planorbis*				C
Pisciolidae	*Pisciola geometrica*	2			C
Flatworm	*Polycelis nigra*	3	1	1	C
Hydracarina	*n/a*	3			C
Lymnaeidae	*Lymnaea peregra*				D
Sphaeridae	*Pisidium amnicum*				D
	Spharium sp.	5		2	D
Glossiphoniidae	*Helobdella stagnalis*				D
Erpobdellidae	*Erpobdella octoculata*	2	2		D
Asellidae	*Asellus aquaticus*	41	7	8	D
Chironomidae	*Chrionomus riparius*	32	2	1	E
Tubificidae	*Tubificid sp.*	9	2	0	E
	Taxon Richness N	**18**	**13**	**15**	
	Q Rating	**Q2**	**Q2-3**	**Q3**	

Table 1.1 – Macro-invertebrate composition at sites 1-3 on the Corlattalan Stream

3.0 Discussion

1.1 Currently the overall water quality on the River Blackwater main channel is achieving target Q4 good status as required under the Water Framework Directive. The Corlattalan Stream to which surface water and treated wastewater discharges to has a Poor status (Q2) and improves and improves as you move away from the site. Future improvement in water quality may push longer longitudinal reaches of the river channel into the good status (Q4) category.

1.2 The Corlattalan Stream tributary of the River Blackwater is a poor water quality. There was evident abundant blanket Cladophora weed. The steam has poor flow and the discharges from Silverhill Foods and and other point sources of pollution is causing a a reduction in water quality in the stream.

1.3 It is recommended that future biological water quality surveys are undertaken on the Corlattalan Stream to determine improvement in discharges in surface water and treated effluent, along with the proposed sub-surface irrigation system.

4.0 References

Kelly, F., Champ, T., McDonnell, N., Kelly-Quinn, M., Harrison, S., Arbuthnott A., Giller, P., Joy, M., McCarthy, K., Cullen, P., Harrod, C., Jordan, P., Griffiths, D. and Rosell, R. (2007). Investigation of the relationship between fish stocks, ecological quality ratings (Q-Values), Environmental factors and degree of Eutrophication. EPA report

Toner, P., Bowman, J., Clabby, K., Lucey, J., McGarrigle, M., Concannon, C., Cleneghan, C., Cunningham, P., Delaney, J.,O' Boyle, S., McCarthaigh, M., Craig, M. & Quinn, R. (2005) Water Quality in Ireland, 2001–2003. Environmental Protection Agency, Co. Wexford, Ireland.

5.0 Photos

Photo 1 Sampling Site 1

Photo 2 Sampling Site 2

Photo 3 Sample Site 3

Appendix 7.3 Licenced Emissions to Stream (WWTP Effluent Discharge W1 & Stormwater)

V Notch Averages 2020

	COD	AMM	NITRATE	SS	pH	Phos	DO	Temp	BOD	m3	Monthly Flow litres	Flow Rate / Hour
Jan	38	0.04	0.59	8.27	7.3	0.73	8.34	10	3	6962	6962160	291
Feb	35	0.03	1.16	8.10	7.4	1.11	9.26	9	3	6987	6987000	293
Mar	29	0.05	1.22	7.24	7.4	1.04	9.29	9	4	7262	7262000	306
Apr	24	0.07	1.08	5.24	7.5	0.77	9.03	12	4	6236	6236000	258
May	23	0.05	1.16	6.01	7.6	0.02	8.74	14	3	2044	2044000	79
Jun	26	0.06	0.36	5.81	7.6	0.18	7.82	17	4	4558	4558000	195
Jul	25	0.05	0.29	6.00	7.2	0.61	7.89	17	4	4693	4693000	204
Aug	26	0.05	0.44	7.10	7.0	0.55	7.37	18	4	5878	5878000	248
Sep	26	0.06	1.02	6.00	6.7	0.17	7.93	16	5	4851	4851000	206
Oct	30	0.03	3.24	8.19	7.0	0.25	9.01	12	3	5521	5521000	233
Nov	30	0.07	1.40	7.33	7.0	0.27	8.33	11	5	7657	7657000	321
Dec	27	0.03	1.48	6.30	7.1	0.30	8.58	8	3	6976	6976000	290
Average 12 mths	**28**	**0.05**	**1.12**	**6.80**	**7.22**	**0.50**	**8.47**	**12.81**	**4**	**5802**	**5802097**	**244**
Total of 12 mths	**339**	**0.61**	**13.44**	**81.59**	**86.62**	**5.999**	**101.59**	**153.70**	**46**	**69625**	**69625160**	**2923**

V Notch Averages 2021

	COD	AMM	NITRATE	Total Nitrogn	SS	pH	Phos	Ortho	DO	Temp	BOD	FOG	m3	Monthly Flow litres	Flow Rate / Hour
Jan	30	0.02	3.65		6.80	7.0	0.15		9.35	7	4		7062	7062000	228
Feb	28	0.03	2.16		6.00	7.1	0.06		9.50	7	3		6725	6725000	240
Mar	27	0.09	1.58		6.45	7.2	0.21		9.29	10	4		7171	7171000	231
Apr	29	0.11	3.61		8.57	7.2	0.35		8.99	10	4	2	5754	5754000	192
May	29	0.04	1.68		6.00	7.2	0.16		8.51	12	3	1	5074	5074000	164
Jun	36	0.05		2.10	6.48	7.2	0.20	0.17	7.85	17	3	1	4547	4547000	152
Jul	29	0.06		7.00	6.36	7.2	0.34	0.27	7.26	18	3	3	5180	5180000	167
Aug	30	0.05		5.90	6.67	7.1	0.42	0.32	7.24	17	4	2	6181	6181000	199
Sep	31	0.03		3.51	6.00	7.3	0.51	0.36	7.79	16	2	3	7192	7192000	240
Oct	30	0.03		5.64	7.70	7.5	0.88	0.34	7.79	14	3	2	6897	6897000	222
Nov	26	0.02		8.37	7.91	7.6	0.69	0.36	8.54	11	3	2	6950	6950000	232
Dec	24	0.03		8.31	8.70	7.6	0.75	0.34	9.57	10	5	2	6449	6449000	208
Average 12 mths	**29**	**0.05**	**2.54**	**5.83**	**6.97**	**7.26**	**0.39**	**0.31**	**8.47**	**12.47**	**3**	**2**	**6265**	**6265167**	**206**
Total of 12 mths	**349**	**0.55**	**12.68**	**40.83**	**83.64**	**87.09**	**4.72**	**2.16**	**101.68**	**149.58**	**41**	**18.00**	**75182**	**75182000**	**2475**

V Notch Averages 2022

	COD	AMM	Total Nitrogn	SS	pH	Phos	Ortho	DO	Temp	BOD	FOG	m3	Monthly Flow litres	Flow Rate / Day
Jan	26	0.03	9.47	8.40	7.6	0.43	0.35	10.44	9	4	2	6023	6023000	194
Feb	24	0.05	12.00	6.38	7.5	0.43	0.32	9.69	10	4	2	5675	5675000	203
Mar	24	0.21	10.91	6.38	7.5	0.45	0.15	8.47	9	4	3	2864	2864000	92
Apr	24	0.12	6.20	7.30	7.6	0.17	0.14	8.82	11	3	1	1934	1934000	64
May	23	0.14	4.35	5.24	7.7	0.14	0.09	8.38	15	4	2	2042	2042000	66
Jun	32	0.31	6.40	6.19	7.7	0.22	0.18	7.65	16	2	2	2271	2271000	76
Jul	38	0.24	4.18	8.67	7.7	0.33	0.23	5.75	18	3	1	2957	2957000	95
Aug	33	0.13	3.14	5.09	7.6	0.27	0.20	6.39	17	2	2	4444	4444000	143
Sep	27	0.04	2.80	5.36	7.6	0.34	0.25	6.92	16	3	3	7566	7566000	252
Oct	25	0.09	3.58	4.90	7.6	0.18	0.21	7.65	13	3	3	9426	9426000	304
Nov													0	
Dec													0	
Average 12 mths	**28**	**0.14**	**6.30**	**6.39**	**7.61**	**0.30**	**0.21**	**8.01**	**13.40**	**3**	**2**	**4520**	**3766833**	**149**
Total of 12 mths	**276**	**1.35**	**63.03**	**63.91073593**	**76.12300649**	**2.9557**	**2.11**	**80.15**	**133.96**	**30**	**21.00**	**45202.00**	**45202000**	**1490**

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/11/2022	SW2	SW3	SW4	SW5
COD	24	19	26	25
Conductivity	643	539	488	562
Suspended Solids	2	3	2	4
Total Ammonia - N	0.08	0.11	0.15	0.12
Orthophosphate (as P)	0.12	0.08	0.11	0.15
pH	7.96	7.74	7.61	7.65

Date: 10/11/2022	SW2	SW3	SW4	SW5
COD				
Conductivity				
Suspended Solids				
Total Ammonia - N				
Orthophosphate (as P)				
pH				

Date: 17/11/2022	SW2	SW3	SW4	SW5
COD				
Conductivity				
Suspended Solids				
Total Ammonia - N				
Orthophosphate (as P)				
pH				

Date: 24/11/2022	SW2	SW3	SW4	SW5
COD				
Conductivity				
Suspended Solids				
Total Ammonia - N				
Orthophosphate (as P)				
pH				

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 06/10/2022	SW2	SW3	SW4	SW5
COD	18	24	26	21
Conductivity	588	481	552	648
Suspended Solids	3	5	8	8
Total Ammonia - N	0.24	0.18	0.22	0.28
Orthophosphate (as P)	0.19	0.14	0.08	0.10
pH	7.76	7.84	7.66	7.58

Date: 13/10/2022	SW2	SW3	SW4	SW5
COD	24	21	19	22
Conductivity	458	537	568	599
Suspended Solids	2	5	4	6
Total Ammonia - N	0.16	0.11	0.34	0.26
Orthophosphate (as P)	0.09	0.15	0.16	0.25
pH	7.81	7.77	7.69	7.85

Date: 20/10/2022	SW2	SW3	SW4	SW5
COD	22	29	18	26
Conductivity	618	548	664	716
Suspended Solids	3	2	4	4
Total Ammonia - N	0.24	0.19	0.29	0.18
Orthophosphate (as P)	0.11	0.08	0.29	0.16
pH	7.89	7.98	8.01	7.64

Date: 27/10/2022	SW2	SW3	SW4	SW5
COD	18	22	12	15
Conductivity	582	638	539	574
Suspended Solids	2	4	4	3
Total Ammonia - N	0.18	0.20	0.22	0.14
Orthophosphate (as P)	0.10	0.09	0.21	0.19
pH	7.87	7.95	7.59	7.72

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 01/09/2022	SW2	SW3	SW4	SW5
COD	12	14	DRY	DRY
Conductivity	387	411	DRY	DRY
Suspended Solids	3	5	DRY	DRY
Total Ammonia - N	0.18	0.24	DRY	DRY
Orthophosphate (as P)	0.33	0.25	DRY	DRY
pH	7.68	7.84	DRY	DRY

Date: 08/09/2022	SW2	SW3	SW4	SW5
COD	24	19	DRY	DRY
Conductivity	319	459	DRY	DRY
Suspended Solids	4	6	DRY	DRY
Total Ammonia - N	0.29	0.31	DRY	DRY
Orthophosphate (as P)	0.19	0.25	DRY	DRY
pH	7.88	7.74	DRY	DRY

Date: 15/09/2022	SW2	SW3	SW4	SW5
COD	17	12	DRY	DRY
Conductivity	431	544	DRY	DRY
Suspended Solids	3	4	DRY	DRY
Total Ammonia - N	0.16	0.27	DRY	DRY
Orthophosphate (as P)	0.22	0.28	DRY	DRY
pH	7.63	7.84	DRY	DRY

Date: 22/09/2022	SW2	SW3	SW4	SW5
COD	19	21	17	12
Conductivity	618	552	483	684
Suspended Solids	5	4	6	8
Total Ammonia - N	0.14	0.22	0.19	0.29
Orthophosphate (as P)	0.09	0.15	0.11	0.16
pH	7.79	7.82	7.92	7.76

Date: 28/09/2022	SW2	SW3	SW4	SW5
COD	22	22	19	15
Conductivity	829	576	511	709
Suspended Solids	10	5	8	3
Total Ammonia - N	0.07	0.23	0.15	0.25
Orthophosphate (as P)	0.26	0.13	0.09	0.13
pH	8.00	7.76	7.91	7.67

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 04/08/2022	SW2	SW3	SW4	SW5
COD	24	19	DRY	DRY
Conductivity	502	439	DRY	DRY
Suspended Solids	4	2	DRY	DRY
Total Ammonia - N	0.196	0.241	DRY	DRY
Orthophosphate (as P)	0.16	0.13	DRY	DRY
pH	7.72	7.91	DRY	DRY

Date: 11/08/2022	SW2	SW3	SW4	SW5
COD	18	22	DRY	DRY
Conductivity	673	549	DRY	DRY
Suspended Solids	4	8	DRY	DRY
Total Ammonia - N	0.266	0.218	DRY	DRY
Orthophosphate (as P)	0.28	0.19	DRY	DRY
pH	7.81	7.68	DRY	DRY

Date: 18/08/2022	SW2	SW3	SW4	SW5
COD	24	19	DRY	DRY
Conductivity	539	617	DRY	DRY
Suspended Solids	4	6	DRY	DRY
Total Ammonia - N	0.19	0.26	DRY	DRY
Orthophosphate (as P)	0.11	0.15	DRY	DRY
pH	7.88	7.68	DRY	DRY

Date: 25/08/2022	SW2	SW3	SW4	SW5
COD	31	26	DRY	DRY
Conductivity	548	511	DRY	DRY
Suspended Solids	7	6	DRY	DRY
Total Ammonia - N	0.29	0.22	DRY	DRY
Orthophosphate (as P)	0.31	0.19	DRY	DRY
pH	8.7	7.61	DRY	DRY

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07/07/2022	SW2	SW3	SW4	SW5
COD	18	15	DRY	DRY
Conductivity	502	596	DRY	DRY
Suspended Solids	3	6	DRY	DRY
Total Ammonia - N	0.28	0.34	DRY	DRY
Orthophosphate (as P)	0.09	0.15	DRY	DRY
pH	7.72	7.86	DRY	DRY

Date: 14/07/2022	SW2	SW3	SW4	SW5
COD	26	21	DRY	DRY
Conductivity	614	537	DRY	DRY
Suspended Solids	6	4	DRY	DRY
Total Ammonia - N	0.19	0.22	DRY	DRY
Orthophosphate (as P)	0.13	0.18	DRY	DRY
pH	7.67	7.76	DRY	DRY

Date: 21/07/2022	SW2	SW3	SW4	SW5
COD	18	15	DRY	DRY
Conductivity	535	486	DRY	DRY
Suspended Solids	3	7	DRY	DRY
Total Ammonia - N	0.26	0.19	DRY	DRY
Orthophosphate (as P)	0.08	0.16	DRY	DRY
pH	7.86	7.71	DRY	DRY

Date: 28/07/2022	SW2	SW3	SW4	SW5
COD	12	19	DRY	DRY
Conductivity	453	511	DRY	DRY
Suspended Solids	2	5	DRY	DRY
Total Ammonia - N	0.15	0.20	DRY	DRY
Orthophosphate (as P)	0.10	0.16	DRY	DRY
pH	7.76	7.83	DRY	DRY

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02/06/2022	SW2	SW3	SW4	SW5
COD	29	25	DRY	DRY
Conductivity	683	672	DRY	DRY
Suspended Solids	4	5	DRY	DRY
Total Ammonia - N	0.092	0.142	DRY	DRY
Orthophosphate (as P)	0.18	0.19	DRY	DRY
pH	7.66	7.79	DRY	DRY

Date: 09/06/2022	SW2	SW3	SW4	SW5
COD	42	34	DRY	DRY
Conductivity	617	581	DRY	DRY
Suspended Solids	6	4	DRY	DRY
Total Ammonia - N	0.138	0.244	DRY	DRY
Orthophosphate (as P)	0.17	0.10	DRY	DRY
pH	7.65	7.83	DRY	DRY

Date: 16/06/2022	SW2	SW3	SW4	SW5
COD	31	28	38	27
Conductivity	731	649	542	558
Suspended Solids	4	6	2	2
Total Ammonia - N	0.162	0.117	0.237	0.143
Orthophosphate (as P)	0.13	0.20	0.25	0.21
pH	7.51	7.68	7.62	7.86

Date: 22/06/2022	SW2	SW3	SW4	SW5
COD	13	29	DRY	DRY
Conductivity	481	524	DRY	DRY
Suspended Solids	12	2	DRY	DRY
Total Ammonia - N	0.14	0.182	DRY	DRY
Orthophosphate (as P)	0.20	0.13	DRY	DRY
pH	8.31	7.61	DRY	DRY

Date: 30/06/2022	SW2	SW3	SW4	SW5
COD	42	31	DRY	DRY
Conductivity	616	586	DRY	DRY
Suspended Solids	2	6	DRY	DRY
Total Ammonia - N	0.160	0.244	DRY	DRY
Orthophosphate (as P)	0.28	0.17	DRY	DRY
pH	7.53	7.49	DRY	DRY

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/05/2022	SW2	SW3	SW4	SW5
COD	20	13	DRY	DRY
Conductivity	502	502	DRY	DRY
Suspended Solids	56	56	DRY	DRY
Total Ammonia - N	0.16	0.14	DRY	DRY
Orthophosphate (as P)	0.16	0.20	DRY	DRY
pH	8.28	8.32	DRY	DRY

Date: 12/05/2022	SW2	SW3	SW4	SW5
COD	24	21	37	27
Conductivity	638	589	486	546
Suspended Solids	10	7	7	6
Total Ammonia - N	0.14	0.43	0.248	0.115
Orthophosphate (as P)	0.16	0.17	0.22	0.17
pH	7.74	7.57	7.67	7.88

Date: 19/05/2022	SW2	SW3	SW4	SW5
COD	21	19	24	31
Conductivity	658	519	449	328
Suspended Solids	10	6	5	3
Total Ammonia - N	0.24	0.23	0.251	0.091
Orthophosphate (as P)	0.17	0.27	0.18	0.24
pH	7.87	7.50	7.78	7.56

Date: 26/05/2022	SW2	SW3	SW4	SW5
COD	19	25	DRY	DRY
Conductivity	715	549	DRY	DRY
Suspended Solids	10	13	DRY	DRY
Total Ammonia - N	0.28	0.27	DRY	DRY
Orthophosphate (as P)	0.39	0.28	DRY	DRY
pH	7.87	7.64	DRY	DRY

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07/04/2022	SW2	SW3	SW4	SW5
COD	24	29	31	DRY
Conductivity	538	649	605	DRY
Suspended Solids	4	8	6	DRY
Total Ammonia - N	0.104	0.153	0.172	DRY
Orthophosphate (as P)	0.06	0.11	0.14	DRY
pH	7.74	7.68	7.59	DRY

Date: 14/04/2022	SW2	SW3	SW4	SW5
COD	18	26	DRY	DRY
Conductivity	712	561	DRY	DRY
Suspended Solids	8	6	DRY	DRY
Total Ammonia - N	0.34	0.103	DRY	DRY
Orthophosphate (as P)	0.26	0.13	DRY	DRY
pH	7.74	7.59	DRY	DRY

Date: 19/04/2022	SW2	SW3	SW4	SW5
COD	11	27	22	DRY
Conductivity	684	582	617	DRY
Suspended Solids	10	4	4	DRY
Total Ammonia - N	0.14	0.183	0.222	DRY
Orthophosphate (as P)	0.33	0.11	0.16	DRY
pH	8.22	7.84	7.61	DRY

Date: 28/04/2022	SW2	SW3	SW4	SW5
COD	24	18	26	DRY
Conductivity	764	600	358	DRY
Suspended Solids	7	6	8	DRY
Total Ammonia - N	0.27	0.149	0.39	DRY
Orthophosphate (as P)	0.24	0.16	0.31	DRY
pH	7.63	7.64	7.88	DRY

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/03/2022	SW2	SW3	SW4	SW5
COD	22	25	DRY	DRY
Conductivity	568	592	DRY	DRY
Suspended Solids	4	2	DRY	DRY
Total Ammonia - N	0.09	0.14	DRY	DRY
Orthophosphate (as P)	0.11	0.09	DRY	DRY
pH	7.37	7.41	DRY	DRY

Date: 10/03/2022	SW2	SW3	SW4	SW5
COD	24	29	24	19
Conductivity	764	724	627	539
Suspended Solids	6	8	6	4
Total Ammonia - N	0.199	0.218	0.081	0.172
Orthophosphate (as P)	0.38	0.14	0.11	0.09
pH	7.67	7.34	7.55	7.74

Date: 16/03/2022	SW2	SW3	SW4	SW5
COD	29	31	22	33
Conductivity	798	758	632	596
Suspended Solids	7	8	6	6
Total Ammonia - N	0.29	0.242	0.167	0.113
Orthophosphate (as P)	0.29	0.15	0.12	0.08
pH	7.76	7.32	7.48	7.77

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Date: 22/03/2022	SW2	SW3	SW4	SW5
COD	14	25	23	28
Conductivity	684	621	677	592
Suspended Solids	11	6	4	6
Total Ammonia - N	0.32	0.157	0.113	0.161
Orthophosphate (as P)	0.4	0.13	0.11	0.08
pH	7.93	7.33	7.84	7.69

Date: 31/03/2022	SW2	SW3	SW4	SW5
COD	22	27	DRY	DRY
Conductivity	783	609	DRY	DRY
Suspended Solids	8	6	DRY	DRY
Total Ammonia - N	0.49	0.144	DRY	DRY
Orthophosphate (as P)	0.22	0.16	DRY	DRY
pH	7.98	7.84	DRY	DRY

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/02/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	27	22	31
Conductivity	599	617	624	654
Suspended Solids	2	4	4	6
Total Ammonia - N	0.092	0.115	0.117	0.084
Orthophosphate (as P)	0.11	0.09	0.17	0.12
pH	7.34	7.44	7.59	7.31

Date: 07/02/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	24	22	27
Conductivity	745	554	527	564
Suspended Solids	9	6	6	8
Total Ammonia - N	0.13	0.124	0.177	0.139
Orthophosphate (as P)	0.44	0.11	0.21	0.19
pH	7.94	7.39	7.43	7.54

Date: 17/02/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	21	26	19	24
Conductivity	537	568	491	587
Suspended Solids	4	8	4	4
Total Ammonia - N	0.07	0.11	0.09	0.09
Orthophosphate (as P)	0.07	0.13	0.09	0.11
pH	7.37	7.49	7.44	7.64

Date: 24/02/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	28	24	19
Conductivity	781	694	538	583
Suspended Solids	6	4	4	2
Total Ammonia - N	0.18	0.14	0.11	0.09
Orthophosphate (as P)	0.34	0.09	0.08	0.11
pH	7.94	7.59	7.51	7.32

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 06/01/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	26	28	24	19
Conductivity	764	781	652	631
Suspended Solids	6	8	4	2
Total Ammonia - N	0.137	0.193	0.102	0.094
Orthophosphate (as P)	0.08	0.11	0.13	0.09
pH	7.37	7.44	7.51	7.29

Date: 13/01/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	29	DRY	DRY
Conductivity	734	770	DRY	DRY
Suspended Solids	4	6	DRY	DRY
Total Ammonia - N	0.193	0.211	DRY	DRY
Orthophosphate (as P)	0.11	0.14	DRY	DRY
pH	7.32	7.48	DRY	DRY

Date: 19/01/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	24	DRY	DRY
Conductivity	884	598	DRY	DRY
Suspended Solids	11	4	DRY	DRY
Total Ammonia - N	0.8	0.169	DRY	DRY
Orthophosphate (as P)	0.87	0.10	DRY	DRY
pH	8.11	7.31	DRY	DRY

Date: 27/01/2022	**SW2**	**SW3**	**SW4**	**SW5**
COD	27	24	18	19
Conductivity	617	719	559	531
Suspended Solids	8	8	6	4
Total Ammonia - N	0.188	0.207	0.108	0.086
Orthophosphate (as P)	0.11	0.14	0.08	0.07
pH	7.54	7.61	7.74	7.44

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02/12/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	24	29	16
Conductivity	594	601	559	667
Suspended Solids	4	4	2	6
Total Ammonia - N	0.097	0.102	0.233	0.121
Orthophosphate (as P)	0.06	0.12	0.11	0.09
pH	7.31	7.42	7.61	7.55

Date: 09/12/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	22	17	19
Conductivity	482	517	611	538
Suspended Solids	6	6	2	4
Total Ammonia - N	0.156	0.127	0.244	0.311
Orthophosphate (as P)	0.11	0.14	0.09	0.09
pH	7.64	7.44	7.52	7.39

Date: 17/12/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	14	18	19	24
Conductivity	772	593	711	633
Suspended Solids	12	6	4	4
Total Ammonia - N	0.3	0.162	0.087	0.254
Orthophosphate (as P)	0.46	0.121	0.166	0.094
pH	7.91	7.44	7.39	7.55

Date: 23/12/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	18	19	24
Conductivity	762	788	621	597
Suspended Solids	6	4	4	8
Total Ammonia - N	0.174	0.231	0.087	0.124
Orthophosphate (as P)	0.145	0.197	0.074	0.097
pH	7.41	7.52	7.33	7.42

Date: 30/12/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	24	23	19
Conductivity	647	672	528	568
Suspended Solids	6	8	4	2
Total Ammonia - N	0.189	0.224	0.087	0.124
Orthophosphate (as P)	0.15	0.21	0.08	0.09
pH	7.58	7.34	7.61	7.41

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 04/11/2021	SW2	SW3	SW4	SW5
COD	25	31	27	19
Conductivity	669	754	637	684
Suspended Solids	4	8	8	6
Total Ammonia - N	0.09	0.121	0.214	0.124
Orthophosphate (as P)	0.05	0.09	0.12	0.14
pH	7.35	7.38	7.11	7.24

Date: 11/11/2021	SW2	SW3	SW4	SW5
COD	17	31	24	36
Conductivity	700	712	625	634
Suspended Solids	13	4	4	6
Total Ammonia - N	0.75	0.111	0.214	0.094
Orthophosphate (as P)	1.64	0.16	0.24	0.19
pH	7.92	7.51	7.24	7.35

Date: 18/11/2021	SW2	SW3	SW4	SW5
COD	24	30	19	23
Conductivity	518	592	621	633
Suspended Solids	4	6	8	4
Total Ammonia - N	0.117	0.136	0.211	0.097
Orthophosphate (as P)	0.05	0.17	0.24	0.09
pH	7.45	7.43	7.61	7.33

Date: 25/11/2021	SW2	SW3	SW4	SW5
COD	17	22	21	27
Conductivity	581	604	671	712
Suspended Solids	2	6	6	4
Total Ammonia - N	0.106	0.214	0.197	0.224
Orthophosphate (as P)	0.09	0.14	0.21	0.13
pH	7.55	7.30	7.16	7.28

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07/10/2021	SW2	SW3	SW4	SW5
COD	24	31	21	18
Conductivity	687	583	644	724
Suspended Solids	4	6	6	8
Total Ammonia - N	0.146	0.268	0.163	0.112
Orthophosphate (as P)	0.13	0.22	0.10	0.12
pH	7.65	7.78	7.34	7.69

Date: 14/10/2021	SW2	SW3	SW4	SW5
COD	16	35	28	23
Conductivity	982	711	648	517
Suspended Solids	13	4	6	2
Total Ammonia - N	0.56	0.164	0.119	0.187
Orthophosphate (as P)	1.03	0.12	0.08	0.15
pH	8.33	7.69	7.27	7.35

Date: 21/10/2021	SW2	SW3	SW4	SW5
COD	31	29	24	26
Conductivity	578	546	617	718
Suspended Solids	4	6	2	4
Total Ammonia - N	0.181	0.097	0.133	0.149
Orthophosphate (as P)	0.08	0.15	0.11	0.12
pH	7.61	7.44	7.38	7.49

Date: 28/10/2021	SW2	SW3	SW4	SW5
COD	28	21	19	24
Conductivity	761	721	652	617
Suspended Solids	2	4	4	6
Total Ammonia - N	0.156	0.211	0.144	0.164
Orthophosphate (as P)	0.09	0.11	0.15	0.13
pH	7.24	7.41	7.39	7.55

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02/09/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	35	29	31	22
Conductivity	634	712	581	544
Suspended Solids	8	10	6	4
Total Ammonia - N	0.287	0.134	0.144	0.321
Orthophosphate (as P)	0.12	0.13	0.24	0.34
pH	7.42	7.58	7.31	7.22

Date: 08/09/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	16	29	35	21
Conductivity	707	578	661	624
Suspended Solids	24	8	4	4
Total Ammonia - N	0.8	0.221	0.146	0.226
Orthophosphate (as P)	0.47	0.19	0.22	0.15
pH	8.00	7.44	7.37	7.64

Date: 16/09/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	29	31	41	22
Conductivity	623	559	644	717
Suspended Solids	6	6	4	2
Total Ammonia - N	0.271	0.194	0.227	0.331
Orthophosphate (as P)	0.17	0.26	0.12	0.20
pH	7.52	7.34	7.44	7.53

Date: 23/09/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	27	22	19
Conductivity	726	541	745	655
Suspended Solids	2	6	4	4
Total Ammonia - N	0.094	0.155	0.213	0.148
Orthophosphate (as P)	0.26	0.12	0.14	0.09
pH	7.35	7.51	7.91	7.57

Date: 30/09/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	26	30	19	24
Conductivity	687	597	566	643
Suspended Solids	4	4	6	4
Total Ammonia - N	0.118	0.162	0.211	0.097
Orthophosphate (as P)	0.14	0.11	0.17	0.19
pH	7.68	7.44	7.64	7.87

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 05/08/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	20	25	31	27
Conductivity	714	631	681	654
Suspended Solids	8	6	6	6
Total Ammonia - N	0.277	0.212	0.343	0.219
Orthophosphate (as P)	0.18	0.21	0.13	0.11
pH	7.35	7.56	7.33	7.64

Date: 11/08/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	15	24	35	27
Conductivity	966	567	377	281
Suspended Solids	8	8	4	4
Total Ammonia - N	0.7	0.288	0.319	0.164
Orthophosphate (as P)	0.43	0.17	0.25	0.11
pH	7.83	7.18	7.44	7.45

Date: 19/08/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	34	25	37	31
Conductivity	447	389	441	397
Suspended Solids	6	8	4	6
Total Ammonia - N	0.282	0.301	0.193	0.224
Orthophosphate (as P)	0.18	0.25	0.21	0.19
pH	7.34	7.18	7.45	7.31

Date: 26/08/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	29	38	26
Conductivity	601	511	461	401
Suspended Solids	8	10	6	4
Total Ammonia - N	0.377	0.386	0.215	0.253
Orthophosphate (as P)	0.13	0.18	0.22	0.21
pH	7.51	7.38	7.33	7.51

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.3	0.5
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 01/07/2021	SW2	SW3	SW4	SW5
COD	21	24	Dry	Dry
Conductivity	628	657	Dry	Dry
Suspended Solids	8	10	Dry	Dry
Total Ammonia - N	0.117	0.184	Dry	Dry
Orthophosphate (as P)	0.09	0.12	Dry	Dry
pH	7.34	7.39	Dry	Dry

Date: 08/07/2021	SW2	SW3	SW4	SW5
COD	19	34	Dry	Dry
Conductivity	704	657	Dry	Dry
Suspended Solids	6	8	Dry	Dry
Total Ammonia - N	0.205	0.183	Dry	Dry
Orthophosphate (as P)	0.10	0.13	Dry	Dry
pH	7.36	7.42	Dry	Dry

Date: 15/07/2021	SW2	SW3	SW4	SW5
COD	17	23	Dry	Dry
Conductivity	624	651	Dry	Dry
Suspended Solids	8	6	Dry	Dry
Total Ammonia - N	0.160	0.192	Dry	Dry
Orthophosphate (as P)	0.11	0.08	Dry	Dry
pH	7.39	7.61	Dry	Dry

Date: 22/07/2021	SW2	SW3	SW4	SW5
COD	28	31	Dry	Dry
Conductivity	664	618	Dry	Dry
Suspended Solids	10	6	Dry	Dry
Total Ammonia - N	0.111	0.095	Dry	Dry
Orthophosphate (as P)	0.09	0.11	Dry	Dry
pH	7.88	7.64	Dry	Dry

Date: 29/07/2021	SW2	SW3	SW4	SW5
COD	25	19	Dry	Dry
Conductivity	918	647	Dry	Dry
Suspended Solids	11	8	Dry	Dry
Total Ammonia - N	1.8	0.065	Dry	Dry
Orthophosphate (as P)	0.85	0.07	Dry	Dry
pH	7.96	7.52	Dry	Dry

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Conductivity	800	1000
Suspended Solids	15	25
Total Ammonia - N	0.5	0.8
Orthophosphate (as P)	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/06/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	2	16	Dry	Dry
Conductivity	918	631	Dry	Dry
Suspended Solids	11	8	Dry	Dry
Total Ammonia - N	0.17	0.254	Dry	Dry
Orthophosphate (as P)	1.87	0.18	Dry	Dry
pH	7.61	7.42	Dry	Dry

Date: 10/06/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	30	22	Dry	Dry
Conductivity	615	605	Dry	Dry
Suspended Solids	8	6	Dry	Dry
Total Ammonia - N	0.317	0.265	Dry	Dry
Orthophosphate (as P)	0.14	0.15	Dry	Dry
pH	7.39	7.35	Dry	Dry

Date: 17/06/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	28	31	Dry	Dry
Conductivity	598	641	Dry	Dry
Suspended Solids	8	10	Dry	Dry
Total Ammonia - N	0.277	0.317	Dry	Dry
Orthophosphate (as P)	0.18	0.13	Dry	Dry
pH	7.38	7.45	Dry	Dry

Date: 24/06/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	35	Dry	Dry
Conductivity	561	622	Dry	Dry
Suspended Solids	10	8	Dry	Dry
Total Ammonia - N	0.189	0.217	Dry	Dry
Orthophosphate (as P)	0.23	0.18	Dry	Dry
pH	7.41	7.33	Dry	Dry

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 06/05/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	14	12	Dry
Suspended Solids	6	6	4	Dry
Total Ammonia - N	0.158	0.057	0.241	Dry
Total P	0.148	0.133	0.224	Dry
pH	7.81	7.18	7.55	Dry

Date: 13/05/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	28	34	19	Dry
Suspended Solids	4	8	6	Dry
Total Ammonia - N	0.193	0.087	0.143	Dry
Total P	0.024	0.184	0.317	Dry
pH	7.61	7.45	7.64	Dry

Date: 21/05/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	35	22	29	Dry
Suspended Solids	10	6	4	Dry
Total Ammonia - N	0.02	0.127	0.348	Dry
Total P	0.102	0.131	0.276	Dry
pH	7.71	7.37	7.31	Dry

Date: 27/05/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	36	29	38	Dry
Suspended Solids	4	6	4	Dry
Total Ammonia - N	0.091	0.155	0.318	Dry
Total P	0.197	0.184	0.317	Dry
pH	7.24	7.61	7.41	Dry

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 01/04/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	34	27	19	28
Suspended Solids	8	4	4	6
Total Ammonia - N	0.147	0.087	0.122	0.208
Total P	0.207	0.114	0.187	0.146
pH	7.18	7.21	7.34	7.11

Date: 08/04/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	24	31	28
Suspended Solids	4	4	6	8
Total Ammonia - N	0.181	0.162	0.283	0.174
Total P	0.222	0.214	0.354	0.227
pH	7.34	7.28	7.39	7.41

Date: 15/04/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	1	28	42	26
Suspended Solids	41	4	6	10
Total Ammonia - N	0.06	0.127	0.083	0.103
Total P	0.10	0.249	0.184	0.241
pH	8.00	7.17	7.39	7.25

Date: 22/04/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	21	DRY	DRY
Suspended Solids	4	6	DRY	DRY
Total Ammonia - N	0.154	0.097	DRY	DRY
Total P	0.217	0.189	DRY	DRY
pH	7.39	7.27	DRY	DRY

Date: 29/04/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	25	17	DRY	DRY
Suspended Solids	6	4	DRY	DRY
Total Ammonia - N	0.185	0.218	DRY	DRY
Total P	0.097	0.124	DRY	DRY
pH	7.41	7.36	DRY	DRY

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 04/03/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	34	27	19	21
Suspended Solids	6	4	8	8
Total Ammonia - N	0.214	0.120	0.311	0.277
Total P	0.186	0.248	0.221	0.173
pH	7.15	7.34	7.67	7.38

Date: 11/03/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	38	20	17	19
Suspended Solids	4	4	6	8
Total Ammonia - N	0.185	0.209	0.352	0.207
Total P	0.201	0.111	0.163	0.120
pH	7.24	7.68	7.33	7.19

Date: 18/03/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	22	27	21
Suspended Solids	6	2	4	6
Total Ammonia - N	0.106	0.174	0.204	0.157
Total P	0.217	0.231	0.153	0.240
pH	7.61	7.54	7.18	7.34

Date: 25/03/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	20	21	27
Suspended Solids	4	4	2	6
Total Ammonia - N	0.204	0.231	0.179	0.244
Total P	0.188	0.211	0.097	0.108
pH	7.34	7.42	7.23	7.17

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 04/02/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	28	34	14	18
Suspended Solids	8	10	6	6
Total Ammonia - N	0.153	0.218	0.177	0.366
Total P	0.257	0.122	0.344	0.175
pH	7.32	7.14	7.51	7.33

Date: 11/02/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	32	22	14	26
Suspended Solids	4	4	8	6
Total Ammonia - N	0.181	0.094	0.248	0.315
Total P	0.237	0.327	0.197	0.144
pH	7.55	7.96	7.17	7.22

Date: 18/02/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	38	26	40
Suspended Solids	8	4	8	10
Total Ammonia - N	0.268	0.188	0.213	0.228
Total P	0.125	0.241	0.117	0.084
pH	7.52	7.41	7.34	7.41

Date: 25/02/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	34	21	26	DRY
Suspended Solids	6	10	8	DRY
Total Ammonia - N	0.254	0.341	0.304	DRY
Total P	0.151	0.148	0.196	DRY
pH	7.56	7.24	7.19	DRY

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07/01/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	26	19	31	21
Suspended Solids	6	8	10	8
Total Ammonia - N	0.311	0.285	0.300	0.183
Total P	0.188	0.194	0.213	0.198
pH	7.31	7.01	7.28	7.61

Date: 14/01/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	43	29	21	30
Suspended Solids	6	6	8	10
Total Ammonia - N	0.349	0.217	0.165	0.209
Total P	0.161	0.085	0.094	0.102
pH	7.52	7.71	7.35	7.41

Date: 21/01/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	31	19	48
Suspended Solids	4	8	8	6
Total Ammonia - N	0.108	0.166	0.217	0.229
Total P	0.348	0.421	0.331	0.401
pH	7.24	7.05	7.11	7.64

Date: 28/01/2021	**SW2**	**SW3**	**SW4**	**SW5**
COD	33	25	19	26
Suspended Solids	8	4	6	10
Total Ammonia - N	0.129	0.107	0.097	0.155
Total P	0.320	0.358	0.338	0.298
pH	7.66	7.25	7.44	7.26

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/12/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	31	19	38
Suspended Solids	4	6	6	12
Total Ammonia - N	0.141	0.238	0.217	0.367
Total P	0.189	0.271	0.194	0.248
pH	7.51	7.14	7.68	7.03

Date: 10/12/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	22	25	33
Suspended Solids	8	6	6	10
Total Ammonia - N	0.163	0.187	0.244	0.221
Total P	0.254	0.141	0.175	0.129
pH	7.21	7.38	7.11	7.49

Date: 17/12/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	27	21	31	29
Suspended Solids	6	4	6	8
Total Ammonia - N	0.143	0.224	0.183	0.219
Total P	0.182	0.142	0.217	0.169
pH	7.01	7.21	7.36	7.58

Date: 24/12/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	17	34	29
Suspended Solids	6	8	8	10
Total Ammonia - N	0.184	0.217	0.195	0.249
Total P	0.212	0.186	0.262	0.243
pH	7.24	7.54	7.09	7.28

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 05/11/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	31	19	27	46
Suspended Solids	8	12	10	8
Total Ammonia - N	0.241	0.333	0.185	0.217
Total P	0.128	0.243	0.177	0.361
pH	7.18	7.26	7.34	7.62

Date: 12/11/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	22	23	41
Suspended Solids	6	4	8	12
Total Ammonia - N	0.144	0.195	0.214	0.354
Total P	0.177	0.264	0.197	0.257
pH	7.52	7.61	7.24	7.38

Date: 19/11/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	27	21	26	34
Suspended Solids	6	6	4	10
Total Ammonia - N	0.217	0.314	0.258	0.243
Total P	0.143	0.201	0.156	0.174
pH	7.42	7.38	7.29	7.18

Date: 26/11/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	31	22	34
Suspended Solids	6	4	8	12
Total Ammonia - N	0.173	0.214	0.155	0.268
Total P	0.249	0.116	0.231	0.194
pH	7.61	7.22	7.18	7.74

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 01/10/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	41	18	35	49
Suspended Solids	8	8	14	10
Total Ammonia - N	0.357	0.394	0.213	0.450
Total P	0.218	0.248	0.187	0.266
pH	7.25	7.61	7.84	7.67

Date: 08/10/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	30	24	51	66
Suspended Solids	6	4	10	8
Total Ammonia - N	0.267	0.334	0.262	0.318
Total P	0.196	0.317	0.401	0.155
pH	7.68	7.96	7.01	6.87

Date: 15/10/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	44	39	51	29
Suspended Solids	12	10	14	10
Total Ammonia - N	0.257	0.311	0.194	0.302
Total P	0.105	0.217	0.348	0.200
pH	7.91	7.53	7.81	7.24

Date: 22/10/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	57	34	41	35
Suspended Solids	8	10	6	12
Total Ammonia - N	0.241	0.304	0.410	0.363
Total P	0.157	0.354	0.217	0
pH	7.54	7.15	7.68	7.31

Date: 29/10/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	29	44	38	50
Suspended Solids	8	10	8	12
Total Ammonia - N	0.317	0.184	0.269	0.217
Total P	0.274	0.219	0.233	0.189
pH	8.01	7.65	7.18	7.39

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03/09/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	34	41	27	36
Suspended Solids	8	10	12	10
Total Ammonia - N	0.374	0.264	0.397	0.214
Total P	0.241	0.148	0.201	0.121
pH	7.32	7.81	7.31	7.49

Date: 10/09/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	47	51	34	50
Suspended Solids	4	6	6	12
Total Ammonia - N	0.455	0.311	0.297	0.210
Total P	0.178	0.142	0.314	0.112
pH	7.64	7.02	7.14	7.31

Date: 17/09/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	44	49	35	51
Suspended Solids	8	10	12	4
Total Ammonia - N	0.405	0.391	0.352	0.261
Total P	0.244	0.301	0.214	0.195
pH	7.51	7.31	7.09	8.02

Date: 24/09/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	31	27	40	56
Suspended Solids	4	8	8	14
Total Ammonia - N	0.194	0.214	0.266	0.349
Total P	0.277	0.308	0.329	0.212
pH	7.25	7.58	7.12	7.84

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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 06/08/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	31	25	36
Suspended Solids	8	10	12	6
Total Ammonia - N	0.143	0.279	0.159	0.237
Total P	0.281	0.174	0.216	0.193
pH	7.10	7.34	7.62	7.59

Date: 13/08/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	48	34	DRY
Suspended Solids	4	12	10	DRY
Total Ammonia - N	0.398	0.189	0.211	DRY
Total P	0.241	0.217	0.276	DRY
pH	7.49	7.67	7.24	DRY

Date: 20/08/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	37	43	27
Suspended Solids	8	8	10	6
Total Ammonia - N	0.262	0.318	0.216	0.192
Total P	0.194	0.264	0.273	0.143
pH	7.51	7.68	7.14	7.37

Date: 27/08/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	19	34	29	23
Suspended Solids	10	6	10	12
Total Ammonia - N	0.268	0.187	0.334	0.314
Total P	0.193	0.227	0.216	0.288
pH				

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02/07/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	24	41	DRY	DRY
Suspended Solids	8	12	DRY	DRY
Total Ammonia - N	0.241	0.349	DRY	DRY
Total P	0.364	0.272	DRY	DRY
pH	7.42	7.63	DRY	DRY

Date: 09/07/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	23	DRY	DRY
Suspended Solids	4	12	DRY	DRY
Total Ammonia - N	0.141	0.227	DRY	DRY
Total P	0.245	0.261	DRY	DRY
pH	7.59	7.31	DRY	DRY

Date: 16/07/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	37	26	41	18
Suspended Solids	8	6	8	10
Total Ammonia - N	0.282	0.327	0.199	0.267
Total P	0.161	0.278	0.253	0.194
pH	7.14	7.92	7.01	7.26

Date: 23/07/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	47	31	36	29
Suspended Solids	8	8	10	12
Total Ammonia - N	0.167	0.211	0.255	0.374
Total P	0.213	0.318	0.267	0.263
pH	7.68	6.94	7.84	7.21

Date: 30/07/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	31	22	47	19
Suspended Solids	6	8	12	8
Total Ammonia - N	0.277	0.137	0.268	0.384
Total P	0.452	0.166	0.314	0.410
pH	7.14	7.31	7.78	7.47

SILVER HILL FARM
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mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 04/06/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	15	12	DRY	DRY
Suspended Solids	6	4	DRY	DRY
Total Ammonia - N	0.159	0.142	DRY	DRY
Total P	0.217	0.194	DRY	DRY
pH	7.31	7.42	DRY	DRY

Date: 11/06/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	12	8	10
Suspended Solids	6	8	8	4
Total Ammonia - N	0.287	0.315	0.274	0.258
Total P	0.178	0.163	0.219	0.171
pH	7.63	7.57	7.53	7.64

Date: 18/06/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	18	21	15
Suspended Solids	4	8	8	6
Total Ammonia - N	0.118	0.214	0.197	0.216
Total P	0.224	0.233	0.164	0.194
pH	7.44	7.31	7.52	7.46

Date: 25/06/2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	6	10	11	15
Suspended Solids	6	4	6	10
Total Ammonia - N	0.244	0.161	0.258	0.314
Total P	0.129	0.183	0.219	0.116
pH	7.51	7.49	7.14	7.35

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07-05-2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	24	Dry	Dry
Suspended Solids	10	8	Dry	Dry
Total Ammonia - N	0.211	0.138	Dry	Dry
Total P	0.164	0.214	Dry	Dry
pH	7.67	7.59	Dry	Dry

Date: 14-05-2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	26	Dry	Dry
Suspended Solids	6	8	Dry	Dry
Total Ammonia - N	0.272	0.392	Dry	Dry
Total P	0.169	0.257	Dry	Dry
pH	7.66	7.45	Dry	Dry

Date: 21-05-2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	25	19	Dry	Dry
Suspended Solids	4	6	Dry	Dry
Total Ammonia - N	0.249	0.197	Dry	Dry
Total P	0.214	0.251	Dry	Dry
pH	7.35	7.61	Dry	Dry

Date: 28-05-2020	**SW2**	**SW3**	**SW4**	**SW5**
COD	20	18	Dry	Dry
Suspended Solids	2	4	Dry	Dry
Total Ammonia - N	0.125	0.244	Dry	Dry
Total P	0.334	0.191	Dry	Dry
pH	7.47	7.46	Dry	Dry

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02-04-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	16	18	19
Suspended Solids	6	8	6	10
Total Ammonia - N	0.162	0.314	0.224	0.129
Total P	0.281	0.117	0.326	0.367
pH	7.15	7.36	7.41	7.62

Date: 09-04-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	22	14	16	14
Suspended Solids	10	8	12	10
Total Ammonia - N	0.274	0.158	0.217	0.329
Total P	0.181	0.294	0.304	0.364
pH	7.25	7.16	7.51	7.42

Date: 16-04-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	14	12	Dry	Dry
Suspended Solids	6	4	Dry	Dry
Total Ammonia - N	0.214	0.297	Dry	Dry
Total P	0.164	0.216	Dry	Dry
pH	7.14	7.28	Dry	Dry

Date: 23-04-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	10	8	Dry	Dry
Suspended Solids	8	4	Dry	Dry
Total Ammonia - N	0.193	0.265	Dry	Dry
Total P	0.274	0.291	Dry	Dry
pH	7.69	7.67	Dry	Dry

Date: 30-04-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	16	21	Dry	Dry
Suspended Solids	6	10	Dry	Dry
Total Ammonia - N	0.317	0.343	Dry	Dry
Total P	0.268	0.211	Dry	Dry
pH	7.25	7.37	Dry	Dry

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	**Action Limits**
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 05-03-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	21	8	13
Suspended Solids	6	4	12	6
Total Ammonia - N	0.275	0.164	0.257	0.415
Total P	0.089	0.153	0.261	0.289
pH	7.35	7.49	7.28	7.62

Date: 12-03-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	8	16	14	25
Suspended Solids	2	12	6	8
Total Ammonia - N	0.157	0.191	0.352	0.278
Total P	0.098	0.178	0.341	0.198
pH	7.52	7.61	7.18	7.21

