13 TRAFFIC AND ROAD ASSESSMENT

13.1 INTRODUCTION

TOBIN Consulting Engineers Ltd. has been appointed by Roadstone to carry out a road and traffic assessment for a proposed waste license for an existing waste permit area within Mullaghcrone Quarry, Donore, Co. Meath. This assessment forms part of an Environmental Impact Statement (EIS) for the site which is being submitted for the purposes of acquiring a waste license.

In preparing this report, TOBIN Consulting Engineers has made reference to

- The National Roads Authority (NRA) 'Traffic and Transport Assessment Guidelines' 2007;
- The NRA 'Future Traffic Forecasts 2002 to 2040';
- Geometric Design Guidelines RT180 (Classification, Alignment, Cross Section);
- Meath County Development Plan 2013-2019;
- NRA TD 9/07; and
- NRA TD 41 - 42/09.

13.1.1 Objectives

The objective of this section of the EIS is to assess the impact the proposed waste licence facility at Mullaghcrone Quarry has with respect to traffic and the local road network. This section will calculate the expected volume of traffic that will be generated by the proposed facility and assess the impact that this traffic will have on the operational capacity of the road network in the vicinity of the development. In this case the quarry entrance onto the L1601, the quarry entrance onto the L5612 and the junction between the L5613 and R152 were analysed.

13.1.2 Methodology

An estimate of the number of truck movements into and out of the site was generated based on the quantities of materials that are proposed to be taken into the waste licence facility. The increase in vehicles leaving/arriving at the site were added to the existing flows and distributed onto the network. An analysis of the junctions referred to in paragraph 13.1.1 was undertaken based on these flows. The junctions have been analysed using the Transport Research Laboratory (TRL) computer program PICADY, a widely accepted tool used for the analysis of priority junctions.

The key parameters examined in the results of the analysis are the Ratio of Flow to Capacity Value (RFC value – desirable value should be no greater than 0.85 for PICADY, values over 1.00 indicate the approach arm is over capacity), the maximum queue length on any approach to the junction and the average delay for each vehicle passing through the junction during the modelled period.

PICADY requires the following input data:

- Basic modelling parameters (usually peak hour traffic counts synthesised over a 90 minute model period)
- Geometric parameters (including lane numbers & widths, visibility, storage provision etc)
- Traffic demand data (usually peak hour origin/destination table with composition of heavy goods vehicles input).

The results of the PICADY analysis are presented in section 13.3.2.2. The origin/destination traffic demand tables for all the different scenarios tested for the analysed junction are provided in Appendix 13.1 of this report. Volumes entering and leaving the quarry have not changed significantly since 2010.

13.2 EXISTING ENVIRONMENT

13.2.1 Site location

The existing Mullaghcrone Quarry is located in the townlands of Platin and Cruicerath Co. Meath. The quarry is less than 1km south east of Donore village and approximately 4km west of Drogheda, the two largest towns in the vicinity. Access to the quarry is provided by means of two priority entrances, one onto the Local Road L1601 and the other onto the Local Road L5612. The location of the quarry entrances is shown in Figure 12.1 below.

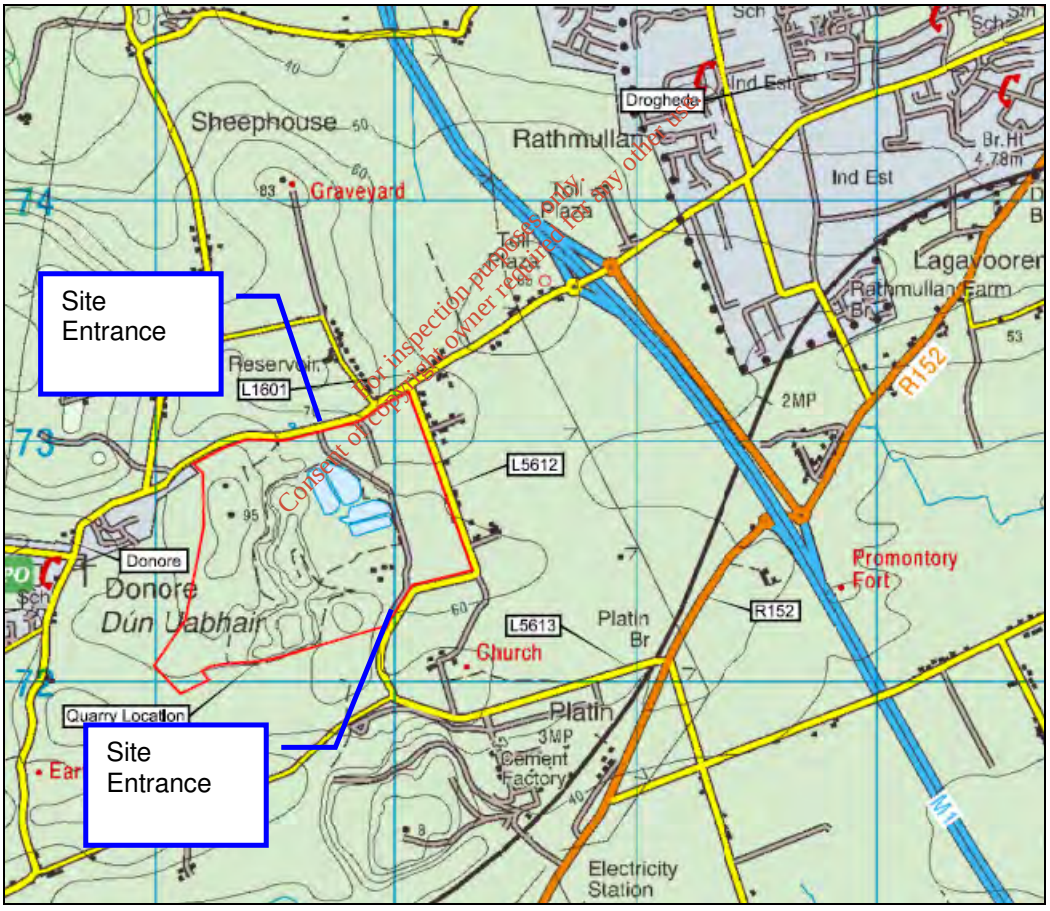


Figure 13 – Site Location

13.2.2 Description of Existing and Proposed Development

The Mullaghcrone Quarry is located on a land holding of approximately 94.8ha with a proposed activity area of approximately 15.3 ha. The planning permission allows for the extraction of 500,000 tonnes of material per year; however, the amount of material that is extracted depends on demand. This often results in an extraction rate lower than the permitted volume. The quarry previously had a waste permit, WMP 2006/19, which allowed for approximately 66,000 tonnes of soil and stones to be accepted per annum and has an existing waste permit, WFP/MH/11/003/01, which allows for 30,000 tonnes of construction and demolition waste material to be accepted per annum.

