

2016 ANNUAL ENVIRONMENTAL REPORT

**LENNON QUARRIES LIMITED,
SOIL RECOVERY FACILITY,
TALLAGH HILL, BELMULLET, CO. MAYO**

Waste Licence Reg. No. WO-256-02

(Reporting Period January 2016– December 2016)



Prepared For:

The Environmental Protection Agency (E.P.A)

TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
1. ENVIRONMENTAL MONITORING AT THE FACILITY	2
1.1. ENVIRONMENTAL MONITORING AT TALLAGH HILL SOIL RECOVERY FACILITY.....	2
2. WASTE MANAGEMENT AT THE FACILITY	6
3. SITE WORKS	9
4. RESOURCE MANAGEMENT AT THE FACILITY	10
5. COMPLAINTS SUMMARY	11
5.1 COMPLAINTS.....	11
6. ENVIRONMENTAL MANAGEMENT AT THE FACILITY	11
6.1 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS.....	11
6.2 ENVIRONMENTAL MANAGEMENT PROGRAMME – REPORT FOR 2016.....	11
6.3 ENVIRONMENTAL MANAGEMENT PROGRAMME – PROPOSAL FOR 2017.....	12
7. BIRD SURVEY REPORT	13
8. TANK AND PIPELINE TESTING AND INSPECTION REPORT	13
8.1 TANK AND PIPELINE TESTING / INSPECTION.....	13
9. REPORTED INCIDENTS SUMMARY	13
9.1. REPORTED INCIDENTS SUMMARY.....	13
THERE WERE NO REPORTABLE INCIDENTS AT THE FACILITY DURING 2016.	13
10. FACILITY MANAGEMENT	14
10.1 MANAGEMENT AND STAFFING STRUCTURE AT THE FACILITY.....	14
11. PROGRAMME FOR PUBLIC INFORMATION	15
11.1 PROGRAMME FOR PUBLIC INFORMATION.....	15
12. REVIEW OF CLOSURE, RESTORATION AND AFTERCARE MANAGEMENT PLAN (CRAMP)	16
12.1 CRAMP REVIEW.....	16
13. ENVIRONMENTAL LIABILITIES RISK ASSESSMENT REVIEW	19
13.1 ELRA REVIEW.....	19
14. OTHER ITEMS	21
14.1 LIST OF OTHER ITEMS SPECIFIED BY THE AGENCY	21

INTRODUCTION

This Annual Environmental Report provides information on environmental compliance at the Lennon Quarries Limited Soil Recovery Facility, Tallagh Hill, Belmullet, Co. Mayo.

The Environmental Protection Agency issued Lennon Quarries Limited, Glencastle, Bunnahowen, Ballina, Co. Mayo with a Waste Licence on the 20th of May, 2011 (W0256-01). A review of that Licence was successfully undertaken in 2014 to increase the annual intake capacity at the facility from 24,900 to 90,000 tonnes. Licence W0256-01 was replaced by W0256-02 on the 14th of August 2014.

In accordance with Schedule E of the Waste Licence (W0256-01) an Annual Environmental Report (AER) is to be prepared and submitted yearly.

The period covered by this Annual Environmental Report is from the 1st of January 2016 to the 31st of December 2016.

1. ENVIRONMENTAL MONITORING AT THE FACILITY

1.1. Environmental Monitoring at Tallagh Hill Soil Recovery Facility.

During the year 2016 environmental monitoring was undertaken at the site in accordance with conditions of waste licence W0256-02.

The following environmental parameters were monitored in accordance with conditions Schedule C:

- Dust (3 Monitoring Points – D1, D2, D3- twice annually)
- Surface Water (5 Monitoring Points – SW1, SW2, SW3, SW4, SW5 – 4 times annually)
- Noise (No specified frequency)

1.1. Dust Monitoring

1.2.1 Dust Monitoring

Dust Deposition Monitoring was undertaken twice annually in 2016 as per Schedule C of the Licence.

Dust deposition monitoring was based on the modified version of the Bergerhoff Method VDI2119 – “Measurement of Dustfall using the Bergerhoff Instrument” (Standard Method). A 30 day composite sample with results expressed as mg/m²/day.

Dust Deposition Limits – 350mg/m²/day.

1 Table 1 - 2016 - Dust Deposition Results Summary

Sampling Date	Location	Dust Deposition Result (mg/m ² /day)	Limit (mg/m ² /day)
10/06/2016	DS1	42	350
	DS2	34	
	DS3	43	

Table 2 - 2016 - Dust Deposition Results Summary

Sampling Date	Location	Dust Deposition Result (mg/m ² /day)	Limit (mg/m ² /day)
10/01/2017	DS1	83	350
	DS2	84	
	DS3	12	

1.3 Surface Water Monitoring

In accordance with Schedule C of the Waste Facility Permit, Surface water monitoring of grab samples was undertaken on four occasions (quarterly) at the facility during 2016. Samples were analysed by CLS Laboratories in Rosmuc, Co. Galway. Weekly visual inspection of surfacewater was also carried out weekly.

2 Table 3. 2016 Surface Water Analysis Summary –SW1 – Tallagh Hill

SURFACE WATER MONITORING – W0256-02					
Sampling Point Ref:	SW1				Limit (as per WL)
Sampling Dates:	03/02/16	10/06/16	18/11/16	25/01/17	
Parameter	Results	Results	Results	Results	
pH (units)	7.1	6.5	6.6	6.4	No Value Stated
Conductivity (us/cm)	277	386	163	374	No Value Stated
Mineral Oil (ug/l)	201	<65	<130	<65	No Value Stated
Total Suspended Solids (mg/l)	<2	4	9	4	25 mg/l
Total Heavy Metals	3.14	<0.5	2	0.8	No Value Stated

Table 4. 2016 Surface Water Analysis Summary –SW2 – Tallagh Hill

SURFACE WATER MONITORING – W0256-02					
Sampling Point Ref:	SW2				Limit (as per WL)
Sampling Dates:	03/02/16	10/06/16	18/11/16	25/01/17	
Parameter	Results	Results	Results	Results	
pH (units)	7.0	6.7	6.7	6.5	No Value Stated
Conductivity (us/cm)	275	384	162	374	No Value Stated
Mineral Oil (ug/l)	171	<65	<130	<65	No Value Stated
Total Suspended Solids (mg/l)	<2	6	12	3	25 mg/l
Total Heavy Metals	3.1	<0.5	2	0.9	No Value Stated

Table 5. 2016 Surface Water Analysis Summary –SW3 – Tallagh Hill

SURFACE WATER MONITORING – W0256-02					
Sampling Point Ref:	SW3				Limit (as per WL)
Sampling Dates:	03/02/16	10/06/16	18/11/16	25/01/17	
Parameter	Results	Results	Results	Results	
pH (units)	7.0	6.7	6.6	6.4	No Value Stated
Conductivity (us/cm)	277	378	163	374	No Value Stated
Mineral Oil (ug/l)	193	<65	<130	<65	No Value Stated
Total Suspended Solids (mg/l)	<2	<2	11	4	25 mg/l
Total Heavy Metals	0.6	<0.5	4	0.8	No Value Stated

Table 6. 2016 Surface Water Analysis Summary –SW4 – Tallagh Hill

SURFACE WATER MONITORING – W0256-02					
-------------------------------------	--	--	--	--	--

Sampling Point	SW4				Limit (as per WL)
Sampling Dates:	03/02/16	10/06/16	18/11/16	25/01/17	
Parameter	Results	Results	Results	Results	
pH (units)	7.0	6.7	6.7	6.4	No Value Stated
Conductivity (us/cm)	276	386	162	373	No Value Stated
Mineral Oil (ug/l)	684	99.6	<130	<65	No Value Stated
Total Suspended Solids (mg/l)	<2	<2	13	3	25 mg/l
Total Heavy Metals	0.65	<0.5	1	0.8	No Value Stated

Table 7. 2016 Surface Water Analysis Summary –SW5 – Tallagh Hill

SURFACE WATER MONITORING – W0256-02					
Sampling Point Ref:	SW5				Limit (as per WL)
Sampling Dates:	03/02/16	10/06/16	18/11/16	25/01/17	
Parameter	Results	Results	Results	Results	
pH (units)	7.0	6.7	6.8	6.4	No Value Stated
Conductivity (us/cm)	274	382	162	373	No Value Stated
Mineral Oil (ug/l)	98	<65	<65	<65	No Value Stated
Total Suspended Solids (mg/l)	<2	<2	14	5	25 mg/l
Total Heavy Metals	3.76	<0.5	1	0.8	No Value Stated

All of the Surface Water results shown above are in compliance with the conditions of the Waste Licence W0256-02 and are within the Emission Limit Values prescribed and expected.