Date: 19-03-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	18	10	8
Suspended Solids	8	6	10	8
Total Ammonia - N	0.219	0.184	0.378	0.265
Total P	0.162	0.243	0.361	0.337
pH	7.51	7.28	7.32	7.61

Date: 26-03-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	11	8	6	4
Suspended Solids	4	2	6	4
Total Ammonia - N	0.164	0.387	0.191	0.238
Total P	0.254	0.197	0.214	0.369
pH	7.41	7.54	7.68	7.39

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 06-02-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	Dry	10	Dry
Suspended Solids	2	Dry	6	Dry
Total Ammonia - N	0.311	Dry	0.039	Dry
Total P	0.264	Dry	0.214	Dry
pH	7.31	Dry	7.41	Dry

Date: 13-02-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	5	11	12
Suspended Solids	2	6	4	6
Total Ammonia - N	0.189	0.050	0.021	0.274
Total P	0.460	0.350	0.081	0.311
pH	7.47	7.25	7.20	7.01

Date: 20-02-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	10	6	12	11
Suspended Solids	6	4	8	4
Total Ammonia - N	0.189	0.050	0.021	0.421
Total P	0.440	0.368	0.164	0.297
pH	7.44	7.30	7.31	7.20

Date: 27-02-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	10	8	5	9
Suspended Solids	6	8	10	8
Total Ammonia - N	0.287	0.354	0.369	0.435
Total P	0.235	0.319	0.114	0.217
pH	7.32	7.41	7.35	7.29

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 02-01-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	17	12	10	8
Suspended Solids	4	2	4	2
Total Ammonia - N	0.150	0.047	0.029	0.25
Total P	0.451	0.201	0.187	0.360
pH	7.60	7.49	7.91	7.71

Date: 09-01-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	5	14	16
Suspended Solids	2	8	2	4
Total Ammonia - N	0.432	0.091	0.048	0.258
Total P	0.378	0.216	0.381	0.439
pH	7.48	7.34	7.49	7.54

Date: 16-01-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	7	16	14
Suspended Solids	2	6	4	6
Total Ammonia - N	0.397	0.090	0.039	0.264
Total P	0.317	0.251	0.097	0.387
pH	7.38	7.30	7.41	7.50

Date: 23-01--20	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	Dry	14	Dry
Suspended Solids	2	Dry	2	Dry
Total Ammonia - N	0.360	Dry	0.032	Dry
Total P	0.479	Dry	0.264	Dry
pH	7.35	Dry	7.40	Dry

Date: 30-01-20	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	6	8	5
Suspended Solids	4	6	4	8
Total Ammonia - N	0.211	0.087	0.040	0.359
Total P	0.257	0.319	0.296	0.390
pH	7.34	7.30	7.39	7.55

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 05/12/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	5	12	9	2
Suspended Solids	5	2	10	8
Total Ammonia - N	0.150	0.047	0.029	0.45
Total P	0.451	0.350	0.497	0.360
pH	7.60	7.49	7.91	7.71

Date: 12/12/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	14	13	8	10
Suspended Solids	12	7	3	8
Total Ammonia - N	0.176	0.082	0.062	0.472
Total P	0.478	0.213	0.098	0.159
pH	7.33	7.95	7.31	7.68

Date: 19/12/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	14	10	11	7
Suspended Solids	13	8	7	12
Total Ammonia - N	0.410	0.066	0.122	0.387
Total P	0.422	0.312	0.487	0.356
pH	7.44	7.50	7.77	7.75

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 07/11/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	12	14	18	15
Suspended Solids	5	4	8	7
Total Ammonia - N	0.190	0.049	0.028	0.37
Total P	0.45	0.32	0.41	0.353
pH	7.68	7.69	7.92	7.93

Date: 14/11/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	18	10	11	6
Suspended Solids	5	2	3	8
Total Ammonia - N	0.157	0.064	0.014	0.42
Total P	0.422	0.429	0.26	0.367
pH	7.49	7.54	7.77	7.75

Date:21/11/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	17	Dry	13	4
Suspended Solids	2	Dry	6	10
Total Ammonia - N	0.151	Dry	0.013	0.14
Total P	0.414	Dry	0.172	0.471
pH	7.39	Dry	7.55	7.45

Date: 28/11/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	38	21	9	Dry
Suspended Solids	14	5	8	Dry
Total Ammonia - N	0.434	0.124	0.027	Dry
Total P	0.349	0.179	0.217	Dry
pH	7.40	7.70	7.77	Dry

Date:	**SW2**	**SW3**	**SW4**	**SW5**
COD				
Suspended Solids				
Total Ammonia - N				
Total P				
pH				

SILVER HILL FARM
ESTABLISHED 1962

mg/L	Trigger Values	
	Warning Limits	Action Limits
COD	75	100
Suspended Solids	15	25
Total Ammonia - N	0.5	1
Total P	0.5	1
pH	< 6.5 - > 8.5	< 6 - > 9

Date: 03.10.19	**SW2**	**SW3**	**SW4**	**SW5**
COD	13	Dry	17	25
Suspended Solids	4	Dry	6	5
Total Ammonia - N	0.104	Dry	0.137	0.45
Total P	0.124	Dry	0.224	0.215
pH	7.1	Dry	7.3	7.5

Date: 10.10.19	**SW2**	**SW3**	**SW4**	**SW5**
COD	11	Dry	Dry	31
Suspended Solids	5	Dry	Dry	6
Total Ammonia - N	0.087	Dry	Dry	0.33
Total P	0.098	Dry	Dry	0.233
pH	7.2	Dry	Dry	7.6

Date: 17.10.19	**SW2**	**SW3**	**SW4**	**SW5**
COD	10	Dry	19	28
Suspended Solids	5	Dry	6	6
Total Ammonia - N	0.050	Dry	0.031	0.41
Total P	0.211	Dry	0.202	0.236
pH	7.0	Dry	7.1	7.3

Date: 24.10.19	**SW2**	**SW3**	**SW4**	**SW5**
COD	11	10	17	24
Suspended Solids	4	7	6	6
Total Ammonia - N	0.042	0.036	0.150	0.30
Total P	0.084	0.077	0.188	0.206
pH	6.9	7.0	7.1	7.1

Date:31/10/19	**SW2**	**SW3**	**SW4**	**SW5**
COD	9	Dry	Dry	Dry
Suspended Solids	4	Dry	Dry	Dry
Total Ammonia - N	0.066	Dry	Dry	Dry
Total P	0.074	Dry	Dry	Dry
pH	7.2	Dry	Dry	Dry

Independent Analytical Supplies

Test Report

Lab Report Number: 10018S001

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	220622F
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	EFFLUENT	**Date Sample Received:**	19/04/2022
Sample Reference:	FOG	**Date Analysis Commenced:**	19/04/2022
Sample Description:	FOG	**Date Certificate Issued:**	05/05/2022

Parameter	Method	Result	Unit
Oils, Fats and Grease	SOP 2015	1.3	mg/l

Signed: WD McCall Date: 29/06/2022

Wendy McCall - Laboratory Manager

^ = Subcontracted

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Phone: 059 9721022 Email: reception@iaslabs.ie Web: www.iaslabs.ie

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Independent Analytical Supplies

Test Report

Lab Report Number: 11504S005

Customer ID:	SILV.H1	**Analysis Type:**	Silver 1 (SILVER 1)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	250822I
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	EFFLUENT	**Date Sample Received:**	25/08/2022
Sample Reference:	WATER SAMPLES	**Date Analysis Commenced:**	25/08/2022
Sample Description:	V NOTCH	**Date Certificate Issued:**	14/09/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.60	pH units
Biochemical Oxygen Demand	SOP 2006	2	mg/l
Chemical Oxygen Demand	SOP 2005	28	mg/l
Total Suspended Solids	SOP 2016	4	mg/l
Total Nitrogen	SOP 2075	3.14	mg/l
Ammonia Nitrogen	SOP 2057	0.28	mg/l NH_3-N
Total Phosphorus	SOP 2126	0.31	mg/l P
Orthophosphate P	SOP 2061	0.19	mg/l P
Oils, Fats and Grease*	SOP 2015	2.4	mg/l

Signed: Laura Kavanagh Date: 14/09/2022

Laura Kavanagh - Deputy Lab Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: 7069S001

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	220622F
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	EFFLUENT	**Date Sample Received:**	08/02/2022
Sample Reference:	FOG	**Date Analysis Commenced:**	08/02/2022
Sample Description:	FOG	**Date Certificate Issued:**	23/02/2022

Parameter	Method	Result	Unit
Oils, Fats and Grease	SOP 2015	2.1	mg/l

Signed: _____ Date: 29/06/2022

Wendy McCall - Laboratory Manager

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Independent Analytical Supplies

Test Report

Lab Report Number: **10426S001**

Customer ID:	SILV.H1	**Analysis Type:**	99A (99A)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	CUSTOMER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	220622F
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	EFFLUENT	**Date Sample Received:**	22/06/2022
Sample Reference:	FOG	**Date Analysis Commenced:**	22/06/2022
Sample Description:	FOG	**Date Certificate Issued:**	29/06/2022

Parameter	Method	Result	Unit
Oils, Fats and Grease	SOP 2015	2.3	mg/l

Signed: WD McCall Date: 29/06/2022

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number: 8585S001

Customer ID:	SILV.H1	**Analysis Type:**	Silver 3 Effluent (SILVER 3 E)
Contact Name:	STEPHEN ASKIN	**Delivery By:**	COURIER
Company Name:	SILVER HILL FOODS	**Sample Card Number:**	200422.K1
Address:	EMYVALE CO MONAGHAN	**Condition on Receipt:**	Acceptable
Sample Type:	EFFLUENT	**Date Sample Received:**	22/03/2022
Sample Reference:	EFFLUENT	**Date Analysis Commenced:**	22/03/2022
Sample Description:	V NOTCH	**Date Certificate Issued:**	05/04/2022

Parameter	Method	Result	Unit
pH	SOP 2004	7.34	pH units
Biochemical Oxygen Demand	SOP 2006	5	mg/l
Chemical Oxygen Demand	SOP 2005	29	mg/l
Total Nitrogen	SOP 2075	11.2	mg/l
Total Phosphorus	SOP 2126	0.41	mg/l P
Total Suspended Solids	SOP 2016	6	mg/l
Orthophosphate P	SOP 2061	0.13	mg/l P
Ammonia Nitrogen	SOP 2057	0.086	mg/l NH_3-N
Oils, Fats and Grease	SOP 2015	3	mg/l
Conductivity	SOP 2076	691	µS/cm 20°C

Signed: WD McCall Date: 04/05/2022

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

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Appendix 7.4 a: Sewer Connection Layout Map

LEGEND

- Proposed electrical lines
- Proposed connection to existing onsite water supply
- feather line to existing disposal at feather plant
- Process wash water to existing on site lines
- Surface water
- Proposed foulwater connection

Drip Irrigation Bed
Drip Irrigation Plant Room
Proposed area for Attenuation system 637m3 capacity
Proposed 300mm dia overflow pipe for surface water to Lagoon
Proposed Exit SW 1
Proposed Pump unit for Process water
SW (1)
SWM 11
Hydrobrake
Existing Wash water Holding Tank
28M
Existing Lagoon
4.8-5.4m deep
44M
Existing bunded area
SWM
Oil interceptor
Silt Trap
Existing Sub station
LEAK DETECTION
2no 125 dia ducts to Main Factory
2no 150 dia ducts
SUB-STATION
Structures to be demolished
SWM
Tank
Existing sub
Proposed grit tank and petrol interceptor
(8)
SWM 10
122.793+ C.L
120.393+ I.L
(5)
Treatment
Process water
PO3
Process water
SW. PT (2)
SW. PT (3)
sign
Existing Surface water line removed
5J
K
L
5M
5N
5O
5P
5Q
SWM 9
SWM 8
SWM 7
M.H
104
8 no cycle parking covered stands
Aeration Basin (not in use)
Contact Tank
100mm dia. duct
Proposed Gas Tank surrounded with protective bollards
PROPOSED OFAL PROCESSING EXTENSION
(4)
39.5M
Treatment Percolation
New concrete apron surrounding building.
New SW gullies connecting into the SW system
Existing Entrance
SITE NOTICE
SWM
SWM 6
128.493+ C.L
124.893+ I.L
EXISTING SEWAGE PUMP STATION
Proposed 6m high Light pole
Proposed Crossing point (C.P)
SWM 5
128.193+ I.L
Proposed 6m high Light pole
SWM 4
128.322+ I.L
Surface water
SWM 1
128.715+ I.L
Proposed 6m high Light pole
6J
6K°
6L°
6M
6N
6O
6P
6Q
Proposed underground water storage tank
TANK 1
TANK 2
TANK 3
TANK 4
Proposed connection to existing slurry line
Proposed Grassed area
DAF Unit
Proposed path 2.2m wide, 150mm depth, 30N concrete for cable tray support.
To processing plant
204.9M
GRAVEL AREA
CONCRETE
SKIP HOUSE
FEATHER PLANT
153.3M
Feather Line
Proposed Crossing point (C.P)
Existing surface water line
Process water
FOULWATER
Surface water
Feather Line
Process water
(7)
(3)
F.F.L130.543+
(8)
Solar Panels
(1)
PROPOSED FACTORY
(9)
Solar Panels
7J
7K
7L
7M
7N
7O
7P
Existing concrete yard area to be demolished
Proposed factory development 130.543+F.F.L
Proposed mesh security fence
Proposed green area/grass/trees
SW. PT (4).
Proposed employee access footpath
Existing silt trap
Proposed Sliding gate
Proposed Crash Barrier
Proposed Surface water line
Proposed conveyor to factory from chillrc
Proposed Retaining wall
Proposed underground water storage tank
Proposed Gravel access road
Proposed gas tank to be removed
Proposed Crash Barrier
Proposed skip house shed 133.669+ F.F
Proposed gravel yard area
Existing surface water line
Proposed Reinforced concrete ret. W
Existing surface water line
Conveyor
SWM 3
128.629+ I.L
Proposed green area/grass/trees/benches
Plant Room
F.F.L133.669+
Skip House
Plant Yard
(2)
86.1M
8J
8K
8L
8M
8N
8O
8P
Proposed Retaining wall
OVERHEAD POWER LINE
WATER TREATMENT
Mainswater
REDUNDANT/ DISUSED GROWING UNIT 4
WATER
RWP
GENERATOR
SUB STATION
DIESEL
CABIN
GAS
EVENI
EVENING SUN
MORNING SUN
N
W
E
S

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CLIENT: Silverhill Foods Ltd.

PROJECT: Proposed Factory Development at Corlattallan, Emyvale, Co. Monaghan

DATE: 28/01/2023

REV	DRAWN	CHECKED	APPROVED
00	-	M. HETHERTON	M. HETHERTON

DRAWING No.: D9

TITLE: **TOTAL SERVICES LAYOUT MAP**

SCALES: 1:500@A1

SEWER CONNECTION

LEGEND

- Proposed electrical lines
- Proposed connection to existing onsite water supply
- feather line to existing disposal at feather plant
- Process wash water to existing on site lines
- Surface water
- Proposed foulwater connection

Drip Irrigation Bed
Drip Irrigation Plant Room
Proposed area for Attenuation system 637m3 capacity
Proposed 300mm dia overflow pipe for surface water to Lagoon
Proposed Exit SW 1
Proposed Pump unit for Process water
SW (1)
SWM 11
Existing Wash water Holding Tank
Hydrobrake
28M
Existing Lagoon 4.8-5.4m deep
44M
Existing bunded area
SWM
Oil interceptor
Silt Trap
Existing Sub station
LEAK DETECTION
2no 125 dia ducts to Main Factory
2no 150 dia ducts
SUB-STATION
Structures to be demolished
SWM
Tank
Existing sub
Proposed grit tank and petrol interceptor
(8)
SWM 10
122.793+ C.L
120.393+ I.L
(5)
Treatment
Process water
PO3
Process water
Aeration Basin (not in use)
5J
5K
5L
5M
5N
5O
5P
5Q
sign
Existing Surface water line removed
SW. PT (2)
SW. PT (3)
SWM
SWM 9
SWM 8
SWM 7
M.H
8 no cycle parking covered stands
Existing Entrance
SITE NOTICE
EXISTING SEWAGE PUMP STATION
SWM 6
128.493+ C.L
124.893+ I.L
Process water
100mm dia. duct
Proposed Gas Tank surrounded with protective bollards
PROPOSED OFAL PROCESSING EXTENSION
(4)
39.5M
New concrete apron surrounding building.
New SW gullies connecting into the SW system
Treatment Percolation
Proposed underground water storage tank
TANK 1
TANK 2
TANK 3
TANK 4
Proposed connection to existing slurry line
Proposed Grassed area
DAF Unit
Proposed path 2.2m wide, 150mm depth, 30N concrete for cable tray support.
To processing plant
204.9M
Proposed 6m high Light pole
Proposed Crossing point (C.P)
Proposed 6m high Light pole
SWM 5
128.193+ I.L
SWM 4
128.322+ I.L
SWM 1
128.715+ I.L
Surface water
Foul water
Process water
Feather Line
Surface water
Feather Line
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6J
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Solar Panels
(1)
PROPOSED FACTORY
(9)
(7)
Solar Panels
7J
7K
7L
7M
7N
7O
EMYVALE
office development
PAVING
WHEEL CHAIR ACCESS
Conveyor
SWM 3
128.629+ I.L
GENERATOR
SUB STATION
GAS
Proposed green area/grass/trees/benches
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Proposed Reinforced concrete ret. W
Existing surface water line
EVENI
EVENING SUN
MORNING SUN
N
W
E
S

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REV	DRAWN	CHECKED	APPROVED
00	-	M. HETHERTON	M. HETHERTON

DRAWING No.: D9

TITLE: **SEWER CONNECTION LAYOUT MAP**

SCALES: 1:500@A1

Appendix 8.1: Katestone Air Quality Assessment Report

Air Quality Assessment – Silver Hill Foods Emyvale Facility

Prepared for:

Silver Hill Foods Unlimited Company

January 2023

Final

Prepared by:

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Reviewed by:	Simon Welchman
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Contents

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Glossary

Term	Definition
kg	kilogram
kg/m³	kilogram per cubic meter
km	kilometre
km/hr	kilometre per hour
m	metre
m/s	metres per second
m^2	square metres
m^3	cubic metres
m^3/s	cubic metres per second
m^3/hr	cubic metres per hour
mg	milligram
Mg	Megagram
mg/kg	Milligram per kilogram
MWh	Megawatt hour
Z_0	roughness length
$\mu g/m^3$	micrograms per cubic meter
Nomenclature	**Definition**
NO_2	nitrogen dioxide
N_2O	nitrous oxide
PM_{10}	particulate matter with a diameter less than 10 micrometres
$PM_{2.5}$	particulate matter with a diameter less than 2.5 micrometres
Abbreviations	**Definition**
AG4	Air Guidance 4
BAT	Best available techniques
CAFE	Cleaner Air for Europe
EC	European Council
EPA	Environmental Protection Agency
EF	Emission factor
EU	European Union
UK	United Kingdom
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

Katestone Environmental Pty Ltd (Katestone) was commissioned by Silver Hill Foods Unlimited Company to complete an air quality assessment (AQA) of a thermal oxidiser that will be installed at its food processing facility at Emyvale, Co. Monaghan (Silver Hill Emyvale Facility). The Silver Hill Emyvale Facility operates under a licence issued by EPA (licence registration P0422-03).

Silver Hill Foods Unlimited Company proposes to install the thermal oxidiser as part of a proposed rendering plant at the Silver Hill Emyvale Facility. The thermal oxidiser will function as an air pollutant abatement system and will also produce thermal energy for the rendering process.

There are two existing boilers at the site including:

- A duty gas-fired boiler that is used to produce steam required for production processes
- A back-up gasoil fired boiler that only operates when the duty boiler is off-line (e.g., during maintenance).

The AQA has been conducted to determine the potential cumulative impact of emissions from the proposed thermal oxidiser in conjunction with the onsite boilers

The AQA is underpinned by dispersion modelling assessments, which have been conducted in accordance with the EPA Ireland's Air Guidance note for dispersion modelling (AG4).

2. OVERVIEW OF THE SILVER HILL EMYVALE FACILITY

The Silver Hill Emyvale Facility is located in a rural area of Co. Monaghan, immediately north of the village of Emyvale.

The duty gas-fired boiler is an IVAR BHP 1750 steam boiler. It has an attached Ecoflam burner (model BLU 1500.1 Low NO_x PAB TC). The back-up gasoil fired boiler is an IVAR BHP 1750 steam boiler. It has an attached Riello burner (Model RL130). The rated thermal capacity of the Riello RL130 is 1,540 kW.

The proposed thermal oxidiser will be fueled using LPG. Foul air and cooking vapours will be passed into the combustion chamber of the thermal oxidiser where they will be oxidised to compounds that are not odorous (chiefly carbon dioxide and water vapour). The oxygen required for combustion will come from air extracted from the mill meal cooler room and ducted to the combustion chamber. Additional fresh air can be supplied if necessary.

The Silver Hill Emyvale Facility includes a duck rearing operation with ducks kept in a number of housing units. The duck rearing operation is proposed to be decommissioned. The site layout is presented in Figure 1.

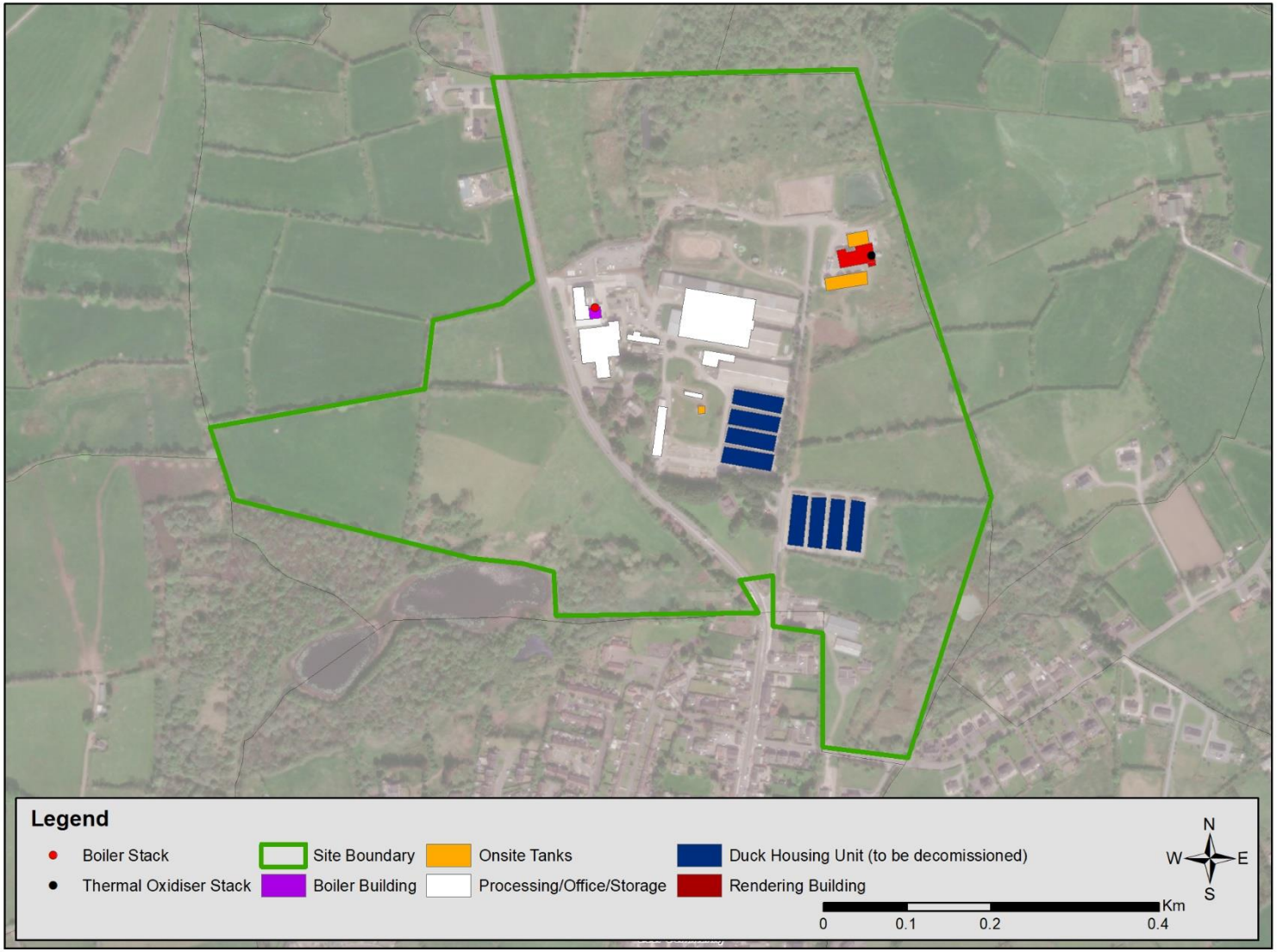

Figure 1 **Layout of the Silver Hill Emyvale Facility**

3. REGULATORY FRAMEWORK AND ASSESSMENT CRITERIA

3.1 Environmental Protection Agency Acts 1992 and 2003

The *Environmental Protection Agency Act 1992 (EPA Act)* and Part 2 of the *Protection of the Environment Act 2003* are collectively referred to as the *Environmental Protection Agency Acts 1992 and 2003*. The *Environmental Protection Agency Acts 1992 and 2003* provide for the management of air emissions from activities (meaning any process, development or operation) specified in the First Schedule of the *Environmental Protection Agency Acts 1992 and 2003*.

Section 4 (2) of the *Environmental Protection Agency Acts 1992 and 2003* states that Air Pollution:

> *"means the direct or indirect introduction to an environmental medium, as a result of human activity, of substances, heat or noise which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment, and includes -*
>
> *(a) 'air pollution' for the purposes of the Air Pollution Act 1987,*
>
> *(b) ……..*
>
> *(c) ……."*

The *Air Pollution Act 1987* (AP Act) is "*an act to provide for the control of air pollution and other matters connected with air pollution".* According to the AP Act *"'pollutant' means any substance specified in the First Schedule or any other substance (including a substance which gives rise to odour) or energy which, when emitted into the atmosphere either by itself or in combination with any other substance, may cause air pollution".*

Section 4 of the AP Act states:

> *"Air pollution" in this Act means a condition of the atmosphere in which a pollutant is present in such a quantity as to be liable to —*
>
> *(i) be injurious to public health, or*
>
> *(ii) have a deleterious effect on flora or fauna or damage property, or*
>
> *(iii) impair or interfere with amenities or with the environment."*

Section 24 of the AP Act states:

> *(1) The occupier of any premises, other than a private dwelling, shall use the best practicable means to limit and, if possible, to prevent an emission from such premises.*
>
> *(2) The occupier of any premises shall not cause or permit an emission from such premises in such a quantity, or in such a manner, as to be a nuisance.*
>
> *(3) In any prosecution for a contravention of this section, it shall be a good defence to establish that—*
>
> *(a) the best practicable means have been used to prevent or limit the emission concerned, or*
>
> *(b) the emission concerned was in accordance with a licence under this Act, or*
>
> *(c) the emission concerned was in accordance with an emission limit value, or*

(d) the emission concerned was in accordance with a special control area order in operation in relation to the area concerned, or

(e) in the case of an emission of smoke, the emission concerned was in accordance with regulations under section 25, or

(f) the emission did not cause air pollution.

Section 75 (1) the *Environmental Protection Agency Acts 1992 and 2003* states:

"The Agency shall, in relation to any environmental medium and without prejudice to its functions under section 103, specify and publish quality objectives which the Agency considers reasonable and desirable for the purposes of environmental protection."

3.2 Air contaminants

The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives. The fourth Daughter Directive (2004/107/EC) will be included in CAFE at a later stage. The limit and target values for both Directives are outlined below.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) (DEHLG, 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

The limit values of the CAFE Directive that have been applied in this assessment are presented in Table 1.

Table 1 Limit values of CAFE Directive 2008/50/EC

Air contaminant	Averaging period	Limit value ($\mu g/m^3$)	Basis of application of limit value
NO_2	1-hour	200	Not to be exceeded more than 18 times in a calendar year
	annual	40	Average
PM_{10}	24-hour	50	35th Highest
	annual	40	Average
$PM_{2.5}$	annual	25	Average
SO_2	1-hour	350	Not to be exceeded more than 24 times in a calendar year
	24-hour	125	Not to be exceeded more than 3 times in a calendar year
	annual	20	Average
CO	8-hour	10,000	Maximum
Benzene	Annual	5	Average

3.3 Odour

In 2020, the EPA issued its updated guidance document air quality impact assessment (known as AG4). Appendix H of this document provides guidance that is specific to the assessment of odour impacts using dispersion modelling techniques.

In relation to the odour assessment criteria, AG4 states:

> *Currently there is no general statutory odour standard in Ireland relating to industrial installations.*
>
> .....
>
> *Guidance from the UK (EA, 2011, and adapted for Irish EPA use) recommends that odour standards should vary from 1.5 – 6.0 OUE/m3 as a 98th%ile of one hour averaging periods at the worst-case sensitive receptor based on the offensiveness of the odour and with adjustments for local factors such as population density...*

Table A4 of AG4 contains indicative odour standards based on offensiveness of odour that have been adapted for use in Ireland. Relevant aspects are reproduced as follows:

- The most offensive odours should be assessed against an Indicative Criterion of 1.5 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor
- Moderately offensive odours should be assessed against an Indicative Criterion of 3.0 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor
- Less offensive odours should be assessed against an Indicative Criterion of 6.0 OU_E/m^3 as a 98th%ile of hourly averages at the worst-case sensitive receptor.

The industrial sectors that fit into each category are described as follows:

- Most offensive:
    - Processes involving decaying animal or fish remains.
    - Processes involving septic effluent or sludge waste sites including landfills, waste transfer stations and non-green waste composting facilities.
- Moderately offensive
    - Intensive Livestock Rearing
    - Fat Frying / Meat Cooking (Food Processing)
    - Animal Feed
    - Sugar Beet Processing
    - Well aerated green waste composting.
- Less offensive
    - Brewery / Grain / Oats Production
    - Coffee Roasting
    - Bakery
    - Confectionery.

The sources of odour at the Silver Hill Emyvale Facility fall into the moderately offensive category. The most offensive odours to be generated at the site are likely to be associated with by-products from the duck processing facility. These by-products will be transferred to the proposed rendering plant as a fresh product and are, therefore, not subject to significant decay or septic conditions prior to being processed.

The odour exposure criterion relevant to operations at the Site is C98, 1-hour ≤ 3.0 ouE/m^3.

4. EXISTING ENVIRONMENT

4.1 Local terrain and land-use

The Silver Hill Emyvale Facility is in a rural location surrounded by pasture. The village of Emyvale is immediately south of the site.

The terrain of the site and surrounding area is rolling rural with gently undulating areas or relatively flat land. The site has an elevation of approximately 70 metres (m) above sea level. There are no major features in the region that would affect local wind flows.

4.2 Local meteorology

Meteorological parameters recorded at the closest Met Eireann Observation Station to the site at Ballyhaise in Co. Cavan were extracted and processed to assess meteorological conditions.

The observation station at Ballyhaise is approximately 47 km southwest of the site and approximately 60 m above sea level. The terrain surrounding the observation station is relatively flat, undulating and used as pasture. The land between the observation station and the site is also primarily flat. The land surrounding the site and Ballyhaise monitoring station is predominantly comprised of non-irrigated arable land and pastures.

The data from the observation station at Ballyhaise is considered representative of the site due to:

- The similar nature of the terrain at both locations
- The similar nature of land use at both locations
- The absence of major terrain features between the observation station and the site.

Wind speed and wind direction are important parameters for the transport and dispersion of air pollutants. Wind roses representing the annual distribution of winds for each year between 2015 and 2019 are presented in Figure 2.

The prevailing wind direction in Ireland is between south and west. It is clear from Figure 2 that these winds have a strong influence on wind patterns at Ballyhaise. Winds at all times of day are dominated by the prevailing wind directions. During the afternoon, winds are stronger than all other times of day as indicated in the diurnal wind roses (Figure 3).

The seasonal distributions of wind speed and wind direction are presented in Figure 4. The strongest winds at Ballyhaise occur most frequently from south to west during the winter months. Winds during summer are the lightest compared to other seasons. Some south to southeasterly winds occur throughout the year but are most prevalent in autumn and winter.

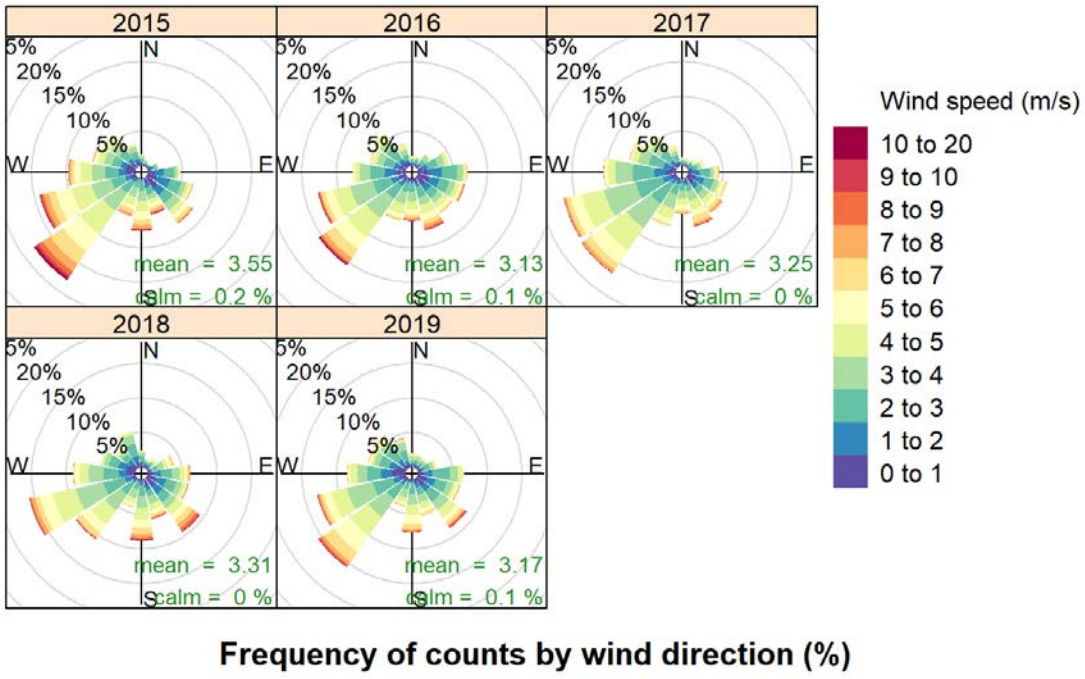

Figure 2 **Wind distribution monitored at Ballyhaise for each year between 2015 and 2019**

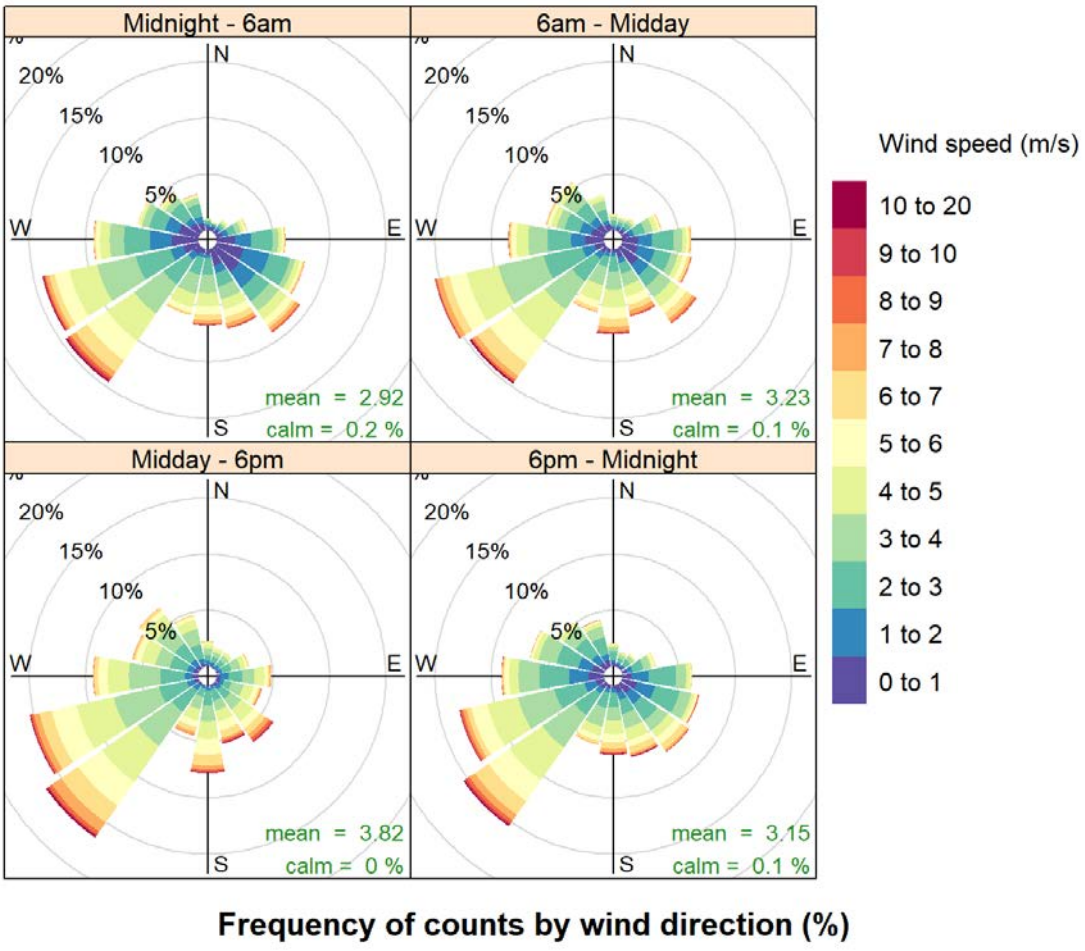

Figure 3 **Diurnal wind distribution at Ballyhaise between 2015 and 2019**

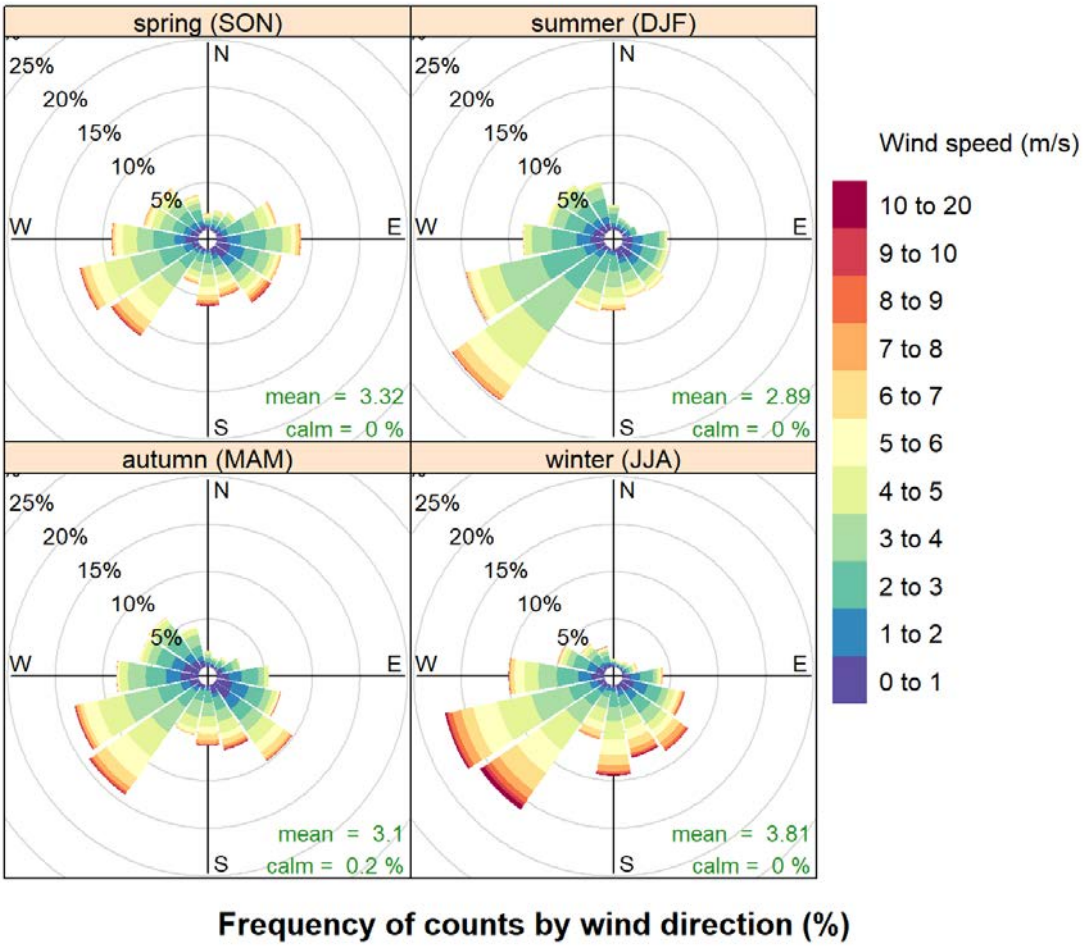

Figure 4 Seasonal wind distribution at Ballyhaise between 2015 and 2019

4.3 Background air quality

Under the Clean Air for Europe Directive, EU member states must designate "Zones" for the purpose of managing air quality. In Ireland, four zones are defined in the *Air Quality Standards Regulations 2011* (DEHLG, 2011). The Silver Hill Emyvale Facility is in Zone D, which is rural Ireland.

Background air quality data for Zone D was obtained from three reports:

- Air Quality in Ireland 2017 – Indicators of Air Quality (EPA, 2018)
- Air Quality in Ireland 2018 – Indicators of Air Quality (EPA, 2019)
- Air Quality in Ireland 2019 – Indicators of Air Quality (EPA, 2020).

A summary of the background data that is relevant to the Silver Hill Emyvale Facility is provided in Table 2.

Table 2 Ambient background data

Pollutant	Averaging period	Value (µg/m^3)	Source
Nitrogen dioxide	1-hour	91	Maximum from Emo or Kilkitt between 2017 and 2019
	Annual	5.0	Maximum from Emo or Kilkitt between 2017 and 2019
PM_{10}	24-hour	12.0[1]	Maximum from Claremorris or Kilkitt between 2017 and 2019
	Annual	12.0	Maximum from Claremorris or Kilkitt between 2017 and 2019
$PM_{2.5}$	Annual	6.0	Maximum from Claremorris between 2017 and 2019
Sulphur Dioxide	1-hour	14.8	Maximum from Shannon Estuary or Kilkitt between 2017 and 2019
	24-hour	4.1	Maximum from Shannon Estuary or Kilkitt between 2017 and 2019
	Annual	2.3	Maximum from Shannon Estuary or Kilkitt between 2017 and 2019
Carbon Monoxide	8-hour	1,240	Maximum concentration measured at Portlaoise in 2019
Benzene	Annual	0.21	Maximum concentration measured at Kilkenny between 2017 and 2019

Note:

[1] UK DEFRA and EPA advise that the 36th high 24-hour mean process contribution can be added to the annual mean background PM_{10}

4.4 Sensitive receptors

The sensitive receptors that are nearest to the site are presented in Figure 5. The closest sensitive receptors are immediately south and immediately west of the site boundary. The closest sensitive receptors east and northeast of the Silver Hill Emyvale Facility are isolated rural dwellings located approximately 250 from the site boundary. The closest sensitive receptor to the boiler stack is over 180 m northwest of the boiler stack location. The closest sensitive receptor to the rendering plant is approximately 350 m west of the thermal oxidiser stack location.

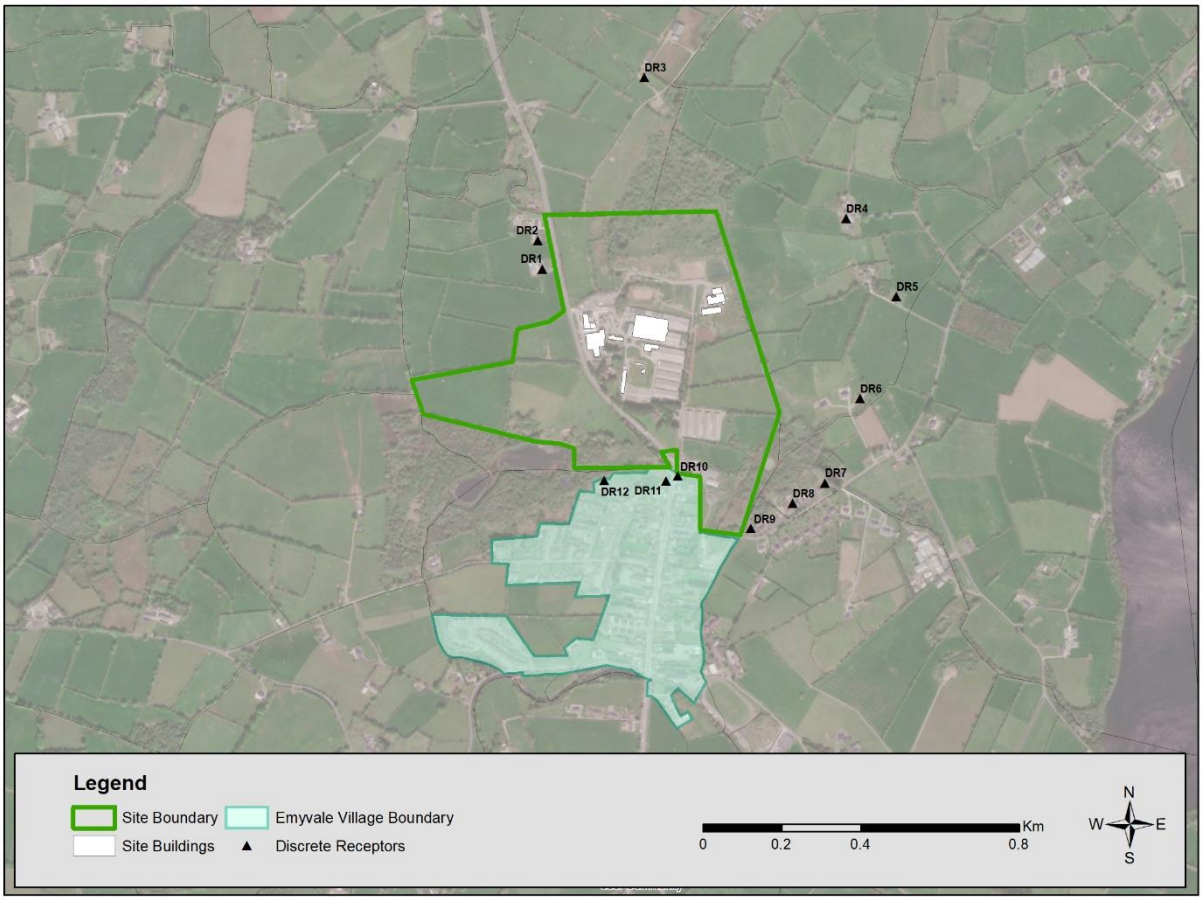

Figure 5 Modelled discrete receptor locations

5. AIR QUALITY ASSESSMENT

5.1 Methodology

The following section describes the modelling methodology that was adopted to assess the potential impacts of air contaminants from the sources of combustion at the Silver Hill Emyvale Facility including the onsite boilers and the thermal oxidiser. The methodology is based on a dispersion modelling study incorporating source characteristics and operational activity data with meteorological data that is representative of the site and surrounding region. The assessment has been prepared in accordance with industry standards, regulatory requirements and best practice approaches.

The sources of emissions at the Silver Hill Emyvale Facility considered in the dispersion modelling assessment include:

- The gas fired boiler
- The back-up gas oil boiler
- The thermal oxidiser

The assessment methodology has included:

- Selection of relevant air quality assessment criteria.
- Derivation of an emissions inventory for onsite sources based on their design, capacity and monitoring reports.
- Characterisation of regional and local meteorology.
- Characterisation of meteorological conditions in the region and generation of a representative meteorological dataset using observations from Ballyhaise.
- Dispersion modelling using the regulatory dispersion model, AERMOD, to predict ground-level concentrations of air contaminants across a Cartesian grid that covers the study area.
- Comparison of the predicted ground-level concentrations of air contaminants against the relevant air contaminant assessment criteria.

The air contaminants included in the assessment are nitrogen dioxide (NO_2), particulate matter (PM) including PM_{10} (fine particulate matter with an aerodynamic diameter ≤10 µm) and $PM_{2.5}$ (fine particulate matter with an aerodynamic diameter ≤2.5 µm), sulphur dioxide (SO_2), carbon monoxide (CO) and benzene. These air contaminants were included in the assessment as they either have limits specified in the Air Quality Standards Regulations 2011, as amended, or have emission limits specified in EPA licenses for thermal oxidisers operating at other rendering plants in the Republic of Ireland.

The potential impact of odour emissions from the thermal oxidiser has also been considered as odour emission limits have been specified in EPA licenses for thermal oxidisers operating at other rendering plants in the Republic of Ireland.

