

Appendices - Volume 3



Remedial Environmental Impact Assessment Report

Substitute Consent Application,
Scotshouse Quarry Ltd

Aghnaskew, Scotshouse,
Co.Monaghan






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**Title: Appendices - Volume 3, Remedial Environmental Impact Assessment Report
Substitute Consent Application, Scotshouse Quarry Ltd, Aghnaskew, Scotshouse,
Co.Monaghan**

Job Number: E2037


Prepared By: Ruth Crumpton

Signed:  _____

Checked By: David Dwyer

Signed:  _____

Approved By: Kenneth Goodwin

Signed:  _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	22/03/23	EIAR Appendices Vol 3	FINAL	RC	DD	KG

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Substitute Consent Application, Scotshouse Quarry Ltd
Aghnaskew, Scotshouse, Co.Monaghan

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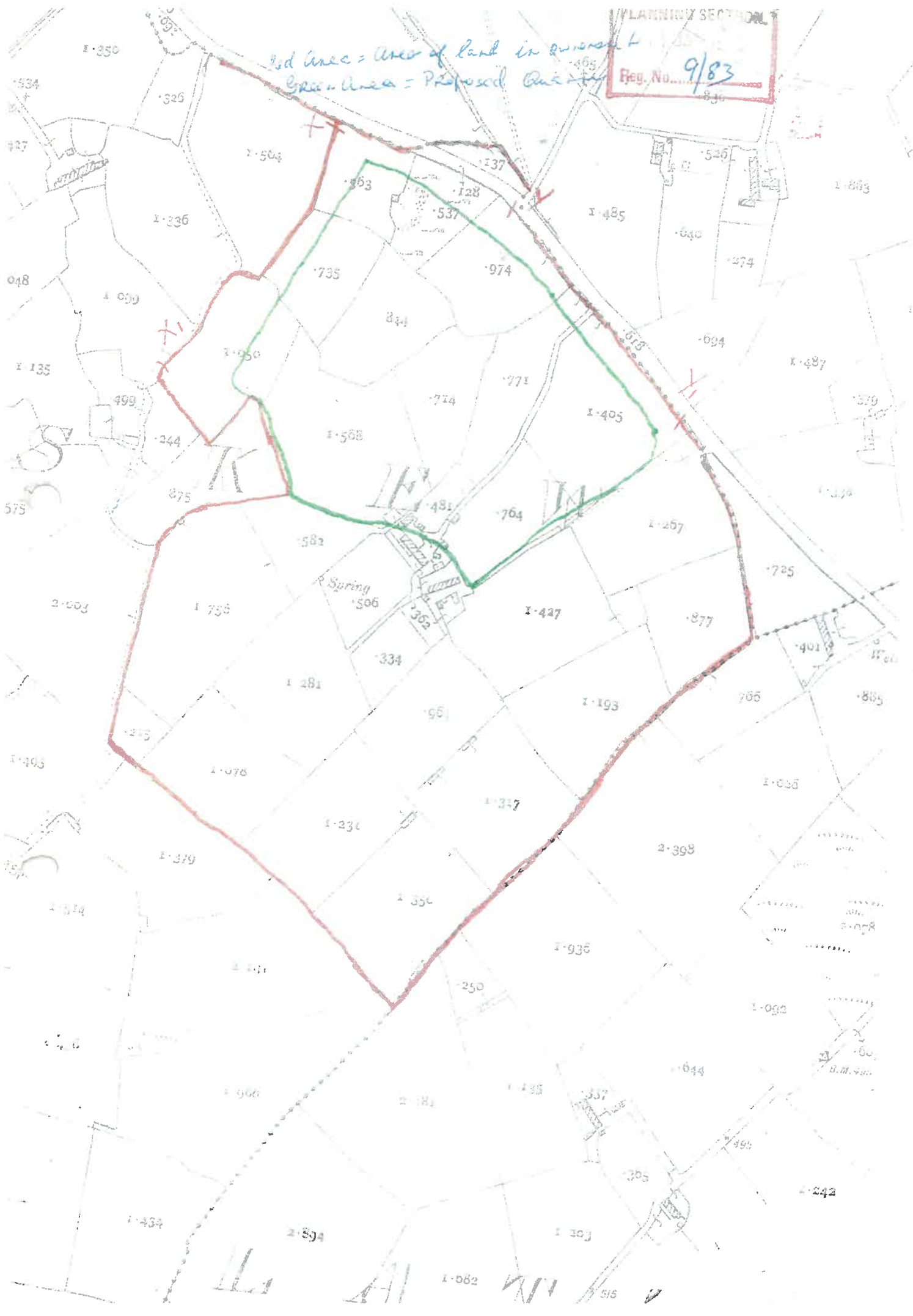
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APPENDIX 2-1

PLANNING SECTION
Reg. No. 9/83

Red Area = Area of land in question
Green Area = Proposed Outline



Planning Application by Mr. Patrick Cunningham, Lally Clonak, for development of quarry at Auckashow, Scotshouse.

Conditions 1 - 16

1. Applicant to enter an agreement with Monaghan County Council indemnifying the Council against any damage caused to County Roads in the vicinity of the quarry and accepting responsibility for any repair works required over and above normal maintenance.
2. Entrance to site to have a minimum sight distance of 100 metres in both directions.
3. Under no circumstances will surface water from the quarry be allowed to flow onto public roadway.
4. a. Adequate measures to be taken for the suppression of dust at any point of emission.
b. The dust outfall measured at any point at the site boundaries not to exceed $150 \mu\text{g}/\text{m}^3$.
c. Blasting mechanical or electrical work operations to be confined to the day hours of 8 am to 5 pm and the noise emission (other than from blasting) during these hours not to exceed 43 d B (A) rated sound level at any point along the boundaries of the development.
5. The entrance area of the site to be restored and surfaced.
6. a. Top soil from working areas to be stored and land to be reinstated following termination of activities ~~and~~ works out areas of site become available. Reinstated areas to be planted with trees and shrubs native to the area.
7. a. A screen belt of trees 6 m. in depth to be planted along the north western and the north eastern boundaries of the quarry site marked X X and Y Y on site map.
b. This belt of trees to consist of a mixture of Lombardy poplar, Japanese larch, whitethorn, hawthorn, lime, ash and red oak.
c. Trees should be planted at 2 - 3m centres.
d. These belts of trees to be underplanted with shrubs to provide additional screening and noise protection.
e. The remaining boundaries of the site to be planted with trees and shrubs native to the area or where hedges already exist these should be retained.
f. A solid stained wooden screenfence to be erected at the entrance area to the quarry where it may prove difficult to plant. Solid wooden gates to fence off the quarry to be erected. Gates to open inwards only.
8. All requirements of the Fire Authority to be complied with in full in the proposed development (see attached list).
9. No sign or advertisement to be erected within the curtilage of the development without a prior grant of permission from the planning authority.
10. Subject to the above conditions the development to be carried out in strict conformity with the lodged plans and specifications.

It is recommended that as a matter of courtesy that local residents be notified in advance of any blasting operations.

Contd/;

APPENDIX 2-2

MONAGHAN COUNTY COUNCIL

261

File No. . QYA

QUARRY REGISTER

O.S. No. :

Rec. Date. : 11/11/2004

App Type :

Applicant : Thomas Leddy
Address : Derryvackney
Milltown
Belturbet
Co Cavan

Company Reg. No. :

Description : Operating a Limestone Rock Quarry

Dev. Location : Aughnaskew
Scotshouse
Clones
Co Monaghan

Decision : MANAGERS ORDER

.....

..... **Date :**

.....

Further Information Requested **F.I. Received** .

Contributions Required **Yes**__ **No**__ .

Security Required **Yes**__ **No**__ .

DETAILS OF APPEAL If Any

.....

.....

DECISION OF AN BORD PLEANALA :

.....

..... **Date :**

1 1

MONAGHAN COUNTY COUNCIL

File No. : QY/1

QUARRY REGISTER

O.S. No. :

Rec. Date. : 05/04/2005 12:00:00 AM

App Type :

Applicant : Thomas Leddy
Address : Derryvackney
Milltown
Belturbet
Co Cavan

Company Reg. No. :

Description : Operating a Limestone Rock Quarry

Dev. Location : Aughnaskew
Scotshouse
Clones
Co Monaghan

Decision : MANAGERS ORDER NO.

.....

..... Date :

.....

Further Information Requested F.I. Received

Contributions Required Yes__ No__

Security Required Yes__ No__

DETAILS OF APPEAL If Any

.....

.....

DECISION OF AN BORD PLEANALA :

.....

..... Date : 20.....

(a) The area and folio number of the quarry, including the extracted area delineated on a map:

Total site area..... **11.5 ha.**
Extraction Area..... **10 ha.**
Folio Number..... **13636 & 14067**

(b) The material being extracted and processed (if at all) **Limestone Rock**

(c) The date when quarrying operations commenced on the land (where known)
25/07/1983 12:00:00 AM

(d) The hours of the day during which the quarry is in operation.... **8am-6pm**
Loading/Offsite Haulage Hours.....

(e) The traffic generated by the operation of the quarry including the type and frequency of vehicles entering and leaving the quarry.....**8 Wheel Tippers & 4 Lorries 5 times a day**

(f) The levels of noise and dust generated by the operations in the quarry ...**Not available**

(g) Any material changes in the particular referred to in paragraph (a) to (f) during the period commencing on the commencement of this section and the date on which the information is provided.....

(h) Whether-

(i) Planning permission under Part IV of the Act of 1963 was granted in respect of the quarry and if so, the conditions, if any, to which the permission is subject.....

Or

The operation of the quarry commenced before 1st October 1964.....

Date of commencement of quarry: **25/07/1983 12:00:00 AM**

And

(ii) Such other matter in relation to the operations of the quarry as may be prescribed.

MONAGHAN COUNTY COUNCIL

File No. : 04/3002

241

PLANNING REGISTER

O.S. No. :

Grid Ref. :

Rec. Date. : 11/11/2004

Completed : 05/04/2005

Registration of Quarries

Applicant : Thomas Leddy
Address : Derryvackney
Milltown
Belturbet
Co. Cavan

Description : Quarry

Dev. Location : Aghnaskew
Scotshouse
Clones

Planning Reference P83/9.....

Decision of Planning Authority On Application: to grant permission
Development of quarry at
Aghnaskew, Scotshouse.

Applicant: Patrick Cunningham, Largy, Clones

Date of notification of Grant: 25th July 1983

Further Information Requested F.I. Received

DETAILS OF APPEAL if any

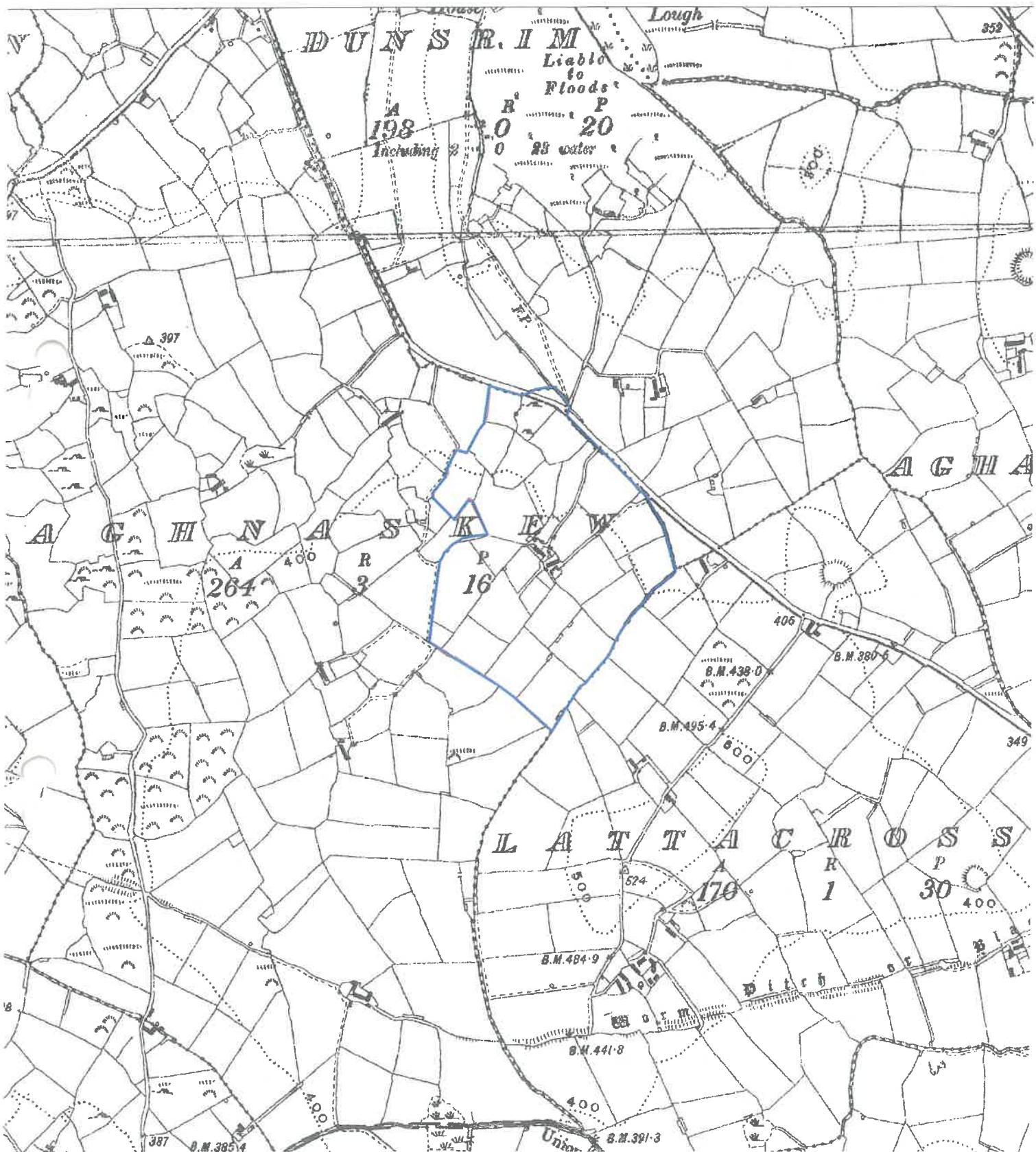
DECISION OF AN BORD PLEANALA :

..... Date :

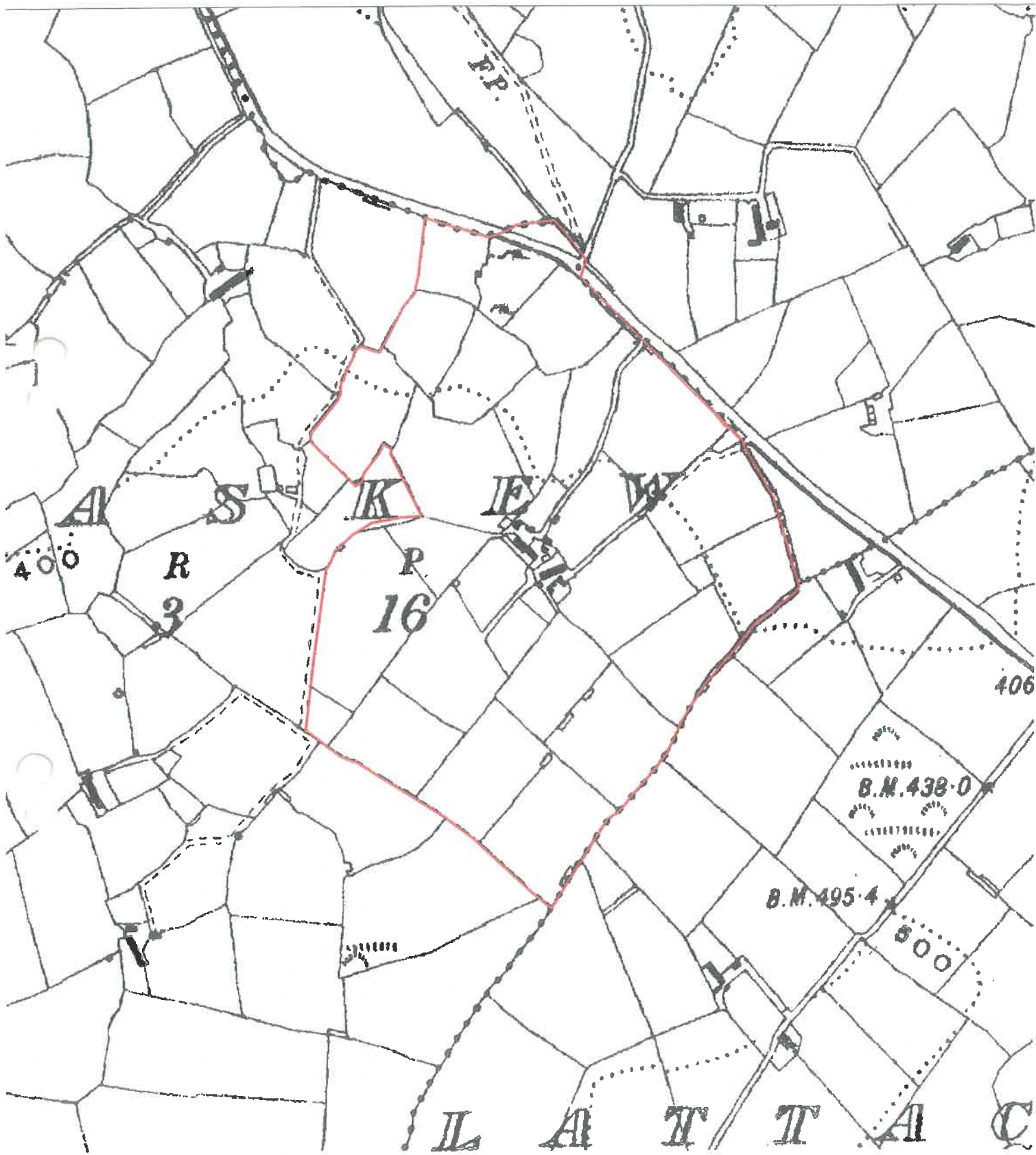
004/3002 - Continued.

- (a) The area of the quarry, including the extracted area delineated on a map.....**Folio No. 13636 – 4.25ha. Folio No.14067 – 6.42ha.**
- (b) The material being extracted and processed (if at all)**Limestone Rock.**
- (c) The date when quarrying operations commenced on the land (where known).....**1983.**
- (d) The hours of the day during which the quarry is in operation.....**Occasional use at present Week days ...9am – 5pm.**
- (e) The traffic generated by the operation of the quarry including the type and frequency of vehicles entering and leaving the quarry.....**Occasional**
- (f) The levels of noise and dust generated by the operations in the quarry...**minimal...due to infrequent use.**
- (g) Any material changes in the particulars referred to in paragraph (a) to (f) during the period commencing on the commencement of this section and the date on which the information is provided.....
- (h) Whether-
planning permission under Part IV of the Act of 1963 was granted in respect of the quarry and if so, the conditions, if any, to which the permission is subject, - **P83/9.**
or
the operation of the quarry commenced before 1st October 1964, **No**

and
such other matters in relation to the operations of the quarry as may be prescribed.







Recommended conditions to be attached to operation of quarry in accordance with section 261 (6) (a) (ii) of Planning and Development Act, 2000:

- 1 a. Sight distances of 80 metres in each direction shall be provided from a point in the entrance 3.0 metres from the road edge and 1.0 metre above ground level. Sight distances shall be measured to the nearside road edge in both directions. Where it is necessary to remove hedges/trim embankments in order to achieve this sight distance, the new boundary shall be located clear of sightlines. Any pole or column materially affecting visibility must also be removed.
- b. Cattle grid/ACO Drain/Gullies shall be installed at the entrance constructed in such a manner as to prevent water from the entrance flowing onto the public road. Similarly measures shall be taken to prevent road surface water from flowing onto the entrance. The discharge from the above to be piped to drainage pipeline.
- c. The discharge of surface water from the public road on to the site through road surface drainage and road subsoil drainage shall remain unimpeded.
- d. Provision shall be made within the site for surface water drainage and no surface water shall be allowed flow on to the public roadway.

Reason. In the interest of traffic safety.

- 2 a. Adequate measures shall be taken for the suppression of dust at any point of emission.
- b. The dust outfall measured at any point at the site boundaries shall not exceed 150 mg/m².
- c. Blasting, mechanical or electrical work operations shall be confined to the day hours of 8 am to 6 pm and the noise emission (other than from blasting) during these hours shall not exceed 45 db(A) rated sound level at any point along the boundaries of the development.

Reason. In the interest of residential amenity and environmental protection.

- 3 a. Within two months of the issue of this Notice, a site restoration plan shall be submitted to, and agreed in writing with the Planning Authority. This plan shall include the following:
 - (i). The identification of all items of plant, machinery, scrap metals, stockpiles and waste material to be removed.
 - (ii). The identification of all areas to be levelled and graded.
 - (iii). The position of all quarry faces, together with details of measures to be used to ensure that all final faces are left in a safe and stable condition.
 - (iv). Details of all additional landscaping measures to be implemented; and
 - (v). A timescale for the implementation of the restoration scheme.

- b. The restoration scheme shall be implemented in accordance with the approved plans and within the approved timescale.

Reason. To facilitate the restoration of the site.

4. No sign or advertisement shall be erected within the curtilage of the development without a prior grant of permission from the planning authority.
Reason. In the interest of visual amenity and orderly development.

5. Subject to the above the quarry shall be operated in accordance with planning permission, granted under file ref. P9/83 and the information submitted accompanying the application for registration.
Reason. To prevent unauthorised development.

Please note that this permission, with attached restated, modified or added conditions shall be deemed, for the purposes of the Planning and Development Act 2000, to have been granted under section 34, and any condition so restated, modified or added shall have effect as if imposed under section 34.

APPENDIX 2-3

261A.

Quarry Assessment – Internal Report

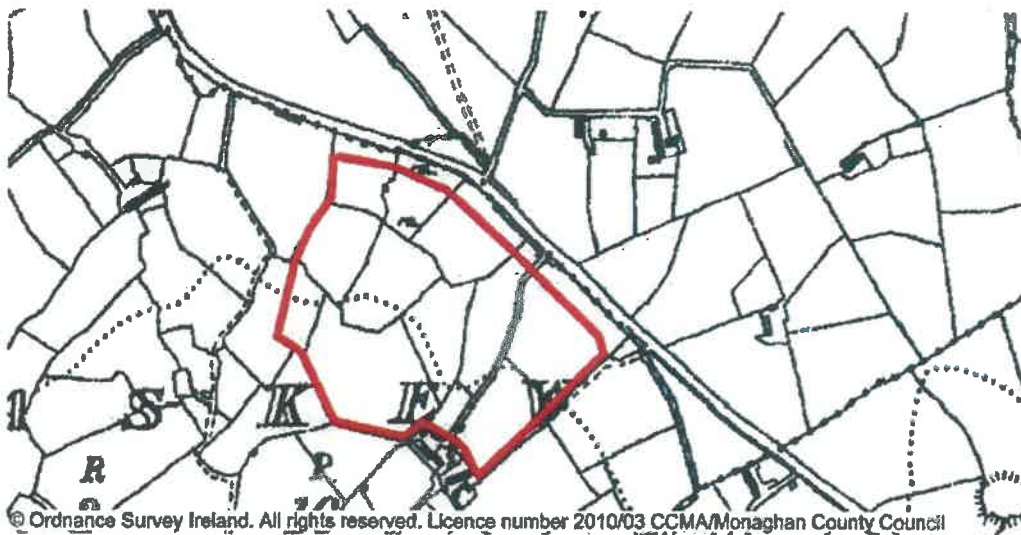
General Information

Name of Quarry owner: **Paddy Connolly**

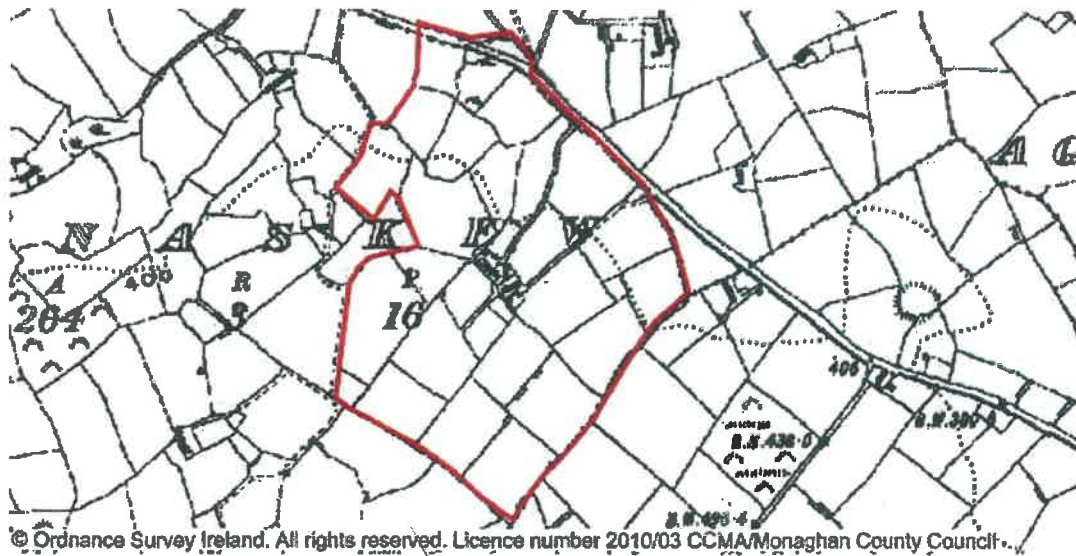
Address of quarry owner: **C/o Aughnaskew, Scotshouse, Clones**

Address of quarry/Townland: **Aughnaskew, Scotshouse, Clones**

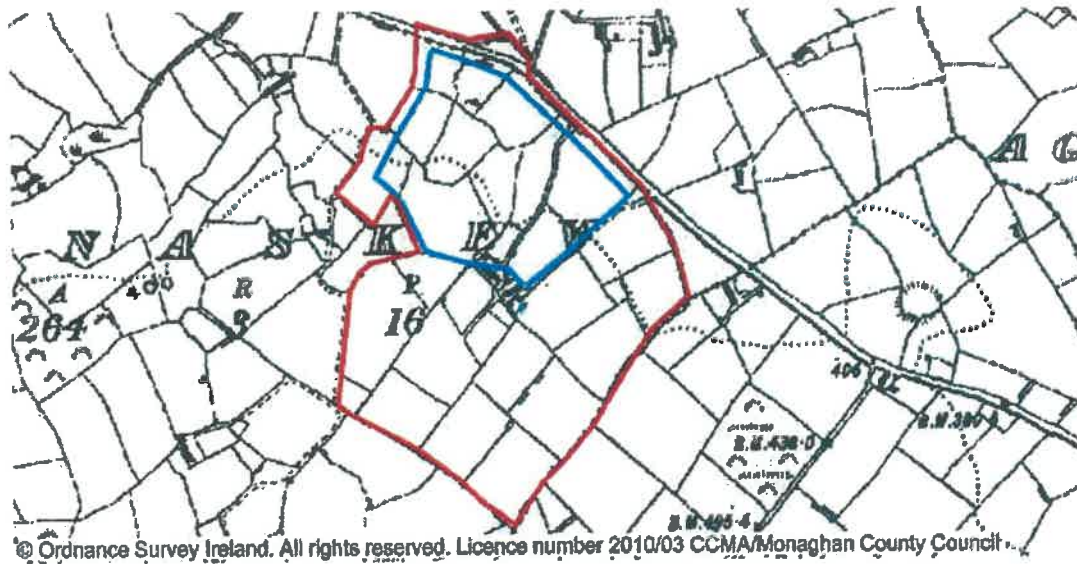
X/Y co-ordinates: **249367, 318357**



Site as approved under P/83/9



Site as approved under Q/2004/3002



— Site as per Section 261 registration

— Site as per permission P/1983/09



Aerial photograph illustrating quarry for the period 2004-2006

Quarry History

Quarry Development undertaken pre 1964: Yes No (1983)

Quarry development undertaken after 1st February 1990: Yes No

Planning History

Planning Reference Number:

9/83: Permission to develop a quarry – approved with conditions. Conditions attached at end of report

08/787: Existing floodlights

09/618: Consist of Portal Frame Workshop building and all associated site works

10/127: Retention permission for a Prefabricated single storey office building, weighbridge, and 2.4m high roadside boundary palisade fence

Environmental Impact Assessment undertaken: Yes No

Determination as to whether EIA required undertaken: Yes No

Appropriate Assessment undertaken: Yes No

Section 261 Registration: Yes No

Section 261 reference: **Q/2004/3002 – conditions attached.**

Enforcement Reference Number, if applicable: **Not applicable.**

Enforcement Details: Active Case closed case conviction other

Specific Information

Area of Quarry – Total site area:

Site area as per P/1983/09: approximately 3.3 hectares

Site area as per Q/2004/3002: approximately 11 hectares

Description of Quarry including type of extraction material: **Greywacke Stone**

Status of Quarry: Currently in operation Quarry excavation visible but not in operation
No evidence of quarry other

Is the quarry within the boundary of or within 15km of a Special Area of Conservation (SAC): Yes
No

Site lies within 15km (approx 9kms) from Kilroosky Lough SAC.

Site lies within 15km of Lough Oughter SAC (Co. Cavan)

Is the quarry within the boundary of or within 15km of a Special Protection Area (SPA): Yes No

Is the quarry within the boundary of or within 15km of a Natural Heritage Area or Proposed Natural Heritage Area. Yes No

Quarry lies within 15km of the following Proposed Natural Heritage Areas

Drumcor Lough pNHA

Annagheane Lough pNHA

Lisabuck Lough pNHA

Drumgole Lough pNHA

Dromore Lakes pNHA

Lisarilly Bog pNHA

Rafinny Lough pNHA

Drumcor Lough pNHA

Annagheane Lough pNHA

Is the quarry located within a flood risk zone: Yes No

Provide details of watercourses which adjoin the site: **No watercourses within the vicinity of the site.**

Provide details (including distances) of quarry to adjoining dwellings/buildings/settlements: **Number of single dwellings located within the vicinity of the site. Nearest dwelling is located approximately 70 metres from the quarry boundary.**

Additional quarry developments in the area (cumulative impacts): **Not applicable**

Submissions

Number of submission received:**1**

Summary of main issues raised: **Submission received from Ian Lumley, Heritage Officer with An Taisce.**

Submission in full is attached to report and is summarised as follows:

1. **Legal obligation on council with regard to addressing the status of all quarries within its functional area with regard to compliance with the EIA and Habitats Directives and relevant European and Irish Court judgements.**
 - **Substitute consent – is retention by a different name and does not resolve Case C215-06.**
 - **Former retention applications – planning authority will be required to close down any operation where previous retention applications or unjustified Section 261 Registrations**

were lodged to “regularise” unauthorised developments which would have required an Environmental Impact Statement to be lodged.

- **Pre 1963 claims – note the High Court Judgement of Mr Justice Charleton overturning a decision by An Bord Pleanala granting continuation of quarrying at Lemgare. The initial operation of Section 261 Planning and Development Act 2000 resulted in large scale fraudulent pre 1963 claims without any proper evidence being submitted of**
 - **Existence of an operating quarry on the site seeking registration in Oct 1964**
 - **Where a pre 1963 Act claim was made documentation on the extent of quarry unit and extraction rate at that time.**
 - **Screening for sub threshold EIA and/or cumulative impact generating EIA requirement – A determination must be made where EIA is required:**
 - **Where sub threshold quarry areas might have a significant effect on the environment by reason of sensitivity to a European site, Priority Habitat, watercourse or archaeological feature.**
 - **Where there is a cumulative impact with an adjacent quarry or associated development, including sites managed by another operator or where activity has ceased.**
- 2. Consideration of applications on quarries with previous planning consents**
- **Compliance with financial conditions – an audit should be carried out to ascertain if there are outstanding financial conditions.**
 - **Compliance with reinstatement conditions – planning authority should examine the issue of reinstatement bonds and the issue of progressive reinstatement.**
 - **Non compliance with reinstatement plans – any operation found not to be reinstating as per their planning conditions, should be subject to and enforcement proceedings issued.**
 - **Breach of permitted extraction area – there are concerns that many quarry operators have exceed their permitted extraction area, this should be investigated.**
 - **Illegal blasting – planning authorities should examine sand and gravel quarries for presence of solid rock and to clarify how this is being extracted. Evidence of any unauthorised blasting should result in immediate closure and enforcement action.**
 - **Illegal dewatering – some sand and gravel quarries engage in dewatering in order to continue extraction in defiance of planning conditions which indicates that all extraction be conducted above the water table. Any evidence of illegal dewatering should result in immediate closure followed by enforcement action.**
 - **Unauthorised extraction – regularly permitted extraction volumes are grossly exceeded. Extractive areas can be determined by comparison of maps and an up to date GPS survey.**
 - **Unauthorised disposal of water – all water courses surrounding quarries should be examined with a view to locating any water being diverted from the quarries. Unauthorised disposal of water should result in the quarry being closed down followed by enforcement.**

Appropriate Assessment

Site lies within 15km of the Kilroosky Lough Cluster SAC. The conservation objectives of this SAC are as follows:

- To maintain the Annex I habitat for which this cSAC has been selected at favourable conservation status:
 - 3140 hard oligo-mesotrophic waters with benthic vegetation of Chara species
 - 7210 - Calcareous fens with cladium mariscus and Carcicion davalliance
 - 7230 Alkaline fens.
- To maintain the Annex II species for which the cSAC has been selected at favourable conservation status: White-clawed crayfish.

Given the distance of the quarry from the SAC (approx 9kms) and the fact that there are no watercourses located within the vicinity of the site, there are not considered to be any pathway connectors linked with this development and any Natura 200 sites. Consequently the planning authority is of the opinion that an Appropriate Assessment is not required for this quarry development.

Environmental Impact Assessment/Determinations in relation to Environmental Impact Assessment
--

- Mandatory for new quarries in excess of 5 hectares (1990)

Applicable

Not Applicable

- Mandatory for the extension of a quarry which brought the total quarry to in excess of 5 hectares and represented an increase of over 25% of the existing quarry, provided that the extension in itself exceeded 2.5 hectares (1/5/1999)

Applicable

Not Applicable

The planning history is crucial when assessing this quarry with regard to determining whether this quarry is subject to an environmental impact assessment or a determination for an environmental impact assessment.

This site is authorised by planning permission P/83/09. Whilst it is noted that development has taken place post 1990, post 1997 and post 2008 it is also noted that no quarrying activity has been undertaken outside of the originally, granted site.

The Guidelines for Planning Authorities on Section 261A state "if development carried out after 1/2/1990 was authorised by a planning permission granted prior to 1/2/90, EIA is not required in respect of such development under the Directive because the Directive does not apply in respect of projects authorised before the Directive became operative. Any development which obtained planning permission before the EIA Directive came into effect and is operating in accordance with the terms of its planning permission is not affected by the Directive and does not require EIA under the terms of this Directive.

Similarly, appropriate assessment is not required in respect of developments authorised by a planning permission granted prior to 26/02/1997.

Sub thresholds

There is a requirement to carry out EIA where the competent authority considers that a development would be likely to have significant effects on the environment.

The planning authority is of the opinion that an environmental impact assessment is not required for the quarry development in question. In accordance with Article 103 of the Planning and Development Regulations 2001, it is noted that the site does not lie within any of the following:

- a) A European site
- b) An area the subject of a notice under section 16(2)(b) of the Wildlife (Amendment) Act 2000
- c) Land established or recognised as a nature reserve within the meaning of section 15 or 16 of the Wildlife Act 1976 as amended by sections 26 and 27 of the Wildlife (Amendment) Act 2000 or
- d) Land designated as a refuge for flora or as a refuge for fauna under section 17 of the Wildlife Act, 1976 as amended by section 28 of the Wildlife (Amendment) Act 2000.

The planning authority does note that the site lies within 15km of Kilroosky Lough SAC. However, given the distance of the quarry from the SAC (approx 9kms) and the fact that there are no watercourses located within the vicinity of the site, there are not considered to be any pathway connectors linked with this development and it is therefore considered that the development will have no impact upon the Natura 2000 network.

In accordance with Schedule 7, the following points are noted:

- There are no additional quarries within the vicinity of the site.
- The surrounding area is not considered to be densely populated.
- The surrounding area is not considered to be environmentally sensitive.
- It is considered that the conditions imposed under P/83/9 and Q/04/3002 has ensured that the development has been assessed with regard to traffic safety, residential amenity, environmental protection and visual amenity.

Assessment under Section 261A of the Planning and Development Act 2000 and related provisions

- I. Following Stage 1 Screening, it is the conclusion of the Planning Authority that Appropriate Assessment

Was required

Was not required

- II. Following EIA Screening, it is the conclusion of the Planning Authority that an Environmental Impact Assessment

Was required

Was not required

- III. Following EIA Screening, it is the conclusion of the Planning Authority that a Determination as to whether an Environmental Impact Assessment was required

Was required

Was not required



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- Aerial photographs attached to report indicate that quarrying activity has been contained within the boundary of the original planning permission.
- Section 261A(2)(a) states that the planning authority must demonstrate whether:
 - (i) Development carried out after 1st February 1990 was not authorised by a permission granted under Part IV of the Act of 1963, prior to 1 February 1990, which development would have required either an environmental impact assessment or a determination as to whether an environment impact assessment was required, but that such an assessment or determination was not carried out.
 - (ii) Development was carried out after 26 February 1997, which was not authorised by a permission granted under Part IV of the Act of 1963 prior to 26 February 1997,

which development would have required having regard to the Habitats Directive, an appropriate assessment, but that such an assessment was not carried out.

- The planning authority is of the opinion that no development has occurred on this site post 1990 or post 1997 that was not covered by the original 1983 planning permission.
- In addition, the quarry was fully registered under Q/2004/3002.
- Quarry remains operational.

Recommendation

It is the recommendation of the Planning Authority that no further action is required under Section 261A of the Planning and Development Act 2000 and related provisions.