1.4 Noise Monitoring

Table 8: Noise Emission Limits

<i>Day dB(A) L_{Aeq} [15 minutes]</i>	<i>Night dB(A) L_{Aeq} [15 minutes]</i>
55	45

Noise Monitoring was not undertaken at the facility during 2016. No nuisance noise emissions were identified nor were any noise related complaints received and as such there was no requirement to carry out Noise Monitoring.

2. WASTE MANAGEMENT AT THE FACILITY

2.1 Waste Management and Recovery at the facility

Only waste fill conforming to European Waste Catalogue Code *17 05 04 Soil and Stones and 19 12 09 Minerals* was accepted at the facility during 2016. All waste to the facility was recorded and weighed over the certified weighbridge at the Lennon Quarries, Glencastle Quarry and MRF site prior to being deposited at the Tallagh Hill. The majority of waste fill accepted at the facility emanated from the local area of North Mayo. All fills brought to the site were uncontaminated.

All waste collection contractors to the Tallagh Hill facility were assessed on the validity of their Waste Collection Permits. All contractors were issued acceptance letters from Lennon Quarries for the W0256-02 licensed site. The following table outlines the list of Waste Contractors that carried waste to the site during the reporting period and their associated vehicles and Waste Collection Permit registration numbers.

Table 9 – Waste Collection Contractors accepted at Lennon Quarries Soil Recovery Facility, Tallagh Hill in 2016.

Company Name	Waste Collection Permit Reg. Number	Vehicle Registration Numbers
Lennon Quarries Ltd	NWCPO-15-11536-01	10MO10816 141MO1 07MH4823 05WW3321 07KE2739 06MO5 08MO2 08C13638 03MO6 03KY4051
Barry Quinn Transport Ltd	WCP-MO-10-282-01	02MO2920 05KK315 04LK6408 04MO2783 99CE4408
Barretts Quarry Ltd	WCP-MO-11-0667-01	07D88394 12MO1669 06RN2706 07D88384 07G8620 08MO2594 08SO1492 12MO1669 141MO873

3.1.1 Total Waste in 2016

Table 10 – Total Waste Handled in 2016- Lennon Quarries Limited, Tallagh Hill Soil Recovery Facility (WO-256-02)

TOTAL WASTE HANDLED in 2016:	26,501.84 Tonnes
-------------------------------------	------------------

Table 11 : Breakdown of Tonnage by EWC Code to Lennon Quarries Soil Recovery Facility. (2016)

EWC 17 05 04 - tonnes	EWC 19 12 09 tonnes	Total 2016
11,563.15	14,938.69	26,501.84
Soil & Stones	Minerals	Total Fills

Table 11 : Wastes removed from Lennon Quarries Soil Recovery Facility 2016.

Date	Waste Description	EWC Code	Tonnes	Destination / Authorisation No.	Treatment
	There is a Waste Quarantine Area on-site for non-conforming material.		0.00		

2.2 Waste Recovery

All waste fill taken to the site was recovered at the facility. The careful placement of fill and the subsequent reseeded, rolling etc. ensured that the resultant ground was agriculturally viable

No waste loads were rejected from the facility during 2016. All waste accepted at the site was in compliance with conditions of the Waste Facility Permit.

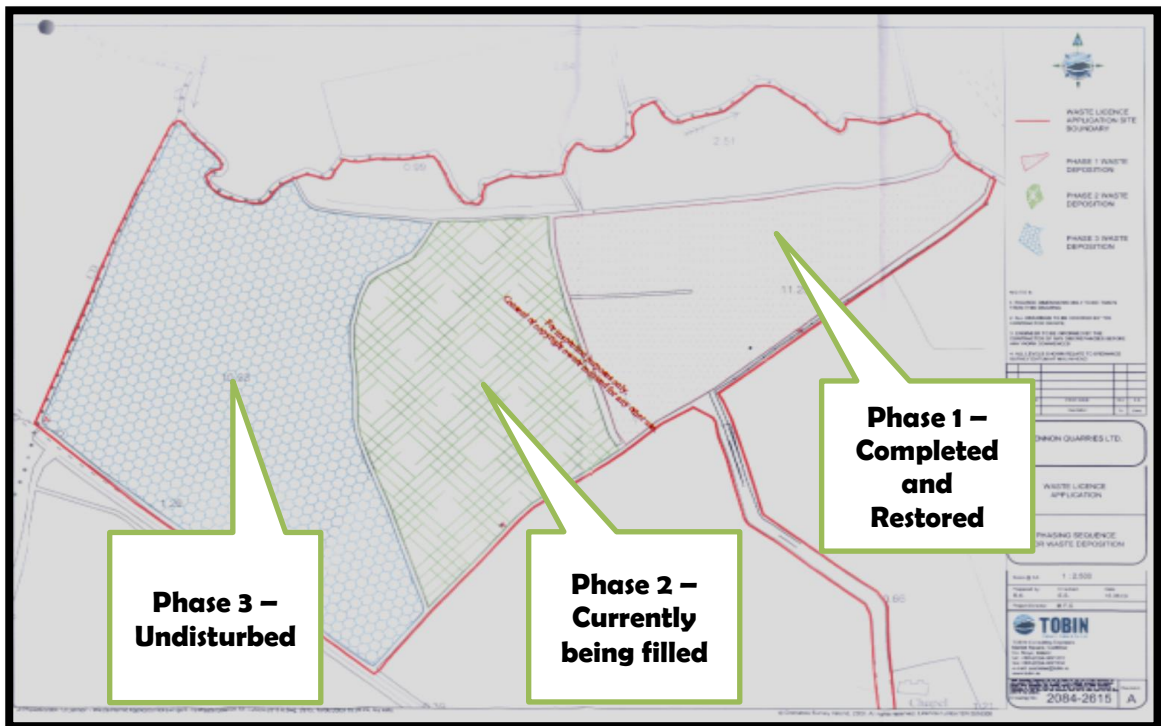
Some extraneous individual items of non-complaint materials were extracted from loads during offloading at the Inspection zone. These items included pieces of plastic piping / ducting, geo-textiles, concrete pipes, reinforcing steel bars and some items of PPE (hard-hat, gloves etc.). These waste items had been placed in a covered 14 cu y skip located in the on-site Waste Quarantine Area. The material will be taken to the Lennon Quarries Material Recovery and Transfer Facility, Glencastle, Belmullet for recovery when a full load has been gathered.

3. SITE WORKS

3.1 Progress of Waste Deposition Works

The site was approximately 60% by volume filled by end of 2016. All wastes taken to the site have been deposited in accordance with the phased filling plan. Phase 1 (the eastern section of the site) is now complete – filled and topsoiled. Reseeding and the rendering of filled areas as suitable for agriculture have been undertaken in Phase 1. A fodder crop (silage bales) was taken from the reclaimed Phase 1 sector. The amount of exposed bare earth at the facility is limited as much as possible to the current incoming filling area - this reduce the impact from dust to the atmosphere and suspended solids to the drainage system and freshwaters.

Fig 1. Fill Phases of Tallagh Hill Facility



3.2 Expected Project Completion Date

The expected completion date for the project is unknown at this date as it is dependent on the upcoming availability of suitable volumes of fill in the catchment area.

3.3 Topographical Survey

A topographical survey was undertaken in December 2016 by Earth Science Partnership Consultants. This is included in **Appendix 1 -Topographical Survey of Tallagh Hill Facility**

3.4 Stability Assessment

An over of the Stability at the site was undertaken by Earth Science Partnership Ltd, Civil Engineering Consultants, Westport, Co. Mayo in 2016. This is included in **Appendix 2**

4. RESOURCE MANAGEMENT AT THE FACILITY

4.1 Resource Consumption, Use and Energy Efficiency Report

All items of plant used at the facility are powered by diesel combustion engines. A tracked excavator was utilised to place and level incoming fill material at the facility. A 4-wheel drive tractor was utilised to rotavate, spread grass seed and roll the areas readied for reclamation. No electricity is used at the site.

Table 12 – Total Fuel Usage in 2016- Lennon Quarries Limited, Tallagh Hill Soil Recovery Facility (WO-256-02)

TOTAL FUEL USED in 2016:	3,465 Litres
Equivalent kWh:	35,204.40

5. COMPLAINTS SUMMARY

5.1 Complaints

Details of all complaints made by the public are recorded in a Complaints Register. Complaints can be registered by contacting management or staff at the site. The register includes the name of the complainant, the nature of the complaint, the date of the complaint and the actions taken to remedy the complaint. The Managing Director / Facility Manager must sign off all completed forms.

There were no complaints received during the reporting period.