One of the drawbacks of dispersion modelling with multiple sources of odour is that the model assumes that the odours are additive. While this is correct for single chemical contaminants, it is not correct for odour units because the actual downwind odour concentration will depend on the various concentrations of the chemical constituents in the odour mixture. If the two sources were of quite different make-up, then the combined, diluted mixture of these two odour sources can have quite a different cumulative impact on the receiving environment. In some cases the effects may be additive and in other cases it may be positively or negatively synergistic (EHP, 2021).

The character of post combustion emissions from the thermal oxidiser will be different from the cooking odours (pet food facility and duck cooking infrastructure) and the non-cooking odour (wastewater treatment, irrigation, duck processing and manure storage) considered in the EIAR. As the character of post combustion emissions from the thermal oxidiser will be different from the odours considered in the EIAR they have been assessed separately. The results of the assessment of odour from the thermal oxidiser in isolation are presented in this report.

5.2 Meteorological modelling

The EPA's Air Dispersion Modelling Guidance Note (AG4) (EPA, 2020) states:

> "*The dispersion process is dependent on the underlying meteorological conditions and ensuring that the air dispersion model includes representative meteorological data is critical.*
>
> *The USEPA (24) has defined meteorological representativeness as:*
>
> > *"the extent to which a set of {meteorological} measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application"*
>
> *and has expanded on this definition by outlining the factors to consider in the selection of appropriate meteorological data:*
>
> - *Proximity of the meteorological station to the modelling domain;*
> - *The complexity of the terrain;*
> - *The exposure of the meteorological monitoring site;*
> - *The period of time during which data is collected."*

Data gathered at Ballyhaise is likely to be representative of meteorological conditions at the Silver Hill Emyvale Facility as defined in EPA's Air Dispersion Modelling Guidance Note (AG4).

AERMET is a general-purpose meteorological preprocessor for organizing meteorological data into a format suitable for use by the AERMOD air quality dispersion model.

The AERMET meteorological pre-processor was configured with surface data from Ballyhaise and upper air data from Castor Bay in Co. Down. AERMET was used to generate a meteorological file suitable for use in the AERMOD dispersion model.

AERMET requires inputs of roughness length (Z_o), Bowen ratio and Albedo. The AERMET User's Guide stipulates that Z_o should be determined based on land cover within a 1.0 km radius of the meteorological site. If the value of Z_o varies significantly by direction, then sector dependency should be used. Sector width should be >= 30°.

The Bowen ratio and Albedo should be determined based on land cover within a 10 km x 10 km domain. A simple unweighted mean has been used for the Albedo and a weighted geometric mean for the Bowen ratio as required by the AERMET User's Guide.

The approach to determine these parameters is described in Appendix A.

5.3 Development of an emissions inventory

The operation of the boilers and the thermal oxidiser at the Silver Hill Emyvale Facility will result in emissions of combustion products to the atmosphere.

This section describes the emissions inventory developed for the air quality assessment.

5.3.1 Ivar Boiler - Gas

The gas fired boiler is an IVAR BHP 1750 steam boiler. It has an attached Ecoflam burner (model BLU 1500.1 Low NO_x PAB TC). Ecoflam states that the model of gas burner is a low NO_x burner that is certified to Class 3 according to European Standard EN676, which limits emissions of NO_x to less than 80 mg/kWh (Ecoflam, 2021).

The emission rate of NO_x was derived for the gas boiler at the Emyvale Facility as the product of:

- The thermal input of the burner at rated capacity.
- The emission limits specified in European standard EN 676 for gas boilers that meet Class 3 emission limit value of 80 mg/kWh for NO_x.

The emission rate of other air contaminants was derived using emission factors published by the European Environment Agency (EEA) in conjunction with the European Monitoring and Evaluation Programme (EMEP) in the EMEP/EEA air pollutant emission inventory guidebook 2019 (EMEP/EEA, 2019). The emission rate of each air contaminant was calculated as the product of:

- The maximum energy input rate
- The emission factor published in EMEP/EEA, 2019 for that air contaminant.

The emission rates of air contaminants based on this maximum energy input are presented in Table 3.

Table 3 Emission rates adopted in the dispersion modelling assessment for the gas fired boiler at the Emyvale Facility

Parameter	Value	Unit
Maximum heat input to burner[1]	1,750	kWh
Maximum energy input to burner[2]	0.00175	GJ/s
Emission limit - NO_x[3]	80	mg/kWh
Emission Factor - CO	29	g/GJ
Emission Factor - SO_x	0.67	g/GJ
Emission Factor - PM_{10}	0.78	g/GJ
Emission Factor - $PM_{2.5}$	0.78	g/GJ
Emission rate - NO_x[2]	0.039	g/s
Emission Rate - CO[2]	0.05075	g/s
Emission Rate- SO_x[2]	0.00117	g/s
Emission Rate - PM_{10}[2]	0.00137	g/s
Emission Rate - $PM_{2.5}$[2]	0.00137	g/s

[1] Reported by Silver Hill Foods as part of its Medium Combustion Plant Directive reporting requirements for 2019
[2] Calculated
[3] Maximum emission rate of NO_x to comply with Class 3 of EN676
[4] Tier 1 Emission factor reported for NFR source categories 1.A.4.a/c using gaseous fuels including commercial institutional sources reported in Table 3.8 of EMEP/EEA (2019)

Details of source characterisation as configured in the dispersion model are provided in Section 5.4.

5.3.2 Ivar Boiler - Gasoil

The gasoil fired boiler is an IVAR BHP 1750 steam boiler. It has an attached Riello burner (Model RL130). The rated thermal capacity of the Riello RL130 is 1,540 kW. Riello (2012) states that the RL130 burner complies with

emission limits for NO_x specified in the 2010 German emission standard specified in the *'First ordinance for the implementation of the Federal Immission Control Act (Ordinance on small and medium-sized combustion plants – 1). BImSchV'* of 26 January 2010, which specifies an emission limit for NO_x of 185 mg/kWh for oil and gas firing systems with a nominal heat output greater than 400 kW.

The emi–ion rate of NO_x was derived for the gasoil boiler at the Emyvale Facility is the product of:

- The calculated thermal input of the burner at rated capacity
- The emission limit specified in the German Federal Immission Control Act of 26 January 2010 of 185 mg/kWh for NO_x.

The emission rate of other air contaminants was derived using emission factors published by the EEA in conjunction with the EMEP in the EMEP/EEA air pollutant emission inventory guidebook 2019 (EMEP/EEA, 2019). The emission rate for each air contaminant was calculated as the product of:

- The thermal rating of the burner at rated capacity
- The emission factor published in EMEP/EEA, 2019 for that air contaminant.

The emission rates of air contaminants of the gas oil boiler, as adopted in the dispersion modelling assessment are presented in Table 4Table 3.

Table 4 Emission rates adopted in the dispersion modelling assessment for the gasoil fired boiler at the Emyvale Facility

Parameter	Value	Unit
Maximum heat input to burner[1]	1711	kWh
Maximum energy input to burner[2]	0.00171	GJ/s
Emission limit – NO_x[3]	185	mg/kWh
Emission Factor – CO	93	g/GJ
Emission Factor – SO_x	94	g/GJ
Emission Factor – PM_{10}	21	g/GJ
Emission Factor – $PM_{2.5}$	18	g/GJ
Emission rate – NO_x[2]	0.088	g/s
Emission Rate – CO[2]	0.159	g/s
Emission Rate- SO_x[2]	0.161	g/s
Emission Rate – PM_{10}[2]	0.036	g/s
Emission Rate – $PM_{2.5}$[2]	0.0308	g/s

[1] Calculated based on an assumed thermal efficiency of 90%
[2] Calculated
[3] Maximum emission rate of NO_x to comply with emission limit specified in the German Federal Immission Control Act of 26 January 2010
[4] Tier 1 Emission factor reported for NFR source categories 1.A.4.a/c using liquid fuels including commercial institutional sources reported in Table 3.9 of EMEP/EEA (2019)

Details of source characterisation as configured in the dispersion model are provided in Section 5.4.

5.3.3 Thermal Oxidiser

The rendering process results in the production of effluent and foul air. A thermal oxidation is proposed to be installed to treat effluent and foul air produced during the rendering process achieving the following:

- Reduction in the volume and contaminant load of wastewater produced
- Deodourisation of vapours created as part of the cooking process.

Oxidation of contaminants is achieved by passing cooking vapours and room air from the rendering process through a flame or a ceramic heat exchange material in a combustion chamber. Oxidation is achieved by heating the air contaminants to a sufficient temperature for a sufficient length of time in the flame or a ceramic heat exchange material.

The combustion chamber can be heated by burning either:

- Fossil fuels (e.g., natural gas, LPG, gasoil etc.)
- Tallow produced as part of the rendering process.

The thermal oxidiser at the Silver Hill Emyvale Facility will be heated using LPG. Foul air and cooking vapours will be passed into the combustion chamber for treatment. The oxygen required for combustion will come from air extracted from the mill meal cooler room and ducted to the combustion chamber. Additional fresh air can be supplied if necessary.

Emissions to air from the thermal oxidiser include the products of combustion of LPG and the products of oxidation of the foul air and cooking vapours including:

- Oxides of nitrogen
- Oxides of sulphur
- Particulate matter
- Volatile organic compounds
- Carbon monoxide.

Emissions of odour from the thermal oxidiser have also been considered in this assessment.

The emission rates adopted in the dispersion modelling assessment were derived as the product of:

- A design airflow rate for the chimney stack of the thermal oxidiser
- In-stack emission limit values (ELVs) for each of the air contaminants listed above based on:
    - The ELVs in EPA licence of other rendering facilities operating thermal oxidisers in Ireland
    - Data supplied by the manufacturer.

The data underpinning the emission rates adopted in the dispersion modelling assessment of the thermal oxidiser is presented in Table 5.

Table 5 Emission rates adopted in the dispersion modelling assessment for the thermal oxidiser at the Emyvale Facility

Parameter	Value	Unit
Air flowrate[1]	14,026	Nm³/h
In-stack concentration of NO_x[2]	625	mg/Nm³
In-stack concentration of SO_x[3]	1,000	mg/Nm³
In-stack concentration of PM_{10}[4]	225	mg/Nm³

In-stack concentration of $PM_{2.5}$[4]	225	mg/Nm³
In-stack concentration of TVOC[5]	20	mg/Nm³
In-stack concentration of CO[6]	100	mg/Nm³
Emission rate of NO_x	1.7	g/s
Emission rate of SO_x	2.7	g/s
Emission rate of PM_{10}	0.6	g/s
Emission rate of $PM_{2.5}$	0.6	g/s
Emission rate of TVOC	0.055	g/s
Emission rate of CO	0.27	g/s

[1] The design wet airflow rate (22,215 m³/hr with 30% moisture) normalised to standard temperature and pressure (0°C, 101.325 kPa), dry an oxygen concentration of 11%.
[2]The highest ELV for NO_x reported in EPA licences for two rendering plants in Ireland that operate(d) thermal oxidisers. The limit value reported in the licences was corrected to reference level for oxygen of 11%, which is reported here
[3]The highest ELV for SO_x reported in EPA licences for two rendering plants in Ireland that operate(d) thermal oxidisers. The limit value reported in the licences was corrected to reference level for oxygen of 11%, which is reported here
[4]The highest ELV for particulate matter reported in EPA licences for two rendering plants in Ireland that operate(d) thermal oxidisers. The limit value reported in the licences was corrected to reference level for oxygen of 11%, which is reported here (EPA, 2021;)
[5] The ELV for TVOC as reported in an pollution prevention and control (PPC) Licence issued by the Northern Ireland Environment Agency (Air Scientific, 2020)
[6] The ELV for carbon monoxide as reported in an PPC Licence issued by the Northern Ireland Environment Agency (Air Scientific, 2020)

5.3.4 Duck housing units

There are eight duck housing units at the Silver Hill Emyvale Facility. These will be decommissioned. Consequently, there will be no emissions from the duck housing units.

5.4 Dispersion modelling

The dispersion modelling was conducted in accordance with recognised techniques specified in EPA's Air Dispersion Modelling Guidance Note (AG4). AERMOD was used to predict ground-level concentrations of air contaminants across the model domain due to sources at the site.

5.4.1 Modelled sources

The gas and gasoil boiler stacks and the thermal oxidiser stack at the Silver Hill Emyvale Facility were configured in the dispersion modelling assessment as a point sources.

It was conservatively assumed that all modelled sources at the Silver Hill Emyvale Facility operate continuously 24-hours per day, 365 days per year.

5.4.2 Source Parameters

5.4.2.1 Ivar Boiler - Gas

The parameters used to represent the gas fired boiler at the Emyvale Facility in the dispersion modelling assessment are presented in Table 6.

Table 6 Dispersion modelling parameters used to represent the gas fired boiler at the Emyvale Facility in the dispersion modelling assessment

Source ID	Easting	Northing	Base Elevation	Height[1]	Temperature[2]	Exit Velocity[3]	Diameter[1]
	UTM (m)	UTM (m)	m	m	K	m/s	m
Boil2	632490	6023982	55.7	11	427.95	6.11	0.4

[1] Provided by Silver Hill
[2] Renick Engineering Co Ltd. (2021a) Boiler Report Sheet. Gas Boiler – Silver Hill Food, Emyvale
[3] Exhaust velocity calculated in accordance with EPA approved methodology described in Annex E of EN ISO 16911-1 assuming an airflow fuel factor of 0.24 m³/MJ for gas, corrected to an exhaust temperature of 154.8°C based on stack monitoring (Renick Engineering Co Ltd., 2021a) and an oxygen concentration of 3% which was assumed typical of actual stack conditions in gas fired boiler exhausts (EPA, 2021a).

5.4.2.2 Ivar Boiler - Gasoil

The parameters used to represent the gasoil fired boiler at the Emyvale Facility in the dispersion modelling assessment are presented in Table 7.

Table 7 Dispersion modelling parameters used to represent the gasoil fired boiler at the Emyvale Facility in the dispersion modelling assessment

Source ID	Easting	Northing	Base Elevation	Height[1]	Temperature[2]	Exit Velocity[3]	Diameter[1]
	UTM (m)	UTM (m)	m	m	K	m/s	m
Boil1	632490	6023982	55.7	11	443.15	6.39	0.4

[1] Provided by Silver Hill
[2] Renick Engineering Co Ltd. (2021b) Boiler Report Sheet. Gasoil Boiler – Silver Hill Food, Emyvale
[3] Exhaust velocity calculated in accordance with EPA approved methodology described in Annex E of EN ISO 16911-1 assuming an airflow fuel factor of 0.25 m³/MJ for liquid fuels, corrected to an exhaust temperature of 170°C based on stack monitoring (Renick Engineering Co Ltd., 2021a) and an oxygen concentration of 3% which was assumed typical of actual stack conditions in liquid fired boiler exhausts (EPA, 2021a).

5.4.2.3 Thermal Oxidiser

The parameters used to represent the thermal oxidiser at the Emyvale Facility in the dispersion modelling assessment are presented in Table 8.

Table 8 Dispersion modelling parameters used to represent the thermal oxidiser at the Emyvale Facility in the dispersion modelling assessment

Source ID	Easting	Northing	Base Elevation	Height[1]	Temperature[2]	Exit Velocity[3]	Diameter[1]
	UTM (m)	UTM (m)	m	m	K	m/s	m
ThOx	632819	6024044	55.8	13	519.15	12.3	0.8

[1] Provided by Silver Hill
[2] Exhaust temperature specified by manufacturer
[3] Based on the design wet airflow rate of 22,215 m³/hr specified by the manufacturer

5.4.3 Modelling domain

The dispersion modelling included gridded and discrete receptors. The modelling domain was configured as a 4.0 km x 4.0 km cartesian grid centered between the Emyvale Facility (UTM Coordinates 632,680, 6023,860). The grid was configured with a 40 m x 40 m resolution. The extents of the modelling domain cover the modelled discrete receptors including the closest receptors town of Emyvale. It is of sufficient size to determine the location of maximum impact that will result from the installation of the modelled sources.

5.4.4 Modelled Terrain

The model was configured with terrain data derived from the U.S. Geological Survey (USGS) Shuttle Radar Topography Mission (SRTM) dataset. The terrain in this dataset has a resolution of 3 arc-seconds (approximately 90m).

5.4.5 Building Downwash

A plume of a short stack is likely to be down-washed if its height is less than two and a half times the height of nearby buildings within a distance of 10 x L from each source, where L is the lesser of the height or width of the building. A Building Profile Input Program (BPIP) was used to determine the effects of nearby buildings on all point sources of emissions at the configured in the dispersion modelling assessment. The Plume Rise Model

Enhancements (PRIME) algorithm is recommended in EPA Guidance for use with AERMOD (EPA, 2020; USEPA, 2017). PRIME was used to determine the effect of building induced turbulence on plumes from point sources at the modelled farms. Building downwash is only applicable to point source of emissions and not to area or volume sources in dispersion models.

The PRIME algorithm takes into account the position of each stack relative to each relevant building and the projected shape of each building for 36 wind directions (at 10º intervals). The model determines the change in plume centreline location with downwind distance based on the slope of the mean streamlines and coupled to a numerical plume rise model.

The coordinates representing the vertices of the buildings included in BPIP are presented in Table 9.

Table 9 Coordinates representing the buildings included in BPIP

Building	Easting	Northing
	UTM (m)	UTM (m)
Rendering Plan Building	632777	6024050
	632788	6024052
	632789	6024048
	632800	6024050
	632799	6024055
	632819	6024059
	632824	6024037
	632781	6024029
Onsite Tanks	632763	6024017
	632813	6024025
	632815	6024010
	632766	6024002
Rendering abatement unit	632815	6024035
	632824	6024037
	632825	6024032
	632816	6024030
Onsite Tanks	632789	6024068
	632814.4	6024073
	632816.53	6024058.6
	632792	6024054
Processing building	632474.43	6023915.4
	632470.15	6023956.3
	632506.14	6023960.2
	632505.7	6023965.3
	632518.2	6023966
	632520.4	6023943.7
	632517.5	6023943.2
	632519	6023924.6
	632505.4	6023923.2
	632507.6	6023899.26

Building	Easting	Northing
	UTM (m)	UTM (m)
	632491.8	6023897.7
	632489.7	6023916.5
Onsite building	632527.4	6023943.6
	632528.3	6023950.7
	632535	6023949.53
	632535.7	6023954.5
	632544.4	6023953.1
	632543.6	6023948.54
	632566.1	6023945.2
	632565.8	6023938
Onsite building	632466.69	6023967.7
	632463.16	6024005.8
	632476.3	6024006.94
	632478.34	6023984.61
	632481.59	6023984.6
	632483.24	6023968.7
Boiler building	632483.2	6023968.6
	632481.8	6023981.7
	632496.1	6023982.7
	632497.4	6023969.3

5.4.6 Methods for the conversion of NO_x to NO_2

A conservative assessment of NO_2 was conducted assuming:

- 50% conversion of NO_x to NO_2 for 1-hour average concentrations of NO_2
- 100% conversion of NO_x to NO_2 for annual average concentrations of NO_2.

This approach follows UK guidance, which is reproduced in Appendix G of EPA's AG4 guidance document. It is considered a conservative representation of potential short-term and long-term impacts of NO_2.

5.4.7 Method to consider volatile organic compounds (VOCs)

To consider volatile organic compounds (VOCs) in a dispersion modelling assessment AG4 recommends the following:

> *When modelling unidentified / semi-quantified mixtures of volatile organic compounds (VOCs), a worst-case approach may be to assume that all emissions are in the form of benzene. Where this indicates an exceedance of the EU ambient air quality standard, a more detailed assessment will be required in order to determine the main constituents of the mixture and thereafter to assess whether compliance is being achieved with the relevant standards or guideline values for these constituents.*

Emissions of non-methane VOCs (NMVOCs) from the boilers and total VOCs (TVOCs) from the thermal oxidiser have been modelled as part of this assessment. The potential cumulative impact of these emissions has been considered by comparing the predicted impacts against the EU ambient air quality standard for benzene.

6. ASSESSMENT RESULTS

The following sections present the predicted ground-level concentrations of air contaminants and odour due to the sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with relevant baseline levels of air contaminants. Dispersion modelling has been conducted for five years of meteorological data. The following sections present the highest concentrations across the five-year modelled period.

Contour plots presenting the ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility in isolation in isolation are presented in the following figures:

- The 18th highest, 1-hour average ground-level concentrations of NO_2 in Plate 1
- The annual average ground-level concentrations of NO_2 in Plate 2
- The 36th highest 24-hour average ground-level concentrations of PM_{10} in Plate 3
- The annual average ground-level concentrations of PM_{10} in Plate 4
- The annual average ground-level concentrations of $PM_{2.5}$ in Plate 5.
- The 19th highest, 1-hour average ground-level concentrations of SO_2 in Plate 6
- The 4th highest 24-hour average ground-level concentrations of SO_2 in Plate 7.
- The annual average ground-level concentrations of SO_2 in Plate 8
- The annual average ground-level concentrations of benzene in Plate 9.

Contour plots presenting the ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility in combination with a representative baseline concentration are presented in the following figures:

- The 18th highest, 1-hour average ground-level concentrations of NO_2 in Plate 10
- The annual average ground-level concentrations of NO_2 in Plate 11
- The 36th highest 24-hour average ground-level concentrations of PM_{10} in Plate 12
- The annual average ground-level concentrations of PM_{10} in Plate 13
- The annual average ground-level concentrations of $PM_{2.5}$ in Plate 14.
- The 19th highest, 1-hour average ground-level concentrations of SO_2 in Plate 15
- The 4th highest 24-hour average ground-level concentrations of SO_2 in Plate 16.
- The annual average ground-level concentrations of SO_2 in Plate 17
- The annual average ground-level concentrations of benzene in Plate 18.

A contour plot presenting the ground-level concentrations of odour resulting from emissions from the thermal oxidiser at the Silver Hill Emyvale Facility is presented in Plate 19.

Ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility in isolation at the modelled discrete receptors are presented in Table 10. Ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility with a representative baseline concentration at the modelled discrete receptors are presented in Table 11.

Table 10 **Ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility in isolation at the modelled discrete receptors**

Discrete Receptor	NO_2		PM_{10}		$PM_{2.5}$
	1hr 18th High	Annual Average	24hr 36th High	Annual Average	Annual Average
DR1	35.3	2.9	3.0	1.0	0.9
DR2	49.7	2.3	2.4	0.8	0.8
DR3	12.4	1.0	1.1	0.4	0.3
DR4	26.6	4.4	4.2	1.6	1.5
DR5	13.0	1.3	1.4	0.5	0.4
DR6	8.0	0.7	0.7	0.2	0.2
DR7	6.6	0.4	0.5	0.2	0.2
DR8	6.2	0.4	0.5	0.1	0.1
DR9	8.2	0.4	0.5	0.1	0.1
DR10	9.5	0.4	0.4	0.1	0.1
DR11	8.4	0.4	0.4	0.1	0.1
DR12	7.5	0.3	0.3	0.1	0.1
Criteria	**200**	**40**	**50**	**40**	**25**

Table 11 **Ground-level concentrations of air contaminants resulting from emissions from the Silver Hill Emyvale Facility with a representative baseline concentration at the modelled discrete receptors**

Discrete Receptor	NO_2		PM_{10}		$PM_{2.5}$
	1hr 18th High	Annual Average	24hr 36th High	Annual Average	Annual Average
DR1	126.3	7.9	15.0	13.0	6.9
DR2	140.7	7.3	14.4	12.8	6.8
DR3	103.4	6.0	13.1	12.4	6.3
DR4	117.6	9.4	16.2	13.6	7.5
DR5	104.0	6.3	13.4	12.5	6.4
DR6	99.0	5.7	12.7	12.2	6.2
DR7	97.6	5.4	12.5	12.2	6.2
DR8	97.2	5.4	12.5	12.1	6.1
DR9	99.2	5.4	12.5	12.1	6.1
DR10	100.5	5.4	12.4	12.1	6.1
DR11	99.4	5.4	12.4	12.1	6.1
DR12	98.5	5.3	12.3	12.1	6.1
Criteria	**200**	**40**	**50**	**40**	**25**

The results show that:

- Predicted 18th highest 1-hour average ground-level concentrations of NO_2 **comply** with the air quality criterion of 200 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.

- Predicted annual average ground-level concentrations of NO_2 **comply** with the air quality criterion of 40 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 36th highest 24-hour average ground-level concentrations of PM_{10} **Comply** with the air quality criterion of 50 µg/m^3 at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of PM_{10} **comply** with the air quality criterion of 40 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of $PM_{2.5}$ **comply** with the air quality criterion of 25 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 19th highest 1-hour average ground-level concentrations of SO_2 **comply** with the air quality criterion of 350 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 4th highest 24-hour average ground-level concentrations of SO_2 **comply** with the air quality criterion of 125 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of SO_2 **comply** with the air quality criterion of 20 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted highest 8-hour average ground-level concentrations of CO **comply** with the air quality criterion of 10,000 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of benzene **comply** with the air quality criterion of 5 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.

7. CONCLUSIONS

Katestone was commissioned by Silver Hill Foods Unlimited Company to complete an air quality assessment of two boilers and a proposed thermal oxidiser at its food processing facility on a site at Emyvale, Co. Monaghan.

The air quality assessment considered the impacts of:

- Air contaminants from the sources at the site (boilers and thermal oxidiser) in isolation.
- Air contaminants from the sources at the site in combination with relevant baseline levels of air contaminants for the area
- Odour from the thermal oxidiser

The air quality assessment was conducted in accordance with recognised techniques for dispersion modelling specified in EPA's Air Dispersion Modelling Guidance Note (AG4). AERMOD was used to predict ground-level concentrations of odour and air contaminants across the model domain due to sources at the Silver Hill Emyvale Facility.

The air assessment found:

- Predicted 18th highest 1-hour average ground-level concentrations of NO_2 **comply** with the air quality criterion of 200 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of NO_2 **comply** with the air quality criterion of 40 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 36th highest 24-hour average ground-level concentrations of PM_{10} **Comply** with the air quality criterion of 50 µg/m^3 at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of PM_{10} **comply** with the air quality criterion of 40 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of $PM_{2.5}$ **comply** with the air quality criterion of 25 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 19th highest 1-hour average ground-level concentrations of SO_2 **comply** with the air quality criterion of 350 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted 4th highest 24-hour average ground-level concentrations of SO_2 **comply** with the air quality criterion of 125 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of SO_2 **comply** with the air quality criterion of 20 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver

Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.

- Predicted highest 8-hour average ground-level concentrations of CO **comply** with the air quality criterion of 10,000 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.
- Predicted annual average ground-level concentrations of benzene **comply** with the air quality criterion of 5 µg/m³ at all areas beyond the site boundary for the operation of sources of emissions at the Silver Hill Emyvale Facility in isolation and in combination with a representative ambient background concentration.

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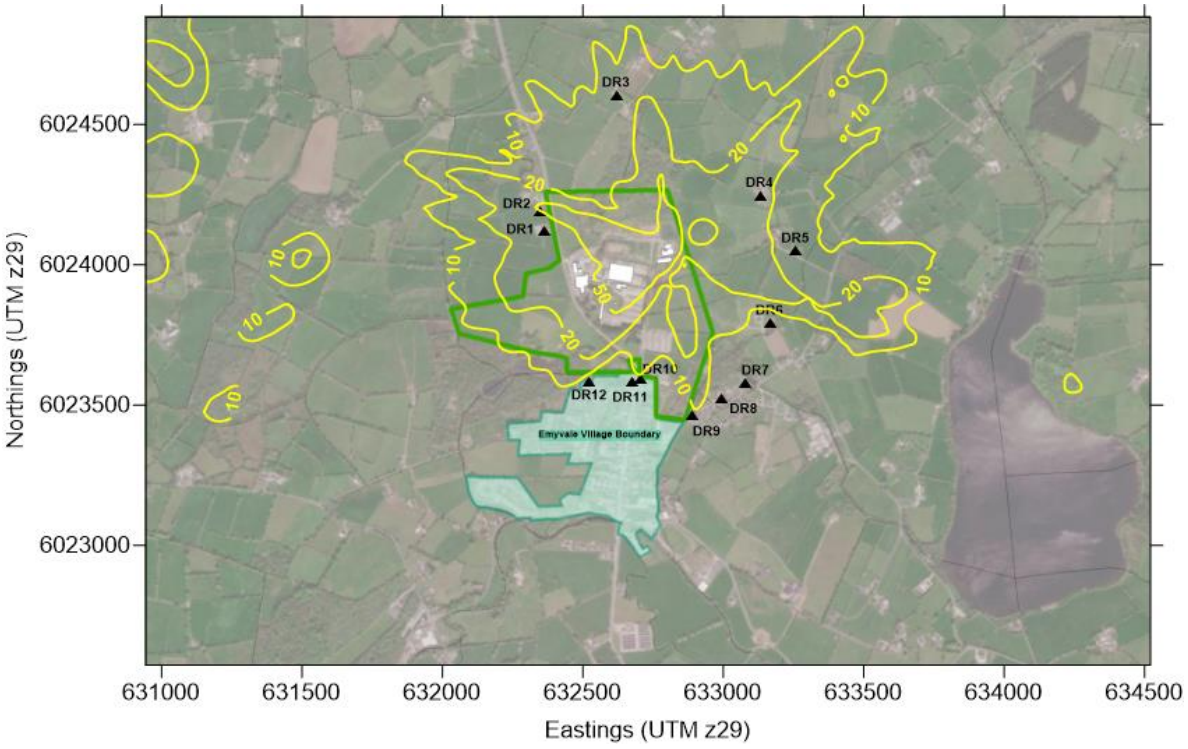

Plate 1	**Highest 5-year modelling period, predicted 18th highest 1-hour average ground-level NO_2 concentrations due to the Silver Hill Emyvale Facility in isolation**		
Location: Silver Hill Emyvale Facility	Averaging period: 1-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 18th	Criterion level: 200 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

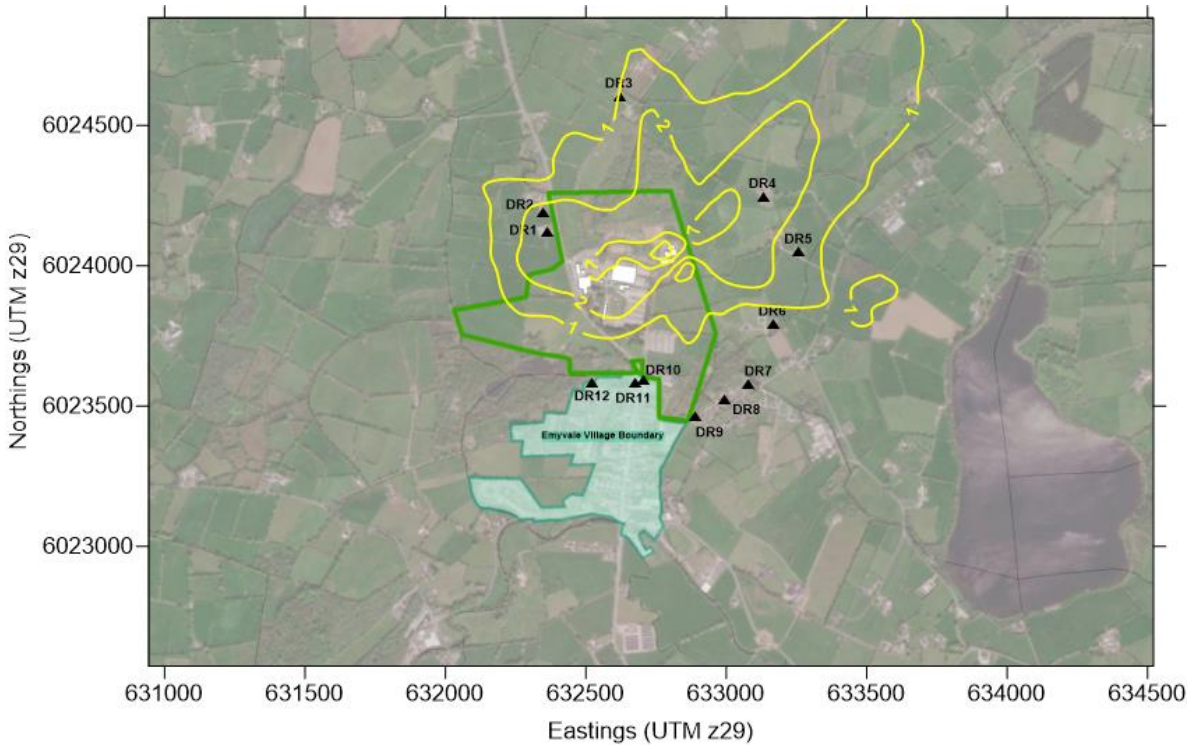

Plate 2	**Highest 5-year modelling period, predicted annual average ground-level NO_2 concentrations due to the Silver Hill Emyvale Facility in isolation**		
Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 40 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

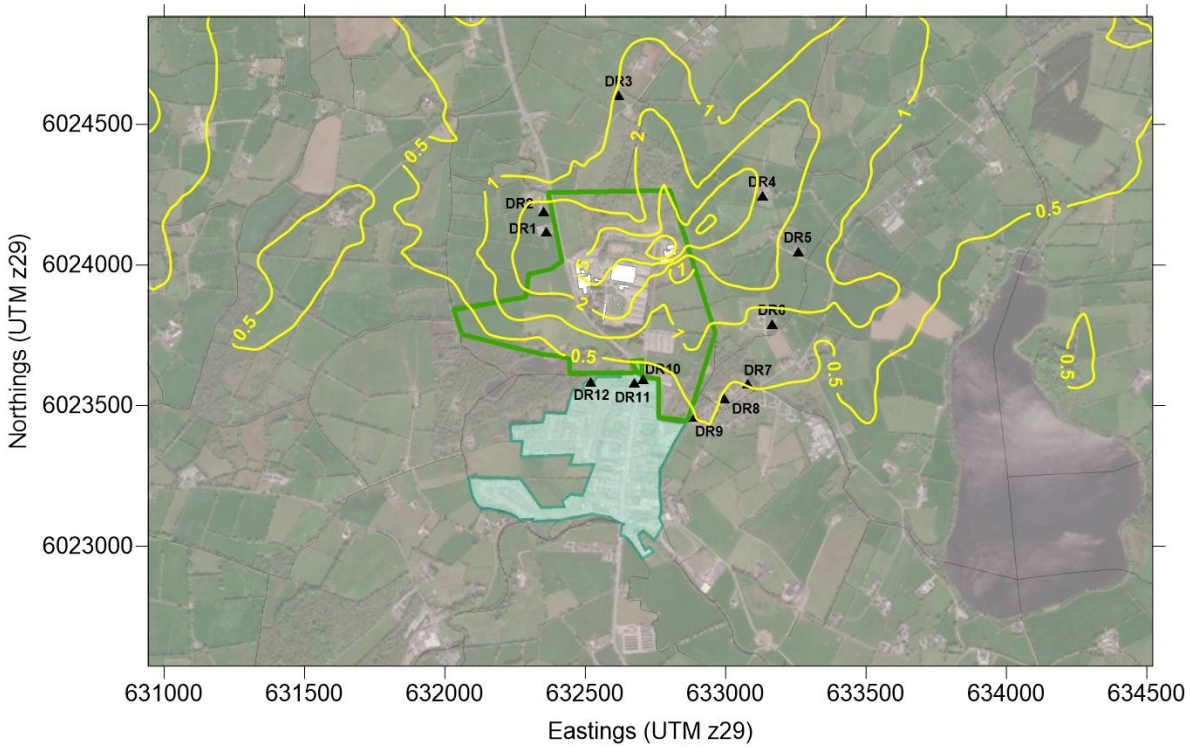

Plate 3 **Highest 5-year modelling period, predicted 36th highest 24-hour average ground-level PM_{10} concentrations due to the Silver Hill Emyvale Facility in isolation**

Location: Silver Hill Emyvale Facility	Averaging period: 24-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 36th	Criterion level: 50 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

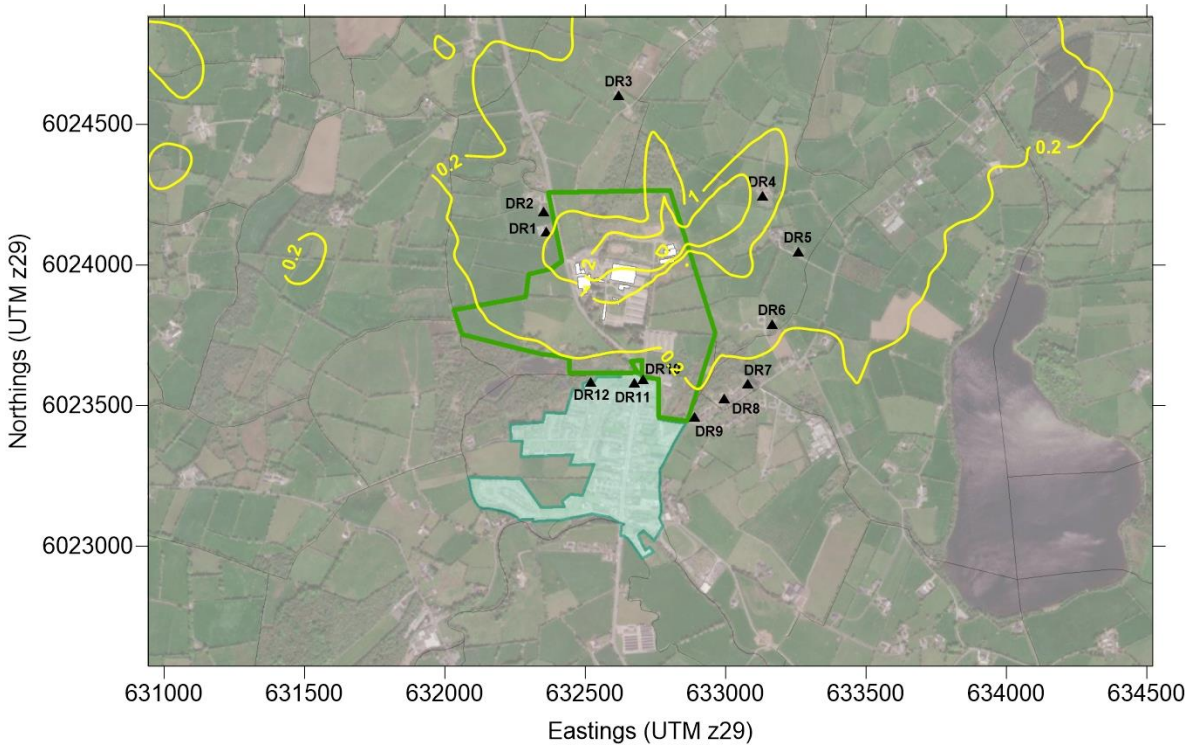

Plate 4 **Highest 5-year modelling period, predicted annual average ground-level PM_{10} concentrations due to the Silver Hill Emyvale Facility in isolation**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 40 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

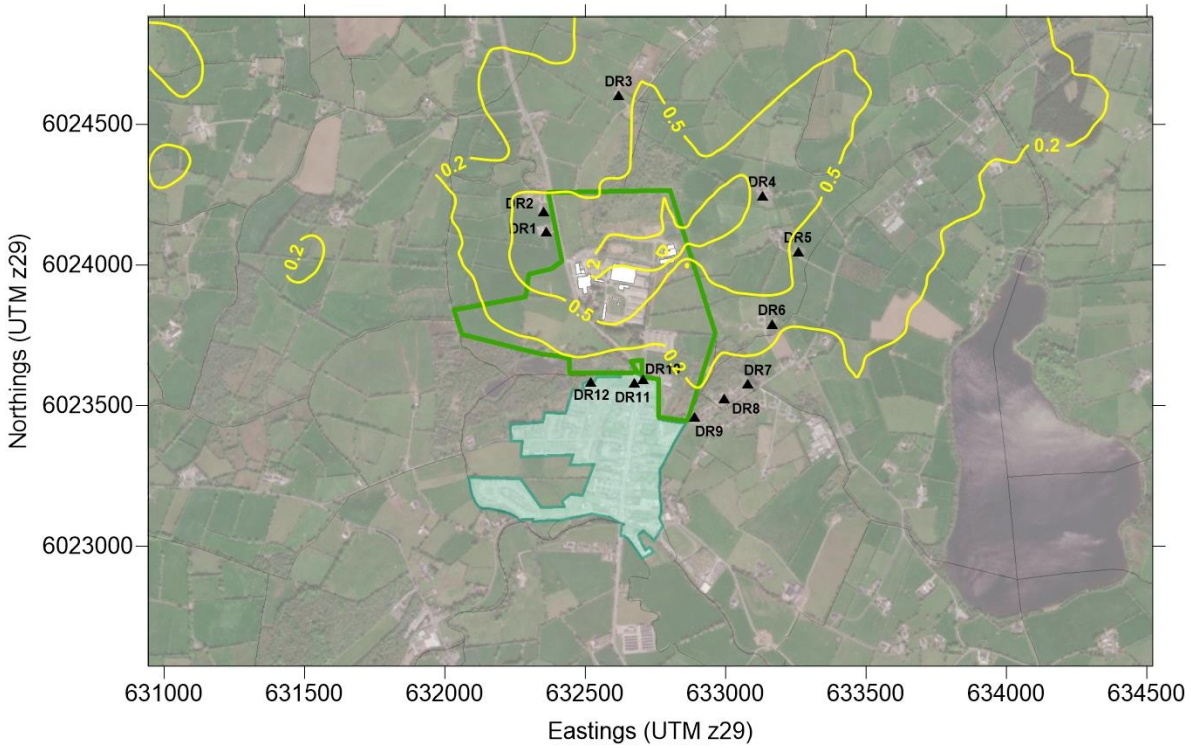

Plate 5 **Highest 5-year modelling period, predicted annual average ground-level $PM_{2.5}$ concentrations due to the Silver Hill Emyvale Facility in isolation**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 25 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

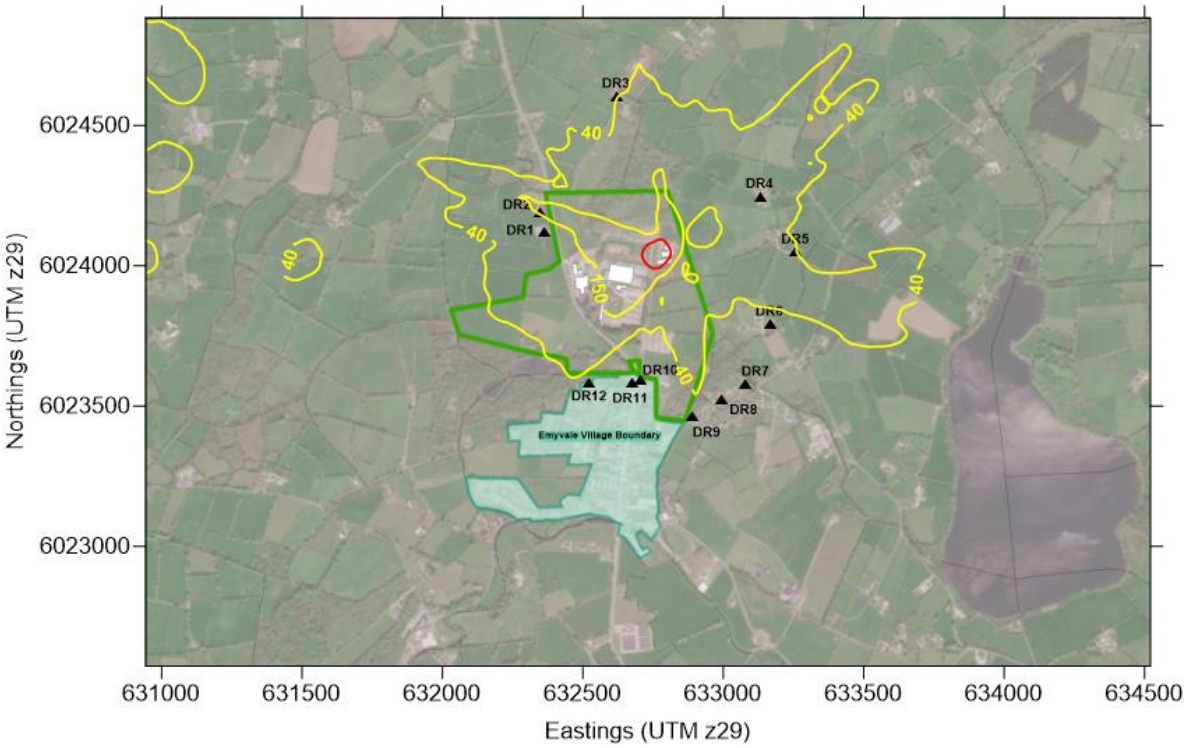

Plate 6 **Highest 5-year modelling period, predicted 19th highest 1-hour average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in isolation**

Location: Silver Hill Emyvale Facility	Averaging period: 1-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 19th	Criterion level: 350 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

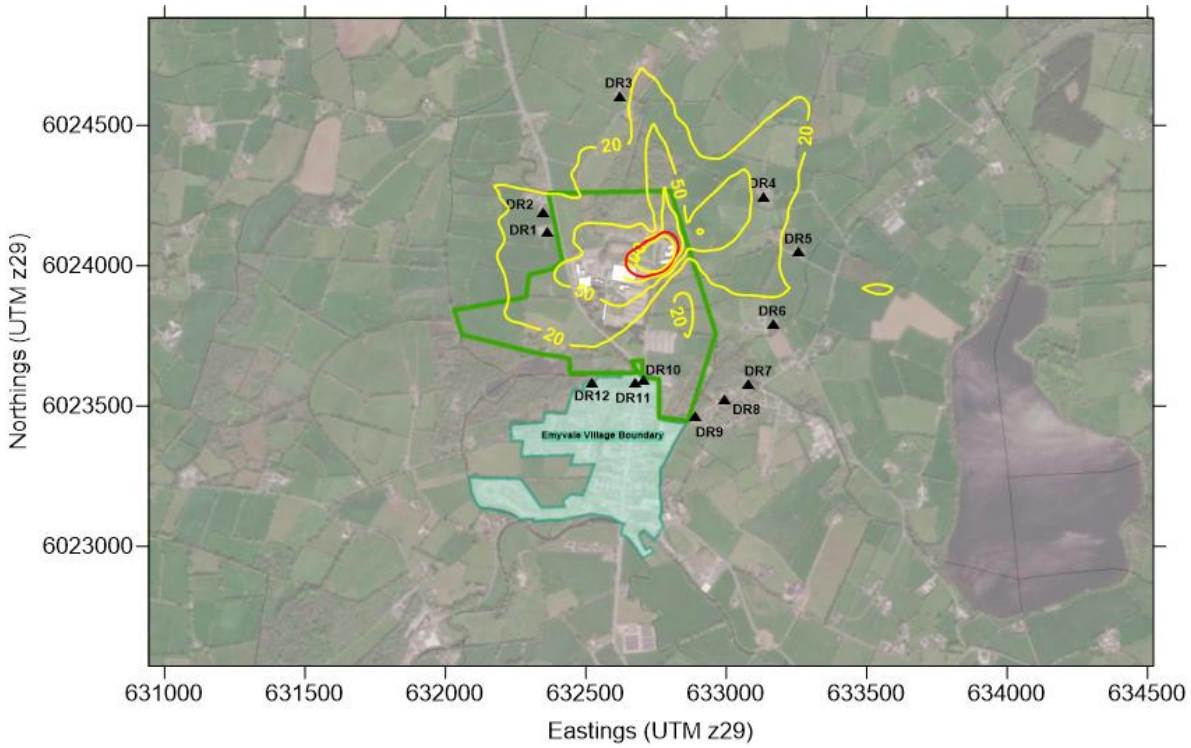

Plate 7 **Highest 5-year modelling period, predicted 4th highest 24-hour average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in isolation**

Location: Silver Hill Emyvale Facility	Averaging period: 24-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 4th	Criterion level: 125 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