The waste licence being applied for is seeking to allow for an increase in the amount of waste that can be accepted by the quarry. The proposed waste licence is to allow for the acceptance of 100,000 tonnes per annum of soil and stones materials and 50,000 tonnes of construction and demolition waste materials.

13.2.3 Traffic Survey

In order to determine the magnitude of the existing traffic flows, TOBIN used the results of Manual Classified Traffic Surveys that were carried out by Abacus Transportation Surveys Ltd. The survey was carried out between the hours of 07.00 to 19.00 and distinguished between cars, buses, light good vehicles and heavy good vehicles. The count was carried out on Thursday 2nd September 2010 at the entrance to the quarry on the L1601 and the crossroads between the R152, L5613 and Gaffney Road.

The count indicated that the peak hours of flow occur between 8.30 and 9.30 in the morning and 14.15 and 15.15 in the afternoon at the quarry entrance. The percentage of HGV's using this junction was 9.3%.The peak hours of flow at the R152, L5613 and Gaffney Road Crossroads were between 8.00 and 9.00 in the morning and 17.45 and 18.45 in the evening. The percentage of HGV's at this junction was 8.5%.

Traffic Flows at the quarry entrance were determined using the count undertaken at the R152, L5613 and Gaffney road crossroads. It was assumed that all traffic turning onto the L5613 at this junction will follow the road to the entrance with HGV's turning into the entrance and light vehicles travelling past it in a northbound direction. Similarly, HGV flows emanating from the L5613 at the crossroads are assumed to have originated at the quarry entrance with light vehicles travelling past the entrance in a southbound direction. As a result the peak hours at this junction are the same as per the crossroads and the HGV percentage is 15.3%.

Details of the results of the survey are provided in Appendix 13.2 of this report.

13.2.4 Existing Road Network

The L1601 is a local road which links Donore to Drogheda. One of the two entrances into the quarry is located on the L1601 and quarry products destined for Drogheda use this entrance. The road has a carriageway width of approximately 7.4m in the vicinity of the entrance. This entrance is located within an 80km/h zone and, based on the standards set out in the NRA DMRB, a visibility splay of 2.4m x

160m is appropriate for this design speed. There is adequate visibility available to the left of the entrance however visibility to the right is somewhat restricted by vegetation. There are no pedestrian facilities or street lighting present at the entrance.

The alternative entrance to the quarry is located on the L5612. This entrance is generally used by vehicles travelling to/from destinations other than Drogheda. The L5612 has a carriageway width of approximately 5.6m and is located within an 80km/h speed zone. At the entrance, visibility to the right is in accordance with is in accordance with the NRA DMRB for this speed zone however visibility to the left is restricted by the L5612's horizontal and vertical geometry. Footpaths & street lighting are not present at this location.

The L5613 forms part of the same road as the L5612, and joins up with the R152 which provides access for vehicles wishing to use the M1 Motorway. The L5613 has a similar width to the L5612, generally being between 5 and 6m in width. The section of this road that is used by quarry traffic is within an 80km/h speed zone. There are no pedestrian facilities or street lighting present along this road.

The R152 is a regional road which connects Drogheda to Kilbrew (N2) and generally has a speed limit of 80km/h. This road is used by quarry vehicles to access the M1 Motorway to the north and the N2 to the south. The section of the road used by quarry vehicles is approximately 7m wide with 1m wide hardshoulders on each side and verges of varying width. At the junction between the L5613 and the R152, the appropriate visibility splay of 3m x 160m is currently not available to the right or left of the junction. The left visibility splay is restricted by a crest in the R152's vertical alignment visibility to the right is restricted by vegetation.

13.2.5 Proposed Road Improvements

No proposed road improvements were identified as being planned for the area.

13.3 POTENTIAL IMPACTS

13.3.1 Traffic Generation

The additional volume of traffic that will be generated by the proposed waste licence facility has been derived from the additional quantities of waste materials for which the waste licence is being sought. Permission is being sought for the acceptance of 150,000 tonnes of materials per annum. This quantity is broken down into 100,000 tonnes of soil and stones material and 50,000 tonnes of construction and demolition waste. The earthwork materials will be retained on site while the construction and demolition materials will be processed and subsequently leave the quarry.

The quarry is currently permitted to accept 30,000 tonnes of waste per annum under waste permit WFP/MH/11/0003/01 and this will is reflected in the traffic counts. As such the increase in quantities being accepted per annum are 100,000 tonnes of earthwork materials and 20,000 tonnes of construction and demolition waste.

Table 13.1 quantifies the number of additional trips expected to be generated by the acceptance of waste at the quarry.

ESTIMATED ADDITIONAL ONE WAY TRIPS GENERATED BY QUARRY				
Task	Quantity of Material (tonnes)	Trucks Per Annum	Trucks Per Day*	Trucks Per Hour*
Inert Soil and stones Materials	100,000	5,000	20	2.5
Construction and Demolition Waste Materials	20,000	1,000	4	0.5
Total		**6,000**	**24**	**3**

Table 13.1 – Estimated One Way Trips Generated by Quarry

** Rounded up to nearest whole number*

Notes
20 tonnes per truckload assumed for quarry materials
48 operational weeks assumed for quarry
5.5 days per week assumed
9 hour day assumed

Additionally, the trips estimated in Table 13.1 above are one-way trips only. For every vehicle delivering waste to the quarry there will be a corresponding return trip. Construction and demolition waste will be processed and subsequently leave the site however it is expected that this process will make use of trucks that would otherwise be leaving empty. Taking account of this, the actual number of additional trips that are expected to be generated at the quarry entrances during the AM and PM peak hours are detailed in Table 13.2 below.

	AM Peak Hour		PM Peak Hour	
	Arriving	Departing	Arriving	Departing
Quarry Output	3	3	3	3

Table 13.2 – AM and PM Peak Hour Traffic Generated

No additional staff are to be employed as a result of the increase in accepted materials.