6. ENVIRONMENTAL MANAGEMENT AT THE FACILITY

6.1 Schedule of Environmental Objectives and Targets

- To comply fully with the conditions of EPA Waste Licence W0256-02;
- To comply with applicable environmental legislation and best industry practice;
- To be a good neighbour
- To respect the legitimate concerns and interests of the community;
- To achieve continuous improvement in environmental performance;
- Carry out the business of soil/stones recovery in a manner which will minimise adverse effects on the environment and the local community;
- Conserve resources by making efficient use of energy and raw materials;
- Ensure that employees and contractors perform their duties in a manner consistent with this environmental code;
- Be committed to good environmental management.
- To protect and develop suitable habitat for the endangered Corncrake (*Crex crex*)

6.2 Environmental Management Programme – Report for 2016

The EMP was followed as prescribed in 2016 with good environmental performance and compliance all round at the facility. There were no environmental or operational issues at the facility during the year. All emission monitoring at the facility during 2016 yielded results compliant with licensed limits.

No complaints were received by Lennon Quarries in relation to any aspect of the facility.

At the Annual Review Meeting praise was given to all staff involved with the facility and in particular efforts made to assist the National Parks and Wildlife Service in their efforts to protect and encourage the endangered Corncrake species at the site.

During 2016, again a continued effort was made to focus on and assist the NWPS with their efforts in conservation of the endangered Corncrake (*Crex crex*) species.

The Lennon Quarries Tallagh Hill Facility had several calling males in and adjacent to the site.

Lennon Quarries had set-aside over 1 hectare of reclaimed land during 2015 in order to provide ideal, undisturbed habitat for the Corncrake to nest. The area selected was seeded with grass seed and with nettles to offer cover for the endangered birds.

During 2016 the temporary fencing that surrounded the reserve was replaced by a more permanent fence using heavy-gauge barbed and sheep wire and more durable fencing posts in order to fully stock-proof the area. The reserve area was managed in accordance with the requirements of the NWPS guidelines. Grass and nettles were encouraged to grow using agricultural fertilizer and was left untouched until after nesting season when the mowing of same was recommended. Further signage was erected clearly identifying the reserve. Access to the site was granted to the personnel from NWPS and from Birdwatch Ireland upon request to allow for surveying and recording of the Corncrake.

The Tallagh area is one of the most important Corncrake reserves in the country and Lennon Quarries have committed to ensuring that where possible the Tallagh Soil Recovery Facility will be an integral component of this effort.

6.3 Environmental Management Programme – Proposal for 2017

Lennon Quarries aim to continue their efforts in conservation of the Corncrake for 2017. Over 60-65% of the available site will be filled (should the supply of suitable fill continue at current rates).

A review of the Objectives and Targets will again be undertaken in 2017.

It is proposed that an educational aspect will be incorporated into the operations at the Tallagh site. Lennon Quarries will offer educational establishments in the local region the opportunity to see an EPA Waste Licensed Soil Recovery Facility in action and (subject to NWPS approval) the opportunity to see what efforts are being made for the preservation of the Corncrake in the Erris area. It is hoped that a talk on the Corncrake can be incorporated into any site visits by schools or colleges.

It is also proposed for 2017 that all staff at Lennon Quarries that have roles and responsibilities regarding the Tallagh Waste Licensed Facility will undergo further training concerning The Licence and its conditions along with further awareness of the Environmental Management System and of special precautions relating to the Corncrake on-site.

7. BIRD SURVEY REPORT

A Breeding Bird Survey was undertaken by Kelly Environmental Consultants during 2016. The report is attached in **Appendix 3**.

8. TANK AND PIPELINE TESTING AND INSPECTION REPORT

8.1 Tank and Pipeline Testing / Inspection

There are no items requiring testing or inspection at the facility. No oils or fuels are stored on the site. No chemicals are stored at the facility. Re-fueling is undertaken using mobile fuel bowser (self-bunded).

There are 5 no. Settlement Ponds at the facility for the removal of suspended solids from surfacewater discharges. A weekly inspection of these infrastructures is undertaken and recorded by Lennon Quarries personnel. All ponds and associated drainage systems are were in good working order in 2016.

9. REPORTED INCIDENTS SUMMARY

9.1. Reported Incidents Summary

There were no reportable incidents at the facility during 2016.

10. FACILITY MANAGEMENT

10.1 Management and Staffing Structure at the Facility

The facility is managed by Mr. Dermot Lennon with Mr. T.J. Lennon (Jnr) as Assistant Manager. The Soil Recovery Facility is an associated activity of the Lennon's quarrying and processing business and a number of employees operate between both arms of the company. Figure 1 below outlines the current organizational structure at the MRF.

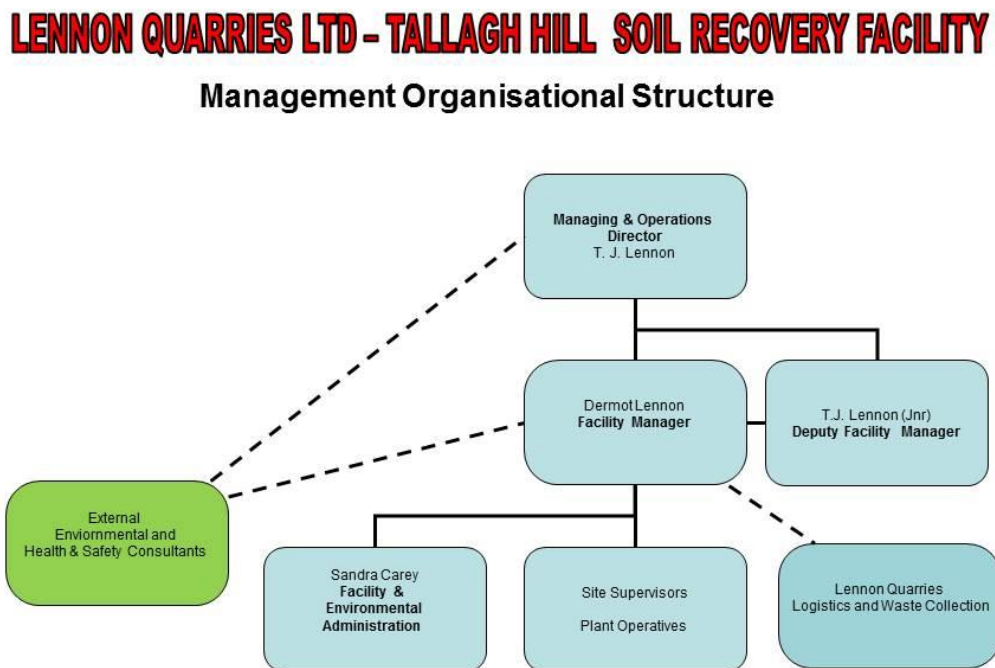


Fig 1 Management and Staffing Structure at Lennon Quarries Soil Recovery Facility, Tallagh Hill.

11. PROGRAMME FOR PUBLIC INFORMATION

11.1 Programme for Public Information

A Communications Programme is in place for the facility as part of the Environmental Management System. This includes;

- The Public Notice Board located adjacent to entrance to the site from the public road. Contact details and emergency out-of-hours contact details are listed on the sign.
- A porta cabin office located at the site which houses a copy of the Waste Licence and compliance documentation
- Access to Lennon Quarries Head Office in Glencastle – where comprehensive information on the facility is available within working hours,
- Availability of Company Director T.J. Lennon, Facility Manager Dermot Lennon or Assistant Facility Manager T.J. Lennon (jnr) at all reasonable times in person or by telephone to discuss any issues or answer questions from interested parties.

Continued communication with all interested parties in the vicinity of the facility was undertaken during 2016. All relevant parties (from private householders to local organisations such as the G.A.A to public bodies such as The North Western Region Fisheries Board, NWPS) are always notified of any activities or proposed alterations to the facility

No objections were lodged against the facility and active, open communication with the local community remains a priority for Lennon Quarries. Mr. TJ Lennon himself lives locally and is an active member of the community.

12. REVIEW OF CLOSURE, RESTORATION AND AFTERCARE MANAGEMENT PLAN (CRAMP)

12.1 CRAMP Review

A comprehensive Closure, Aftercare and Management Plan (CRAMP) is in place for the facility having been developed by Tobin Engineering Consultants. The plan was assessed as part of an environmental and operational review of the facility in 2016. The review of the CRAMP yielded minor alterations (presented in the Costing Table below). As the facility is of a Environmental Sensitivity Low Risk Score of 1, a Closure Plan is the only requirement in the necessary CRAMP. The financial costs identified to facilitate the Closure Plan, has been altered to take into account the removal of the completed Phase 1 area. A further review of the CRAMP will again be undertaken in 2017.