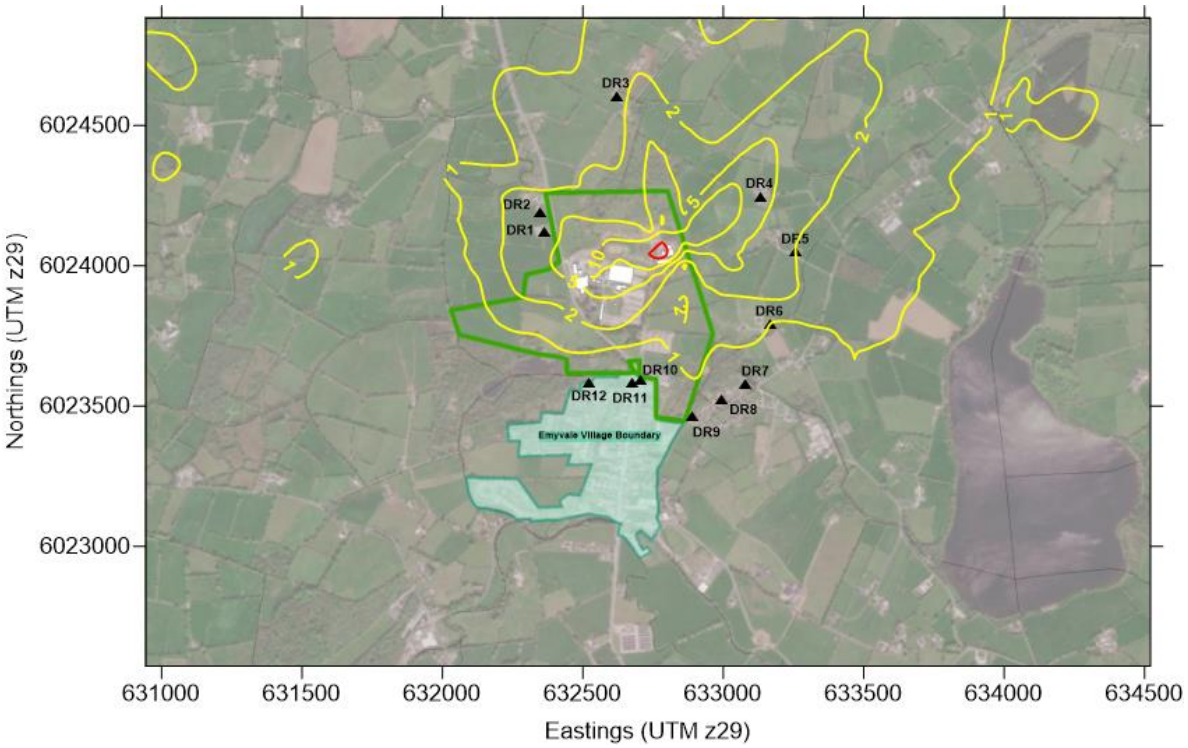

Plate 8	**Highest 5-year modelling period, predicted annual average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in isolation**		
Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 20 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

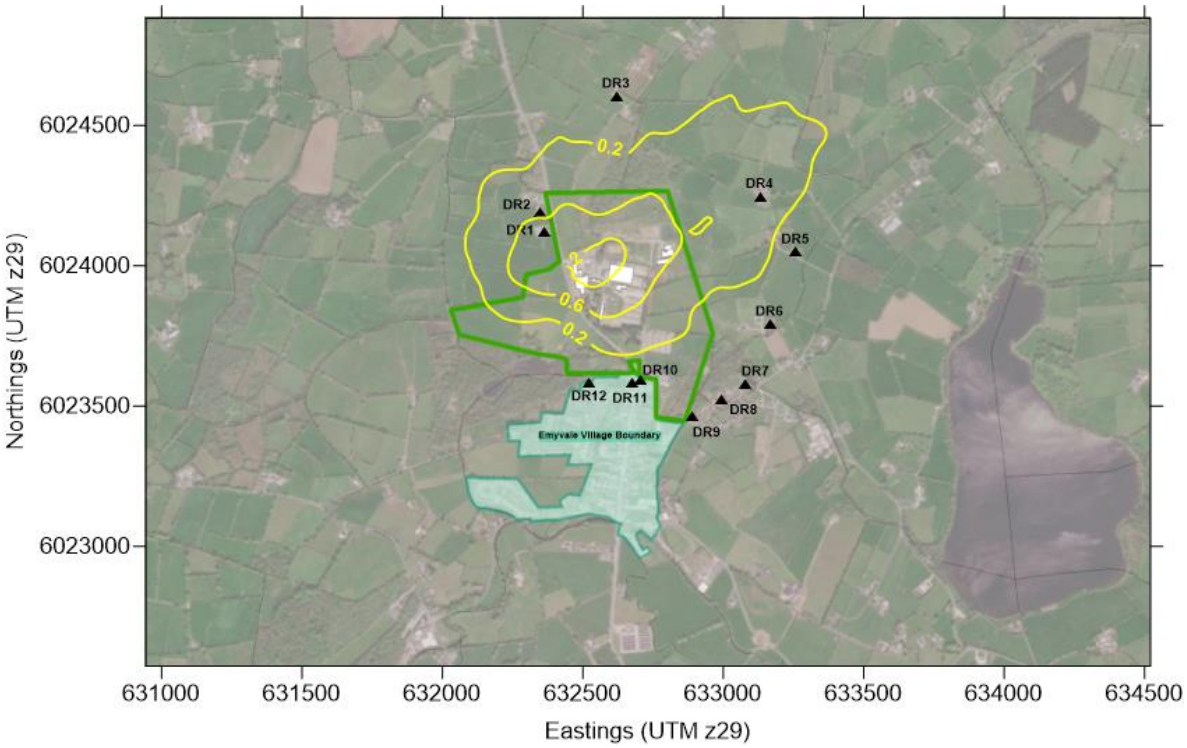

Plate 9	**Highest 5-year modelling period, predicted annual average ground-level benzene concentrations due to the Silver Hill Emyvale Facility in isolation**		
Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 5 µg/m³ (Red Line)	Prepared by: M. Fogarty	Date: February 2022

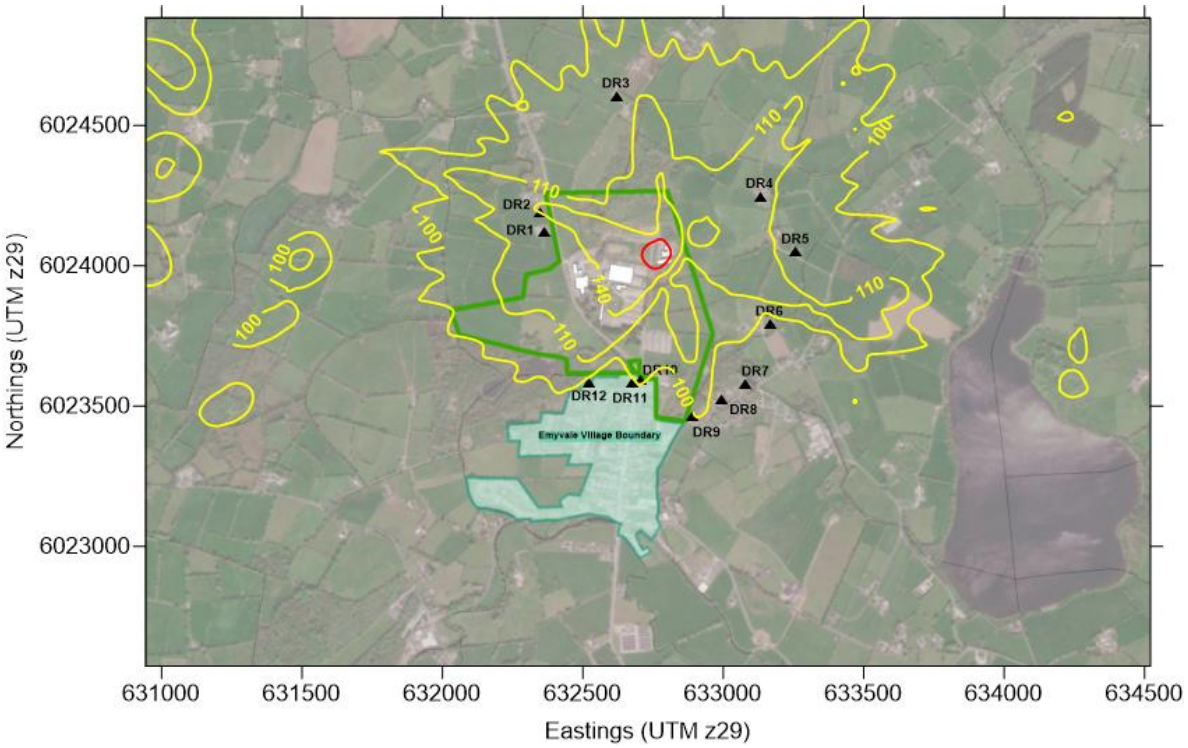

Plate 10	**Highest 5-year modelling period, predicted 18th highest 1-hour average ground-level NO_2 concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 18th	Criterion level: 200 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

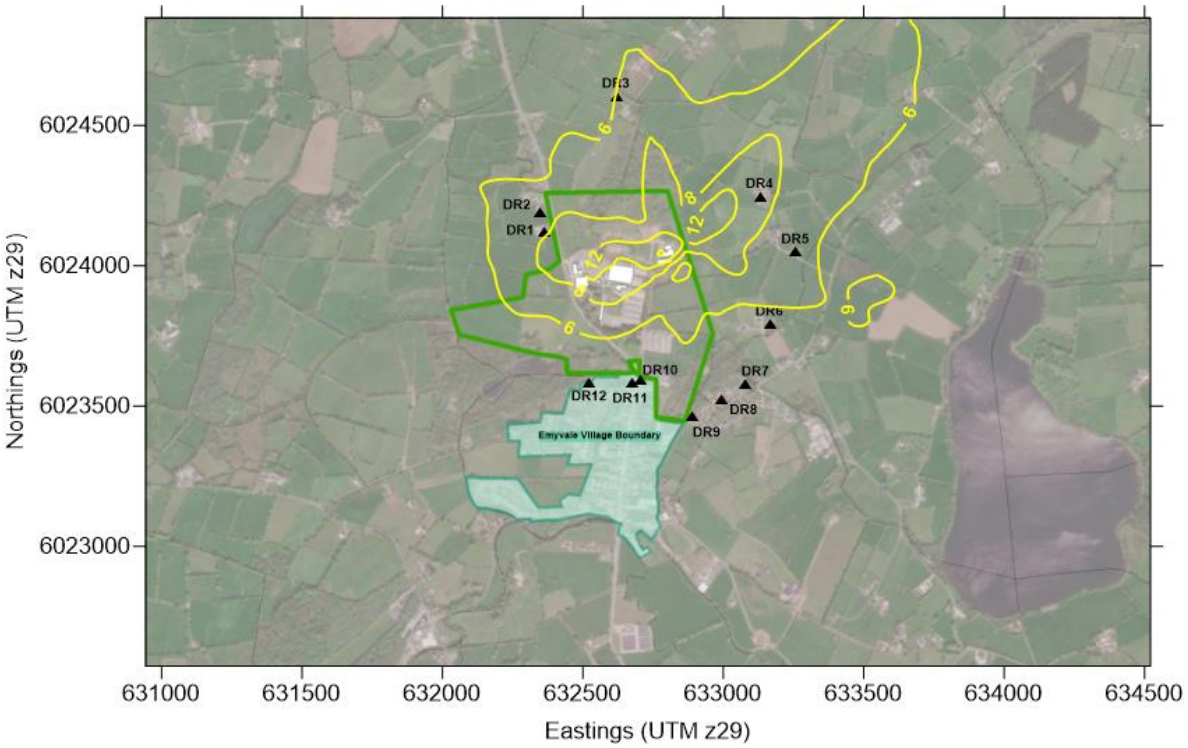

Plate 11 **Highest 5-year modelling period, predicted annual average ground-level NO_2 concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 40 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

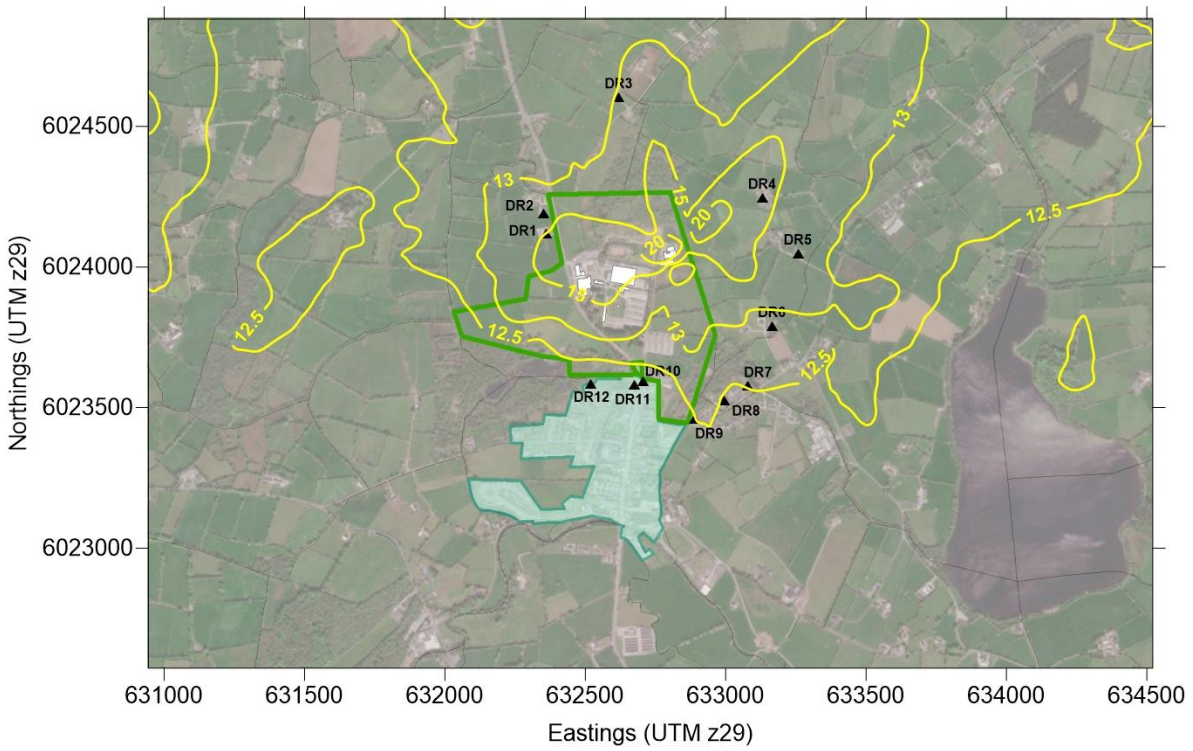

Plate 12 **Highest 5-year modelling period, predicted 36th highest 24-hour average ground-level PM_{10} concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 24-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 36th	Criterion level: 50 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

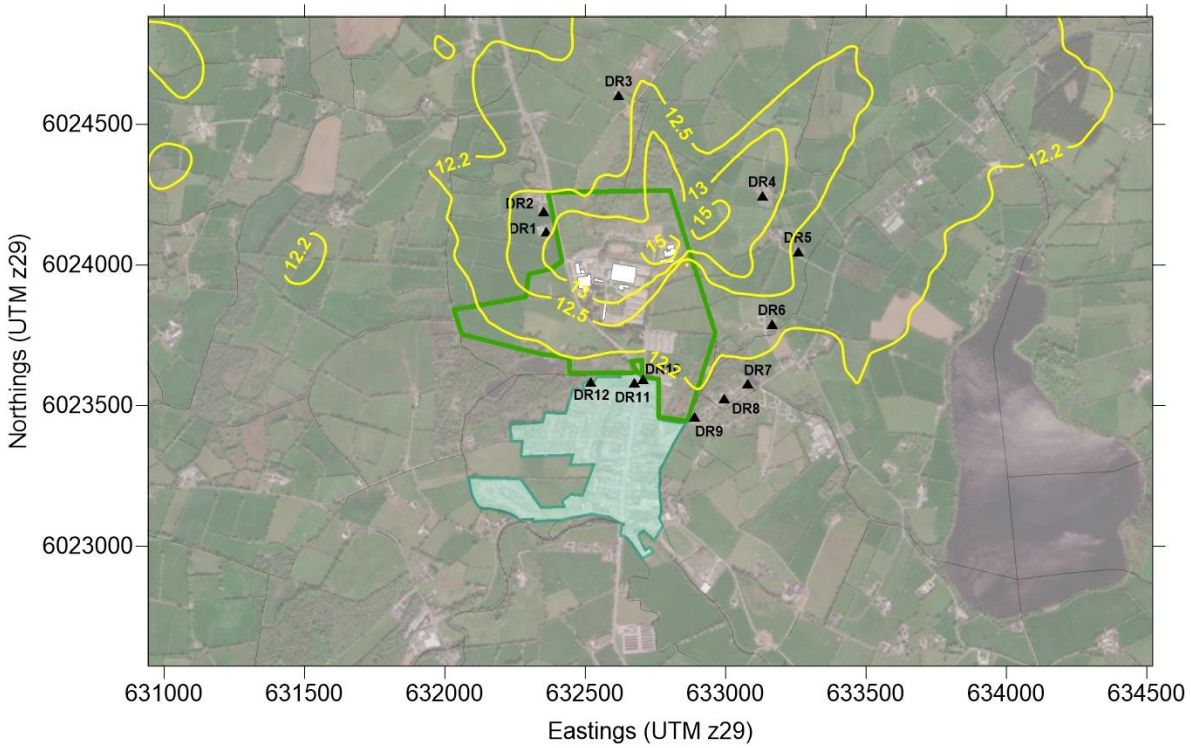

Plate 13 **Highest 5-year modelling period, predicted annual average ground-level PM_{10} concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 40 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

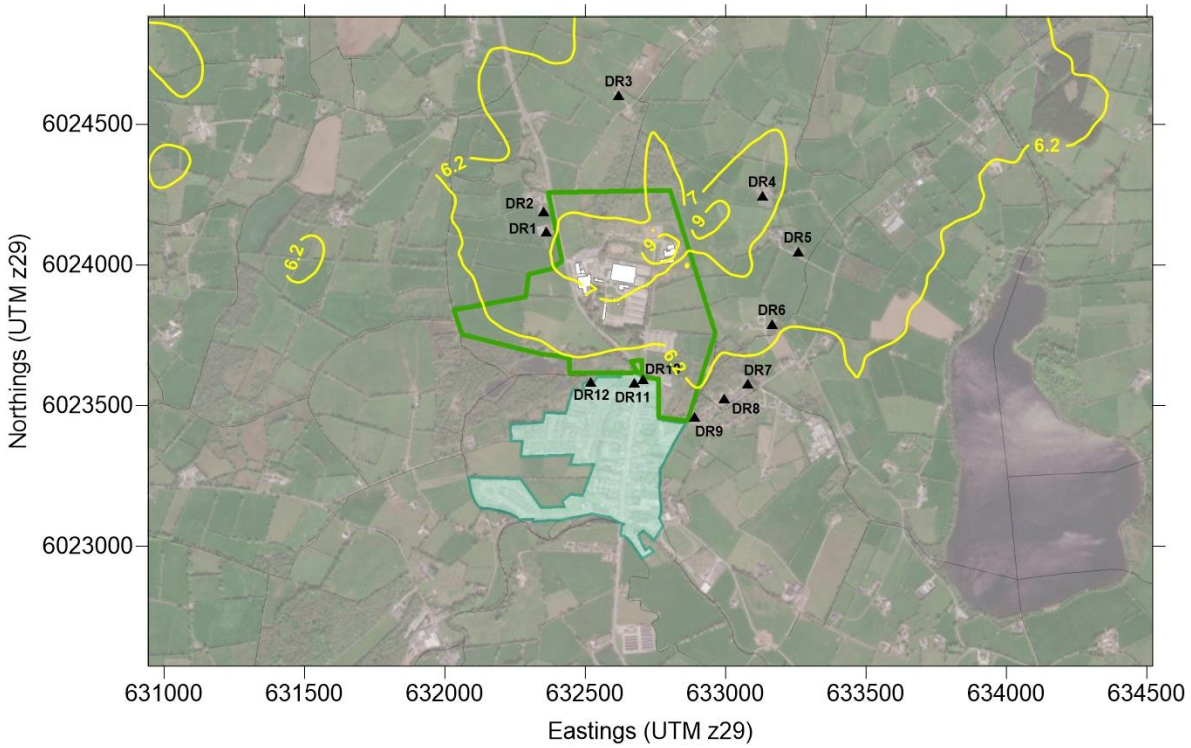

Plate 14 **Highest 5-year modelling period, predicted annual average ground-level $PM_{2.5}$ concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location:	Averaging period:	Data source:	Units:
Silver Hill Emyvale Facility	1-year	AERMOD	µg/m³
Type:	Criterion level:	Prepared by:	Date:
Average	25 (Red Line)	M. Fogarty	February 2022

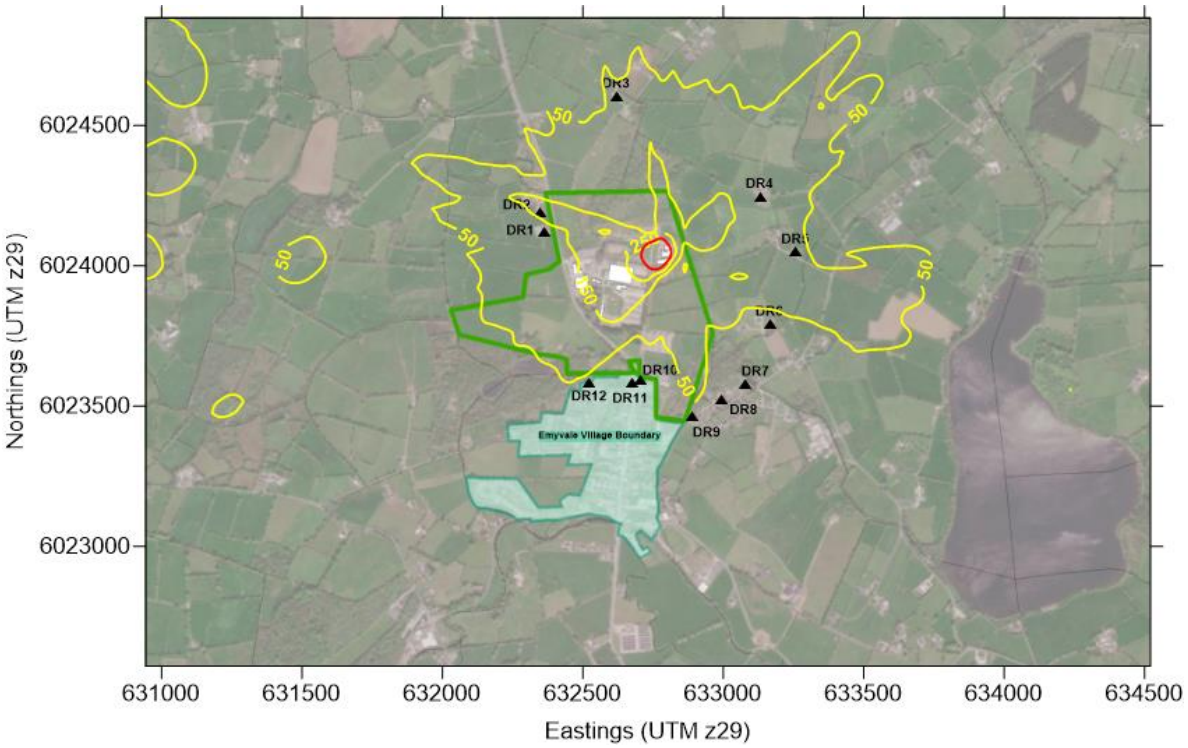

Plate 15 **Highest 5-year modelling period, predicted 19th highest 1-hour average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 19th	Criterion level: 350 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

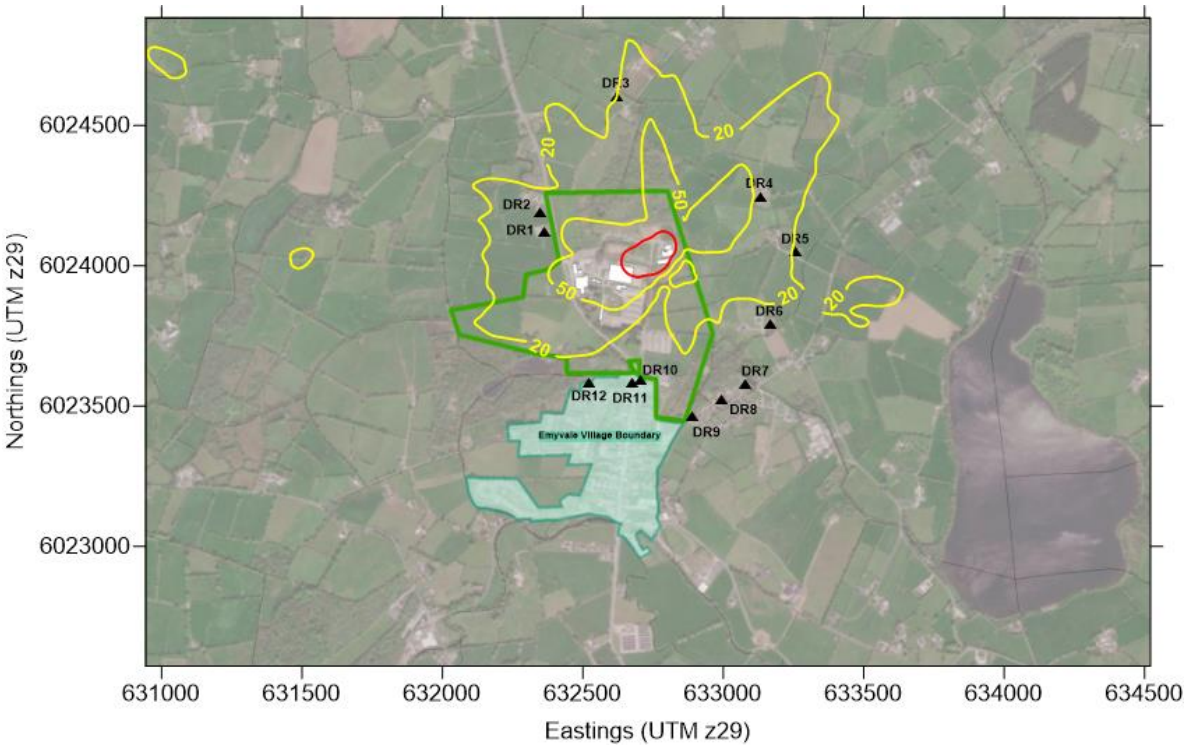

Plate 16 **Highest 5-year modelling period, predicted 4th highest 24-hour average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 24-hour	Data source: AERMOD	Units: µg/m³
Type: Rank 4th	Criterion level: 125 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

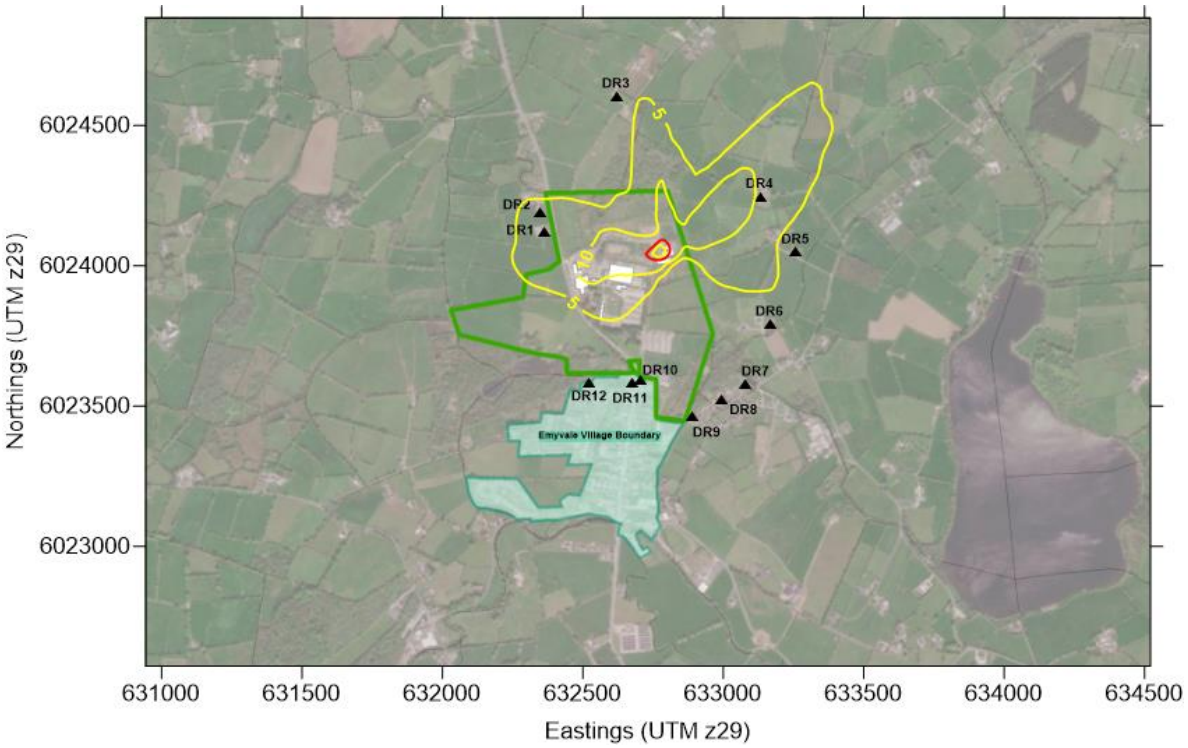

Plate 17 **Highest 5-year modelling period, predicted annual average ground-level SO_2 concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 20 (Red Line)	Prepared by: M. Fogarty	Date: February 2022

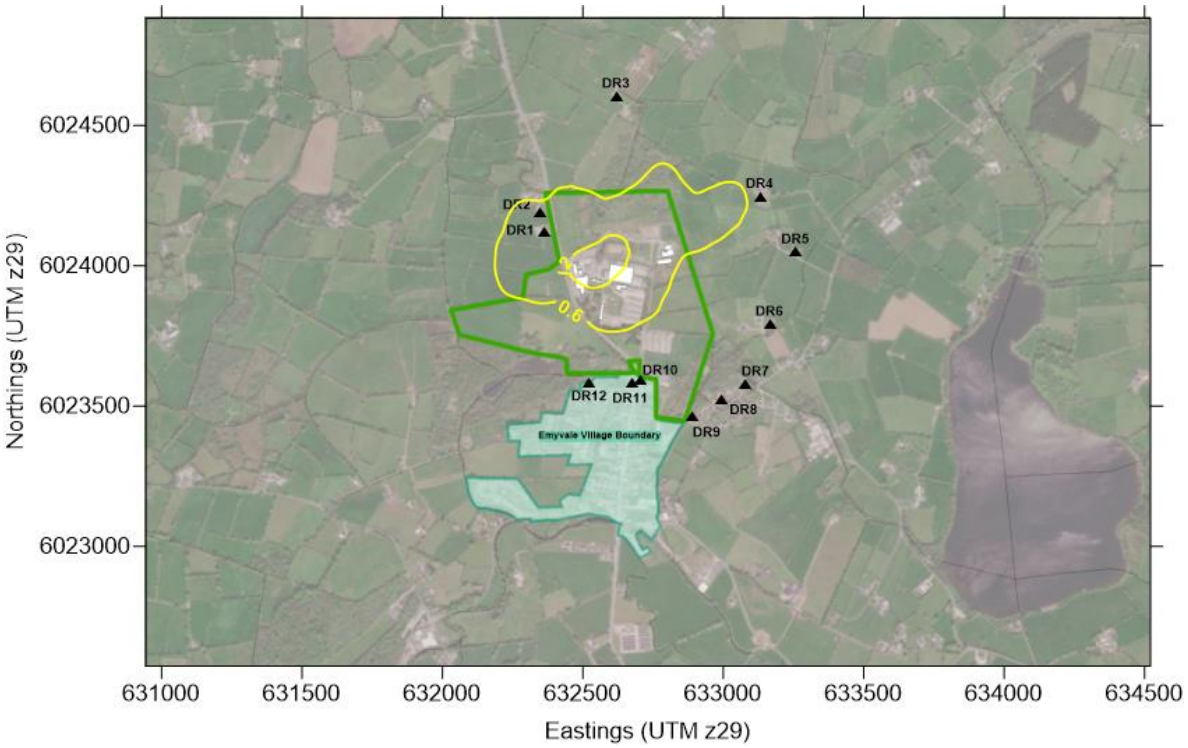

Plate 18 **Highest 5-year modelling period, predicted annual average ground-level benzene concentrations due to the Silver Hill Emyvale Facility in combination with a representative baseline concentration**

Location: Silver Hill Emyvale Facility	Averaging period: 1-year	Data source: AERMOD	Units: µg/m³
Type: Average	Criterion level: 5 µg/m³ (Red Line)	Prepared by: M. Fogarty	Date: February 2022

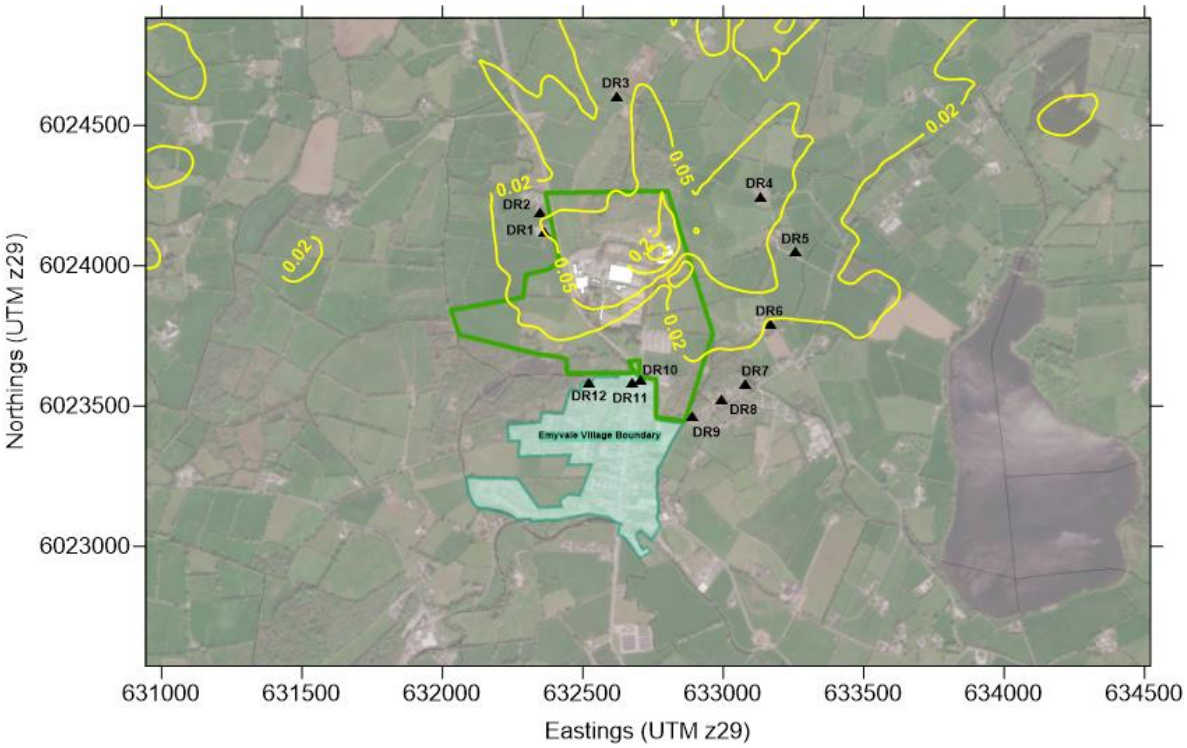

Plate 19 **Highest 5-year modelling period, predicted 98th percentile 1-hour average ground-level concentrations of odour due to the thermal oxidiser at the Silver Hill Emyvale Facility**

Location:	Averaging period:	Data source:	Units:
Silver Hill Emyvale Facility	1-hour	AERMOD	ou/m³
Type:	Criterion level:	Prepared by:	Date:
98th percentile	3 ou/m³ (Red Line)	M. Fogarty	February 2022

APPENDIX A METEOROLOGICAL MODELLING METHODOLOGY

A1 CALCULATION OF Z_0 AND THE ALBEDO AND BOWEN RATIO

A1.1 Calculation of Z_0

According to the AERMOD and AERMET manuals, Z_0 should be determined based on land cover within a 1.0 km radius from the meteorological site located at Ballyhaise Weather Station, Cavan (Lat, Lon = 54.053118, -7.313833, elevation = 78m). If the value of Z_0 varies significantly by direction, sector dependency should be used, with sector width >= 30 degrees.

From the aerial view images, the land use within a 1 km radius is a mix of grassland, mixed forest and low density residential and is sector dependent. The land use in the vicinity of the meteorological monitoring site at Ballyhaise is presented in Figure A1. If the value of Z_0 varies significantly by direction, sector dependency should be used; sector width >= 30 degrees.

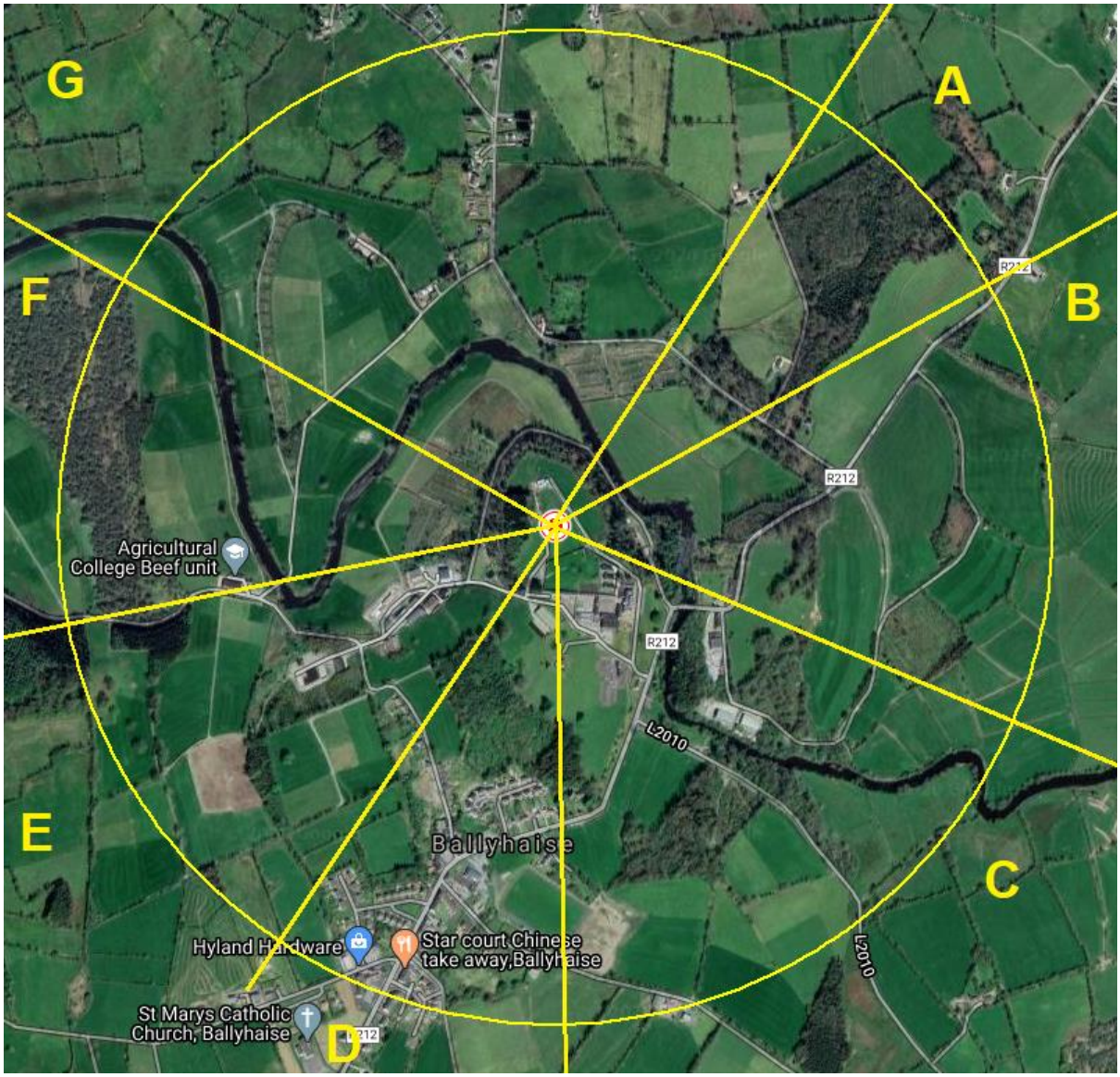

Figure A1 Land use in the vicinity of the meteorological monitoring site at Ballyhaise

The sector boundaries and seasonal Z_0 values for each sector and individual sector weights are presented in Table A.1.

Table A.1 Sector boundaries and seasonal Z_o values

Sector	WDir-1	WDir-2	Summer	Autumn	Winter	Spring
A	33	63	0.274	0.068	0.015	0.169
B	63	112	0.162	0.025	0.004	0.090
C	112	179	0.257	0.065	0.015	0.163
D	179	214	0.270	0.089	0.025	0.186
E	214	259	0.127	0.016	0.002	0.066
F	259	300	0.156	0.023	0.003	0.085
G	300	33	0.100	0.010	0.001	0.050

A1.2 Calculation of Albedo and Bowen Ratio

These should be determined based on land cover within a 10km x 10km domain. A simple unweighted mean should be used for the Albedo and a weighted geometric mean for the Bowen ratio, no need for sector dependency. From the aerial view photo shown in (Figure A2), it is evident that the main land use groups are grassland, some mixed forest, some low density residential and various small lakes (open water).

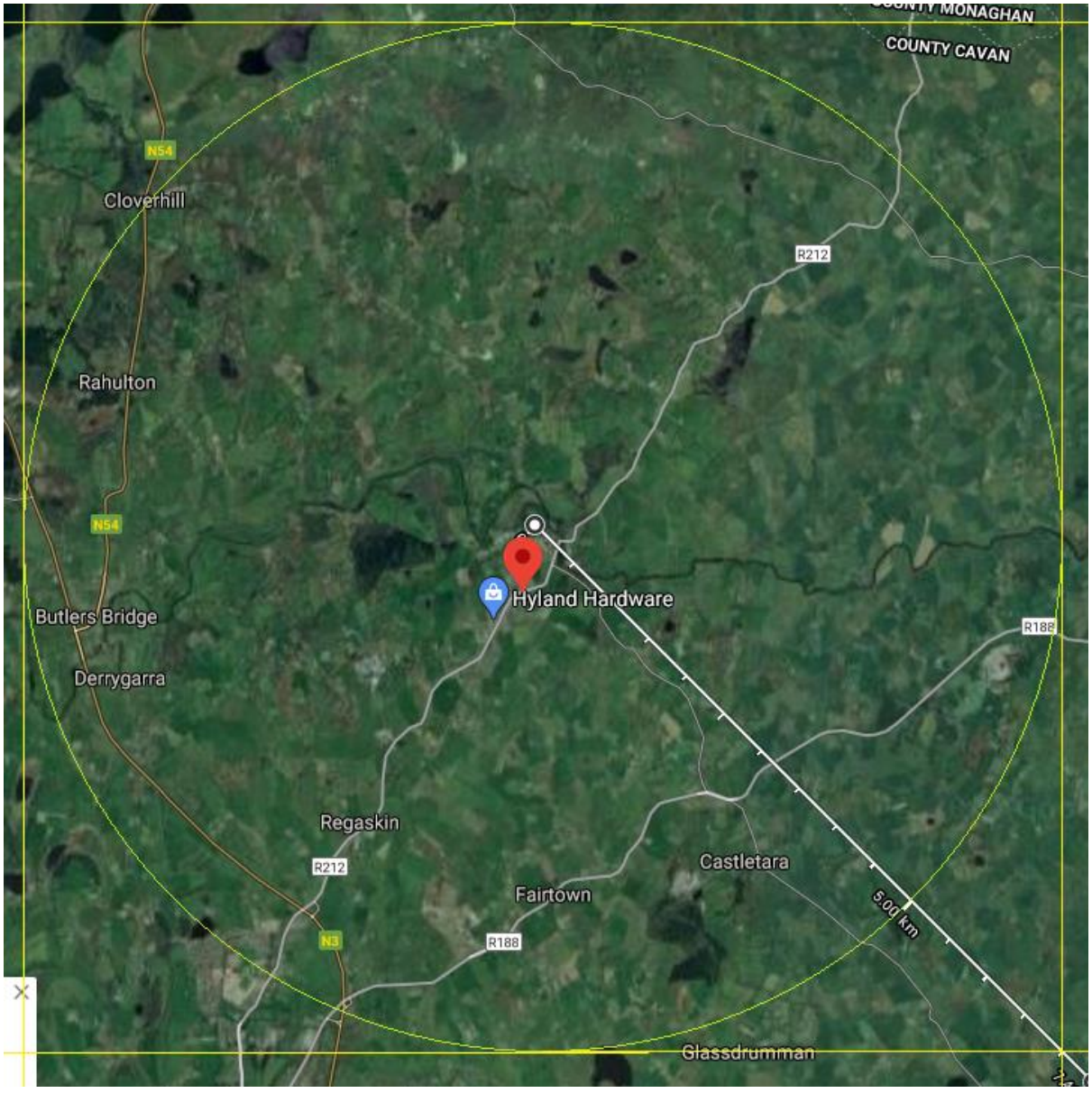

Figure A2 Land cover within a 10km x 10km domain of Ballyhaise monitoring location

The land use fractions and seasonal Albedo and Bowen ratios are summarized in Table A.2 and Table A.3, respectively.

Table A.2 Fractional Landuse

Land use	Fraction (%)
Open Water	1.2
Low intensity Residential	1.7
Mixed Forest	1.7
Grassland	95.3

Table A.3 Seasonal Bowen Ratio values

Land use	Summer	Autumn	Winter	Spring
Albedo Arithmetic Weighted Average	0.178	0.178	0.197	0.178
Bowen Ratio Geometric Mean	0.767	0.971	0.971	0.402

Appendix 9.1: Landscaping Plan

FOR PLANNING PURPOSES ONLY

1. Read in conjunction with Engineers and other Contract Drawings and with Specification.
2. Refer to title block for remit of information on this drawing.
3. All works to comply with current Building Regulations.
4. Any anomalies between drawings and/or specification, to be referred to Architect for clarification. IF IN DOUBT... ASK.
5. Do not scale from drawing.
6. Use figured dimensions only.
7. All dimensions to be checked on site prior to commencement of works.
8. This drawing is copyright protected.
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CLIENT
Silverhill Foods Ltd.

PROJECT
Proposed Factory Development at Corlattallan, Emyvale, Co. Monaghan

DATE
28/01/2023

REV	DRAWN	CHECKED	APPROVED
00	–	M. HETHERTON	M. HETHERTON

DRAWING No.
D12

TITLE
LANDSCAPING SITE LAYOUT PLAN

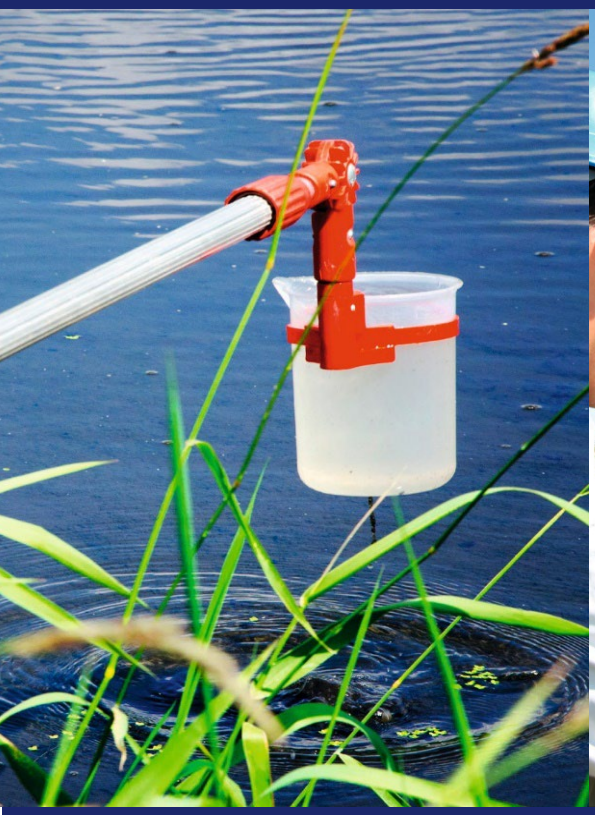
SCALES
1:500@A1

Proposed Exit SW 1
Drip Irrigation Plant Room
Proposed grea for Attenuation system 637m3 capacity
Proposed 300mm dia overflow pipe for surface water to Lagoon
Proposed Pump unit for Process water
SW (1)
SWM 11
Existing Wash water Holding Tank
Existing Sub stat
Tank
Existing surface water line removed
SW. PT (2)
SW. PT (3)
SWM 10
122.793+ C.L
120.393+ I.L
Proposed grit tank and petrol interceptor
Treatment
Process water
PO3
Aeration Basin (not in use)
LEAK DETECTION
2no.125 dia ducts to Main Factory
SUB-STATION
SWM 9
SWM 8
SWM 7
M.H
SWM 6
128.493+ C.L
124.893+ I.L
EXISTING SEWAGE PUMP STATION
Contact Tank
100mm dia. duct
Proposed Gas Tank surrounded with protective bollards
Existing Entrance
SITE NOTICE
TAR
SW
Proposed 6m high Light pole
175.8M
372.9M
SWM 5
128.193+ I.L
Proposed Crossing point (C.P)
SWM 4
128.372+ I.L
FOULWATER
Surface water
SWM 1
128.715+ I.L
GRAVEL AREA
CONCRETE
SKIP HOUSE
FEATHER PLANT
153.3M
Feather Line
Existing surface water line
F.F.L130.543+
Solar Panels
PROPOSED FACTORY
Proposed green area/grass/trees
SW. PT (4).
TANK 1
TANK 2
TANK 3
Proposed path 2.2m wide, 150mm depth, 30N concrete for cable tray support.
To processing plant
204.9M
TO DERRY
TO EMYVALE
Proposed Mini Pillar
Proposed Crossing point (C.P)
Proposed 6m high Light pole
Gate
300M
office development
WHEEL CHAIR ACCESS
Conveyor
SWM 3
128.629+ I.L
GENERATOR
SUB STATION
Proposed green area/grass/trees/benches
Proposed underground water storage tank
Plant Room
Skip House
F.F.L133.669+
Plant Yard
DIESEL
GAS
CABIN
OVERHEAD POWER LINE
Proposed Retaining wall
WATER
Mainswater
RWP
86.1M

LEGEND
- CONCRETE/GRAVEL
- TREES, SHRUBS
- ROADS
- GRASS

Appendix 10.1: Ecological Impact Assessment

Rowan



Ecological Impact Assessment for Proposed Development

Client Silver Hill Foods

Prepared for Rowan Engineering Consultants

By Whitehall Environmental

January 2023

Table Of Contents

1. Introduction

1.1 Background

This Ecological Impact Assessment (EcIA) addresses the potential impacts of a proposed development that may occur in the future on the biodiversity and ecological integrity of a site at Corlattallan, Emyvale, Co. Monaghan.