13.3.1.1 Trip Distribution

Vehicles travelling to and from Drogheda and other local markets will use the entrance onto the L1601. All other vehicles will use the entrance onto the L5612 / L5613 to reach the R152, where they will either turn south towards the N2 or north towards the M1. The proportions of the vehicles following these routes vary based on current demand. The additional trips being generated have been apportioned to the two entrances based on the distribution surveyed by the traffic counts. Subsequent to their leaving the development, quarry vehicles are assumed to distribute as per the flows of HGV traffic identified by the traffic survey.

Figures 13.1 – 13.2 below show the distribution of traffic to and from the site and Figures 13.3 – 13.4 show the generated traffic volumes in both the AM and PM peaks.

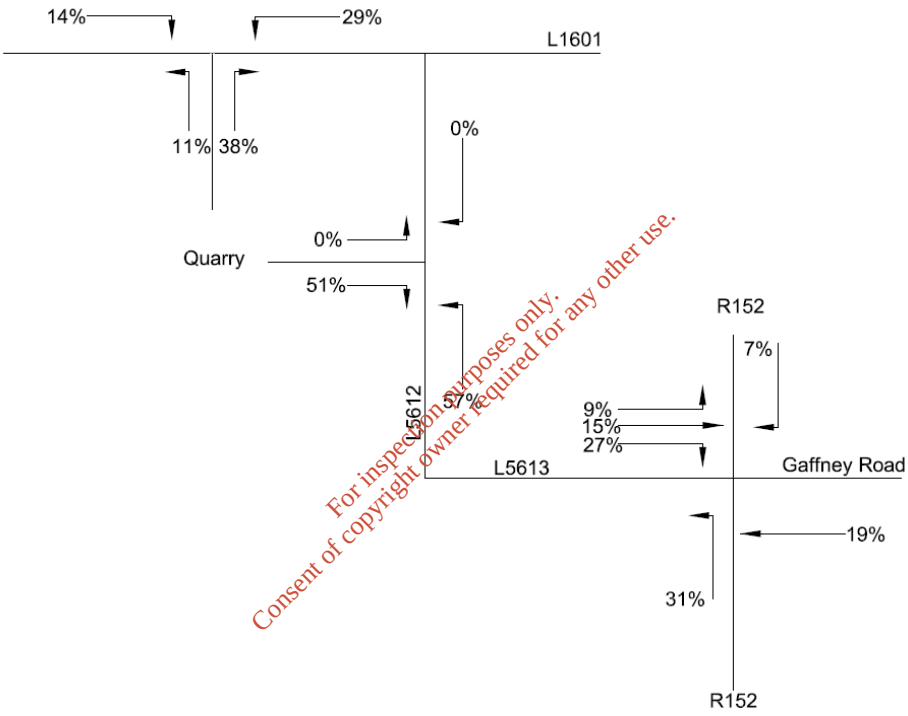


Figure 13.1 – AM Distribution

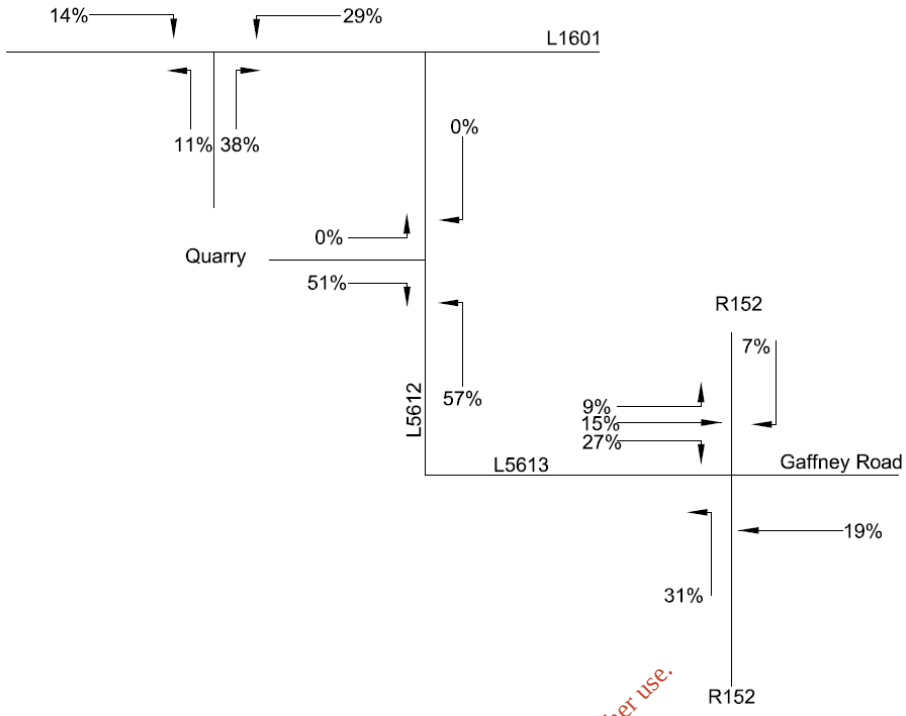