Conditions attached to quarry registration under Section 261



Recommended conditions to be attached to operation of quarry in accordance with section 261 (6) (a) (ii) of Planning and Development Act, 2000:

- 1 a. Sight distances of 80 metres in each direction shall be provided from a point in the entrance 3.0 metres from the road edge and 1.0 metre above ground level. Sight distances shall be measured to the nearside road edge in both directions. Where it is necessary to remove hedges/trim embankments in order to achieve this sight distance, the new boundary shall be located clear of sightlines. Any pole or column materially affecting visibility must also be removed.
 - b. Cattle grid/ACO Drain/Gullies shall be installed at the entrance constructed in such a manner as to prevent water from the entrance flowing onto the public road. Similarly measures shall be taken to prevent road surface water from flowing onto the entrance. The discharge from the above to be piped to drainage pipeline.
 - c. The discharge of surface water from the public road on to the site through road surface drainage and road subsoil drainage shall remain unimpeded.
 - d. Provision shall be made within the site for surface water drainage and no surface water shall be allowed flow on to the public roadway.
- Reason. In the interest of traffic safety.

- 2 a. Adequate measures shall be taken for the suppression of dust at any point of emission.
 - b. The dust outfall measured at any point at the site boundaries shall not exceed 150 mg/m².
 - c. Blasting, mechanical or electrical work operations shall be confined to the day hours of 8 am to 6 pm and the noise emission (other than from blasting) during these hours shall not exceed 45 db(A) rated sound level at any point along the boundaries of the development.
- Reason. In the interest of residential amenity and environmental protection.

- 3 a. Within two months of the issue of this Notice, a site restoration plan shall be submitted to, and agreed in writing with the Planning Authority. This plan shall include the following:
 - (i). The identification of all items of plant, machinery, scrap metals, stockpiles and waste material to be removed.
 - (ii). The identification of all areas to be levelled and graded.
 - (iii). The position of all quarry faces, together with details of measures to be used to ensure that all final faces are left in a safe and stable condition.
 - (iv). Details of all additional landscaping measures to be implemented; and
 - (v). A timescale for the implementation of the restoration scheme.
 - b. The restoration scheme shall be implemented in accordance with the approved plans and within the approved timescale.
- Reason. To facilitate the restoration of the site.

4. No sign or advertisement shall be erected within the curtilage of the development without a prior grant of permission from the planning authority.
Reason. In the interest of visual amenity and orderly development.

5. Subject to the above the quarry shall be operated in accordance with planning permission, granted under file ref. P9/83 and the information submitted accompanying the application for registration.
Reason. To prevent unauthorised development.

X Please note that this permission, with attached restated, modified or added conditions shall be deemed, for the purposes of the Planning and Development Act 2000, to have been granted under section 34, and any condition so restated, modified or added shall have effect as if imposed under section 34. X

APPENDIX 2-4

Opinion

- Re:** Regularisation of alleged unauthorised development at Scotshouse Quarries Ltd. and associated enforcement proceedings pursuant to section 154 Planning and Development Act, 2000 as amended
- Querist:** Paddy Connolly, Scotshouse Quarries Ltd.
- Agent:** O'Sullivan Murtagh Solicitors
- Counsel:** Mary Moran-Long BL

1. Background and Introduction

I have been requested to prepare an opinion and advices on the above issues namely the most appropriate, timely and cost effective steps/process required to regularise the quarry at Aghnaskew, Scotshouse, Co. Monaghan for past and future development; and the steps required to defend an alleged failure to comply with the provisions of an enforcement notice under section 154 PDA 2000 as amended served on 3rd June 2020.

A preliminary matter arises in that the submission prepared by Earth Science Partnership Ireland limited reference is made to '*This quarry site has been in operations for many decades, including pre-63 origins.*'. The application documents (Refs: QY1;04/3002), in respect of the registration of the quarry under section 261 of the Planning and Development Act 2000 as amended (herein referred to as the 2000 Act) state the quarry commenced operation on 25 July 1983, (1983), registration Ref: Q/2004/3002, that being the date of grant of permission, Ref: 83/09. Furthermore, the Quarry Assessment Report for the quarry carried out under section 261A of the 2000 Act prepared by Monaghan County Council planning authority in 2012 states, that no development was undertaken pre October 1964 and indicates 1983 as the date of commencement of quarrying.

This opinion is prepared on the basis of permission Ref.: 83/09 granted on 25th July 198 and not a pre-1964 established use.

The background may be summarised as follows:

- Permission 83/09 granted on 25th July 1983 for an area of 3.3 Ha. within landholding of 11.5 ha., having 10. no conditions attached. (Application by Patrick Cunningham - previous owner)

1.1. Section 261 Registration

- Application for registration of quarry under section 261 submitted 11th November 2004. Application form dated 28th October 2004 completed by Thomas Leddy, applicant set out the matters as required under s. 261(2) which indicated that the quarry was in occasional/infrequent use only. Map submitted delineated the quarry area as 11.5 Ha and extraction area: 10 Ha. (p133 s.261 FOI)
- Letter 12th April 2005 from planning authority stated the application which included *inter alia* 'the extracted area delineated' was considered a valid application for registration under s. 261, A further letter of same date indicated the application was

entered into the planning register. (Application was submitted while in ownership of Thomas Leddy prior to purchase of lands by Querist in January 2006). The following are noted:

- letter from Senior Executive Engineer dated 11th May 2005 including suggested conditions indicated that the quarry was not in use at the time of the registration.
- additional Application form dated 3rd January 2005 submitted by Thomas Leddy set out the matters as required under s. 261(2) which indicated that the quarry was operational,
- Environmental Health Officer Report dated 5th August 2005 which considered the conditions attached to the 1983 permission acceptable;
- Notice published in Northern Standard on 22nd September 2005 *inter alia* of intension of planning authority to restate, modify or add conditions to operation of the quarry under section 261(6)(a)(ii) Ref: Q05/3002.

Section 261(6)(a)(ii) provides that where a quarry had an existing permission (Scotshouse having the 1983 permission) that within 2 years of the registration the planning authority in the interests of proper planning and sustainable development, having regard to the development plan and any submissions had the power to restate, modify or add conditions. Pursuant to the subsection, the planning authority imposed 10 additional conditions. Where a quarry did not the permission but had a pre-1964 established use under section 261(6)(a)(i) it could impose conditions on the operation of the quarry.

- Planning authority internal document re s.261 registration (p62 FOI file) notes the application for registration indicated: '*Quarrying operation began in 1983; Planning permission was granted in 1983 under 83/09 to develop quarry; the extraction area of the quarry is 11 hectares*' and includes 'Notice for issue' dated 24th November 2005 of proposal by planning authority to restate, modify or add conditions to operation of the quarry pursuant to s.261(6)(a)(ii) PDA 2000.
- Notice dated 7th December 2005 issued to applicant.
- Letter/submission from applicant's solicitor to planning authority dated 16 December 2005 requesting confirmation that the quarry was registered and response dated 8th December confirming a valid application to register had been submitted.
- Letter from applicant's solicitor to planning authority dated 16 January 2006 requesting that further conditions not be imposed and noted that the draft proposed conditions had not been seen.
- Letter from planning authority dated 16th February 2006 acknowledged receipt of aforementioned submission which was referred to executive planner
- Planning authority decision (Q04/3002) issued 13th March 2006 attached 5 no. conditions pursuant to section 261(6)(a)(ii).
- Order of 24th March 2006 quarry was registered under section 261 PDA 2000 as amended, quarry area 11.5 ha. and 10 ha. extraction area, as delineated on map submitted with application Plan Reg. Ref: Q2004/3002. The 10 ha. extraction area of the quarry registered under s.261 was substantially greater (6.7 ha.) than the 3.3ha extraction area permitted under Ref; 83/09. Permission and conditions were deemed to be granted under section 34 PDA 2000 as amended.
- The 5 no conditions were in addition to the 10 conditions attached to permission 83/09, therefore 15 conditions in total attached. Condition no 5 requires that the quarry be operated in accordance with permission Reg. Ref: 83/09 and the information submitted

for registration under s.261. Registration Q2004/3002 comprised the original 1983 permission as modified by the section 261 conditions for quarrying activities on the site.

- Condition no 3 required that within two months of the issue of the section 261 notice that a site restoration plan be submitted and agreed in writing with the planning authority and stated the requirements for inclusion in the plan. The stated reason is: To facilitate the restoration of the site.
- In compliance with conditions no 3 Querist engaged Quarryplan Limited to prepare a site restoration plan. Under cover letter dated 3rd August 2006, (received 8th August 2006) a comprehensive sequence of plans for the site restoration was submitted to the planning authority by Quarryplan.
- Letter dated 6th November 2006 from the planning authority to Thomas Leddy and Querist (letter 10th November 2006 to Quarryplan) stated the landscaping restoration details submitted on 8th August 2006 were in compliance with condition no 3 attached to the s.261 permission.

Registration Q/2004/3002 of Scotshouse quarry, although having been deemed as a permission granted under section 34 does not enjoy the status enjoyed by a permission granted under a *de novo* application for permission submitted under s.34 and is enforceable.

In this regard the High Court in *M & F Quirke & Ors v. An Bord Pleanála & Ors* [2009] IEHC 426 which related to a quarry claiming pre-1964 established use, was of the view that notwithstanding that conditions are imposed at a point in time under s.261(6), the developer might in the future be required to seek planning permission irrespective of the provisions of s261(7) in the interest of proper planning and sustainable development. The

The case of *Pierson & Ors. v. Keegan Quarries* [2009] IEHC 550 involved a pre-1964 quarry. The allegation was that when the quarry underwent the s.261 registration process it constituted unauthorised development and therefore the applicant was entitled to take injunctive proceedings under s. 160 PDA 2000 as amended. Irvin J stated where she stated:

“40. I do not accept that a decision made by a planning authority to register a quarry subject to the imposition of conditions under s. 261 of the 2000 Act has the legal effect contended for by the respondent. If the quarry constituted unauthorised development at the start of the s. 261 process, its registration subject to conditions does not, in my view, alter its status. Neither does that decision have any legal effect on the right of a party with the appropriate locus standi, such as the applicants in the present case, to challenge that development as being unauthorised under s. 160 of the 2000 Act.”

Subsequently, in *McGrath Limestone Quarries v An Bord Pleanala* [2014] 382 at paragraph 4.2 Charlton J in respect of the effect of s.261 agreed stating that registration (of a quarry) means no more than putting details in a register and ‘*It is settled as a matter of law that the registration of a quarry under s.261 does not alter its status.*’

The status of Scotshouse quarry after registration Q04/3002 was not altered and the permitted area of the quarry for extraction remained the 3.3 ha. granted under permission 83/09.

It is noted, however, that Querist is not responsible for the increase in the extraction area of the quarry which clearly occurred between 1983 and 2004/5 at the time of the application for registration under s.261, prior to his purchasing the lands in 2006 and which he understood to

be fully compliant with planning. It is important to note that the quarry registered under section 261 had an extraction area of 10 ha. when Querist purchased the quarry.

1.2.Further Planning History and Licencing of the site

The following summarises planning permissions and licensing since the site was purchased by Querist:

- 08/787: Retention permission for floodlights granted 2008
- 08/1087: Removal of Condition no 2 associated with permission 08/787; granted 2008
- 09/618: Permission for Portal Frame Workshop building and all associated site works; granted 2009
- 20/217: Permission for prefabricated single story office building weigh bridge and 2.m high roadside boundary palisade fence: granted 2010
- 14/124: Retention permission for crushing plant facility comprising 2 no. crushing plans, a screening plant, concrete storage facility, conveyors, concrete feeding chute, concrete supporting structure, electrical services control container, all utilities and associated site works ; Granted 2014.

It is noted that a site inspection was carried out on 14th March 2014 and enforcement report prepared by Rory Woods, assistant planner dated 21st March 2014. The report addressed the planning history and background and refers to Registration 2004/3002, in which the *'entirety of the site area was detailed on submitted documentation as being the area for extraction'*. The report is based on the follow up inspection of 14th March 2014 which found *'the quarry operations ongoing and the extraction area remains within the area as detailed under registration 04/3002.'* The planner was of the view that no unauthorised quarrying was taking place; and in respect of compliance with the conditions attached to 04/3002, he did not find any outstanding matters which renders the development to be non-compliant with 04/3002.

The aggregate screening machines /breaking equipment and associated bays erected on the quarry floor were found, however, to be without permission. On that basis Querist was invited to apply for retention permission for the said development within 4 weeks of the date of the correspondence, 24th March 2014. The relevant application was submitted, (ref. letter from Finnegan & Jackson to planning authority dated 17th April 2014) and retention permission granted. (Reg. Ref: 14/124) Note documents found in s.261A FOI file

- 14/157: Permission for construction of a site office, wastewater treatment unit and associated raised filter percolation area, car park comprising 7 no spaces, storm drainage, foul drainage and all associated site works. Granted 2014
- 15/113: Permission for Construction of Macadem Plant – Granted 2015
- 18/485: Permission for installation of ESB substation Granted 2018
- 19/2011: Permission for site office, wastewater treatment, car park etc. Granted 2-19
- WP26/15: Licence to discharge Trade Effluent at Aghnaskew, Scotshouse, Co. Monaghan granted 2015.

1.3.Section 261A Assessment

The planning authority assessed the quarry in accordance with the provisions of section 261A PDA 2000 as amended.

The section 261A file obtained in response to the FOI request includes a spreadsheet entitled *'Quarry Reference Number Q 002'* which refers to the quarry at Aghnaskew, Scotshouse;

Planning permission for quarry ref: 83/09; Registration status under s.261, Q2004/3002 and additional 5 no. conditions; Registration status under 261A, ‘No action required’, ‘Quarry approved under reference P/83/09’, ‘No development has occurred outside of the original site boundary’, ‘Given the original permission an EIA/determination for an EIA were not deemed necessary’, which clearly were errors on the part of Monaghan County Council planning authority. The spreadsheet continues; ‘the site lies 9km form Kilroosky SAC however, there are no watercourses within the vicinity of the site and it is considered that the quarry is not considered to be a risk to the Natura 2000 network’, ‘Quarry registered under s.261.’

A letter (undated) in respect of ‘Quarry at Aghnaskew, Co. Monaghan by Mr P Connolly Section 261A of the Planning and Development Acts 2000-2010’ from Adrian Hughes, Senior Planner ref. ‘Scotshouse Quarry’ refers to the requirement by the planning authority under section 261A(2)(a) to examine every quarry within its administrative area and to determine whether, having regard to the EIA and Habitats Directives, an EIA (for development works commenced after 1st February 1990), a determination as whether an EIA is required (for development works commenced after 1st February 1990), and appropriate assessment (for development works commenced after 26th February 1997).

The letter refers to the s. 261A assessment undertaken in respect of the quarry and determined ‘the provisions of s.261A(2)(a) are not applicable’ and ‘no further action shall be taken under s.261A of the PDA 2000-2010’. The letter is confirmation of the errors on the part of Monaghan County Council planning authority in its assessment of the quarry under s.261A.

The letter goes on to state that the planning authority intended to investigate every quarry within its administrative area to determine where quarry developments are being carried out in strict compliance with existing planning permission and ‘where issues of non-compliance are raised, you are advised that enforcement proceedings will be commenced.’

The letter reflects the purpose of an assessment of quarries under s.261A(2)(a) for compliance with the EIA and Habitats Directives. Compliance with permissions or otherwise (i.e. a claim of pre 1964 use) under national law was not assessed under the s.261A procedure. To some extent the matter was addressed in **J.J. Flood (Manufacturing) Ltd. & Anor .v. An Bord Pleanala [2020] IEHC 195 para. 97**, a case involving a quarry having a pre-1964 established use, where the court found in effect that a s.261A direction to apply for substitute consent amounts to a decision that the quarry was not in compliance with EU law as set out in the Directives, and stated:

“I do not think it could accurately be said that it amounts to “unauthorised development” because that phrase is used to denote illegality under domestic planning law. As noted under the previous heading, a quarry might, in principle, be compliant with domestic law (as interpreted by the Supreme Court in Waterford County Council v. John A. Woods [1999] 1 IR 556) yet still require development consent as a matter of EU law.”

The inspection carried out on 14 March 2014 by Rory Woods, assistant planner for the planning authority referred to above, assessed the quarry in respect of compliance with national law and confirmed ‘the quarry operations ongoing and the extraction area remains within the area as detailed under registration 04/3002’, that no unauthorised quarrying was taking place; and that there was compliance with the conditions attached to 04/3002 and concluded there were no outstanding matters which rendered the development to be non-compliant with 04/3002. The

planner recommended that retention permission be sought for the aggregate screening machines/breaking equipment and associated bays erected on the quarry floor within 4 weeks of his report.

It follows that if the quarry was found to be operating outside of its permission and unauthorised development was being carried out at the site, a recommendation to seek retention permission for the aggregate screening and crushing activities would not have been recommended by the planning and/or the planning authority would have refused retention permission for the activities on the site. The report by Rory Woods, therefore, further copper fastened Querist's belief that quarrying on the site was fully authorised and compliance with planning law.

The Quarry Assessment - Internal Report in respect of s.261A sets out the reflects the contents of the letter of Adrian Hughes. A summary of the content of the Quarry Assessment Report is as follows:

- Maps showing the approved site under permission 83/09 and Q/2004/3002, a combined map showing the quarry areas of permission 83/09 and s.261 registration. An aerial photograph illustrating quarry area for period 2004 -2006 is included.
- Under Quarry History, pre-1964 quarry development was indicated as not having occurred, however, quarry development had been undertaken after 1st February 1990.
- Under Planning History references made to relevant permissions particularly 09/83 and others. It was indicated that no environmental impact assessment was undertaken; a determination as to whether an EIA is required was not carried out; an Appropriate Assessment was not carried out. It referred to s.261 registration with conditions attached and no record of enforcement.
- Under Specific Information, the site extraction area under permissions 83/09 was 3.3 ha and under registration Q/2004/3002 the extraction area was stated as approximately 11 ha. (10 ha extraction area in total quarry area of 11.5 ha.) The quarry was currently in operation. The quarry boundary is within 15 km of SAC Kilroosky Lough SAC (9 km and of Lough Oughter SAC in Co Cavan. Stated the quarry site boundary was not within 15km of an SPA.
- It was determined that the quarry was within the boundary of or within 15 km of proposed natural heritage areas which were set out. The quarry was found not to be in a flood risk zone and no water courses are within the vicinity of the site.
- A single dwelling was located within the vicinity of the site, the nearest approx. 70 m from the quarry boundary. It was stated that there were no additional quarry developments in the area hence no cumulative impacts.
- Submissions were obtained from An Taisce which appeared to be general relating to quarries.
- In respect of an appropriate assessment it was concluded that given the 9km distance of the quarry from the SAC and the fact that there are no watercourses located within the vicinity of the site there are no pathway connectors linking the quarry with any Natura 2000 site, the planning authority was up the opinion that an AA was not required for the quarry as of 2012.

At the time of the 261A assessment the estimated area of extraction area of the quarry was circa 5.7-5.8 ha.

- The Assessment Report makes reference to mandatory EIA for new quarries in excess of 5 ha as not being applicable; and mandatory EIA for an extension of a quarry which brought the total area in excess of 5 ha. and represented an increase of over 25% of the existing quarry, provided that the extension itself exceeded 2.5 ha., which was found not to be applicable and determined that an EIA was not required.
- The note stated that the planning history is crucial when assessing this quarry with regards to determining whether this quarry is subject to an EIA or a determination for an EIA and goes on to state:
“The site is authorised by planning permission P/83/09. Whilst it is noted that development has taken place post 1990, post-1997 and post 2008, it is also noted that no quarrying activity has been undertaken outside the originally, granted site”
- In this regard, reference is made to Ministerial Guidelines for planning authorities on Section 261A which states *“If development carried out after 1/2/90, EIA is not required in respect of such development under the Directive because the Directive does not apply in respect of projects authorised before the Directive became operative. Any development which obtained planning permission before the EIA directive came into effect and is operating in accordance with the terms of its planning permission is not affected by the Directive and does not require EIA under the terms of this Directive.”*
- Assessment found that similarly appropriate assessment is not required in respect of developments authorised by a permission granted prior to the 26th of February 1997.
- Under the title ‘Sub-threshold’ the planning authority was of the opinion that an environmental impact assessment was not required as the development was not within certain parameters set out article 103 of the planning and development regulations 2001 (as it then provided). It noted that due to the site distance from Kilrooskey Lough SAC there would be no impact.
- In terms of assessment in accordance with Schedule 7 PDR 2001 it noted that there are no additional quarries in the vicinity; local area was not densely populated, the area is not considered to be environmentally sensitive, the conditions imposed under the 1983 permission and the 2005 registration ensured that the development has been assessed with regards to traffic safety, residential amenity and environmental protection and visual amenity.
- The assessment report concluded that an Appropriate Assessment, an EIA and/or a determination whether an EIA was required, were not required.
- The assessment refers to aerial photographs which indicate the quarry activity has been contained within the boundary of the original planning permission.
- It was recommended that “no further action is required under section 261A of the Planning and Development act 2000 and related provisions.”

Section 261A (2)(a) provides:

“Each planning authority shall, not later than 9 months after the coming into operation of this section examine every quarry within its administrative area and make a determination as to whether—

(i) development was carried out after 1 February 1990 [...]which development would have required, having regard to the Environmental Impact Assessment Directive, an environmental impact assessment or a determination as to whether an environmental impact assessment was required, but that such an assessment or determination was not carried out or made, or

(ii) development was carried out after 26 February 1997,[...] which development would have required, having regard to the Habitats Directive, an appropriate assessment, but that such an assessment was not carried out.”

The 261A assessment report stated: “*The site is authorised by planning permission P/83/09. Whilst it is noted that development has taken place post 1990, post-1997 and post 2008...* This clearly invoked the provisions of s.261A(2)(a)

The report also stated: “*It is also noted that no quarrying activity has been undertaken outside the originally, granted site*”, which was incorrect, given the extraction area had increased from 3.3 ha. permitted in 1983 to circa 5.7-5.8 ha. at the time.

Subsection (3) of s.261A provides:

“(3)(a) Where a planning authority makes a determination under subsection (2)(a) that subparagraph (i) or (ii) or both, if applicable, of that paragraph apply in relation to a quarry (in this section referred to as a determination under subsection (2)(a), and the authority also decides that—

(i) either the quarry commenced operation before 1 October 1964 or permission was granted in respect of the quarry under Part III of this Act or Part IV of the Act of 1963, and

(ii) if applicable, the requirements in relation to registration under section 261 were fulfilled, the planning authority shall issue a notice, not later than 9 months after the coming into operation of this section, to the owner or operator of the quarry.
[...]

(c) A notice referred to in paragraph (a) shall be in writing and shall inform the person to whom it is issued of the following matters:

(i) the determination under subsection (2)(a) and the reasons therefor;

(ii) the decision of the planning authority under paragraph (a) and the reasons therefor;

(iii) that the person is directed to apply to the Board for substitute consent in respect of the quarry, under section 177E, with a remedial environmental impact statement or remedial Natura impact statement or both of those statements, as the case may be, in

accordance with the determination of the planning authority under subsection (2)(a), not later than 12 weeks after the date of the notice, or such further period as the Board may allow;

(iv) the person may apply to the Board, not later than 21 days after the date of the notice, for a review of the determination of the planning authority [...]"

It is clear from the assessment report that:

- the provisions of subsection 261A(2)(a) applied;
- the quarry had permission 83/09 ((3))(a)(i) applied); and
- the requirements under s.261 were fulfilled (subsection (3)(a)(ii) applied).

It follows that Monaghan County Council planning authority was incorrect in its assessment of the quarry under section 261A and its recommendation that no further action was required.

The Assessment Report referred to the 1983 permission (for 3.3 ha.) and noted that development had taken place post 1990, post-1997 and post 2008, but mistakenly went on to note that no quarrying activity has been undertaken outside the originally granted site. Clearly this conclusion is incorrect given that when the quarry was registered under s.261 the extraction area was identified as 10 ha. Furthermore, at the time of the assessment under s.261A the extraction area was c. 5-7-5.8 ha. The extraction area clearly had increased by 2.4-2.5 ha. (from 3.3 ha). The quarry extraction area was in excess of 5 ha. threshold and the increase was in excess of 25% of the existing quarry for which permission was granted (3.3 ha.)

There can be no doubt that Monaghan County Council planning authority made a mistake in its calculations regarding the increased quarry area and incorrectly concluded that a determination as to whether was EIA was required or an EIA was not required.

In the circumstances, the planning authority was in error in its determination under s.261A that no further action was required and in that regard, it failed to issue a notice under section 261A(3)(a) directing Querist to apply for substitute consent following the assessment at the time. In this regard Querist and his business is suffering significant detriment as it now falls upon him to regularise the quarry so that it is compliant with EU law, through no fault of his own. The alleged unauthorized development and enforcement proceedings under s.154 is a separate matter.

2. Regularisation of the Quarry

An application for substitute consent is required to regularise quarrying that has taken place outside of the area permitted under Ref: 83/09. Given that the s.261A process is no longer available in this instance, an application for substitute under section 177E may only be made to the Board where either the planning authority issues a notice under section 177B directing the person to apply for substitute consent; or following a successful application to the Board seeking leave to apply for substitute consent under s177C, the Board grants leave to apply under section 177D. The question is which process should be followed?

Section 177B(1) provides:

“177B.— (1) Where a planning authority becomes aware in relation to a development in its administrative area for which permission was granted by the planning authority or the Board, and for which—

- (a) an environmental impact assessment,
- (b) a determination in relation to whether an environmental impact assessment is required, or
- (c) an appropriate assessment, was or is required,

that a final judgment of a court of competent jurisdiction in the State or the Court of Justice of the European Union has been made that the permission was in breach of law, invalid or otherwise defective in a material respect because of—

- (i) any matter contained in or omitted from the application for permission including omission of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or inadequacy of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or
- (ii) any error of fact or law or procedural error,

it shall give a notice in writing to the person who carried out the development or the owner or occupier of the land as appropriate.”

Section 177B(1)(and s.177D(1)(a)) requires that there be a defective permission, the elements of which were set out by McKechnie J in *An Taisce v An Bord Pleanala, Sweetman .v. An Bord Pleanala* [2020] IESC 39 para 91 set out what the court considered the core constituents of a defective permission as follows:

- “(i) that the completed development, in respect of which an EIA “was or is” required, has been the subject matter of a permission,*
- (ii) that permission may be invalid or otherwise defective in a “material respect”,*
- (iii) as so determined by the Court of Justice or by a domestic court “or otherwise”,*
- (iv) by reason of the “omission” to carry out an EIS or its “inadequacy” or,*
- (v) by reason of “any error of fact or law or a procedural error.”*

The issue of a defective permission does not arise in this context. The only permission which exists is Ref: 83/09 which cannot be considered defective. The fact that the quarry was registered under s.261 Q/04/3002 is not a permission *per se* as it does not have the status of a permission granted following a *de novo* s.34 application. In any event the registration under s.261 is not defective and the additional 5 conditions attached under s.261(6)(a)(ii) were fully complied with.

The assessment under s261A is defective, however, that is not a permission but merely an assessment of the quarry to determine whether it is compliant under EU law.

In the circumstances, therefore, the s.177B route is not an option.

Section 177D (1) provides for the defective permission route or in the alternative:

“(b) that exceptional circumstances exist such that the Board considers it appropriate to permit the opportunity for regularisation of the development by permitting an application for substitute consent.”

Subsection 177D(2) provides:

“(2) In considering whether exceptional circumstances exist the Board shall have regard to the following matters:

(a) whether regularisation of the development concerned would circumvent the purpose and objectives of the Environmental Impact Assessment Directive or the Habitats Directive;

(b) whether the applicant had or could reasonably have had a belief that the development was not unauthorised;

(c) whether the ability to carry out an assessment of the environmental impacts of the development for the purpose of an environmental impact assessment or an appropriate assessment and to provide for public participation in such an assessment has been substantially impaired;

(d) the actual or likely significant effects on the environment or adverse effects on the integrity of a European site resulting from the carrying out or continuation of the development;

(e) the extent to which significant effects on the environment or adverse effects on the integrity of a European site can be remediated;

(f) whether the applicant has complied with previous planning permissions granted or has previously carried out an unauthorised development;

(g) such other matters as the Board considers relevant.”

Such application is made for leave to apply for substitute consent which is provided under section 177C:

“177C.— (1) A person who has carried out a development referred to in *subsection (2)*, or the owner or occupier of the land as appropriate, to whom no notice has been given under *section 177B*, may apply to the Board for leave to apply for substitute consent in respect of the development.

(2) A development in relation to which an applicant may make an application referred to in *subsection (1)* is a development which has been carried out where an environmental impact assessment, a determination as to whether an environmental impact assessment is required, or an appropriate assessment, was or is required, and in respect of which—

(a) the applicant considers that a permission granted for the development by a planning authority or the Board may be in breach of law, invalid or otherwise defective in a material respect, whether pursuant to a final judgment of a court of competent

jurisdiction in the State or the Court of Justice of the European Union, or otherwise, by reason of—

(i) any matter contained in or omitted from the application for permission including omission of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or inadequacy of an environmental impact assessment report or a Natura impact statement or both that report and that statement], as the case may be, or

(ii) any error of fact or law or a procedural error,

Or

(b) the applicant is of the opinion that exceptional circumstances exist such that it may be appropriate to permit the regularisation of the development by permitting an application for substitute consent.

(3) An applicant for leave to apply for substitute consent under *subsection (1)* shall furnish the following to the Board:

(a) any documents that he or she considers are relevant to support his or her application.

(aa)

(b) any additional information or documentation that may be requested by the Board, within the period specified in such a request.

(3A) The information furnished under *subsection (3)(aa)* may be accompanied by a description of the features, if any, of the development and the measures, if any, incorporated or envisaged to avoid, prevent or reduce what might otherwise be or have been significant adverse effects on the environment of the development.

(4) Where an applicant for leave to apply for substitute consent under *subsection (1)* fails to furnish additional information or documentation within the period specified in a request under *subsection (3)(b)*, or such additional period as the Board may allow, the application shall be deemed to have been withdrawn by the applicant.

(5) The Board may seek information and documents as it sees fit from the planning authority for the administrative area in which the development the subject of the application under this section is situated, including information and documents in relation to a permission referred to in *subsection (2)(a)* and in relation to any other development that may have been carried out by the applicant and the planning authority shall furnish the information not later than 6 weeks after the information is sought by the Board.”

177D(3) provides that in deciding whether it is prepared to grant leave to apply for substitute consent under section 177D the Board shall have regard to any information furnished by the applicant under section 177C(3) information, if any, furnished under section 177C(3A) and any information furnished by the planning authority under section 177C(5).

The circumstances which have arisen in this instance clearly provide for exceptional circumstances as envisaged under section 177D(2). It is advised, therefore, that the appropriate (and indeed the only) route for regularisation of the quarry through substitute consent is to make an application under section 177C to the Board seeking leave to apply.

The application must comply with the requirements set out in section 177C and 177D stated above to include the information which demonstrated exceptional circumstances which have caused the situation to arise, through no fault of Querist.

2.1. Permission for further development of the quarry

An application may be made to the Board under s.37L of the 2000 Act, however s. 37L(1) provides:

“Where an application for substitute consent is or was required to be made by the owner or operator of a quarry pursuant to subsection (7), (10) or (12) of section 261A, the owner or operator may apply for permission to further develop that quarry in accordance with this section.”

Subsection (7), (10) and (2) all include scenarios where a notice was issued under subsections 261A(3)(a), (4)(a) or (5)(a), none of which apply in this instance, given that in its s.261A assessment, the planning authority decided that no further action was required and therefore no notice was issued.

Section 37L was enacted to close the gap regarding permissions for further development where substitute consent was granted following notices issued under s.261A requiring application for substitute consent to be made to the Board. It appears that an application under s.37L for permission for further development is not available in this instance.

If there was a defective permission, which unfortunately is not the case, the application for substitute consent contemplates future development. In this respect s.177(2A)(a) provides:

“(2A)(a) Where an application for substitute consent is made in respect of a development pursuant to—

- (i) a notice given under section 177B,
- (ii) a decision to grant leave to apply for substitute consent under section 177D in respect of a development to which section 177D(1)(a) applies, or
- (iii) a decision to grant leave to apply for substitute consent under section 261A(20)(a), that application may, subject to paragraph (b), be made in relation to—
 - (I) that part of the development permitted under the permission granted in respect of that development that has been carried out at the time of the application, or
 - (II) that part of the development permitted under the permission granted in respect of that development that has been carried out at the time of the application and all or part of the development permitted under the permission granted in respect of that development that has not been carried out at the time of the application.”

Further development in an application for substitute consent where the permission is defective is envisaged also in s.177I(2)(d)(i) regarding the report from the planning authority is required

to be submitted to the Board where an application for substitute consent is made and which refers to development which is ‘proposed to take place’.

This unfortunately has no application in this instance. The only other route available, therefore, is to apply to Monaghan County Council planning authority under s.34 for permission for further development of the quarry. The application will require an EIAR to be submitted and an AA screening report or NIS to accompany the application.

3. Enforcement

On foot of a letter of complaint to Monaghan County Council planning authority (and letter dated 12 June 2020 from A&L Goodbody representing Lagan Asphalt Ltd. to Querist solicitor) a warning letter pursuant to section 152 of the PDA 2000 as amended dated 2nd October 2019 was directed to Querist in respect of an extension to quarrying on the lands without permission/unauthorised quarrying at Scotshouse Quarries was issued to Querist.

Informal discussions took place with representatives of the planning authority after the warning letter was received and a submission dated 12th November 2019 was submitted by Quarryplan on Querist’s behalf to the planning authority within 4 weeks of service of the warning letter.

A second warning letter dated 20th February 2020 couched in similar terms was directed to Scotshouse Quarries Limited.

Following the second warning letter, a further submission dated 13th March 2020 was submitted to the enforcement officer by Quarryplan on behalf of Querist.

It is noted that the letter from A&L Goodbody to Querist’s solicitor post-dates the issuing of the first enforcement notice under section 154 and threatens in effect that if quarrying continues that is not permitted under planning permission it reserves the right to issue proceedings under section 160 PDA as amended.

It is noted that two contracts for local and regional roads were withdrawn from Scotshouse Quarries limited resulting from the complaint. In addition, communications from two national newspaper journalists to Monaghan County Council suggest that the impression had been created that Querist had done something wrong, which is not the case.

An enforcement notice under section 154 PDA issued 19th May 2020, which was withdrawn. A second dated 21st May 2020, was withdrawn also. The third and final enforcement notice dated 2nd June 2020 (no planning register reference shown) served on 3rd June 2020 requires the following actions:

“Action A

On or before the day of 2nd October 2020 (extended to 2nd April 2021)

(A) To permanently cease all quarrying activity on lands which are outside the site area in respect of which planning permission was granted under Ref. No. 83/9 (the unauthorised lands) (see map attachment 2 to this Notice which shows the approved quarry area under Ref. No. 83/9 within a line edged green).

(B) To submit to Monaghan County Council, for its approval a comprehensive site restoration plan in respect of the unauthorised lands prepared by a suitably qualified and competent person and to furnish to Monaghan County Council on request all additional information and documentation required by it to enable it to approve the plan. This plan shall include the following:

- The identification of all items of plant, machinery, scrap metals, stockpiles, and waste material to be removed.
- The position of all quarry faces, together with details of measures to be used to ensure that all final faces are left in a safe and stable condition.
- Details of comprehensive landscape proposals for that re-instatement of the site area to include:
 - o details of species, varieties, number and location of trees/shrubs for purposes of forming dense screen planting along all boundaries.
- A timescale for the implementation and completion of the site restoration plan which shall be completed in full within a period not exceeding 24 months from the date of serving the enforcement notice.

Action B

To carry out and complete in or before the day of 2nd June 2022 all the works required under the site restoration plan which has been approved by Monaghan County Council.” (emphasis added)

Map 1 attached to the enforcement notice delineates the area of the quarry registered under s261. Map 2 delineated the s.261 quarry area (red line) and the area permitted under permission 83/09 (green line).

The timelines for subsequent correspondence /steps are as follows:

- On or about 4th September 2020 a site restoration plan prepared by Finnegan Jackson Surveyors was submitted (in compliance with Action A(B) of the enforcement notice).
- Letter dated 25th September 2020 Querist requested an extension of six months to complete action A and B.
- From FOI enforcement file draft letter dated 1st October 2020 by Darren McAdam which rejected the site restoration plan was emailed to Adrian Hughes which asked if he would sign/send it. (Note 1st October 2020 email from Adrian Hughes to a Gareth McMahan attaching his note of meeting/discussion with Martin Sweeney in which serious allegations were made against Querist, Sweeney was asked to put the accusations in writing, Hughes indicated in his note he would follow up.)
- 16th October 2020 FOI request from OSM solicitors submitted seeking s.261 and s.261A file. Andrew Scurfield, Quarryplan had requested the Managers Orders re same by email dated 26th February 2020.
- 19th October 2020, Darren McAdam carried out a site visit and roughly pointed out the area of the quarry which he considered unauthorised.
- Subsequent to the site visit a meeting was held between Querist, Adrian Hughes senior planner and Darren McAdam at which some notes were taken by Adrian Hughes. Mr Hughes appeared helpful and suggested that if the quarried area was less than 5 ha. (i.e sub-threshold for mandatory EIA) it might be possible to seek retention permission for the exceeded area.

With respect, the suggestion by the senior planner ignored the statutory provisions of section 34(12)(b) PDA 2000 as amended which expressly prohibits a planning authority considering an application for retention permission where a determination as to whether an environmental impact assessment is required, which was required in the instant case. The suggestion by the senior planner, therefore, was misplaced at best as the retention procedure in such circumstances is *ultra vires* the planning authority's statutory powers.

In any event the area of extraction at the time of the s.261A assessment was circa. 5.7-5.8 ha. and the extraction area at the time of the enforcement notice being issued had increased further.