It follows a standard approach based upon the description of the existing baseline conditions within the development site. An evaluation of the likely habitats and species currently present within the proposed development site is also given, along with the identification of the potential ecological impacts arising from the construction and operation of the proposed development. An assessment of the likely significance of the identified impacts on valued ecological receptors (VERs), both within and close to the development site is also made. Where a significant negative impact has been identified, then suitable remedial mitigation measures are provided in order to prevent, reduce or offset the impact.

1.2 Location and Setting

The application site is located on the northern outskirts of Emyvale town, approximately 400m north of the town centre. Access to the site is via an existing entrance that is located just off the N2. The site is approximately 35 hectares and it encompasses the processing site along with agricultural lands to the east of the site and to the west of the N2. A site location map is shown in Figure 1.

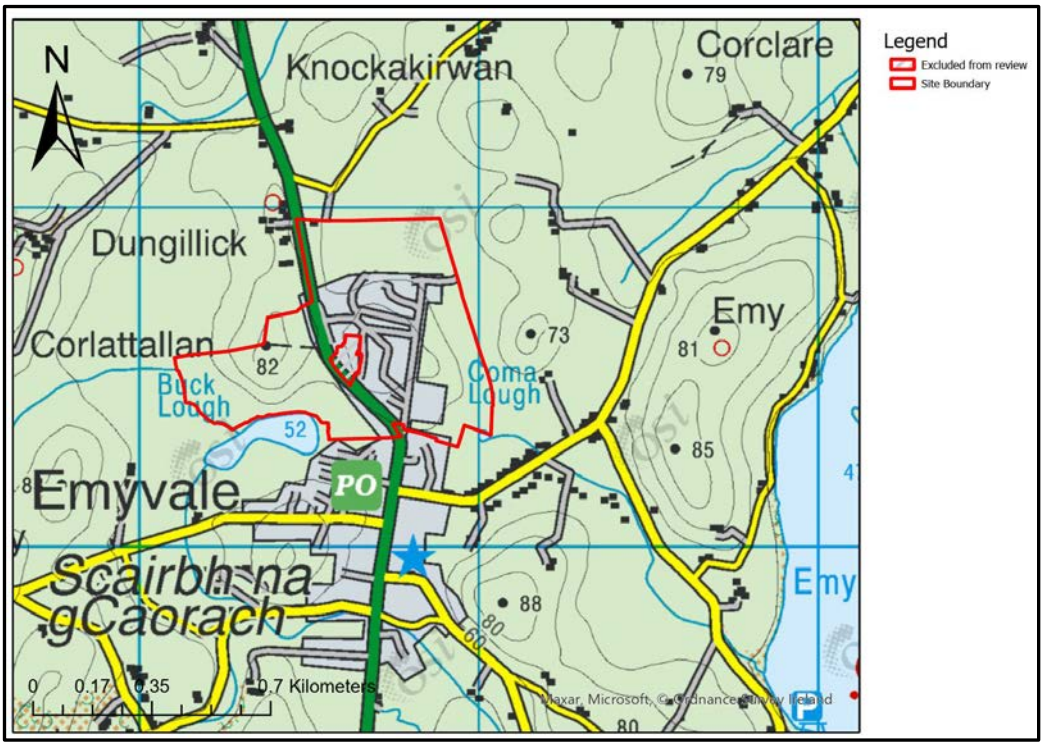


Figure 1 – Map Showing the Location of the Site (Outlined in Red)

1.3 Legislative and Policy Context

1.3.1 Legislative Context

The Irish Wildlife Act 1976 (and its amendment of 2000) provides protection to most wild birds and animals. Interference with such species can only occur under licence. Under the act it is an offence to "wilfully interfere with or destroy the breeding place or resting place of any protected wild animal". The basic designation for wildlife is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Amendment Act (2000) NHAs are legally protected from damage. NHAs are not part of the Natura 2000 network and so the Appropriate Assessment process does not apply to them.

The Flora Protection Order 1999 provides statutory protection in Ireland to a number of rare plant species from being wilfully cut, picked, uprooted or damaged. It is also illegal under this order to alter, damage or interfere with their habitats.

The Birds Directive (Council Directive2009/147/EC) recognises that certain species of birds should be subject to special conservation measures concerning their habitats. The Directive requires that Member States take measures to classify the most suitable areas as Special Protection Areas (SPAs) for the conversation of bird species listed in Annex 1 of the Directive. SPAs are selected for bird species (listed in Annex I of the Birds Directive), that are regularly occurring populations of migratory bird species and the SPA areas are of international importance for these migratory birds.

The EU Habitats Directive (92/43/EEC) requires that Member States designate and ensure that particular protection is given to sites (Special Areas of Conservation) which are made up of or support particular habitats and species listed in annexes to this Directive.

The Water Framework Directive (WFD) (2000/60/EC), which came into force in December 2000, establishes a framework for community action in the field of water policy. The overall sim of the WFD is the eventual achievement of good status in all waterbodies. The WFD was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003). The WFD rationalises and updates existing legislation and provides for water management on the basis of River Basin Districts (RBDs). RBDs are essentially administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD. Ireland is now within the 2nd cycle of the WFD (2015 – 2021), where previous RBDs

were merged into one national RBD. This cycle will also facilitate a greater input of communities at the local catchment level.

1.3.2 Planning Policies

National

Nationally, the Government's commitment to sustainable development is set out in a number of documents including the National Development Plan 2007-2013, the National Spatial Strategy 2002-2020 and Sustainable Development: A Strategy for Ireland 1997.

Regional

The Regional Planning Guidelines for the Border Region, adopted by the Border Regional Authority on 29th September 2010, provides a planning framework covering the counties of Cavan, Donegal, Leitrim, Louth, Monaghan and Sligo for the period 2010-2022. These guidelines contain a number of policies relevant to ecology and nature conservation. These guidelines are summarised in Table 1.

Policy Reference	Policy
ENVP5	All development plans and projects within the Border Region shall conserve and protect biodiversity and the ecological integrity of: • All designated sites, or any new or extended ecological sites designated during the life of the Guidelines, of international and national importance, and sites proposed for designation, in particular, European sites (including Natura 2000 sites), and Ramsar sites, NHAs and statutory Nature Reserves; • Species listed under Annex I, Natural Habitats; Annex II, Animal and Plant Species and Annex IV, Animal and Plant Species of Community Interest in need of strict protection of the Council Directive92/43/EEC.

Table 1 – Regional Policies Relevant to Ecology and Nature Conservation

Local

Planning policy at the local level is provided by the Monaghan County Development Plan 2019 –2022. This plan contains a number of policies relevant to ecology, biodiversity and nature conservation. These are summarised in Table 2.

Policy Reference	Policy
HCLSO 1	To promote and encourage the conservation and preservation of the County's natural environment, cultural heritage and amenities in accordance with legislation, plans and policies developed to specifically address these areas and to ensure a rich cultural landscape, healthy environment and the full provision of ecosystems services in the county.
HLP 1	To implement in partnership with all relevant stakeholders the objectives and actions detailed within the County Monaghan Heritage Plan 2017-2022 and any subsequent versions.
HLP 2	To implement in partnership with all relevant stakeholders the objectives and actions detailed within the County Monaghan Heritage Plan 2017-2022 and any subsequent versions.
HLP 3	To implement in partnership with all relevant stakeholders the objectives and actions detailed within the County Monaghan Heritage Plan 2017-2022 and any subsequent versions.
HLP 4	No projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this plan (either individually or in combination with other plans or projects).
HLP 5	To recognise that nature conservation is not just confined to designated sites and acknowledge the need to protect non-designated habitats and landscapes and to conserve their biological diversity and provide ecosystem services.
HLP 6	To support the implementation of any relevant recommendations contained in the National Biodiversity Plan, the National Pollination Plan and the National Peatlands Strategy.
HLP 9	To protect the landscapes and natural environments of the County by ensuring that any new developments in designated sensitive rural landscapes do not detrimentally impact on the character, integrity,

	distinctiveness or scenic value of the area. Any development which could unduly impact upon such landscapes shall be resisted.
GIP 6	To contribute towards the protection and enhancement of biodiversity and ecological connectivity, including woodlands, trees, hedgerows, wetlands, rivers, streams, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive.
GIP 7	To encourage and facilitate, in consultation with relevant stakeholders, the development of green infrastructure that recognises the synergies that can be achieved with regard to the following:-Provision of open space amenities -Sustainable management of water -Protection and management of biodiversity-Protection of cultural heritage -Protection of protected landscape sensitivities.
WLP 1	Development that would destroy, fragment or degrade any wetland will be resisted.
WLP 2	Where it is proposed to infill or reclaim a wetland area, an Ecological Impact Assessment will be required.
WLP 3	To implement the relevant parts of the Planning and Development (Amendment) (No. 2) Regulations 2011 and the European Communities (Amendment to Planning and Development) Regulations 2011 which require planning permission to be applied for where the area impacted by works relating to the drainage or reclamation of a wetland exceeds 0.1 hectares or where such works may have a significant effect on the environment. Such planning applications would need to be supported by an Appropriate Assessment where necessary.
TWP 1	To minimise loss of tree(s) and hedgerow associated with any development proposal and encourage the retention of existing mature trees, hedgerows and woodlands in new developments. Where removal is unavoidable consideration should be given to transplanting trees and/or providing compensatory planting on the site.
TWP 2	To preserve trees and/or groups of trees that have a significant amenity value, and to designate Tree Preservation Orders where appropriate.

Table 2 – Local Policies Relevant to Ecology and Nature Conservation

Biodiversity and Heritage Plans

Ireland's National Biodiversity Plan identifies actions that need to be taken in order to understand and protect biodiversity in Ireland. It states that biodiversity and ecosystems in Ireland should be conserved and restored, to deliver benefits that are essential to all sectors of society and that Ireland should contribute to the efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally.

The Monaghan Heritage Plan identifies a number of objectives and policies in order to protect the natural heritage and biodiversity of Co. Monaghan.

2. Methodology

2.1 Statement of Competency

The site visit in August 2022 was undertaken by Dr James Massey. James a senior environmental consultant and ecologist with Rowan, holding a BSc (Hons) in Applied Marine Biology (Heriot-Watt University) Doctorate (University of Glasgow and University of Arizona) and has over 20 years experience in ecology and environmental management, a Chartered Scientist (CSci) and Environmentalist (CEnv). James is a Fellow of the Institute of Environmental Sciences since 2012. The 2022 river water quality analysis (Q values) were undertaken by Montgomery Environmental (MEHS). The site suitability survey, river water quality analysis (Q values) and report was carried out by Noreen McLoughlin. Noreen is the owner and main ecologist at Whitehill Environmental. Noreen holds a BA (Hons) in Natural Science (Mod) Zoology and an MSc in freshwater ecology (TCD, Dublin). She has been a full member of the CIEEM (Chartered Institute of Ecology and Environmental Management) for over 15 years

2.2 Study Area

The study area encompasses all the land within the area defined in the plan submitted for planning consent, i.e., the proposed application site. In addition, important ecological habitats and receptors within the zone of influence of the proposed development were also studied.

2.3 Desk Based Studies

The desk study involved the examination of aerial photographs, current and historical maps and plans and drawings of the site. In addition, information was collated on designated nature sites within a 15km radius of the proposed site and on protected and rare species within the 1km square of the site.

The following websites were used to access information and data:

- National Parks and Wildlife Service - Aerial photographs and maps of designated sites, information on habitats and species within these sites and information on protected plant or animal species, conservation objectives, site synopses and standard data forms for relevant designated sites.
- Environmental Protection Agency (EPA)- Information pertaining to water quality, geology and licensed facilities within the area;
- Myplan.ie – Mapped based information;
- National Biodiversity Data Centre (NBDC) – Information pertaining to protected plant and animal species within the study area;
- Bing maps & Google Street View – High quality aerials and street images;

- Michael Hetherton Architects an Eng Services Ltd – Plans and information pertaining to the development.
- Monaghan County Council – Information on planning history in the area for the assessment of cumulative impacts.

2.4 Field Based Studies

A site walk over of the habitats and site conditions was conducted on 11th August 2022. Sampling of the Corlattallan Stream was undertaken during base flow water conditions on the 29th July 2022.

The site suitability survey application site at Corlattallan was conducted by Whitehill Environmental on August 13th 2020, when habitat mapping and field ecology notes within the application site were classified and coded according to Level 3 of A Guide to Habitats in Ireland (Fossit, 2000) to prepare the baseline ecological assessment.

In addition, along with a study of the terrestrial receptors, a study of the Corlattallan Stream, which is the receiving water for the Silver Hill discharge, was also undertaken on this day. Two separate points were surveyed along the stream, at points upstream and downstream of the current discharge location. These sites and their locations are summarised in Table 3.

Station No.	River Name & Location	Grid Reference
Upstream	Upstream of Discharge Point	54.346597, -6.962773
Downstream	Downstream of Discharge Point	54.347778, -6.960921

Table 3 – Stations Sampled as Part of this Assessment

At each station, the surrounding habitats were noted along with other parameters such as water flow, stream depth and the predominance of vegetation. Following this, a two-minute kick sample was taken with a Freshwater Biological Association approved hand held sweep net with a mesh diameter of 500µm. If a kick sample was not suitable due to the depth or flow conditions of the river, then a two-minute sweep sample of the in-stream vegetation and a stone wash was taken instead.

The samples were retained in plastic containers at the sampling site. In the laboratory, mud was removed from each sample by sieving under running water through a 500 µm sieve. The sieved samples were then sorted live in a white sorting tray under a bench lamp. All macro-invertebrates were removed from the samples and preserved in 70% ethanol. They were later counted and identified to an appropriate taxonomic level. Based on the relative abundance of indicator species, a biotic index (Q rating) was then determined for the sites in accordance with the biological assessment procedure used by the Environmental Protection Agency (Toner *et al.* 2005).

2.5 Q Value Assessment

Along with other parameters (fish, morphology, chemistry), the Q value is used to determine the ecological status of the waterbody, which is an action required under the obligations set out in the EU Water Framework Directive. Under this Directive, all water bodies are required to meet good status within a certain time period. Ireland is now in the second cycle of the Water Framework Directive and therefore good status should be achieved in all water bodies by the end of this current cycle, i.e., 2021. If a waterbody is unlikely to achieve this status, then it is deemed to be *At Risk.* Table 4 summaries the Q values in relation to Water Framework Directive status.

Q Value	WFD Status	Pollution Status	Condition
Q5, Q4-5	High	Unpolluted	Satisfactory
Q4	Good	Unpolluted	Satisfactory
Q3-4	Moderate	Slightly polluted	Unsatisfactory
Q3, Q2-3	Poor	Moderately polluted	Unsatisfactory
Q2, Q1-2, Q1	Bad	Seriously polluted	Unsatisfactory

Table 4 – Q Rating in Relation to WFD Status

Based on the relative abundance of indicator species, the Q value was determined for the sites in accordance with the biological assessment procedure used by the Environmental Protection Agency (Toner *et al.* 2005). The method categorises invertebrates into one of five different groups based on their sensitivity or tolerance to pollution. Group A are the most sensitive forms, Group B are less sensitive, Group C are tolerant, Group D are very tolerant and Group E are the most tolerant. Overall, the higher the biological diversity and the greater the abundance of invertebrate species that are sensitive to organic pollution, then the higher the water quality is assumed to be and the higher the Q value assigned to that sampling station.

The relative abundance of each group of invertebrates in the samples was assigned as follows:

- Present (1/2 individuals)
- Scarce/Few (<1%)
- Small Numbers (<5%)

- Fair Numbers (5-10%)
- Common (10-20%)
- Numerous (25-50%)
- Dominant (50-75%)
- Excessive (>75%)

2.6 Seasonal Constraints

Given the composition of habitats on the site, no seasonal constraints were identified due to the timing of the survey.

2.7 Assessment Methodology

2.7.1 Evaluation of Ecological Features

The methodologies used to determine the value of ecological resources, to characterise the impacts of the proposed scheme, and to assess the significance of impacts and any residual effects are described below. This approach is in accordance with EPA guidance and the CIEEM's (Chartered Institute of Ecology and Environmental Management) guidelines.

CIEEM suggest that to ensure a consistency of approach, ecological features are valued in accordance with their geographical frame of reference, as defined below:

- International
- National (Ireland)
- Regional (East)
- County (Monaghan)
- District (Emyvale)
- Local/Townland (Corlattallan townland)

The above categories are then applied to the ecological features identified. Ecological features can be defined as:

- Designated sites (i.e., SACs, SPAs, NHAs, pNHAs, National Nature Reserves) or non-statutory locally designated sites and features.
- Non-designated sites and habitats and features of recognised biodiversity value, such as rivers and streams. The features being evaluated can be considered in

the context of the site and locality and thus a more accurate assessment of the impacts in the locality can be made.

The criteria used in evaluating ecological habitats follow the NRA (2009) and CIEEM (2006). The site evaluation criteria are detailed in Table 5.

Ecological Valuation	Description
Internationally Important	• Sites designated (or qualifying for designation) as an SAC* or SPA* under the EU Habitats or Birds Directives. • Undesignated sites that fulfil criteria for designation as a European Site. • Features essential to maintaining the coherence of the Natura 2000 network. • Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive. • Ramsar Sites, World Heritage Sites or Biosphere Reserve. • Site hosting significant species populations under the Bonn Convention or Berne Convention. • Biogenetic Reserve or European Diploma Site. • Salmonid waters.
Nationally Important	• Sites or waters designated or proposed as an NHA*or Statutory Nature Reserve. • Refuge for fauna and flora protected under the Wildlife Acts. • National Park. • Undesignated sites fulfilling criteria for designation as a NHA. • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Act. • Resident or regularly occurring populations (assessed to be important at the national level) of species • protected under the Wildlife Acts and/or species listed on the relevant Red Data list). • Site containing viable areas of the habitat types listed in Annex I of the Habitats Directive.
County Importance	• Areas of Special Amenity. • Area subject to a Tree Preservation Order. • Area of High Amenity, or equivalent, designated under the County Development Plan. • Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list.

	• Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance. • County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or local BAP. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (higher value)	• Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP. • Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (lower value)	• Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites of features containing non-native species that are of some importance in maintaining habitat links.

Table 5 - Conservation Evaluation (after Natura Site Evaluation Scheme, NRA, 2009).

SAC = Special Area of Conservation SPA = Special Protection Area NHA = Natural Heritage Area.

2.7.2 Assessment of Impacts

The assessment of potential ecological impacts has been carried out using guidelines published by the EPA and the CIEEM. They can be summarised as:

- The identification of the range of potential impacts which can reasonably be expected to occur should the proposed developments receive consent;
- The consideration of the systems and processes in place to avoid, reduce and mitigate the possible effects of these impacts;
- The identification of opportunities for ecological enhancement within the site.

Impacts are defined as being positive, negative or neutral. A significant impact is defined as an impact upon the integrity of a defined ecosystem and/or the conservation status of a habitat or species within a given area.

Where a potential negative impact has been identified, mitigation measures have been formulated using best practices techniques and guidance to prevent, reduce or offset the impact.

3. Development Description

3.1 Existing Activities

Silver Hill Foods is a fully integrated duck producing company based in Corlattallan, Emyvale, Co. Monaghan. Activities on the site include the processing, cooking and packaging of duck products.

3.2 Future Activities

Silver Hill Foods is planning to add pet food processing within the existing facilities. In addition the pilot drip irrigation scheme will be extended to a larger area to increase capacity and reduce current discharge to stream.

Silver Hills are also planning to include solar panel area on roof and a potential future PV site at the lower field area behind the slurry lagoon area.

4. Receiving Environment

This section provides an overview of the existing ecological conditions within the site and the surrounding environment.

4.1 General Site Description

The application site is located in the townland of Corlattallan, which is just north of Emyvale. It is located in a drumlin characterised landscape, in an area where agriculture is the dominant land use and where improved agricultural grassland is the dominant habitat. Other habitats present locally include wet grasslands, scrub, small areas of broadleaved woodlands, hedgerows, treelines and surface water features. A site location map is provided in Figure 3, whilst an aerial photograph of the site and its surrounding habitats is shown in Figure 4.

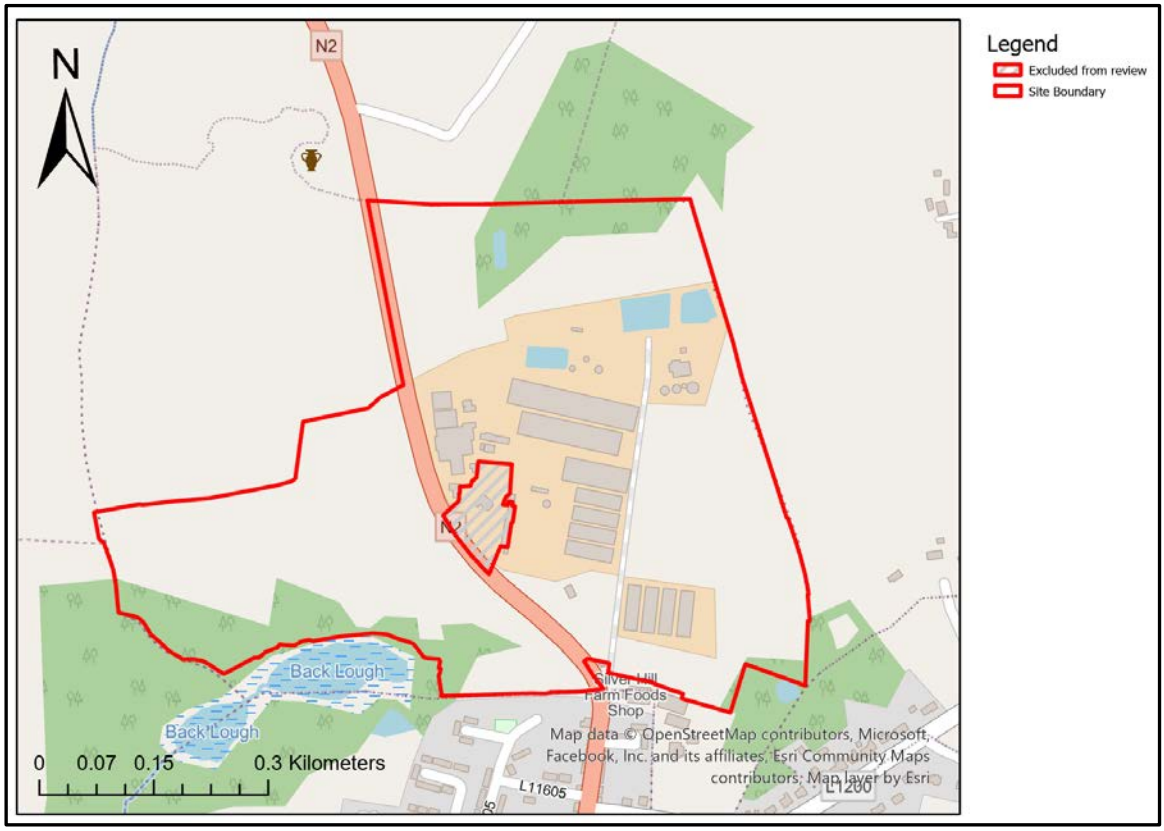


Figure 3 – Site Location Map

Figure 4 – An OSI Aerial Photograph of the Site and Surrounding Habitats.

4.2 Designated Sites

4.2.1 Natura 2000 Sites

The proposed application site is not within nor adjacent to any site that has been designated as a Special Area of Conservation (SAC) or a Special Protection Area (SPA) under the EU Habitats or EU Birds Directive.

There are three Natura 2000 sites within 15km of this proposed development. These sites are the summarised in Table 6. The location of the application site in relation to these designated areas is shown in Figure **5** and a full synopsis of the relevant sites can be read online on the website of the National Parks and Wildlife Service (www.npws.ie) and the Joint Nature Conservation Committee (jncc.defra.gov.uk). In addition, any other sites further than 15km, but potentially within its zone of influence were also considered. The zone of influence may be determined by an assessment of the connectivity between the application site and the designated areas by virtue of hydrological connectivity, atmospheric emissions, flight paths, ecological corridors etc.

Site Name & Code	Distance from Proposed Development	Qualifying Interests
Slieve Beagh SPA 004167	6.59km north-west	• Hen Harrier *Circus cyaneus*
Slieve Beagh-Mullaghafad-Lisnaskea SPA UK9020302	9.3km north-west	Hen Harrier *Circus cyaneus*
Slieve Beagh SAC UK0016622	11.1km north-west	• Natural dystrophic lakes and ponds • European dry heaths • Blanket bogs
Lough Neagh and Lough Beg SPA UK9020091	~70km downstream	• Common pochard *Aythya farina* • Tufted duck *Aythya fuligula* • Common goldeneye *Bucephala clangula* • Bewick's swan *Cygnus columbianus bewickii* • Whooper swan *Cygnus Cygnus* • Common tern *Sterna hirundo*

Table 5 – Natura 2000 Sites of Relevance to the Proposed Development

The generic conservation objectives of all these sites are:

1. To maintain the favourable conservation status of the qualifying interests (outlined above) of these SACs.

2. To maintain the extent, species richness and biodiversity of the entire site.

3. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

The favourable conservation status of a habitat is achieved when:

- Its natural range and area it covers within that range is stable or increasing and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;

- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- The population dynamics data on the species concerned indicate that it is maintaining itself on a long -term basis as a viable component of its natural habitats;

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;

- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

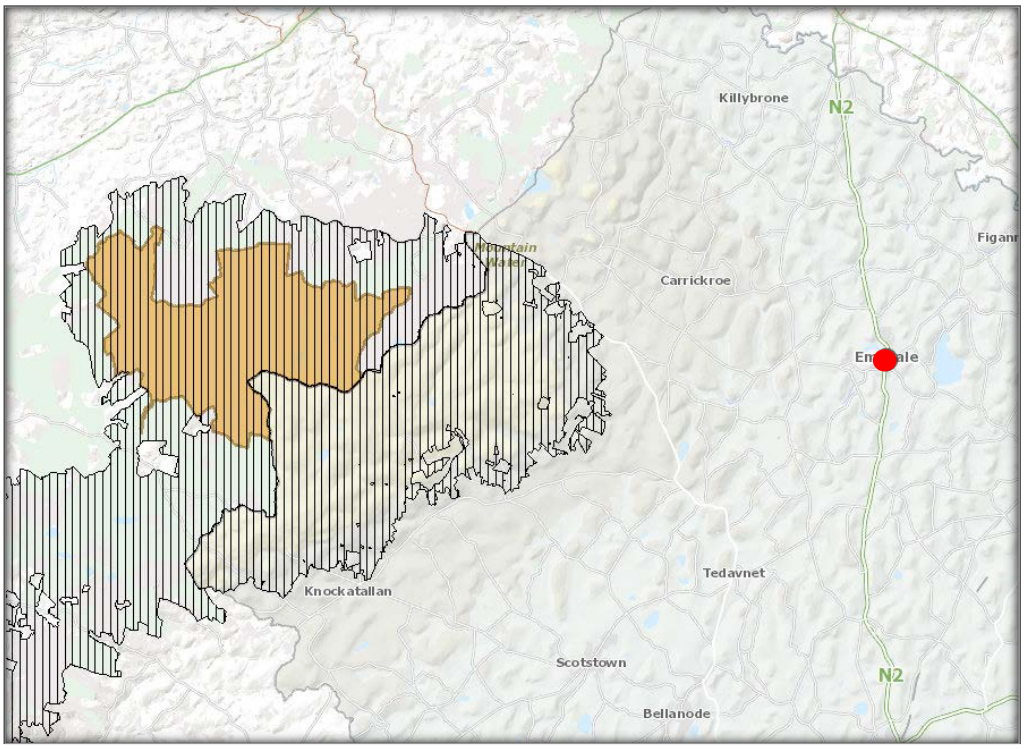


Figure 5 – The Application Site (Pinned) in relation to the Relevant Designated Sites. SACs - Red Cross Hatching, SPAs – Red Vertical Hatching.

4.2.2 Nationally Important Sites

The application site is not within nor adjacent to any nationally designated site, such as a Natural Heritage Area or a proposed Natural Heritage Area. It is within 15km of ten sites that have been designated as proposed Natural Heritage Areas. These sites are summarised in Table 7 and a map showing their locations relative to the application site is shown in Figure 6.

Site Name	Distance from Proposed Development	Ecological Connectivity
Monmurray Grassland pNHA 000562	3.8km east	No
Glaslough Lake pNHA 000559	5.2km south-east	No
Mullaghmore Lake (South) pNHA 001785	7.8km south-west	No
Eshbrack Bog NHA 001603	8.4km west	No
Drumreaske Lough pNHA 001602	9.7km south	No
Wright's Wood pNHA 001612	10.9km south	No
Rosefield Lake and Woodland pNHA	11km south	No
Ulster Canal (Aghalish) pNHA 001611	12.4km south	No
Corcreeghy Lake and Woodland pNHA 001783	13.7km south	No
Emy Lough pNHA 000558	822m east	No

Table 7 – Nationally Important Sites within 15km of the Proposed Development

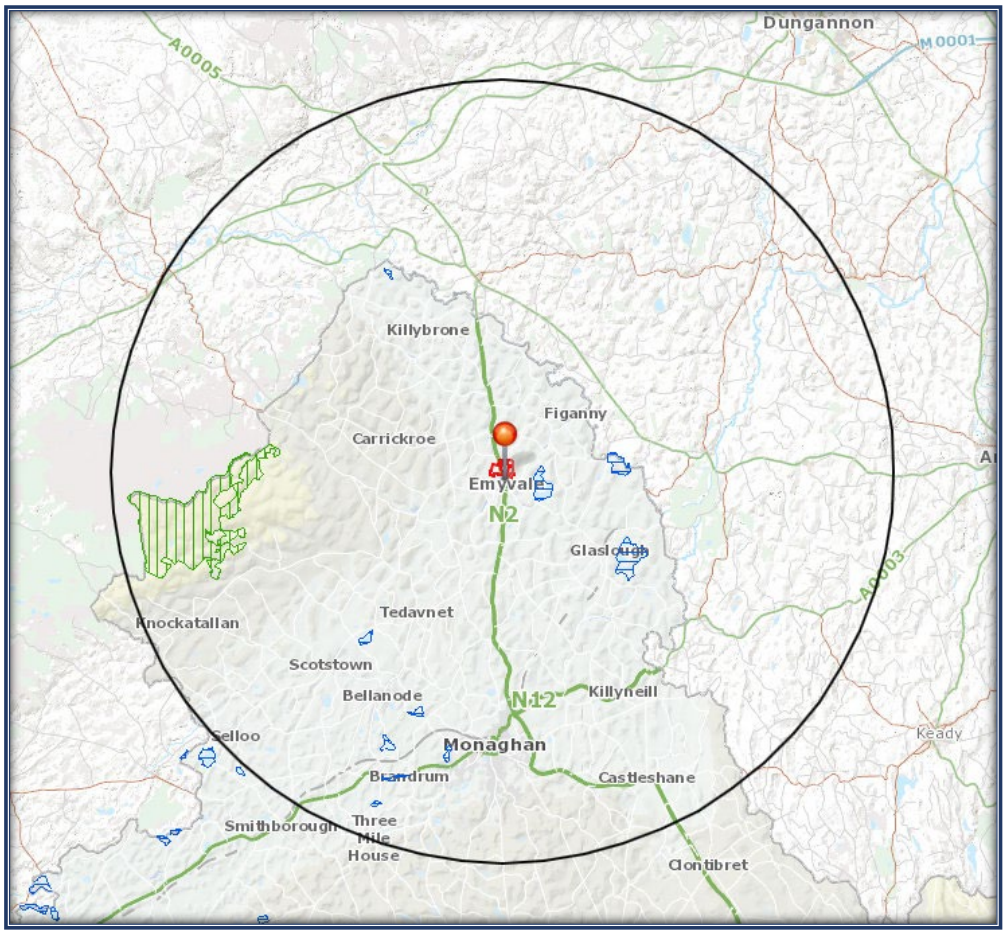


Figure 6– The Proposed Application Site at Corlattallan (Pinned) in Relation to proposed Natural Heritage Areas (Blue Cross Hatching)

4.3 Flora and Fauna

4.3.1 Rare and Protected Plant Species

An examination of the website of the National Parks and Wildlife, the National Biodiversity Data Centre and the Online Atlas of Vascular Plants for Ireland revealed that no species protected under the Flora Protection Order occurs within the 1km square (H6744) Zone of Influence of the proposed application site.

4.3.2 Non-Native Invasive Species

No non-native invasive species that are regulated for control under the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477) were recorded from within the study area. Particular attention was paid to the potential presence of Japanese knotweed *Fallopia japonica*, which is very common in urban areas and disturbed ground in Ireland.

4.3.3 Habitats within the Study Area

Overview

No part of the site lies within any area that is designated for nature conservation purposes. All proposed construction works on the site will take place on habitats classed as low ecological value. The proposed drip irrigation system will be laid on pasture lands that surround the site. The habitats are described in greater detail below whilst a habitat map is illustrated in Figure 7. A full list of the plant species recorded from the study area is shown in Appendix I and photos of the site can be seen in Appendix II.

Habitat Description

The dominant habitats within the application site include buildings and artificial surfaces (BL3) and improved agricultural grasslands (GA1). The buildings and artificial surfaces include the offices, processing facility, car parks and all other built areas associated with Silverhill Foods. There is limited vegetation associated within these habitats. The proposed construction works will all take place in these areas.

There are also some areas of recolonising bare ground ED3 within the main application site around the existing buildings, in areas to the north of the carpark by the wastewater treatment plant and old slurry lagoon. These areas have been colonised by typical ruderal species such as silverweed *Argentina anserina*, scentless mayweed *Tripleurospermum inodorum*, redshank *Persicaria maculosa*, scarlet pimpernel *Anagallis arvensis*, clovers *Trifolium* sp, willowherbs *Epilobium* sp and germander speedwell *Veronica chamaedrys*. There are also some pockets of unimproved grassland / grassy verge type habitats scattered throughout the main site.

There is some maintained landscaping on the site also, including amenity grasslands (GA2) and scattered trees (WD5). There is an ornamental hedgerow (WL1) along the boundary of the site on the main road.

The remainder of the site consists of a number of pastures which are improved and these areas are the proposed locations for the drip irrigation system. These pastures occur on the undulating drumlin landscape which surrounds the site and they occur on either side of the main road. Many of these are being grazed by cattle and they are generally quite species poor. Grasses such as rye grass *Lolium* sp and meadow grasses *Poa* sp are dominant. Herbaceous broadleaved species were not common in the sward, but those noted included broadleaved dock *Rumex obtusifolius*, common mouse-ear *Cerastium fontanum* and ragwort *Jacobaea vulgaris*. The fields are mostly well drained but there are some pockets of wet grassland GS4, where rushes *Juncus* sp. dominate.

The field boundaries generally consist of well developed and managed treelines (WL2) and hedgerows (WL1). Some of these linear features are of high biodiversity value. The most common species noted included ash *Fraxinus excelsior*, willow *Salix* sp., elder *Sambucus nigra* and hawthorn *Crataegus monogyna*, with bramble *Rubus fruticosus* and ivy *Herera helix* occurring throughout also.

The pastures in the south-western corner of the application site extend down to two small lakes. These lakes are outside of the application site. These lakes are fringed with marsh vegetation such as common reed *Phragmites australianis* and bulrush *Typha latifolia.* Willow woodland / scrub (*Salix alba*) also extends out from these two small lakes and it forms the boundary of the fields which occur in the south-western corner of the site.

There is an area of mixed broadleaved woodland (WD2) immediately north of the application site. Species noted in this area included elder *Sambucus nigra*, willows *Salix* sp. and birch *Betula* sp. There will be no impacts upon this habitat arising out of the proposed works.

The Corlattin Stream (depositing lowland river FW2) flows within the site, and it is currently the receiving water for the treated effluent from the onsite wastewater treatment plant. This small stream rises in lands that are west of the site. It is culverted under the road and it flows through the site in an easterly, then northerly direction. There is a high level of silt in this stream and little instream vegetation. A kick sample was taken in order to obtain a representative sample of invertebrates in this stream. Upon examination of the net, a definite odour of hydrocarbon was present, whist there was also a hydrocarbon sheen on the surface of the water. The water level in the stream on the day of sampling was low.

Overall Evaluation of Habitats within the Site

The biodiversity value of the entire site varies from low to high on a local level. Within the area surrounding the factory, the dominant habitats are modified and manmade. These have no ecological value. The pastures are improved and are also considered to be of low biodiversity value. The treelines and hedgerows that form the boundaries of the fields are well structured and diverse, and they are of high ecological value on the local level. They are an important part of the green infrastructure around Emyvale, potentially linking up areas of high biodiversity value such as wetlands and woodlands. They are important ecological corridors for birds and mammals, and they also provide valuable nesting sites for birds, as well as roosting sites for bats. Flowering plants within and along the verges are also important sources of nectar for pollinating insects.

The Corlattallan Stream can also be considered as an ecological feature with local / county importance.

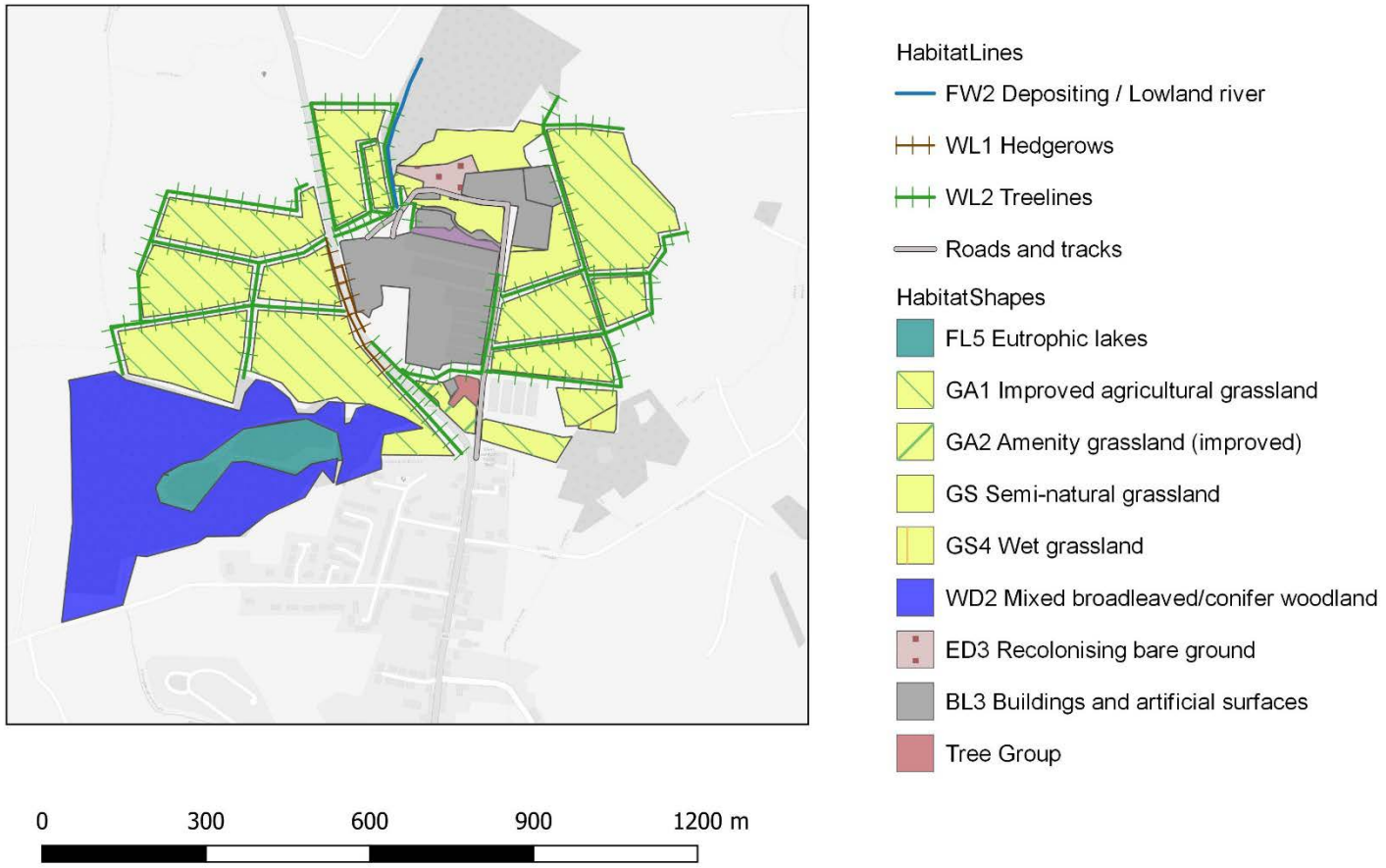


Figure 7 – Map of the Main Habitats within and Surrounding the Application Site

4.4 Fauna

4.4.1 Protected Mammals

No protected mammals were observed on site during the course of the field survey. No mammal tracks were observed and no badger setts were noted, however it is possible that they do occur in the area.

Records from the National Biodiversity Data Centre reveal the presence of the following protected mammals from within the 10km square (H64) of this proposed application site:

- Badger *Meles meles*
- Pygmy shrew *Sorex minutus*
- European Hedgehog *Erinaceus europaeus*
- Otter *Lutra lutra*
- Red squirrel *Sciurus vulgaris*
- Fallow deer *Dama dama*
- Irish Hare *Lepus timidus subsp. Hibernicus*
- Irish stoat *Mustela erminea subsp. hibernica*
- Pine Marten *Martes martes*
- Daubenton's bat *Myotis daubentonii*
- Natterer's Bat *Myotis nattereri*
- Pipistrelle *Pipistrellus pipistrellus sensu lato*
- Lesser Noctule *Nyctalus leisleri*
- Soprano *Pipistrelle Pipistrellus pygmaeus*

There are no records of any of these species within the relevant 1km^2 or the Corlattallan townland, however this is likely due to a lack of recording rather than any lack of these species from the area. All these species are protected under the Irish Wildlife Acts. In addition, the otter *Lutra lutra* is protected under Annex II of the European Habitats Directive. Bats are likely to fly around the site to forage during summer nights, and there are likely to be some local bat roosts in suitable trees in the treelines within the site and within the woodland habitats that surround the site. Badgers and pine martins may also use the natural habitats close to the site. None of these species were observed onsite during the days surveyed.

4.4.2 Birds

Bird activity was limited on the days of the survey, however species observed / heard included:

- Blackbird *Turdus merula*
- Great tit *Parus major*
- House martin *Delichon urbicum*
- Jackdaw *Corvus monedula*
- Magpie *Pica pica*
- Robin *Erithacus rubecula*
- Rook *Corvus frugilegus*
- Starling *Sturnus vulgaris*
- Swallow *Hirundo rustica*
- Wren *Troglodytes troglodytes*

4.4.3 Amphibians, Reptiles, Invertebrates

No amphibians or reptiles were noted on the day; however, they are likely to occur locally. There was a small range of invertebrates noted on the wing, including butterflies (small tortoiseshell, painted lady, small white), diurnal moths and dipterns.

4.5 Aquatic Environment

4.5.1 Water Features and Quality

The Corlattallan Stream

The main part of the application site is located within the Lough Neagh and Lower Bann Hydrometric Area and Catchment, and the Blackwater Tributary Sub-Catchment and the Blackwater (Annaghroe) Sub-Basin. However, some of the pasture lands on the western side of the N2 are located within the Mountain Water Sub-Catchment and Sub-Basin.

As mentioned in the previous section, the Corlattallan Stream flows through the application site and it is the receiving water for the current discharge from the Waste Water Treatment Plant. This stream rises in lands to the south-west of the site and it is culverted under the road. It flows through the site in a northerly direction towards its confluence with the Knockakirwan Stream. This stream flows north until it meets the Blackwater Tributary, at a point approximately 5km downstream of the application site. The River Blackwater eventually flows into Lough Neagh.

Previous Water Quality Results

The EPA have not classified the ecological status of the Corlattallan Stream, the Knockakirwan Stream or the Blackwater Tributary (this lies within the UK therefore they would not be obliged to monitor this). The Department of Agriculture, Environment and Rural Affairs in Northern Ireland have classed the ecological status of the River Blackwater as moderate. Under the requirements of the Water Framework Directive, this is unsatisfactory and good status must be achieved

In 2017, in order to gather a baseline ecological status (presented as a Q value) of the Corlattallan Stream, kick samples were taken from three points along the stream by Montgomery EHS and a Q-analysis was undertaken for these samples. The results of this Q analysis were as follows:

- Site 1 (at discharge) – Q2-3, poor ecological status
- Site 2 (downstream of discharge) – Q2-3, poor ecological status
- Site 3 – (upstream of confluence with Blackwater) – Q3, moderate ecological status.

Biological Water Quality - Results of this Assessment

The results of the Q value assessment for the upstream and downstream stations of the Corlattallan Stream are presented in Table 8. A full list of the invertebrates recorded from both stations is presented in Appendix III.

Station	Location	Q Value & Status	Q Value & Status
1	Upstream	Q3 - Moderate	Q3 - Moderate
2	Downstream	Q2-3 - Poor	Q2-3 - Poor

Table 9 – Q Values of the Corlattallan Stream

Station One - Corlattallan Stream (Upstream)

The sample was taken across the road from the Silver Hill foods site, before the stream is culverted under the N2. The stream here is more akin to a drainage ditch and no suitable riffle habitats were present. There was very little flow in the stream here and it has formed a small pool in the corner of the field. There is a hedgerow along the eastern (roadside) bank of the stream whilst the western bank of the stream was fenced off from grazing livestock. There was a high level of silt in the stream at this point.

Macro-invertebrate biodiversity in the sample was very low, and the sample was dominated by diptern larvae from the Chironomidae family. These comprised over 87% of the total faunal assemblage. Chironomidae larvae are Group C organisms, which mean that they are relatively tolerant of organic pollution. Other Group C taxa included beetles from the Dytiscidae family. The most sensitive Group A and Group B taxa were absent from the sample. Group D taxa are quite tolerant of pollution and these were present in small numbers. They were represented by bivalves from the Sphaeriidae family.

Overall, based on the presence and absence of the indicator taxa and the presence of Group C taxa in excessive numbers, a Q3 was assigned here. This means that the stream at this point is of moderate ecological status and under the requirements of the Water Framework Directive, this is unsatisfactory.

Station Two - Corlattallan Stream (Downstream)

Sample Two was taken within the site, just downstream of the primary discharge point. The stream at this point is quite narrow, with a gravelly substrate, although the level of silt between the stones and gravel was quite high. The western bank of the stream here consists of a treeline, and the eastern bank is open.

Macro-invertebrate biodiversity in this sample was relatively low. The most sensitive Group A and Group B taxa were absent from the sample. Group C and Group D taxa were present in similar numbers. The most common organism in the sample was the water louse *Asellus aquaticus.* This Group D taxa is quite tolerant of pollution. *Asellus* comprised 49% of the overall taxa (numerous) and it was the only Group D taxa present. Group C were also numerous in the sample at 46% and taxa included Chironomidae larvae, Simuliidae larvae and beetles from the Dytiscidae family. The most tolerant Group E taxa were also present in this sample in fair numbers. This group are very tolerant. Dipterns from the chironomous genus represented this group.

Overall, based on the presence and absence of the indicator taxa and the presence of both Group C and D taxa in similar proportions, a Q2-3 was assigned here. This is indicative of poor status and this result aligns with the previous baseline report that was carried out for this stream.

From an analysis of both upstream and downstream samples, there is a difference in the ecological status of the Corlattallan Stream at points upstream and downstream of the Silver Hills discharge. This indicates that the discharge may be influencing the status of this stream. It is also likely that generalised run-off from the carpark and surrounding site may be impacting the stream. There was a definite presence of hydrocarbons in the stream within the site.

4.6 Ecological Evaluation

4.6.1 Summary of the Value of the Application Site

The site at Corlattallan is within 15km of three sites designated under the Natura 2000 network. It is hydrologically connected to the Lough Neagh and Lough Beg SPA, but the downstream distance is ~70km.

The site is also within 15km of ten sites designated as Natural Heritage Areas (NHAs and pNHAs). None of these pNHAs are hydrologically connected to the application site.