The Closure Plan is prescribed and must be followed in the event of completion of the site / surrender of the Licence / cessation of the business;

From the Facility Closure Remediation and Aftercare Plan - 3.2.4

Criteria for Successful Closure

As a 'Clean-Closure' is expected, a benchmark set of criteria has been established in order to evaluate the success of closure. These criteria include:

- Top soiling & Grass Seeding of entire area of deposition;
- Removal of all Plant from the site (i.e. excavator & quarantine skip);
- Removal of all Infrastructure from the site (i.e. Portocabin & portoloo);
- Removal of 5 no. settlement ponds from the site and reinstatement of original drainage channels);
 - Removal of raw materials from the site (broken stone used for construction of hardcore turning area & temporary hauls roads);
 - Removal of all wastes from the site (stored in quarantine skip);
 - Access to a full record of all materials accepted at the facility, over the active lifetime of the facility (including quantities & material identification);
 - Access to a full record of all wastes exported from the site;
 - Access to a full record of all environmental monitoring carried out on the site, over the active lifetime of the facility and during the closure phase of the facility;
 - Proof that the Environmental Management System remained in place throughout the active lifetime of the facility and during the closure phase of the facility

3.2.5 Closure Plan Costing

The estimated costs to implement the Closure Plan for the facility are summarised on Table 3-2 following. A contingency fee of 25% has also been included.

From the CRAMP Document Review - Table 3.2 – Closure Plan Costing

Item	Description	Cost Estimate (€)
Top Soiling & Grass Seeding	Entire Area of Deposition, Over 3 No. Phases (Lennon Quarries Ltd.)	€8,000 (Reduced from €10,000 as Phase 1 Completed)
Plant Removal	Excavator (Lennon Quarries Ltd.)	€150
	Quarantine Skip (Waste Management Company)	€500
Infrastructure Removal	Portocabin (Specialist Provider)	€200
	Portoloo (Specialist Provider)	€150
	5 No. Settlement Ponds (& Reinstatement of Original Drainage Channels) (Lennon Quarries Ltd.)	€500
Raw Materials Removal	Broken Stone used for Construction of Hardcore Turning Area & Temporary Haul Roads (Lennon Quarries Ltd.)	€500
Waste Disposal/Recovery	Wastes Stored in Quarantine Skip (Waste Management Company)	€500
Environmental Monitoring	During Closure Period & For Short Period Afterwards (Lennon Quarries Ltd. & Independent Lab)	€1000
Verification Audit/Certification	To Certify Closure Plan Completed (Independent Consultants)	€1000
Report to EPA	To Certify Closure Plan Completed (Independent Consultants)	€1000
Decontamination	Not Required	N/A
Decommissioning Supervision	Not Required	N/A
Facility Security and Staffing	Nor Required	N/A
Demolition	Not Required	N/A
Test Programme	Not Required	N/A

Other Relevant Items Specific to the Licensee's Site	Specified Above	N/A
Total (ex Contingency)		€13,500
Contingency (25%)		€3,375
Total (Excluding VAT)		€16,875

The review again identified that the costings in place for the placement of topsoil and reseeded were to cater for the “whole” of licensed site. As the Phase 1 section (one third in area) is now filled and reclaimed for agricultural purposes (grass harvesting and grazing) then accordingly a third of that allocated cost can technically be removed – reducing the costings from €10,000 to €6,600. However the figure of €8,000 is deemed to be necessary to provide contingency based on current prices for the reseeded with a high quality mixed grass seed that will provide ideal cover for future nesting corncrakes at the site.

13. ENVIRONMENTAL LIABILITIES RISK ASSESSMENT REVIEW

13.1 ELRA Review

A review of the Environmental Liabilities Risk Assessment was undertaken in 2016. The review involved alteration to an attribute in Table 2.2 Environmental Sensitivity Sub-Matrix for Tallagh Soil / Stones Recovery. The Attribute that was subject to the review was sub-category "Protected Ecological Sites & Species". The change involved an increase in the Environmental Attribute Score from a "1" to a "2" due to the recent presence of the endangered Corncrake (*Crex crex*) species both on the site and in the adjacent lands.

From ELRA Document Review – "Table 2-2:Environmental Sensitivity Sub-Matrix for Tallagh Soil/Stones Recovery"

Environmental Attribute	Environmental Attribute Score
<u>Human Occupation:</u>	
<50m	5
50m - 250m	3
250m - 1000m	1
>1000m	0
<u>Groundwater Protection:</u>	
Regionally Important Aquifer	2
Locally Important Aquifer	1
Poor Aquifer	0
!vulnerability Rating – Extreme	3
Vulnerability Rating – High	2
Vulnerability Rating – Moderate	1
Vulnerability Rating – Low	0
<u>Sensitivity of Receiving Waters:</u>	
Class A	3
Class B	2
Class C	1
Class D	0
Designated Coastal & Estuarine Waters	2
Potentially Eutrophic Coastal & Estuarine Waters	1
<u>Topography:</u>	

Complex Terrain	2
Intermediate Terrain	1
Simple Terrain	0
<u>Protected Ecological Sites & Species:</u>	
Within or Directly Bordering Species Protected Site	2 (This has been reviewed taking into account the presences of Corncrake on-site)
<1km to Protected Site	1
>1km from Protected Site	0
<u>Sensitive Agricultural Receptors:</u>	
Fruit, Vegetable or Dairy Farming <50m from the Activity Footprint	
Fruit, Vegetable or Dairy Farming 50m - 150m from the Activity Footprint	2
Fruit, Vegetable or Dairy Farming >150m from the Activity Footprint	1
	0
TOTAL Environmental Attribute Score:	4

From ELRA - Table 2-3: Environmental Sensitivity Classification

Total Environmental Attribute Score	Environmental Sensitivity Classification
Low <7	1
Moderate 7 - 12	2
High >12	3

The Total Environmental Attribute Score even taking into account the review alteration is still in the Low category with the associated Environmental Sensitivity Classification remaining at 1.

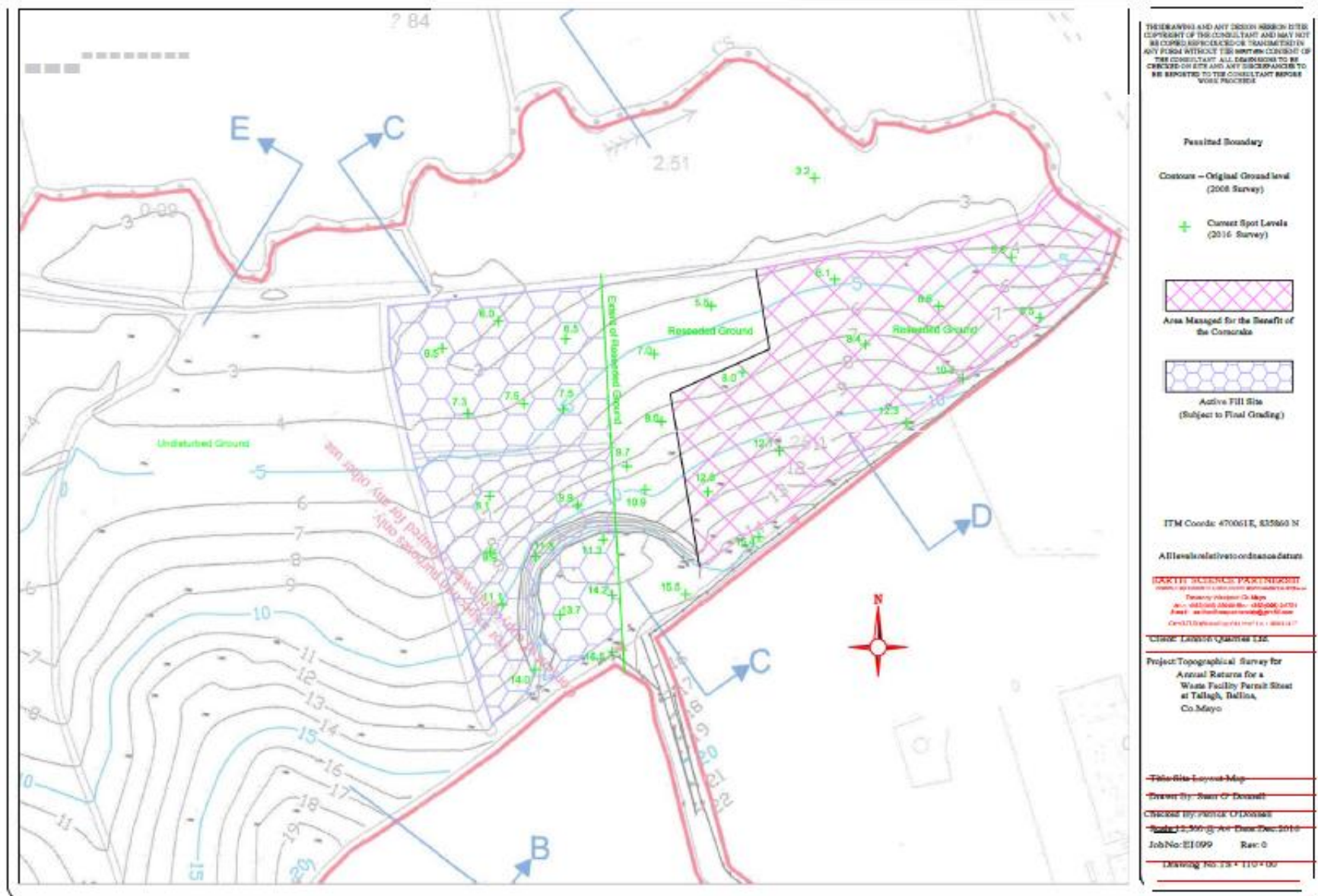
14. OTHER ITEMS

14.1 List of other items specified by the Agency

No further items have been specified by the Agency for inclusion in the Annual Environmental Report for 2016.