Figure 13.2 – PM Distribution

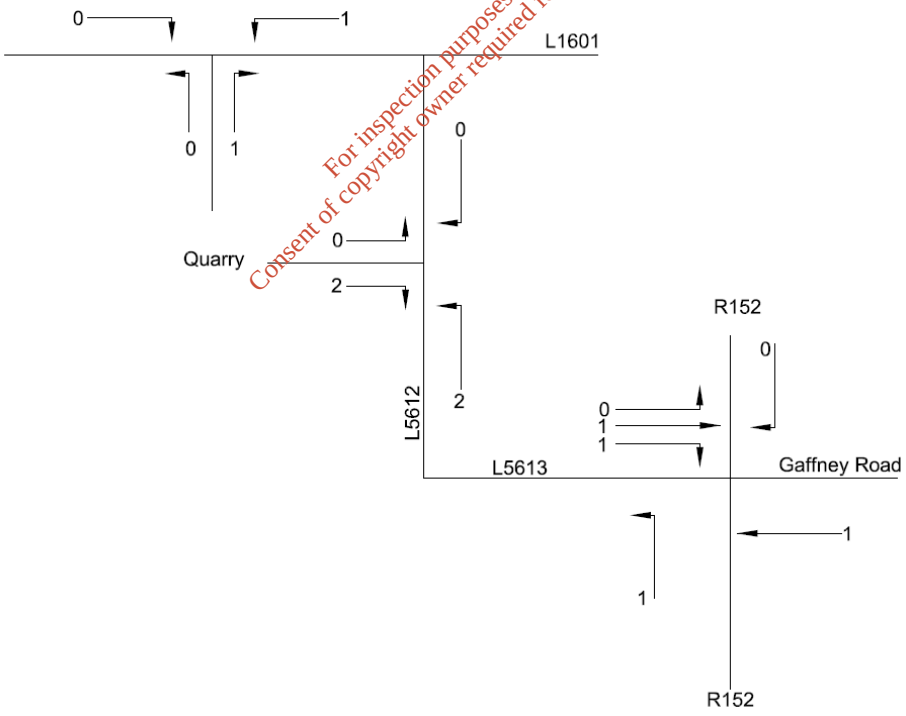


Figure 13.3 – AM Generation

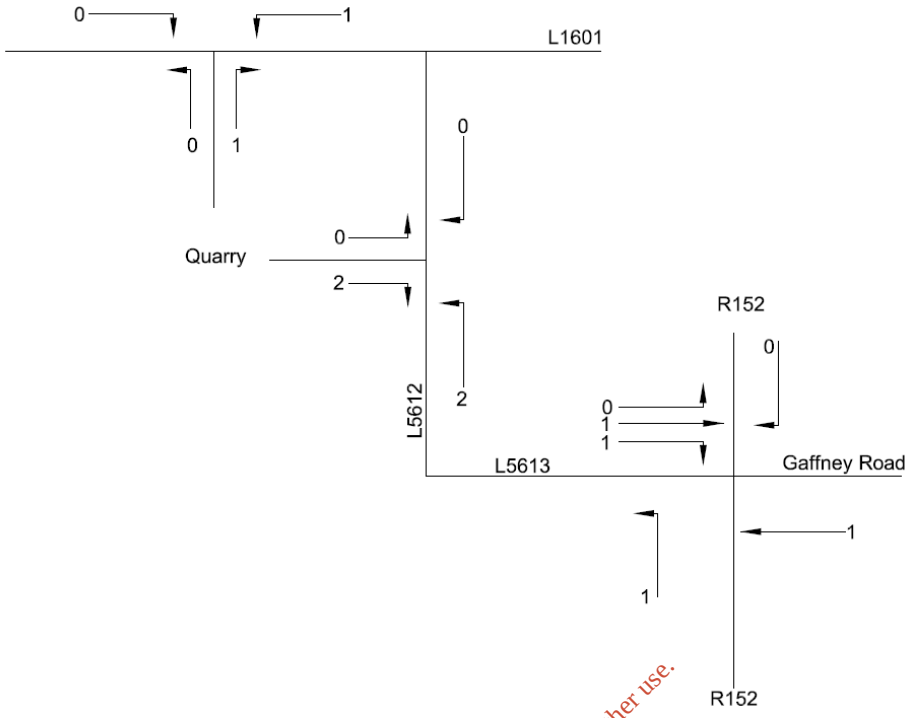


Figure 13.4 – PM Generation

13.3.1.2 Seasonal Adjustment

In order to undertake an analysis of the traffic flows, it may be necessary to apply a correction factor to convert the surveyed traffic flows into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic surveys. These seasonally adjusted conversion factors were calculated from data taken from a fixed automatic traffic counter located on the M1 to the south of Dunleer during 2008. It was found that traffic volumes were higher during September than the average peak flows over the course of a year. Despite this, in order to produce a robust assessment, no correction factor has been applied. The seasonally adjusted traffic flows for the AM and PM Peaks are depicted in Figures 13.5 and 13.6 respectively. The percentage of HGV's is shown in parentheses.