There is a limited range of habitats within the application site where buildings works will occur and most of these are highly modified and are of low biodiversity value. The proposed location of the drip irrigation system will be confined to improved agricultural grassland.

The Corlattallan Stream flows through the application site. It is of moderate status upstream of the Silver Hill discharge point, whilst it deteriorates to poor status downstream of the discharge. It also seems to be influenced by run-off from the carpark area as both silt and hydrocarbons were present in the stream. This is unsatisfactory.

5. Potential Impacts

5.1 Introduction

5.1.1 Significant Effects

The information gathered as part of the desk study and field survey for this proposed application has been used to make an Ecological Impact Assessment (EcIA). This EcIA has been undertaken following the latest guidelines set out by CIEEM (2018) and the EPA.

The identification of potential effects and the assessment of their significance typically requires the identification of the type and magnitude of the impacts. For example, will the impacts be short term or long term, direct, indirect or cumulative and will they occur during construction or operation. This section will establish whether ecological impacts of the proposed development at Corlattallan are likely to occur and whether or not they are significant. These potential impacts will be examined with respect to the ecological receptors identified in the previous section.

The emphasis in EcIA is on “significant” effects, rather than all ecological effects (CIEEM, 2018). For the purpose of EcIA, a “significant effect” is an effect that either supports or undermines biodiversity conservation objectives for important ecological features for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national / local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local.

A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. In broad terms, significant effects encompass impacts on structures and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution). (CIEEM, 2018).

5.2 Impacts upon Designated Sites

5.2.1 Natura 2000 Sites

The closest designated site to the application site is the Slieve Beagh SPA and this is 6.6km north-west of the application site. There is no connectivity between the application site and this SPA, therefore significant effects can be ruled out. The site is hydrologically connected to the Lough Neagh and Lough Beg SPA. However, the hydrological distance is approximately 70km and therefore significant effects arising on this SPA can also be ruled out.

5.2.2 Natural Heritage Areas

The closest pNHA to the application site is the Monmurry Grassland pNHA. There will be no effects upon this or any other nationally designated site arising from the proposed application site.

5.3 Impacts Upon Non-Designated Habitats

5.3.1 Construction Phase

Should the proposed infilling development at Corlattallan be allowed to proceed then the following impacts are likely to occur.

- **Habitat loss and fragmentation** – The construction of the new structures will largely take place on habitats of low biodiversity value, i.e., existing buildings and artificial surfaces. There will be no loss or fragmentation of any habitats of biodiversity value.

  The installation of the proposed drip irrigation system will occur on agricultural land. There will be minimal work required for the installation of this system. No habitats of biodiversity value will be affected. All treelines and hedgerows of biodiversity within the application site will be maintained.

- **Disturbance to local wildlife** – During the construction phase, there will be an increase in human activity and noise on the site. This will be a temporary impact on the local populations of birds and small mammals. However, overall given the nature of habitats currently on the site, this effect is not considered as significant.

  The installation of the drip irrigation system will have no impacts upon any bird or mammal species.

- **Deterioration in Water Quality** – The Corlattallan Stream flows within the application site. If appropriate mitigation measures are not taken during the construction of the proposed development, then there is the possibility that water quality locally in this stream may be negatively impacted upon. Possible direct impacts include the

pollution of the water with silt, oil, cement, hydraulic fluid etc. This would directly affect the habitat of water dependent species by reducing water quality. These substances would also have a toxic effect on the ecology of the water in general, directly affecting certain species and their food supplies. In addition, an increase in the siltation levels of the river could result in the smothering of fish eggs, an increase in the mortality rate in fishes of all ages, a reduction in the amount of food available for fish and the creation of impediments to the movement of fish. Pollution of the water with hydrocarbons or aggregate could also have a significant negative effect on the fish and aquatic invertebrate populations. This is a problem which seems to be ongoing at the present time.

- **Construction timeline** whilst the overall construction may take between 5-17 months, the impact on habitats will be limited to the installation of the drip irrigation. Each filed area will take approximately 2 weeks to complete, ant which point the section will be restored and reseeded. Only improved grassland will be affected and the period of impact is not significant.

5.3.2 Operational Phase

The following impacts are likely to occur during the operation of the site.

- **Deterioration in Water Quality –** The stream will continue to receive surface water run-off from the site and the carparking area. Since the initial survey a hydrocarbon and a silt interceptor have been constructed 9based on the recommendations of the 2020 report),

  The installation of the drip irrigation system will remove the pressure of the current discharge from the Corlattallan Stream. This will be a positive impact upon this stream in the long term. Restoring this stream to good status, as required under the Water Framework Directive, should be the long-term goal.

  The emissions to land from the drip irrigation system will have no significant effects on the surface water or groundwater receptors locally.

- **Land-Spreading -** The change in operations at the facility have ceased the need to land spreading reducing any potential nutrient load to nearby streams and watercources.

- **Cumulative Impacts** – Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first; through persistent additions or losses of the same materials or resource, and second,-through the

compounding effects as a result of the coming together of two or more effects (Bowers-Marriott, 1997).

A search of the planning portal of Monaghan County Council for other applications in the Emyvale area revealed a number of recent residential and agricultural developments. These developments will have no cumulative impacts on the biodiversity of the surrounding areas when considered in combination with this current application.

A cumulative impact assessment of the contract growers and associated facilties has determined no operators within 1km of designated sites. In addition there are no significant clusters of operations that would result in localised pressure as associated facilties. The cumulative impact assessment of the site, and an assessment of potential associated facilties has determined that there is no cumulative impacts as a result of direct, indirect or associated activities.

6. Mitigation Measures

In order to prevent the loss and fragmentation of habitats of high biodiversity value, to impacts on birds and mammals and to avoid any reductions in water quality in the area surrounding the proposed development, a number of mitigation measures must be implemented and followed. The primary parties responsible for the implementation of these measures include the applicants and the construction team (site manager, site workers).

Site Preparation and Construction

- Site preparation and construction should be confined to the development site only and in order to protect water quality in the Corlattallan Stream, it should adhere to best practice and where applicable should conform to the Inland Fisheries Ireland Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites (www.fisheriesireland.ie) and The Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.

- During construction, in order to avoid any pollution of water quality, guidelines in the CIRIA (Construction Industry Research and Information Association) Publications including C532 – Control of Water Pollution from Construction, guidance for Consultants and Contractors should also be followed. These guidelines require the following measures when working in or near river sites and they include:

- Fuels, oils, greases and hydraulic fluids must be stored in bunded compounds well away from watercourses and drains. Refuelling of machinery, etc., must only be carried out in bunded areas;

- Run-off from machine service and concrete mixing areas must not enter the watercourse, rather it should only be routed to the watercourse via suitably designed and sited settlement ponds/filter channels;

- Settlement ponds should be inspected daily and maintained regularly;

- Watercourse banks should be left intact. If they have to be disturbed, all practicable measures should be taken to prevent soils from entering the watercourse;

- Construction works, especially those involving the pouring of concrete must be carried out in dry weather.

- Where concrete is being poured on site, the following concrete / aggregate management measures should include:

  - Best practice in bulk-liquid concrete management must be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc.

  - Stockpile areas for sands and gravel should be kept to a minimum size, well away from the drains and watercourses (minimum 50m).

  - Where concrete shuttering is used, measures should be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils.

  - Ready mix concrete wagons and mixers should be washed off site to minimise emissions into the local watercourses.

  - Activities which result in the creation of cement dust should be controlled by dampening down the areas.

  - Raw and uncured waste concrete should be disposed of by removal from the site or by burial on the site in a location and manner which will not impact upon the local watercourses.

  - Stockpiles for sand and gravel will be sited over 50m from any surface water feature or drainage channel. Stockpiles or areas of bare soil will be covered or seeded if not required in the short term.

- Measures for the protection of water quality during construction should be outlined in a Construction and Environment Management Plan. This should be presented to the local authority and Inland Fisheries Ireland for approval prior to the commencement of any works on site.

- Any excavated material arising from the construction process must not be disposed of within any designated site or area of biodiversity value. It must be used responsibly within the boundary, stored within a bunded area away from the river or else disposed of in a licensed facility using a registered contractor.

- The drip irrigation system should be installed under the supervision of a suitability qualified environmental engineer.

- During site operation, surface water run-off into the stream should only be discharged via suitable oil and silt interceptors. These should be serviced regularly. Good ecological status in this stream should be achieved.

- The existing hedgerows and treelines that occur throughout the application site are important biodiversity features. Their integrity should be maintained at all stages. It is illegal to remove hedgerows / treelines during the bird nesting season (September – March).

- If any tree needs to be removed, it should be done outside of the bird nesting season. If it's a particularly mature tree, with crevices, fissures and ivy it should be inspected by a bat ecologist prior to felling.

- Future management of the area of the application site and grasslands could also consider the creation of biodiversity areas for the benefit of local wildlife. Verges could be maintained in order to encourage the growth of nectar rich plants, which would benefit local pollinating insects such as bees and hoverflies.

- All organic waste arising from the poultry on site, should be utilised on lands that have an agronomic requirement for fertiliser, and in accordance with with S.I. 605 of 2017 European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2017).

7. Residual Impacts and Conclusion

With the recommended mitigation measures, it can be concluded that the proposed development at Silver Hill Foods in Corlattalan, Emyvale, Co. Monaghan will have a neutral impact upon locally areas of biodiversity value. Significantly reducing WWTP discharge into the Corlattallan Stream will have a positive effect.

8. Monitoring

Monitoring is generally required where there may be significant residual impacts despite the implementation of the mitigation measures. The following monitoring measures are recommended:

- Annual evaluation of the ecological status of the Corlattallan Stream.

Appendix I – Species List

Common Name	Scientific Name
Alder	*Alnus glutinosa*
Ash	*Fraxinus excelsior*
Bindweed	*Calystegia sepium*
Blackthorn	*Prunus spinosa*
Bramble	*Rubus fruticosus agg.*
Broadleaved Dock	*Rumex obtusifolius*
Bulrush	*Typha latifolia*
Bush vetch	*Vicia sepium*
Chickweed	*Stellaria media*
Cleavers	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Coltsfoot	*Tussilago farfara*
Common reed	*Phragmites australis*
Compact rush	*Juncus conglomeratus*
Crab apple	*Malus sylvestris*
Creeping buttercup	*Ranunculus repens*
Dandelion	*Taraxacum officinale*
Dog rose	*Rosa canina*
Elder	*Sambucus nigra*
Fennel	*Foeniculum vulgare*
Fescue	*Festuca sp.*
Flag iris	*Iris pseudacorus*
Fool's water cress	*Apium nodiflorum*
Germander speedwell	*Veronica chamaedrys*
Gorse	*Ulex europaeus*
Hawthorn	*Crataegus monogyna*
Herb Robert	*Geranium robertianum*
Horsetail	*Equisetum sp.*
Ivy	*Hedera helix*
Kidney vetch	*Anthyllis vulneraria*

Meadow grass	*Poa sp.*
Meadowsweet	*Filipendula ulmaria*
Mouse ear	*Cerastium fontanum*
Nettle	*Urtica dioica*
Perennial rye-grass	*Lolium perenne*
Pineapple Weed	*Matricaria discoidea*
Ragwort	*Jacobaea vulgaris*
Red Clover	*Trifolium pratense*
Red leg	Persicaria *maculosa*
Ribwort plantain	*Pantago lanceolate*
Scarlett pimpernel	*Anagallis arvensis*
Scentless mayweed	*Tripleurospermum inodorum*
Silverweed	*Argentina anserina*
Sow thistle	*Sonchus oleraceus*
Spear thistle	*Cirsium vulgare*
Sycamore	*Acer pseudoplatanus*
Vetch	*Vicia sp.*
White clover	*Trifolium repens*
White willow	*Salix willow*
Willowherb	*Epilobium sp.*
Willow	*Salix sp.*

APPENDIX II – Photographs

2020 Photographs

The Corlattallan Stream within the Application Site

Pastures within the Site (Proposed Location of Drip Irrigation)

View from the Site south Towards the Small Lake

Buildings and Artificial Surfaces within the Site

2022 Photographs

Grasslands and hedgerows: view from grassland (future drip irrigation)

Improved scrub (along roadways) and the decommissioned rearing sheds

Lower site. Decommissioned slurry tanks. Scrub and opportunist plants on made ground. Site for future solar panel installation

Empty slurry tank – to be maintained as emergency storage

New hydrocarbon and sediment interceptors

Onsite stream and discharge point

Views of drip irrigation pilot field.

Appendix IIIa – Q Value Results 2020

Station One – Corlattallan Stream (Upstream)

Indicator Group	Taxon	Number	%
Group A	**Absent**	**0**	**0**
(Very sensitive)			
Group B	**Absent**	**0**	**0**
(Moderately sensitive)			
Group C		**80**	**46.2**
(Moderately tolerant)	**Diptera**		
	Chironomidae	55	32
	Simuliidae	9	5.2
	Dicranota	1	0.57
	Coleoptera		
	Dytiscidae	14	8
	Hemiptera		
	Veliidae	1	0.57
Group D		**85**	**49.1**
(Very tolerant)	**Isopoda**		
	Asellus aquaticus	85	49.1
Group E		**8**	**4.6**
(Most tolerant)	**Diptera**		
	Chironomidae	8	
Total Abundance		**173**	
Q Value – Q2/3 Poor Ecological Status			

Station Two – Corlattallan Stream (Downstream)

Indicator Group	Taxon	Number	%
Group A	**Absent**	**0**	**0**
(Very sensitive)			
Group B	**Absent**	**0**	**0**
(Moderately sensitive)			
Group C		**63**	**91.6**
(Moderately tolerant)	**Diptera**		
	Chironomidae	63	87.5
	Coleoptera		
	Dytiscidae	3	4.1
Group D		**6**	**8.3**
(Very tolerant)	**Bivalves**		
	Sphaeriidae (Pisidium)	6	8.3
Group E	**Absent**	**0**	**0**
(Most tolerant)			
Total Abundance		**72**	
Q Value – 3 Poor Ecological Status			

Appendix IIIb – Q Value Results 2022

Family	Species	Site 1	Site 2	Site 3	EPA Class
Heptageniidae	*Heptagenia sulphurea*		2		A
	Rhithrogena semicolorata			3	A
Nemouridae	*Amphinemura sulcicolis*				A
Taenyopterigdae	*Brachyptera risi*			4	A
Perlodidae	*Isoperla grammatica*				A
Chloroperlidae	*Chloroperla torrentium*			2	A
Limnephilidae	*Anabola nervosa*		1	2	B
Goeridae	*Silo pallipes*			2	B
Seracostomatidae	*Seracosoma personatum*		2		B
Caenidae	*Caenis lactuosa*			2	C
Baetidae	*Baetis rhodani*	27	34	3	C
Ephemerellidae	*Ephemerella ignita*				C
Ryacophilidae	*Ryacophila dorsalis*				C
Hydropsychidae	*Hydropsyche siltalai*	6			C
	Hydropsyche augustipennis	11	21		C
Polycentropodidae	*Holocentropus picicornis*				C
	Polycentropus kingi	2			C
	Oecetis ochracea				C
Gammaridae	*Gammarus duebenii*	29	19	2	C
Elmidae	*Elmis aenea*	3	2		C
	Limnius volkmari	2			C
Simulidae	*Simulium sp.*	7	3	2	C
Chironomidae	*Chironominae*				C
	Spaniotoma sp.		1		C
Tipulidae	*Dicranota sp.*	1			C
Lumbricinae	*Eiseniella sp.*				C
Lymnaeidae	*Lymnaea stagnalis*		5	7	C
Valvatidae	*Valvata piscinalis*				C
Ancylidae	*Ancylus fluviatilis*	7			C
Hydrobiidae	*Hydrobia ventrosa*				C
Planorbidae	*Planorbis planorbis*				C
Pisciolidae	*Pisciola geometrica*	2			C
Flatworm	*Polycelis nigra*	3	1	1	C
Hydracarina	*n/a*	3			C
Lymnaeidae	*Lymnaea peregra*				D
Sphaeridae	*Pisidium amnicum*				D
	Sphorium sp.	5		2	D
Glossiphoniidae	*Helobdella stagnalis*				D
Erpobdellidae	*Erpobdella octoculata*	2	2		D
Asellidae	*Asellus aquaticus*	41	7	8	D
Chironomidae	*Chironomus riparius*	32	2	1	E
Tubificidae	*Tubificid sp.*	9	2	0	E
	Taxon Richness N	18	13	15	
	Q Rating	Q2	Q2-3	Q3	

Table 1.1 – Macro-invertebrate composition at sites 1-3 on the Corlattalan Stream

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Appendix 10.2: Appropriate Assessment Screening

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Environmental

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Noreen McLoughlin, MSc
Environmental Consultant

HABITATS DIRECTIVE SCREENING STATEMENT FOR A PROPOSED DEVELOPMENT AT SILVER HILL FOODS, CORLATTALAN, EMYVALE, CO. MONAGHAN

IN LINE WITH THE REQUIREMENTS OF ARTICLE 6(3) OF THE EU HABITATS DIRECTIVE

Silver Hill Foods
c/o Rowan Engineering Consultants Ltd.
Unit 1
Scurlockstown Business Park
Trim,
Co. Meath

January 2023

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Table of Contents

1. Introduction

1.1 Background

Article 6 of the EU Habitat's Directive (Council Directive 92/43/EEC) requires that all plans and projects be screened for potential impacts upon Special Areas of Conservation (SACs) or Special Protection Areas (SPAs). The aim of this screening process is to establish whether a full Appropriate Assessment of the proposed plan or project is necessary.

A comprehensive assessment of the potential significant effects of a proposed development in Emyvale upon certain Natura 2000 sites was carried out in July 2022 by Noreen McLoughlin, MSc, MCIEEM of Whitehill Environmental. This development will allow the competent authority, in this case Monaghan County Council, to issue an Appropriate Assessment determination of the project, as required under Article 6 (3).

The location of the proposed development is within 15km of sites designated under European Law. As such and in accordance with Article 6(3) of the EU Habitat's Directive (Council Directive 92/43/EEC) regarding Appropriate Assessment, this screening exercise for Appropriate Assessment was carried out in order to identify whether any significant impacts on designated sites are likely. This exercise will also determine the appropriateness of the proposed project, in the context of the conservation status of the designated sites.

1.2 Regulatory Context

1.2.1 Relevant Legislation

The Birds Directive (Council Directive2009/147/EC) recognises that certain species of birds should be subject to special conservation measures concerning their habitats. The Directive requires that Member States take measures to classify the most suitable areas as Special Protection Areas (SPAs) for the conversation of bird species listed in Annex 1 of the Directive. SPAs are selected for bird species (listed in Annex I of the Birds Directive), that are regularly occurring populations of migratory bird species and the SPA areas are of international importance for these migratory birds.

The EU Habitats Directive (92/43/EEC) requires that Member States designate and ensure that particular protection is given to sites (Special Areas of Conservation) which are made up of or support particular habitats and species listed in annexes to this Directive.

Articles 6(3) and 6(4) of this Directive also call for the undertaking of an Appropriate Assessment for plans and projects not directly connected with or necessary to the

management of, but which are likely to have a significant effect on any European designated sites (i.e. SACs and SPAs).

The Water Framework Directive (WFD) (2000/60/EC), which came into force in December 2000, establishes a framework for community action in the field of water policy. The WFD was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003). The WFD rationalises and updates existing legislation and provides for water management on the basis of River Basin Districts (RBDs). RBDs are essentially administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD. The aim of the WFD is to ensure that waters achieve at least good status by 2027 and that status does not deteriorate in any waters.

Appropriate Assessment and the Habitats Directive

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora – the 'Habitats Directive' - provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as *Natura 2000*. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC).

Articles 6(3) and 6(4) of the Habitats Directive sets out the decision-making tests for plans or projects affecting Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

Article 6(4) deals with the steps that should be taken when it is determined, as a result of appropriate assessment, that a plan/project will adversely affect a European site. Issues dealing with alternative solutions, imperative reasons of overriding public interest and compensatory measures need to be addressed in this case.

Article 6(4) states:

"If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

The Appropriate Assessment Process

The aim of Appropriate Assessment is to assess the implications of a proposal in respect of a designated site's conservation objectives.

The 'Appropriate Assessment' itself is an assessment which must be carried out by the competent authority which confirms whether the plan or project in combination with other plans and projects will have an adverse impact on the integrity of a European site.

Screening for Appropriate Assessment shall be carried out by the competent authority as set out in Section 177U(1) and (2) of the Planning and Development Act 2000 (as amended) as follows:

'(1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.

(2) A competent authority shall carry out a screening for appropriate assessment under subsection (1) before—

(a) a Land use plan is made including, where appropriate, before a decision on appeal in relation to a draft strategic development zone is made, or

(b) consent for a proposed development is given.'

The competent authority shall determine that an Appropriate Assessment is not required if it can be excluded, that the proposed development, individually or in combination with other plans or project will have a significant effect on a European site.

Where the competent authority cannot exclude the potential for a significant effect on a European site, an Appropriate Assessment shall be deemed required.

Where an Appropriate Assessment is required, the conclusions of the Appropriate Assessment Report (Natura Impact Statement (NIS)) should enable the competent authority to ascertain whether the plan or proposed development would adversely affect the integrity of the European site. If adverse impacts on the integrity of a European site cannot be avoided, then mitigation measures should be applied during the appropriate assessment process to the point where no adverse impacts on the site remain. Under the terms of the Habitats Directive consent can only be granted for a project if, as a result of the appropriate assessment either (a) it is concluded that the integrity of any European sites will not be adversely affected, or (b) after mitigation, where adverse impacts cannot be excluded, there is shown to be an absence of alternative solutions, and there exists imperative reasons of overriding public interest for the project should go ahead.

Section 177(V) of the Planning and Development Act 2000 (as amended) outlines that the competent authority shall carry out the Appropriate Assessment, taking into account the Natura Impact Statement (amongst any other additional or supplemental information). A determination shall then be made by the competent authority in line with the requirements of Article 6(3) of the Habitats Directive as to whether the plan or proposed development would adversely affect the integrity of a European site, prior to consent being given.

2. Methodology

2.1 Appropriate Assessment

This Statement of Screening for Appropriate Assessment (Stage 1) has been prepared with reference to the following:

- European Commission (2018) Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- European Commission (2021) Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission (2006) Nature and Biodiversity Cases: Ruling of the European Court of Justice.
- European Commission (2007) Clarification of the Concepts of: Alternative Solution, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.
- Department of Environment, Heritage and Local Government (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.

The EC Guidance sets out a number of principles as to how to approach decision making during the process. The primary one is 'the precautionary principle' which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty.

When considering the precautionary principle, the emphasis for assessment should be on objectively demonstrating with supporting evidence that:

- There will be no significant effects on a Natura 2000 site;
- There will be no adverse effects on the integrity of a Natura 2000 site;
- There is an absence of alternatives to the project or plan that is likely to have an adverse effect to the integrity of a Natura 2000 site; and
- There are compensation measures that maintain or enhance the overall coherence of Natura 2000.

This translates into a four stage process to assess the impacts, on a designated site or species, of a policy or proposal.

The EC Guidance states that "each stage determines whether a further stage in the process is required". Consequently, the Council may not need to proceed through all four stages in undertaking the Appropriate Assessment.

The four-stage process is:

Stage 1: Screening – The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether or not these impacts are likely to be significant;

Stage 2: Appropriate Assessment – The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage 3: Assessment of Alternative Solutions – The process which examines alternative ways of achieving objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site;

Stage 4: **Assessment where no alternative solutions exist and where adverse impacts remain –** An assessment of the compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

In complying with the obligations set out in Articles 6(3) and following the guidelines described above, this screening statement has been structured as a stage by stage approach as follows:

- Description of the proposed project;
- Identification of the Natura 2000 sites close to the proposed development;
- Identification and description of any individual and cumulative impacts on the Natura 2000 sites likely to result from the project;
- Assessment of the significance of the impacts identified above on site integrity. Exclusion of sites where it can be objectively concluded that there will be no significant effects;
- Description of proven mitigation measures.

2.2 Statement of Competency

This AA screening report was carried out by Noreen McLoughlin, BA, MSc, MCIEEM. Noreen has an honours degree in Zoology and an MSc in Freshwater Ecology from Trinity College, Dublin and she has been a full member of the Chartered Institute of Ecology and Environmental Management for over 16 years.

2.3 Desk Studies & Consultation

Information on the site and the area of the proposed development was studied prior to the completion of this statement. The following data sources were accessed in order to complete a thorough examination of potential impacts:

- National Parks and Wildlife Service - Aerial photographs and maps of designated sites, information on habitats and species within these sites and information on protected plant or animal species, conservation objectives, site synopses and standard data forms for relevant designated sites.
- Environmental Protection Agency (EPA)- Information pertaining to water quality, geology and licensed facilities within the area;
- Myplan.ie – Mapped based information;
- National Biodiversity Data Centre (NBDC) – Information pertaining to protected plant and animal species within the study area;
- Bing maps & Google Street View – High quality aerials and street images;
- Silver Hill Foods – Plans and information pertaining to the development.

2.4 Field Based Studies

Field walkovers undertaken by an ecologist in July 2022 to confirm the findings of the site suitability surveys and assessment conducted by Whitehill Environmental on August 13th 2020, when field notes were taken and habitats within the application site were classified and coded according to Level 3 of *A Guide to Habitats in Ireland* (Fossit, 2000). Studies upon the water quality in the stream that flows through the application site were also undertaken and repeated in 2022

2.5 Assessment Methodology

The proposed development was assessed to identify its potential ecological impacts and from this, the Zone of Influence (ZoI) of the proposed development was defined. Based on the potential impacts and their ZoI, the Natura 2000 sites potentially at risk from direct, indirect or in-combination impacts were identified. The assessment considered all potential impact sources and pathways connecting the proposed development to Natura 2000 sites, in view of the conservation objectives supporting

the favourable conservation condition of the site's Qualifying Interests (QIs) or Special Conservation Interests (SCIs).

The conservation objectives relating to each Natura 2000 site and its QIs/SCIs are cited generally for SACs as "to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or Annex II species for which the SAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

As defined in the Habitat's Directive, the favourable conservation status of a habitat is achieved when:

- Its natural range and area it covers within that range is stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- The conservation status of its typical species is favourable.
- The favourable conservation status of a species is achieved when:
- The population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Where site-specific conservation objectives (SSCOs) have been prepared for a European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured. Where potential significant effects are identified, then these SSCOs should be considered in detail.

3. Screening

3.1 Existing Activities at Silver Hill Foods

Silver Hill Foods is a fully integrated duck producing company based in Corlattalan , Emyvale, Co. Monaghan. Activities on the site include the processing, cooking and packaging of duck products.

The processes at Silver Hill Foods are as follows;

- Silver Hill Foods employ a number of Contract Growers and duck suppliers from across Ireland. Currently twenty three Contract Growers supply live ducks to the facility and manage their own duck rearing farms. The Contract Growers are country wide, with supply from counties Donegal, Down, Monaghan, Waterford, Cavan, Armagh, Fermanagh and Tyrone.
- Silver Hill Foods Farm in Emyvale had the capacity to rear 96,000 ducks. Currently there are no ducks reared on site due to operational changes in 2020 from the impact of Covid19 and risks associated with disease control. The rearing facilities are not in use, nor proposed to resume rearing and the buildings have been decommissioned,. The facilities are to be repurposed, or demolished.
- When the Ducks have reached an age of 42 days they are delivered to the site, where they may be held on lairage for a short period (0-4 hrs holding time).
- The ducks are then slaughtered in the processing plant and are produced into both cooked and raw duck products. Approximately 3.5 million ducks are processed per year, with kills occurring 5 days per week Mon-Fri. Current kill pattern is 3 days a week to align production with sales during Covid pandemic, however the EIAR considers a return to pre-pandemic levels and a 5 day operation.
- The feathers are washed at the onsite feather plant (Site 1) and are sorted according to their grade. The feathers are then sold in bulk or made into duvets, cushions, clothing and sold. All waste feathers are sent as Category 3 to Farragh Proteins, Crossdoney, Co. Cavan.
- Manure is no longer produced onsite by rearing sheds.
- Silver Hill Foods have a Waste Water Treatment Plant (WWTP) on site to treat the process water. Duck waste and process waste water is removed and compressed to sludge and transported by licenced haulier to a Anaerobic Digestion (AD) facility as AD feed stock material. After treatment the WWTP releases the final treated water to the an unnamed stream running through the site in accordance with the sites IED Licence.

3.2 Proposed Development

In addition to ongoing normal operations, Silver Hill Foods are examining options to convert their offal waste stream material into a raw material for use in the pet food industry or other similar industries. Silverhill wish to use this material as a product, which is utilised as a raw material in the pet food industry or other similar industries. The processes will involve cooking the offal and then separating the solid material and the fat. It is proposed to locate this process on site by developing the building at the environmental management area, (See **Figure 1**)

Silver Hill Foods are applying for planning permission for the following;

- construction of a part single storey/part two storey factory development incorporating chilling, plucking and processing areas, offices, plant rooms, lairage and loading and unloading areas, canteen and hygiene facilities and single storey conveyor linkage to existing factory facility;
- single storey skip storage and plant room;
- construction of 2 no. underground water storage tanks;
- construction of a single storey extension to side of existing storage shed to incorporate a rendering facility;
- provision of additional car parking facilities, security fencing and access roads;
- connection to existing on-site mains foul sewer, water and drainage services;
- partial removal of existing concrete yard areas and associated structures;
- installation of solar panels onsite
- installation of a Drip Irrigation scheme onsite; and
- completion of all associated site structures and ancillary site works.

The drip irrigation will remove the need to discharge to stream. A proposed site plan is illustrated in **Figure 1**.

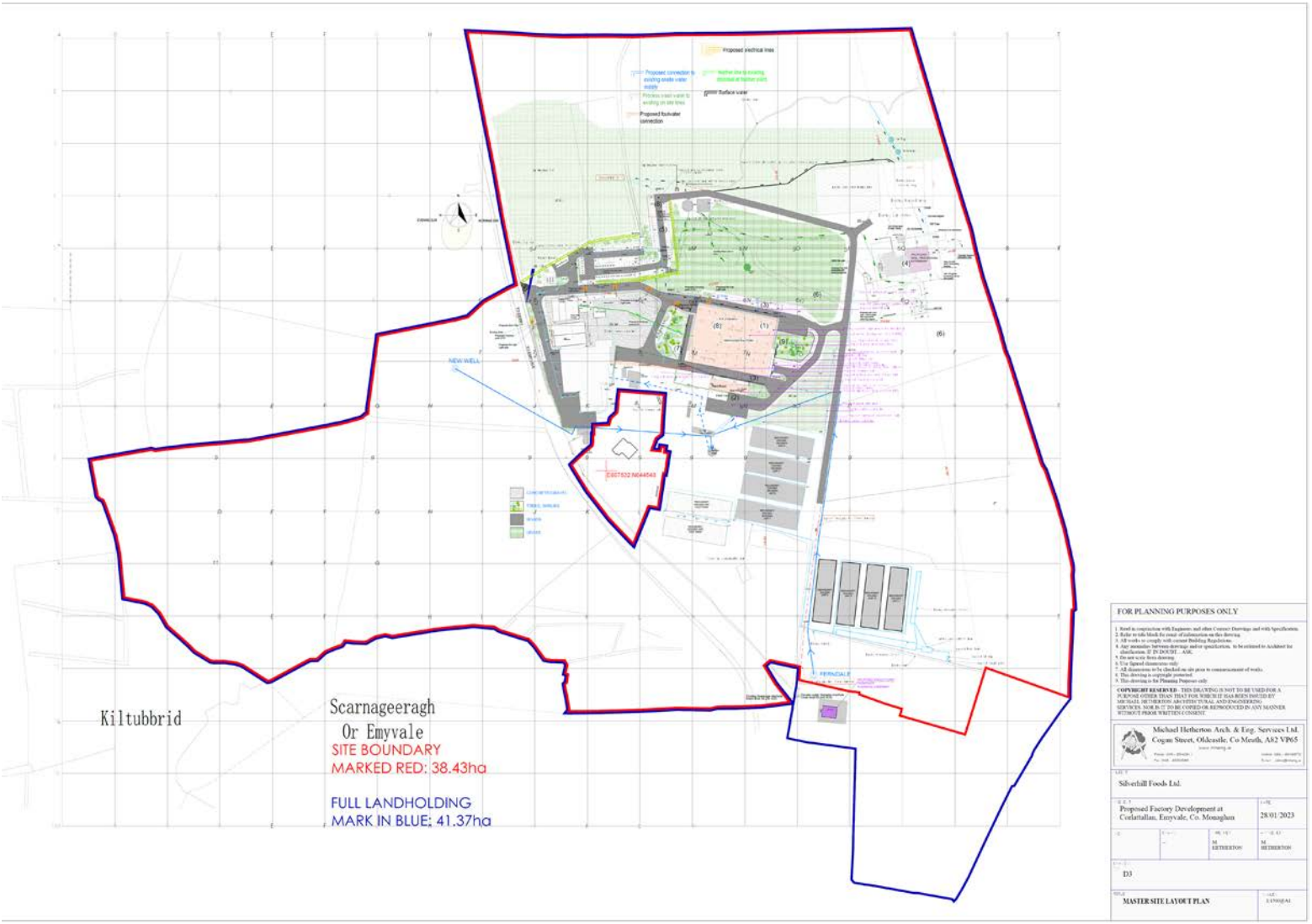


Figure 1 – Extract from Planning Drawings (Prepared by Michael Hetherton Arch and Eng Services)

3.3 Emissions to Water

Processing Facility

The processing plant at Silver Hill Foods generates in the region of 200 cubic meters of process effluent per day. This volume is generated through both factory itself and the feather plant. The waste water generated is pumped to the existing waste water treatment plant where it passes the following stages; inlet screening, balancing, partial treatment through a contact tank, and aeration basin and a final clarifier. The effluent is treated to comply with the EPA emission limit values (ELVs).

Under the proposal for the increase in duck processing to 120,000 ducks, the volume would increase to 480 cubic meters per day as a maximum. This is within the design specification of the WWTP.

Other surface water discharges from the processing facility take place at four discharge points around the site. Under the proposals for the site, the number of surface water discharge locations will be reduced to 3. A combination of appropriately sized, operated and maintained interceptors and /or attenuation systems will help maintain the quality of the run-off. A surface water management plan is now in place to ensure that no contaminated surface water goes into the surrounding surface water network.

Waste Water Treatment Process

All wastewater from the dirty wastewater from the processing plant and the feather plant is piped to the current wastewater treatment plant located on-site where it is biologically treated and discharged to a local watercourse in compliance with the EPA IE Licence.

The existing upgraded Wastewater Treatment Plant is licensed to discharge 480m³/day with current flows in the region of 220 to 280 m³ /day. Silver Hill have also gained permission from Irish Water to discharge to the town sewer system at a maximum discharge limit of 21m³/hour to the public sewer between the hours of 20:00 and 7:00 daily, with a total maximum discharge of 230m³ in this period and no shock loading to the public sewer from Silver Hill Foods at any time.

Within the IW conditions, there is also a requirement to provide two days effluent storage at the premises to control the release of effluent to the Emyvale WWTP and also for additional storage capacity necessary to cater for storm conditions (230m³ x 2 = 460m³ storage volume).

An additional agreement is in place with Monaghan County Council for the tinkering of upto 250 m^3 /day of treated effluent to their facility to allow to account for future capacity, for the increased production with 100% redundancy

The site plans to phase out the discharge to the Corlattallon stream and a new drip irrigation system would use land adjacent to the site in up to 9 or 10 plots each with an area of c 15ha area. Treated water would be piped to the fields and dispersed in the soil matrix using a network of distributor pipes. The design flow rate would be 3l/m^2/day or c 480m^3/day.

A pilot project of 1 plot has been completed and reported to the EPA for review. An ecological walkover after the pilot has noted no change to the site and biodiversity.

This gives adequate capacity in the existing wastewater treatment plant. If the Processing Plant reaches maximum capacity of 120,000 ducks a week, this will be a 60% increase from current numbers and it is reasonable to envisage a 60% increase in waste and wash water volumes (400m^3 /day) with a total capacity of 480 m^3 /day available.

Emissions to Sewer

There is one emission point to the sewer, SE1, located on the main road outside the plant. It facilitates the handling of sewerage only from the main office / administration building adjacent to the main processing plant. It is connected to the sewer at the main road outside the plant and has a normal daily flow of approximately 0.6m^3 per day. This line would only be in operation over an 8 hour working day. Under revised plans for the site, a second connection would be tapped into the IW system at the above mentioned rates.

Emissions to Air

No live ducks will be reared on site, therefore ammonia and nitrogen emissions to the atmosphere arising from poultry stock on site will not arise.

There are no direct process emissions to atmosphere from the lairage facility where ducks may be held up to 4 hrs awaiting processing Emissions from this facility are as a result of general air changes within the growing houses. This is a factor of growing poultry and can be termed as fugitive emissions. These include:

a) Gases produced by the respiration and digestion processes of the birds (i.e. CO2, methane etc;

The levels are minor in comparison to the previous rearing process onsite.

The main source of direct emission to atmosphere is the boiler emission. The boiler has a heat output of 1.75MW and is gas fired. A smaller (1.34MW) oil fired is also used at the site. Both are regularly maintained and are registered with the EPA under the MCP registration scheme.

Other minor atmospheric emissions are generated from one propane fuelled water heater, hot air emissions from the ovens in the cooking plant. Even less significant are the steam emissions from the heat shrink tunnel and from the feather drying process.

Poultry Manure

No live ducks will be kept on the site in the future, therefore the land spreading of poultry manure arising from onsite activities will not arise.

The poultry manure arising from the offsite growers was also considered within this AA screening process, as this is an activity which could generate potential indirect impacts and effects upon designated European sites. In that regard, the locations of all twenty-one off site growers have been listed and mapped. Information on the locations of the twenty-one growers and the relevant distances to designated sites has been included. This information has been provided in Appendix I.
No clusters of growers or numbers within or in close proximity to designated sites were identified that could result in cumulative effects.

3.4 Site Location and Surrounding Environment

3.4.1 Site Location

The application site is located on the northern outskirts of Emyvale town, approximately 400m north of the town centre. Access to the site is via an existing entrance that is located just off the N2. The site is approximately 35 hectares and it encompasses the existing processing site along with agricultural lands to the east of the site and to the west of the N2.

The site is located in a drumlin characterised landscape, in an area where agriculture is the dominant land use and where improved agricultural grassland is the dominant habitat. Other habitats present locally include wet grasslands, scrub, small areas of broadleaved woodlands, hedgerows, treelines and surface water features. Site location maps are provided in Figures 2 and 3, whilst an aerial photograph of the site and its surrounding habitats is shown in Figure 4.

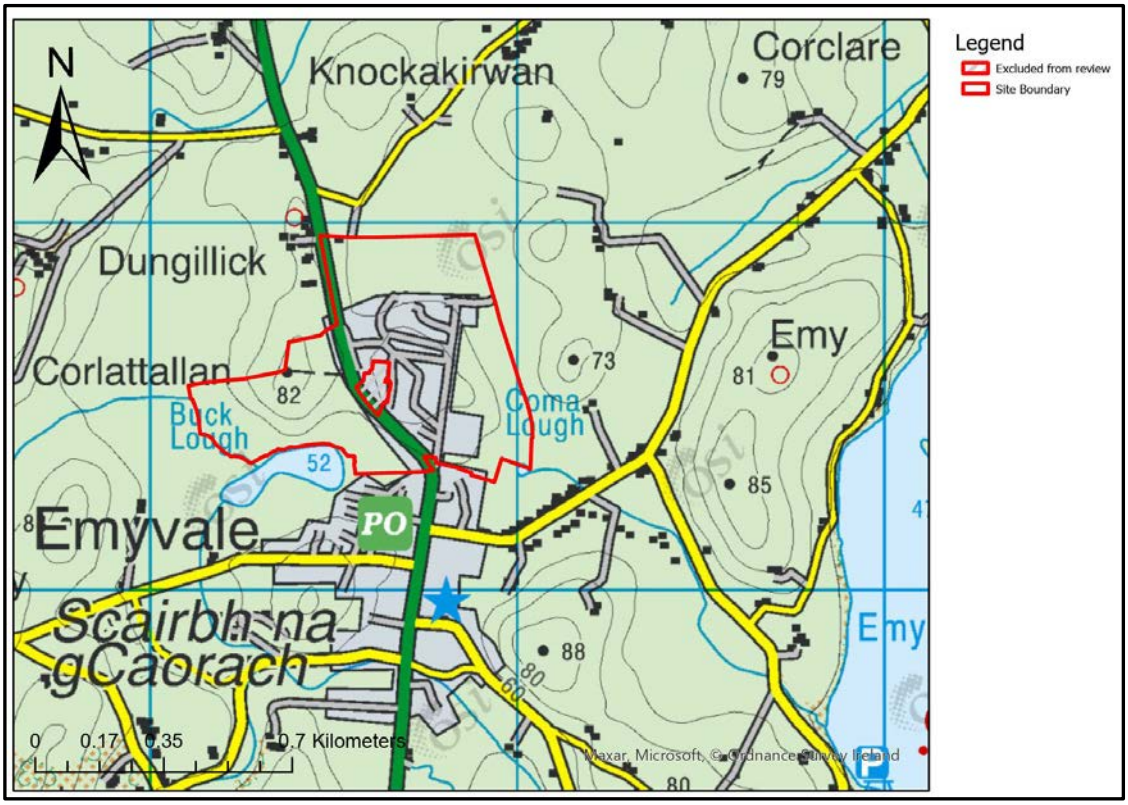


Figure 2 – Map Showing the Location of the Site (Outlined in Red)

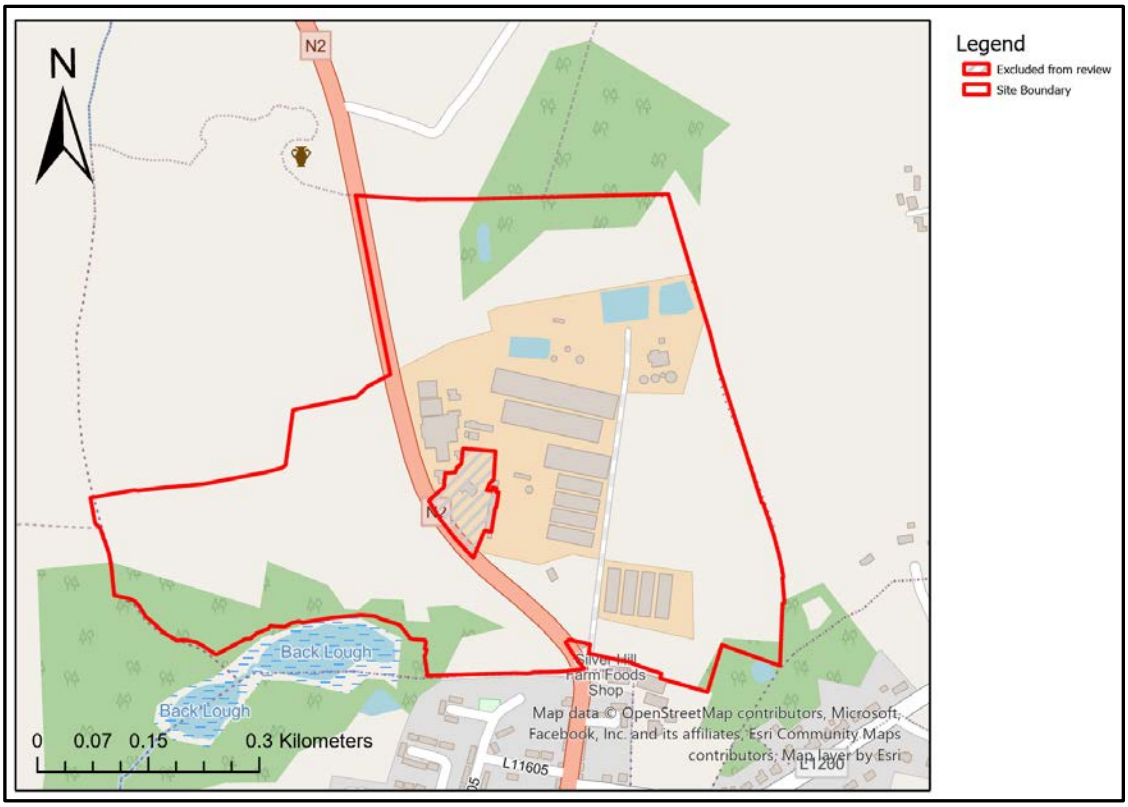


Figure 3 – Site Location Map

Figure 4 – An OSI Aerial Photograph of the Site (Outlined in Red) and Surrounding Habitats.

3.4.2 Habitats within the Application Site

The habitats within the application site were determined as part of the field work that was undertaken for the Ecological Impact Assessment report. No part of the site lies within any area that is designated for nature conservation purposes. All proposed construction works on the site will take place on habitats classed as low ecological value. The proposed drip irrigation system will be laid on pasture lands that surround the site. The habitats are described in greater detail below whilst a habitat map is illustrated in Figure 5.

Habitat Description

The dominant habitats within the application site include buildings and artificial surfaces (BL3) and improved agricultural grasslands (GA1). The buildings and artificial surfaces include the offices, processing facility, car parks and all other built areas associated with Silverhill Foods. There is limited vegetation associated within these habitats. The proposed construction works will all take place in these areas.

There are also some areas of recolonising bare ground ED3 within the main application site around the existing buildings, in areas to the north of the carpark by the wastewater treatment plant and old slurry lagoon. These areas have been colonised by typical ruderal species such as silverweed *Argentina anserina*, scentless mayweed *Tripleurospermum inodorum*, redshank *Persicaria maculosa*, scarlet pimpernel *Anagallis arvensis*, clovers *Trifolium* sp, willowherbs *Epilobium* sp and germander

speedwell *Veronica chamaedrys*. There are also some pockets of unimproved grassland / grassy verge type habitats scattered throughout the main site.

There is some maintained landscaping on the site also, including amenity grasslands (GA2) and scattered trees (WD5). There is an ornamental hedgerow (WL1) along the boundary of the site on the main road.

The remainder of the site consists of a number of pastures which are improved and these areas are the proposed locations for the drip irrigation system. These pastures occur on the undulating drumlin landscape which surrounds the site and they occur on either side of the main road. Many of these are being grazed by cattle and they are generally quite species poor. Grasses such as rye grass *Lolium* sp and meadow grasses *Poa* sp are dominant. Herbaceous broadleaved species were not common in the sward, but those noted included broadleaved dock *Rumex obtusifolius*, common mouse-ear *Cerastium fontanum* and ragwort *Jacobaea vulgaris*. The fields are mostly well drained but there are some pockets of wet grassland GS4, where rushes *Juncus* sp. dominate.

The field boundaries generally consist of well developed and managed treelines (WL2) and hedgerows (WL1). Some of these linear features are of high biodiversity value. The most common species noted included ash *Fraxinus excelsior*, willow *Salix* sp., elder *Sambucus nigra* and hawthorn *Crataegus monogyna*, with bramble *Rubus fruticosus* and ivy *Herera helix* occurring throughout also.

The pastures in the south-western corner of the application site extend down to two small lakes. These lakes are outside of the application site. These lakes are fringed with marsh vegetation such as common reed *Phragmites australianis* and bulrush *Typha latifolia.* Willow woodland / scrub (*Salix alba*) also extends out from these two small lakes and it forms the boundary of the fields which occur in the south-western corner of the site.

There is an area of mixed broadleaved woodland (WD2) immediately north of the application site. Species noted in this area included elder *Sambucus nigra*, willows *Salix* sp. and birch *Betula* sp. There will be no impacts upon this habitat arising out of the proposed works.

The Corlattan Stream (depositing lowland river FW2) flows within the site, and it is currently the receiving water for the treated effluent from the onsite wastewater treatment plant. This small stream rises in lands that are west of the site. It is culverted under the road and it flows through the site in an easterly, then northerly direction. It is a tributary of the Blackwater. There is a high level of silt in this stream and little instream vegetation. A kick sample was taken in order to obtain a representative sample of

invertebrates in this stream. The water level in the stream on the day of sampling was low.

Overall Evaluation of Habitats within the Site

The biodiversity value of the entire site varies from low to high on a local level. Within the area surrounding the factory, the dominant habitats are modified and manmade. These have no ecological value. The pastures are improved and are also considered to be of low biodiversity value. The treelines and hedgerows that form the boundaries of the fields are well structured and diverse, and they are of high ecological value on a local level. They are an important part of the green infrastructure around Emyvale, potentially linking up areas of high biodiversity value such as wetlands and woodlands. They are important ecological corridors for birds and mammals, and they also provide valuable nesting sites for birds, as well as roosting sites for bats. Flowering plants within and along the verges are also important sources of nectar for pollinating insects. The Corlattalan Stream can also be considered as an ecological feature with high local / county importance.