APPENDIX 1
TOPOGRAPHICAL SURVEY

FIG 1. 2016 TOPOGRAPHICAL SURVEY – WO256-02 LENNON QUARRIES – TALLAGH SOIL RECOVERY FACILITY



APPENDIX 2
STABILITY ASSESSMENT

Earth Science Partnership (Ire) Ltd

Waste Facility Site at Tallagh, Ballina, Co. Mayo

Slope Stability

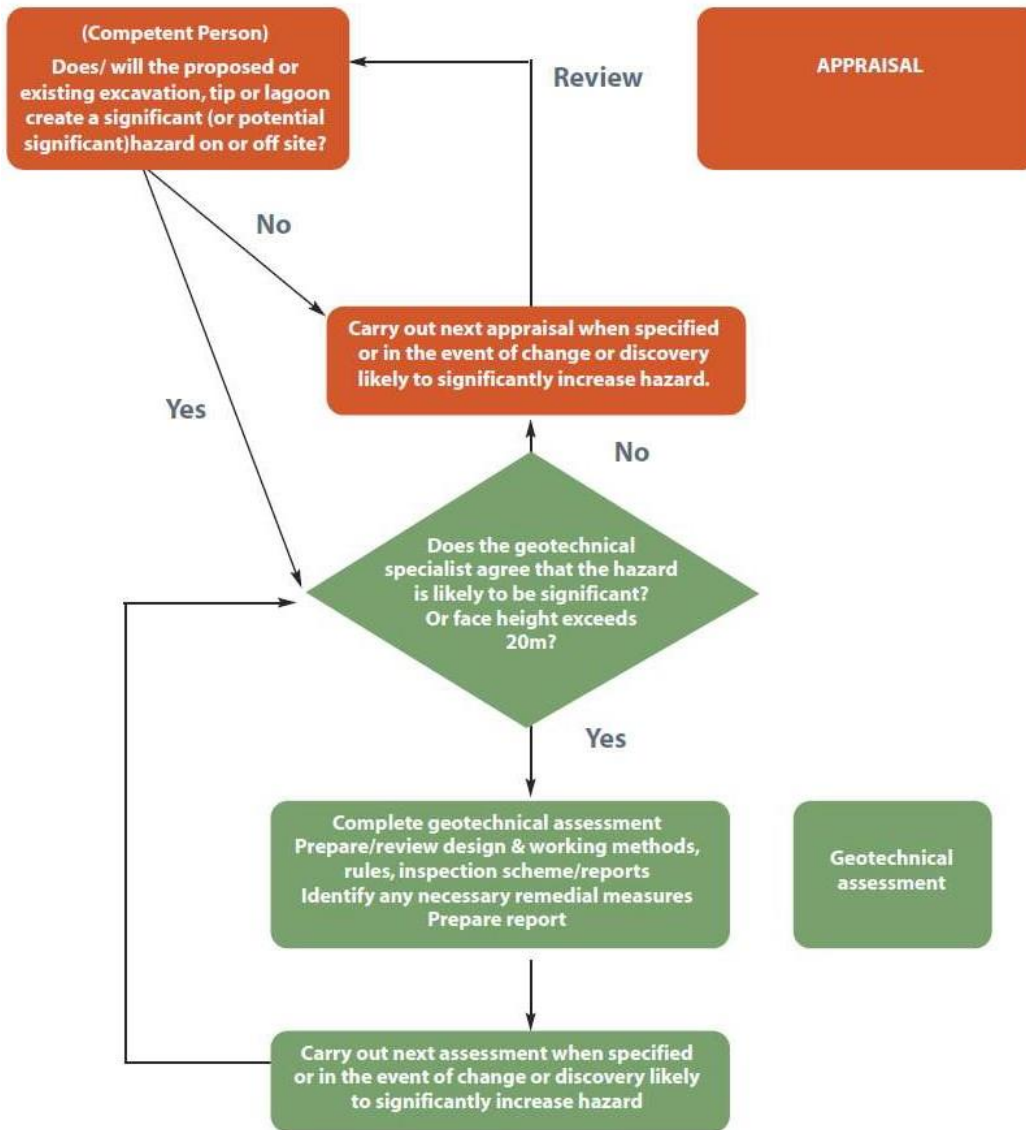
Earth Science Partnership have been retained by TJ Lennon to assess slope stability at his Waste Facility Site at Tallagh, Ballina, Co. Mayo. Please find below our findings in relation to same.

In the absence of any other methodology the operator has used the Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008, Section 52 - Appraisal and site investigation of excavations, tips and lagoons (Regulation 54). The requirements are set out as follows; -

- (1) Subject to paragraph (2), the operator shall ensure that, before quarrying operations commence or re-commence in a particular area in the quarry, a suitable appraisal of all proposed and existing -
 - (a) excavations, (b) tips and (c) lagoons in that particular area is undertaken by a competent person in order to determine whether any such excavation, tip or lagoon represents a significant hazard, or a potential significant hazard.
- (2) Where the face height of an excavation in a particular area of the quarry planned to be worked exceeds 20metres, the operator shall ensure that, before quarrying operations commence or re-commence in that particular area, a geotechnical assessment is carried out in accordance with Regulation 55.
- (3) Where an appraisal by a competent person under paragraph (1) identifies a significant hazard that cannot be rectified immediately in a safe manner, the operator shall ensure that the provisions of subparagraphs (a) to (c) of paragraph (5) are complied with.
- (4) Where an appraisal by a competent person under paragraph (1) identifies a potential significant hazard that cannot be rectified immediately in a safe manner, the operator shall ensure that -
 - (a) the provisions of subparagraphs (a) and (b) of paragraph (5) are complied with, and
 - (b) a geotechnical specialist carries out a site investigation to determine whether a geotechnical assessment under Regulation 55 is required.

- (5) Where the conclusion reached by the geotechnical specialist, following a site investigation made under this Regulation, is that the excavation, tip or lagoon represents a significant hazard, the operator shall ensure that -
- (a) appropriate protective measures are taken, including informing all persons affected by it, (b) only work that can be carried out safely is undertaken at the excavation, tip or lagoon, and (c) a geotechnical assessment is carried out in accordance with Regulation 55.
- (6) The operator shall ensure that - (a) any significant findings, and (b) any conclusions reached and the reasons for those conclusions made under an appraisal or a sit investigation pursuant to this Regulation are recorded by the competent person or the geotechnical specialist, as the case may be.

An appraisal is intended to be an exercise to determine which fill site, proposed or existing, would pose a significant risk if they failed or move significantly more than that allowed, and so merit an assessment by a geotechnical specialist. The relationship between the appraisal and assessment are illustrated in the flow chart below;-



(7) Flowchart of the Appraisal & Assessments of Excavations, Tips and Lagoons

The Appraisal

The appraisal should be carried out with enough detail and sufficient expertise to decide, on the basis of the guidance in this section, if the placed material poses a significant risk from collapse or movement. It is not normally necessary for appraisals to be carried out by a geotechnical specialist, though advice from one is appropriate where the level of hazard is unclear.

When carrying out an appraisal there is no need to duplicate work already done, as long as all the matters detailed in this section are adequately addressed.

In some instances, there may be areas where no one (person) is at risk from a collapse or slope failure. However, this area still needs to be assessed in the appraisal because failure in such areas could affect the stability of the remainder of the fill site.

Among other things, the appraisal should take account of the proposed fill material, especially its structure, water content, drainage ability, proximity to watercourses, roadways, workplaces and any evidence or history failures.

(8) Significant Hazard

To determine if the hazard is significant or potentially significant it is necessary to consider how certain materials structure might feasibly fail and the likely consequences of any such failure. The likely consequences are crucial when deciding if a particular hazard is significant. The probability of such a failure actually happening is not relevant in this context. The consequences depend on the likely scale of the failure and the area that could be affected by it, and whether people are likely to be injured.