- Email dated 20th October 2020 from Angela Gallagher to Darren McAdam noted that there are no managers orders for Scotshouse. The email post-dates the issue date of the enforcement notice (2nd June 2020) which suggests there is no Managers/CE Order for issue of the enforcement notice, as required under section 151 of the Local Government Act 2001 as amended. or issued by a delegated employee (if appropriate) under section 154 of the LGA 2001 as amended.
- Letter dated 7th December 2020 (response to letter of 25th September 2020 from Querist) agreed 3 month extension for Action A only.
- Further letter dated 17th December 2020 from Querist repeated request for 6 month extension.
- Letter dated 4th January 2021 from Darren McAdam rejected request stating no sufficient justification for the 6 months extension.
- Further letter dated 14th January 2021 from Querist stated he had liaised with the site H&S officer who had highlighted various remedial works which were required particularly to the quarry face to make it safe. This required specialist machinery and given the Covid 19 restrictions imposed by Government this would take considerable time.
- Letter dated 25th January 2021 from Darren McAdam agreed a further extension of time for Action A to 2nd April 2021.
- Letter dated 15th March 2021 from Darren McAdam refers to a site visit on 10th March 2021 and raised concern that quarrying is taking place over and above that which was need to make the quarry face safe as referred to Querist letter dated 14th January 2020 which he states contributed in large part to the agreed extension to 2nd April 2021 for compliance wit action A. He advised only works to make the rock face safe should be carried out and that a site inspection would be carried out on 2nd April 2021 to check for compliance.
- A new/revised site restoration plan prepared by Brackley Landscape Services was submitted along with the submission dated 30th March 2021 to the planning authority and received 1st April 2021. It appears that the new plan and submission was forwarded to Wells & O'Carroll, solicitors acting for Monaghan County Council apparently seeking a legal opinion.
- No response was received as to whether the plan is approved or rejected. This issue is to be raised as a defence in the s.154 proceedings, given that Querist is required to submit a site restoration plan which is required to be approved by the planning authority. The restoration of the site (compliance with the enforcement notice) is dependent on the plan being approved. If there is an issue it is incumbent on the planning authority to inform Querist as soon as possible so that he can take any action required. This issue goes to the heart of the time limits imposed for compliance with the terms of the enforcement notice.

- The summons issued following an application made on 16th August 2021 by or on behalf of Monaghan County Council which alleges an offence that on 18th June 2021 Querist failed to comply with ‘Action A’ of the Enforcement Notice pursuant to section 154 of the 2000 Act served on 3rd June 2020 18th June 2021, contrary to section 154(8) of the 2000 Act.

Action A of the enforcement notices comprised Action A(A) and A(B) which is set out above. It is not clear from the summons as to which part of Action A it is alleged non-compliance has occurred., i.e. cease all quarrying activities, Action A(A) and/or submit a comprehensive site restoration plan to Monaghan County Council for approval, Action A(B).

A new/revised site restoration plan was received by Monaghan County Council on 1st April 2021 for which no response has been received. It is noted that the site restoration plan is to include ‘*The identification of all items of plant, machinery, scrap metals, stockpiles and waste material to be removed*’. Following a site visit on 3rd September 2021 and consultation, stockpiles of material were noted on the alleged unauthorised quarry floor. It seems from Action A(B) that the site restoration plan requires the removal of stockpiles, hence such activity cannot amount to a non-compliance with Action (A)(B) stated in the enforcement notice.

It is noted that the site restoration plan includes a requirement to identify stockpiles to be removed, therefore, movement of materials from the ‘unauthorised area’ is required under Action A(B). This may have been an activity which occurred on 18th June 2021, however that is not clear from the Summons.

Furthermore, Desmond Black of Safeman Limited who has responsibility for Health and Safety on the site issued a report dated 7th June 2021 in respect of an inspection of the quarry on that date. He identified a lot of cracks and a large overhang of quarry face. He proceeded to inspect the quarry face from the top of the quarry and concluded that the only solution to make the face safe was to drill holes and blast the overhang as it was in a dangerous condition and required urgent attention to prevent any rock slide. He contacted Exsol, who carried out drilling and blasting at the quarry and arranged for its representative to visit the site as soon as possible to make the rock face safe. Desmond Black states that he took it upon himself to make the arrangement given the traumatic family circumstances for Querist and his family at the time. He indicated the next available date that Exsol to carry out the blasts was 18th June 2021.

A further letter dated 18th June 2021 from Desmond Black confirmed that the blasts had taken place in the places that he had marked out and that he was satisfied that the area was now in a safe condition and posed no further risk to operatives working on site. Querist and/or any member of his family was on site on the date which coincided with the funeral of a close family member.

A letter dated 22nd June 2021 from Exsol Ltd. reflects and supports the situation described above.

3.1.Enforcement under section 154 of the Planning and Development Act 2000 as amended

Before addressing the provisions of section 154 of the 2000 Act it is necessary to review relevant aspects of the procedure under sections 152 and 153, in particular, leading to the decision on the part of the planning authority to issue an enforcement notice .

Section 152(1) requires the planning authority to issue a warning letter *inter alia* to the owner/occupier of lands following a representation in writing (or otherwise) that unauthorised development may have been, is being or may be carried out, and it appears to the planning authority that the representation is not vexatious, frivolous or without substance or foundation.

Subsection 152(2) provides that where the development in question is of a trivial nature the planning authority may decide not to issue a warning letter. Subsection 152(4)(b) provides that a person served with a warning letter may make written submissions/observations regarding the purported offence within 4 weeks of service of the warning letters

Section 153(1) requires the planning authority to make such investigation as it considers necessary to enable it to make a decision on whether to issue an enforcement notice or initiate injunction proceedings under section 160.

Subsection 153(3) requires the planning authority to consider any representations made i.e. letter(s) of complaint or submissions, under s.152(4)(b). The decision whether to issue the enforcement notice including the reasons for the decision must be entered in the planning register (s.153(4)). The extent of the duty to give reasons depends on the context and in certain cases more substantial reasons are necessary, *O'Neill & Ors .v. Kerry County Council* [2015] IEHD 827. In that case Humphreys J refused leave to apply for judicial review of the decision of Kerry County Council to issue an enforcement notice as the reasons for its decision were set out in the recitals of the notice.

Following an investigation, where the planning authority establishes that unauthorised development (other than that is of a trivial or minor nature) has been or is being carried out and the position has not been remedied (by the owner/occupier) the planning authority must issue an enforcement notice under s.154 (and or proceedings under s.160) unless there are compelling reasons for not doing so, (s.153(7)).

The question of what amount to ‘compelling reasons’ for not issuing an enforcement notice has not yet troubled the courts. It is arguable that the matters which constitute exceptional circumstances in respect of an application for leave to apply for substitute consent/substitute consent to the Board, may also be considered compelling reason for the planning authority to have decided not to issue the enforcement notice.

The *O'Neill v Kerry County Council* ‘context’ of the instant case includes the s.261 registration of the quarry, whereby five additional conditions were attached (increasing the condition to 15) with which Querist complied and was informed by the planner from Monaghan County Council following a site visit in March 2014 that “*the quarry operations ongoing and the extraction area remains within the area as detailed under registration 04/3002*”; the close communications between the planning authority and Querist during the various applications for permissions throughout the intervening years which indicated to Querist that quarrying was fully compliant with law; and the significant errors which Monaghan County Council made in its s.261A assessment of the quarry, requires more substantial justification and reasoning on the part of the planning authority in making its decision to issue the enforcement notice, other than the recitals on the notice. The reasons are required to be entered into the planning register.

The circumstances suggest that Monaghan County Council planning authority should have refrained from issuing the section 154 Enforcement Notice and allowed Querist time and supported him in regularising the quarry.

Instead, the planning authority have issued a summons alleging non-compliance with the enforcement notice. The matter of non-compliance referred to in the summons is far from clear. The summons was issued in circumstances where Monaghan County Council, planning authority delayed in its response to the first site restoration plan prepared by Finnegan Jackson Surveys submitted on 4th September 2020 which it rejected eventually by letter dated 12 January 2021 (although the letter had been drafted on 20th October 2020). Following the rejection, the second site restoration plan prepared by Brackley Landscape Services was submitted to the planning authority along with the submission prepared by Earth Science Partnership (Irl.) Ltd. dated 30th March 2021 and was received 1st April 2021. Monaghan County Council planning authority has not responded at all in respect of the second site restoration plan, although the enforcement notice contains strict time limits for compliance which the planning authority itself has imposed.

Querist, therefore, has no idea whether the site restoration plan is acceptable and/or whether actions which were taken in compliance with the enforcement notice, in particular the site restoration plan submitted in compliance with Action A(B), comprise the alleged non-compliance with the enforcement Notice stated in the summons.

The conduct of Monaghan County Council planning authority flies in the face of due process and fair procedure and offends the principles of natural and constitutional justice.

3.2. Jurisdiction of District Court in section 154 proceedings

Proceedings on foot of a summons issued under s.154 are summary in nature. The District Court has limited jurisdiction in such proceedings.

An alleged offence is committed where a person served with an enforcement notice allegedly fails to comply with the notice within the specified time.

The prosecution must show that an enforcement was served on the defendant and that the steps specified have not been carried out. It is not necessary for the prosecution to prove that unauthorised development was carried out.

Section 156(7) provides:

(7) Where an enforcement notice has been served under section 154, it shall be a defence to a prosecution under section 151 or 154 if the defendant proves that he or she took all reasonable steps to secure compliance with the enforcement notice.

In terms of defence the precision of the contents of the enforcement notice are relevant. In *Dundalk Town Council .v. Lawler [2005] ILRM 106* which was referred to the High Court by way of case stated from the District Court, O'Neill J held that the enforcement notice in question had not properly specified the steps required to be taken.

It is advised that this issue arises in the instant case given that the summons refers to a failure to comply with Action A which comprises Actions A(A) and A(B). Given that a new/revised restoration plan was submitted and received by the planning authority on 1st April 2021 but has not been responded to either way, Querist does not know if it has rejected the plan and issued the enforcement notice on that basis. The summons refers to the failure having occurred on 18th June 2021, however, the activity carried out on that date was for health and safety reasons to

make the quarry face safe for quarry operatives in remediating the site. Equally it is possible that stockpiles were removed from the site on the date, however that forms part of site remediation.

Section 156(7) may be relied upon by Querist in his defence given that he has taken all reasonable steps to comply with the enforcement notice in ceasing works within the time period and submitted two (the first rejected) site restoration plans, the second of which has not been acknowledged or responded to by the planning authority. He also took steps to ensure the quarry was made safe which required some blasting of the quarry face to render it safe and has reports from Safemen Limited Training and Consultancy in that regard.

Section 154 proceedings do not give the District Court jurisdiction to direct an order of the High Court in respect of s.177B (if such route was available) or at all. The District Court may in appropriate circumstances refer a question(s) to the High Court as a consultative case stated or a party may appeal a decision of the District Court by way of case stated. Both procedures are complicated, cumbersome, potentially expensive and best avoided if possible.

Where a defective permission is alleged (which is not the case) an Order of the High Court to declare a planning permission defective would arise either from judicial review or section 160 proceedings, neither of which are an option.

4. Prejudice suffered by Querist

Monaghan County Council planning authority was incorrect in its assessment of the quarry under section 261A and its recommendation that no further action was required in 2012. The assessment was entirely flawed. At the time Monaghan County Council planning authority was required and should have issued a notice under subsection 261A(3)(a) directing Querist to apply to the Board for substitute consent under s.177E. In deciding that no further action was required, Monaghan County Council planning authority placed Querist in the compromised position in which he now finds himself, through no fault of his own.

The warning letters and enforcement notice were issued by Monaghan County Council planning authority on foot of a letter of complaint from a competitor, Lagan Asphalt limited. The motive for the complaint is clearly premised on the fact that Scotshouse Quarries Limited now produces similar products to Lagan Asphalt.

Querist has lost the benefits of having a notice issued under section 261A which would have given him the time to regularise the quarry by applying to the Board for substitute consent under section 177E at the time, which is not available to him now. Moreover, Querist could have operated the quarry while the s.261A application was processed by the Board, which also is not available, given the s.154 proceedings issued by the planning authority. The summons to the District Court for alleged non-compliance with the enforcement notice is far from clear.

Querist has submitted a revised restoration plan in compliance with Action A(B) of the Enforcement Notice which was received by Monaghan County Council planning authority on 1st April 202, and for which no response had been forthcoming, yet it imposed strict time limits for compliance. In these circumstances Querist is now having to defend enforcement proceedings under section 154 of the 2000 Act which places Querist in a situation of significant prejudice.

Querist must now apply to the Board under section 177C of the 2000 Act for leave to apply for substitute consent and if leave is granted, he must then apply to the Board for substitute consent under section 177E. In the time it takes for the Board to make its decision in respect of the applications, which could take 4-5 years, to include an application for further development under s.34, Querist cannot operate his quarry to its full extent to extract raw materials, including for the asphalt business which in effect is likely to result in the closure of the quarry and an end his business. Clearly that was the intention of Lagan Asphalt in making its complaint.

Querist may lose his business entirely due to mistakes made by Monaghan County Council planning authority in the s.261A assessment of the quarry. Querist relied upon the correspondence, reports from the planning authority and communications following site visits by its representatives that the quarrying was fully authorised and in compliance with law. He was totally unaware of the mistakes on the part of the planning authority and first became aware that there was an issue when he received the first warning letter dated 2nd October 2019 which he believed must have been sent by mistake.

Querist is further deprived of utilising the 37L procedure to seek permission for further development of the quarry, given that no notice issued under the relevant provisions of section 261A.

In 2019 Monaghan County Council awarded two roads contracts to Scotshouse Quarries for a local road improvement scheme and a national roads (primary and secondary) schemes. Scotshouse successfully competed the projects which were economically advantageous to Monaghan County Council. In 2020 Scotshouse Quarries applied for similar roads contracts and received a letter of intent from Monaghan County council.

Shortly after the letter of complaint from Lagan Asphalt Ltd., citing alleged planning irregularities, Monaghan County Council was forced to withdraw its letter of intent. In that respect, journalists from national newspapers who clearly were alerted to the matter by the complainant, contacted the Council seeking further information regarding contracts with Scotshouse Quarries where there was alleged unauthorised quarrying. Therefore, not only has Querist business suffered the consequences of the mistake by Monaghan County Council, and has to defend enforcement proceedings, the perception has been created that he is responsible.

Querist has been placed in a position of extreme prejudice and detriment through no fault of his own. Monaghan County Council planning authority should rectify the situation and mitigate its mistakes by providing full support to Querist for the application for leave to apply for substitute consent to the Board under s.177C and the subsequent application for substitute consent under section 177E. Furthermore, it is incumbent on Monaghan County Council to alert the Board to its mistakes and to request that the Board give priority to the Querist's application so that it is dealt with as expeditiously as possible.

Furthermore, Monaghan County Council in mitigating the effects of its mistake should agree to a stay on the s.154 proceedings and allow Querist the opportunity to extract materials to supply his asphalt business. In doing so it is merely placing Querist in the position he would have been in had it issued the notice directing that the application be made for substitute consent in 2012.

5. Conclusions for regularisation of quarry

In conclusion a valid permission exists for 3.3 ha. Ref 83/09 to which 10 conditions are attached; the quarry was registered under s.261 to which 5 further conditions attached RefQ04/3002. The s.261A assessment was defective in that a notice under section 261A(3)(a) should have issued requiring Querist to apply for substitute consent at the time, however instead no further action was recommended which was an error on the part of the planning authority.

A defective permission does not arise that would enable an applying for substitute consent s.177B.

An application for leave to apply for substitute consent should be made to the Board, citing exceptional circumstances. The history set out in the foregoing provides ample support to the exceptional circumstances in this instance.

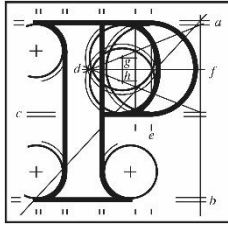
In respect of further development s.37L requires that a notice was issued under the provisions of s.261A requiring the developer to seek substitute consent and that the s.37L application related to an application for further development at a quarry site. As no such notice was issued and an application for substitute consent was not made, the s.37L procedure is not available in this instance. The only option is an application to Monaghan County Council planning authority under s.34 for further development of the site which must be accompanied by an EIAR subsequent to the applications to the Board under s.177C and s.177E.

Nothing further occurs.

Mary Moran-Long BL

16th September 2021

APPENDIX 2-5



An
Bord
Pleanála

Inspector's Report ABP-311755-21

Development	Extraction/quarrying development
Location	Lands at Aghaskew (Dartee by), Scotshouse, Co. Monaghan
Planning Authority	Monaghan County Council
Planning Authority Reg. Ref.	n/a
Applicant(s)	Scotshouse Quarries Ltd
Type of Application	Leave to apply for substitute consent
Planning Authority Decision	n/a
Date of Site Inspection	17 th February 2022
Inspector	Hugh D. Morrison

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1.0 Introduction

- 1.1. This is an application for leave to apply for substitute consent under Section 177(C)(1) & 2(b) of the Planning and Development Act, 2000 – 2021. The applicant is of the opinion that “substantial exceptional circumstances” apply to its lands at Aghaskew (Dartree by), Scotshouse, Co. Monaghan, such that it should be given leave to apply for substitute consent for extraction/quarrying activities.

2.0 Site Location and Description

- 2.1. The site is located 0.9km to the south of the village of Scotshouse within a drumlin landscape. It is accessed off the south-western side of the L6280, 0.75km to the south of its junction with the R212, which runs between Cavan Town and Clones.
- 2.2. The site itself is roughly kite shaped and it extends over an area of 11.5 hectares. Some 8.9 hectares has been the subject of extraction for stone known as greywacke. The site entrance is at the northernmost corner of the site, and it is accompanied by a site office and staff welfare facilities, a weighbridge, a wheel wash, and surface water settlement tanks. Further into the site, but still within its northern portion, lies a considerable amount of plant and machinery used to process and crush stone and to produce coated road stone. The central and southern portions of the site have been the subject of the most recent extraction activities. Stockpiles of material are laid out on the quarry floor within these areas. A road runs around the perimeter of the site, elevated above the exposed rock faces.

3.0 Planning History

- 3.1. The key quarrying elements of the planning history of the site are summarised below.
 - 83/09: Develop quarry c. 3.3 hectares: Permitted on 25th July 1983.
 - QY1: Section 261 registration of a 11.5-hectare quarry with an extraction area of 10 hectares: Registration confirmed by the Planning Authority on 12th April 2005.

- Q04/3002: Section 261(6)(a)(ii) conditions attached to operation of quarry on 24th March 2006. Pursuant to Condition 3 a restoration plan for the 11.5-hectare quarry was submitted to and agreed in writing by the Planning Authority on 6th November 2006.
- Section 261A(2)(a): In 2012, the Planning Authority prepared a “Quarry Assessment – Internal Report”, which addressed the need for EIA and NIA and which recommended that “no further action is required”.
- Enforcement report dated 21st March 2014 following site visit on 14th March 2014: No unauthorised quarrying recorded and no non-compliance with conditions recorded.
- Enforcement enquiry E1760: Enforcement report dated 24th October 2017 concluded that “the quarry is operating within the boundaries/site area registered under ref. 4/3002 and compliant with subsequent permissions.”
- Enforcement enquiry E82.2019: Warning letters issued on 2nd October 2019 and 20th February 2020 concerning extension to quarry and quarrying on lands without planning permission and a subsequent enforcement notice was issued on 2nd June 2020.

3.2. Other planning applications are summarised below, all of which were made by the current applicant:

- 08/787: Existing floodlights: Retention permission granted.
- 09/618: Portal frame workshop: Permitted.
- 10/127: Prefabricated single storey office building, weighbridge, and 2.4m high roadside boundary palisade fence: Retention permission granted.
- 14/124: Crushing plant facility: Retention permission granted.
- 14/157: Site office, wastewater treatment unit and associated raised filter percolation area, 7-space car park, storm drainage, foul drainage and all other associated site works: Permitted and subsequent application 19/9011 for extension of duration of permission granted until 27th August 2024.
- 15/113: Coated road stone plant: Permitted.
- 18/485: ESB sub-station and customer switch room: Permitted.

4.0 The applicant's Case for Leave for Substitute Consent

4.1. I will summarise the applicant's case using the headings that he cites for ease of reference.

Planning History to Section 261A

- 4.2. The quarry has operated over many decades, including from before 1963.
- 4.3. Permitted application 83/09 regularised planning for extraction from within an area of c. 3.3 hectares of an overall landholding of 11.5 hectares.
- 4.4. Entire landholding of 11.5 hectares registered under Section 261, as the quarry QY1, with 10 hectares for extraction. Conditions attached to this registration under Section 261(6)(a)(ii) were added to those attached under permitted application 83/09 and deemed to be equivalent to a Section 34 permission.
- 4.5. At the time of registration, the extraction area permitted under 83/09 had been exceeded.
- 4.6. Additional Condition 3 required the submission of a restoration plan. One was prepared for the entire landholding and accepted in writing by the Planning Authority.
- 4.7. Subsequent applications for ancillary buildings and structures (08/787, 09/618, and 10/127) indicated that the quarry extended over the entire landholding.

Section 261A

- 4.8. In 2012, under Section 261A, the Planning Authority assessed the quarry and concluded that, as neither an EIA nor a NIA offence existed on the site, "no further action" was needed. The need for Appropriate Assessment was screened out.
- 4.9. By 2012, the area under extraction had exceeded 3.3 hectares to extend over an additional 2.4 hectares. Consequently, a total of 5.7 hectares was under extraction, i.e. in excess of the 5-hectare threshold for EIA.
- 4.10. In these circumstances, the Planning Authority's above cited conclusion indicates that it viewed the "modified permission", i.e. 83/09 + Section 261 conditions, as providing for extraction within the registered site.
- 4.11. The Planning Authority's internal quarry assessment report contains plans showing the extent of the 83/09 site and the Section 261 registered site. Under the heading

“EIA/ Determinations in relation to EIA” of this report, the following commentary is given:

This site is authorised by planning permission P/83/09. Whilst it is noted that development has taken place post 1990, post 1997 and post 2008. It is also noted that no quarrying activity has been undertaken outside of the originally, granted site.

The reference here to “originally, granted site” can only “make sense” if it refers to the area of the modified permission.

Further Authorisations Post Section 261A

- 4.12. Both application 14/124, for a static aggregates processing/crushing assembly, and 15/113, for a tarmacadam plant, were permitted in the knowledge that they would be dependent upon site won aggregates, i.e. these aggregates must have been regarded as authorised.
- 4.13. In 2015 a discharge licence WP26/15 was issued to the operator following a further Screening for Appropriate Assessment
- 4.14. Only in 2019, following an enforcement enquiry, did the Planning Authority take the view that the existing modified permission was defective. A warning letter was received by the applicant on 2nd October 2019, and it has ceased extracting from the “unauthorised area” and agreed a site restoration plan for this area.

Route to Planning Compliance

- 4.15. Prior to 2019, the Planning Authority treated the site as fully authorised for quarrying. The applicant reasonably understood that the modified permission was sound and so it purchased the site on this basis.
- 4.16. On foot of the warning notice and an enforcement notice, the applicant, through no fault of its own, must seek to address any shortfall in the authorisation of its site.
- 4.17. In the above cited circumstances, the closure of the quarry would be a disproportionate response.
- 4.18. If the Planning Authority had identified the need for EIA under the Section 261A process in 2012, then the applicant would have been able automatically to avail of the substitute consent process.

4.19. In March 2021, the applicant approached the Planning Authority with a view to applying to the High Court for an order under Section 177B. Its case would have been that the modified permission was valid if defective. The High Court could then have issued an order under Section 177E directing the applicant to apply for substitute consent with a remedial EIAR for the area quarried beyond that which was authorised under 83/09, i.e. as of October 2021 an additional 5.6 hectares. However, as the Planning Authority has not responded to the applicant's approach, it has resorted to the current Section 177C application for leave to apply for substitute consent from the Board.

Applicability of Section 177C Leave to Apply for Substitute Consent

- 4.20. The Board must decide if an EIA and/or a NIA offence exists. If so, then it must decide if exceptional circumstances exist that would justify granting leave to apply for substitute consent under Section 177C.
- 4.21. The applicant accepts that quarrying in its site since 1990 has exceeded the threshold of 5 hectares for EIA and so, in the absence of an EIA, an EIA offence has arisen.
- 4.22. The Planning Authority has Screened for Appropriate Assessment on several occasions, i.e. under the Section 261A process, under subsequent planning applications, and under the discharge licence process. No need for NIA was thereby identified.
- 4.23. The applicant has submitted a Stage 1 Screening for Appropriate Assessment for the site of 8.9 hectares where quarrying has occurred to date. This Screening undertaken to current standards concludes that a Stage 2 Appropriate Assessment is not needed.
- 4.24. Given the planning history of the site, quarrying beyond the original 3.3-hectare site needs to be the subject of EIA, i.e. the 5.6 hectares.
- 4.25. The Board must now decide on whether exceptional circumstances exist, which would allow leave to apply for a substitute consent to be granted, thereby making it possible for a subsequent application to be made for substitute consent with a remedial EIAR.

Considerations including Exceptional Circumstances

(i) Procedural Error

- 4.26. Section 177D(1)(a)(ii) enables the Board to grant leave to apply for substitute consent where “any error of fact or law or procedural error” has occurred.
- 4.27. The applicant relied upon the outcome of the Section 261 process, namely the conditions attached to its site, in proceeding to expand the area of quarrying without seeking any further permission with an EIS under Section 34.
- 4.28. The applicant relied upon the outcome of the Section 261A process, namely that the Planning Authority concluded that “No further action” was needed, thereby unwittingly denying itself access to the process under Sections 261A(2) & (3), which would have allowed the need for EIA to be established and the substitute consent process to be accessed.

(ii) Exceptional Circumstances

- 4.29. The above cited procedural errors are exceptional circumstances in their own right and they are sufficient to justify leave to apply for substitute consent.
- 4.30. Prior to the enforcement enquiry in 2019, the Planning Authority was satisfied with the on-going development of the site as regulated by Section 261 and subsequent permissions/licences granted to it, which would necessarily have entailed assessment of cumulative impact and impacts arising from connectivity.
- 4.31. Under Section 177D(1A)(b), the view is expressed that any EIA of the site would not identify significant risks of environmental impact and so EIA is needed on the basis of the site’s size alone.
- 4.32. Under Section 177D(2), the Board must consider whether various matters (a) – (g) (inclusive) are applicable. Given the planning history of the site, the opportunities that multiple applications afforded for the Planning Authority to assess impacts upon the site, and the applicant’s commitment to obtaining permissions, the view is expressed that matters (a) – (g) are applicable and so exceptional circumstances do exist.
- 4.33. A legal opinion has also been submitted in support of the view that exceptional circumstances do exist.

Conclusion

- 4.34. Extraction was authorised under 83/09 and aerial photographs for 1995 – 2005 illustrate that the area thus authorised was exceeded in advance of the Section 261 process, which resulted in conditions and a modified permission. As no EIA has been undertaken, this modified permission is defective and so the site outside the originally authorised area has been left in planning jeopardy.
- 4.35. As of 18th June 2021, extraction has ceased outside the originally authorised area following works undertaken to ensure that benches are left in a safe condition.
- 4.36. As the Planning Authority has not responded to the applicant's approach to regularise matters under Section 177B, the current application, under Section 177C, was made for leave to apply for substitute consent from the Board. Relevant conditions in this respect, under Section 177D, have been complied with.
- 4.37. The effect of the Planning Authority's errors and the inevitable lapses in time involved in seeking to regularise the planning of the site mean that the applicant's business has been severely impacted: The remaining reserves within the originally authorised area are extremely limited.

5.0 Planning Authority Submission

- 5.1. The Planning Authority's view is that exceptional circumstances arise in this case.
- 5.2. By way of background to this view it states the following:

The 2006 decision on the 261 quarry registration arguably should have identified the site being quarried. The 2014 assessment and decision on the 261A quarry registration application failed to identify that the quarrying extraction area was extending beyond the site area of the P9/83 application.

Furthermore the assessment of planning enforcement complaints in 2014 and 2017 erroneously deemed an enlarged quarrying site to be authorised by virtue of having regard to documents submitted with the 261 registration application and which showed a quarrying area beyond the red line site area of the P9/83 application.

6.0 Legislative Provisions

6.1. Section 34 of the Planning and Development Act, 2000 – 2021, (hereafter referred to as the Act) addresses “Permission for development”. Sub-section 12 states the following:

A planning authority shall refuse to consider an application to retain unauthorised development of land where the authority decides that if an application for permission had been made in respect of the development concerned before it was commenced the application would have required that one or more than one of the following was carried out —

(a) an environmental impact assessment,

(b) a determination as to whether an environmental impact assessment is required, or

(c) an appropriate assessment.

6.2. Section 177C of the Act addresses the subject of “Application for leave to apply for substitute consent where notice not served by planning authority.” Relevant extracts from this Section are set out below.

(1) A person who has carried out a development referred to in subsection (2), or the owner or occupier of the land as appropriate, to whom no notice has been given under section 177B, may apply to the Board for leave to apply for substitute consent in respect of the development.

(2) A development in relation to which an applicant may make an application referred to in subsection (1) is a development which has been carried out where an environmental impact assessment, a determination as to whether an environmental impact assessment is required, or an appropriate assessment, was or is required, and in respect of which —

(a) the applicant considers that a permission granted for the development by a planning authority or the Board may be in breach of law, invalid or otherwise defective in a material respect, whether pursuant to a final judgment of a court of competent jurisdiction in the State or the Court of Justice of the European Union, or otherwise, by reason of —

(i) any matter contained in or omitted from the application for permission including omission of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or

inadequacy of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or

(ii) any error of fact or law or a procedural error,

or

(b) the applicant is of the opinion that exceptional circumstances exist such that it may be appropriate to permit the regularisation of the development by permitting an application for substitute consent.

6.3. Section 177D of the Act addresses the subject of “Decision of Board on whether to grant leave to apply for substitute consent.” Relevant extracts from this Section are set out below.

(1) The Board shall only grant leave to apply for substitute consent in respect of an application under section 177C where it is satisfied that an environmental impact assessment, a determination as to whether an environmental impact assessment is required, or an appropriate assessment, was or is required in respect of the development concerned and where it is further satisfied —

(a) that a permission granted for development by a planning authority or the Board is in breach of law, invalid or otherwise defective in a material respect whether by reason of a final judgment of a court of competent jurisdiction in the State or the Court of Justice of the European Union, or otherwise, by reason of —

(i) any matter contained in or omitted from the application for the permission including omission of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or inadequacy of an environmental impact assessment report or a Natura impact statement or both that report and that statement, as the case may be, or

(ii) any error of fact or law or procedural error,

or

(b) that exceptional circumstances exist such that the Board considers it appropriate to permit the opportunity for regularisation of the development by permitting an application for substitute consent.

(2) In considering whether exceptional circumstances exist the Board shall have regard to the following matters:

(a) whether regularisation of the development concerned would circumvent the purpose and objectives of the Environmental Impact Assessment Directive or the Habitats Directive;

(b) whether the applicant had or could reasonably have had a belief that the development was not unauthorised;

(c) whether the ability to carry out an assessment of the environmental impacts of the development for the purpose of an environmental impact assessment or an appropriate assessment and to provide for public participation in such an assessment has been substantially impaired;

(d) the actual or likely significant effects on the environment or adverse effects on the integrity of a European site resulting from the carrying out or continuation of the development;

(e) the extent to which significant effects on the environment or adverse effects on the integrity of a European site can be remediated;

(f) whether the applicant has complied with previous planning permissions granted or has previously carried out an unauthorised development;

(g) such other matters as the Board considers relevant.

7.0 National Planning Guidelines

7.1. The Quarries and Ancillary Activities Guidelines (April 2004) advise on the Section 261 registration process as follows:

Section 261 of the Planning and Development Act, 2000 introduces a new system of once-off registration for all quarries. Only those for which planning permission was granted in the 5 years before section 261 became operative are excluded. The registration system has two purposes:

- to give a 'snapshot' of the current use of land for quarrying. This will ensure that local authorities have basic information about a quarry's operations. Planning permission may then be required for any proposed expansion or intensification of its operations;*
- where necessary, to permit the introduction of new or modified controls on the operation of certain quarries. These controls may be imposed in two ways. Quarries may have to comply with certain new or modified conditions on their operation...*

8.0 Assessment

- 8.1. The applicant accepts that, as the area of rock extraction within its site has extended over an area of 8.9 hectares, the threshold for mandatory EIA of 5 hectares cited under Item 2(b) of Part 2 of Schedule 5 to Article 93 of the Planning and Development Regulations, 2001 – 2021, has been exceeded and so its quarry needs to be the subject of EIA.
- 8.2. The applicant has addressed the question as to whether its quarry needs to be the subject of NIA, too. Previously, Stage 1 screening exercises were conducted as part of applications for planning permission and for a discharge licence. In each case, it was concluded that such need did not arise. The applicant has submitted with its current application a further Stage 1 screening exercise, which applies contemporaneous standards to this matter. Again, the conclusion reached is that NIA is not required.
- 8.3. I have reviewed the applicant's submission and I concur that the need for EIA, as distinct from NIA, exists and so I will proceed on this basis.
- 8.4. The applicant requests leave to apply for substitute consent under Section 177C of the Planning and Development Act, 2000 – 20021. By way of background, it explains in its submission why the route to planning compliance on its site necessarily entails the use of this Section. Section 177C(2) applies to situations within which development has been carried out where an EIA was or is required. It then goes on, to outline two alternative scenarios denoted as (a) and (b), under which an application for leave for substitute consent can be made:
- (a) envisages a scenario wherein a permission granted for the development "may be in breach of law, invalid or otherwise defective in a material respect" by reason of (i), for example, the omission of an EIAR, or (ii) "any error of fact or law or a procedural error", or
 - (b) envisages a scenario wherein "the applicant is of the opinion that exceptional circumstances exist such that it may be appropriate to permit the regularisation of the development by permitting an application for substitute consent."
- 8.5. On Page 10 of the submitted legal opinion, the applicant's barrister states that the planning permission granted to application 83/09 is the only planning permission that

exists for quarrying on the site, and it is not considered to be defective. She goes on to state that the Section 261 registration “is not a permission *per se* as it does not have the status of a permission granted under a *de novo* Section 34 application.” She adds that this registration was not defective, and the additional conditions attached under it have been complied with.

8.6. Section 177(D) addresses the decision of the Board on whether to grant leave to apply for substitute consent. Under Section 177D(1) the above cited scenarios are repeated from Section 177C(2). In the light of the foregoing paragraph, I consider that the first of these scenarios, (a), is not applicable to the applicant’s situation. I will, therefore, consider whether the second scenario, (b), is applicable. Section 177D(2) sets out matters, denoted as (a) – (g), which the Board is to have regard to in considering whether exceptional circumstances exist. I will consider each of these matters in turn below.

(a) Whether regularisation of the development concerned would circumvent the purpose and objectives of the EIA Directive or the Habitats Directive.

8.7. Article 1 of the EIA Directive states that it “shall apply to the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment.”

8.8. The applicant expresses the view that its project does not have significant effects on the environment and that the need for EIA arises only from the fact that the extraction area of its quarry has exceeded 5 hectares, i.e. the threshold for mandatory EIA.

8.9. I consider that the submission of an application for substitute consent with a remedial Environmental Impact Assessment Report (rEIAR) would provide the opportunity for the environmental effects of the applicant’s project to be assessed and for any mitigation measures to be identified and implemented. In such circumstances, the purpose and objectives of the EIA Directive would be capable of being upheld and so I conclude that such regularisation would not circumvent them.

8.10. The applicant draws attention to several Stage 1 screening exercises for Appropriate Assessment that have been undertaken by the Planning Authority. It also draws attention to its own screening exercise, which was undertaken for the working quarry, i.e. the extraction area of 8.9 hectares, and which is submitted as part of its

current application. In each case the conclusion was reached that Stage 2 Appropriate Assessment is not required. *Prima facie* the Habitats Directive is not therefore relevant to the current application.

(b) Whether the applicant had or could reasonably have had a belief that the development was authorised.

8.11. The applicant sets out the planning history of the site. It purchased the site of the quarry following its Section 261 registration and the attachment of conditions. One of these conditions required the preparation of a site restoration plan. Such a plan was subsequently prepared for the entire site and submitted to and agreed in writing by the Planning Authority.

8.12. The applicant as owner of the site subsequently made a considerable number of planning applications and its site was the subject of several enforcement enquiries. Prior to the warning notices served upon it in 2019, the applicant had been given no reason to believe by the Planning Authority that its extraction activities within the site of the quarry were unauthorised for planning purposes. Instead, the Planning Authority gave the applicant every reason to believe that it considered these activities to be authorised, as is illustrated by the following items:

- Under Section 261A, the Planning Authority assessed the site of the quarry in 2012. Extraction activities were occurring over an area of 2.4 hectares beyond the boundaries of the 3.3-hectare site permitted for quarrying under 83/09. Nevertheless, the Planning Authority concluded that no EIA offence was occurring and so “no further action” was needed.
- An enforcement report following a site visit in March 2014 recorded no unauthorised quarrying and no non-compliance with conditions.
- Under 14/124, the applicant applied to retain a crushing plant facility on the site of the quarry. The case planner’s report concludes that “The elements of the development to be retained are used in conjunction with the daily operations of this established quarry and are therefore considered acceptable in principle from a planning perspective.”
- Under 15/113, the applicant applied for a coated road stone plant. An accompanying “Written Statement” comments that “Approximately 90 – 95%

of materials to be employed at the plant site will be sourced from the existing quarry.”

- An enforcement report following a site visit in October 2017 recorded the quarry is operating within the boundaries/site area registered under ref. 4/3002 and in compliance with subsequent permissions.

8.13. The applicant draws particular attention to applications 14/124 and 15/113, which entailed the introduction of plant and machinery to the site of the quarry on the basis that they would use the aggregates extracted on-site from within areas that exceeded the boundaries of the 83/09 permission. For these applications to be permitted, the accompanying extraction of aggregates must have been regarded as authorised. The conclusions of the two enforcement reports, cited above, corroborate that this was indeed the understanding.

8.14. In the Planning Authority’s submission to the current application, it accepts that it failed, at both the Section 261 and 261A stages, to identify that extraction was occurring beyond the boundaries of the 83/09 permission. It also accepts that the enforcement reports referred to above erred insofar as they understood the site registered under Section 261 to be authorised for extraction beyond the boundaries of the 83/09 permission.

8.15. In the light of the foregoing, I conclude that the applicant had or could reasonably have had a belief that the development was authorised.

(c) Whether the ability to carry out an assessment of the environmental impacts of the development for the purpose of an EIA or an AA and to provide public participation in such a scenario has been substantially impaired.

8.16. The applicant acknowledges that substitute consent is needed for the extraction that has occurred beyond the boundaries of the 83/09 permission and that this extraction needs to be the subject of a rEiAR. During my site visit, I observed that recent extraction appears to have occurred wholly within the area beyond the 83/09 permission.