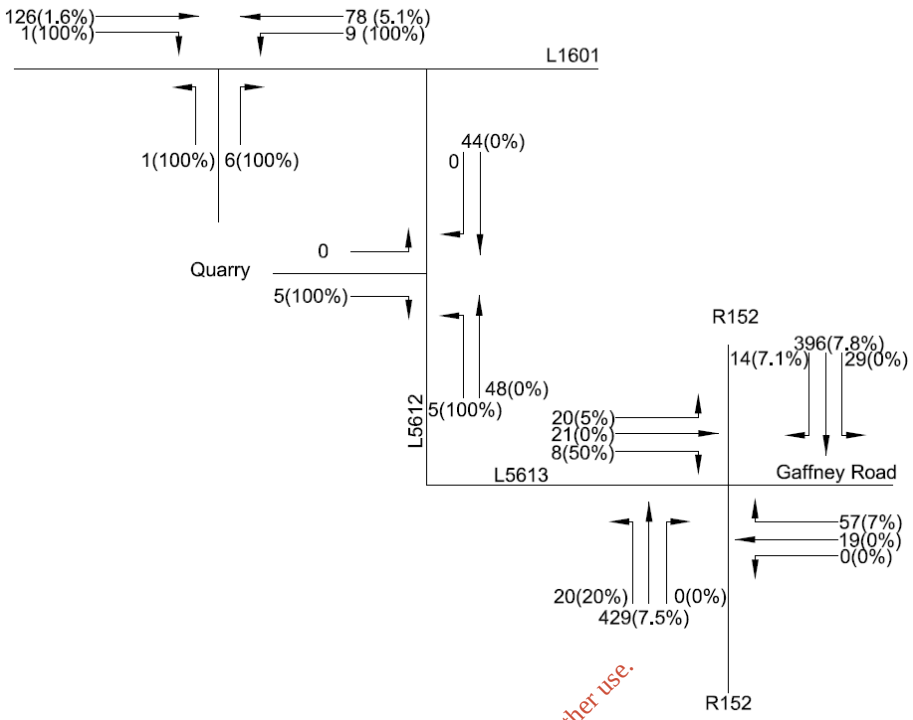


Figure 13.5 – 2010 AM Baseflow Traffic Volumes

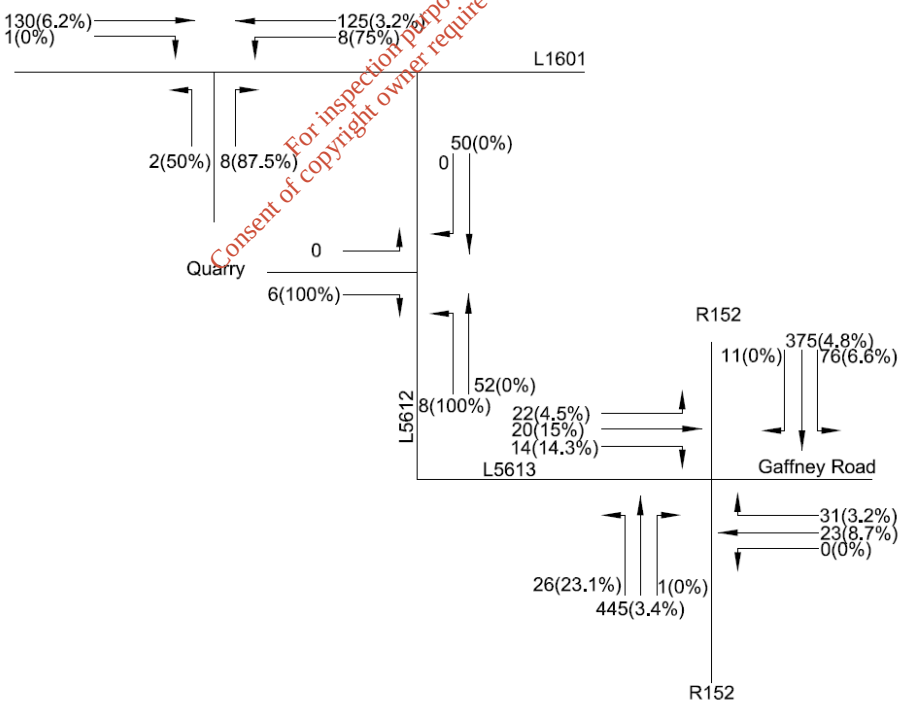


Figure 13.6 – 2010 PM Baseflow Traffic Volumes

13.3.1.3 Traffic Growth

The background traffic growth factors used in the analysis in this report are those provided by the NRA for the non-national road network (Published August 2003 for years 2002 – 2040). The quarry is expected to receive the waste licence in 2014 and with an expected lifespan of 20 years i.e. 2034. Growth factors used to account for the potential increase in both light and heavy vehicle traffic for the years analysed are as follows:

2013 - 2014

- Light Vehicles - 1.018
- Heavy Vehicles - 1.009

2014 – 2034

- Light Vehicles – 1.188
- Heavy Vehicles – 1.237

The baseflow traffic for the AM and PM peaks is shown below in Figures 13.7 – 13.10, for the opening year 2014 and the design year of 2034. The percentage of HGV's is shown in parentheses.