The hazard should be considered significant or potentially significant if such a failure would directly or indirectly, be:

liable to endanger premises, roadways or other places where people are likely to be found offsite;

or

likely to cause serious or fatal injuries to persons on or off-site.

If the degree of hazard is significant than the advice of a geotechnical specialist should be sought. Properly validated analytical techniques for calculating the hazard created may also be used to determine the significance of the hazard. Such techniques can also be useful in prioritising work.

Where an appraisal of any fill site identifies a potential significant hazard, the operator must engage a geotechnical specialist to carry out a site investigation to

establish if a full geotechnical assessment is required.

The following list gives examples of where this may be necessary:

- (a) if the material is in a wholly, or mainly, solid state and not in solution or suspension,. (i.e. viscous state – the ability to flow if not contained); and –
 - (i) if the area of the land covered exceeds 10,000 square metres, or
 - (ii) if the height of the material exceeds 20 metres, or
 - (iii) if the average gradient of the land covered by the fill material exceeds 1 in 12

9) Site Inspection and Appraisal

An inspection of the fill site in Tallagh, as demonstrated by the photographs below;





The inspection and photographic evidence shows that the material being deposited is;-

- In a solid state
- The existing ground does not exceed 1 in 12 slope
- The total height of the material does not exceed 2.5 meters at any time
- The material that is unloaded in the designated area is levelled and maintained at a slope of less than 1 in 3 at all times prior to final levelling & final grading.
- The total area being filled at any one time is less than 5,000 square meters.
- There are no structures or objects within the fill area which may be in danger

As none of the criteria requiring further assessment by a geotechnical expert has been met, the assessment by a competent person (the operator) is sufficient.

As can be seen from the above photographs it is evident that the ground conditions does not pose any significant risk from collapse or movement and the hazard is deemed not to be significant or potentially significant it is not necessary to consider any further action.

APPENDIX 3
BREEDING BIRD SURVEY



Breeding Bird Survey 2016

Lennon Quarries Limited.

at

**Tallagh Soil Recovery Facility,
Belmullet, Co Mayo
(E.P.A LICENCE REG. NO. W0051)**

Prepared by:

**KELLY ENVIRONMENTAL,
CONSULTING & ADVISORY SERVICES
OFFICE 2, THE RESOURCE CENTRE,
BALLYCASTE
COUNTY MAYO.**

Table of Contents

List of Figures	3
List of Tables	3
1. Introduction	4
2. Site Description	4
3. Methods/ Methodology	5
4. Results	7
5. Conclusion	10

1. List of Figures

Figure 1: Site Layout	5
Figure 2: Location of 3 Viewpoints	6
Figure 3: Location Birds Noted On-Site	9

2. List of Tables

Table 1: Results from Viewpoints	8
Table 2: Results from Transect/Walkover Survey	8
Table 3: Location and Direction of Species on-site	9

3. Introduction

In accordance with condition 6.15 of the Lennon Quarries EPA Waste License (registration no: W0256-01), an annual breeding bird survey is to be undertaken at their Soil Recovery Facility at Tallagh, Belmullet, Co. Mayo, unless otherwise required by the agency. It states, the survey should record the number of birds of conservation concern utilising the site. The results of the survey are demonstrated in this document.

The breeding bird survey was undertaken on Wednesday the 15th of June 2016 at the site. The Survey consisted of approximately 3 hour watches from each of 3 vantage points (VPs 1, 2 and 3). The Survey also included observation of any habitat or breeding species within a 100m range outside of the site boundary in question.

4. Site Description

The facility consists of a 27 hectare site located 3km north of Belmullet town. The site is principally dominated by cutover bog habitat which has been used for peat fuel supply and sheep grazing in the past. The site is currently active as a Soil Recovery Facility with an annual intake of 90,000 tonnes licensed. The site is being reclaimed for agricultural purposes using clean soil / stone (EWC 17 05 04) and filling is undertaken in a phased approach. At present approximately 65 % of the licensed area has been filled. To the north of the site runs the Clooneen River flowing in an easterly direction to the sea. This is protected from inflow of silts from activities at the site by a number of settlement ponds.

The land use surrounding the site is mainly rough grazing agricultural and consists of bogland, cut away bogland, with little tree-cover, some hedgerows and scattered private dwellings.

It must be noted the site is adjacent to a derelict former intensive mushroom growing facility. The grounds around the former industry are not grazed and are lush with vegetation (primarily the Annual Nettle- *Urtica urens*).

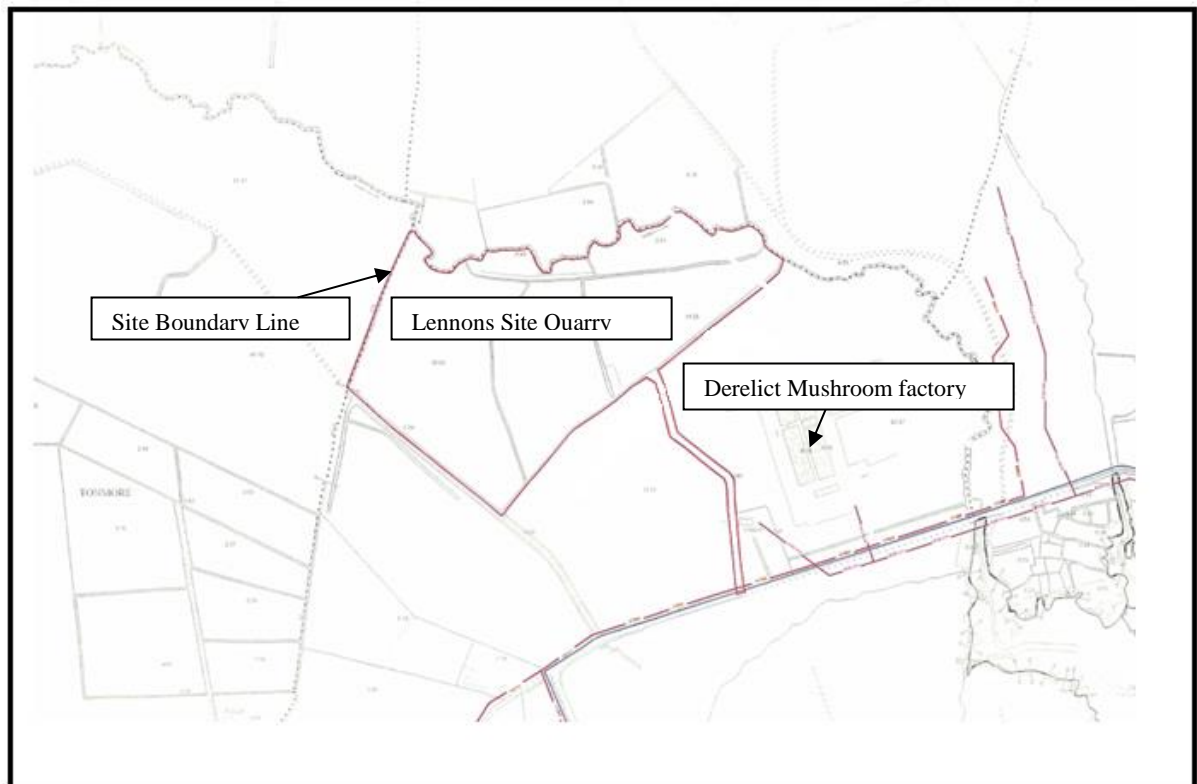


Figure 1: Site Layout

5. Methods/ Methodology

The site was surveyed on the 15th June, 2016, as the bird nesting season runs from 1st March to the 31st September this was an ideal time to verify any breeding birds on the site.

The survey areas included three vantage points plus a buffer zone of approximately 100m around the site boundary; however the full site boundary was inaccessible from the ground.

The breeding birds survey was conducted in accordance with the Countryside Bird Survey (CBS) by conducting two transects across the survey area, walk of site boundary and Vantage point watches.

Vantage Point Watches

These vantage points are marked in figure 3 and were chosen as they provide a good view over the site. The location was also chosen as this sector of the site is where the majority of filling and restoration activity occurs. Three-hour watches were undertaken at each of the points.