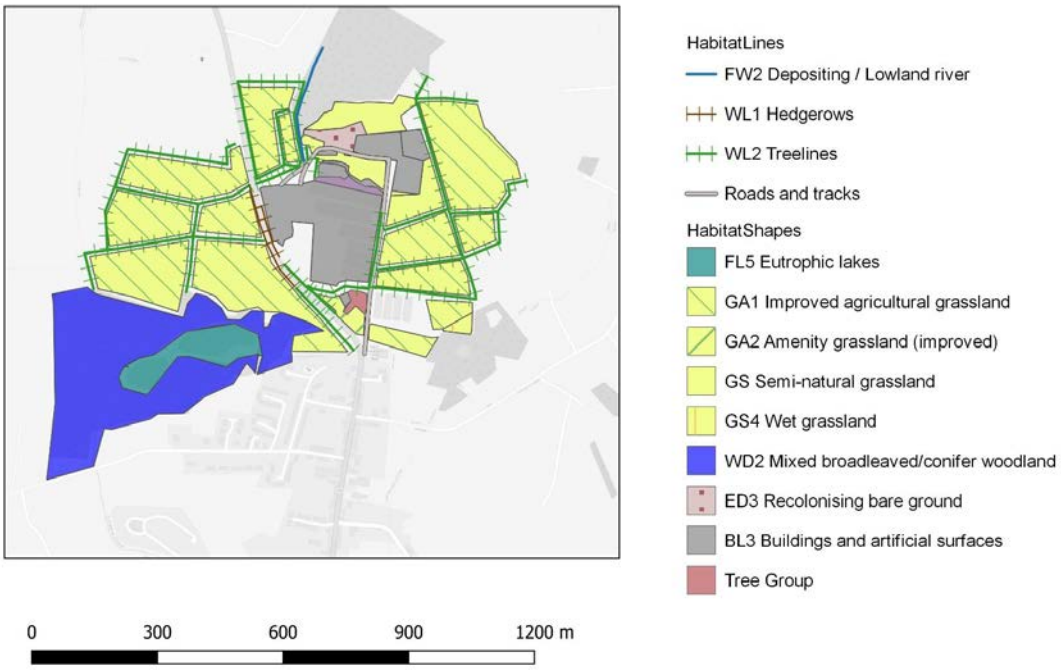


Figure 5 – Habitats within the Site

3.4.3 Water Features and Quality

Unnamed Stream

The main part of the application site is located within the Lough Neagh and Lower Bann Hydrometric Area and Catchment, and the Blackwater Tributary Sub-Catchment and the Blackwater (Annaghroe) Sub-Basin. However, some of the pasture lands on the western side of the N2 are located within the Mountain Water Sub-Catchment and Sub-Basin. The drains and small unnamed stream that run through site and to which there is currently the surface water discharge is a tributary of the Corlattalan Stream. This stream rises in lands to the south-west of the site and it is culverted under the road.

The Corlattalan Stream

The small stream flows through the application site and it is the receiving water for the current discharge from the Waste Water Treatment Plant is a tributary of the Corlattalan Stream. It flows through the site in a northerly direction towards its confluence with the Knockakirwan Stream. This stream flows north until it meets the Blackwater Tributary, at a point approximately 5km downstream of the application site. The River Blackwater eventually flows into Lough Neagh.

Previous Water Quality Results

The EPA have not classified the ecological status of the Unnamed stream, the Corlattalan Stream, the Knockakirwan Stream or the Blackwater Tributary (this lies within the UK therefore they would not be obliged to monitor this). The Department of Agriculture, Environment and Rural Affairs in Northern Ireland have classed the ecological status of the River Blackwater as moderate. Under the requirements of the Water Framework Directive, this is unsatisfactory and good status must be achieved

In 2017, in order to gather a baseline ecological status (presented as a Q value) of the Corlattalan Stream, kick samples were taken from three points along the stream by Montgomery EHS and a Q-analysis was undertaken for these samples. The results of this Q analysis were as follows:

- Site 1 (Upstream of discharge) – Q2-3, poor ecological status
- Site 2 (downstream of discharge) – Q2-3, poor ecological status
- Site 3 – (upstream of confluence with Blackwater) – Q3, moderate ecological status.
-

Biological Water Quality - Results of this Assessment (data gathered summer 2020)

The results of the baseline Q value assessment for the upstream and downstream stations of the Corlattalan Stream are presented in Table 1.

Station	Location	Q Value & Status
1	Upstream	Q3 - Moderate
2	Downstream	Q2-3 - Poor

Table 1 – Baseline Q Values of the Corlattalan Stream

Station One - Corlattalan Tributary (Unnamed) Stream (Upstream)

The sample was taken across the road from the Silver Hill foods site, before the stream is culverted under the N2. The stream here is more akin to a drainage ditch and no suitable riffle habitats were present. There was very little flow in the stream here and it has formed a small pool in the corner of the field. There is a hedgerow along the eastern (roadside) bank of the stream whilst the western bank of the stream was fenced off from grazing livestock. There was a high level of silt in the stream at this point.

Macro-invertebrate biodiversity in the sample was very low, and the sample was dominated by diptern larvae from the Chironomidae family. These comprised over 87% of the total faunal assemblage. Chironomidae larvae are Group C organisms, which mean that they are relatively tolerant of organic pollution. Other Group C taxa included beetles from the Dytiscidae family. The most sensitive Group A and Group B taxa were absent from the sample. Group D taxa are quite tolerant of pollution and these were present in small numbers. They were represented by bivalves from the Sphaeriidae family.

Overall, based on the presence and absence of the indicator taxa and the presence of Group C taxa in excessive numbers, a Q3 was assigned here. This means that the stream at this point is of moderate ecological status and under the requirements of the Water Framework Directive, this is unsatisfactory.

Station Two - Corlattalan Tributary (Unnamed) Stream (Downstream)

Sample Two was taken within the site, just downstream of the primary discharge point. The stream at this point is quite narrow, with a gravelly substrate, although the level of silt between the stones and gravel was quite high. The western bank of the stream here consists of a treeline, and the eastern bank is open.

Macro-invertebrate biodiversity in this sample was relatively low. The most sensitive Group A and Group B taxa were absent from the sample. Group C and Group D taxa were present in similar numbers. The most common organism in the sample was the

water louse *Asellus aquaticus.* This Group D taxa is quite tolerant of pollution. *Asellus* comprised 49% of the overall taxa (numerous) and it was the only Group D taxa present. Group C were also numerous in the sample at 46% and taxa included Chironomidae larvae, Simuliidae larvae and beetles from the Dytiscidae family. The most tolerant Group E taxa were also present in this sample in fair numbers. This group are very tolerant. Dipterns from the chironomous genus represented this group.

Overall, based on the presence and absence of the indicator taxa and the presence of both Group C and D taxa in similar proportions, a Q2-3 was assigned here. This is indicative of poor status and this result aligns with the previous baseline report that was carried out for this stream.

In 2022, Silverhill samples the sites as part of its ongoing monitoring of the stream. The results were the same as the 2020 baseline and the report is included in the supporting documentation of the application and in the Appendices of the EcIA.

3.5 Natura 2000 Sites Identified

In accordance with the guidelines issued by the Department of the Environment and Local Government, a list of Natura 2000 sites within 15km of the proposed development has been identified and described according to their site synopses, qualifying interests and conservation objectives. In addition, any other sites further than this, but potentially within its zone of influence can also be considered. The zone of influence may be determined by an assessment of the connectivity between the application site and the designated areas by virtue of hydrological connectivity, atmospheric emissions, flight paths, ecological corridors etc.

There are three Natura 2000 sites within 15km of this proposed development. These sites are the summarised in Table 2. The location of the application site in relation to these designated areas is shown in Figure 6 and a full synopsis of the relevant sites can be read online on the website of the National Parks and Wildlife Service (www.npws.ie) and the Joint Nature Conservation Committee (jncc.defra.gov.uk). In addition, any other sites further than 15km, but potentially within its zone of influence were also considered. The zone of influence may be determined by an assessment of the connectivity between the application site and the designated areas by virtue of hydrological connectivity, atmospheric emissions, flight paths, ecological corridors etc.

Site Name & Code	Distance	Features of Interest	Potential Significant Effects
Slieve Beagh SPA 004167	6.59km north-west	• Hen Harrier *Circus cyaneus*	*Potential significant effects are unlikely but will be considered further.*
Slieve Beagh-Mullaghafad-Lisnaskea SPA UK9020302	9.3km north-west	• Hen Harrier *Circus cyaneus*	*Potential significant effects are unlikely but will be considered further.*
Slieve Beagh SAC UK0016622	11.1km north-west	• Natural dystrophic lakes and ponds • European dry heaths • Blanket bogs	*Potential significant effects are unlikely but will be considered further.*
Lough Neagh and Lough Beg SPA UK9020091	~70km downstream	• Common pochard *Aythya farina* • Tufted duck *Aythya fuligula* • Common goldeneye *Bucephala clangula* • Bewick's swan *Cygnus columbianus bewickii* • Whooper swan *Cygnus Cygnus* • Common tern *Sterna hirundo*	*Given the downstream distance between the application site and this SPA, it is considered that potential significant effects are unlikely.*

Table 2 – Natura 2000 Sites Within 15km of the Proposed Site

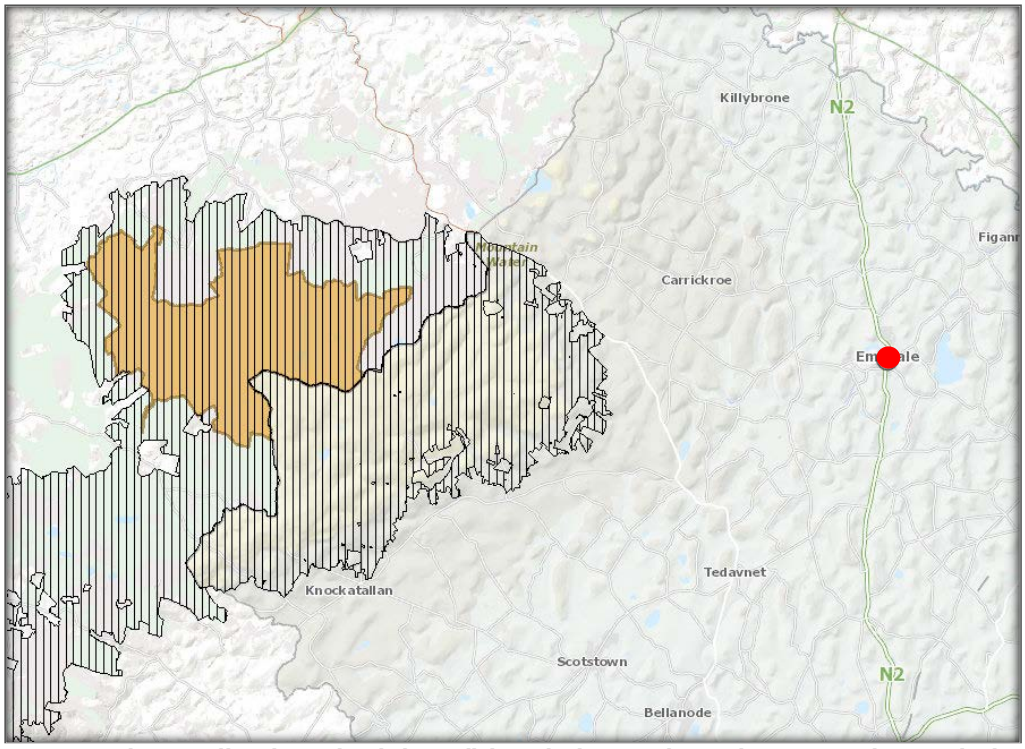


Figure 6 – The Application Site (Pinned) in relation to the Relevant Designated Sites. SACs - Red Cross Hatching, SPAs – Red Vertical Hatching.

Off Site Growers and Land-spreading

There are twenty-one off site growers and the locations of these growers is provided in Appendix I. The location of these duck farms in relation to designated sites (including SACs, SPAs and pNHAs) were mapped. The potential for significant effects to arise on the designated sites from the ongoing activities (including land-spreading) on these farms was considered. All these farms operate under a Nutrient Management Plan and under the requirements of The European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022 (S.I. 113 of 2022).

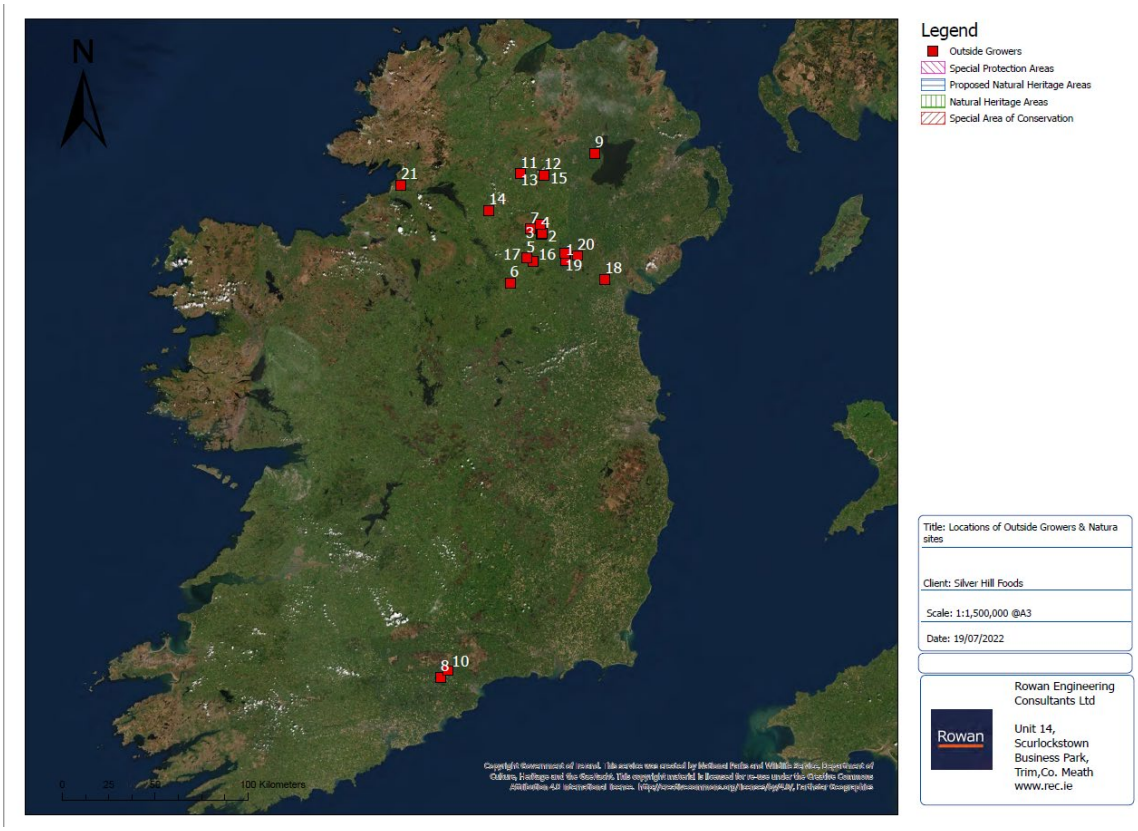


Figure 7 – The distribution of the offsite associated facilities (Contract growers).

3.6 Natura 2000 Impact Assessment

The potential significant effects of the proposed development on the Natura 2000 sites identified above are described below.

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on nearby Natura 2000 site:
Silverhill Ducks are applying for planning permission for a development at their existing facility in Corlattalan , Emyvale, Co, Monaghan. This development will have no negative effects upon the designated sites identified. There are no individual elements of the proposed project that are likely to give rise to negative effects on these aforementioned sites. There will be no potential direct, indirect or cumulative impacts upon the designated sites or their individual Qualifying Interests arising from the proposed development when considered on their own or in-combination with other developments. There will be no ammonia or nitrogen emissions from the site as no live ducks will be kept on site and additionally no duck manure will be produced on site.
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the nearby Natura 2000 sites by virtue of:
Size and scale: Given the small size and scale of the development in relation to the overall size of the Natura 2000 sites identified, the likelihood of any direct, indirect or cumulative impacts on these designated sites arising from the infilling of the site are low. **Land-take:** There will be no land-take from any designated site. There will be no interference with the boundaries of any designated site. **Distance from Natura 2000 site or key features of the site:** There are three Natura 2000 sites within 15km of the application site. The closest of these is the Slieve Beagh SPA and this is 6.5km north-west of the application site. In this instance, given the nature, size and scale of the development, along with the lack of hydrological connectivity, this distance is sufficient to ensure that no significant effects will arise on this site or its Qualifying Interest (hen harrier). **Resource requirements (water abstraction etc.):** No resources will be taken from any Natura 2000 site and there are no resource requirements that will impact upon any designated site. **Emissions:** There will be no emissions from the proposed development that will give rise to significant effects upon any Natura 2000 site. The site is hydrologically connected to the Lough Neagh and Lough Beg SPA, but the downstream distance is over 70km, and this distance is sufficient to ensure that significant effects will not arise. There will be no atmospheric emissions from the site that could give rise to significant effects upon the Natura 2000 sites in the Slieve Beagh area. No living ducks to be kept on the site, therefore ammonia / nitrogen emissions from live stock on the site will not arise.

Off-Site Growers: There are twenty-one off site growers that provide stock for Silverhill Foods in Emyvale. The location of these growers is presented in Appendix I. The operation of these farms, including land-spreading of poultry manure, will be done in accordance with the individual NMPs for those farms. All manure will be accounted for and used in accordance with the legislation set out in S.I. 113 of 2022.

Excavation requirements: There will be no excavation in any Natura 2000 site.

Transportation requirements: There will be no additional transportation requirements resulting from the proposed development and associated works that will have any significant effects upon the Natura 2000 sites identified.

In-Combination / Cumulative Impacts: In order to assess potential cumulative impacts arising from the proposed development and other developments in the area, an examination of the planning portal on the website of Monaghan County Council was undertaken for information pertaining to other recent or pending planning applications in the Emyvale area. The proposed development will have no significant effects upon any Natura 2000 site when considered in combination with other developments that have been properly screened for AA, or where AA has been carried out and an NIS submitted.

Any future application that has the potential to impact upon any Natura 2000 site will be subjected to Appropriate Assessment as required under Articles 6(3) of the Habitats Directive.

There are other agricultural activities ongoing close to the application site (including another farm operated by the applicant at a distance 1km north-west of the application site), therefore cumulative impacts arsing from the operation of these farms together were considered. All farms, regardless of whether licensed by the EPA or not, are required to operate within the legalisation defined in S.I. 113 of 2022 regarding manure storage, minimisation of soiled water and general good agricultural practice, etc. Therefore, cumulative impacts arising from the combined operation of these activities with the continued operation of this site and the nearby farms at will be negligible.

Duration of construction, operation, decommissioning etc: Works will be completed in approximately a year. The operation of the site will be ongoing.

Describe any likely changes to the nearby Natura 2000 sites arising as a result of:

Reduction of habitat area: The proposed development lies outside the boundaries of the Natura 2000 sites identified in Section 3.3. There will be no reduction of designated habitat area or interference with any protected habitat within any SAC / SPA. There will be no interference with the boundaries of any designated site.

Disturbance to key species: There will be no direct or indirect disturbance to any species listed in Annex I of the Birds Directive or Annex II of the Habitats Directive. There will be no disturbance to the hen harrier or any of its breeding or roosting habitats.

Habitat or species fragmentation: There will be no habitat or species fragmentation within any SAC or SPA. No ecological corridors between the site and any Natura 2000 site will be damaged or destroyed.

Reduction in species density: There will be no reduction in species density within any SAC and SPA.

Changes in key indicators of conservation value (water quality etc.): There will be no negative impacts upon surface or ground water quality within any SAC or SPA. There will be no negative impacts upon the water quality in any designated site.

Describe any likely impacts on the nearby Natura 2000 sites as a whole in terms of:

Interference with the key relationships that define the structure or function of the site: It is not considered likely that there will be any impacts on the key relationships that define the structure or function of the Natura 2000 sites identified.

Provide indicators of significance as a result of the identification of effects set out above in terms of:

Loss - Estimated percentage of lost area of habitat: None

Fragmentation: None

Disruption & disturbance: None

Change to key elements of the site (e.g. water quality etc.): None

3.7 Finding of No Significant Effects

Finding of No Significant Effects Report Matrix	
Name of project	Construction of a New Development at Silver Hill Foods, Emyvale, Co. Monaghan
Name and location of Natura 2000 site	There are three Natura 2000 sites within 15km of the application site. The closest of these is the Slieve Beagh SPA and this is 6.5km north-west of the application site. In this instance, given the nature, size and scale of the development, along with the lack of hydrological connectivity, this distance is sufficient to ensure that no significant effects will arise on this site or its Qualifying Interest.
Description of project	Construction of new buildings and works within an existing site at Silver Hill Foods
Is the project directly connected with or necessary to the management of the site?	No
Are there other projects or plans that together with project being assessed could affect the site?	No
The Assessment of Significance of Effects	
Describe how the project is likely to affect the Natura 2000 site	No Significant Effects likely.
Explain why these effects are not considered significant	Not applicable as there is no potential for negative impacts
Describe how the project is likely to affect species designated under Annex II of the Habitats Directive.	No Significant Effects likely.
Data Collected to Carry out the Assessment	
Who carried out the assessment	Noreen McLoughlin, MSC, MCIEEM. Consultant Ecologist
Sources of data	NPWS, EPA, National Biodiversity Data Centre, Monaghan County Council
Level of assessment completed	Stage1 Appropriate Assessment Screening
Where can the full results of the assessment be accessed and viewed	Full results included

4. Appropriate Assessment Conclusion

It can be concluded objectively that this proposed development does not need to proceed to Stage II of the Appropriate Assessment process. There will be no impacts upon the integrity or the conservation objectives of the Natura 2000 sites identified. The habitats and species associated with this site will not be adversely affected.

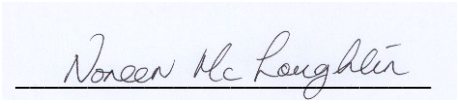
However, the author of this report acknowledges that it is for the competent authority (Monaghan County Council) to carry out the screening for AA and to reach one of the following determinations:

a) AA of the proposed development is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites;

b) AA of the proposed development is *not* required if it can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites.

Based on the information provided in this report, Monaghan County Council and / or the EPA, as the competent authorities, have reached the following determination from above:

b) AA of the proposed development is not required as it can be excluded, on the basis of objective information provided in this report, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites.



Noreen McLoughlin, MSc, MCIEEM.
Ecologist.

(PI Insurance details available on request)

5. Appendix I – Off Site Growers Information

Appendix 13.2: EPA Appropriate Assessment Screening Letter

Electronic copy

Mr. Michael Briody
On behalf of Silver Hill Foods

12 September 2019 Reg. No. P0422-03

Re: Appropriate Assessment in respect of a licence review from Silver Hill Foods for an installation located at Silver Hill Foods, Hillcrest, Emyvale, Monaghan.

Dear Sir,

I refer to your application for a licence review in respect of an installation at Hillcrest, Emyvale, Monaghan.

I am to advise you in accordance with Regulation 42(8)(a) of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, that the EPA has made a determination that an Appropriate Assessment is not required as the project, individually or in combination with other plans or projects, *is not* likely to have a significant effect on a European site. Notification of this determination is attached for your reference.

The application and all associated correspondence are available to view on the EPA website at www.epa.ie. You are advised to refer to the website for information on the progress of the application.

If you have any further queries, please contact licensing@epa.ie.

Yours faithfully,

Environmental Licensing Programme
Office of Environmental Sustainability
Tel: 053 – 9160600

Appendix 13.3: PO0422-03 EPA Licence Final Determination

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

INDUSTRIAL EMISSIONS LICENCE

Licence Register Number:	**P0422-03**
Company Register Number:	**56668**
Licensee:	**Silver Hill Foods Unlimited Company**
Location of Installation:	**Hillcrest Emyvale County Monaghan**

ENVIRONMENTAL PROTECTION AGENCY ACT 1992 AS AMENDED

INDUSTRIAL EMISSIONS LICENCE

Decision of Agency, under Section 90(2) of the EPA Act 1992 as amended in respect of licence

Reference number in Register of licences: P0422-03

Further to notice dated 22/12/20, the Agency in exercise of the powers conferred on it by the Environmental Protection Agency Act 1992 as amended, for the reasons hereinafter set out, hereby grants an Industrial Emissions review licence to Silver Hill Foods Unlimited Company, Hillcrest, Emyvale, County Monaghan, CRO number 56668,

to carry on the following activities

6.1 (a)	The rearing of poultry in installations where the capacity exceeds 40,000 places

at Hillcrest, Emyvale, County Monaghan subject to the conditions as set out.

GIVEN under the Seal of the Agency on this the 11th day of March 2021.

PRESENT when the seal of the Agency
was affixed hereto:

Tara Gillen

Tara Gillen, Authorised Person

INTRODUCTION

This introduction is not part of the licence and does not purport to be a legal interpretation of the licence.

Silver Hill Foods Unlimited Company are involved in the rearing and slaughter/processing of ducklings for both the national and international trade. There is accommodation on-site for approx. 100,000 ducklings. The slaughtering activity occurs within the licensable site. The installation is located in a rural area on the outskirts of Emyvale village in County Monaghan. Normal working hours on-site are five days a week from 06:00 to 24:00.

On the 30th June 2011, the Environmental Protection Agency initiated a review of the IPPC licence held by Silver Hill Foods Unlimited Company for the installation located at Emyvale, Co. Monaghan, IPPC licence register number P0422-02. The reasons for initiating the review are in light of the following requirements under the following regulations:

(1) *The European Communities Environmental Objectives (Surface Water) Regulations 2009 as amended;*
(2) The European Communities Environmental Objectives (Ground Water) Regulations 2010 as amended.

Process effluent is currently treated on site by a wastewater treatment plant (WWTP) and the treated effluent is discharged to an unnamed tributary of the Corlattallan Stream, which is a tributary of the Ulster Blackwater. The licence provides that when there is less than 15 dilutions available in the tributary the treated effluent can be drip irrigated to farmland within the installation boundary within 24 months of the date of grant of this licence. The licence specifies that sludge and duck slurry shall be landspread on lands outside of the licence installation boundary in accordance with European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017, as amended (S.I. No. 605 of 2017). Sanitary wastewater arising from the installation is discharged to sewer and treated at Emyvale WWTP before discharge under WWDL D0346-01.

The activity is above the IE licensing threshold of 40,000 places specified under Annex 1 of the Industrial Emissions Directive and the First Schedule of the EPA Act 1992 as amended. This licence limits the number of birds (ducklings) housed at the installation to 100,000. The slaughter of ducks at the installation is limited to a carcass production capacity of 50 tonnes per day.

For the purposes of the Industrial Emissions Directive (2010/75/EU), this installation falls within the scope of Annex 1, Category:

- Intensive rearing of poultry with more than 40,000 places for poultry.

The licence sets out in detail the conditions under which Silver Hill Foods Unlimited Company, Hillcrest, Emyvale, County Monaghan, will operate and manage this installation.

Table of Contents

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Glossary of Terms

All terms in this licence should be interpreted in accordance with the definitions in the Environmental Protection Agency Act 1992 as amended, unless otherwise defined in the glossary.

Accident	For the purpose of this licence an accident means an unplanned event that may result in pollution.
Adequate lighting	20 lux measured at ground level.
AER	Annual Environmental Report.
Approval	Approval in writing/electronically.
Agreement	Agreement in writing.
Animal By-Product Regulations	Regulation (EC) No. 1069/2009 of the European Parliament and of the Council of 21 October 2009 and Commission Regulation (EU) No. 142/2011 of 25 February 2011
Annually	All or part of a period of twelve consecutive months.
Appropriate Facility	A waste management facility or installation, duly authorised under relevant law and technically suitable.
Attachment	Any reference to Attachments in this licence refers to attachments submitted as part of this licence application.
BAT	Best Available Techniques (BAT) as described in the Commission Implementing Decision (CID) (EU 2017/302) of 15 February 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the intensive rearing of poultry or pigs. Reference to BAT numbers in the conditions of this licence are references to the BAT Conclusions according to how they are numbered in the aforementioned CID.
BAT conclusions	A document containing the parts of a BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, relevant site remediation measures.
BAT reference document	A document drawn up by the Commission of the European Union in accordance with Article 13 of the Industrial Emissions Directive, resulting from the exchange of information in accordance with that Article of that Directive and describing, in particular, applied techniques, present emissions and consumption levels, techniques considered for the determination of best available techniques as well as BAT conclusions and any emerging techniques.
Biannually	At approximately six-monthly intervals.
Biennially	Once every two years.

BOD	5-day Biochemical Oxygen Demand (without nitrification suppression).
CEN	Comité Européen De Normalisation – European Committee for Standardisation.
CID	Commission Implementing Decision (EU 2017/302) of 15 February 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the intensive rearing of poultry or pigs.
COD	Chemical Oxygen Demand
CRO No.	Company Registration Number.
Customer Farmers	Farmers who may use/recover organic fertiliser generated at the installation as fertiliser on their lands.
DAFM	Department of Agriculture, Food and Marine.
Daily	During all days of plant operation and, in the case of emissions, when emissions are taking place; with at least one measurement on any one day.
Day	Any 24 hour period.
Daytime	07:00 hrs. to 19:00 hrs.
dB(A)	Decibels (A weighted).
Diffuse Emissions	Non-channelled emissions which can result from 'area' sources (e.g. tanks) or 'point' sources (e.g. pipe flanges).
DO	Dissolved oxygen.
Documentation	Any report, record, results, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this licence.
Drawing	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this licence.
EIA	Environmental Impact Assessment
Emission limits	Those limits, including concentration limits and deposition rates, established in *Schedule B: Emission Limits* of this licence.
EMP	Environmental Management Programme
Environmental damage	As defined in Directive 2004/35/EC.

End User Agreement	An agreement between the licensee and Irish Water which provides for the contractual conditions and arrangements (outside the terms and conditions set out in this licence) relating to the acceptance of, and treatment by, Irish Water of the licensee's trade effluent and wastewater.
EMS	Environment Management System. The aspect of the organisation's overall management structure that addresses immediate and long-term impacts of its products, services and processes on the environment.
EPA	Environmental Protection Agency.
Evening Time	19:00 hrs. to 23:00 hrs.
Existing Activity	An activity licensed prior to the publication of the BAT conclusions under Commission Implementing Decision 2017/302/EU, BAT conclusion requirements must be met by the installation four years from date of publication of the Commission Implementing Decision 2017/302/EU.
Facility	Any site or premises used for the purpose of the recovery or disposal of waste.
Fortnightly	A minimum of 24 times per year, at approximately two week intervals.
Freeboard	The difference in elevation between the maximum elevation of the washwater and the minimum elevation of the storage tank (i.e. the minimum spare vertical height between tank contents and point of over-topping).
Gas oil	Gas Oil as defined in DIRECTIVE (EU) 2016/802 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels.
Groundwater	Has the meaning assigned to it by Regulation 3 of the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010).
Hazardous Substances	Substances or mixtures as defined in Article 3 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
ha.	Hectare
Heavy metals	This term is to be interpreted as set out in "Parameters of Water Quality, Interpretation and Standards" published by the Agency in 2001. ISBN 1-84095-015-3.
Hours of operation	The hours during which the installation is authorised to be operational.
IE	Industrial Emissions.
IFI	Inland Fisheries Ireland.
Incident	The following shall constitute an incident for the purposes of this licence:

(i) an emergency;
(ii) any emission which does not comply with the requirements of this licence;
(iii) any malfunction or breakdown of key environmental abatement, control or monitoring equipment;
(iv) any trigger level specified in this licence which is attained or exceeded;
(v) any indication that environmental pollution has, or may have, taken place.

Industrial Emissions Directive	Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast).
Installation	A stationary technical unit or plant where the activity concerned referred to in the First Schedule of EPA Act 1992 as amended is or will be carried on, and shall be deemed to include any directly associated activity, which has a technical connection with the activity and is carried out on the site of the activity.
Irish Water	Irish Water, Colvill House, 24/26 Talbot Street, Dublin 1.
K	Kelvin
kPa	Kilopascals
$L_{Aeq,T}$	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).
$L_{Ar,T}$	The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.
Licensee	Silver Hill Foods Unlimited Company, Hillcrest, Emyvale, County Monaghan (CRO No. 56668).
List of Waste (Low)	A harmonised, non-exhaustive list of wastes drawn up by the European Commission and published as Commission Decision 2014/955/EU, as amended by any subsequent amendment published in the Official Journal of the European Community.
Livestock	All animals kept for profit (including cattle, horses, pigs, poultry, sheep and any creature kept for the production of food, wool, skins and fur) as assigned to it by Regulation 4(1) of the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2014. (S.I 31 of 2014).
Local Authority	Monaghan County Council.
Maintain	Keep in a fit state, including such regular inspection, servicing, calibration and repair as may be necessary to perform its function adequately.

Mass flow limit	An emission limit value expressed as the maximum mass of a substance that can be emitted per unit time.
Mass flow threshold	A mass flow rate above which a concentration limit applies.
Monthly	A minimum of 12 times per year, at intervals of approximately one month.
MWWTP	Municipal Wastewater Treatment Plant
Night-time	23:00 hrs. to 07:00 hrs.
Noise-sensitive location (NSL)	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other premises or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Nutrient Management Plan	Nutrient Management Plan.
Odour-sensitive location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other premises or area of high amenity which for its proper enjoyment requires the absence of odour at nuisance levels.
Oil separator	Device installed according to the International Standard I.S. EN 858-2:2003 (Separator system for light liquids, (e.g. oil and petrol) – Part 2: Selection of normal size, installation, operation and maintenance).
Organic fertiliser	Any fertiliser other than that manufactured by industrial process and includes livestock manure, dungstead manure, farmyard manure, slurry, soiled water, silage effluent, non-farm organic substances such as sewage sludge, industrial by-products and sludges and residues from fish farms.
Potential emissions	Emissions which take place only under abnormal operating conditions. Examples include emissions from overpressure valves, bursting discs, and emergency generators.
Poultry	Fowl (chickens), turkeys, guinea fowl, ducks, geese, quails, pigeons, pheasants and partridges reared or kept in captivity for breeding, the production of meat or eggs for consumption, or for restocking supplies of game.

PRTR	Pollutant Release and Transfer Register.
Quarterly	All or part of a period of three consecutive months beginning on the first day of January, April, July or October.
Relevant Hazardous Substances	Those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation.
SAC	Special Area of Conservation designated under the *Habitats Directive,* Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
Sample(s)	Unless the context of this licence indicates to the contrary, the term samples shall include measurements taken by electronic instruments.
Sanitary effluent	Wastewater from installation toilet, washroom and canteen facilities.
Sludge	The accumulation of solids resulting from chemical coagulation, flocculation, separation and/or sedimentation during/after water or wastewater treatment, with greater than 2% dry matter.
Slurry/manure	Animal faeces, urine, washwater and any associated feed or bedding.
Soiled water	Seepage from dungsteads and holding areas for farmyard manures, water from concreated areas/hardstandings/contaminated with livestock faeces/urine, farm chemicals or dairy washings (including milking parlour washings) and water used in washing farm equipment.
Soil	The top layer of the Earth's crust situated between the bedrock and the surface. The soil is composed of mineral particles, organic matter, water, air and living organisms.
SOP	Standard operating procedure.
SPA	Special Protection Area designated under the *Birds Directive*, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.
Specified emissions	Those emissions listed in *Schedule B: Emission Limits*, of this licence.
Standard method	A National, European or internationally recognised procedure (e.g. I.S. EN, ISO, CEN, BS or equivalent); or an in-house documented procedure based on the above references; a procedure as detailed in the current edition of "Standard Methods for the Examination of Water and Wastewater" (prepared and published jointly by A.P.H.A., A.W.W.A. & W.E.F.), American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005, USA; or an alternative method as may be agreed by the Agency.
Storage	Includes holding of waste.
Storm water	Rain water run-off from roof and non-process areas.

The Agency	Environmental Protection Agency.
Trade effluent	Trade effluent has the meaning given in the Water Services Act, 2007.
Trigger level	A parameter value, the achievement or exceedance of which requires certain actions to be taken by the licensee.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Water Services Authority	Monaghan County Council.
Weekly	During all weeks of plant operation and, in the case of emissions, when emissions are taking place; with at least one measurement in any one week.
WWTP	Waste water treatment plant.

Decision & Reasons for the Decision

The Environmental Protection Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this licence, any emissions from the activity will comply with and will not contravene any of the requirements of Section 83(5) of the Environmental Protection Agency Act 1992 as amended.

The Agency has applied the Commission Implementing Decision (CID) of 15/02/2017 establishing Best Available Techniques (BAT) Conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on Industrial Emissions, for the Intensive rearing of poultry (CID (EU) 2017/302) as a reference when setting licence conditions relevant to slurry storage, reducing emissions to water from waste water, generation of wastewater and water use only.

The Agency has accordingly decided to grant a revised licence to Silver Hill Foods Unlimited Company to carry on the activity listed in *Part I, Schedule of Activities Licensed*, subject to the conditions set out in *Part III*, *Conditions*; such licence to take effect in lieu of Licence Register Number: P0422-02.

In reaching this decision the Agency has considered the documentation relating to: the existing licence, Register Number: P0422-02, information submitted by the licensee, Register Number: P0422-03, the submissions received; the Inspector's Report dated 03/12/2020, the Addendum Inspector's Report dated 04/12/2020 and the Addendum Inspector's Report dated 16/12/2020; the Proposed Determination dated 22 December 2020; the objection received from the Applicant; the Technical Committee Report dated 25 February 2021 on the objection to the Proposed Determination and has carried out an Appropriate Assessment Screening of the likely significant effects of the activity on European Sites.

EIA, as respects the matters that come within the functions of the Agency, was not required for the activity to which this decision relates. The requirements of Section 83(2A) and Section 87(1A) to (1I) of the EPA Act 1992 as amended do not apply to a review of a licence carried out by the Agency under Section 90(1)(a) of the EPA Act 1992 as amended. Therefore, this licence review has not been made subject to an Environmental Impact Assessment (EIA).

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the activity, individually or in combination with other plans or projects is likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at Slieve Beagh SPA (Site Code 004167), Slieve Beagh-Mullaghfad-Lisnaskea SPA (UK9020302) and Slieve Beagh SAC (UK0016622).

The activity is not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it can be excluded, on the basis of objective information, that the activity, individually or in combination with other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activity was not required.

This determination was based on the following:

- There was no hydrological connection between the installation and a European site.
- Emissions from the installation will not cause an adverse effect on water quality and on qualifying interests at a European Site.

Part I Schedule of Activities Licensed

In pursuance of the powers conferred on it by the Environmental Protection Agency Act 1992 as amended, the Agency hereby grants this revised Industrial Emissions licence to:

Silver Hill Foods Unlimited Company, Hillcrest, Emyvale, County Monaghan, CRO No. 56668,

under Section 90(2) of the said Act to carry on the following activity:

6.1(a):- the rearing of poultry in installations where the capacity exceeds 40,000 places

at Hillcrest, Emyvale, County Monaghan, subject to the following twelve Conditions, with the reasons therefor and associated schedules attached thereto.

Part II Schedule of Activities Refused

None of the proposed activities as set out in the licence application have been refused.

Part III Conditions

Condition 1. Scope

1.1 Industrial Emissions Directive activities at this installation shall be restricted to those listed and described in *Part I Schedule of Activities Licensed* and shall be as set out in the licence application or as modified under Condition 1.5 of this licence and subject to the conditions of this licence.

1.2 The licensee shall carry on the licensed activity in accordance with the limitations set out in *Schedule A: Limitations* of this licence.

1.3 For the purposes of this licence, the installation is the area of land outlined in red on the Drawing No. P019042 submitted to the Agency on 28/08/2019. Any reference in this licence to "installation" shall mean the area thus outlined in red. The licensed activity shall be carried on only within the area outlined.

1.4 All activities which are directly associated with, and technically connected to the licensed activity, whether operated by the licensee or by another party, shall be subject to the conditions of this licence, and the licensee shall bear full responsibility for any breach of these conditions.

1.5 No alteration to, or reconstruction in respect of, the activity, or any part thereof, that would, or is likely to, result in

(i) a material change or increase in:

- the nature or quantity of any emission;
- the abatement/treatment or recovery systems;
- the range of processes to be carried out;
- the fuels, raw materials, intermediates, products or wastes generated, or

(ii) any changes in:

- site management, infrastructure or control with adverse environmental significance;

shall be carried out or commenced without prior notice to, and without the approval of, the Agency.

1.6 The installation shall be controlled, operated and maintained, and emissions shall take place as set out in the licence. All programmes required to be carried out under the terms of this licence become part of this licence.

1.7 This licence is for the purpose of licensing under the EPA Act 1992 as amended only and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.

1.8 This licence shall have effect in lieu of the licence granted on 28/10/2005 (Register No. P0422-02).

Reason: ***To clarify the scope of this licence.***

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Condition 2. Management of the Installation

2.1 Installation Management

2.1.1 The licensee shall employ a suitably qualified and experienced installation manager who shall be designated as the person in charge. The installation manager or a nominated, suitably qualified and experienced deputy shall be present on the installation at all times during its operation or as otherwise required by the Agency.

2.1.2 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and experience as required and shall be aware of the requirements of this licence.

2.2 Environmental Management System (EMS)

2.2.1 The licensee shall maintain and implement an Environmental Management System (EMS), which shall incorporate energy efficiency management, within six months of the date of grant of this licence. The EMS shall be reviewed for suitability, adequacy and effectiveness and updated on an annual basis.

2.2.2 The EMS shall include, as a minimum, the following elements:

2.2.2.1 Commitment of management, including senior management.

2.2.2.2 An environmental policy, defined by Management, that includes a commitment to continuous improvement of the environmental performance of the installation.

2.2.2.3 The necessary procedures, objectives and targets, in conjunction with financial planning and investment.

2.2.2.4 Management and Reporting Structure and responsibility.

2.2.2.5 Procedures for ensuring compliance with environmental legislation.

2.2.2.6 Procedures that ensure employee involvement safeguarding compliance with environmental legislation.

2.2.2.7 A procedure for checking performance by sectoral benchmarking on a regular basis including energy efficiency.

2.2.2.8 Tracking the development of cleaner technologies.

2.2.2.9 Maintenance programmes.

2.2.2.10 Effective process control.

2.2.2.11 Maintenance of records.

2.2.2.12 Schedule of Environmental Objectives and Targets

The licensee shall maintain and implement a Schedule of Environmental Objectives and Targets. The schedule shall, as a minimum, provide for a review of all operations and processes, including an evaluation of practicable options, for energy and resource efficiency, reduction in water consumption, reduction in effluent generation, optimisation of Cleaning in Place (CIP) system, the use of cleaner technology, cleaner production, odour and noise management, the prevention, reduction and minimisation of waste including waste reduction targets and the impacts from eventual decommissioning of the installation. The Schedule shall include time frames for the achievement of set targets and shall address a five-year period as a minimum. The Schedule shall be reviewed annually.

2.2.2.13 Environmental Management Programme (EMP)

The licensee shall maintain and implement an EMP, including a time schedule, for achieving the Environmental Objectives and Targets prepared under Condition 2.2.2.11. The EMP shall include:

- designation of responsibility for targets;
- the means by which they may be achieved; and
- the time within which they may be achieved.

The EMP shall be reviewed annually.

A report on the programme, including the success in meeting agreed targets, shall be prepared and submitted to the Agency as part of the AER. Such reports shall be retained on-site for a period of not less than seven years and shall be available for inspection by authorised persons of the Agency.

2.2.2.14 Documentation

(i) The licensee shall establish, maintain and implement an environmental management documentation system.

(i) The licensee shall issue a copy of this licence to all relevant personnel whose duties relate to any condition of this licence.

2.2.2.15 Corrective and Preventative Action

(i) The licensee shall maintain and implement procedures to ensure that corrective and preventative action is taken should the specified requirements of this licence not be fulfilled. The responsibility and authority for persons initiating further investigation and corrective and preventative action in the event of a reported non-conformity with this licence shall be defined.

(ii) Where a breach of one or more of the conditions of this licence occurs, the licensee shall without delay take measures to restore compliance with the conditions of this licence in the shortest possible time and initiate any feasible preventative actions to prevent recurrence of the breach.

(iii) All corrective and preventative actions shall be documented.

2.2.2.16 Internal Audits

The licensee shall establish, maintain and implement a programme for internal audits of the trade. Such audits shall be carried out at least once every three years. The audit programme shall determine whether or not the EMS is being implemented and maintained properly, and in accordance with the requirements of the licence. Audit reports and records of the resultant corrective and preventative actions shall be maintained as part of the EMS in accordance with Condition 2.2.2.12.

2.2.2.17 Awareness, Training and Competence

The licensee shall establish, maintain and implement procedures for identifying training needs, and for providing appropriate training, for all personnel whose work can have a significant effect upon the environment to ensure awareness and competence in their work area. Appropriate records of training shall be maintained.

2.2.2.18 Public Awareness and Communications Programme

The licensee shall establish, maintain and implement a Public Awareness and Communications Programme to ensure that members of the public are informed, and can obtain information at the installation, at all reasonable times, concerning the environmental performance of the installation. The Public Awareness and Communication Programme shall include a specific programme of outreach to interested local residents on matters relating to the prevention of nuisance, including odours and noise and other factors at the installation. The programme shall be agreed by the Agency and a report on the programme shall be prepared and submitted to the Agency annually.

2.2.2.19 Maintenance Programme

The licensee shall establish, maintain and implement a programme for maintenance of all plant and equipment based on the instructions issued by the manufacturer/supplier or installer of the equipment. Appropriate record keeping and diagnostic testing shall support this maintenance programme. The licensee shall clearly allocate responsibility for the planning, management and execution of all aspects of this programme to appropriate personnel (see Condition 2.1 above). The maintenance programme shall use appropriate techniques and measures to ensure the optimisation of energy efficiency in plant and equipment.

2.2.2.20 Efficient Process Control

The licensee shall establish, maintain and implement a programme to ensure there is adequate control of processes under all modes of operation. The programme shall identify the key indicator parameters for process control performance, as well as identifying methods for measuring and controlling these parameters. Abnormal process operating conditions shall be documented and analysed to identify any necessary corrective action.

Reason: ***To make provision for management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.***

Condition 3. Infrastructure and Operation

3.1 The licensee shall ensure, at all times after the grant of this licence, that all infrastructure and all equipment required under this licence has been and is:

(i) installed;
(ii) commissioned;
(iii) present on site; and
(iv) maintained in full working order.

3.2 Where any Condition / Schedule of this licence specifies any later deadline for installation of any piece of infrastructure or equipment, Condition 3.1 shall apply as and from the deadline specified.

3.3 The licensee shall establish and maintain, for each component of the installation, all infrastructure referred to in this licence within three months of the date of grant of the licence, or as required by the conditions of this licence. Infrastructure specified in the application that relates to the environmental performance of the installation and is not specified in the licence, shall be installed in accordance with the schedule submitted in the application.

3.4 The licensee shall use all the applicable techniques listed in BAT 2 (good housekeeping) in order to prevent or reduce the environmental impact and improve overall performance of the installation.

3.5 The licensee shall have regard to the following when choosing and/or designing any new plant/infrastructure:

(i) energy efficiency; and

(ii) the environmental impact of eventual decommissioning.

3.6 Installation Notice Board

(i) The licensee shall within one month of the date of grant of this licence, provide an Installation Notice Board on the installation so that it is legible to persons outside the main entrance to the installation. The minimum dimensions of the board shall be 1200 mm by 750 mm. The notice board shall be maintained thereafter.

(ii) The board shall clearly show:

(i) the name and telephone number of the installation;
(ii) the normal hours of operation;
(iii) the name of the licence holder;
(iv) an emergency out of hours contact telephone number;
(v) the licence reference number; and
(vi) where environmental information relating to the installation can be obtained.

3.7 The licensee shall install on all emission points such sampling points or equipment, including any data-logging or other electronic communication equipment, as may be required by the Agency. All such equipment shall be consistent with the safe operation of all sampling and monitoring systems.

3.8 In the case of composite sampling of aqueous emissions from the operation of the installation, a separate composite sample or homogeneous sub-sample (of sufficient volume as advised) shall be refrigerated immediately after collection and retained as required for EPA use.

3.9 The licensee shall clearly label and provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the Agency. The requirement with regard to off-site points is subject to the prior agreement of the landowner(s) concerned.

3.10 Tank, Container and Drum Storage Areas

3.10.1 All tank, container and drum storage areas shall be rendered impervious to the materials stored therein. Bunds shall be designed having regard to Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (2004).

3.10.2 All tank and drum storage areas shall, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following:
(i) 110% of the capacity of the largest tank or drum within the bunded area; or
(ii) 25% of the total volume of substance that could be stored within the bunded area.

3.10.3 All drainage from bunded areas shall be treated as contaminated unless it can be demonstrated to be otherwise. All drainage from bunded areas shall be diverted for collection and safe disposal, unless it can be deemed uncontaminated and does not exceed the trigger levels set for storm water emissions under Condition 6.18.

3.10.4 All inlets, outlets, vent pipes, valves and gauges must be within the bunded area.

3.10.5 All tanks, containers and drums shall be labelled to clearly indicate their contents.

3.10.6 All bunds shall be uniquely identified and labelled at the bund.

3.10.7 The licensee shall apply a leak detection system in accordance with BAT to all storage tanks, lagoons, container and drum storage areas that contain liquid material other than water.

3.11 The licensee shall maintain screens and/or traps prior to effluent entering the on-site waste water treatment plant.