8.17. A rEiAR would provide the opportunity for the environmental impacts of the above cited extraction to be assessed and reported upon. As part of an application for substitute consent, it would be the subject of public participation and it would inform

the EIA conducted by the Board. I do not anticipate that the ability to prepare a rEIAR has been substantially impaired by the chronology of development upon the site or any other factors.

8.18. I conclude that the ability to carry out an assessment of the environmental impacts of the development for the purpose of an EIA and to provide public participation in such a scenario has not been substantially impaired.

(d) The actual or likely significant effects on the environment or adverse effects on the integrity of a European site resulting from the carrying out or continuation of the development.

8.19. As noted above, the applicant does not consider that actual significant effects on the environment have occurred as a result of extraction activities within the site of its quarry. Clearly, a rEIAR would provide the opportunity to assess and report upon all such effects and to establish whether they are significant or not. The Board's own EIA would further consider this question.

8.20. I conclude that whether actual significant effects on the environment resulting from the carrying out of the development that has occurred would be addressed by a rEIAR and a subsequent EIA.

(e) The extent to which significant effects on the environment or adverse effects on the integrity of a European site can be remediated.

8.21. The extraction activities authorised under the permission granted to application 83/09 were conditioned and they were further conditioned under Section 261(6)(a)(ii). The Planning Authority's enforcement officer and the applicant's barrister in her legal opinion advise that these conditions have been/are being complied with. Precedence thereby exists for the regulation of extraction activities on the site of the quarry.

8.22. The more recent extraction activities on the site have occurred beyond the boundaries of the 83/09 permission in an extension to the original quarry. Insofar as the above precedence exists, I consider that it is reasonable to expect that satisfactory remediation of the extended quarry would be attainable too.

8.23. I conclude that it is reasonable to expect that any significant effects on the environment can be remediated to a satisfactory extent.

(f) Whether the applicant has complied with previous planning permissions granted or has previously carried out an unauthorised development.

- 8.24. The planning history of the site of the quarry is summarised under Section 3.0 of my report. This summary includes instances wherein retention permissions were applied for and granted. It also includes evidence from enforcement reports of compliance with planning conditions.
- 8.25. Prior to 2019, there is no evidence before me that either the Planning Authority or the applicant were aware that extraction activities beyond the boundaries of the 83/09 permission were unauthorised. In 2019, these activities were the subject of enforcement action, by means of warning notices and an enforcement notice, which has cumulated in the current application for leave to apply for substitute consent as the hoped-for precursor to a substitute consent and eventual authorisation.
- 8.26. I conclude that the planning history of the site indicates that only the extraction activities that lie behind the current application are unauthorised.

(g) Such other matters as the Board considers relevant.

- 8.27. I am not aware of any other matters that are relevant for the Board to consider in this case.

Overall conclusion

- 8.28. In the light of my above discussion, I conclude that exceptional circumstances do exist under Section 177D(2) and so the applicant's request for leave to apply for substitute consent should be granted.

9.0 Recommendation

That leave to apply for substitute consent be granted.

10.0 Reasons and Considerations

Having regard to Section 177D(1) of the Planning and Development Act, 2000 – 2021, the Board considers that an EIA is required in respect of the development concerned and that exceptional circumstances exist such that the Board considers it appropriate to permit the opportunity for regularisation of the development by permitting an application for substitute consent.

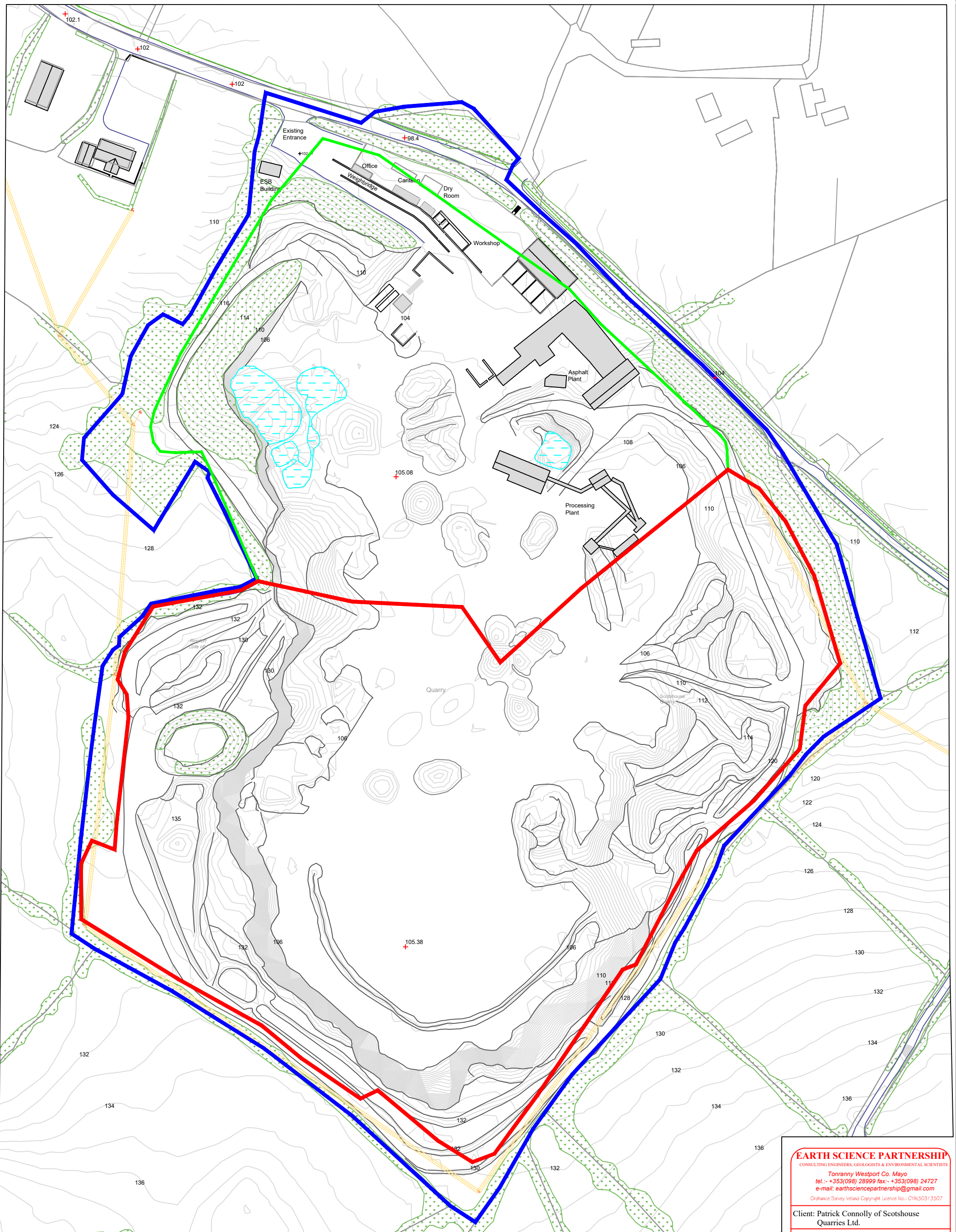
Having regard to Section 177D(2) of the Act, the Board considers these exceptional circumstances to be as follows:

- (a) Regularisation of the development concerned would not circumvent the purpose and objectives of the EIA Directive,
- (b) The applicant had or could reasonable have had a belief that the development was authorised,
- (c) The ability to carry out an assessment of the environmental impacts of the development for the purpose of an EIA and to provide public participation in such a scenario has not been substantially impaired,
- (d) The actual or likely significant effects on the environment resulting from the carrying out or continuation of the development would be capable of assessment, and
- (e) The satisfactory extent to which significant effects on the environment can be remediated.

Hugh D. Morrison
Planning Inspector


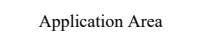
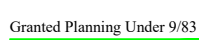
21st February 2022

APPENDIX 3-1



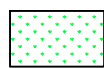
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Legend

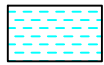
-  Ownership Boundary
-  Application Area
Area = 5.6 Ha
-  Granted Planning Under 9/83
Area = 3.3 Ha (8.2 acres)



Plant & Infrastructure



Vegetation



Water

OS Sheet Ref. No. 1417



All Levels Relative to Ordnance Datum

ITM Coords: 649530 E, 817785 N

EARTH SCIENCE PARTNERSHIP
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Client: Patrick Conolly of Scotthouse Quarries Ltd.

Project: Substitute Consent Application for a Quarry Located at Aughnaskew, Scotthouse, Co. Monaghan.

Title: Existing Site Layout Map

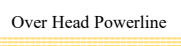
Drawn By: Sean O' Donnell

Checked By: Patrick O' Donnell

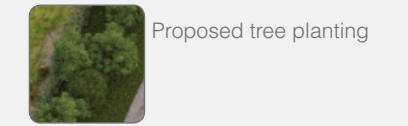
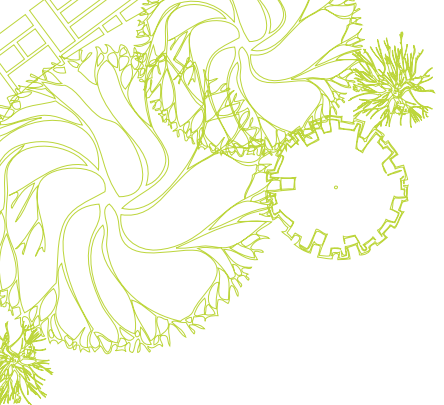
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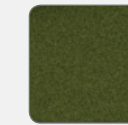
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 Over Head Powerline

APPENDIX 3-2



Proposed tree planting

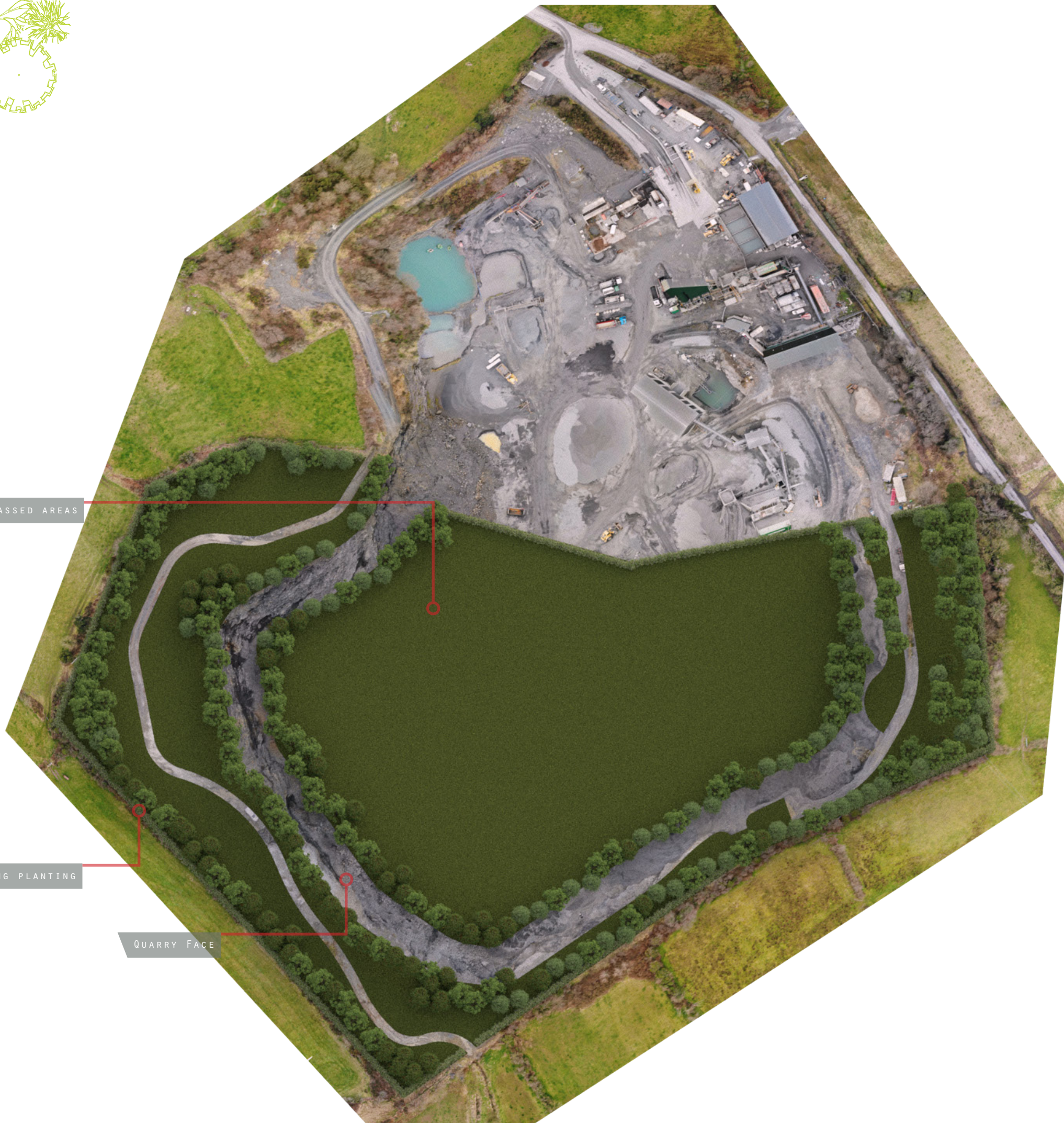


Proposed grassed areas

GRASSED AREAS

NATIVE SCREENING PLANTING

QUARRY FACE

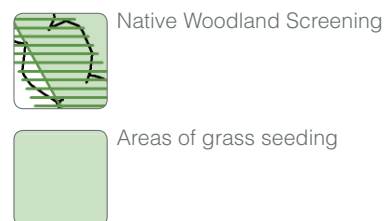
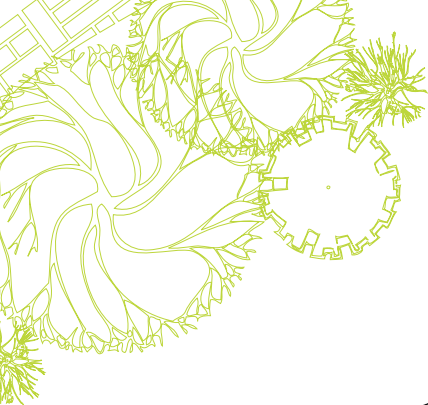


ISSUED FOR REVIEW

Bawnboy, Co.Cavan
www.brackleylandscapes.ie
049 952 3552

Client	Scotshouse Quarry
Project	Scotshouse, Co.Monaghan
Title	Masterplan
Scale	Nts @ A3
Date	19-03-2021
Dwg.no	298-DW01





Hedging

All existing boundary hedges to be thickened where gaps exist with mixed native hedging as per below. All plants planted in triple staggered rows at 400mm spacing. Base of hedge to be mulched with 75mm chipped bark mulch to control weeds and allow establishment.

Name	Size	Density	Type	
Botanical Name	Common	Height	%	
<i>Crataegus monogyna</i>	Hawthorn	60-90cm 1+2	60%	BR
<i>Prunus spinosa</i>	Blackthorn	60-90cm 1+2	20%	BR
<i>Corylus avellana</i>	Hazel	60-90cm 1+2	10%	BR
<i>Malus sylvestris</i>	Crab Apple	60-90cm 1+2	5%	BR
<i>Viburnum opulus</i>	Guelder Rose	60-90cm 1+2	5%	BR

Native Woodland Screening Mix

Total planting area 11250m²

Planting as per below schedule, mixed randomly at 2.5m spacing:

Name	Common	Height/Size	No	Type	Specification
<i>Betula pubescens</i>	Downey Birch	200-250cm	450	BR	Feathered
<i>Alnus glutinosa</i>	Alder	200-250cm	450	BR	Feathered
<i>Quercus robur</i>	Oak	10-12cm	300	BR	Feathered
<i>Pinus sylvestris</i>	Scots pine	1.5-1.75m	300	RB	Feathered
<i>Crataegus monogyna</i>	Hawthorn	200-250cm	300	BR	Feathered

To be under planted with the following native under storey/shrub planting at 1.5m spacing:

Name	Common	Height/Size	%	No	Type
<i>Ilex aquifolium</i>	Holly	40-60cm	20	1000	2L pot
<i>Ulex europaeus</i>	Gorse	30-40cm	50	2500	2L pot
<i>Corylus avellana</i>	Hazel	60-90cm 1+2	30	1500	BR

Grass Seed Mixture

Sow seed as per landscape specification. Minimum of 150mm depth multi-purpose topsoil to BS3882. Recommended sowing rate: 12 – 15kgs per acre. 2.50kg Moira Seed, 2.50kg Aberclyde Seed, 1.00kg Red Clover Seed, 0.75kg Plantain Seed, 0.25kg Puma Chicory Seed, 0.50kg Perennial Chicory Seed, 1.00kg White Clover Seed, 1.00kg Cocksfoot Seed, 0.25kg Yarrow Seed, 2.00kg Timothy Seed, 0.75kg Sainfoin Seed, 0.25 kg Sheeps Parsley Seed, 0.25 kg, 0.25 kg Sheeps Burnet Seed.

General Planting Specification

All handling of plants must be in accordance with the HTA 'Handling and establishing landscape plants' Part I, Part II and Part III (obtainable from the Horticultural Trades Association) and the CPSE publication: 'Plant Handling'. Plants must be supplied at the same size and species as specified in the planting schedule on the landscape masterplan. Any proposed replacement species or deviation from the proposed schedule should be highlighted to and agreed prior to installation. The work must be carried out while soil and weather conditions are suitable. Planting is not to take place during periods of frost, strong winds or when the ground is waterlogged.

All plants are to be watered thoroughly before planting stage to ensure rootball is thoroughly soaked prior to final backfilling. Any topsoil retained on site in stockpiles for use in planting works is to be stored in heaps of no greater than 1.2m in height and is to be kept weed free at all times. Apply proprietary herbicide

to any perennial weeds and allow a period of time recommended by manufacturer to elapse before disturbing and re-using elsewhere on site. Do not use peat or peat based products.

Tree Planting

Follow tree planting procedure as outlined in the tree pit details supplied. Break up bottom of tree pit to a depth of 200mm and ensure ground is free-draining. Loosen edges of tree pit at time of planting by hand, using a fork to ensure good drainage. Pits should be excavated no greater than 48hrs prior to planting and dewatered as required. Incorporate a soil conditioner/ameliorant in the form of peat-free tree and shrub compost or well rotted spent mushroom compost into backfill material at the rate of min. 40L per pit (80L for semi-mature trees and bigger). Backfill topsoil mix in layers of 150mm, firming at each layer and loosening the pit sides to aid drainage. The surface level of the pit should be 50mm above the surrounding ground. Trees shall be planted in the centre of the

excavated pits with the top of the root ball level with the surrounding surface.

Lawn Grass Seeding

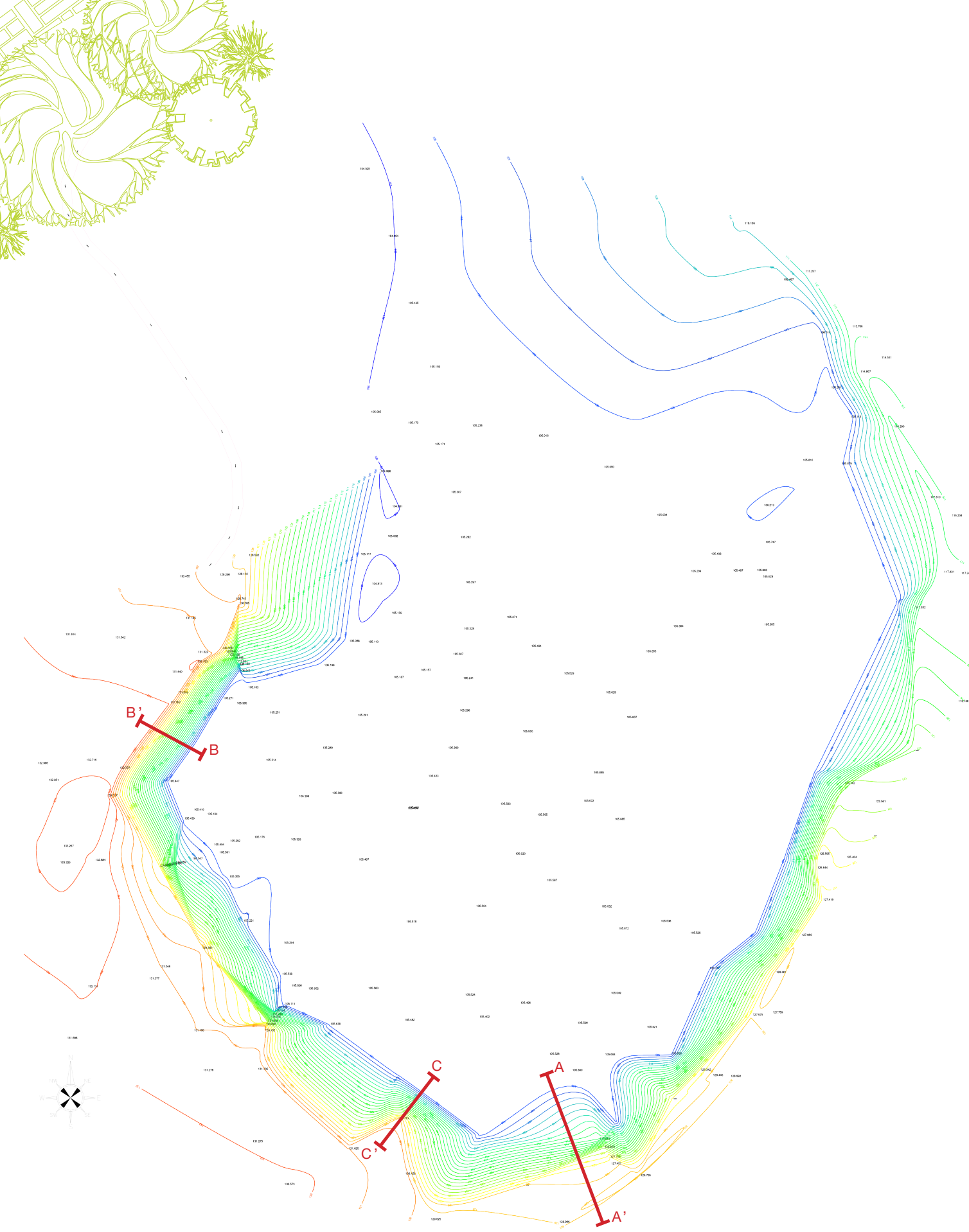
Areas to be seeded are to be finely graded to bring to a uniform and even grade at the correct finished level and to remove all minor hollows and ridges. All stones and debris greater than 50mm in size to be removed and disposed of off-site. Seeded areas are to consist of min. 150mm topsoil; either existing retained site sourced topsoil (free from weeds) or imported topsoil (sandy loam, General Purpose grade to BS3882) or a combination of the two as necessary. Final preparation of the seeded areas shall be carried out as to create a fine tilth surface suitable for seeding. The area is to be seeded between April and October with approved grass seed mix, as specified in the planting schedules at the specified rate. Following seeding areas are to be lightly rolled.



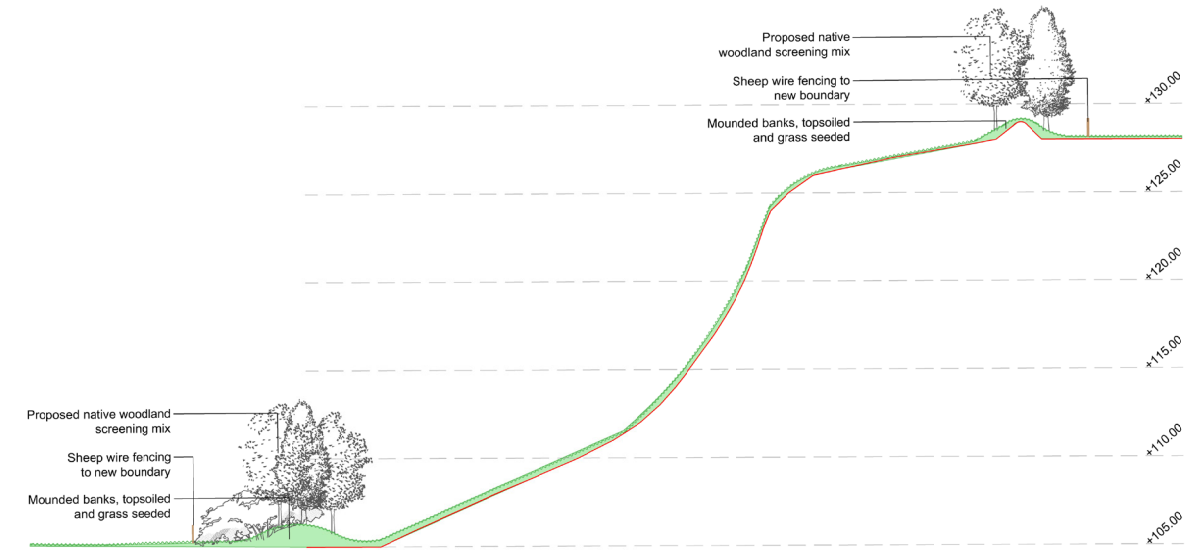
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Client	Scotshouse Quarry
Project	Scotshouse, Co.Monaghan
Title	Planting Specification
Scale	Nts @ A3
Date	19-03-2021
Dwg.no	298-DW02



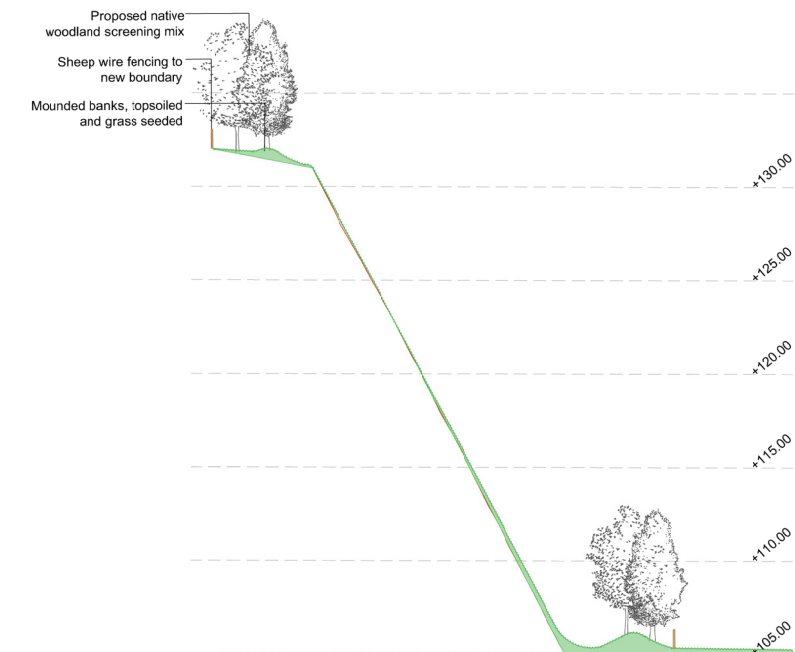
SECTION A-A'



SECTION B'-B



SECTION C'-C



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Client	Scotshouse Quarry
Project	Scotshouse, Co.Monaghan
Title	Contours + Sections
Scale	Nts @ A3
Date	19-03-2021
Dwg.no	298-DW03

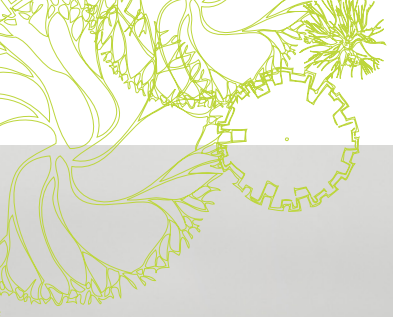


Image taken on 03-03-21



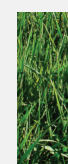
Artists impression of proposed planting result after 5-7 years



Artists impression of proposed planting result after 10-15 years



Viewpoint



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Client	Scotshouse Quarry
Project	Scotshouse, Co.Monaghan
Title	Visuals
Scale	Nts @ A3
Date	19-03-2021
Dwg.no	298-DW04

APPENDIX 7-1

BOREHOLE LOG



Project Number: E2037 - Substitute Consent Application, Scotshouse Quarry Client: Scotshouse Quarries Ltd.
 Project Title: Remedial Environmental Impact Assessment Report Site Location: Aghnaskew, Scotshouse, County Monaghan

BOREHOLE NO: GW1

SUBSURFACE CONDITIONS					SAMPLE		INSTALLATION DETAILS
Depth (mbgl)	SYMBOL	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	
0	XXXXX	0.0-0.15mbgl - Hardcore Broken Bedrock					
1		0.15-49.8mbgl - Competent Bedrock	From 0.15 to 13.0 - Dark grey to black Greywacke interbedded with frequent shale layers				
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13			At 13.0mbgl - Dark grey Greywacke				
14							
15							
16							
17							
18			At 18.0mbgl - Dark grey Greywacke interbedded with frequent soft mudstone/shale layers				
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39			At 39.5mbgl - Grey/greenish Greywacke				
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50			At 49.8mbgl - EOH				

Drill Date: 08/11/2022
 Drill Method: Air rotary
 Drilled By: Petersen Drilling Service Ltd.
 Reference Datum: Elevation: 0
 Easting: 0
 Northing: 0
 Water Strike: Strike: Level:

Logged By: NM
 Checked By: EG
 Revision: Final Page: 1 of 1

BOREHOLE LOG

MOR
MALONE O'REGAN
ENVIRONMENTAL

Ground Floor - Unit 3
Bracken Business Park
Bracken Road,
Sandyford

Project Number: E2037 - Substitute Consent Application, Scotshouse Quarry **Client:** Scotshouse Quarries Ltd.

Project Title: Remedial Environmental Impact Assessment Report **Site Location:** Aghnaskew, Scotshouse, County Monaghan

BOREHOLE NO: GW2

SUBSURFACE CONDITIONS					SAMPLE		INSTALLATION DETAILS
Depth (mbgl)	SYMBOL	DESCRIPTION	COMMENTS	WATER (mbgl)	Depth (mbgl)	PID (ppm)	
0	XXXXX	0.0-0.60mbgl-Hardcore Broken Bedrock					
1		0.60-51.0mbgl - Competent Bedrock	Dark grey Greywacke interbedded with shale/mudstone layers				
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
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42							
43							
44							
45							
46							
47							
48							
49							
50							
51			At 51.0mbgl - EOH				

Drill Date: 08/11/2022
Drill Method: Air rotary
Drilled By: Petersen Drilling Service Ltd.

Reference Datum: Elevation: 0
Easting: 0
Northing: 0

Water Strike:
Strike: Level:

Logged By: NM
Checked By: EG

Revision: Final **Page:** 1 of 1

DISCLAIMER: This log is for environmental purposes only.

APPENDIX 8-1

Appendix 8-1

Table 1:
Groundwater Monitoring Results

Sample Identity			Groundwater Standards		GW1	GW2		External Well
Laboratory Report No.			Groundwater Regulations 2010 (S.I. No. 9 of 2010) as amended (S.I. No. 149 of 2012 and S.I. No. 366 of 2016)	EPA Interim Guideline Value (IGV) for Groundwater	23/512	22/20240	23/512	23/1443
Sample Date					11/01/2023	05/12/2022	11/01/2023	25/01/2023
Parameters	Unit	MDL						
Field Measured Parameters								
pH	pH Units		-	≥6.5 and ≤9.5	7.45	7.27	7.5	-
Temperature	°C		-	25	7.22	9.37	7.24	-
Dissolved Oxygen	mg/l		-	-	8.41	11.11	7.43	-
Dissolved Oxygen	%		-	NAC	71.46	96.97	56.56	-
Electrical Conductivity (EC)	µS/cm		800 ¹ - 1875 ³	1000	423.45	981.41	459.06	-
Oxidation/Reduction Potential (ORP)	mV		-	-	80.3	48.2	80	-
Colour	~		-	NAC	Cloudy	Grey	Cloudy	-
Sheen	~		-	-	No	No	No	-
Observations	~		-	-	No s.s	s.s	No s.s	-
Odour	~		-	-	No	No	No	-
Taste	~		-	-	-	-	-	-
Turbidity	~		-	-	-	-	-	-
Indicators, Inorganics and Nutrients								
Chloride	mg/l		24 ¹ - 187.5 ³	30	12.2	27.7	11.2	9
Nitrate as NO3	mg/l		37.5 ^{3,4}	25	<0.2	<0.2	<0.2	<0.2
Nitrite as NO2	mg/l		0.375 ⁴	0.1	<0.02	<0.02	<0.02	<0.02
Total Ammonium (mg N/l)	mg N/l		0.065 ² - 0.175 ⁴	0.15	0.03	0.06	0.03	<0.03
Total Cyanide	mg/l		0.0375	0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	mg/l		187.5 ¹	200	28.9	219.2	37.4	59.8
Orthophosphate	mg/l		-	0.03	<0.06	<0.06	<0.06	<0.06
Total Organic Carbon (TOC)	mg/l		-	NAC	<2	<2	<2	<2
Total Organic Nitrogen (TON)	mg/l		-	NAC	0.6	1.9	0.8	<0.5
Alkalinity	mg/l		-	NAC	217	179	806	287
Bicarbonate	mg/l		-	NAC	<1	<1	<1	287
Carbonate	mg/l		-	NAC	217	179	806	<1
Hardness (as CaCO ₃)	mg/l		-	200	196	279	196	315
Total Dissolved Solids (TDS)	mg/l		-	1000	294	541	280	396
Fluoride	mg/l		-	1	<0.3	<0.3	<0.3	<0.3
Silica			-	NAC	11.8	9.9	14.1	14.1
Metals								
Dissolved Aluminium	µg/l		150 ⁴	-	<20	<20	<20	<20
Dissolved Arsenic	µg/l		7.5 ⁴	-	3.8	<2.5	<2.5	<2.5
Dissolved Barium	µg/l		-	-	85	32	41	205
Dissolved Boron	µg/l		750	-	25	53	34	29
Dissolved Cadmium	µg/l		3.75	-	<0.5	<0.5	<0.5	<0.5
Dissolved Calcium	mg/l		-	-	38.9	78.4	49	87.6
Total Dissolved Chromium	µg/l		37.5 ⁴	-	<1.5	<1.5	<1.5	<1.5
Dissolved Copper	µg/l		1500	-	<7	<7	<7	<7
Total Iron	µg/l		-	200	<20	<20	<20	<20
Dissolved Lead	µg/l		7.5 ⁴	-	<5	<5	<5	<5
Dissolved Magnesium	mg/l		-	-	23.6	19.7	17.4	22.9
Dissolved Manganese	µg/l		-	-	69	52	10	74
Dissolved Mercury	µg/l		0.75 ⁴	-	<1	<1	<1	<1
Dissolved Nickel	µg/l		15	-	2	3	3	5
Dissolved Potassium	mg/l		-	-	2.5	6.2	2.5	2.5
Dissolved Selenium	µg/l		-	-	<3	<3	<3	<3
Dissolved Sodium	mg/l		150	-	20	58.9	21.5	13.5
Dissolved Zinc	µg/l		75 ⁴	-	8	9	<3	15
Total Uranium	µg/l		-	9	-	<5	-	<5
Organic Compounds								
MTBE	ug/l	<5	10 ⁴	30	<0.1	<0.1	<0.1	<0.1
Benzene	ug/l	<5	0.75 ⁴	1	<0.5	<0.5	<0.5	<0.5
Toluene	ug/l	<5	525 ⁴	10	<5	<5	<5	<5
Ethylbenzene	ug/l	<5	-	10	<1	<1	<1	<1
m/p-Xylene	ug/l	<5	-	10	<2	<2	<2	<2
o-Xylene	ug/l	<5	-	10	<1	<1	<1	<1
Total Xylenes	ug/l			10	<3	<3	<3	<3
Total Petroleum Hydrocarbons (TPH-CWG)								
Aliphatics								
>C5-C6	µg/l	<10	-	-	<10	<10	<10	<10
>C6-C8	µg/l	<10	-	-	<10	<10	<10	<10
>C8-C10	µg/l	<10	-	-	<10	<10	<10	<10
>C10-C12	µg/l	<5	-	-	<5	<5	<5	<5
>C12-C16	µg/l	<10	-	-	<10	<10	<10	<10
>C16-C21	µg/l	<10	-	-	<10	<10	<10	<10
>C21-C35	µg/l	<10	-	-	<10	<10	<10	<10
>C35-C44	µg/l	<10	-	-	<10	<10	<10	<10
Total aliphatics C5-44	µg/l	<10	-	-	<10	<10	<10	<10
Aromatics								
>C5-EC7	µg/l	<10	-	-	<10	<10	<10	<10
>EC7-EC8	µg/l	<10	-	-	<10	<10	<10	<10
>EC8-EC10	µg/l	<10	-	-	<10	<10	<10	<10
>EC10-EC12	µg/l	<5	-	-	<5	<5	<5	<5
>EC12-EC16	µg/l	<10	-	-	<10	<10	<10	<10
>EC16-EC21	µg/l	<10	-	-	<10	<10	<10	<10
>EC21-EC35	µg/l	<10	-	-	<10	<10	<10	<10
>EC35-EC44	µg/l	<10	-	-	<10	<10	<10	<10
Total aromatics C5-44	µg/l	<10	-	-	<10	<10	<10	<10
Total aliphatics and aromatics(C5-44)	µg/l	<10	7.5 ^{4,23}	10	<10	<10	<10	<10