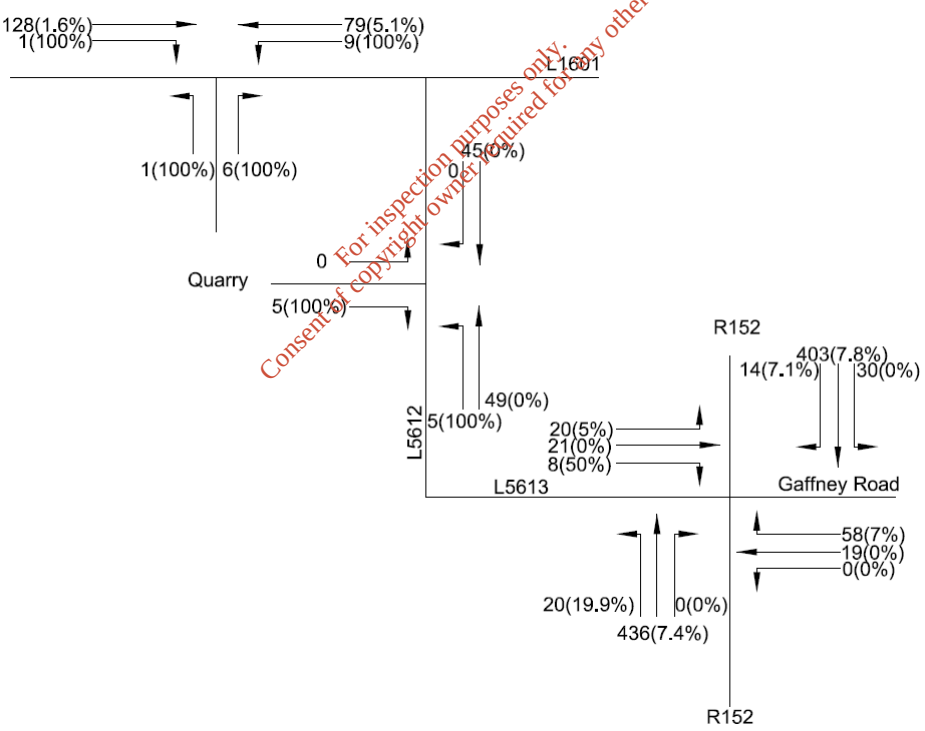


Figure 13.7 – 2011 AM Baseflow Traffic Volumes

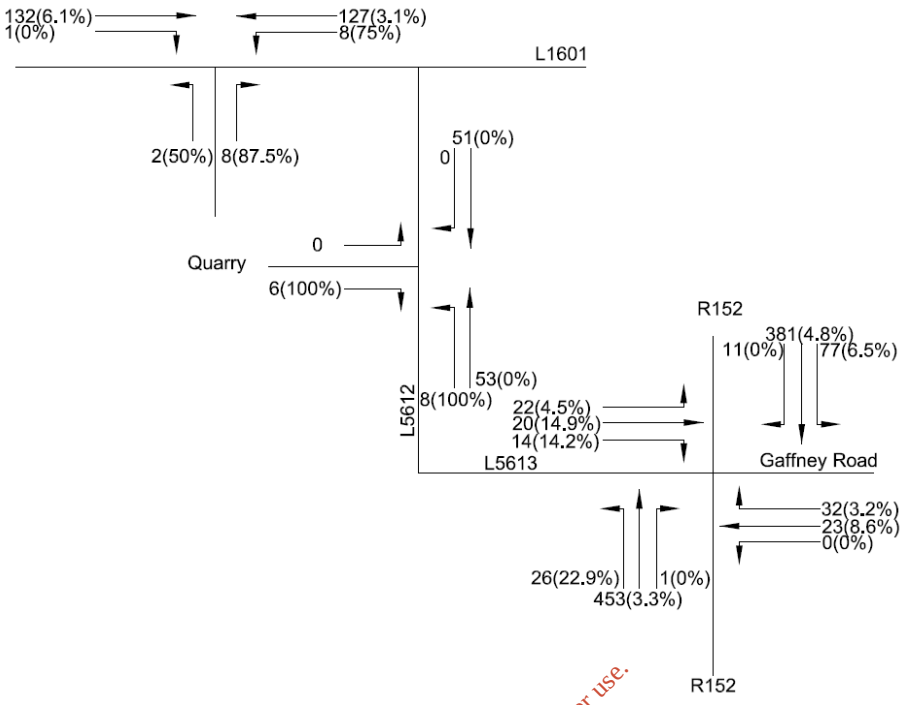


Figure 13.8 – 2014 PM Baseflow Traffic Volumes

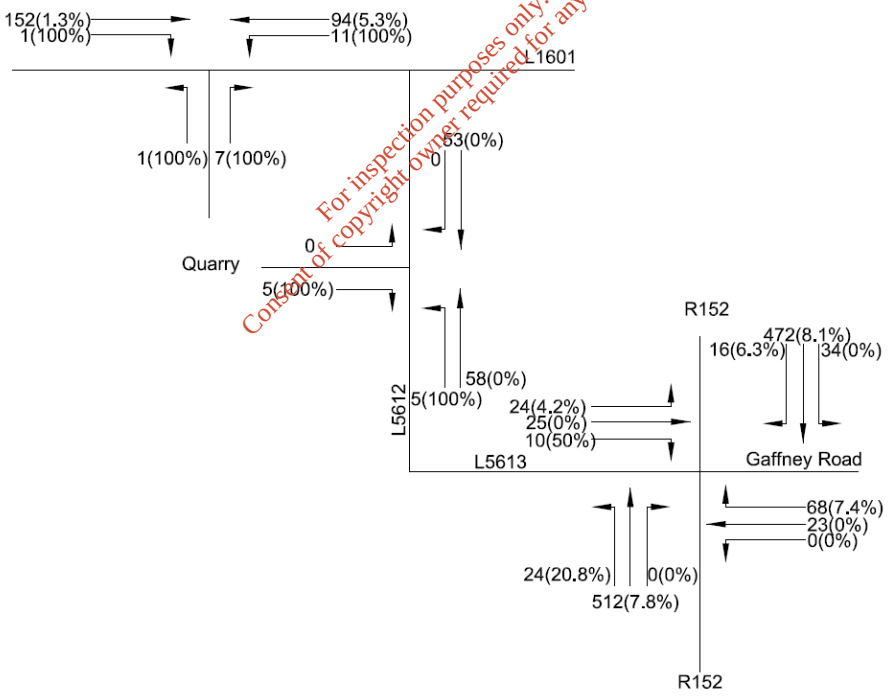


Figure 13.9 – 2034 AM Baseflow Traffic Volumes

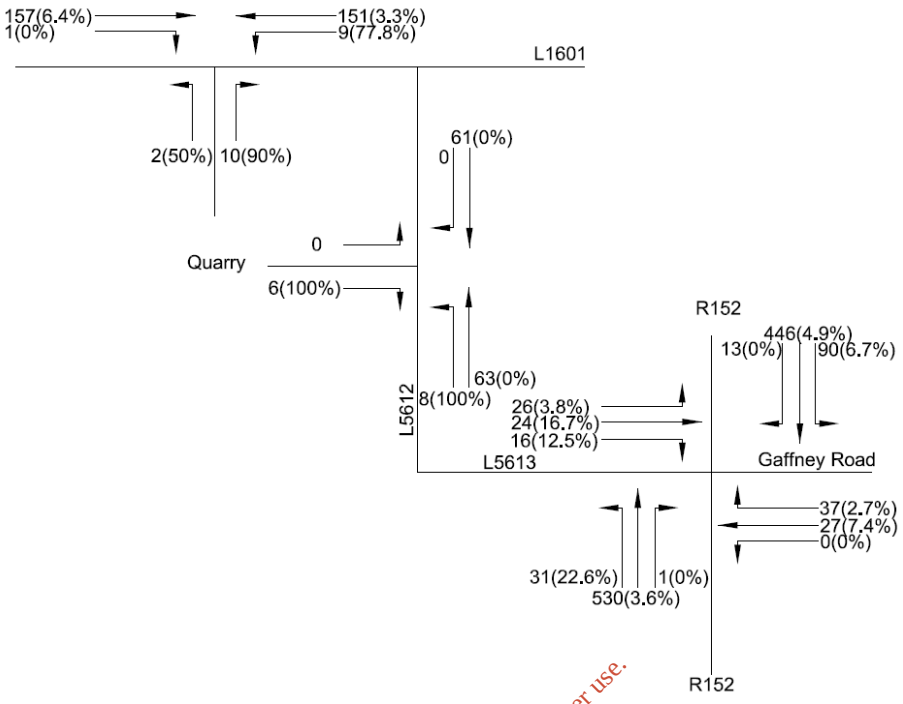


Figure 13.10 – 2034 PM Baseflow Traffic Volumes

The baseflow traffic with the additional generated traffic for the AM and PM peaks is shown below in Figures 13.11– 13.14, for both the opening year of 2014 and the design year of 2034. The percentage of HGV's is shown in parentheses.