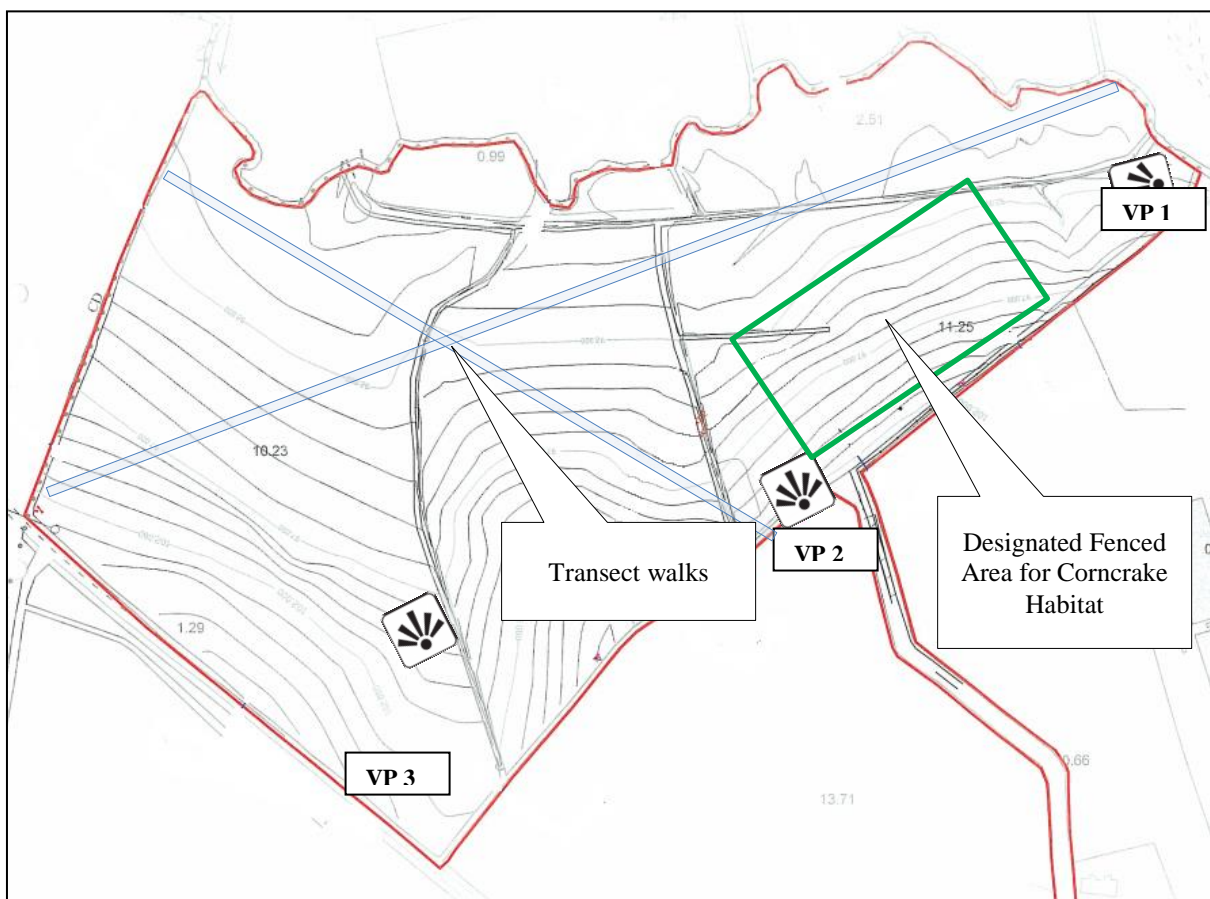


Figure 2: Location of Vantage Points at Tallagh Soil Recovery Site

Transect and Walk Survey

This methodology involved walking two transects across the site, including a walk of the boundary (800m approx.) where accessible. During this survey a number of stops

were made to examine and listen for any overhead of low lying birds, also examining beyond the site boundary.

Site visits were carried out from 06:00 to 18:00. Weather conditions - overcast with low cloud cover, moderate south-westerly wind and occasional rain showers. The weather conditions were suitable for the survey.

The conservation value of birds within the EU is based on the species listed in Annex I of the “Birds Directive”, which are protected under Irish and European law. The species mentioned in Annex I of the Directive “shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution” (EEC, 1979). Within Ireland, BirdWatch Ireland has agreed a list of priority bird species for conservation action on the island of Ireland. These Birds of Conservation Concern in Ireland are published in a list known as the BoCCI list (lynas *et al.* 2007). In this BoCCI List, birds are classified into three separate lists (Red, Amber and Green), based on the conservation status of the bird and hence conservation priority. The Red Listed birds are of high conservation concern, the Amber List birds are of medium conservation concern and the Green List birds are not considered threatened. Specific criteria are used to classify a bird into one of these three categories.

6. Results

VP	Common Name	Scientific Name	No. Of Sightings	Conservation Status	Comments
VP 1	SkyLark	<i>Alaudia avensis</i>	2	Amber	Heard singing overhead
	Swallow	<i>Hirunda Rustica</i>	3	Amber	Seen overhead and foraging on site
VP2	Swallow	<i>Hirunda Rustica</i>	3	Amber	Seen overhead and foraging on site
	Concrake	<i>Crex crex</i>	2	Red	2 males heard off-site calling from within nettle and grass foliage adjacent to old mushroom Factory. Initially thought 1 male was calling from the Reserve Area

					– but no call heard for the remainder of the survey duration
--	--	--	--	--	--

VP3	Swallow	<i>Hirunda rustica</i>	2	Amber	seen flying overhead
	Robin	<i>Erithacus rubecula</i>	1	Green	Seen flying in a southerly direction
	SkyLark	<i>Alaudia avensis</i>	1	Amber	Heard singing overhead

Total Number of Birds Species Recorded during the Viewpoint Survey:	4
---	----------

Table 1: Results from Viewpoints

Common Name	Scientific Name	No. Of Sightings	Conservation Status	Comment
SkyLark	<i>Alaudia avensis</i>	4	Amber	Seen singing overhead and nest identified on ground
Dipper	<i>Cinclus cinclus</i>	1	Green	Seen flying in Easterly direction over the site (adjacent to Stream)
Starling	<i>Sturnus Vulgais</i>	4	Amber	Seen flying East overhead
Hooded Crow	<i>Corvus cornix</i>	2	Green	Seen flying in a Westerly direction overhead

Total Number of Birds Species Recorded During the Transect/Walkover :	4
---	----------

Table 2: Results from Transect/Walkover Survey

Total Number of Birds Species Surveyed at the Lennon Quarries Soil Recovery Facility	8
--	----------

Figure 3 demonstrates the location of the birds from the three viewpoints

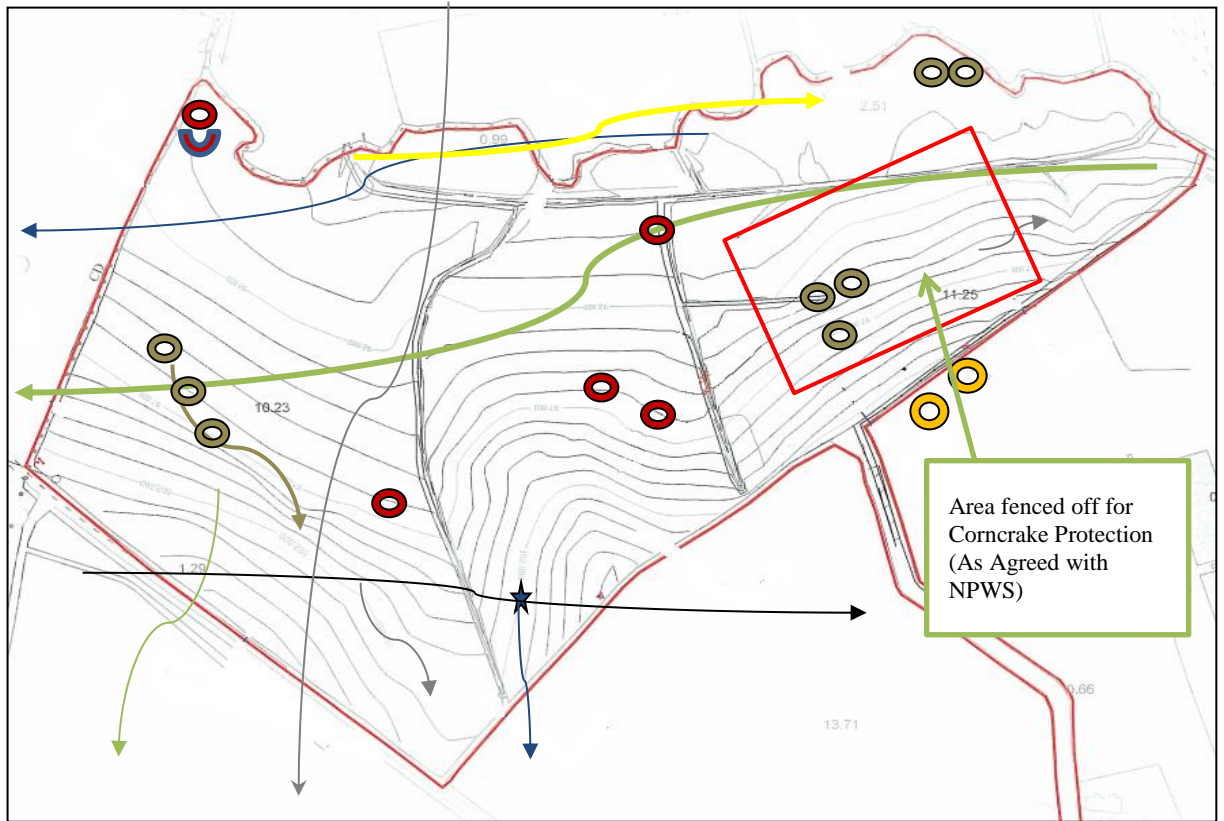


Figure 3: Location Birds Noted On-Site









	Skylarks heard and seen overhead, possible breeding on-site due to locality, 1 nest evidence from survey in undisturbed area of the site  (skylark nest)
	Hooded Crows flying in a southerly direction overhead
	Swallows over head and foraging on site
	Concrakes heard offsite in nettles
	Dipper seen flying overhead in direction of stream
	Robin flying south
	Starlings flying East overhead