Semi-Volatile Organic Compounds (SVOC's)								
Phenols								
2-Chlorophenol	ug/l	-	-	200	<1	<1	<1	<1
2-Methylphenol	ug/l	-	-	0.5	<0.5	<0.5	<0.5	<0.5
2-Nitrophenol	ug/l	-	-	0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	ug/l	-	-	0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	ug/l	-	-	0.5	<1	<1	<1	<1
2,4,5-Trichlorophenol	ug/l	-	-	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	ug/l	-	-	200	<1	<1	<1	<1
4-Chloro-3-methylphenol	ug/l	-	-	0.5	<0.5	<0.5	<0.5	<0.5
4-Methylphenol	ug/l	-	-	0.5	<1	<1	<1	<1
4-Nitrophenol	ug/l	-	-	0.5	<10	<10	<10	<10
Pentachlorophenol	ug/l	-	-	2	<1	<1	<1	<1
Phenol	ug/l	-	-	-	<1	<1	<1	<1
PAHs								
2-Chloronaphthalene	ug/l	-	-	-	<1	<1	<1	<1
2-Methylnaphthalene	ug/l	-	-	-	<1	<1	<1	<1
Naphthalene	ug/l	-	-	1	<1	<1	<1	<1
Acenaphthylene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Acenaphthene	ug/l	-	-	0.1	<1	<1	<1	<1
Fluorene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Phenanthrene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Anthracene	ug/l	-	-	10000	<0.5	<0.5	<0.5	<0.5
Fluoranthene	ug/l	-	-	1	<0.5	<0.5	<0.5	<0.5
Pyrene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Chrysene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Benzo(bk)fluoranthene	ug/l	-	-	0.5 / 0.05	<1	<1	<1	<1
Benzo(a)pyrene	ug/l	0.0075 ⁴	-	0.01	<1	<1	<1	<1
Indeno(123cd)pyrene	ug/l	-	-	0.05	<1	<1	<1	<1
Dibenzo(ah)anthracene	ug/l	-	-	0.1	<0.5	<0.5	<0.5	<0.5
Benzo(ghi)perylene	ug/l	-	-	0.05	<0.5	<0.5	<0.5	<0.5
Phthalates								
Bis(Di (2-ethylhexyl) phthalate	ug/l	-	6	8	<5	<5	<5	<5
Butylbenzyl phthalate	ug/l	-	-	-	<1	<1	<1	<1
Di-n-butyl phthalate	ug/l	-	-	2	<1.5	<1.5	<1.5	<1.5
Di-n-Octyl phthalate	ug/l	-	-	5	<1	<1	<1	<1
Diethyl phthalate	ug/l	-	-	5	<1	<1	<1	<1
Dimethyl phthalate	ug/l	-	-	5	<1	<1	<1	<1
Additional SVOCs								
SVOC TICs (trace organics)	ug/l	-	-	-	-	-	-	-
1,2-Dichlorobenzene	ug/l	-	-	10	<1	<1	<1	<1
1,2,4-Trichlorobenzene	ug/l	-	-	0.4	<1	<1	<1	<1
1,3-Dichlorobenzene	ug/l	-	-	-	<1	<1	<1	<1
1,4-Dichlorobenzene	ug/l	-	-	-	<1	<1	<1	<1
2-Nitroaniline	ug/l	-	-	-	<1	<1	<1	<1
2,4-Dinitrotoluene	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
2,6-Dinitrotoluene	ug/l	-	-	-	<1	<1	<1	<1
3-Nitroaniline	ug/l	-	-	-	<1	<1	<1	<1
4-Bromodiphenylether (4-Bromophenylphenylether)	ug/l	-	-	-	<1	<1	<1	<1
4-Chloroaniline	ug/l	-	-	-	<1	<1	<1	<1
4-Chlorodiphenylether (4-Chlorophenylphenylether)	ug/l	-	-	-	<1	<1	<1	<1
4-Nitroaniline	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Azobenzene	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Bis(2-chloroethoxy)methane	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Bis(2-chloroethyl)ether	ug/l	-	-	-	<1	<1	<1	<1
Carbazole	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Dibenzofuran	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene	ug/l	-	-	0.03	<1	<1	<1	<1
Hexachlorobutadiene	ug/l	-	-	0.1	<1	<1	<1	<1
Hexachlorocyclopentadiene	ug/l	-	-	-	<1	<1	<1	<1
Hexachloroethane	ug/l	-	-	-	<1	<1	<1	<1
Isophorone	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
N-nitrosodi-n-propylamine	ug/l	-	-	-	<0.5	<0.5	<0.5	<0.5
Nitrobenzene	ug/l	-	-	10	<1	<1	<1	<1

VOCs								
Dichlorodifluoromethane	µg/l	-	-	<2	<2	<2	<2	<2
Methyl Tertiary Butyl Ether	µg/l	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Chloromethane	µg/l	-	-	<3	<3	<3	<3	<3
Vinyl Chloride	µg/l	0.375 ⁴	-	<0.1	<0.1	<0.1	<0.1	<0.1
Bromomethane	µg/l	-	-	<1	<1	<1	<1	<1
Chloroethane	µg/l	-	-	<3	<3	<3	<3	<3
Trichlorofluoromethane	µg/l	-	-	<3	<3	<3	<3	<3
1,1-Dichloroethene	µg/l	-	-	<3	<3	<3	<3	<3
Dichloromethane	µg/l	15 ⁴	0.04	<3	<3	<3	<3	<3
trans-1-2-Dichloroethene	µg/l	-	-	<3	<3	<3	<3	<3
1,1-Dichloroethane	µg/l	-	-	<3	<3	<3	<3	<3
cis-1-2-Dichloroethene	µg/l	-	-	<3	<3	<3	<3	<3
2,2-Dichloropropane	µg/l	-	-	<1	<1	<1	<1	<1
Bromochloromethane	µg/l	-	-	<2	<2	<2	<2	<2
Chloroform	µg/l	-	12	<2	<2	<2	<2	<2
1,1,1-Trichloroethane	µg/l	-	500	<2	<2	<2	<2	<2
1,1-Dichloropropene	µg/l	-	-	<3	<3	<3	<3	<3
Carbon-tetrachloride/Tetrachloromethane	µg/l	-	2	<2	<2	<2	<2	<2
1,2-Dichloroethane	µg/l	2.25 ⁴	3	<2	<2	<2	<2	<2
Benzene	µg/l	0.75 ⁴	-	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	µg/l	7.5 ⁴	10	<3	<3	<3	<3	<3
1,2-Dichloropropane	µg/l	-	-	<2	<2	<2	<2	<2
Dibromomethane	µg/l	-	-	<3	<3	<3	<3	<3
Bromodichloromethane	µg/l	-	-	<2	<2	<2	<2	<2
cis-1-3-Dichloropropene	µg/l	-	-	<2	<2	<2	<2	<2
Toluene	µg/l	525 ⁴	10	<5	<5	<5	<5	<5
trans-1-3-Dichloropropene	µg/l	-	-	<2	<2	<2	<2	<2
1,1,2-Trichloroethane	µg/l	-	-	<2	<2	<2	<2	<2
Tetrachloroethene	µg/l	7.5 ⁴	10	<3	<3	<3	<3	<3
1,3-Dichloropropane	µg/l	-	-	<2	<2	<2	<2	<2
Dibromochloromethane	µg/l	-	-	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/l	-	-	<2	<2	<2	<2	<2
Chlorobenzene	µg/l	-	1	<2	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane	µg/l	-	-	<2	<2	<2	<2	<2
Ethylbenzene	µg/l	-	10	<1	<1	<1	<1	<1
p/m-Xylene	µg/l	-	10	<2	<2	<2	<2	<2
o-Xylene	µg/l	-	10	<1	<1	<1	<1	<1
Styrene	µg/l	-	-	<2	<2	<2	<2	<2
Bromoform	µg/l	-	-	<2	<2	<2	<2	<2
Isopropylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane	µg/l	-	-	<4	<4	<4	<4	<4
Bromobenzene	µg/l	-	-	<2	<2	<2	<2	<2
1,2,3-Trichloropropane	µg/l	-	-	<3	<3	<3	<3	<3
Propylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
2-Chlorotoluene	µg/l	-	-	<3	<3	<3	<3	<3
1,3,5-Trimethylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
4-Chlorotoluene	µg/l	-	-	<3	<3	<3	<3	<3
tert-Butylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
1,2,4-Trimethylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
sec-Butylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
4-Isopropyltoluene	µg/l	-	-	<3	<3	<3	<3	<3
1,3-Dichlorobenzene	µg/l	-	-	<3	<3	<3	<3	<3
1,4-Dichlorobenzene	µg/l	-	-	<3	<3	<3	<3	<3
n-Butylbenzene	µg/l	-	-	<3	<3	<3	<3	<3
1,2-Dichlorobenzene	µg/l	-	10	<3	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	µg/l	-	-	<2	<2	<2	<2	<2
1,2,4-Trichlorobenzene	µg/l	-	0.4	<3	<3	<3	<3	<3
Hexachlorobutadiene	µg/l	-	0.1	<3	<3	<3	<3	<3
Naphthalene	µg/l	-	1	<2	<2	<2	<2	<2
1,2,3-Trichlorobenzene	µg/l	-	0.4	<3	<3	<3	<3	<3
PCBS								
Total PCBs	µg/l	-	0.01	-	<0.2	-	-	<0.2
Pesticides								
Organochlorine Pesticides								
Aldrin	µg/l	-	0.01	-	<0.01	-	-	<0.01
Alpha-HCH	µg/l	-	0.1	-	<0.01	-	-	<0.01
Beta-HCH	µg/l	-	0.1	-	<0.01	-	-	<0.01
Chlorothalonil	µg/l	-	0.1	-	<2.50	-	-	<2.50
cis-Chlordane	µg/l	-	0.1	-	<0.01	-	-	<0.01
Delta-HCH	µg/l	-	0.1	-	<0.01	-	-	<0.01
Dieldrin	µg/l	-	0.01	-	<0.01	-	-	<0.01
Endosulphan I (alpha endosulphan)	µg/l	-	0.1	-	<0.01	-	-	<0.01
Endosulphan II (beta endosulphan)	µg/l	-	0.1	-	<0.01	-	-	<0.01
Endosulphan sulphate	µg/l	-	0.1	-	<0.01	-	-	<0.01
Endrin	µg/l	-	0.1	-	<0.01	-	-	<0.01
Gamma-HCH/Lindane	µg/l	-	0.1	-	<0.01	-	-	<0.01
Heptachlor	µg/l	-	0.1	-	<0.01	-	-	<0.01
Heptachlor Epoxide	µg/l	-	0.1	-	<0.01	-	-	<0.01
Hexachlorobenzene/Benzene Hexachloride (BHC)	µg/l	-	0.03	-	<0.01	-	-	<0.01
Isodrin	µg/l	-	0.1	-	<0.01	-	-	<0.01
o,p'-DDE (2,4'-DDE)	µg/l	-	0.1	-	<0.01	-	-	<0.01
o,p'-DDT (2,4'-DDT)	µg/l	-	0.1	-	<0.01	-	-	<0.01
o,p'-Methoxychlor	µg/l	-	0.1	-	<0.01	-	-	<0.01
o,p'-TDE (Mitotane, Lysodren, Clodithane)	µg/l	-	0.1	-	<0.01	-	-	<0.01
p,p'-DDE (4,4'-DDE)	µg/l	-	0.1	-	<0.01	-	-	<0.01
p,p'-DDT (Clofenotane, 4,4'-DDT)	µg/l	-	0.1	-	<0.01	-	-	<0.01
p,p'-Methoxychlor	µg/l	-	0.1	-	<0.01	-	-	<0.01
p,p'-TDE (Rhothane, Dilene, 4,4'-DDD)	µg/l	-	0.1	-	<0.01	-	-	<0.01
Pendimethalin	µg/l	-	0.1	-	<0.01	-	-	<0.01
Permethrin I (cis-Permethrin)	µg/l	-	-	Limit for total below	<0.01	-	-	<0.01
Permethrin II (trans-Permethrin)	µg/l	-	-	Limit for total below	<0.01	-	-	<0.01
Quintozene (PCNB)	µg/l	-	0.1	-	<0.01	-	-	<0.01
Tecnazene	µg/l	-	0.1	-	<0.01	-	-	<0.01
Telodrin (Isobezan)	µg/l	-	0.1	-	<0.01	-	-	<0.01
trans-Chlordane	µg/l	-	0.1	-	<0.01	-	-	<0.01
Triadimefon	µg/l	-	0.1	-	<0.01	-	-	<0.01
Triallate	µg/l	-	0.1	-	<0.01	-	-	<0.01
Trifluralin	µg/l	-	0.1	-	<0.01	-	-	<0.01

Organophosphorus Pesticides							
Azinphos ethyl	µg/l	-	0.1	<0.01	<0.01		
Azinphos methyl	µg/l	-	0.1	<0.01	<0.05		
Carbophenothion	µg/l	-	0.1	<0.01	<0.01		
Chlorfenvinphos	µg/l	-	5	<0.01	<0.01		
Chlorpyrifos	µg/l	-	90	<0.01	<0.01		
Chlorpyrifos-methyl	µg/l	-	0.1	<0.01	<0.01		
Diazinon	µg/l	-	0.1	<0.01	<0.01		
Dichlorvos	µg/l	-	0.001	<0.01	<0.01		
Disulfoton	µg/l	-	0.1	<0.01	<0.01		
Dimethoate	µg/l	-	0.1	<0.01	<0.01		
Ethion (Diethion)	µg/l	-	0.1	<0.01	<0.01		
Ethyl Parathion (Parathion)	µg/l	-	0.1	<0.01	<0.01		
Etrinfos	µg/l	-	0.1	<0.01	<0.01		
Fenitrothion	µg/l	-	0.1	<0.01	<0.01		
Fenthion	µg/l	-	0.1	<0.01	<0.01		
Malathion	µg/l	-	0.01	<0.01	<0.01		
Methyl Parathion	µg/l	-	0.1	<0.01	<0.01		
Mevinphos	µg/l	-	0.1	<0.01	<0.01		
Phosalone (Benzophosphate)	µg/l	-	0.1	<0.01	<0.01		
Pirimiphos Methyl	µg/l	-	0.1	<0.01	<0.01		
Propetamphos	µg/l	-	0.1	<0.01	<0.01		
Triazophos (Hostathion, Methoxone)	µg/l	-	0.1	<0.01	<0.01		

¹: Test: Assessment for the presence of saline or other intrusions

²: Test: Assessment of adverse impacts of chemical inputs from groundwater on associated surface water bodies.

³: Test: Assessment of whether groundwater intended for human consumption in drinking water protected areas is impacted by pollutants and/or is showing a significant and sustained rise in pollutant levels.

⁴: Test: Assessment of the general quality of groundwater in a groundwater body in terms of whether its ability to support human uses has been significantly impaired by pollution.

²³: Sum of TPH including the VPH range and EPH range: hydrocarbons C2-C5 and hydrocarbons C6-C40 respectively.

NAC: No Abnormal Change

Malone O'Regan
Ground Floor - Unit 3
Bracken Business Park
Bracken Road
Sandyford
Dublin 18
D18 V4K6



Attention : David Dwyer
Date : 16th March, 2023
Your reference : E2037
Our reference : Test Report 22/20240 Batch 1
Location :
Date samples received : 8th December, 2022
Status : Final Report
Issue : 1.2

One sample was received for analysis on 8th December, 2022 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Malone O'Regan
 Reference: E2037
 Location:
 Contact: David Dwyer
 EMT Job No: 22/20240

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-6																	
Sample ID	GW2																	
Depth																		
COC No / misc																		
Containers	V H N P G																	
Sample Date	05/12/2022																	
Sample Type	Ground Water																	
Batch Number	1																	
Date of Receipt	08/12/2022																	
												LOD/LOR	Units	Method No.				
Pesticides																		
Organochlorine Pesticides																		
Aldrin	<0.01											<0.01	ug/l	TM149/PM30				
Alpha-HCH (BHC)	<0.01											<0.01	ug/l	TM149/PM30				
Beta-HCH (BHC)	<0.01											<0.01	ug/l	TM149/PM30				
Chlorothalonil	<2.50 _{Ac}											<0.01	ug/l	TM149/PM30				
cis-Chlordane	<0.01											<0.01	ug/l	TM149/PM30				
Delta-HCH (BHC)	<0.01											<0.01	ug/l	TM149/PM30				
Dieldrin	<0.01											<0.01	ug/l	TM149/PM30				
Endosulphan I	<0.01											<0.01	ug/l	TM149/PM30				
Endosulphan II	<0.01											<0.01	ug/l	TM149/PM30				
Endosulphan sulphate	<0.01											<0.01	ug/l	TM149/PM30				
Endrin	<0.01											<0.01	ug/l	TM149/PM30				
Gamma-HCH (BHC)	<0.01											<0.01	ug/l	TM149/PM30				
Heptachlor	<0.01											<0.01	ug/l	TM149/PM30				
Heptachlor Epoxide	<0.01											<0.01	ug/l	TM149/PM30				
Hexachlorobenzene	<0.01											<0.01	ug/l	TM149/PM30				
Isodrin	<0.01											<0.01	ug/l	TM149/PM30				
o,p'-DDE	<0.01											<0.01	ug/l	TM149/PM30				
o,p'-DDT	<0.01											<0.01	ug/l	TM149/PM30				
o,p'-Methoxychlor	<0.01											<0.01	ug/l	TM149/PM30				
o,p'-TDE	<0.01											<0.01	ug/l	TM149/PM30				
p,p'-DDE	<0.01											<0.01	ug/l	TM149/PM30				
p,p'-DDT	<0.01											<0.01	ug/l	TM149/PM30				
p,p'-Methoxychlor	<0.01											<0.01	ug/l	TM149/PM30				
p,p'-TDE	<0.01											<0.01	ug/l	TM149/PM30				
Pendimethalin	<0.01											<0.01	ug/l	TM149/PM30				
Permethrin I	<0.01											<0.01	ug/l	TM149/PM30				
Permethrin II	<0.01											<0.01	ug/l	TM149/PM30				
Quintozone (PCNB)	<0.01											<0.01	ug/l	TM149/PM30				
Tecnazene	<0.01											<0.01	ug/l	TM149/PM30				
Telodrin	<0.01											<0.01	ug/l	TM149/PM30				
trans-Chlordane	<0.01											<0.01	ug/l	TM149/PM30				
Triadimefon	<0.01											<0.01	ug/l	TM149/PM30				
Triallate	<0.01											<0.01	ug/l	TM149/PM30				
Trifluralin	<0.01											<0.01	ug/l	TM149/PM30				

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Malone O'Regan
Reference: E2037
Location:
Contact: David Dwyer
EMT Job No: 22/20240

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-6										LOD/LOR	Units	Method No.
Sample ID	GW2												
Depth													
COC No / misc													
Containers	V H N P G												
Sample Date	05/12/2022												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	08/12/2022												
Please see attached notes for all abbreviations and acronyms													
Pesticides													
Organophosphorus Pesticides													
Azinphos ethyl	<0.01										<0.01	ug/l	TM149/PM30
Azinphos methyl	<0.01										<0.01	ug/l	TM149/PM30
Carbophenothion	<0.01										<0.01	ug/l	TM149/PM30
Chlorfenvinphos	<0.01										<0.01	ug/l	TM149/PM30
Chlorpyrifos	<0.01										<0.01	ug/l	TM149/PM30
Chlorpyrifos-methyl	<0.01										<0.01	ug/l	TM149/PM30
Diazinon	<0.01										<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01										<0.01	ug/l	TM149/PM30
Disulfoton	<0.01										<0.01	ug/l	TM149/PM30
Dimethoate	<0.01										<0.01	ug/l	TM149/PM30
Ethion	<0.01										<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01										<0.01	ug/l	TM149/PM30
Etrimphos	<0.01										<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01										<0.01	ug/l	TM149/PM30
Fenthion	<0.01										<0.01	ug/l	TM149/PM30
Malathion	<0.01										<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01										<0.01	ug/l	TM149/PM30
Mevinphos	<0.01										<0.01	ug/l	TM149/PM30
Phosalone	<0.01										<0.01	ug/l	TM149/PM30
Pirimiphos Methyl	<0.01										<0.01	ug/l	TM149/PM30
Propetamphos	<0.01										<0.01	ug/l	TM149/PM30
Triazophos	<0.01										<0.01	ug/l	TM149/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10										<10	ug/l	TM36/PM12
>C6-C8 #	<10										<10	ug/l	TM36/PM12
>C8-C10 #	<10										<10	ug/l	TM36/PM12
>C10-C12 #	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10										<10	ug/l	TM5/PM16/PM30
>C35-C44	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10										<10	ug/l	TM5/PM16/PM30

Element Materials Technology

Client Name: Malone O'Regan
Reference: E2037
Location:
Contact: David Dwyer
EMT Job No: 22/20240

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-6																				
Sample ID	GW2																				
Depth																					
COC No / misc																					
Containers	V H N P G																				
Sample Date	05/12/2022																				
Sample Type	Ground Water																				
Batch Number	1																				
Date of Receipt	08/12/2022																				
											LOD/LOR	Units	Method No.								
TPH CWG																					
Aromatics																					
>C5-EC7 #	<10																				
>EC7-EC8 #	<10																				
>EC8-EC10 #	<10																				
>EC10-EC12 #	<5																				
>EC12-EC16 #	<10																				
>EC16-EC21 #	<10																				
>EC21-EC35 #	<10																				
>EC35-EC44	<10																				
Total aromatics C5-44	<10																				
Total aliphatics and aromatics(C5-44)	<10																				
PCBs (Total vs Aroclor 1254)	<0.2																				
Fluoride	<0.3																				
Sulphate as SO ₄ #	219.2																				
Chloride #	27.7																				
Nitrate as NO ₃ #	<0.2																				
Nitrite as NO ₂ #	<0.02																				
Ortho Phosphate as PO ₄ #	<0.06																				
Total Cyanide #	<0.01																				
Ammoniacal Nitrogen as N #	0.06																				
Total Alkalinity as CaCO ₃ #	179																				
Carbonate Alkalinity as CaCO ₃	<1																				
Bicarbonate Alkalinity as CaCO ₃ (water soluble)	179																				
Organic Nitrogen	1.9																				
Silica	9.90																				
Total Organic Carbon #	<2																				
Total Dissolved Solids #	541																				

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Malone O'Regan
Reference: E2037
Location:
Contact: David Dwyer
EMT Job No: 22/20240

SVOC Report : Liquid

EMT Sample No.	1-6																							
Sample ID	GW2																							
Depth																								
COC No / misc																								
Containers	V H N P G																							
Sample Date	05/12/2022																							
Sample Type	Ground Water																							
Batch Number	1																							
Date of Receipt	08/12/2022																							
										LOD/LOR	Units	Method No.	Please see attached notes for all abbreviations and acronyms											
SVOC MS																								
Phenols																								
2-Chlorophenol #	<1												<1	ug/l	TM16/PM30									
2-Methylphenol #	<0.5												<0.5	ug/l	TM16/PM30									
2-Nitrophenol	<0.5												<0.5	ug/l	TM16/PM30									
2,4-Dichlorophenol #	<0.5												<0.5	ug/l	TM16/PM30									
2,4-Dimethylphenol	<1												<1	ug/l	TM16/PM30									
2,4,5-Trichlorophenol #	<0.5												<0.5	ug/l	TM16/PM30									
2,4,6-Trichlorophenol	<1												<1	ug/l	TM16/PM30									
4-Chloro-3-methylphenol #	<0.5												<0.5	ug/l	TM16/PM30									
4-Methylphenol	<1												<1	ug/l	TM16/PM30									
4-Nitrophenol	<10												<10	ug/l	TM16/PM30									
Pentachlorophenol	<1												<1	ug/l	TM16/PM30									
Phenol	<1												<1	ug/l	TM16/PM30									
PAHs																								
2-Chloronaphthalene #	<1												<1	ug/l	TM16/PM30									
2-Methylnaphthalene #	<1												<1	ug/l	TM16/PM30									
Naphthalene #	<1												<1	ug/l	TM16/PM30									
Acenaphthylene #	<0.5												<0.5	ug/l	TM16/PM30									
Acenaphthene #	<1												<1	ug/l	TM16/PM30									
Fluorene #	<0.5												<0.5	ug/l	TM16/PM30									
Phenanthrene #	<0.5												<0.5	ug/l	TM16/PM30									
Anthracene #	<0.5												<0.5	ug/l	TM16/PM30									
Fluoranthene #	<0.5												<0.5	ug/l	TM16/PM30									
Pyrene #	<0.5												<0.5	ug/l	TM16/PM30									
Benzo(a)anthracene #	<0.5												<0.5	ug/l	TM16/PM30									
Chrysene #	<0.5												<0.5	ug/l	TM16/PM30									
Benzo(bk)fluoranthene #	<1												<1	ug/l	TM16/PM30									
Benzo(a)pyrene	<1												<1	ug/l	TM16/PM30									
Indeno(123cd)pyrene	<1												<1	ug/l	TM16/PM30									
Dibenzo(ah)anthracene #	<0.5												<0.5	ug/l	TM16/PM30									
Benzo(ghi)perylene #	<0.5												<0.5	ug/l	TM16/PM30									
Phthalates																								
Bis(2-ethylhexyl) phthalate	<5												<5	ug/l	TM16/PM30									
Butylbenzyl phthalate	<1												<1	ug/l	TM16/PM30									
Di-n-butyl phthalate #	<1.5												<1.5	ug/l	TM16/PM30									
Di-n-Octyl phthalate	<1												<1	ug/l	TM16/PM30									
Diethyl phthalate #	<1												<1	ug/l	TM16/PM30									
Dimethyl phthalate	<1												<1	ug/l	TM16/PM30									

Element Materials Technology

Client Name: Malone O'Regan
Reference: E2037
Location:
Contact: David Dwyer
EMT Job No: 22/20240

SVOC Report : Liquid

EMT Sample No.	1-6												
Sample ID	GW2												
Depth													
COC No / misc													
Containers	V H N P G												
Sample Date	05/12/2022												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	08/12/2022												
										LOD/LOR	Units	Method No.	
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene #	<1									<1	ug/l	TM16/PM30	
1,2,4-Trichlorobenzene #	<1									<1	ug/l	TM16/PM30	
1,3-Dichlorobenzene #	<1									<1	ug/l	TM16/PM30	
1,4-Dichlorobenzene #	<1									<1	ug/l	TM16/PM30	
2-Nitroaniline	<1									<1	ug/l	TM16/PM30	
2,4-Dinitrotoluene #	<0.5									<0.5	ug/l	TM16/PM30	
2,6-Dinitrotoluene	<1									<1	ug/l	TM16/PM30	
3-Nitroaniline	<1									<1	ug/l	TM16/PM30	
4-Bromophenylphenylether #	<1									<1	ug/l	TM16/PM30	
4-Chloroaniline	<1									<1	ug/l	TM16/PM30	
4-Chlorophenylphenylether #	<1									<1	ug/l	TM16/PM30	
4-Nitroaniline	<0.5									<0.5	ug/l	TM16/PM30	
Azobenzene #	<0.5									<0.5	ug/l	TM16/PM30	
Bis(2-chloroethoxy)methane #	<0.5									<0.5	ug/l	TM16/PM30	
Bis(2-chloroethyl)ether #	<1									<1	ug/l	TM16/PM30	
Carbazole #	<0.5									<0.5	ug/l	TM16/PM30	
Dibenzofuran #	<0.5									<0.5	ug/l	TM16/PM30	
Hexachlorobenzene #	<1									<1	ug/l	TM16/PM30	
Hexachlorobutadiene #	<1									<1	ug/l	TM16/PM30	
Hexachlorocyclopentadiene	<1									<1	ug/l	TM16/PM30	
Hexachloroethane #	<1									<1	ug/l	TM16/PM30	
Isophorone #	<0.5									<0.5	ug/l	TM16/PM30	
N-nitrosodi-n-propylamine #	<0.5									<0.5	ug/l	TM16/PM30	
Nitrobenzene #	<1									<1	ug/l	TM16/PM30	
Surrogate Recovery 2-Fluorobiphenyl	94									<0	%	TM16/PM30	
Surrogate Recovery p-Terphenyl-d14	97									<0	%	TM16/PM30	

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Malone O'Regan
Reference: E2037
Location:
Contact: David Dwyer
EMT Job No: 22/20240

VOC Report : Liquid

Please see attached notes for all abbreviations and acronyms												
EMT Sample No.	1-6									LOD/LOR	Units	Method No.
Sample ID	GW2											
Depth												
COC No / misc												
Containers	V H N P G											
Sample Date	05/12/2022											
Sample Type	Ground Water											
Batch Number	1											
Date of Receipt	08/12/2022											
VOC MS												
Dichlorodifluoromethane	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2									<2	ug/l	TM15/PM10
Chloroform #	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2									<2	ug/l	TM15/PM10
Toluene #	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2									<2	ug/l	TM15/PM10
Dibromochloromethane #	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1									<1	ug/l	TM15/PM10
Styrene	<2									<2	ug/l	TM15/PM10
Bromoform #	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3									<3	ug/l	TM15/PM10
Naphthalene	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	102									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	101									<0	%	TM15/PM10

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 22/20240

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% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

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Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

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As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

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DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x3 Dilution
AB	x15 Dilution
AC	x250 Dilution
AD	x750 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 22/20240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				

EMT Job No: 22/20240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitrogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM52	Silica determination by reaction with Amino Acid F Reagent, Citric acid and Molybdate Reagent which is analysed spectrophotometrically.	PM0	No preparation is required.				
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.				
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270D v5:2014	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				

EMT Job No: 22/20240

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				

Malone O'Regan
Ground Floor - Unit 3
Bracken Business Park
Bracken Road
Sandyford
Dublin 18
D18 V4K6



Attention : David Dwyer
Date : 16th March, 2023
Your reference : E2037
Our reference : Test Report 23/512 Batch 1
Location : Scotshouse Quarries
Date samples received : 13th January, 2023
Status : Final Report
Issue : 1.2

Two samples were received for analysis on 13th January, 2023 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/512

SOILS and ASH

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All solid results are expressed on a dry weight basis unless stated otherwise.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/512

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

EMT Job No: 23/512

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM38/TM125	Total Nitrogen/Organic Nitrogen by calculation	PM0	No preparation is required.				
TM52	Silica determination by reaction with Amino Acid F Reagent, Citric acid and Molybdate Reagent which is analysed spectrophotometrically.	PM0	No preparation is required.				
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.				
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.				

Appendix 8-1

E2037 - Groundwater Monitoring

Table 2: Groundwater Level Measurements (Before Purging)

Measured Parameter		Total Depth	Elevation of Reference (Top of Casing)	Water Level (Before Purge)		Water Level (Before Purge)		Water Level (Before Purge)		Water Level (Before Purge)	
Units		mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
Date Measured		05/12/2022			11/01/2023		25/01/2023		10/02/2023		
Well ID	GW1	50	105.286	1	104.286	1.3	103.986	5.46	99.826	1.16	104.126
	GW2	51	104.89	0.1	104.79	0	104.89	0	104.89	0	104.89

Table 3: Groundwater Level Measurements (After Purging)

Measured Parameter		Total Depth	Elevation of Reference (Top of Casing)	Water Level (After Purge)		Water Level (After Purge)		Water Level (After Purge)	
Units		mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
Date Measured		05/12/2022			11/01/2023		25/01/2023		
Well ID	GW1	50	105.286	45.6	59.686	44.54	60.746	7.66	97.626
	GW2	51	104.89	42.21	62.68	44.73	60.16	1.12	103.77

Table 4: Groundwater Level Measurements (After Recharge)

Measured Parameter		Total Depth	Elevation of Reference (Top of Casing)	Water Level (Recharge Level)		Water Level (Recharge Level)		Water Level (Recharge Level)	
Units		mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
Date Measured		06/12/2022			11/01/2023		25/01/2023		
Well ID	GW1	50	105.286	36.21	69.076	43.23	62.056	6.9	98.386
	GW2	51	104.89	9.9	94.99	40.56	64.33	0	104.89

Appendix 8-1
 Project: E2037
 Surface Water Monitoring

Table 5 : Results obtained from MCC for SW discharge

Parameter/Date	May-16	Oct-16	Jun-17	Sep-17	Sep-18	Nov-18	Jul-19	Nov-19	ELVs	SWACs
Flow									4	-
Temperature									25	less than 1.5 change before/after discharge
pH range	7.6	8.0	8.0	7.8	8.11	7.79	8.1	7.9	6 - 9	4.5 / 6 - 9
Parameters Limited by Discharge Licence (mg/l)	May-16	Oct-16	Jun-17	Sep-17	Sep-18	Nov-18	Jul-19	Nov-19	ELVs	SWACs
BOD5	<2	<2	<2	<2	<2	<2	3	<2	5	1.5 mean
Suspended Solids	9.0	12.0	4.0	25.0	13.0	49.0	30.0	30.0	20	-
Molybdate Reactive Phosphate (as P)	<0.01	<0.01	<0.01	<0.04	<0.04	<0.04	0.231	<0.01	0.3	0.035 mean
Total Ammonia (as N)	0.75	0.92	0.14	0.12	0.53	0.23	1.06	1.06	0.3	0.065 mean
Additional Sampled Parameters	May-16	Oct-16	Jun-17	Sep-17	Sep-18	Nov-18	Jul-19	Nov-19	ELVs	SWACs
COD (mg/l)	6.0	<5	8.0	8.0	<5	<5	<10	<10	-	-
Conductivity (uscM-1 @20C)	1715	1854	1939	1251	1761	1165	1509	1314	-	-
Nitrate (mg/l)	11.74	12.07	11.03	11.8	13.98	8.31	14.6	9.89	-	-

A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/267/01
Customer PO		Date of Receipt	17/05/2016
Customer Ref	9:38 wp 26/15 Scotshouse Quarries	Sampled On	17/05/2016
Ref 2		Date Testing Commenced	17/05/2016
Ref 3		Received or Collected	By Fitz: Jason
		Condition on Receipt	Acceptable
		Date of Report	26/05/2016
		Sample Type	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Limit	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.05	0.75	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	2	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	10	6	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	150	1715	uscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	0.01	11.740	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	-	7.6	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	0.03	<0.010	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	5	9	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Acc. : Accredited Parameters by ISO 17025:2005

Date : 26/05/2016

For bacterial analysis a result of 0 means none detected in volume examined
All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)



A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/295/01
Customer PO		Date of Receipt	12/10/2016
Customer Ref	WP 26/15 Scotshouse Quarries Final Effluent	Sampled On	11/10/2016
Ref 2	11/10/16 09.27	Date Testing Commenced	12/10/2016
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	24/10/2016
		Sample Type	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.92	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	<5	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	1854	uscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	12.070	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	8.0	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	<0.010	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	12	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Date : 24/10/2016

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)



A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/334/01
Customer PO		Date of Receipt	23/06/2017
Customer Ref	WP 26/15 Scotshouse Quarries	Sampled On	23/06/2017
Ref 2	23/06/17 09.40	Date Testing Commenced	23/06/2017
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	03/07/2017
		Sample Type	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.14	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	8	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	1939	uscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	11.03	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	8.0	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	<0.01	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	4	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Date : 03/07/2017

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)



A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/350/07
Customer PO		Date of Receipt	28/09/2017
Customer Ref	WP 26/15 Scotshouse Quarries final eff	Sampled On	28/09/2017
Ref 2		Date Testing Commenced	28/09/2017
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	09/10/2017
		Sample Type	Trade Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.12	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	8	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	1251	uscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	11.80	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	7.8	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	<0.04	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	25	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Date : 09/10/2017

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)



A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/400/01
Customer PO		Date of Receipt	27/09/2018
Customer Ref	WP26/15 Scotshouse Quarries	Sampled On	27/09/2018
Ref 2	Discharge to WC	Date Testing Commenced	27/09/2018
Ref 3	27/09/2018 10:10	Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	05/10/2018
		Sample Type	Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.53	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	<5	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	1761	µscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	13.98	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	8.11	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	<0.04	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	13	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Date : 05/10/2018

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)





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A copy of this certificate is available on www.fitzsci.ie

Customer	Lisa Smith Monaghan Co. Co. The Glen Offices Monaghan Monaghan	Lab Report Ref. No.	0810/409/01
Customer PO		Date of Receipt	29/11/2018
Customer Ref	WP 26/15 Scotshouse Quarries	Sampled On	29/11/2018
Ref 2	29/11/18 10:00	Date Testing Commenced	29/11/2018
Ref 3		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
		Date of Report	13/12/2018
		Sample Type	Effluent

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Industrial Eff.)	114	Colorimetry	0.23	mg/L as N	UKAS
BOD (Industrial Eff.)	113	Electrometry	<2	mg/L	UKAS
COD (Industrial Eff.)	107	Colorimetry	<5	mg/L	UKAS
Conductivity (Industrial Eff at 20C)	112	Electrometry	1165	µscm -1 @20C	UKAS
Nitrate (Industrial Eff.)	103	Colorimetry	8.31	mg/L as N	UKAS
pH (Industrial Eff)	110	Electrometry	7.79	pH Units	UKAS
Phosphate (Ortho) Industrial Eff	117	Colorimetry	<0.04	mg/L as P	UKAS
Solids (Total Suspended) Industrial E	106	Gravimetry	49	mg/L	UKAS

Signed : 
Aoife Harmon - Technical Supervisor

Date : 13/12/2018

Acc. : Accredited Parameters by ISO 17025:2005

PVL - Parametric Value Limit as per EU (Drinking water) Regulations (SI 122 2014)

For bacterial analysis a result of 0 means none detected in volume examined

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results shall not be reproduced, except in full, without the approval of Fitz Scientific

Results contained in this report relate only to the samples tested (P) : Presumptive Results

** : The test result for this parameter may be invalid as it has exceeded the recommended holding time (BS EN ISO 5667-3:2012)



CERTIFICATE OF ANALYSIS

Client : Kieran Duffy (Act. Sen. Exec. Engineer)
 Monaghan County Council
 Civic Offices
 Carrickmacross
 Co. Monaghan

Report No. : 393146
 Date of Receipt : 03/07/2019
 Start Date of Analysis : 03/07/2019
 Date of Report : 17/07/2019
 Order Number :
 Sample taken by : Client

Lab No	Sample Description	Test	Ref.	Result	Units
968036	Scotshouse Quarry	Suspended Solids	I, R	30	mg/l
		COD	I, R	<10	mg/l
		pH	I, R	8.1	pH Units
		Conductivity @20C	I, R	1509	uS/cm
		Nitrate as N	I, R	14.6	mg/l
		BOD.	I, R	3	mg/l
		Ammonia as N	I, R	1.06	mg/l
		Molybdate Reactive Phosphorus (MRP unfiltered) as PO4-P	I, R	0.231	mg/l



Approved by: *Barbara Lee*

Barbara Lee
 Environmental
 Scientist

See below for test specifications and accreditation status.
 This report only relates to items tested and shall not be reproduced but in full with the permission of CLS.
 est. is an estimated count.