3.12 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the installation. Once used, the absorbent material shall be disposed of at an appropriate facility.

3.13 The licensee shall install and maintain a water meter on all water supplies serving the installation within six months from the date of grant of this licence. Records of water usage shall be maintained on site and a summary records report shall be submitted annually to the Agency.

3.14 Silt Traps and Oil Separators

The licensee shall within twelve months of the date of grant of the licence, install and thereafter maintain silt traps and oil separators at the installation:

(i) silt traps to ensure that all storm water discharges, other than from roofs, from the installation pass through a silt trap in advance of discharge; and

(ii) an oil separator on the storm water discharge from operational yard areas (i.e. any delivery areas and/or loading areas). The separator shall be a Class I full retention interceptor.

(iii) A bypass separator shall be installed and maintained on the storm water discharges from non-operational yard areas (i.e. carparks and reception areas).

The silt traps and separator(s) shall be in accordance with I.S. EN-858-2: 2003 (separator systems for light liquids).

3.15 Fire-water Retention

3.15.1 The licensee shall carry out a risk assessment to determine if the activity should have a fire-water retention facility. The licensee shall submit a report to the Agency for approval on the findings and recommendations of the assessment within six months of the date of grant of this licence.

3.15.2 In the event that a significant risk exists for the release of contaminated fire-water, the licensee shall, based on the findings of the risk assessment, prepare and implement, with the approval of the Agency, a suitable risk management programme. The risk management programme shall be fully implemented within six months of date of notification by the Agency.

3.15.3 In the event of a fire or a spillage to storm water, the site storm water shall be diverted for collection.

3.15.4 The licensee shall examine (based upon the findings of the risk assessment in Condition 3.15.1), as part of the response programme in Condition 3.15.2 above, the provision of automatic diversion of storm water for collection.

3.15.5 The licensee shall have regard to any guidelines issued by the Agency with regard to firewater retention when carrying out the requirements of Conditions 3.15.1 and 3.15.2.

3.16 All pump sumps, aeration basin, effluent sump, storage tanks, lagoons or other treatment plant chambers from which spillage of environmentally significant materials might occur in such quantities as are likely to breach local or remote containment or separators, shall be fitted with high liquid level alarms (or oil detectors as appropriate) within twelve months from the date of grant of this licence.

3.17 The licensee shall upgrade the existing control system for the management of alarms on the wastewater treatment plant for emission limit value exceedances. All tanks and sumps will be alarmed with email /text message alerts within six months of the date of grant of this licence.

3.18 The provision of a catchment system to collect any leaks from flanges and valves of all over-ground pipes used to transport material other than water shall be examined. This shall be incorporated into a Schedule of Environmental Objectives and Targets set out in Condition 2. of this licence for the reduction in fugitive emissions.

3.19 All wellheads at the installation shall be adequately protected to prevent contamination or physical damage.

3.20 The licensee shall maintain in a prominent location on the site a wind sock, or other wind direction indicator, which shall be visible from the public roadway outside the site.

3.21 The licensee may recover duck slurry and WWTP sludge as fertiliser for use on land in accordance with the conditions of this licence.

3.22 The licensee shall provide a minimum of 22 weeks storage for organic fertiliser/organic sludge on-site or

(i) have a contract providing exclusive access to adequate alternative storage capacity located outside the installation,
(ii) have a contract for the transfer of organic fertiliser to a treatment facility for livestock organic fertiliser/organic sludge, or
(iii) have a contract for the transfer of the organic fertiliser/organic sludge to a person registered under and in accordance with the European Communities (Transmissible Spongiform Encephalopathies and Animal By-products) Regulations 2008 S.I. 252 of 2008 to undertake the transport of organic fertiliser/organic sludge.

3.23 The licensee shall provide a minimum of 15 days storage for the treated effluent within the installation boundary.

3.24 The licensee shall establish, maintain and implement a rodent and pest control programme. This programme shall be in accordance with to any relevant guidelines issued by the Department of Agriculture, Food and the Marine.

Reason: ***To provide for appropriate operation of the installation to ensure protection of the environment.***

Condition 4. Interpretation

4.1 Emission limit values for emissions to waters/ground in this licence shall be achieved without the introduction of dilution, and shall be interpreted in the following way:

4.1.1 Continuous Monitoring

(i) No flow value shall exceed the specific limit.

(ii) No pH value shall deviate from the specified range.

(iii) No temperature value shall exceed the limit value.

4.1.2 Composite Sampling

(i) No pH value shall deviate from the specified range.

(ii) For parameters other than pH and flow, eight out of ten consecutive composite results, based on flow proportional composite sampling, shall not exceed the emission limit value. No individual results similarly calculated shall exceed 1.2 times the emission limit value.

4.1.3 Discrete Sampling

For parameters other than pH and temperature, no grab sample value shall exceed 1.2 times the emission limit value.

4.2 Where the ability to measure a parameter is affected by mixing before emission, then, with agreement from the Agency, the parameter may be assessed before mixing takes place.

4.3 Noise

Noise from the installation shall not give rise to sound pressure levels measured at the Noise Sensitive Locations which exceed the limit value(s).

Reason: ***To clarify the interpretation of limit values fixed under the licence.***

Condition 5. Emissions

5.1 Emissions may be made from the specified emission points set out in *Schedule B: Emission Limits*, of this licence, subject to compliance with the Emission Limit Values specified in that Schedule.

5.1.1 Uncontaminated storm water may be discharged to surface water.

5.1.2 Uncontaminated storm water may be emitted to groundwater or to soil.

5.1.3 Minor, diffuse and potential emissions may be emitted to air as specified in the application, or as approved by the Agency under Condition 1 of this licence.

5.2 Notwithstanding the requirements of Condition 5.1, there shall be no other emissions from the installation.

5.3 Pilot Project

(i) A nine-month pilot project shall be completed and submitted to the Agency within 18 months of the date of grant of this licence, in accordance with the Conditions of this licence and the proposal submitted on the 30/01/2018 entitled "Proposal for a Wastewater Drip Irrigation System Pilot Project for Silver Hill Foods, Emyvale, Co. Monaghan".

(ii) The pilot project shall commence within six months of the date of grant of this licence.

5.4 The licensee shall commence monthly groundwater monitoring and surface water monitoring at the receptors of the chosen pilot study treatment area (at a minimum three months prior to commencement of its construction).

5.5 The licensee shall submit an updated drip irrigation proposal and a map of the final pipeline route of the drip irrigation system to be approved by the Agency, within three months of the completion of the pilot project.

5.6 The discharge at W1, after 24 months of the date of grant of this licence, shall only be permitted when there are at least 15 dilutions available in the receiving water. Treated effluent shall be discharged to W1 in accordance with *Schedule B.2: Emissions to Water/Ground*, of this licence and *Schedule C: Control & Monitoring,* of this licence.

5.7 The discharge at W2 to the drip irrigation system after 24 months of the date of grant of licence, shall only be permitted when there is less than 15 dilutions available in the receiving water at W1. All treated effluent drip irrigated at W2 within the installation boundary must be in accordance with the conditions and schedule of this licence within 24 months of date of grant of licence.

5.8 If the treated effluent discharge at W2 is deemed unsuitable for drip irrigation of treated effluent in accordance with *Schedule C.6: Code of Practice for Drip Irrigation of Treated Effluent,* of this licence, the discharge to W2 must cease and effluent be diverted to lagoons.

5.9 No emissions, including odours, from the activities carried on at the site shall result in an impairment of, or an interference with amenities or the environment beyond the installation boundary or any other legitimate uses of the environment beyond the installation boundary.

5.10 No substance shall be discharged in a manner, or at a concentration, that, following initial dilution, causes tainting of fish or shellfish.

5.11 The licensee shall ensure that all or any of the following: Vermin, Birds, Flies, Mud, Litter associated with the activity do not result in an impairment of, or an interference with, amenities or the environment at the installation or beyond the installation boundary or any other legitimate uses of the environment beyond the installation boundary. Any method used by the licensee to control or prevent any such impairment/interference shall not cause environmental pollution.

5.12 Dissolved Air Floatation (DAF) sludge may be landspread with the approval of the Agency, provided the fats, oils and grease content has been demonstrated to be less than 4% by analysis as required under *Schedule C.3.: Waste & Organic Fertiliser/Organic Sludge Monitoring*, of this licence.

5.13 Boilers shall be inspected and maintained annually. Boiler combustion efficiency shall be tested annually, and the results submitted annually to the Agency.

Reason: ***To provide for the protection of the environment by way of control and limitation of emissions***

Condition 6. Control and Monitoring

6.1 The licensee shall carry out such sampling, analyses, measurements, examinations, maintenance and calibrations as set out below and as in accordance with *Schedule C: Control & Monitoring,* of this licence.

6.1.1 Sampling and analysis shall be undertaken by competent staff in accordance with documented operating procedures. Unless otherwise approved by the Agency, sampling and analysis of emissions to atmosphere shall be carried out by ISO 17025 accredited persons/organisations, with accreditation for the relevant scope of sampling and analysis, and in accordance with the Agency's air monitoring policy.

6.1.2 Such procedures shall be assessed for their suitability for the test matrix and performance characteristics shall be determined.

6.1.3 Such procedures shall be subject to a programme of Analytical Quality Control using control standards with evaluation of test responses.

6.1.4 Where any analysis is sub-contracted it shall be to a competent laboratory.

6.2 The licensee shall ensure that:

(i) sampling and analysis for all parameters listed in the schedules to this licence; and

(ii) any reference measurements for the calibration of automated measurement systems

shall be carried out in accordance with CEN-standards. If CEN standards are not available, ISO, national or international standards which will ensure the provision of data of an equivalent scientific quality, shall apply.

6.3 The automated measuring systems shall be subject to parallel measurements with the reference methods at least once per year. The licensee shall submit to the Agency an air monitoring report with the results of the parallel measurements.

6.4 All automatic monitors and samplers shall be functioning at all times (except during maintenance and calibration) when the activity is being carried on unless alternative sampling or monitoring has been agreed in writing by the Agency for a limited period. In the event of the malfunction of any continuous monitor, the licensee shall contact the Agency as soon as practicable, and alternative sampling and monitoring facilities shall be put in place. The use of alternative equipment, other than in emergency situations, shall be as agreed by the Agency.

6.5 Monitoring and analysis equipment shall be installed, operated and maintained as necessary so that all monitoring results accurately reflect any emission, discharge or parameter specified in this licence.

6.6 The licensee shall ensure that groundwater monitoring well sampling equipment is available or installed on-site at the installation and is fit for purpose at all times. The sampling equipment shall be to Agency specifications.

6.7 All treatment/abatement and emission control equipment shall be calibrated and maintained in accordance with the instructions issued by the manufacturer/supplier or installer.

6.8 The frequency, methods and scope of monitoring, sampling and analyses, as set out in this licence, may be amended as required or approved by the Agency following evaluation of test results.

6.9 The licensee shall prepare and maintain a programme, to the satisfaction of the Agency, for the identification and reduction of fugitive emissions using an appropriate combination of best available techniques. This programme shall be included in the Environmental Management Programme.

6.10 The licensee shall maintain and repair concrete yards, and within 12 months of the date of grant of licence, repair damaged concrete yards, over which wash water may be directed or organic fertiliser may be moved. The licensee shall carry out measures to ensure that the ingress of storm/flood water from adjoining lands does not generate excess soiled water or cause the release of polluting matter to ground, groundwater or surface waters.

6.11 The integrity and water tightness of all tanks bunding structures, containers and underground pipes and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated by the licensee within six months of the date of grant of this licence. This testing shall be carried out by a suitably qualified and experienced person at least once every three years and reported to the Agency on each occasion. In the case of new bunding structures, tanks, underground pipelines and containers installed on site, the testing shall be undertaken in advance of utilisation. This testing shall be carried out in accordance with any guidance published by the Agency. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee. A report on such tests shall be submitted to the Agency.

6.12 The licensee shall ensure that all organic fertiliser generated on-site is stored in a manner which does not pollute ground or surface waters.

6.13 The storm water drainage system (i.e., gullies, manholes, any visible drainage conduits and such other aspects as may be required by the Agency), bunds, silt traps and oil separators shall be inspected weekly, desludged as necessary and properly maintained at all times. All sludge and drainage from these operations shall be collected for safe disposal. The licensee shall review and update their site drainage map, to include recent upgrade works, within three months of the date of grant of this licence. The drainage map shall be reviewed annually and updated as necessary.

6.14 In the event that treated effluent exceeds the emission limit values specified in *Schedule B.2: Emission to Water/ground,* of this licence, the licensee shall cease the discharge to W1 or W2 and divert effluent to the lagoons for re-treatment.

6.15 The licensee shall avoid where possible, the use of cleaning and disinfectant agents containing active chlorine.

6.16 Treated Effluent

6.16.1 The acute toxicity of the undiluted final effluent to at least four aquatic species from different trophic levels shall be determined by standardised and internationally accepted procedures and carried out by a competent laboratory.

6.16.2 Having identified the most sensitive species outlined in Condition 6.16.1, subsequent compliance toxicity monitoring shall be carried out on the two most sensitive species.

6.16.3 A representative sample of effluent shall be screened for the presence of organic compounds. Such screening shall be repeated at intervals as requested by the Agency thereafter.

6.17 An inspection system for the detection of leaks on all flanges and valves on over-ground pipes used to transport materials other than water shall be developed and maintained prior to the commencement of the activity within six months of the date of grant of this licence and maintained thereafter.

6.18 Storm Water

6.18.1 A visual examination of the storm water discharges shall be carried out daily. A log of such inspections shall be maintained.

6.18.2 The licensee shall, within six months of commencement of the activity, establish suitable trigger levels for pH, conductivity, ammonia, orthophosphate, suspended solids and BOD in storm water discharges. The licensee shall have a response programme to address any exceedance of the trigger values. The licensee shall have

regard to the Environmental Protection Agency "Guidance on the setting of trigger values for storm water discharges to off-site surface waters at EPA IPPC and Waste licensed facilities" when establishing the suitable trigger levels.

6.18.3 The licensee shall provide and subsequently maintain a rainwater collection and drainage system for all duck housing on-site.

6.18.4 The licensee shall divert all uncontaminated storm water run-off from roofs and non-contaminated impervious areas of the site, to the storm water drainage system.

6.18.5 The licensee shall provide and maintain inspection chambers at the outlets of the storm water drainage system.

6.19 Duck Slurry Storage Lagoons

6.19.1 All duck slurry generated shall be stored only in the concrete storage lagoon.

6.19.2 The licensee shall ensure that a freeboard of at least 100mm from the top of each covered slurry storage tank/lagoon and 500mm from the top of uncovered slurry storage tanks/lagoons is maintained, as a minimum, at all times.

6.19.3 The two lagoons shall be inspected, integrity tested and certified fit for purpose annually by a suitably qualified and experienced person.

6.20 Underground, partly underground or overground concrete storage facilities shall conform to the Department of Agriculture, Fisheries and Food specifications (S108, S123) or equivalent standard.

6.21 The licensee shall monitor for total nitrogen and total phosphorus in the duck slurry, treated effluent and WWTP sludge, in accordance with *Schedule C.3.: Waste & Organic Fertiliser/Organic Sludge/Treated Effluent/DAF Sludge Monitoring* of this licence.

6.22 Drip Irrigation

6.22.1 The licensee shall notify the Agency three months in advance of the intended date of commencement of the discharge of treated effluent to the drip irrigation system.

6.22.2 The licensee shall carry out monitoring in accordance with *Schedule C.5 Ambient Monitoring*, of this licence. An assessment of monitoring results shall be maintained.

6.22.3 A visual inspection of the drip irrigation lands shall be carried out daily. If ponding is evident in an area, discharge of treated effluent to that specific area shall cease. A log of such inspections, including photographs, shall be maintained.

6.23 Hydrogeological Assessment

6.23.1 The licensee shall arrange for the completion, by an independent and appropriately qualified consultant, of a review and update of the hydrogeological assessment within three months of the completion of the pilot project to include the following:

(i) Evaluation of the suitability of upgradient and downgradient monitoring points and where necessary installation of new monitoring points to assess cumulative impacts.

(ii) Review the conceptual site model to provide a more detailed representation of conditions at the site, including the gleyed areas and the perched watertables in the subsoil.

(iii) Determine compliance of proposed drip irrigation system with the *European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No 9 of 2010) as amended* and *the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009).*

(iv) Demonstrate that the drip irrigation lands can percolate 900mm/yr of effective rainfall (treated effluent added to the actual annual rainfall).

(v) Incorporate previous assessments carried out including hydrogeological assessments, site investigations, and baseline report information.

(vi) Further to the hydrogeological assessment, any actions (including the setting of groundwater compliance values, if appropriate) required to demonstrate compliance with the European Communities Environmental Objectives (Groundwater) Regulations 2010, shall be implemented within a period to be approved by the Agency.

6.23.2 A hydrogeological assessment for the drip irrigation system shall be prepared every three years or as otherwise approved by the Agency.

6.24 Odour

6.24.1 The licensee shall carry out an odour survey of the site operations weekly.

6.24.2 The survey programme shall be undertaken in accordance with the methodology specified in the 'Air Guidance Note 5 (AG5) Odour Impact Assessment Guidance for EPA Licensed Sites' as published by the Agency.

6.25 Odour Management Plan

6.25.1 The licensee shall prepare, maintain and implement, to the satisfaction of the Agency, an Odour Management Plan.

6.25.2 This plan shall be submitted within 12 months of the date of grant of the licence.

6.25.3 The plan shall outline odour reduction and abatement measures.

6.25.4 The plan shall as a minimum address the waste water treatment plant, sludge treatment and storage areas and the storage and handling of wastes and other materials with a potential for causing odour.

6.25.5 The odour reduction programme shall be implemented within 12 months of the date of grant of the licence.

6.25.6 The plan shall be prepared in accordance with the Agency's Odour Emissions Guidance Note (Air Guidance Note AG9).

6.25.7 The plan shall be reviewed annually.

6.26 Noise

6.26.1 The licensee shall carry out a noise survey of the site operations as required by the Agency. The survey programme shall be undertaken in accordance with the methodology specified in the 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the Agency.

6.26.2 The licensee shall use one or a combination of the techniques listed in BAT 10 in order to prevent, or where that is not practicable, to reduce noise emissions.

6.27 Pollutant Release and Transfer Register (PRTR)

The licensee shall submit a PRTR data report for the site. The pollutants and/or wastes to be included in the PRTR shall be determined by reference to EC Regulations No. 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register. The PRTR shall be prepared in accordance with any relevant Agency guidance and shall be submitted electronically in the format specified by the Agency.

The licensee shall maintain a Data Management System for collation, archiving, assessing and graphically presenting the monitoring data generated as a result of this licence.

6.28 Groundwater and Soil Monitoring

The licensee shall carry out monitoring for relevant hazardous substances in soil and groundwater at the site of the installation. The substances for monitoring shall be identified by the licensee by undertaking a risk-based assessment. The risk assessment, sampling and monitoring shall be carried out in accordance with any guidance published by the Agency. The licensee shall have regard to the '*Classification of Hazardous and Non-Hazardous Substances in Groundwater*' as published by the Agency.

6.28.1 Groundwater monitoring shall be carried out at least once every five years. Monitoring shall be carried out in accordance with S*chedule C.5.2 Groundwater Monitoring*, of this licence.

6.28.2 Soil monitoring shall be carried out at the site of the installation at least once every ten years. Monitoring shall be carried out in accordance with *Schedule C.5.6: Soil Monitoring*, of this licence.

6.29 Monitoring of available storage capacity for organic fertiliser/organic sludge/treated effluent/DAF sludge shall be undertaken as outlined in *Schedule C.3.: Waste and Organic Fertiliser/Organic Sludge/Treated Effluent/DAF Sludge Monitoring*, of this licence. Results shall be retained on-site and records of the results shall be available for inspection by authorised persons, including Agency personnel, at all reasonable times.

Reason: ***To provide for the protection of the environment by way of treatment and monitoring of emissions***

Condition 7. Resource Use and Energy Efficiency

7.1 The licensee shall carry out an audit of the energy efficiency of the site as required by the Agency. The audit shall be carried out in accordance with the guidance published by the Agency, "Guidance Note on Energy Efficiency Auditing". The energy efficiency audit shall be repeated at intervals as required by the Agency.

7.2 The audit shall identify all practicable opportunities for energy use reduction and efficiency and the recommendations of the audit will be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.

7.3 The licensee shall identify opportunities for reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible. Reductions in water usage shall be incorporated into Schedule of Environmental Objectives and Targets.

7.4 The licensee shall use a combination of the techniques listed in BAT 5 (Efficient use of water), in order to use water efficiently.

7.5 The licensee shall use a combination of the techniques listed in BAT 6 and in BAT 7 (Emissions from waste water), in order to reduce the generation of waste water on site and emissions to water/ground.

7.6 The licensee shall undertake an assessment of the efficiency of use of materials in all processes, having particular regard to the reduction in waste generated. The assessment should take account of best international practice for this type of activity. Where improvements are identified, these shall be incorporated into the Schedule of Environmental Objectives and Targets.

Reason: ***To provide for the efficient use of resources and energy in all site operations.***

Condition 8. Materials Handling

8.1 The licensee shall ensure that waste generated in the carrying on of the activity shall be prepared for re-use, recycling or recovery or, where that is not technically or economically possible, disposed of in a manner which will prevent or minimise any impact on the environment.

8.2 Disposal or recovery of waste on-site shall only take place in accordance with the conditions of this licence and in accordance with the appropriate National and European legislation and protocols.

8.3 Waste sent off- site for recovery or disposal

8.3.1 Waste sent off-site for recovery or disposal shall be transported only by an authorised waste contractor or an exempted person (Waste Management (Collection Permit) Regulations 2007 as amended). The waste shall be transported from the site of the activity to the site of recovery/disposal only in a manner that will not adversely affect the environment and in accordance with the appropriate National and European legislation and protocols.

8.3.2 Animal tissue or carcasses sent off site for disposal/recovery shall be transported in covered, leak-proof containers and shall at a minimum be removed weekly.

8.3.3 The transport of organic waste/organic fertiliser/sludge via the public road shall be carried out in sealed containers/covered trailers, as appropriate such that no spillage can occur.

8.3.4 Waste sent off-site for recovery or disposal shall be transferred only to an appropriate facility.

8.4 The licensee shall ensure that, in advance of transfer to another person, waste shall be classified, packaged and labelled in accordance with National, European and any other standards which are in force in relation to such labelling.

8.5 The loading and unloading of materials shall be carried out in designated areas protected against spillage and leachate run-off.

8.6 Waste and materials shall be stored in designated areas, protected as may be appropriate against spillage and leachate run-off. The waste shall be clearly labelled and appropriately segregated.

8.7 Waste for disposal/recovery off-site shall be analysed in accordance with *Schedule C: Control & Monitoring,* of this licence.

8.8 Unless approved in writing, in advance, by the Agency the licensee is prohibited from mixing a hazardous waste of one category with a hazardous waste of another category or with any other non-hazardous waste.

8.9 The licensee shall neither import waste into the State nor export waste out of the State except in accordance with the relevant provisions of Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14th June 2006 on shipments of waste and associated national regulations.

8.10 The licensee shall record the movement of all organic fertiliser/organic sludge from the installation, the record of each movement shall as a minimum include the date of movement off site, quantity, nutrient content, transporter, final recipient/customer farmer and off-site storage.

8.11 Organic Fertiliser Movements

8.11.1 The licensee shall record all organic fertiliser movements off-site in an 'organic fertiliser/industrial sludge register' which shall be available for inspection on-site by authorised persons.

8.11.2 The licensee shall maintain an 'organic fertiliser register/industrial sludge' to the satisfaction of the Agency, showing, as a minimum, the name, herd number of the customer farmer receiving organic fertiliser, quantity of organic fertiliser, date of movement off-site, and details in accordance with Article 23 of S.I. No. 605 of 2017 European Union (Good Agricultural Practice for Protection of Waters) Regulations 2017 and as otherwise specified by the Agency or Department of Agriculture, Food and the Marine.

8.11.3 The licensee shall, on or before the 31st December annually, submit to the Department of Agriculture, Food and the Marine the completed records of movement of organic fertiliser/sludge from the installation (referred to as 'Record 3' by the Department of Agriculture, Food and the Marine). The record shall be in accordance with Article 23 of European Union (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017) and as otherwise specified by the Agency or Department of Agriculture, Food and the Marine. A copy of the record submitted shall be maintained on site for inspection.

8.11.4 The licensee shall calculate and record by the 31st of January annually:

(i) the quantity of organic fertiliser generated by the ducks housed on-site in the previous calendar year;

(ii) the total quantity of organic fertiliser moved off site and recorded in the organic fertiliser register/industrial sludge register and 'Record 3' as submitted to the Department of Agriculture, Food and the Marine in the previous calendar year;

(iii) the opening quantity of organic fertiliser/industrial sludge (1st January of the previous year); and closing quantity of organic fertiliser/industrial sludge (1st January of the current year).

These details shall be submitted to the Agency.

8.12 Recovery of Organic Fertiliser by means other than use as fertiliser on land

8.12.1 Where organic fertiliser is not used as a fertiliser on land, the licensee shall by the first of February each year submit details of all proposed recipients of organic fertiliser for recovery/disposal other than by landspreading. Details required shall include method of recovery/disposal, location of recovery/disposal facility, permit/authorisation for recovery/disposal facility, agreements between recipient and licensee and quantities to be accepted by the recipient.

8.12.2 Recovery/disposal of organic fertiliser shall take place only by methods agreed in advance by the Agency and at agreed recovery/disposal facilities which have appropriate authorisation.

8.12.3 Agreements between the licensee and recipients of organic fertiliser for recovery/disposal, other than landspreading, shall not conflict with any conditions of this licence.

8.13 Landspreading of WWTP sludge and duck slurry shall be carried out in accordance with *European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017, as amended (S.I. No. 605 of 2017).* All landspreading activities shall be carried out in such a manner as to avoid contamination of surface waters and groundwaters, and so as to minimise odour nuisance.

8.14 There shall be no landspreading of duck slurry arising from the installation within the installation boundary.

8.15 Drip Irrigation of Treated Effluent within installation boundary

8.15.1 All drip-irrigation activities shall be carried out in such a manner as to avoid contamination of surface waters and groundwaters, and so as to minimise odour nuisance.

8.15.2 Where there is evidence of contamination the licensee shall cease the discharge to W2.

8.15.3 Drip irrigation of treated effluent shall as a minimum, be carried out in accordance with *European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017, as amended (S.I. No. 605 of 2017).*

8.15.4 A Nutrient Management Plan shall be submitted annually to the Agency, in accordance with *European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017, as amended (S.I. No. 605 of 2017).*

8.15.5 All drip irrigation system activities shall be undertaken in accordance with a Nutrient Management Plan.

8.15.6 In relation to hydraulic loading, treated effluent shall not be applied to land by irrigation at a rate exceeding 5mm per hour. The licensee may reduce the time period between applications of treated effluent, as specified above, where it is demonstrated

to the satisfaction of the Agency that the increased application frequency will not have an impact on the receiving environment.

8.15.7 Treated effluent monitoring at the site shall be analysed in accordance with *C.2.2. Monitoring of Emissions to Water/Ground* and *C.3. Waste & Organic Fertiliser/Organic Sludge/Treated Effluent/DAF Sludge Monitoring* of this licence.

8.16 The licensee shall, prior to the first of January of each year, submit to the Agency and maintain on-site the following information:

8.16.1 Map (scale of 1:50,000) showing the location of farms where organic waste/WWTP sludge/slurry/manure may be recovered;

8.16.2 Declaration by suitable qualified person that lands used for recovery of organic waste/WWTP sludge/slurry/manure, have been inspected and are suitable for landspreading.

Reason: ***To provide for the appropriate handling of material and the protection of the environment.***

Condition 9. Accident Prevention and Emergency Response

9.1 The licensee shall, within six months of date of grant of this licence, ensure that a documented Accident Prevention Procedure is in place that addresses the hazards on-site, particularly in relation to the prevention of accidents with a possible impact on the environment. This procedure shall be reviewed annually and updated as necessary.

9.2 The licensee shall, within six months of date of grant of this licence, ensure that a documented Emergency Response Procedure is in place, that addresses any emergency situation which may originate on-site. This procedure shall include provision for minimising the effects of any emergency on the environment. This procedure shall be reviewed annually and updated as necessary.

9.3 Incidents

9.3.1 In the event of an incident the licensee shall immediately:

(i) carry out an investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

(ii) isolate the source of any such emission;

(iii) evaluate the environmental pollution, if any, caused by the incident;

(iv) identify and execute measures to minimise the emissions/malfunction and the effects thereof;

(v) identify the date, time and place of the incident; and

(vi) notify the Agency as required by Condition 11.3 of this licence.

9.3.2 Where an incident or accident that significantly affects the environment occurs, the licensee shall, without delay take measures to limit the environmental consequences of the incident or accident and to prevent further incident or accident.

Reason: ***To provide for the protection of the environment.***

Condition 10. Closure, Restoration and Aftercare Management

10.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery any soil, subsoil, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution. A final validation report to include a certificate of completion to demonstrate there is no continuing risk to the environment shall be submitted to the Agency within three months of termination or planned cessation of the activity.

Reason: ***To make provision for the proper closure of the activity ensuring protection of the environment.***

Condition 11. Notification, Records and Reports

11.1 The licensee shall submit the reports, proposals and submissions required by this licence by the deadlines specified. The licensee shall not be in compliance with the requirements of this condition unless and until it has submitted every report, proposal and submission, the deadline for which has passed.

11.2 The licensee shall carry out every action required by the Agency, and arising out of such reports, proposals or submission, by such deadline as the Agency may specify. The licensee shall not be in compliance with the requirements of this condition unless and until it has carried out every such action.

11.3 The licensee shall notify the Agency by both telephone and either email or webform, to the Agency's headquarters in Wexford, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:

(i) an incident or accident as defined by the glossary;

(ii) any release of environmental significance to atmosphere from any potential emissions point including bypasses; and

(iii) any breach of one or more of the conditions attached to this licence.

The licensee shall include as part of the notification, date and time of the incident, summary details of the occurrence, and where available, the steps taken to minimise any emissions. All details required to be communicated must be in accordance with any guidance provided by the Agency.

11.4 The licensee shall identify the technique, or combination of techniques where required, used for each BAT referenced in the conditions of this licence. The licensee shall prepare a report setting out the selected technique(s) used and submit this report annually to the Agency.

11.5 The following shall be notified, as soon as practicable after the occurrence of any incident which relates to a discharge to water:

(i) Inland Fisheries Ireland in the case of discharges to receiving waters.

(ii) Irish Water in the case of any incident where the discharges have been identified as upstream of a drinking water abstraction point.

11.6 The licensee shall make a record of any notification made under Condition 11.3. This record shall include details of the nature, extent, and impact of, and circumstances giving rise to, the incident or accident. The record shall include all corrective actions taken to manage the incident or accident, minimise wastes generated and the effect on the environment, and avoid recurrence. In the case of a breach of a condition, the record shall include measures to restore compliance.

11.7 The licensee shall record all complaints of an environmental nature related to the operation of the activity. Each such record shall give details of the date and time of the complaint, the name of the complainant (if provided), and give details of the nature of the complaint. A record shall also be kept of the response made in the case of each complaint.

11.8 The licensee shall record all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence and all other such monitoring which relates to the environmental performance of the installation.

11.9 The licensee shall as a minimum ensure that the following documents are accessible at the site:

(i) the licences relating to the installation;

(ii) the current EMS for the installation including all associated procedures, reports, records and other documents;

(iii) the previous year's AER for the installation;

(iv) records of all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence and all other such monitoring which relates to the environmental performance of the installation;

(v) relevant correspondence with the Agency;

(vi) up-to-date site drawings/plans showing the location of key process and environmental infrastructure, including monitoring locations and emission points;

(vii) up-to-date Standard Operational Procedures for all processes, plant and equipment necessary to give effect to this licence or otherwise to ensure that standard operation of such processes, plant or equipment does not result in unauthorised emissions to the environment; and

(viii) any elements of the licence application or EIA documentation referenced in this licence.

This documentation shall be available to the Agency for inspection at all reasonable times.

11.10 The licensee shall submit to the Agency, by the 31st March of each year, an AER covering the previous calendar year. This report, which shall be to the satisfaction of the Agency, shall include as a minimum the information specified in *Schedule D: Annual Environmental Report,* of this licence and shall be prepared in accordance with any relevant guidelines issued by the Agency.

11.11 A full record, which shall be open to inspection by authorised persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall be as a minimum contain details of the following:

(i) the tonnages and LoW Code for the waste materials imported and/or sent off-site for disposal/recovery;

(ii) the names of the agent and carrier of the waste, and their waste collection permit details, if required (to include issuing authority and vehicle registration number);

(iii) details of the ultimate disposal/recovery destination facility for the waste and its appropriateness to accept the consigned waste stream, to include its permit/licence details and issuing authority, if required;

(iv) written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site;

(v) details of all waste consigned abroad for Recovery and classified as 'Green' in accordance with the EU Shipment of Waste Regulations (Council Regulation EEC No. 1013/2006, as may be amended). The rationale for the classification must form part of the record;

(vi) details of any rejected consignments;

(vii) details of any approved waste mixing;

(viii) the results of any waste analyses required under *Schedule C: Control & Monitoring,* of this licence; and

(ix) the tonnage and LoW Code for the waste materials recovered/disposed on-site.

11.12 The licensee shall maintain the following records:

(i) register of Duckling stock levels;
(ii) mortality and dead bird disposal;
(iii) emergency action plan;
(iv) chemical Inventory and Usage;
(v) weekly water consumption;
(vi) electric energy consumption;
(vii) fuel consumption;
(viii) feed delivery records and details of feed consumption;
(ix) heating systems and back-up generator maintenance certificates;
(x) hours of operation and reason for operation of back-up generator; and
(xi) safety statement.

These records shall be available for inspection by authorised persons of the Agency at all reasonable times.

11.13 The licensee shall submit report(s) electronically as required by the conditions of this licence to the Agency.

11.14 All reports shall be certified accurate and representative by the installation manager or a nominated, suitably qualified and experienced deputy.

Reason: ***To provide for the collection and reporting of adequate information on the activity.***

Condition 12. Financial Charges and Provisions

12.1 Agency Charges

12.1.1 The licensee shall pay to the Agency an annual contribution of €2,768 or such sum as the Agency from time to time determines, having regard to variations in the extent of reporting, auditing, inspection, sampling and analysis or other functions carried out by the Agency, towards the cost of monitoring the activity as the Agency considers necessary for the performance of its functions under the Environmental Protection Agency Act 1992 as amended. The first payment shall be a pro-rata amount for the period from the date of grant of this licence to the 31st day of December and shall be paid to the Agency within one month from the date of grant of the licence. In subsequent years the licensee shall pay to the Agency such revised annual contribution as the Agency shall from time to time consider necessary to enable performance by the Agency of its relevant functions under the Environmental Protection Agency Act 1992 as amended, and all such payments shall be made within one month of the date upon which demanded by the Agency.

12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased, the licensee shall contribute such sums as determined by the Agency to defray its costs in regard to items not covered by the said annual contribution.

12.2 Environmental Liabilities

12.2.1 The licensee shall submit to the Agency, an annual statement as to the measures taken or adopted at the site, in relation to the prevention of environmental damage, for remedial actions following closure/decommissioning or accidents/incidents, as may be associated with the carrying on of the activity.

12.2.2 The licensee shall have regard to the Environmental Protection Agency's Guidance on Assessing and Costing Environmental Liabilities (2014) and, as appropriate, Guidance on Financial Provision for Environmental Liabilities (2015) when implementing Condition 12.2.1 above.

12.2.3 The Agency may amend this licence at any time in certain circumstances in accordance with section 96 of the Environmental Protection Agency Act 1992 as amended to require, or not require as the case may be, the putting in place of a financial provision to incorporate costings for CRAMP and/or Environmental Liabilities Risk Assessment. This amendment may be implemented by the Agency in the event of an incident that creates a significant residual environmental liability or where the environmental risk profile, changes on site.

Reason:	***To provide for adequate financing for monitoring and financial provisions for measures to protect the environment***

SCHEDULE A: Limitations

A.1 Bird numbers housed at the installation

Poultry Type	Numbers
Ducks	**100,000**

The Slaughter of animals in the installation shall not exceed a carcass production capacity of 50 tonnes per day.

SCHEDULE B: Emission Limits

B.1 Emissions to Air

There shall be no emissions to air of environmental significance.

B.2 Emissions to Water/Ground

Emission Point Reference No:	W1-Treated Effluent [Note 1]	
Name of Receiving Waters:	Unnamed Stream	
Location:	Tributary of the Corlattalan Stream	
Location of monitoring points	Final treated effluent sampling chamber	
Volume to be emitted:	Maximum in any one day:	480 m^3
	Maximum in any one hour:	20 m^3

Parameter	Emission Limit Value
Temperature	25 °C (max)
pH	6-9
Toxicity	5 TU
	mg/1
BOD	10
COD	100
Total Suspended Solids	15
Total Nitrogen	15
Ammonia	0.8
Total Phosphorus	2
Orthophosphate	0.5
Oils Fats and Greases	5

Note 1: The discharge shall only be permitted in accordance with Conditions 5.6.

Emission Point Reference No:	W2-Treated Effluent [Note 1]	
Name of receiving Ground:	Drip Irrigation Lands	
Location of monitoring point:	Final treated effluent sampling chamber	
Volume to be emitted:	Maximum in any one day:	480 m^3
	Maximum in any one hour:	20 m^3

Parameter	Emission Limit Value
Temperature	25 °C (max)
pH	6-9
Toxicity	5 TU
	mg/1
BOD	10
COD	100
Total Suspended Solids	15
Total Nitrogen	15
Ammonia	0.8
Total Phosphorus	2
Orthophosphate	0.5
Oils Fats and Greases	5

Note 1: The discharge shall only be permitted in accordance with Conditions 5.7 and 5.8.

B.3 Noise Emissions

Daytime dB LAr, T (30 minutes)	Evening dB LAr, T (30 minutes)	Night-time dB LAeq, T (30 minutes) [Note 1]
55	50	45

Note 1: During night time hours, there shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise-sensitive location.

SCHEDULE C: Control & Monitoring

C.1. Control and Monitoring of Emissions to Air

There shall be no emissions to air of environmental significance.

C.2.1. Control of Emissions to Water/Ground

Emission Point Reference No.: W1 and W2

Description of Treatment: Biological Waste Water Treatment

Control Parameter	Monitoring	Key Equipment [Note 1]
Balance/inflow:		
Total Ammonia	Weekly [Note 2]	Laboratory tests
COD	Weekly [Note 2]	Laboratory tests
Flow	Continuous	Flow meter/recorder
pH	Daily	pH meter/electrode
Anoxic/ Aeration tanks:		
Dissolved Oxygen	Continuous	Fixed DO Meter, Air blowers
MLSS	Weekly	Laboratory tests
SVI	Daily	Laboratory tests
F/M ratio	Weekly	Laboratory tests
Final effluent:		
Flow	Continuous	Flow meter/recorder
pH	Daily	pH meter/electrode
Sludge Dewatering:		
Sludge condition	Daily inspection	Filtration pumps Polyelectrolyte dosing pumps Picket fence thickener Decanting centrifuge Lime handling equipment

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

Note 2: All samples shall be collected on a 24-hour flow proportional composite sampling basis.

C.2.2. Monitoring of Emissions to Water/Ground

Emission Point Reference No: W1 and W2
Location of monitoring point: Final treated effluent sampling chamber

Control Parameter	Monitoring Frequency	Key Equipment/Technique
Flow	Continuous **Daily** [Note 1]	On-line flow meter with recorder
Temperature	Weekly	On-line temperature probe with recorder
pH	Daily	pH electrode/meter with recorder
Chemical Oxygen Demand	Daily [Note 1]	Standard Method
Biochemical Oxygen Demand	Weekly [Note 1]	Standard Method
Suspended Solids	Daily [Note 1]	Standard Method
Total Nitrogen (as N)	Monthly [Note 1]	Standard Method
Ammonia (as N)	Weekly [Note 1]	Standard Method
Total Phosphorus (as P)	Monthly [Note 1]	Standard Method
Orthophosphate	Weekly [Note 1]	Standard Method
Oils, fats and greases	Monthly [Note 1]	Standard Method
Toxicity [Note 2]	As may be required	To be agreed by the Agency

Note 1: All samples shall be collected on a 24-hour flow proportional composite sampling basis.
Note 2: The number of toxic units (Tu) = 100/x hour EC/LC_{50} in percentage vol/vol so that higher Tu values reflect greater levels of toxicity. For test regimes where species death is not easily detected, immobilisation is considered equivalent to death.

C.2.3. Monitoring of Storm Water Discharges

Description of emission **Storm water**
Discharge Point Reference No: **SW2, SW3, SW4 and SW5**

Control Parameter	Monitoring Frequency	Key Equipment/Technique
pH	**Weekly**	**pH electrode/meter with recorder**
Conductivity	**Weekly**	**Conductivity Probe**
Chemical Oxygen Demand	**Weekly** [Note 1]	**Standard Method**
Suspended Solids	**Weekly** [Note 1]	**Gravimetric**
Ammonia (as N)	**Weekly** [Note 1]	**Standard Method**
Orthophosphate (as P)	**Weekly** [Note 1]	**Standard Method**
Visual Inspection	**Daily**	**Sample and examine for colour**

Note 1: All samples shall be collected by a grab sample.

C.3. Waste & Organic Fertiliser/Organic Sludge/Treated Effluent/DAF Sludge Monitoring

Description	Frequency	Parameter	Method
Duck Slurry	Biannually	Nutrient concentrations (N, P, K)	Estimation by using manure analysis for total nitrogen, potassium and total phosphorus content.
	Monthly and 1st January annually	Available storage capacity	Calculate On-site and off-site storage capacity
Treated effluent	Biannually	Nutrient concentrations (N, P, K)	Standard Method
		Available storage capacity in response to emergency	Calculate On-site and off-site storage capacity
WWTP sludge and Lagoon sludge	Biannually	Nutrient concentrations (N, P, K), % Dry matter	Standard Method
		Available storage capacity	Calculate On-site and off-site storage capacity
Dissolved Air Flotation (DAF) sludge	Biannually	Nutrient concentrations (N, P, K)	Standard Method
	Monthly	% Dry matter % Oils, Fats & Grease	Standard Method Standard Method
	Biannually	Available storage capacity	Calculate On-site and off-site storage capacity

C.4 Noise Monitoring

Period	Minimum Survey Duration
Daytime	A minimum of 3 sampling periods at each noise monitoring location.[Note 2]
Evening-time	A minimum of 1 sampling period at each noise monitoring location.
Night-time[Note 1]	A minimum of 2 sampling periods at each noise monitoring location.

Note 1: Night-time measurements should be made between 2300hrs and 0400hrs, Sunday to Thursday, with 2300hrs being the preferred start time.

Note 2: Sampling period is to be the time period T stated as per *Schedule B3: Noise Emissions,* of this licence. This applies to day, evening and night time periods.

C.5 Ambient Monitoring

C.5.1. Air Monitoring

No ambient monitoring is required in this licence.

C.5.2. Groundwater Monitoring

Locations: Well Nos. AGW1, AGW2, AGW3, MW1, MW2, MW3, MW4, MW5, MW6 and any other locations required by the Agency

Parameter	Monitoring Frequency Note 1	Analysis Method/Techniques
Water level	Quarterly	Dip meter
pH	Quarterly	pH electrode/meter
Conductivity	Quarterly	Standard Method
COD	Quarterly	Standard Method
Nitrate	Quarterly	Standard Method
Total Ammonia	Quarterly	Standard Method
Total Nitrogen	Quarterly	Standard Method
Total Phosphorus	Quarterly	Standard Method
Orthophosphate	Quarterly	Standard Method
Faecal coliforms	Quarterly	Standard Method
Total coliforms	Quarterly	Standard Method
Relevant Hazardous Substances Note 2	Every five years	Standard Method

Note 1: Ambient monitoring requirements may be amended subject to Condition 6.8.
Note 2: Groundwater monitoring for relevant hazardous substances shall be in accordance with Condition 6.28.

C.5.3. Leak Detection Sump Monitoring

Location: Leak detection sump

Parameter	Monitoring Frequency	Analysis Method/Technique
COD	Weekly	Standard Method
Total Ammonia	Monthly	Standard Method

C.5.4. Surface Water Monitoring

Locations: Upstream and Downstream of discharge to Unnamed stream, tributary of Corlattallan Stream and any other locations required by the Agency (Map submitted on 07/09/2012)

Parameter	Monitoring Frequency	Analysis Method/Techniques
Flow	Continuous-every 15 minutes [Note 1]	Flow Meter or flow velocity method
BOD	Biannually	Standard Method
Total Ammonia	Biannually	Standard Method
Orthophosphate	Biannually	Standard Method
Biological Quality (Q) Rating/Q Link	Annually	To be agreed by the Agency

Note 1: The licensee shall monitor and record the flow of the unnamed stream at W1 (Grid Reference 267600E, 344815N) every 15 minutes all year round. The calibration of the flow meter shall be subcontracted out to a competent provider. All measurements shall be available for inspection on site.

Location: Killybressal stream (West of site)-SWMP 12, SWMP 11, Corlattallan Stream (North of site)-SWMP1, SWMP2, SWMP3,
Emylough Stream (South East of site)-SWMP4, SWMP5, SWMP6, SWMP7,
Back Lough (South of site)-SWMP8, SWMP9, SWMP10, SWMP14, SWMP15, SWMP16, SWMP17 and any other locations required by the Agency (Document received on 28/08/2019)

Parameter	Monitoring Frequency	Analysis Method/Techniques
COD	Biannually	Standard Method
Total Ammonia	Biannually	Standard Method
Orthophosphate	Biannually	Standard Method
Visual Inspection	Daily	Sample and examine for colour
Biological Quality (Q) Rating/Q Link	Biannually	To be agreed by the Agency

C.5.5. Land used for Drip Irrigation

Monitoring Location: All lands included in the drip irrigation system [Note 1]

Conditions	Monitoring Frequency [Note 1]	Analysis Method/Techniques Note 2,3,4
Where no soil test available	Prior to the preparation of the first Nutrient Management Plan	Morgan's P test
Soil test available	Annually before preparation of a Nutrient Management Plan	Morgan's P test

Note 1: Nutrient Management Plan shall be prepared prior to commencement of discharge to Drip Irrigation System.
Note 2: Each sample should be representative of a maximum area of 1 ha.
Note 3: Peach, M. and English, L. (1944) 'Rapid micro chemical test'. Soil Science 57: 167.
Note 4: Soil analysis shall only be conducted by Department of Agriculture, Food and the Marine approved laboratories.

C.5.6. Soil Monitoring

Monitoring Location: Monitoring location(s) to be approved by the Agency

Parameter	Monitoring Frequency	Analysis Method/Techniques
Relevant hazardous Substances Note 1	Every ten years	Standard Method

Note 1: Soil monitoring for relevant hazardous substances shall be in accordance with Condition 6.28.

C.6 Code of Practice for Drip Irrigation of Treated Effluent Note 1

Drip Irrigation of treated effluent shall not be applied to land within the installation boundary in any of the following circumstances:
• The land is waterlogged; • The land is flooded or likely to flood; • The land is snow – covered or frozen; • The ground slopes steeply and there is a risk of water pollution having regard to factors such as storm water runoff pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover. • Evidence of contamination of Groundwater (onsite and downstream of the site) and Surface Water (onsite and downstream of the site).
Loadings:
• In relation to hydraulic loading, treated effluent shall not be applied to land by irrigation at a rate exceeding 5mm per hour. The licensee may reduce the time period between applications of treated effluent where it is demonstrated to the satisfaction of the Agency that the increased application frequency will not have an impact on the receiving environment.

Note 1: This Code of Practice may be amended by the Agency as further environmental information becomes available.

SCHEDULE D: Annual Environmental Report

Annual Environmental Report Content Note 1
Waste management record.
Report on total nitrogen and phosphorus in manure.
Report on technique(s) used at the installation for each BAT referenced in the applicable CIDs.
Resource consumption summary.
Tank and pipeline assessment report.
Bund integrity test.
Reported incidents/complaints summary.
Report on the assessment of the efficiency of use of raw materials in processes and the reduction in waste generated.
Report on progress made and proposals being developed to minimise water demand.
Resource use and energy programme.
Development/Infrastrucural works summary (completed in previous year and/or prepared for current year).
Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities).
Quantity of organic fertiliser generated during the AER reporting year.
Quantity of organic fertiliser moved off-site and recorded during the AER reporting year.
Opening and closing quantity of organic fertiliser at the installation.
Organic fertiliser monthly monitoring.
Report on Assessment of the installation of silt traps/swales on the drainage system.
Monitoring of storm water discharges.
Monitoring of receiving water monitoring.
Groundwater monitoring results.
Amendments to Odour Management Plan.
Odour monitoring.
Noise monitoring
Any other items specified by the Agency.

Note 1: Content may be revised subject to the approval of the Agency.

Sealed by the seal of the Agency on this the 11th day of March 2021.

PRESENT when the seal of the Agency was affixed hereto:

Tara Gillen

Tara Gillen, Authorised Person