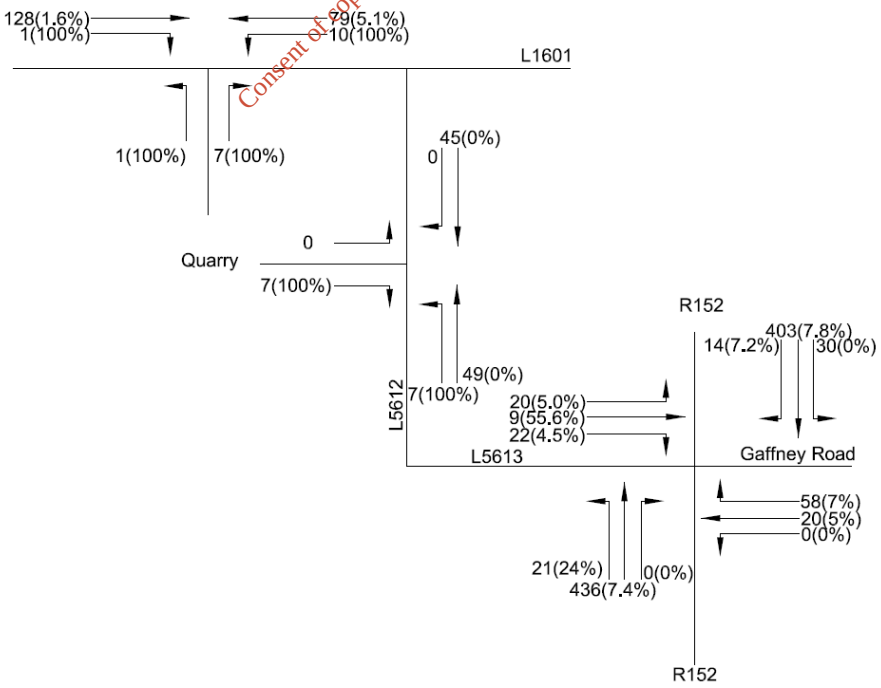


Figure 13.11 – 2014 AM Baseflow + Generated Traffic Volumes

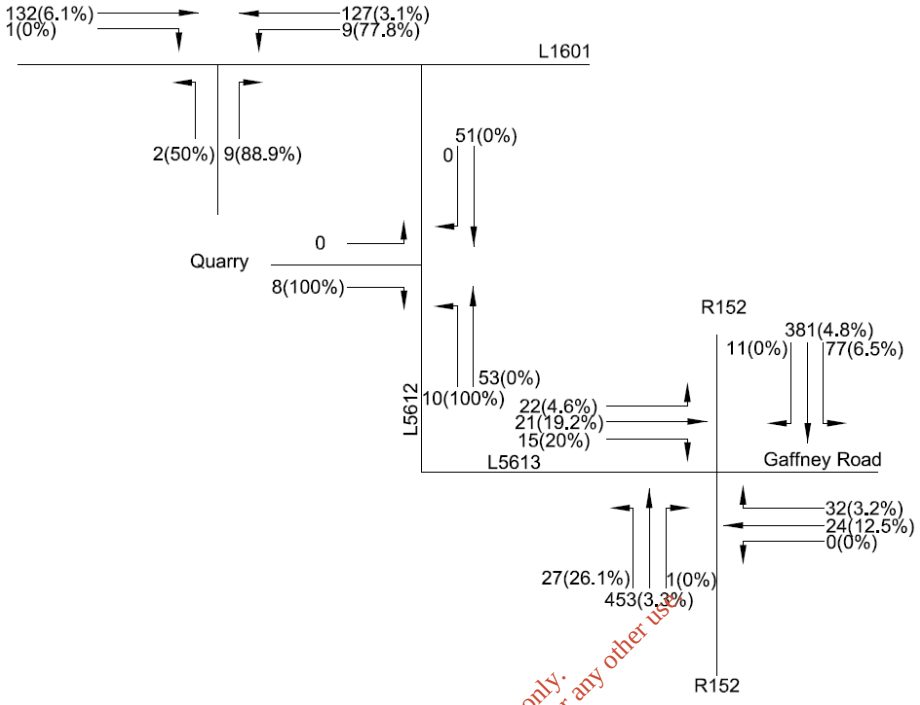


Figure 13.12 – 2014 PM Baseflow + Generated Traffic Volumes

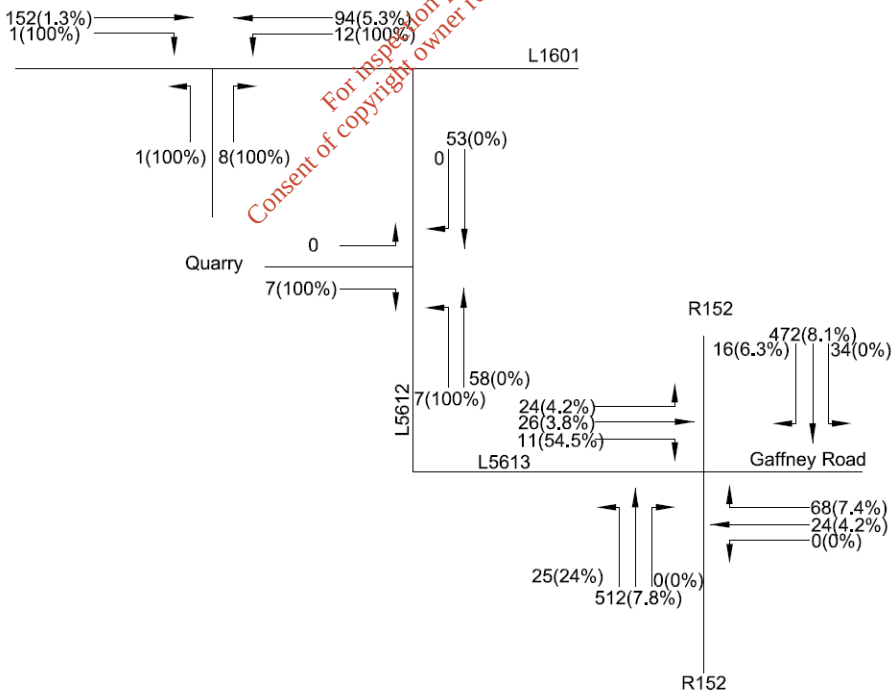


Figure 13.13 – 2034 AM Baseflow + Generated Traffic Volumes

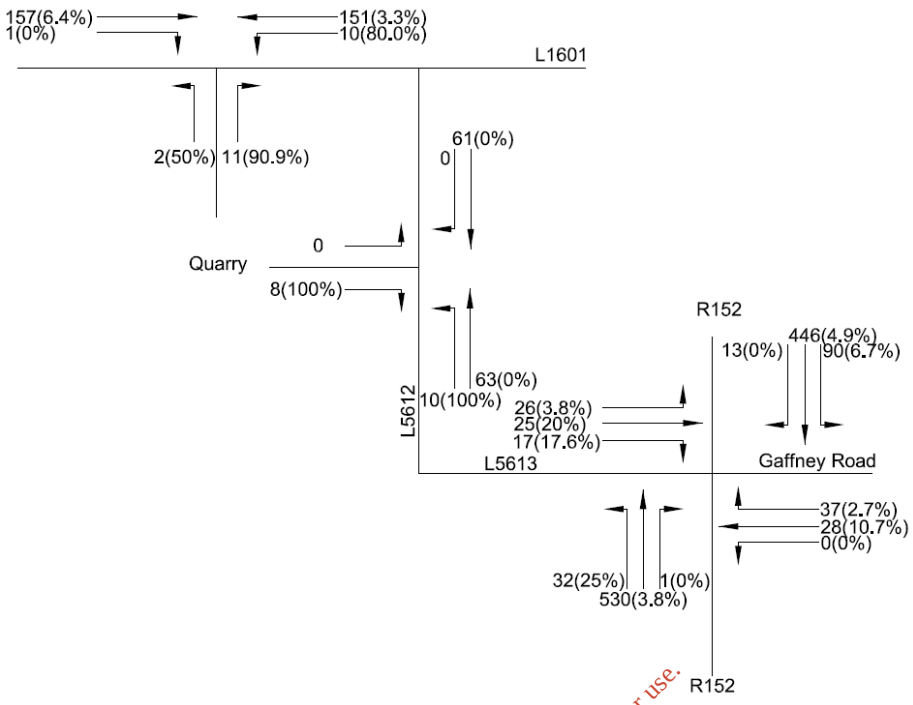


Figure 13.14 – 2034 PM Baseflow + Generated Traffic Volumes

13.3.2 Junction Analysis

13.3.2.1 Assessment Years

The performance of each junction has been analysed for the critical AM and PM peak hours detailed in section 13.2.3, for the baseflow, the baseflow in 2014 with the additional generated traffic, and the design year of 2034.