In-House Test	Specification	17025	GMP/FDA*	ISO**
Suspended Solids	CLS 13	Yes	No	Yes
COD	CLS 52	Yes	No	Yes
pH	CLS 26	Yes	No	Yes
Conductivity @20C	CLS 67	Yes	No	Yes
Nitrate as N	Konelab CLS 39	Yes	No	Yes
BOD.	CLS 12	Yes	No	Yes
Ammonia as N	Konelab CLS 40	Yes	No	Yes
Molybdate Reactive Phosphorus (MRP unfiltered) as PO4-P	Konelab CLS 35	Yes	No	Yes

*Analysis carried out in a GMP approved, FDA inspected facility (MedPharma site only).

**Laboratory Analysis, Sampling, Food Safety Monitoring and Analysts on Contract are all ISO 9001 certified.

Lab No	Sample ID	Sample Condition on Receipt	Sampling Date
968036	Scotshouse Quarry	Good condition	02/07/2019



CERTIFICATE OF ANALYSIS

Client : Kieran Duffy (Act. Sen. Exec. Engineer)
Monaghan County Council
Civic Offices
Carrickmacross
Co. Monaghan

Report No. : 404840
Date of Receipt : 29/11/2019
Start Date of Analysis : 29/11/2019
Date of Report : 11/12/2019
Order Number :
Sample taken by : Client

Lab No	Sample Description	Test	Ref.	Result	Units
1008132	WP 26/15 Scotshouse Quarry	Suspended Solids	I, R	30	mg/l
		COD	I, R	<10	mg/l
		pH	I, R	7.9	pH Units
		Conductivity @20C	I, R	1314	uS/cm
		Nitrate as N	I, R	9.89	mg/l
		BOD.	I, R	<2	mg/l
		Ammonia as N	I, R	1.06	mg/l
		Molybdate Reactive Phosphorus (MRP unfiltered) as PO4-P	I, R	<0.01	mg/l



Approved by:

AnnMarie Nee
Environmental
Services Administrator

See below for test specifications and accreditation status.
This report only relates to items tested and shall not be reproduced but in full with the permission of CLS.
est. is an estimated count.
CLS will test food, water and swabs samples within 24 hours of receipt.
Where samples have been taken by the Client, results apply to the samples as received.



In-House Test	Specification	17025	GMP/FDA*	ISO**
Suspended Solids	CLS 13	Yes	No	Yes
COD	CLS 52	Yes	No	Yes
pH	CLS 26	Yes	No	Yes
Conductivity @20C	CLS 67	Yes	No	Yes
Nitrate as N	Konelab CLS 39	Yes	No	Yes
BOD.	CLS 12	Yes	No	Yes
Ammonia as N	Konelab CLS 40	Yes	No	Yes
Molybdate Reactive Phosphorus (MRP unfiltered) as PO4-P	Konelab CLS 35	Yes	No	Yes

*Analysis carried out in a GMP approved, FDA inspected facility (MedPharma site only).

**Laboratory Analysis, Sampling, Food Safety Monitoring and Analysts on Contract are all ISO 9001 certified.

Lab No	Sample ID	Sample Condition on Receipt	Sampling Date
1008132	WP 26/15 Scotshouse Quarry	Good condition	28/11/2019

Appendix 8-1
 Project: E2037
 Surface Water Monitoring

Table 6: 2022/2023 Surface Water Monitoring Results

Parameter	SW1					SW2					SW3					SW4					SW5	SW6	Current Discharge Licence ELVs	SWACs	
	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Jan-23	Jan-23			
Flow																									-
Temperature	13.3	6.9	4.8	6.4	9.2	12.4	6.4	5.5	7.5	9.6	12.8	7.2	5.2	7.1	9.3	12.4	6.8	5.3	7.5	9.8	7.8	7.71	25		less than 1.5 change before/after discharge
pH range	8.01	7.96	8.03	7.43	7.94	7.67	7.95	7.96	7.73	7.84	7.75	7.75	7.82	7.68	7.59	7.59	7.54	7.97	7.67	7.6	7.82	7.1	6 - 9		4.5/6 - 9
	mg/l					mg/l					mg/l					mg/l					mg/l	mg/l	mg/l	mg/l	
BOD5	0.3	0.3	0.1	0.2	0.3	0.1	0.5	0.4	2.4	0.5	0.6	1.1	0.4	0.9	0.6	0.4	0.7	1.4	<6.0	0.7	1.9	1.2	5		1.5 mean
Suspended Solids	<5	<10	12	<5	5.8	<5	15	34	<5	<5	<5	<10	<10	<5	<5	<10	<10	10	<5	<5	<10	<5	20		-
Molybdate Reactive Phosphate (as P)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	0.012	0.011	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.058	0.3		0.035 mean
Total Ammonia (as N)	0.74	0.4	<0.1	0.1	<0.1	0.31	0.32	0.18	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	0.2	0.15	<0.1	<0.1	<0.1	<0.1	0.3		0.065 mean
COD	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	20	15	<15	<15	<15	<15	<15	<15	<15	<15	<15	19	N/A		-
Nitrate	31	26	<0.5	<0.5	<0.5	17	7.2	3.8	4.8	1.8	1.3	3.5	2.6	2.8	1.2	12	5.7	3.4	4	1.5	8.8	5.3	N/A		-
Sulphate				750	913				877	900				21	<10				491	613	374	55	-		-

SW1 - lagoon
 SW2 - trade effluent discharge
 SW3 - Aghnaskew upstream of discharge
 SW4 - Aghnaskew downstream of discharge
 SW5 - Aghnaskew upstream of wetland
 SW6 - Aghnaskew downstream of wetland, before Dunsrim Lough

TEST REPORT NO: 237352**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/10/5246
Quote Ref: QC006897
Order No: To Follow
Sales Order: 155828
Date Received: 27/10/2022
Date Sampled: 27/10/2022
Date Completed: 08/11/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW1 Lagoon**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.3		03/11/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		03/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		02/11/2022	BHP AC 012
pH		pH Units	8.01		27/10/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		28/10/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	31		28/10/2022	BHP AC 019
Temperature - Field		°C	13.3		27/10/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.74		01/11/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 10/11/2022****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 237352**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/10/5247
Quote Ref: QC006897
Order No: To Follow
Sales Order: 155829
Date Received: 27/10/2022
Date Sampled: 27/10/2022
Date Completed: 08/11/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly****Site: Scotshouse Quarry****BHP Ref: On Demand_Surface Water****Client Ref: SW2 Trade Effluent Discharge**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.1		03/11/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		03/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		02/11/2022	BHP AC 012
pH		pH Units	7.67		27/10/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		28/10/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	17		28/10/2022	BHP AC 019
Temperature - Field		°C	12.4		27/10/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.31		01/11/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 10/11/2022****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 237352 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/10/5248
Quote Ref: QC006897
Order No: To Follow
Sales Order: 155831
Date Received: 27/10/2022
Date Sampled: 27/10/2022
Date Completed: 08/11/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW3**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.6		03/11/2022	BHP AC 005
C.O.D.	Acc.	mg/L	20		03/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		02/11/2022	BHP AC 012
pH		pH Units	7.75		27/10/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	0.012		28/10/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	1.3		28/10/2022	BHP AC 019
Temperature - Field		°C	12.8		27/10/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		01/11/2022	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 11/11/2022****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.**

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 237352 .2**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/10/5249
Quote Ref: QC006897
Order No: To Follow
Sales Order: 155831
Date Received: 27/10/2022
Date Sampled: 27/10/2022
Date Completed: 08/11/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW4**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.4		03/11/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		03/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		02/11/2022	BHP AC 012
pH		pH Units	7.59		27/10/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		28/10/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	12		28/10/2022	BHP AC 019
Temperature - Field		°C	12.4		27/10/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.12		01/11/2022	BHP AC 095

Authorised by:**Dervla Purcell****Date Authorised: 11/11/2022****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 239983**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/11/4901
Quote Ref: QC006967
Order No: To Follow
Sales Order: 158974
Date Received: 23/11/2022
Date Sampled: 23/11/2022
Date Completed: 06/12/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW1 Lagoon**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.3		01/12/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		30/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		29/11/2022	BHP AC 012
pH		pH Units	7.96		23/11/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/11/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	26		25/11/2022	BHP AC 019
Temperature - Field		°C	6.9		23/11/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.40		01/12/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 07/12/2022****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 239983**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/11/4902
Quote Ref: QC006967
Order No: To Follow
Sales Order: 158975
Date Received: 23/11/2022
Date Sampled: 23/11/2022
Date Completed: 06/12/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399****EEmail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly****Site: Scotshouse Quarry****BHP Ref: On Demand_Surface Water****Client Ref: SW2 Trade Effluent Discharge**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.5		01/12/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		30/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	15		29/11/2022	BHP AC 012
pH		pH Units	7.95		23/11/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	0.011		25/11/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	7.2		25/11/2022	BHP AC 019
Temperature - Field		°C	6.4		23/11/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.32		01/12/2022	BHP AC 095

Authorised by:**Dervla Purcell****Date Authorised: 07/12/2022****Laboratory Manager****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 239983 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/11/4903
Quote Ref: QC006967
Order No: To Follow
Sales Order: 158976
Date Received: 23/11/2022
Date Sampled: 23/11/2022
Date Completed: 06/12/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW3**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	1.1		01/12/2022	BHP AC 005
C.O.D.	Acc.	mg/L	15		30/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		29/11/2022	BHP AC 012
pH		pH Units	7.75		23/11/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	0.011		25/11/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	3.5		25/11/2022	BHP AC 019
Temperature - Field		°C	7.2		23/11/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		01/12/2022	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 07/12/2022****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 239983 .2**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/11/4904
Quote Ref: QC006967
Order No: To Follow
Sales Order: 158976
Date Received: 23/11/2022
Date Sampled: 23/11/2022
Date Completed: 06/12/2022
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW4**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.7		01/12/2022	BHP AC 005
C.O.D.	Acc.	mg/L	<15		30/11/2022	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		29/11/2022	BHP AC 012
pH		pH Units	7.54		23/11/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/11/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	5.7		25/11/2022	BHP AC 019
Temperature - Field		°C	6.8		23/11/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.20		01/12/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 07/12/2022****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 244497**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/12/3871
Quote Ref: QC006967
Order No: To Follow
Sales Order: 164001
Date Received: 20/12/2022
Date Sampled: 20/12/2022
Date Completed: 11/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW1 Lagoon**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.1		06/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		05/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	12		21/12/2022	BHP AC 012
pH		pH Units	8.03		20/12/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/12/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	<0.5		21/12/2022	BHP AC 019
Temperature - Field		°C	4.8		20/12/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		23/12/2022	BHP AC 095

Authorised by:**Dervla Purcell****Date Authorised: 13/01/2023****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 244497**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/12/3872
Quote Ref: QC006967
Order No: To Follow
Sales Order: 164002
Date Received: 20/12/2022
Date Sampled: 20/12/2022
Date Completed: 11/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly****Site: Scotshouse Quarry****BHP Ref: On Demand_Surface Water****Client Ref: SW2 Trade Effluent Discharge**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.4		06/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		05/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	34		21/12/2022	BHP AC 012
pH		pH Units	7.96		20/12/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/12/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	3.8		21/12/2022	BHP AC 019
Temperature - Field		°C	5.5		20/12/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.18		23/12/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 13/01/2023****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 244497 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/12/3873
Quote Ref: QC006967
Order No: To Follow
Sales Order: 164003
Date Received: 20/12/2022
Date Sampled: 20/12/2022
Date Completed: 11/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW3**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.4		06/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		05/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		21/12/2022	BHP AC 012
pH		pH Units	7.82		20/12/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/12/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	2.6		21/12/2022	BHP AC 019
Temperature - Field		°C	5.2		20/12/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		23/12/2022	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 13/01/2023****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 244497 .2**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 22/12/3874
Quote Ref: QC006967
Order No: To Follow
Sales Order: 164003
Date Received: 20/12/2022
Date Sampled: 20/12/2022
Date Completed: 11/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399****EEmail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly****Site: Scotshouse Quarry****BHP Ref: On Demand_Surface Water****Client Ref: SW4**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	1.4		06/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		05/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	10		21/12/2022	BHP AC 012
pH		pH Units	7.97		20/12/2022	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/12/2022	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	3.4		21/12/2022	BHP AC 019
Temperature - Field		°C	5.3		20/12/2022	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.15		23/12/2022	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised:**

13/01/2023

Laboratory Manager

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 246892**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/01/3317
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166774
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 31/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
Email: dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW1 Lagoon**

Test	Units	Results	Customer Limits	Date Analysed	Method
B.O.D. Acc.	mg/L	0.2		26/01/2023	BHP AC 005
C.O.D. Acc.	mg/L	<15		26/01/2023	BHP AC 006
Total Suspended Solids Acc.	mg/L	<5		26/01/2023	BHP AC 012
pH	pH Units	7.43		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)	mg/L	<0.01		25/01/2023	BHP AC 095
Nitrate (as NO ₃) Acc.	mg/L	<0.5		25/01/2023	BHP AC 019
Temperature - Field	°C	6.4		23/01/2023	BHP AC 067
Total Ammonia (as N) Acc.	mg/L	0.1		30/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻) Acc.	mg/L	750		25/01/2023	BHP AC 095

Authorised by:**Dervla Purcell****Date Authorised: 06/02/2023****Laboratory Manager****Additional Information:**(Opinions, where stated, are not covered by accreditation)**Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.**

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 246892**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/01/3318
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166775
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 31/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail: dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW2 Discharge**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	2.4		26/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		26/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		26/01/2023	BHP AC 012
pH		pH Units	7.73		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/01/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	4.8		25/01/2023	BHP AC 019
Temperature - Field		°C	7.5		23/01/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	0.11		31/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	877		25/01/2023	BHP AC 095

Authorised by:
Dervla Purcell**Date Authorised: 06/02/2023****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 246892 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/01/3319
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166776
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 07/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW3**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.9		26/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		26/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		26/01/2023	BHP AC 012
pH		pH Units	7.68		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/01/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	2.8		25/01/2023	BHP AC 019
Temperature - Field		°C	7.1		23/01/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		31/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	21		25/01/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 08/02/2023****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 246892 .2**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/01/3320
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166776
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 07/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW4**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	<6.0		02/02/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		26/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		26/01/2023	BHP AC 012
pH		pH Units	7.67		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/01/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	4.0		25/01/2023	BHP AC 019
Temperature - Field		°C	7.5		23/01/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		31/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	491		25/01/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 08/02/2023**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 246892 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/01/3321
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166777
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 31/01/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW5**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	1.9		26/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		26/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<10		26/01/2023	BHP AC 012
pH		pH Units	7.82		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		25/01/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	8.8		25/01/2023	BHP AC 019
Temperature - Field		°C	7.8		23/01/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		31/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	374		25/01/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 07/02/2023**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 246892 .2

Client: Scotshouse Quarries Ltd
Scotshouse
Monaghan
Co. Monaghan

BHP Ref. No: 23/01/3322
Quote Ref: QC007106
Order No: To Follow
Sales Order: 166777
Date Received: 23/01/2023
Date Sampled: 23/01/2023
Date Completed: 31/01/2023
Sample Type: Surface Water



Testing
Analysing
Consulting



BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
Email: dervlapurcell@bhp.ie

FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW6

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	1.2		26/01/2023	BHP AC 005
C.O.D.	Acc.	mg/L	19		26/01/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		26/01/2023	BHP AC 012
pH		pH Units	7.71		23/01/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	0.058		25/01/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	5.3		25/01/2023	BHP AC 019
Temperature - Field		°C	7.1		23/01/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		31/01/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	55		25/01/2023	BHP AC 095

Authorised by:

Dervla Purcell

Date Authorised: 07/02/2023

Laboratory Manager

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

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Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 249770**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/02/4255
Quote Ref: QC007106
Order No: To Follow
Sales Order: 170206
Date Received: 20/02/2023
Date Sampled: 20/02/2023
Date Completed: 28/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW1 Lagoon**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.3		23/02/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		23/02/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	5.8		23/02/2023	BHP AC 012
pH		pH Units	7.94		20/02/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/02/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	<0.5		21/02/2023	BHP AC 019
Temperature - Field		°C	9.2		20/02/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		28/02/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	913		24/02/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 06/03/2023****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 249770**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/02/4256
Quote Ref: QC007106
Order No: To Follow
Sales Order: 170207
Date Received: 20/02/2023
Date Sampled: 20/02/2023
Date Completed: 28/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly****Site: Scotshouse Quarry****BHP Ref: On Demand_Surface Water****Client Ref: SW2 Trade Effluent Discharge**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.5		23/02/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		23/02/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		23/02/2023	BHP AC 012
pH		pH Units	7.84		20/02/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/02/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	1.8		21/02/2023	BHP AC 019
Temperature - Field		°C	9.6		20/02/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		28/02/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	900		24/02/2023	BHP AC 095

Authorised by:

A handwritten signature in black ink, appearing to read 'Dervla Purcell'.

Dervla Purcell**Date Authorised: 06/03/2023****Laboratory Manager**

Additional Information:(Opinions, where stated, are not covered by accreditation)

Acc.: INAB Accredited

ND: None detected in volume analysed

* Subcontracted to an approved accredited laboratory

** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.

~ : Sample Condition : ACCEPTABLE

This test report shall not be duplicated except in full and then only with the permission of the test laboratory.

Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.

Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.

Sampling is outside the scope of accreditation

BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty

TEST REPORT NO: 249770 .1**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/02/4258
Quote Ref: QC007106
Order No: To Follow
Sales Order: 170208
Date Received: 20/02/2023
Date Sampled: 20/02/2023
Date Completed: 28/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW3**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.6		23/02/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		23/02/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		23/02/2023	BHP AC 012
pH		pH Units	7.59		20/02/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	0.010		22/02/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	1.2		21/02/2023	BHP AC 019
Temperature - Field		°C	9.3		20/02/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		28/02/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	<10		24/02/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 06/03/2023****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

TEST REPORT NO: 249770 .2**Client: Scotshouse Quarries Ltd****Scotshouse
Monaghan
Co. Monaghan****BHP Ref. No: 23/02/4259
Quote Ref: QC007106
Order No: To Follow
Sales Order: 170208
Date Received: 20/02/2023
Date Sampled: 20/02/2023
Date Completed: 28/02/2023
Sample Type: Surface Water****Testing
Analysing
Consulting****BHP Laboratories
New Road
Thomondgate
Limerick
Tel: +353 61 455399
EMail:dervlapurcell@bhp.ie****FTAO: Paddy Connolly
Site: Scotshouse Quarry
BHP Ref: On Demand_Surface Water
Client Ref: SW4**

Test		Units	Results	Customer Limits	Date Analysed	Method
B.O.D.	Acc.	mg/L	0.7		23/02/2023	BHP AC 005
C.O.D.	Acc.	mg/L	<15		23/02/2023	BHP AC 006
Total Suspended Solids	Acc.	mg/L	<5		23/02/2023	BHP AC 012
pH		pH Units	7.60		20/02/2023	BHP AC 067
Molybdate Reactive Phosphorus (as P)		mg/L	<0.01		22/02/2023	BHP AC 095
Nitrate (as NO ₃)	Acc.	mg/L	1.5		21/02/2023	BHP AC 019
Temperature - Field		°C	9.8		20/02/2023	BHP AC 067
Total Ammonia (as N)	Acc.	mg/L	<0.1		28/02/2023	BHP AC 095
Sulphate (as SO ₄ ²⁻)	Acc.	mg/L	613		24/02/2023	BHP AC 095

Authorised by:  **Dervla Purcell**
Laboratory Manager**Date Authorised: 06/03/2023****Additional Information:(Opinions, where stated, are not covered by accreditation)****Acc.:** INAB Accredited**ND:** None detected in volume analysed***** Subcontracted to an approved accredited laboratory****** This sample has been analysed outside recommended stability times. It is therefore possible that the results provided may be compromised.**~ :** Sample Condition : ACCEPTABLE**This test report shall not be duplicated except in full and then only with the permission of the test laboratory.****Results apply only to the sample tested and where the laboratory is not responsible for sampling, result apply to the sample as received.****Information identifying the 'Client', 'FTAO', 'Site', 'Client Ref', 'Order No' and 'Date Sampled' where BHP have not taken the sample has been supplied by the customer.****Sampling is outside the scope of accreditation****BHP Laboratory's decision rule: When we report a statement of compliance, we base it on the actual result of the test compared to the standard being used, regardless of the uncertainty**

Appendix 8-1

Project: E2037

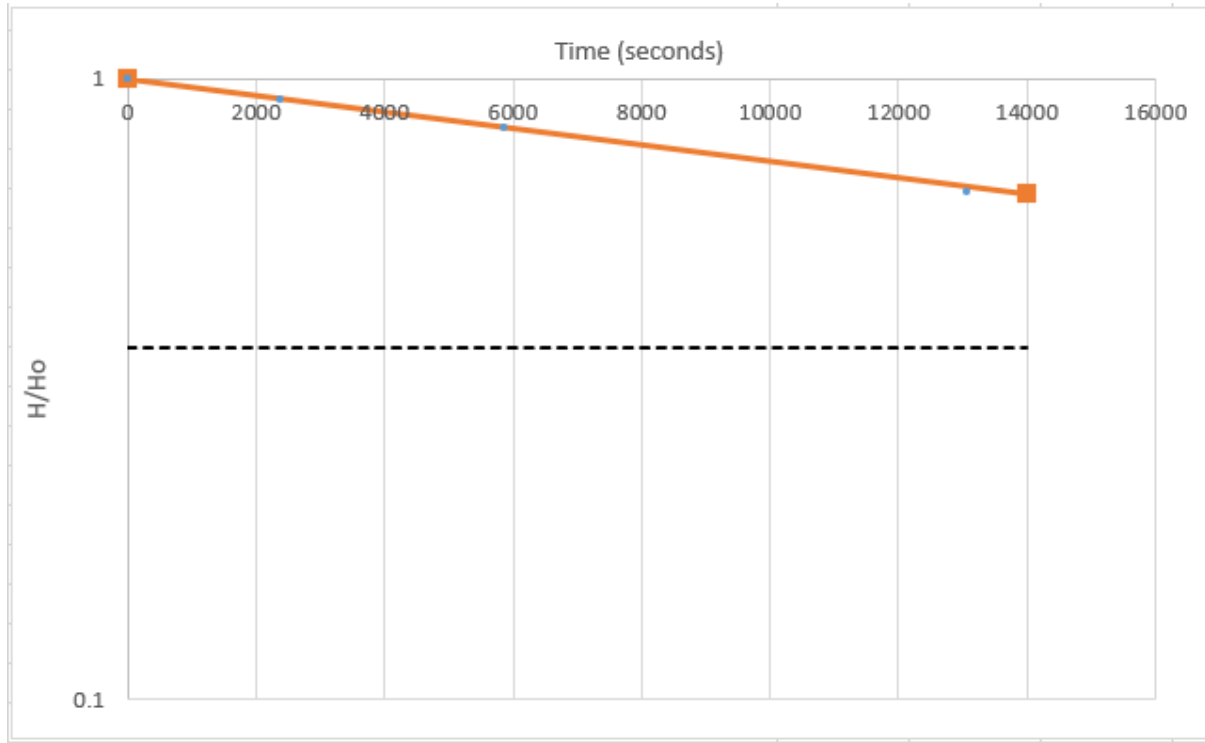
Discharge Flow Monitoring

Table 7: 2023 Discharge Flow Monitor

Date	Time	Volume	Duration	Flow		
		l	s	l/s	l/day	m3/day
20/01/2023	15:09	25	17.5	1.428571	123428.5714	123.4286
27/01/2023	16:35	25	20.7	1.207729	104347.8261	104.3478
03/02/2023	14:45	25	31	0.806452	69677.41935	69.67742
Mean			23.066667	1.147584	99151.27229	99.15127
Var			33.175556	0.066314	495033143.9	495.0331

APPENDIX 8-2

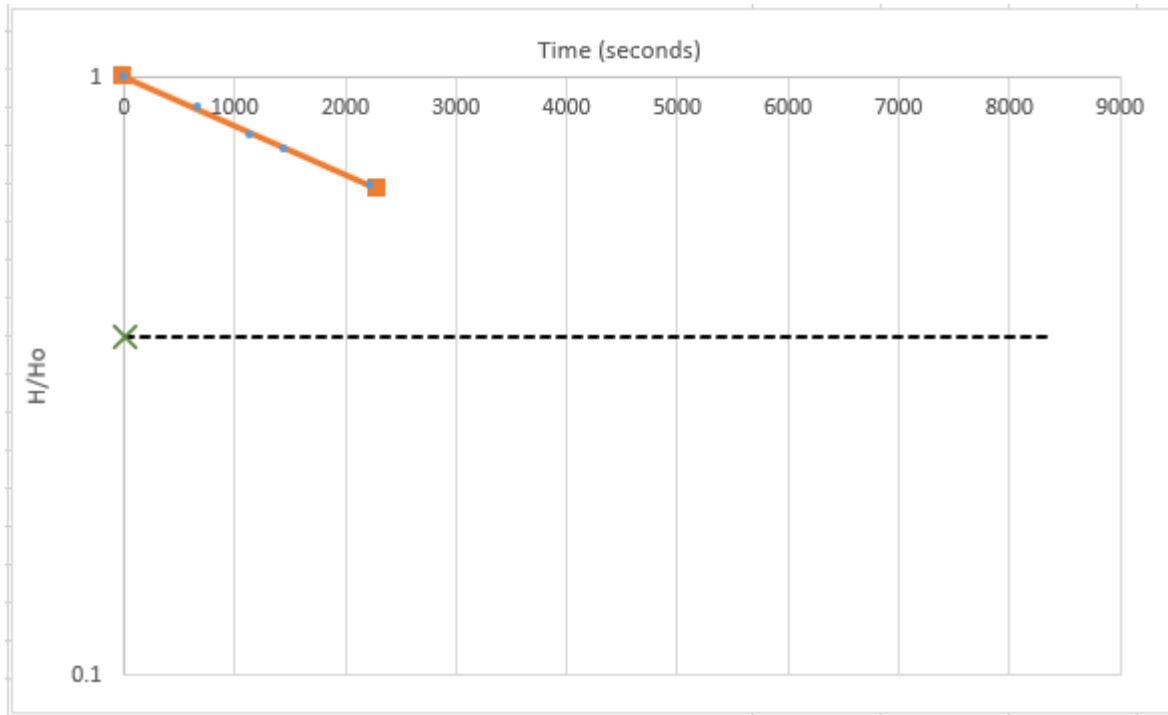
GW1 – Slug Test



Rest water level: 5.46mbtoci

Time (seconds)	Water level		H/Ho
	(mbd)	H (m)	
0	7.66	-2.2	1
2379	7.5	-2.04	0.927273
5859	7.29	-1.83	0.831818
13059	6.9	-1.44	0.654545
Hydraulic conductivity	K	m/s	2.34E-09
		m/d	2.02E-04

GW2 – Slug Test



Rest water level: Ombtoci

Time (seconds)	Water level		
	(mbd)	H (m)	H/Ho
0	1.12	-1.12	1
660	1	-1	0.89285
1140	0.9	-0.9	0.80357
1440	0.85	-0.85	0.75892
2220	0.74	-0.74	0.66071
8340	0	0	0
Hydraulic conductivity	K	m/s	1.16E-08
		m/d	9.98E-04

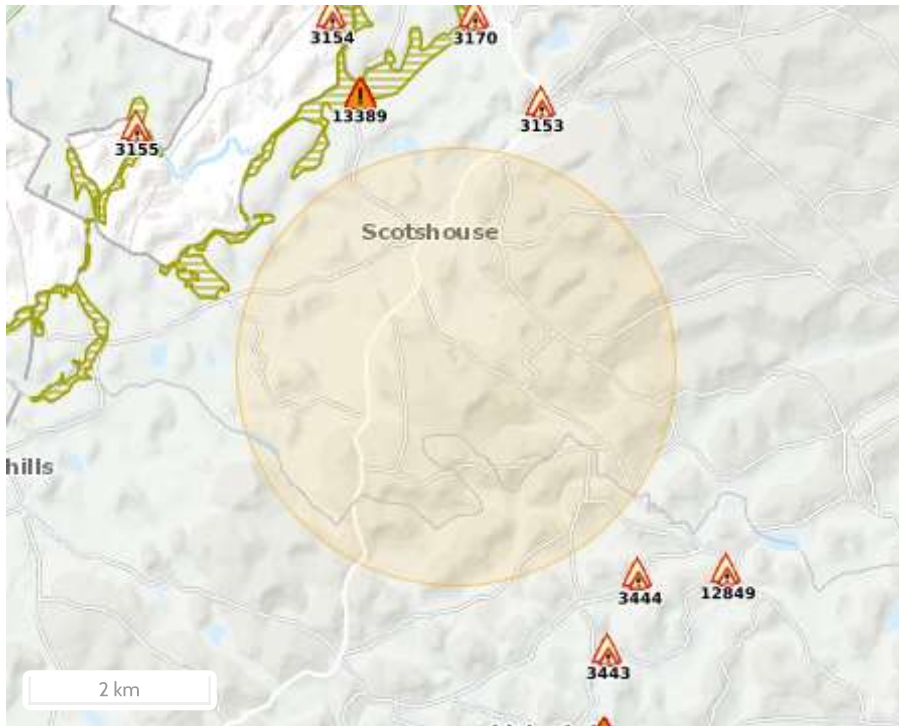
APPENDIX 8-3



Report Produced: 15/3/2023 12:00

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

0 Results

Name (Flood_ID)	Start Date	Event Location
-----------------	------------	----------------

Appendix 9-1

Appendix 9-1
Mineral Dust Risk Assessment
Scotshouse Quarries Ltd
Aghnaskew, Scotshouse, Co. Monaghan

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1 DISAMENIY DUST RISK ASSESSMENT

The IAQM Guidance aims to provide advice on robust and consistent good-practice approaches that can be used to assess the operational phase dust impacts from quarry activities. [1]

1.1 Identification of Sensitive Receptors

For the sensitivity of people and their property to dust soiling, the IAQM recommends the use of professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies. The following classification was used to define a receptor with High, Medium or Low sensitivity to dust soiling:

High Sensitive Receptor

- Users can reasonably expect enjoyment of a high level of amenity; or
- the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.

Indicative examples of a high sensitivity receptor included dwellings, medium and long term carparks and car showrooms.

Medium Sensitive Receptor:

- users would expect a to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or,
- The appearance, aesthetics or value of their property could be diminished by soiling; or,
- the people or property wouldn't reasonably be expected a to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.

Indicative examples include parks, and places of work.

Low Sensitivity Receptor

- the enjoyment of amenity would not reasonably be expected ; or,
- there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or,
- there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.

Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

1.2 Determining the Residual Source of Emissions

The following examples show the residual source emissions for a number of activities, illustrating the factors that may be considered when determining the potential impact.

Figure 1-1: Site Preparation/ Restoration

LARGE		SMALL
Large working area		Small working area
High bunds		Low bunds
High volume of material movement		Low volume of material movement
High no. heavy plant		Low no. heavy plant
Minimal seeding/sealing of bund surface		Bunds seeded/sealed immediately
Material of high dust potential		Material of low dust potential

An example of a large potential dust magnitude from site preparation/restoration may include factors such as a working area >10ha, bunds >8 m in height, >100,000 m³ material movement, >10 heavy plant simultaneously active, bunds un-seeded, fine grained and friable material. Conversely, a small potential dust magnitude may include a site with a working area <2.5ha, bunds <4m in height, <20,000 m³ material movement, <5 heavy plant simultaneously active, all bunds seeded, material with a high moisture content.

Figure 1-2: Mineral Extraction

LARGE		SMALL
Large working area		Small working area
High energy extraction methods		Low energy extraction methods
Material of high dust potential		Material of low dust
Potential high extraction rate		Low extraction rate

An example of a large potential dust magnitude from mineral extraction may include a working area >100 ha, drilling and blasting frequently used, dusty mineral of small particle size and/or low moisture content, 1,000,000 tpa extraction rate. A small potential magnitude may include working area <20 ha, hydraulic excavator, coarse material and/or high moisture content, <200,000 tpa extraction rate.

Figure 1-3: Materials Handling

LARGE		SMALL
High no. heavy plant		Low no. heavy plant
Unconsolidated/bare surface		Hard standing surface
Activities close to site boundary		Activities within quarry void
Material of high dust potential		Material of low dust potential

An example of a large potential dust magnitude from materials handling may include factors such as >10 loading plant within 50m of a site boundary, transferring material of a high dust potential and/or low moisture content on dry, poorly surfaced ground. Conversely, a small potential dust magnitude may include <5 plant, more than 100 m of a site boundary, within the quarry void or clean hardstanding, transferring material of low dust potential and/or high moisture content.

Figure 1-4: Onsite Transportation

LARGE	SMALL
Use of unconsolidated haul roads.....	Use of conveyors
Unpaved haul roads.....	Paved haul roads
Road surface of high dust potential.....	Road surface of low dust potential
High no. HDV movements.....	Low no. HDV movements
High total length of haul roads.....	Low total length of haul roads
Uncontrolled vehicle speed.....	Controlled (low) vehicle speed

An example of a large potential dust magnitude from on-site transportation could include >250 movements in any one day on unpaved surfaces of potentially dusty material. A small potential magnitude may include the employment of covered conveyors used for the majority of the on-site transportation of material, <100 movements of vehicles per day, with surface materials of compacted aggregate, <500 m in length and a maximum speed of 15 mph.

Figure 1-5: Mineral Processing

LARGE	SMALL
Raw material of high dust potential.....	Raw material of low dust potential
End product of high dust potential.....	End product of low dust potential
Complex or combination of processes.....	Single process
High volume material processed.....	Low volume material processed

An example of a large potential dust magnitude from mineral processing may include factors such as a mobile crusher and screener with concrete batching plant on-site, processing >1,000,000 tpa of material with a high dust potential and/or low moisture content e.g. hard rock. Conversely, a small potential dust magnitude may include a site with a fixed screening plant with effective design in dust control, processing <200,000 tpa of material with a low dust potential and/or high moisture content e.g. wet sand and gravel.

Figure 1-6: Stockpiles/Exposed Surfaces

LARGE	SMALL
Long term stockpile.....	Short term stockpile
Frequent material transfers.....	Infrequent material transfers
Material of high dust potential.....	Material of low dust potential
Ground surface unconsolidated/un-kept.....	Ground surface hardstanding/clean
Stockpiles close to site boundary.....	Stockpiles well within quarry void
Large areas of exposed surfaces.....	Small areas of exposed surfaces
High wind speeds/low dust threshold.....	Low wind speeds/high dust threshold

An example of a large potential dust magnitude from stockpiles and exposed surfaces could include a stockpile with a total exposed area >10 ha in an area exposed to high wind speeds located <50 m of the site boundary. Daily transfer of material with a high dust potential and/or low moisture content. Stockpile duration >12 months and quarry production >1,000,000 tpa. A small potential magnitude may include stockpile duration of <1 month with a total area <2.5 ha in an area of low wind speeds, located >100 m from the site boundary. Weekly transfers of material with a low dust potential and/or high moisture content. Quarry production <200,000 tpa.

Figure 1-7: Offsite Transportation

LARGE	SMALL
High No. HDV Movements.....	Low No. HDV Movements
Unconsolidated Access Road.....	Paved Access Road
Limited/No Vehicle Cleaning Facilities.....	Extensive Vehicle Cleaning Facilities
Small Length of Access Road.....	Large Length of Access Road

An example of a large potential dust magnitude from off-site transportation could include total HDV >200 movements in any one day on unsurfaced site access road <20 m in length with no HDV cleaning facilities. No road sweeper available. A small potential magnitude may include <25 HDV movements per day, paved surfaced site access road >50 m in length, with effective HDV cleaning facilities and procedures, the employment of an effective road sweeper.

1.3 Estimation of the Pathway Effectiveness

The site-specific factors considered to determine the Effectiveness of the Pathway were distance and direction of receptors relative to prevailing wind directions. Receptors were identified within 400m of the dust emission source. Table 1-1 shows the categorisation of the frequency of potentially dust winds, based on the meteorological data from a nearby weather station.

Table 1-1: Categorisation of Frequency of Potentially Dust Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

Table 1-2 below shows the categorisation of receptors, based on their distance to the dust emission source.

Table 1-2: Categorisation of Receptor Distance from Source

Distance Category	Criteria
Distant	Receptor is between 200m and 400m from the dust source
Intermediate	Receptor is between 100m and 200m from the dust source
Close	Receptor is less than 100m from the dust source

Table 1-3 below shows the determination of the Pathway Effectiveness based on the frequency of potentially dusty winds and the distance of the receptor from the dust emission source.

Table 1-3: Classification of the Pathway Effectiveness

Receptor Distance Category	Frequency of Potentially Dusty Winds			
	Infrequent	Moderately Frequent	Frequent	Very Frequent
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

1.4 Estimation of the Dust Impact Risk and Effects

Table 1-4 shows the estimation of the Dust Impact Risk based on the Residual Source of Emission and Pathway Effectiveness classifications

Table 1-4: Estimation of Dust Impact Risks

Pathway Effectiveness	Residual Source Emission		
	Small	Medium	Large
Highly Effective Pathway	Low Risk	Medium Risk	High Risk
Moderate Effective Pathway	Negligible Risk	Low Risk	Medium Risk
Ineffective Pathway	Negligible Risk	Negligible Risk	Low Risk

Table 1-5 below shows the estimate of the likely magnitude of Disamenity Effects based on the receptor sensitivity and the risk of dust impacts.

Table 1-5: Descriptors for magnitude of Dust Effects

Receptor Distance Category	Receptor Sensitivity		
	Low	Medium	High
High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium Risk	Negligible effect	Slight Adverse Effect	Moderate Adverse Effect
Low Risk	Negligible effect	Negligible effect	Slight Adverse Effect
Negligible Risk	Negligible effect	Negligible effect	Negligible effect

2 REFERENCES

- [1] IAQM, "Guidance on the Assessment of Mineral Dust Impacts for Planning," Institute of Air Quality Management, London, 2016.