Table 3: Location and Direction of Species on-site

There was a total of 6 bird species which would be of moderate conservation concern recorded at the site. No evidence of breeding on the site was recorded during the

survey. The active section of the facility (where soil is being imported as fill and where ground is being reclaimed) does not provide opportunity for nesting birds due to the exposed earth and disturbance from activity. The evidence of Skylark (*Alaudia avensis*) overhead in a number of locations would point to such species breeding within the site or adjacent to it – possibly within the undisturbed section or within drainage ditches. However no evidence of this was recorded during the Survey.

There was 1 no. Red Annex 1 bird species recorded, the Corncrake (*Crex crex*). 1 male of this species were heard calling from a location off-site (directly adjacent to the Licensed Facility) but no visual contact was made. The Concrakes make use of the abundant cover offered by the dense nettles and scotch grass in that area adjacent to the site. It has been ascertained that the Corncrake (*Crex crex*) has been observed and recorded in that particular site over a number of seasons by personnel from the National Parks and Wildlife Service with as many as 7 calling males identified at on occasion.

7. Conclusion

The site is being filled for reclamation in a phased manner. Approximately one third of the entire the site remains in an undisturbed condition. Where activity is taking place, i.e. the portion of the site being currently filled, earthmoving plant and machinery provides a deterrent to birds from nesting in that area. The filling of the site with clean soil and stone does not appear to have any negative impact on bird life in and around the area.

Apart from one endangered species encountered, the bird life in and around the vicinity of the site was as expected in that particular area of North West Mayo and all observed were overhead or flying through apart from the Pied Wagtail (*Motacilla Alba Yarrellii*).

Special note was taken of the Red Annex 1 Corncrakes (*Crex Crex*) – one of Ireland's most endangered bird species – which were heard calling from an area off- site adjacent to the facility being surveyed. Lennon Quarries replaced the temporary fencing around the reserve are at the request of Corncrake Fieldworker Simon Birch (National Parks and Wildlife Service (NWPS)). A fully cordoned off parcel of reclaimed

land was fenced using sheepwire and post. Again, the infilling activities on the Lennon Quarries site did not appear to be impacting upon it whatsoever. On a number of site visits during 2016, Simon Birch of NWPS informed that again as in 2015, a high number of males of the species were heard calling. It was ascertained that the site and adjacent land have the highest concentration of Corncrakes at any one location in the country.

Lennon Quarries have again fully committed to working with the NWPS to assist with conservations efforts at this location. The setting aside of approx. 4 acres of the newly reclaimed section of the Tallagh site, as prime habitat for the Corncrake, is testament to this effort. The fenced off area also requires annual maintenance including the seasonal cutting of grass and nettle vegetation at a time designated by Birdwatch Ireland.

The continuation of a phased filling approach as prescribed by conditions of the EPA Waste Licence W0256-01 is important as any bird species will be dissuaded from nesting in the active area. Prior to filling a new section of the site particularly in the nesting season, Lennon Quarries have been advised to undertake a walkover of that area to ascertain whether bird nests are present.

The preserving of prescribed buffer zones between the site and the Clooneen River is also essential to provide undisturbed habitat even after activity has ceased.

The facility is being well managed with special attention being given to the preservation of the highly endangered Corncrake (*Crex crex*) species.

Attachment A

Letter from NWPS Ireland

On the Corncrake

The Willows,
Carrabaun,
Westport,
County Mayo.

31 May 2016

Ref: Corncrake Habitat Management Works

Dear Mr. Lennon,

Following your successful implementation of the habitat creation and improvement programme for corncrake habitat at your site at Tallagh, Belmullet County Mayo, there are now some continuing works to be carried out.

To ensure the site is kept in optimum condition for breeding corncrakes it is advised that the area of the site where new habitat was created now be fenced around its perimeter. The existing fencing around the area where habitat improvement took place now needs to be repaired/upgraded to ensure sheep cannot gain access. Sheep wire should be used to fence both plots.

The National Parks & Wildlife Service (NPWS) will also issue you with corncrake information signs that it is hoped you could erect at the site boundaries. The corncrake information signs will be a useful educational tool for the annual Corncrake Tour and other interested parties.

I would like to take this opportunity to thank you for allowing access to your site for the last three years for the annual Tidy Towns/NPWS Corncrake Tour, and to ask your permission to access the site again this year. Your involvement with this project has made a very positive contribution to corncrake conservation with corncrakes continuing to breed at the site. A maximum of 6 calling males have been recorded at this site where until recently corncrakes did not occur.

Yours sincerely,

Samuel Birch
National Parks & Wildlife Service
Senior Corncrake Fieldworker-West Connacht

APPENDIX 4
EXAMPLE OF WEEKLY DRAINAGE
INSPECTION RECORD

RECORD OF WEEKLY INSPECTION OF DRAINAGE SYSTEM

(In Compliance with Conditions 6.12.1, 6.12.2 & Schedule C.2.2 of Waste Licence W0256-01)

DATE:	15/07/16
TIME:	11.15
DRAINAGE CHANNELS: (COLOUR / ODOUR)	Normal / No odour
SETTLEMENT PONDS: (COLOUR / ODOUR)	
NO. 1	Slightly Peaty / None
NO. 2	Slightly Peaty / None
NO. 3	Slightly Peaty / None
NO. 4	Slightly Peaty / None
NO. 5	No flow / None

DL

FILLED EXAMPLE OF WEEKLY DRAINAGE INSPECTION SHEET (COVERING PONDS ETC)

APPENDIX 5

LETTER FROM ACCOUNTANTS ON FINANCIAL STANDING

David J. Cleary & Co.
Chartered Accountants

Unit 5,
Moyvalley Business Park,
Ballina,
Co. Mayo
Tel: 096-79040
Fax: 096-79041

EPA
PO Box 3000
Johnstown Castle Estate
County Wexford
Y35 W821

23 March 2017

Re: Lennon Quarries Limited
Belmullet, Co. Mayo

Dear Sirs,

We wish to confirm that we act as Accountants to the above named company.

In our opinion we are satisfied that the company is off sound financial standing and can confirm that the company is indemnified against liability in respect of accidental bodily injury or accidental loss of or damage to property caused solely by pollution which results from a sudden, identifiable, unintended and unexpected incident and such incident takes place in its entirety at a specific and identified time and place during the period of insurance.

A copy of the company's insurance policy can be provided if requested which provides greater clarity and description of all insured risks.

Yours faithfully,


David J. Cleary & Company

D.J. Cleary, F.C.A.

APPENDIX 6
PRTR SUBMISSION

[Guidance to completing the PRTR workbook](#)

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2016
-----------------------	------

1. FACILITY IDENTIFICATION

Parent Company Name	Lennon Quarries Limited
Facility Name	Lennon Quarries Limited
PRTR Identification Number	W0256
Licence Number	W0256-02

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Tallagh
Address 2	Belmullet
Address 3	
Address 4	
	Mayo
Country	Ireland
Coordinates of Location	-9.99583441855 54.265668
River Basin District	IEWE
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Sandra Carey
AER Returns Contact Email Address	sandra@lennonquarries.com
AER Returns Contact Position	Administration
AER Returns Contact Telephone Number	097 81297
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	097 81734
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	25
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	No
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

[Guidance on waste imported/accepted onto site](#)

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	
--	--

This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR#: W0256 | Facility Name : Lennon Quarries Limited | Filename : W0256_2016.xls | Return Year : 2016 |

3/24/2017 15:50

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
		Method Code	Designation or Description					
					0.0	0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
		Method Code	Designation or Description					
					0.0	0.0	0.0	0.0
ADD NEW ROW		DELETE ROW *		* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button				

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY		
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
		Method Code	Designation or Description					
210	Dust	M	MAB	Data from Bergerhoff guage monitoring extrapolated to calculate emissions from active site area per annum	0.0	98.0	0.0	98.0