APPENDIX 11-1

Glossary of Acoustic Terminology

Abbreviation / Description Descriptor

A Weighted	A time weighting given to noise values to amend the values to suit the human ear response to the various frequency components of the sound.
Acoustic environment	Sound from all sound sources as modified by the environment (BS ISO 12913-1:2013).
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far. <i>Note: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq, T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. <i>Note: the ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound level, $L_{A90, T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
dB (decibel)	A relative unit of measurements, based on a logarithmic scale to describe the ratio between the measured level and a reference or threshold level of 0dB. Unless otherwise stated 0dB within this report is 2×10^{-5} pascals (Pa).
Day	A 24 hour period from midnight to midnight.
Daytime	A 12 hour period between 07:00 – 19:00 hours, as per NG4
Evening-Time	A 4 hour period between 19:00 – 23:00 hours, as per NG4
Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T=t_2-t_1$, has the same mean-squared sound pressure as a sound that varies with time, and is given the following equation: $L_{Aeq,T} = 10 \lg_{10} \left\{ (1/T) \int_{t_1}^{t_2} [p_A(t)^2/p_0^2] dt \right\}$ <p>where: p_0 is the reference sound pressure (20 μPa); and $p_A(t)$ is the instantaneous A-weighted sound pressure (Pa) at time t</p> <i>Note: The equivalent continuous A-weighted sound pressure level is quoted to the nearest whole number of decibels.</i>
$L_{AN,T}$	The Fast interval, A-Weighted noise level in the for the 'N' percentile of the sampling interval 'T'.
$L_{A10,T}$	The A-Weighted noise level for the 10%ile of the sampling interval 'T', typically utilised to represent peak noise events such as intermittent passing traffic.
$L_{A90,T}$	The A-Weighted noise level in the lower 90 percentile of the sampling interval 'T', excludes intermittent features typical of traffic. See also background sound level.
$L_{A95,T}$	The A-Weighted noise level for the 95%ile of the sampling interval 'T'. Representative of steady noise events at a monitoring location.

L _{Aeq,T}	The equivalent continuous sound level, used to describe the fluctuating noise in terms of a single noise level over the same sampling time period (T). Also see ambient sound.
L _{den}	Day-evening-night equivalent level, calculated as: $L_{den} = 10 \log \frac{1}{24} \left(12 * 10^{\frac{L_{day}}{10}} + 4 * 10^{\frac{L_{evening} + 5}{10}} + 8 * 10^{\frac{L_{night} + 10}{10}} \right)$ <p>Where the L_{day}, L_{evening} and L_{night} are as defined in ISO1996-2:1987, and for the duration of 12 hours, 4 hours and 8 hours respectively, are A-weighted long term Leq sound level.</p>
L _{day}	Day equivalent level. A-weighted Leq sound level measured over the 12 hour period from 07:00 hours to 19:00 hours.
L _{evening}	Evening equivalent level. A-weighted Leq sound level measured during the evening period of 19:00 hours to 23:00 hours.
L _{Amax}	The maximum RMS A-Weighted sound pressure level occurring within a specified time period.
L _{night}	Night equivalent level. A-weighted Leq sound level measured during the night period of 23:00 hours to 07:00 hours.
Measurement time interval, T _m	total time over which measurements are taken. <i>Note: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
Rating level, L _{A,r, T_r}	specific sound level plus any adjustment for the characteristic features of the sound.
Reference time interval, T _r	specified interval over which the specific sound level is determined. <i>Note: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h</i>
Residual sound	ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level, L _r = L _{Aeq,T}	equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
Specific sound level, L _s = L _{Aeq,Tr}	equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T _r .
Specific sound source	sound source being assessed.
Night-Time	An 8 hour period between 23:00 – 07:00 hours, as per NG4
Noise Ambient	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far. Also see ambient sound.
Noise Background	The steady existing noise level present without contribution from any intermittent sources, The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, 'T' (L _{AF90,T}). Also see background sound level, L _{A90, T} .
Noise Specific	The sound arising from the source under investigation, disregarding all external and residual sources. Also see specific sound source.
NSR	Noise Sensitive Receptor - an identified dwelling, amenity area, recreational zone or other such place where a change in noise may result in a nuisance impact.
RMS	Root Mean Squared, mathematical method to account for swells and troughs within wave forms, such as sound.

Sound Power Level (L_W)	The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m ² . Utilised to express the intensity at source of a noise emission.
Sound Pressure Level (L_P)	Fluctuations in air pressure caused by the passage of a sound wave. The measurement of sound/noise through the use of a sound level meter, is a representation of these fluctuations in air pressure as they pass the instrument microphone.
Time Weighting	One of the averaging time for noise monitoring instrumentation: F – Fast, instrument samples every 125 milliseconds; S – Slow, instrument samples every 1 second; I – Impulsive, instrument samples every 35 milliseconds.

Note:

Unless otherwise stated all broadband noise values are A-weighted with a fast response.

Where 0dB is referenced it refers to the threshold of hearing – 2×10^{-5} Pa.

All 1/3 octave values are unweighted/linear. (z-weighted on the Bruel and Kjaer software)

APPENDIX 11-2

E2037 - Scotshouse
Sources and Receivers

MORES

Model: 230314 - Updated version - contours
Initial model 060123 - Initial model 060123
Group: (main group)
Listing of: Moving source, for method Industrial noise - LimA - BS 5228

Name	Desc.	ISO H	ISO Terr.	HDef.	Weighting	Flow(D)	Flow(E)	Flow(N)	Avg.speed	Lw 63	Lw 125	Lw 250	Lw 500	Lw 1k	Lw 2k	Lw 4k	Lw 8k
Excavator	Volvo EX300E	0.75	--	Relative	A	10	--	--	10	78.80	96.90	89.40	97.80	98.00	97.20	92.00	83.90
Wheeled L	Wheeled loader	0.75	--	Relative	A	10	--	--	10	86.80	94.90	95.40	99.80	103.00	101.20	101.00	87.90

E2037 - Scotshouse
Sources and Receivers

MORES

Model: 230314 - Updated version - contours
Initial model 060123 - Initial model 060123
Group: (main group)
Listing of: Moving source, for method Industrial noise - LimA - BS 5228

Name	Red 63	Red 125	Red 250	Red 500	Red 1k	Red 2k	Red 4k	Red 8k
Excavator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wheeled L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

E2037 - Scotshouse
Sources and Receivers

MORES

Model: 230314 - Updated version - contours
Initial model 060123 - Initial model 060123
Group: (main group)
Listing of: Point sources, for method Industrial noise - LimA - BS 5228

Name	Desc.	Height	Terrain L	HDef.	Ca(D)	Ca(E)	Ca(N)	Weighting	Lw 63	Lw 125	Lw 250	Lw 500	Lw 1k	Lw 2k	Lw 4k	Lw 8k	Red 63
Scalp Scr	Scalping Screen ROCO	1.50	105.50	Relative	0.00	--	--	A	87.00	90.00	91.00	95.00	95.00	93.00	90.00	81.00	0.00
Crusher		1.50	105.50	Relative	0.00	--	--	A	94.80	97.90	98.40	105.80	103.00	100.20	95.00	85.90	0.00
Tracked Co	Tracked conveyor ROCO	1.50	105.50	Relative	0.00	--	--	A	65.00	77.00	82.00	88.00	88.00	84.00	85.00	76.00	0.00

E2037 - Scotshouse
Sources and Receivers

MORES

Model: 230314 - Updated version - contours
Initial model 060123 - Initial model 060123
Group: (main group)
Listing of: Point sources, for method Industrial noise - LimA - BS 5228

Name	Red 125	Red 250	Red 500	Red 1k	Red 2k	Red 4k	Red 8k
Scalp Scr	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crusher	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tracked Co	0.00	0.00	0.00	0.00	0.00	0.00	0.00

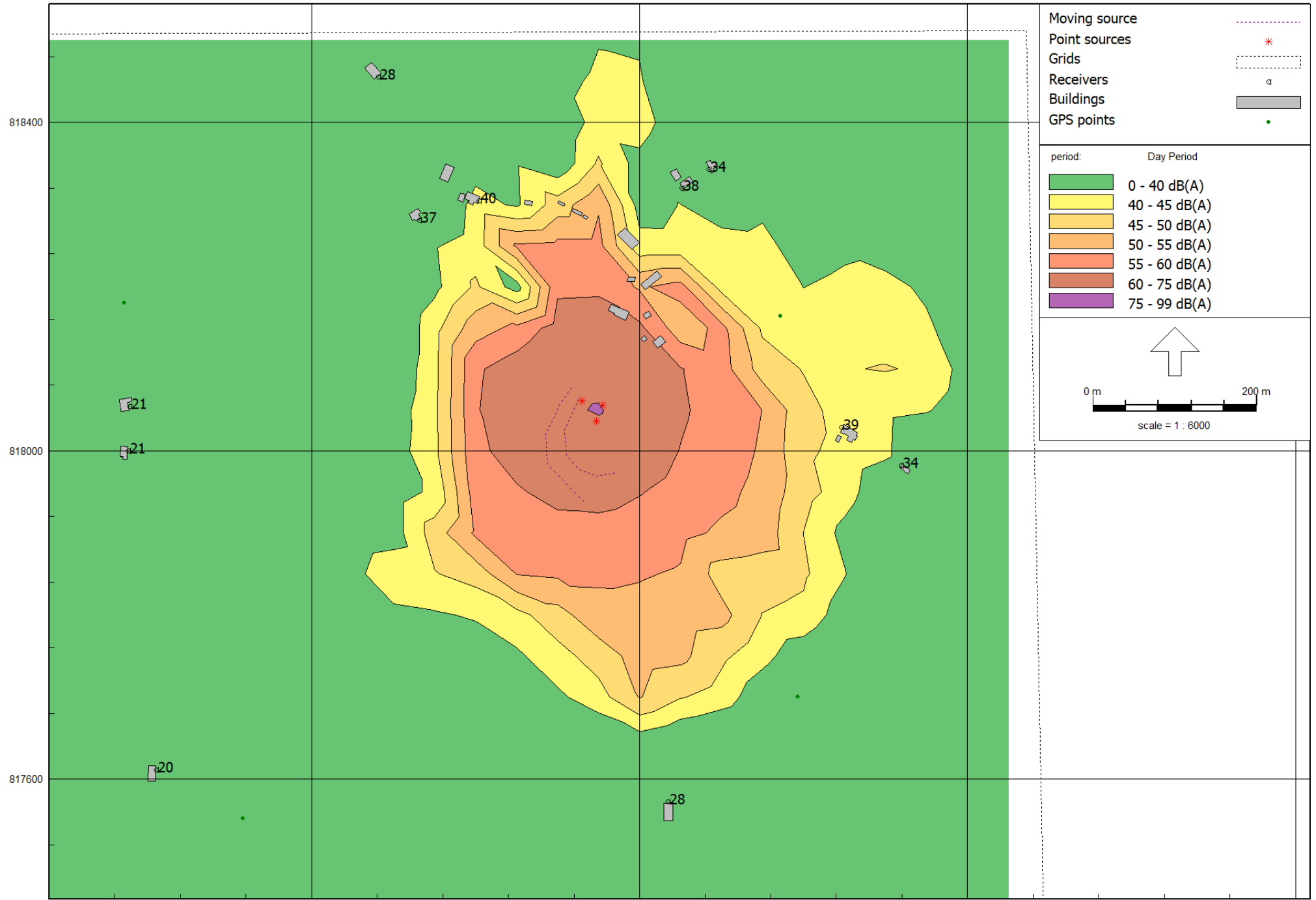
E2037 - Scotshouse
Sources and Receivers

MORES

Model: 230314 - Updated version - contours
Initial model 060123 - Initial model 060123
Group: (main group)
Listing of: Receivers, for method Industrial noise - LimA - BS 5228

Name	Desc.	Terrain L	HDef.	Height A	Height B	Height C	Height D	Height E	Height F	Façade
NSR07		112.73	Relative	1.50	--	--	--	--	--	No
NSR06		115.47	Relative	1.50	--	--	--	--	--	No
NSR11		115.93	Relative	1.50	--	--	--	--	--	No
NSR12		127.82	Relative	1.50	--	--	--	--	--	No
NSR05		154.76	Relative	1.50	--	--	--	--	--	No
NSR03		124.40	Relative	1.50	--	--	--	--	--	No
NSR01		101.78	Relative	1.50	--	--	--	--	--	No
NSR02		100.07	Relative	1.50	--	--	--	--	--	No
NSR10		117.67	Relative	1.50	--	--	--	--	--	No
NSR09		105.58	Relative	1.50	--	--	--	--	--	No
NSR04		128.62	Relative	1.50	--	--	--	--	--	No

APPENDIX 11-3



E2037 - Scotshouse Results

MORES

Report: Table of Results
Model: 230314 - Updated version - contours
LAeq: total results for receivers
Group: (main group)
Group Reduction: No

Name Receiver	Description	X	Y	Height	Day
NSR01_A		649651.59	818319.66	1.50	37.7
NSR02_A		649684.48	818342.37	1.50	34.5
NSR03_A		649846.34	818028.28	1.50	38.7
NSR04_A		649918.82	817982.30	1.50	34.3
NSR05_A		649634.54	817572.12	1.50	28.0
NSR06_A		649331.24	818281.23	1.50	36.6
NSR07_A		649404.55	818304.39	1.50	39.7
NSR09_A		649281.81	818455.74	1.50	27.9
NSR10_A		648976.78	817999.69	1.50	20.7
NSR11_A		648978.31	818053.78	1.50	20.7
NSR12_A		649011.09	817610.99	1.50	19.6

All shown dB values are A-weighted

APPENDIX 11-4

TEST REPORT 244496 Issue 2



Client:

**Scotshouse Quarries Ltd.
Scotshouse
Monaghan
Co. Monaghan**

BHP Ref No.: 22/12/3870

Order No.:

**Date Received: 27th October, 19th
December & 20th December 2022**

**Date Tested: 27th October, 19th December
& 20th December 2022**

Test Specification: Noise Monitoring

BHP

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E Mail

dervlapurcell@bhp.ie

FAO: Paddy Connolly

Item: Noise survey at noise sensitive locations at the Scotshouse Quarries Ltd. site located at Scotshouse, Monaghan, Co.Monaghan.

For and on behalf of BHP Ltd.

A handwritten signature in black ink, appearing to read 'Dervla Purcell'.

Dervla Purcell

Date Issued: 16th January 2023

Supplement to report No. 244496

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory

Contents

- 1.0 Scope
- 2.0 Survey Approach
- 3.0 Date of survey
- 4.0 Results
 - 4.1 Noise levels and sampling notes
- 5.0 Interpretation of results
 - 5.1 Noise Levels
- 6.0 Conclusions

Appendix A: Map showing noise monitoring locations

Appendix B: Photographs indicating noise monitoring locations

1.0 Scope of survey

At the request of Scotshouse Quarries Ltd., BHP undertook noise monitoring at their operation in Scotshouse, Co.Monaghan. The purpose of this survey was to provide Scotshouse Quarries Ltd with the noise data and analysis required as part of their planning requirements.

This report deals with 8 nominated noise monitoring locations at the operation in Scotshouse, Co.Monaghan.

2.0 Survey approach

Two sound level meters (SLM's) were used in the survey, a Cirrus 171C type 1 (serial number G068852) and a Cirrus 831C type 1 (serial number D20874FF). The SLM's were calibrated at the start of the survey with a CRL 515 calibrator (serial number 74767). The same calibrator was used to check the SLM at the end of the survey, to inspect the microphone drift.

Monitoring and the interpretation of acquired data are to the following standards:

- International Standard (ISO 1996-1: 2003E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 1. Basic quantities and assessment procedures.
- International Standard (ISO 1996-2: 2007E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 2. Determination of environmental noise levels.
- British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

60-minute daytime levels were measured at eight locations. The locations were labelled as NM1, NM2, NM3, NSL1, NSL2, NSL3, NSL4 and NSL5 and are identified on the map included in Appendix A.

Appendix B contains photographs of the noise monitoring equipment at the monitoring points.

3.0 Date of survey

The survey was carried out on the 27th October, 19th December and 20th December 2022 for the daytime monitoring.

4.0 Results

4.1 Noise levels:

Levels are presented on the following pages.

**Daytime Measurements- Noise Locations- Scotshouse Quarry,
Monaghan, Co. Monaghan.**

27 October 2022.

Weather Conditions; Clear, Dry, Wind 4-5 m/s SE, 14° C.

19 December 2022.

Weather Conditions; Mostly Cloudy, Wet, Wind 4-5 m/s S, 5° C.

20 December 2022.

Weather Conditions; Partly Cloudy, Wet, Wind 8-9 m/s S, 6° C.

Location	Sampling Period	Duration	L_{Aeqt} dB	L_{A10} dB	L_{A90} dB	L_{AMAX} dB	Impulsive/ Tonal	Notes
NM1	09:32-10:32 20/12/22	60 mins	47	53	40	84	No	Quarry activity audible from this location. Asphalt plant could be heard in the distance at 48-53dBA consistently through testing. Truck passed noise monitoring point during testing. This was the noise associated with the L _{Amax} .
NM2	13:57-14:57 27/10/22	60 mins	55	60	52	67	No	Asphalt plant could be heard during the start of testing (20mins) operating at 58-63dBA. When not running, mobile plant was heard on site at 45-53dBA. Trucks entering and exiting the quarry was audible at 45-50dBA occasionally.
NM3	14:07-15:07 27/10/22	60 mins	54	57	37	72	No	Asphalt plant was audible during the start of testing (10mins) at 50-55dBA. When not running, mobile plant and trucks moving on site was heard at 42-47dBA.
NSL1	15:50-16:50 19/12/22	60 mins	55	59	40	68	No	Asphalt plant audible at 53-58dBA almost consistently through testing. Infrequent traffic passing on local road heard faintly in the background.

NSL2	14:31-15:31 19/12/22	60 mins	51	51	43	81	No	Asphalt plant audible 45-53dBA for second half of testing. Occasional passing traffic on local road was audible and associated with the LAmax of 81dBA.
NSL3	09:22-10:22 20/12/22	60 mins	51	53	42	75	No	Quarry activity not audible from this location. Dog barking is associated with the LAmax of 75dBA regularly during testing. Cattle in nearby sheds could be heard at 65-45dBA occasionally.
NSL4	16:08-17:08 19/12/22	60 mins	50	54	36	73	No	Quarry activity not audible from this location. Nearby tractor was audible intermittently during testing at 45-53dBA. One bus passed audible at up to 73dBA. Occasional passing traffic on local road heard at 55-65dBA.
NSL5	14:22-15:22 19/12/22	60 mins	52	54	40	72	No	Asphalt plant audible at 45-52dBA for the second half of testing. Cars passing on local road were audible at 45-55dBA and an occasional truck passing at up to 72dBA.

5.0 Interpretation of results

5.1 Noise levels;

The noise limits for the Scotshouse Quarries Ltd. operation in Scotshouse Co.Monaghan are as follows:

Daytime Limit $L_{Aeq}55\text{dBA}$

5.1.1 Day-time levels :

As can be seen in section 4.1, L_{Aeq} levels at all monitoring locations are equal to or less than the daytime limit of 55dBA.

6.0 Conclusions

The noise contribution made by the Scotshouse Quarries Ltd. operation did not exceed the daytime limit of 55dBA.

There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Appendix A

Site map showing noise monitoring locations



Appendix B

Photographs of noise monitoring locations

Noise monitoring location NM1



Noise monitoring location NM2



Noise monitoring location NM3



Noise monitoring location NSL1



Noise monitoring location NSL2



Noise monitoring location NSL3



Noise monitoring location NSL4



Noise monitoring location NSL5



TEST REPORT 246892



Client:

**Scotshouse Quarries Ltd.
Scotshouse
Monaghan
Co. Monaghan**

BHP Ref No.: 23/02/0345

Order No.:

Date Received: 23rd January 2023

Date Tested: 23rd January 2023

Test Specification: Noise Monitoring

BHP

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E Mail

dervlapurcell@bhp.ie

FAO: Paddy Connolly

Item: Noise survey at noise sensitive locations at the Scotshouse Quarries Ltd. site located at Scotshouse, Monaghan, Co. Monaghan.

For and on behalf of BHP Ltd.

A handwritten signature in black ink, appearing to read 'Dervla Purcell'.

Dervla Purcell

Date Issued: 17th February 2023

Supplement to report No. N/A

This Test Report shall not be duplicated except in full and then only with the permission of the test laboratory

Contents

- 1.0 Scope
- 2.0 Survey Approach
- 3.0 Date of survey
- 4.0 Results
 - 4.1 Noise levels and sampling notes
- 5.0 Interpretation of results
 - 5.1 Noise Levels
- 6.0 Conclusions

Appendix A: Map showing noise monitoring locations

Appendix B: Photographs indicating noise monitoring locations

1.0 Scope of survey

At the request of Scotshouse Quarries Ltd., BHP undertook noise monitoring at their operation in Scotshouse, Co.Monaghan. The purpose of this survey was to provide Scotshouse Quarries Ltd with the noise data and analysis required as part of their planning requirements.

This report deals with 6 nominated noise monitoring locations at the operation in Scotshouse, Co.Monaghan.

2.0 Survey approach

Two sound level meters (SLM's) were used in the survey, a Cirrus 171C type 1 (serial number G068852) and a Cirrus 831C type 1 (serial number D20874FF). The SLM's were calibrated at the start of the survey with a CRL 515 calibrator (serial number 74767). The same calibrator was used to check the SLM at the end of the survey, to inspect the microphone drift.

Monitoring and the interpretation of acquired data are to the following standards:

- International Standard (ISO 1996-1: 2003E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 1. Basic quantities and assessment procedures.
- International Standard (ISO 1996-2: 2007E) Acoustics – Description, measurement and assessment of Environmental Noise. Part 2. Determination of environmental noise levels.
- British Standard: BS 7445 Part 3: 1991 (ISO 1996-3: 1987) Description and measurement of Environmental Noise. Part 3. Guide to application to noise limits.

60-minute daytime levels were measured at six locations. The locations were labelled as NM1, NM2, NM3, NSL1, NSL2 and NSL5 and are identified on the map included in Appendix A.

Appendix B contains photographs of the noise monitoring equipment at the monitoring points.

3.0 Date of survey

The survey was carried out on the 23rd January 2023 for the daytime monitoring.

4.0 Results

4.1 Noise levels:

Levels are presented on the following pages.

**Daytime Measurements- Noise Locations- Scotshouse Quarry,
Monaghan, Co. Monaghan.**

23 January 2023.

Weather Conditions; Mostly Cloudy, Dry, Calm, 8° C.

Location	Sampling Period	Duration	LAeqt dB	LA10 dB	LA90 dB	LAMAX dB	Impulsive/ Tonal	Notes
NM1	17:28-18:28	60 mins	47	52	27	60	No	No quarry activity audible from this location during testing. Tractor working in nearby off site field. This is the noise associated with the maximum. Birdsong consistently during testing at 45-50dBA.
NM2	15:07-16:07	60 mins	43	45	31	69	No	Mobile plant was heard on site at 40-50dBA. Trucks entering and exiting the quarry was audible at 45-50dBA occasionally.
NM3	15:03-16:03	60 mins	41	44	30	73	No	Mobile plant and trucks moving on site was heard at 42-47dBA regularly during testing.
NSL1	17:22-18:22	60 mins	36	38	25	57	No	Infrequent traffic passing on local road heard faintly in the background. Dog barking from nearby house and was associated with the maximum. No quarry noise audible.
NSL2	16:18-17:18	60 mins	38	43	28	69	No	Occasional passing traffic on local road was audible. Car entered the driveway of the house and was associated with the maximum levels heard. Mobile plant audible faintly in the distance. Distant tractor operating was heard at 35-40dBA occasionally.

NSL5	16:15-17:15	60 mins	46	52	28	67	No	Cars passing on local road were audible at 45-55dBA and an occasional truck passing at up to 67dBA. Mobile plant audible faintly in the distance. Farm related noise such as cattle and sheds banging audible from the site next door to this location.
------	-------------	---------	----	----	----	----	----	---

5.0 Interpretation of results

5.1 Noise levels;

The noise limits for the Scotshouse Quarries Ltd. operation in Scotshouse Co. Monaghan are as follows:

Daytime Limit $L_{Aeq}55\text{dBA}$

5.1.1 Day-time levels:

As can be seen in section 4.1, L_{Aeq} levels at all monitoring locations are less than the daytime limit of 55dBA.

6.0 Conclusions

The noise contribution made by the Scotshouse Quarries Ltd. operation did not exceed the daytime limit of 55dBA.

There was no evidence of tonal or impulsive qualities to the recorded noise from the quarry at the nominated locations.

Appendix A

Site map showing noise monitoring locations.



Appendix B

Photographs of noise monitoring locations

Noise monitoring location NM1



Noise monitoring location NM2



Noise monitoring location NM3



Noise monitoring location NSL1



Noise monitoring location NSL2



Noise monitoring location NSL5



APPENDIX 13-1

RECORDED MONUMENTS IN THE STUDY AREA

MO021-005---- Sherrick West Cairn - unclassified

Situated on a rise with rock outcrop at the bottom of a S-facing slope. This was described in the 1940s as 'a small mound of stones about 8 feet across and not more than 2 high (c. 2.45m; c. 0.6m), bounded by a kerb of rather large stones. Towards the north side of the mound stands a quarried block with rather sharp edges, 3' x 1' 8" x 4' 6" high (c. 0.9m; c. 0.5m; c. 1.35m).

MO021-006---- Aghnaskew Ringfort – rath

Situated on a shelf on a N-facing slope. It is not depicted as a rath on any map but it was described c. 1940 as a subcircular area (dims c. 35m E-W; c. 33m N-S) defined by a stony bank (Wth c. 1m; H c. 0.6m) and hedge E-S-W with no visible fosse (SMR file).

MO021-007---- Dunsrim Ringfort – cashel

Located on a rise on a NE-facing slope, with the headwaters of a small SE-NW stream c. 50m to the SW. It is depicted only on the 1907 edition of the OS 6-inch map as a D-shaped enclosure defined by field walls. This is an oval grass-covered area (dims 28.5m N-S; 22.5m E-W) defined by a grass-covered stone spread (Wth c. 4m; int. H c. 0.2m; ext. H 1.2-1.5m) but no facing stones are identified. The original entrance is not recognised, but the perimeter is slightly clipped by a NW-SE field wall at SW.

MO021-008---- Lattacrossan Ringfort – rath

Situated on a rise which is on a NE-facing slope and overlooking a col with a hill rising to the NE. This rath is the more northerly of two at Lattacrossan represented on McCrea's Map of County Monaghan (1793), and it is also depicted on the 1834 and 1907 editions of the OS 6-inch map. This is an oval and domed grass-covered area (dims 38m NNW-SSE; 32.3m ENE-WSW) defined by a scarp (Wth 1.5m; H 1m at N to 3m at SE) that is incorporated into an overgrown field bank and hedge SE-W-NW. There is no visible fosse and the original entrance is not identified. The perimeter is damaged by quarrying SSE-SSW.

MO021-009---- Aghareagh West Ringfort – rath

Located on a N-S drumlin ridge. This is a circular grass-covered area (diam. 42.5m N-S; 38.5m E-W) defined by an earthen bank (Wth c. 3m; int. H 0.6m; ext. H c. 2-2.5m) NNW-NE that is largely reduced to a scarp (at E: H 1.8m) and hedge. The remains of an outer fosse (Wth of base c. 1.5m) SW-N-SE has been deepened (ext. D c. 0.7m) NNW-NNE. The original entrance is probably the large gap (Wth at base 2.3m) at S.

MO021-010---- Lattacrossan Ringfort – rath

Circular area (c. 25.7m NE-SW; 27.5m NW-SE) surrounded by earthen bank with external fosse. No visible trace of original entrance.

MO021-011---- Aghareagh West, Aghnaskew, Annagheane, Cornapaste, Corrackan, Corrinny, Corrinshigo, Drumavan, Drumgrone, Fastry Or Racreeghan, Killark, Lattacrossan, Skerrick West Linear earthwork

The Black Pig's Dyke is a name that is generally applied to a number of linear earthworks in the south Ulster and north Connaught regions by the map-makers. They form discontinuous sections extending mostly through drumlin country from Donegal Bay in the west almost as far as Dundalk Bay in the east. Other names are the 'Worm's Ditch' or the 'Worm's Cast', and in Co. Cavan the 'Duncla'. Similar earthworks, like the Dane's Cast and the Dorsey in Co. Armagh, could be part of the same phenomenon. Linear earthworks have been regarded as providing border defence, but their entire length could hardly have been defended, and it might be more reasonable to suggest that they were constructed to control access points and to hinder cattle raiding (Raftery 1994, 87). Linear earthworks can date from the Late Bronze Age

up to the high medieval period, but the Black Pig's Dyke dates mainly to the Iron Age (c. 500BC-c. 500 AD). It has recently been studied in detail (Ó Drisceoil et al. 2014), and an article on the Monaghan section is published (Ó Drisceoil 2017).

In Co. Monaghan, apart from two short sections (MO025-044----; MO025-046----) at the E edge of the county close to the Armagh boundary, one long section extends E from a NE-SW section of the Finn river, south of Scotshouse, at the most western point of the county. From the river at Cornapaste – Corr na Péiste, the hill or hollow of the worm – it runs SE through Annagheane and Killark connecting Laurel Lough and Drumcor Lough. From the E end of Drumcor it turns NE (L c. 670m), rising up Doon Hill in Drumavan, before resuming a meandering eastward course through Skerrick West and Corrackan to Aghernaskew. The section to Aghernaskew is poorly preserved and represented as a dotted line on the 1907 edition of the OS 6-inch map. Eastwards from Aghernaskew it survives in generally good condition through the townlands of Lattacrossan, Aghareagh West, and Corrinny where it takes another turn to the N (L c. 300m) before curving eastwards through Drumurcher where it doesn't survive visibly and connects with a small pot lake meeting with Drumgrone, on the E side of which it crosses the NE-SW Bunoe River and comes to an end (total L c. 6.8km).

The earthwork was usually positioned in the valleys and hollows between drumlins, and where it is on a slope it is generally S-facing. Where it survives intact it consists of two banks with associated fosses on the up-slope side or a bank with fosses on either side. Where two banks are present the northern is invariably the stronger. Modern investigations of this earthwork began with Walsh's excavation of a NE-SW portion at Aghareagh West in 1982, which provides a good sample of its original appearance (Walsh 1987; 1991). Before excavation and from the NW it consisted of a fosse (Wth of top 7m; ext. D c. 1m), the wide N bank (Wth of base c. 7m; H over NW c. 3m; H over SE c. 3m) separated by a rounded fosse (Wth of top c. 8.5-9m) from the SE bank (Wth of base 4.5m; H over NW and SE c. 1.2-1.4m), and the earthworks have a total width of c. 24m. A palisade trench (Wth 0.5m; D 0.9m) that had been burnt was found outside the NW fosse. No artefacts were recovered from the excavation, but samples of carbon from the palisade trench produced a revised C14 date of 310 cal. BC to cal. AD 140 (Ó Drisceoil 2014, 78-9). A gradiometer survey (19R0233) by H. Gimson (2019) of the fields to the NW and SE of Walsh's excavation recorded intimations of numerous pits and possible enclosures.

Archaeological testing (98E0245) uncovered an area of brushwood just S of the line of the earthwork at the W edge Cornapaste townland (Moore 2000), but further testing (05E0657) S of its line in the same area produced no related material (O'Hara 2005). However, archaeological testing (05E0915) adjacent to a section at the E end of Lattacrossan townland on the N side of the earthwork produced evidence of a palisade in a layer of burnt clay running parallel with the earthwork which was preserved in situ (Meenan 2008). A remote sensing survey conducted at Corrinny as part of the regional study confirmed the form of the linear earthwork as a double ditch feature with evidence of a burnt palisade trench outside the N ditch (Grimson 2014). As confirmation of these features Meehan (2008) in a limited test excavation (05E0915) at Lattacrossan recorded a spread of burnt clay running parallel with a NE-SW section of the linear earthwork on the NW side.

A section of this monument, in the townland of Annagheane, is subject to a preservation order made under the National Monuments Acts 1930 to 2014 (PO no. 4/1990).

(O'Hara 2005 Archaeological Assessment, Cornapaste, Co. Monaghan. Licence No. 05E06557. Unpublished report, Archaeological Consultancy Services

APPENDIX 14-1

SCOPING STUDY FOR: 11524 - Scotshouse Quarry - Substitute Consent (SC) and Planning Application

CLIENT: Scotshouse Quarries

LOCAL AUTHORITY: Monaghan County Council

SCOPING FORM SENT TO: Kevin West and Brian Braniff,
Monaghan County Council

SENT BY: Maria Rooney **DATE:** 18-11-22

Ref	Item	Requirements
1	Location, Size and nature of proposed description of proposal	Continued use of the substitute consent area together with a greenfield area which the quarry operator wants to extend the quarry into. A total area of 22.8Ha.
2	Is the development in line with National, County and Local Area Plan policy?	Yes
3	Description of existing uses of land	Varying agriculture use.
4	Does the development involve the relocation of an existing use?	No
5	What provisions are there for Pedestrians, Cyclists, Public Transport, Disabled access?	N/A
6	What is the carrying capacity of the existing transportation Networks?	TBC
7	What data sources, guidance is available?	Traffic Counts to be undertaken
8	Are traffic surveys of the existing conditions available or required?	NI
9	Potential trip / traffic generation from the site. Initial estimates can be obtained from available databases, from existing similar development in the locality, or from existing travel patterns if the development is relocating.	Trip generation and distribution to be determined from typical weighbridge data.
10	Are further traffic generation surveys required?	No
11	What are the targets for mode share and how are they achieved?	N/A
12	Are trip distribution and assignment models to be used?	Distribution based on existing distribution.
13	Are further traffic surveys required or can TRICS database be used to estimate trip rates?	Generated Traffic estimated from first principles.
14	What is the rate of traffic growth locally?	Central growth rate as per TII Project Appraisal Guidelines
15	When is the critical time period of assessment? i.e. consider the peak hour for development traffic and also the peak hour for the network – it may be necessary to	To be confirmed from Traffic Counts

Ref	Item	Requirements
	assess both periods if they are different. What are the assessment years?	
16	What are the assessment years?	Peak year of Construction
17	When will the site become fully operational? Are there significant phases to the project?	2023. No.
18	Are there ways to reduce car dependency? Is a mobility management plan and future travel plans required?	N/A
19	Will the site attract traffic from other adjacent sites?	No.
20	Are there any adjacent developments committed or proposed that will have significant trip / traffic implications?	TBC
21	What is the cumulative impact of the development within the area?	TBC
22	What will be the area of impact of the proposal, i.e. which adjacent local regional and National Road routes and junctions will be affected and require capacity calculations?	Existing access in L6280.
23	Is a new or modified highway access likely?	TBC
24	Details of any adjacent highway improvement proposals and, if necessary, any proposals distant from the site	TBC
25	Will adjacent links or junctions become overloaded or be impacted significantly? Is a new or modified road access likely?	TBC
26	What level of car parking provision is proposed?	N/A
27	What sightlines/ visibility splays are available at the proposed development accesses?	TBC
28	Do they comply with the requirements of the relevant standards, <i>TII DN-GEO-03060 Geometric Design of Junctions (priority junctions, direct accesses, roundabout, grade separated and compact separated junctions) & DMURS for Urban Areas</i>	TBC
29	Are there any road safety implications?	TBC
30	Is a Road Safety Impact assessment or Road Safety Audit required? Refer to TII standards.	N/A
31	What type of transport analysis is most suitable, i.e. what type of traffic modelling software is most appropriate to give the best	PICADY

Ref	Item	Requirements
	understanding of the potential impacts?	

APPENDIX 14-2

Traffic Calculations for Scotshouse Quarry, Co. Monaghan
 Site 1 - L6280/ Quarry Access
 AM Peak (07:45 - 08:45)

Seasonally Adjusted 2022

2023 Year of Opening

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016 - 2030 index	1.0115	1.0252	
Years	1	1	
Central Growth Factor	1.0115	1.0252	

2028 (5 Years after Opening)

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016-2030 index	1.0115	1.0252	
Years	6	6	
Central Growth Factor	1.0710	1.1611	

2038 (15 Years after Opening)

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016-2030 index	1.0115	1.0252	
Years	8	8	
Central Growth Factor	1.0958	1.2203	

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2030-2040 index	1.0047	1.0112	
Years	8	8	
Central Growth Factor	1.0382	1.0932	

Combined Factors 1.1377 1.3340

Route	A	HGV	B	HGV	C	HGV
A	0	0	3	1	5	0
B	0	0	0	0	0	5
C	2	0	2	1	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	3	1	5	0
B	0	0	0	0	0	5
C	2	0	2	1	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	3	1	6	0
B	0	0	0	0	0	6
C	2	0	2	1	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	4	1	6	0
B	0	0	0	0	0	7
C	2	0	2	1	0	0

AM PEAK GENERATED TRAFFIC

Site 1 - L6280/ Quarry Access
 WITH DEVELOPMENT

Generated Traffic

Route	A	HGV	B	HGV	C	HGV
A	0	0	12	4	0	0
B	0	0	0	0	0	8
C	0	0	8	4	0	0

Year of Opening

Route	A	HGV	B	HGV	C	HGV
A	0	0	15	5	5	0
B	0	0	0	0	0	13
C	2	0	10	5	0	0

(5 Years after Opening)

Route	A	HGV	B	HGV	C	HGV
A	0	0	15	5	6	0
B	0	0	0	0	0	14
C	2	0	10	5	0	0

(15 Years after Opening)

Route	A	HGV	B	HGV	C	HGV
A	0	0	16	5	6	0
B	0	0	0	0	0	15
C	2	0	10	5	0	0

Traffic Calculations for Scotshouse Quarry, Co. Monaghan
 Site 1 - L6280/ Quarry Access
 PM Peak (16:45 - 17:45)

Seasonally Adjusted 2022

2023 Year of Opening

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016 - 2030 index		1.0115	1.0252
Years		1	1
Central Growth Factor		1.0115	1.0252

2028 (5 Years after Opening)

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016-2030 index		1.0115	1.0252
Years		6	6
Central Growth Factor		1.0710	1.1611

2038 (15 Years after Opening)

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2016-2030 index		1.0115	1.0252
Years		8	8
Central Growth Factor		1.0958	1.2203

<u>Monaghan</u>		<u>LGV</u>	<u>HGV</u>
2030-2040 index		1.0047	1.0112
Years		8	8
Central Growth Factor		1.0382	1.0932

Combined Factors 1.1377 1.3340

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	0	5	0
B	1	0	0	0	1	2
C	5	1	0	0	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	0	5	0
B	1	0	0	0	1	2
C	5	1	0	0	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	0	6	0
B	1	0	0	0	1	2
C	6	1	0	0	0	0

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	0	6	0
B	1	0	0	0	1	3
C	6	1	0	0	0	0

AM PEAK GENERATED TRAFFIC

Site 1 - L6280/ Quarry Access
 WITH DEVELOPMENT

Generated Traffic

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	4	0	0
B	10	0	0	0	10	8
C	0	0	0	4	0	0

Year of Opening

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	4	5	0
B	11	0	0	0	11	10
C	5	1	0	4	0	0

(5 Years after Opening)

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	4	6	0
B	11	0	0	0	11	11
C	6	1	0	4	0	0

(15 Years after Opening)

Route	A	HGV	B	HGV	C	HGV
A	0	0	0	4	6	0
B	11	0	0	0	11	11
C	6	1	0	4	0	0

APPENDIX 14-3

Junctions 10

PICADY 10 - Priority Intersection Module

Version: 10.0.4.1693
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: 11524_ Junction Access.j10
Path: C:\Users\gabriela.iha\OneDrive - TOBIN Consulting Engineers\Documents\workingfiles\unionsquare.tobin.ie
Report generation date: 06/01/2023 11:46:10

- »2022 Base Year, AM
- »2022 Base Year, PM
- »2023 Do Nothing-YoO, AM
- »2023 Do Nothing-YoO, PM
- »2023 Do Something-YoO, AM
- »2023 Do Something-YoO, PM
- »2028 Do Nothing YoO+5, AM
- »2028 Do Nothing YoO+5, PM
- »2028 Do Something YoO+5, AM
- »2028 Do Something YoO+5, PM
- »2038 Do Nothing YoO+15, AM
- »2038 Do Nothing YoO+15, PM
- »2038 Do Something YoO+15, AM
- »2038 Do Something YoO+15, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	Junction LOS	Queue (Veh)	Delay (s)	RFC	Junction LOS
2022 Base Year								
Stream B-C	0.0	12.83	0.02	A	0.0	0.00	0.00	A
Stream B-A	0.0	0.00	0.00		0.0	0.00	0.00	
Stream C-AB	0.0	8.41	0.01		0.0	0.00	0.00	
2023 Do Nothing-YoO								
Stream B-C	0.0	12.83	0.02	A	0.0	0.00	0.00	A
Stream B-A	0.0	0.00	0.00		0.0	0.00	0.00	

Stream C-AB	0.0	8.47	0.01		0.0	0.00	0.00	
2023 Do Something-YoO								
Stream B-C	0.1	13.29	0.05	A	0.1	9.98	0.06	A
Stream B-A	0.0	0.00	0.00		0.0	8.53	0.03	
Stream C-AB	0.0	8.83	0.04		0.0	12.58	0.02	
2028 Do Nothing YoO+5								
Stream B-C	0.0	12.89	0.02	A	0.0	10.71	0.01	A
Stream B-A	0.0	0.00	0.00		0.0	8.26	0.00	
Stream C-AB	0.0	8.55	0.01		0.0	0.00	0.00	
2028 Do Something YoO+5								
Stream B-C	0.1	13.36	0.05	A	0.1	10.09	0.06	A
Stream B-A	0.0	0.00	0.00		0.0	8.54	0.03	
Stream C-AB	0.0	8.84	0.04		0.0	12.55	0.02	
2038 Do Nothing YoO+15								
Stream B-C	0.0	12.94	0.03	A	0.0	10.84	0.01	A
Stream B-A	0.0	0.00	0.00		0.0	8.26	0.00	
Stream C-AB	0.0	8.70	0.01		0.0	0.00	0.00	
2038 Do Something YoO+15								
Stream B-C	0.1	13.41	0.06	A	0.1	10.09	0.06	A
Stream B-A	0.0	0.00	0.00		0.0	8.54	0.03	
Stream C-AB	0.0	8.86	0.04		0.0	12.55	0.02	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

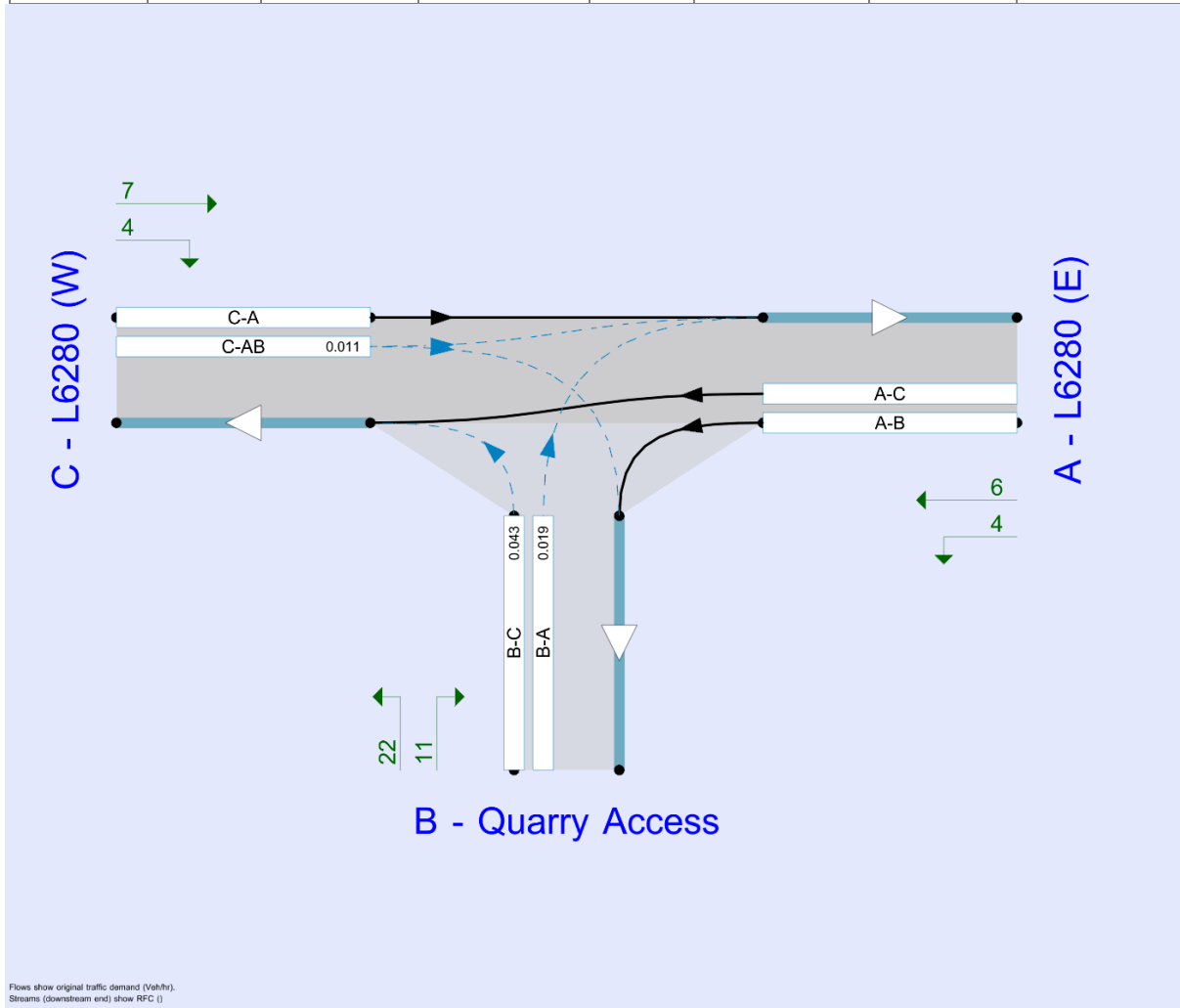
File Description

Title	Quarry Access
Location	
Site number	
Date	06/01/2023

Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	TOBIN\Gabriela.lha
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed	Show lane queues	Show all PICADY	Calculate residual capacity	RFC Threshold	Average Delay	Queue threshold (PCU)	Use iterations	Max number of iterations
--------------------	-----------------------------	--------------------	------------------	-----------------	-----------------------------	---------------	---------------	-----------------------	----------------	--------------------------

		queueing delay	in feet / metres	stream intercepts			threshold (s)		with HCM roundabouts	for roundabouts
5.75	✓					0.85	36.00	20.00		500

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 Base Year	AM	ONE HOUR	07:30	09:00	15	✓
D2	2022 Base Year	PM	ONE HOUR	16:30	18:00	15	✓
D3	2023 Do Nothing-YoO	AM	ONE HOUR	07:30	09:00	15	✓
D4	2023 Do Nothing-YoO	PM	ONE HOUR	16:30	18:00	15	✓
D5	2023 Do Something-YoO	AM	ONE HOUR	07:30	09:00	15	✓
D6	2023 Do Something-YoO	PM	ONE HOUR	16:30	18:00	15	✓
D7	2028 Do Nothing YoO+5	AM	ONE HOUR	07:30	09:00	15	✓
D8	2028 Do Nothing YoO+5	PM	ONE HOUR	16:30	18:00	15	✓
D9	2028 Do Something YoO+5	AM	ONE HOUR	07:30	09:00	15	✓
D10	2028 Do Something YoO+5	PM	ONE HOUR	16:30	18:00	15	✓
D11	2038 Do Nothing YoO+15	AM	ONE HOUR	07:30	09:00	15	✓
D12	2038 Do Nothing YoO+15	PM	ONE HOUR	16:30	18:00	15	✓
D13	2038 Do Something YoO+15	AM	ONE HOUR	07:30	09:00	15	✓
D14	2038 Do Something YoO+15	PM	ONE HOUR	16:30	18:00	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2022 Base Year, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.23	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.23	A

Arms

Arms

Arm	Name	Description	Arm type
A	L6280 (E)		Major
B	Quarry Access		Minor
C	L6280 (W)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right-turn storage	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - L6280 (W)	5.50			0.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane Width (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B - Quarry Access	Two lanes	2.20	2.20	0	0

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	440	0.082	0.207	0.130	0.295
B-C	574	0.090	0.227	-	-
C-B	574	0.227	0.227	-	-

The slopes and intercepts shown above include custom intercept adjustments only.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
----	---------------	------------------	----------------------	--------------------	---------------------	---------------------------	-------------------

D1	2022 Base Year	AM	ONE HOUR	07:30	09:00	15	✓
----	----------------	----	----------	-------	-------	----	---

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	9	100.000
B - Quarry Access		ONE HOUR	✓	5	100.000
C - L6280 (W)		ONE HOUR	✓	5	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	4	5
	B - Quarry Access	0	0	5
	C - L6280 (W)	2	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	25	0
	B - Quarry Access	0	0	100
	C - L6280 (W)	0	33	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.02	12.83	0.0	0.5	B	5	7
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.01	8.41	0.0	0.5	A	3	4

C-A						2	3
A-B						4	6
A-C						5	7

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.013	4	0.0	0.0	12.734	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	431	0.005	2	0.0	0.0	8.388	A
C-A	1	0.37			1				
A-B	3	0.75			3				
A-C	4	0.94			4				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.016	4	0.0	0.0	12.775	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	431	0.006	3	0.0	0.0	8.398	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	4	1			4				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	6	1	286	0.019	5	0.0	0.0	12.828	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	431	0.008	3	0.0	0.0	8.411	A
C-A	2	0.55			2				
A-B	4	1			4				
A-C	6	1			6				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	6	1	286	0.019	6	0.0	0.0	12.828	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	431	0.008	3	0.0	0.0	8.411	A
C-A	2	0.55			2				
A-B	4	1			4				
A-C	6	1			6				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.016	5	0.0	0.0	12.776	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	431	0.006	3	0.0	0.0	8.396	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	4	1			4				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.013	4	0.0	0.0	12.740	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	431	0.005	2	0.0	0.0	8.387	A
C-A	1	0.37			1				
A-B	3	0.75			3				
A-C	4	0.94			4				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.02	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2022 Base Year, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.

Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.00	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.00	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2022 Base Year	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	5	100.000
B - Quarry Access		ONE HOUR	✓	4	100.000
C - L6280 (W)		ONE HOUR	✓	6	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	5
	B - Quarry Access	1	0	3
	C - L6280 (W)	6	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	0
	B - Quarry Access	0	0	67
	C - L6280 (W)	17	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.00	0.00	0.0	~1	A	0	0
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						6	8
A-B						0	0
A-C						5	7

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	0.94			4				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	1			4				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	7	2			7				
A-B	0	0			0				
A-C	6	1			6				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	7	2			7				
A-B	0	0			0				
A-C	6	1			6				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	1			4				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	0.94			4				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 Do Nothing-YoO, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.24	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.24	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2023 Do Nothing-YoO	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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✓	✓	HV Percentages	2.00
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Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	9	100.000
B - Quarry Access		ONE HOUR	✓	5	100.000
C - L6280 (W)		ONE HOUR	✓	5	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	4	5
	B - Quarry Access	0	0	5
	C - L6280 (W)	2	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	25	0
	B - Quarry Access	0	0	100
	C - L6280 (W)	0	34	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.02	12.83	0.0	0.5	B	5	7
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.01	8.47	0.0	0.5	A	3	4
C-A						2	3
A-B						4	6

A-C						5	7
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Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.013	4	0.0	0.0	12.734	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	428	0.005	2	0.0	0.0	8.451	A
C-A	1	0.37			1				
A-B	3	0.75			3				
A-C	4	0.94			4				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.016	4	0.0	0.0	12.775	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	428	0.006	3	0.0	0.0	8.461	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	4	1			4				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	6	1	286	0.019	5	0.0	0.0	12.828	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	428	0.008	3	0.0	0.0	8.474	A
C-A	2	0.55			2				
A-B	4	1			4				
A-C	6	1			6				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	6	1	286	0.019	6	0.0	0.0	12.828	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	428	0.008	3	0.0	0.0	8.475	A
C-A	2	0.55			2				
A-B	4	1			4				
A-C	6	1			6				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.016	5	0.0	0.0	12.776	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	428	0.006	3	0.0	0.0	8.461	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	4	1			4				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	286	0.013	4	0.0	0.0	12.740	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	428	0.005	2	0.0	0.0	8.450	A
C-A	1	0.37			1				
A-B	3	0.75			3				
A-C	4	0.94			4				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.02	0.02	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2023 Do Nothing-YoO, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		0.00	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	0.00	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Do Nothing-YoO	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	5	100.000
B - Quarry Access		ONE HOUR	✓	4	100.000
C - L6280 (W)		ONE HOUR	✓	6	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	5
	B - Quarry Access	1	0	3
	C - L6280 (W)	6	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	0
	B - Quarry Access	0	0	67
	C - L6280 (W)	17	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.00	0.00	0.0	~1	A	0	0
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						6	8
A-B						0	0
A-C						5	7

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	0.94			4				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A

B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	1			4				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	7	2			7				
A-B	0	0			0				
A-C	6	1			6				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	7	2			7				
A-B	0	0			0				
A-C	6	1			6				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	1			4				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	0	0	343	0.000	0	0.0	0.0	0.000	A
B-A	0	0	438	0.000	0	0.0	0.0	0.000	A
C-AB	0	0	528	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	4	0.94			4				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.00	0.00	0.00	0.00	0.00			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2023 Do Something-YoO, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.70	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.70	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2023 Do Something-YoO	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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A-C							5	7
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Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	10	2	286	0.034	10	0.0	0.0	13.033	B
B-A	0	0	433	0.000	0	0.0	0.0	0.000	A
C-AB	11	3	426	0.027	11	0.0	0.0	8.685	A
C-A	1	0.37			1				
A-B	15	4			15				
A-C	4	0.94			4				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	12	3	285	0.041	12	0.0	0.0	13.146	B
B-A	0	0	431	0.000	0	0.0	0.0	0.000	A
C-AB	14	3	425	0.032	14	0.0	0.0	8.746	A
C-A	2	0.44			2				
A-B	18	4			18				
A-C	4	1			4				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	14	4	285	0.050	14	0.0	0.1	13.290	B
B-A	0	0	429	0.000	0	0.0	0.0	0.000	A
C-AB	17	4	424	0.039	17	0.0	0.0	8.828	A
C-A	2	0.53			2				
A-B	22	6			22				
A-C	6	1			6				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	14	4	285	0.050	14	0.1	0.1	13.292	B
B-A	0	0	429	0.000	0	0.0	0.0	0.000	A
C-AB	17	4	424	0.039	17	0.0	0.0	8.827	A
C-A	2	0.53			2				
A-B	22	6			22				
A-C	6	1			6				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	12	3	285	0.041	12	0.1	0.0	13.152	B
B-A	0	0	431	0.000	0	0.0	0.0	0.000	A
C-AB	14	3	425	0.032	14	0.0	0.0	8.747	A
C-A	2	0.44			2				
A-B	18	4			18				
A-C	4	1			4				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	10	2	286	0.034	10	0.0	0.0	13.051	B
B-A	0	0	433	0.000	0	0.0	0.0	0.000	A
C-AB	11	3	426	0.027	11	0.0	0.0	8.690	A
C-A	1	0.37			1				
A-B	15	4			15				
A-C	4	0.94			4				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.03	0.00	0.00	0.03	0.03			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.04	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.03	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.03	0.26	0.46	0.49			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.03	0.25	0.46	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.00	0.00	0.04	0.04			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

2023 Do Something-YoO, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		7.22	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	7.22	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2023 Do Something-YoO	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	9	100.000
B - Quarry Access		ONE HOUR	✓	32	100.000
C - L6280 (W)		ONE HOUR	✓	10	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	4	5
	B - Quarry Access	11	0	21
	C - L6280 (W)	6	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	100	0
	B - Quarry Access	0	0	48
	C - L6280 (W)	17	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.06	9.98	0.1	0.5	A	19	29
B-A	0.03	8.53	0.0	0.5	A	10	15
C-AB	0.02	12.58	0.0	0.5	B	4	6
C-A						5	8
A-B						4	6
A-C						5	7

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	16	4	385	0.041	16	0.0	0.0	9.742	A
B-A	8	2	436	0.019	8	0.0	0.0	8.417	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.562	B
C-A	4	1			4				
A-B	3	1			3				
A-C	4	0.94			4				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	19	5	384	0.049	19	0.0	0.1	9.844	A

B-A	10	2	435	0.023	10	0.0	0.0	8.466	A
C-AB	4	1	290	0.013	4	0.0	0.0	12.576	B
C-A	5	1			5				
A-B	4	1			4				
A-C	4	1			4				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	23	6	384	0.060	23	0.1	0.1	9.981	A
B-A	12	3	434	0.028	12	0.0	0.0	8.531	A
C-AB	5	1	291	0.016	4	0.0	0.0	12.585	B
C-A	7	2			7				
A-B	4	1			4				
A-C	6	1			6				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	23	6	384	0.060	23	0.1	0.1	9.983	A
B-A	12	3	434	0.028	12	0.0	0.0	8.531	A
C-AB	5	1	291	0.016	5	0.0	0.0	12.577	B
C-A	7	2			7				
A-B	4	1			4				
A-C	6	1			6				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	19	5	384	0.049	19	0.1	0.1	9.849	A
B-A	10	2	435	0.023	10	0.0	0.0	8.467	A
C-AB	4	1	290	0.013	4	0.0	0.0	12.559	B
C-A	5	1			5				
A-B	4	1			4				
A-C	4	1			4				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	16	4	385	0.041	16	0.1	0.0	9.754	A
B-A	8	2	436	0.019	8	0.0	0.0	8.420	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.558	B
C-A	4	1			4				
A-B	3	1			3				
A-C	4	0.94			4				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.02	0.02	0.25	0.45	0.48			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.03	0.26	0.47	0.49			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2028 Do Nothing YoO+5, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.23	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.23	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2028 Do Nothing YoO+5	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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✓	✓	HV Percentages	2.00
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Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	11	100.000
B - Quarry Access		ONE HOUR	✓	6	100.000
C - L6280 (W)		ONE HOUR	✓	5	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	5	6
	B - Quarry Access	0	0	6
	C - L6280 (W)	2	3	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	27	0
	B - Quarry Access	0	0	100
	C - L6280 (W)	0	35	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.02	12.89	0.0	0.5	B	6	8
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.01	8.55	0.0	0.5	A	3	4
C-A						2	3
A-B						5	7

A-C						6	8
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Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.016	4	0.0	0.0	12.772	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	425	0.005	2	0.0	0.0	8.520	A
C-A	1	0.37			1				
A-B	4	1			4				
A-C	5	1			5				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.019	5	0.0	0.0	12.823	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	425	0.006	3	0.0	0.0	8.532	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	5	1			5				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	7	2	286	0.023	7	0.0	0.0	12.888	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	425	0.008	3	0.0	0.0	8.546	A
C-A	2	0.55			2				
A-B	6	1			6				
A-C	7	2			7				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	7	2	286	0.023	7	0.0	0.0	12.888	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	425	0.008	3	0.0	0.0	8.545	A
C-A	2	0.55			2				
A-B	6	1			6				
A-C	7	2			7				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.019	5	0.0	0.0	12.827	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	0.68	425	0.006	3	0.0	0.0	8.530	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	5	1			5				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.016	5	0.0	0.0	12.780	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	2	0.57	425	0.005	2	0.0	0.0	8.521	A
C-A	1	0.37			1				
A-B	4	1			4				
A-C	5	1			5				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.02	0.02	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2028 Do Nothing YoO+5, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		3.65	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.65	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2028 Do Nothing YoO+5	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	6	100.000
B - Quarry Access		ONE HOUR	✓	5	100.000
C - L6280 (W)		ONE HOUR	✓	7	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	6
	B - Quarry Access	1	0	4
	C - L6280 (W)	7	0	0

Vehicle Mix

Heavy Vehicle Percentages

From	To		
	A - L6280 (E)	B - Quarry Access	C - L6280 (W)
A - L6280 (E)	0	0	0
B - Quarry Access	0	0	68
C - L6280 (W)	18	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.01	10.71	0.0	0.5	B	4	6
B-A	0.00	8.26	0.0	0.5	A	0.92	1
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						6	10
A-B						0	0
A-C						6	8

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3	1	341	0.009	3	0.0	0.0	10.652	B
B-A	0.75	0.19	438	0.002	0.75	0.0	0.0	8.236	A
C-AB	0	0	526	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	5	1			5				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	341	0.011	4	0.0	0.0	10.677	B

B-A	0.90	0.22	437	0.002	0.90	0.0	0.0	8.245	A
C-AB	0	0	525	0.000	0	0.0	0.0	0.000	A
C-A	6	2			6				
A-B	0	0			0				
A-C	5	1			5				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	341	0.013	4	0.0	0.0	10.709	B
B-A	1	0.28	437	0.003	1	0.0	0.0	8.257	A
C-AB	0	0	525	0.000	0	0.0	0.0	0.000	A
C-A	8	2			8				
A-B	0	0			0				
A-C	7	2			7				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	341	0.013	4	0.0	0.0	10.709	B
B-A	1	0.28	437	0.003	1	0.0	0.0	8.257	A
C-AB	0	0	525	0.000	0	0.0	0.0	0.000	A
C-A	8	2			8				
A-B	0	0			0				
A-C	7	2			7				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	341	0.011	4	0.0	0.0	10.680	B
B-A	0.90	0.22	437	0.002	0.90	0.0	0.0	8.246	A
C-AB	0	0	525	0.000	0	0.0	0.0	0.000	A
C-A	6	2			6				
A-B	0	0			0				
A-C	5	1			5				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3	1	341	0.009	3	0.0	0.0	10.654	B
B-A	0.75	0.19	438	0.002	0.75	0.0	0.0	8.236	A
C-AB	0	0	526	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	5	1			5				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.01	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.25	0.45	0.48			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2028 Do Something YoO+5, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.69	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.69	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	2028 Do Something YoO+5	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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B-C	15	4	285	0.054	15	0.1	0.1	13.356	B
B-A	0	0	429	0.000	0	0.0	0.0	0.000	A
C-AB	17	4	424	0.039	17	0.0	0.0	8.837	A
C-A	2	0.53			2				
A-B	23	6			23				
A-C	7	2			7				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	13	3	285	0.044	13	0.1	0.0	13.206	B
B-A	0	0	431	0.000	0	0.0	0.0	0.000	A
C-AB	14	3	425	0.032	14	0.0	0.0	8.755	A
C-A	2	0.43			2				
A-B	19	5			19				
A-C	5	1			5				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	11	3	286	0.037	11	0.0	0.0	13.094	B
B-A	0	0	432	0.000	0	0.0	0.0	0.000	A
C-AB	11	3	425	0.027	11	0.0	0.0	8.696	A
C-A	1	0.37			1				
A-B	16	4			16				
A-C	5	1			5				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.05	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.03	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.03	0.26	0.46	0.49			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.03	0.25	0.46	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.00	0.00	0.04	0.04			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

2028 Do Something YoO+5, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		7.11	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	7.11	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	2028 Do Something YoO+5	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	10	100.000
B - Quarry Access		ONE HOUR	✓	33	100.000
C - L6280 (W)		ONE HOUR	✓	11	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	4	6
	B - Quarry Access	11	0	22
	C - L6280 (W)	7	4	0

Vehicle Mix

Heavy Vehicle Percentages

From	To		
	A - L6280 (E)	B - Quarry Access	C - L6280 (W)
A - L6280 (E)	0	100	0
B - Quarry Access	0	0	49
C - L6280 (W)	18	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.06	10.09	0.1	0.5	B	20	30
B-A	0.03	8.54	0.0	0.5	A	10	15
C-AB	0.02	12.55	0.0	0.5	B	4	6
C-A						6	10
A-B						4	6
A-C						6	8

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	17	4	382	0.043	16	0.0	0.0	9.834	A
B-A	8	2	436	0.019	8	0.0	0.0	8.423	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.540	B
C-A	5	1			5				
A-B	3	1			3				
A-C	5	1			5				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	20	5	382	0.052	20	0.0	0.1	9.943	A

B-A	10	2	435	0.023	10	0.0	0.0	8.472	A
C-AB	4	1	291	0.013	4	0.0	0.0	12.550	B
C-A	6	2			6				
A-B	4	1			4				
A-C	5	1			5				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	24	6	381	0.064	24	0.1	0.1	10.088	B
B-A	12	3	434	0.028	12	0.0	0.0	8.539	A
C-AB	5	1	292	0.016	5	0.0	0.0	12.553	B
C-A	8	2			8				
A-B	4	1			4				
A-C	7	2			7				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	24	6	381	0.064	24	0.1	0.1	10.090	B
B-A	12	3	434	0.028	12	0.0	0.0	8.539	A
C-AB	5	1	292	0.016	5	0.0	0.0	12.544	B
C-A	8	2			8				
A-B	4	1			4				
A-C	7	2			7				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	20	5	382	0.052	20	0.1	0.1	9.949	A
B-A	10	2	435	0.023	10	0.0	0.0	8.475	A
C-AB	4	1	291	0.013	4	0.0	0.0	12.528	B
C-A	6	2			6				
A-B	4	1			4				
A-C	5	1			5				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	17	4	382	0.043	17	0.1	0.0	9.846	A
B-A	8	2	436	0.019	8	0.0	0.0	8.426	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.534	B
C-A	5	1			5				
A-B	3	1			3				
A-C	5	1			5				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.02	0.02	0.25	0.45	0.48			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.03	0.26	0.47	0.49			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

B-C	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2038 Do Nothing YoO+15, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.76	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.76	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D11	2038 Do Nothing YoO+15	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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✓	✓	HV Percentages	2.00
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Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	11	100.000
B - Quarry Access		ONE HOUR	✓	7	100.000
C - L6280 (W)		ONE HOUR	✓	6	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	5	6
	B - Quarry Access	0	0	7
	C - L6280 (W)	2	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	28	0
	B - Quarry Access	0	0	100
	C - L6280 (W)	0	37	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.03	12.94	0.0	0.5	B	6	10
B-A	0.00	0.00	0.0	~1	A	0	0
C-AB	0.01	8.70	0.0	0.5	A	4	6
C-A						2	3
A-B						5	7

A-C						6	8
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Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.018	5	0.0	0.0	12.806	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	419	0.007	3	0.0	0.0	8.663	A
C-A	1	0.37			1				
A-B	4	1			4				
A-C	5	1			5				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	6	2	286	0.022	6	0.0	0.0	12.864	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	4	1	418	0.009	4	0.0	0.0	8.677	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	5	1			5				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	8	2	286	0.027	8	0.0	0.0	12.939	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	4	1	418	0.011	4	0.0	0.0	8.697	A
C-A	2	0.54			2				
A-B	6	1			6				
A-C	7	2			7				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	8	2	286	0.027	8	0.0	0.0	12.939	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	4	1	418	0.011	4	0.0	0.0	8.696	A
C-A	2	0.54			2				
A-B	6	1			6				
A-C	7	2			7				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	6	2	286	0.022	6	0.0	0.0	12.866	B
B-A	0	0	436	0.000	0	0.0	0.0	0.000	A
C-AB	4	1	418	0.009	4	0.0	0.0	8.675	A
C-A	2	0.45			2				
A-B	4	1			4				
A-C	5	1			5				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	5	1	286	0.018	5	0.0	0.0	12.812	B
B-A	0	0	437	0.000	0	0.0	0.0	0.000	A
C-AB	3	1	419	0.007	3	0.0	0.0	8.664	A
C-A	1	0.37			1				
A-B	4	1			4				
A-C	5	1			5				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.02	0.02	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.03	0.00	0.00	0.03	0.03			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.03	0.00	0.00	0.03	0.03			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.02	0.00	0.00	0.02	0.02			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

2038 Do Nothing YoO+15, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		3.70	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.70	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D12	2038 Do Nothing YoO+15	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	6	100.000
B - Quarry Access		ONE HOUR	✓	5	100.000
C - L6280 (W)		ONE HOUR	✓	7	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	0	6
	B - Quarry Access	1	0	4
	C - L6280 (W)	7	0	0

Vehicle Mix

Heavy Vehicle Percentages

From	To		
	A - L6280 (E)	B - Quarry Access	C - L6280 (W)
A - L6280 (E)	0	0	0
B - Quarry Access	0	0	70
C - L6280 (W)	19	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.01	10.84	0.0	0.5	B	4	6
B-A	0.00	8.26	0.0	0.5	A	0.92	1
C-AB	0.00	0.00	0.0	~1	A	0	0
C-A						6	10
A-B						0	0
A-C						6	8

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3	1	337	0.009	3	0.0	0.0	10.780	B
B-A	0.75	0.19	438	0.002	0.75	0.0	0.0	8.236	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	5	1			5				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	337	0.011	4	0.0	0.0	10.805	B

B-A	0.90	0.22	437	0.002	0.90	0.0	0.0	8.245	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	6	2			6				
A-B	0	0			0				
A-C	5	1			5				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	337	0.013	4	0.0	0.0	10.838	B
B-A	1	0.28	437	0.003	1	0.0	0.0	8.258	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	8	2			8				
A-B	0	0			0				
A-C	7	2			7				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	337	0.013	4	0.0	0.0	10.838	B
B-A	1	0.28	437	0.003	1	0.0	0.0	8.258	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	8	2			8				
A-B	0	0			0				
A-C	7	2			7				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	4	1	337	0.011	4	0.0	0.0	10.808	B
B-A	0.90	0.22	437	0.002	0.90	0.0	0.0	8.247	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	6	2			6				
A-B	0	0			0				
A-C	5	1			5				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	3	1	337	0.009	3	0.0	0.0	10.784	B
B-A	0.75	0.19	438	0.002	0.75	0.0	0.0	8.237	A
C-AB	0	0	523	0.000	0	0.0	0.0	0.000	A
C-A	5	1			5				
A-B	0	0			0				
A-C	5	1			5				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.01	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.25	0.45	0.48			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.01	0.00	0.00	0.01	0.01			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.00	0.00	0.00	0.00	0.00			N/A	N/A

2038 Do Something YoO+15, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		6.90	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.90	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D13	2038 Do Something YoO+15	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
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A-C						6	8
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Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	11	3	286	0.040	11	0.0	0.0	13.112	B
B-A	0	0	432	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	425	0.028	12	0.0	0.0	8.707	A
C-A	1	0.37			1				
A-B	16	4			16				
A-C	5	1			5				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	13	3	285	0.047	13	0.0	0.0	13.240	B
B-A	0	0	431	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	425	0.034	14	0.0	0.0	8.774	A
C-A	2	0.43			2				
A-B	19	5			19				
A-C	5	1			5				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	17	4	285	0.058	16	0.0	0.1	13.409	B
B-A	0	0	429	0.000	0	0.0	0.0	0.000	A
C-AB	18	4	424	0.042	18	0.0	0.0	8.862	A
C-A	2	0.53			2				
A-B	23	6			23				
A-C	7	2			7				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
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B-C	17	4	285	0.058	17	0.1	0.1	13.411	B
B-A	0	0	429	0.000	0	0.0	0.0	0.000	A
C-AB	18	4	424	0.042	18	0.0	0.0	8.861	A
C-A	2	0.53			2				
A-B	23	6			23				
A-C	7	2			7				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	13	3	285	0.047	14	0.1	0.1	13.250	B
B-A	0	0	431	0.000	0	0.0	0.0	0.000	A
C-AB	14	4	425	0.034	14	0.0	0.0	8.775	A
C-A	2	0.43			2				
A-B	19	5			19				
A-C	5	1			5				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	11	3	286	0.040	11	0.1	0.0	13.127	B
B-A	0	0	432	0.000	0	0.0	0.0	0.000	A
C-AB	12	3	425	0.028	12	0.0	0.0	8.711	A
C-A	1	0.37			1				
A-B	16	4			16				
A-C	5	1			5				

Queue Variation Results for each time segment

07:30 - 07:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

07:45 - 08:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
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B-C	0.05	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.03	0.25	0.45	0.48			N/A	N/A

08:00 - 08:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.03	0.26	0.46	0.49			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.03	0.25	0.46	0.48			N/A	N/A

08:15 - 08:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.06	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.00	0.00	0.04	0.04			N/A	N/A

08:30 - 08:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.04	0.00	0.00	0.04	0.04			N/A	N/A

08:45 - 09:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.00	0.00	0.00	0.00	0.00			N/A	N/A
C-AB	0.03	0.00	0.00	0.03	0.03			N/A	N/A

2038 Do Something YoO+15, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm visibility to right	B - Quarry Access - Minor arm geometry	Visibility to right expected to have two components if the arm has two lanes, or two lanes in a flared section.
Warning	Major arm width	C - L6280 (W) - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.
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Junction Network

Junctions

Junction	Name	Junction type	Arm A Direction	Arm B Direction	Arm C Direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	Two-way	Two-way		7.10	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	7.10	A

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D14	2038 Do Something YoO+15	PM	ONE HOUR	16:30	18:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A - L6280 (E)		ONE HOUR	✓	10	100.000
B - Quarry Access		ONE HOUR	✓	33	100.000
C - L6280 (W)		ONE HOUR	✓	11	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	4	6
	B - Quarry Access	11	0	22
	C - L6280 (W)	7	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - L6280 (E)	B - Quarry Access	C - L6280 (W)
From	A - L6280 (E)	0	100	0
	B - Quarry Access	0	0	49
	C - L6280 (W)	19	100	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.06	10.09	0.1	0.5	B	20	30
B-A	0.03	8.54	0.0	0.5	A	10	15
C-AB	0.02	12.55	0.0	0.5	B	4	6
C-A						6	10
A-B						4	6
A-C						6	8

Main Results for each time segment

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	17	4	382	0.043	16	0.0	0.0	9.834	A
B-A	8	2	436	0.019	8	0.0	0.0	8.423	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.540	B
C-A	5	1			5				
A-B	3	1			3				
A-C	5	1			5				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	20	5	382	0.052	20	0.0	0.1	9.943	A

B-A	10	2	435	0.023	10	0.0	0.0	8.473	A
C-AB	4	1	291	0.013	4	0.0	0.0	12.551	B
C-A	6	2			6				
A-B	4	1			4				
A-C	5	1			5				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	24	6	381	0.064	24	0.1	0.1	10.088	B
B-A	12	3	434	0.028	12	0.0	0.0	8.539	A
C-AB	5	1	292	0.016	5	0.0	0.0	12.554	B
C-A	8	2			8				
A-B	4	1			4				
A-C	7	2			7				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	24	6	381	0.064	24	0.1	0.1	10.090	B
B-A	12	3	434	0.028	12	0.0	0.0	8.539	A
C-AB	5	1	292	0.016	5	0.0	0.0	12.545	B
C-A	8	2			8				
A-B	4	1			4				
A-C	7	2			7				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	20	5	382	0.052	20	0.1	0.1	9.949	A
B-A	10	2	435	0.023	10	0.0	0.0	8.475	A
C-AB	4	1	291	0.013	4	0.0	0.0	12.529	B
C-A	6	2			6				
A-B	4	1			4				
A-C	5	1			5				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-C	17	4	382	0.043	17	0.1	0.0	9.844	A
B-A	8	2	436	0.019	8	0.0	0.0	8.428	A
C-AB	3	1	290	0.011	3	0.0	0.0	12.532	B
C-A	5	1			5				
A-B	3	1			3				
A-C	5	1			5				

Queue Variation Results for each time segment

16:30 - 16:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.04	0.00	0.00	0.04	0.04			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

16:45 - 17:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.03	0.25	0.45	0.48			N/A	N/A
B-A	0.02	0.02	0.25	0.45	0.48			N/A	N/A
C-AB	0.01	0.01	0.25	0.45	0.48			N/A	N/A

17:00 - 17:15

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.03	0.26	0.47	0.49			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:15 - 17:30

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

17:30 - 17:45

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.07	0.00	0.00	0.07	0.07			N/A	N/A
B-A	0.03	0.00	0.00	0.03	0.03			N/A	N/A
C-AB	0.02	0.00	0.00	0.02	0.02			N/A	N/A

B-C	0.06	0.00	0.00	0.06	0.06			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A

17:45 - 18:00

Stream	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile message	Marker message	Probability of reaching or exceeding marker	Probability of exactly reaching marker
B-C	0.05	0.00	0.00	0.05	0.05			N/A	N/A
B-A	0.02	0.00	0.00	0.02	0.02			N/A	N/A
C-AB	0.01	0.00	0.00	0.01	0.01			N/A	N/A