13.3.2.2 Analysis Results

The analysis results for the Quarry Entrance onto the L1601 for both the AM and PM peak hours are provided below in Table 13.3. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L1601 East		Arm B – Quarry Entrance		Arm C – L1601 West		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
2010 AM	-	-	0.024	0.02	0.004	0.00	0.01
2010 PM	-	-	0.031	0.03	0.002	0.00	0.01
2014 AM + Generated Traffic	-	-	0.028	0.03	0.004	0.00	0.01
2014 PM + Generated Traffic	-	-	0.035	0.04	0.002	0.00	0.01

2034 AM + Generated Traffic	-	-	0.033	0.03	0.004	0.00	0.01
2034 PM + Generated Traffic	-	-	0.035	0.5	0.002	0.00	0.01

Table 13.3– PICADY Results: Quarry Entrance onto the L1601AM and PM Peak Hours

The above results indicate that the Quarry Entrance onto the L1601 will operate below its capacity up to and including 2034 and is capable of handling the traffic that will be generated by the proposed increase in operations.

The analysis results for the Quarry Entrance onto the L5612 for both the AM and PM peak hours are provided below in Table 13.4. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L5612 South		Arm B – Quarry Entrance		Arm C – L5612 North		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
2010 AM	-	-	0.022	0.02	0.000	0.00	0.01
2010 PM	-	-	0.027	0.03	0.000	0.00	0.01
2014 AM + Generated Traffic	-	-	0.031	0.03	0.000	0.00	0.02
2014 PM + Generated Traffic	-	-	0.036	0.04	0.000	0.00	0.02
2034 AM + Generated Traffic	-	-	0.036	0.04	0.000	0.00	0.02
2034 PM + Generated Traffic	-	-	0.040	0.04	0.000	0.00	0.02

Table 13.4– PICADY Results: Quarry Entrance onto the L5612 AM and PM Peak Hours

The above results indicate that the Quarry Entrance onto the L5612 will operate below its capacity up to and including 2034 and is capable of handling the traffic that will be generated by the proposed increase in operations.

The analysis results for the junction between the R152, L5612 and the Gaffney Road for both the AM and PM peak hours are provided below in Table 13.5. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L5612 South		Arm B – Quarry Entrance		Arm C – L5612 North		Arm D – L5612 North		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	(min/veh)
2010 AM	0.038	0.05	0.301	0.42	0.000	0.00	0.072	0.08	0.03
2010 PM	0.028	0.04	0.213	0.27	0.003	0.00	0.081	0.09	0.02
2014 AM + Generated Traffic	0.038	0.05	0.309	0.44	0.000	0.00	0.077	0.08	0.03
2014 PM + Generated Traffic	0.028	0.04	0.220	0.28	0.003	0.00	0.090	0.10	0.02
2034 AM + Generated Traffic	0.051	0.08	0.410	0.67	0.000	0.00	0.103	0.11	0.04
2034 PM + Generated Traffic	0.036	0.05	0.283	0.39	0.003	0.00	0.115	0.13	0.03

Table 13.5– PICADY Results: R152, L5612 and Gaffney Road Crossroads AM and PM Peak Hours

The above results indicate that the crossroads between the R152, L5612 and the Gaffney Crossroads will operate below its capacity up to and including 2034 and is capable of handling the traffic that will be generated by the proposed increase in operations.

13.3.3 Link Capacity

A link capacity assessment has been carried out for the R152, the L1601 and L5612/5613 with reference to the Geometric Design Guidelines RT180. In order to undertake the link capacity assessment, it was necessary first to convert the raw traffic survey data, which consisted of cars and heavy vehicles, into a common index known as passenger car units (PCU's). This was undertaken by applying a factor to all surveyed traffic movements to take account of the composition of the different types of vehicle. This factoring calculation assumes 1 car / light vehicle = 1 PCU, 1 heavy vehicle = 2.3 PCU's and 1 bus = 2 PCU's.

The R152 is approximately 7.0m wide and with 0% visibility greater than 460m. Assuming level of Service D[8] is to be provided, this means the two way capacity of the road is 1300 vehicles per hour. The maximum two way flow that is expected to occur is during the PM peak in 2034 with a flow volume of 1332 PCUs. This means that the R152 will be operating approximately 2% above capacity by 2034.

The L1601 is approximately 7.5m wide and with 0% visibility greater than 460m with lateral clearance of 0m to obstructions on both sides. Assuming level of Service D is to be provided, this means the two way capacity of the road is 1058 vehicles per hour. The maximum two way flow that is expected to occur is during the PM peak in 2034 with a flow volume of 376 PCUs. This is below the capacity of the

[8] Level of Service D is defined as traffic conditions where passing is extremely difficult with very high demand and limited opportunity. Driver delay up to 75% due to slower vehicles.

road meaning that the local road will operate within capacity up to and including 2034 where there will be approximately 64% spare capacity.

The L5612 / L5613 are approximately 5.5m wide and with 0% visibility greater than 460m with lateral clearance of 0m to obstructions on both sides. Assuming level of Service D is to be provided, this means the two way capacity of the road is 748 vehicles per hour. The maximum two way flow that is expected to occur is during the PM peak in 2034 with a flow volume of 172 PCUs. This is below the capacity of the road meaning that the local road will operate within capacity up to and including 2034 where there will be approximately 77% spare capacity.

13.3.4 Other Considerations

13.3.4.1 Road Safety

As referred to in section 13.2.4, visibility to the right at the entrance onto the L1601 is restricted by vegetation. A telecom pole is also obstructing visibility to the right. It is recommended that vegetation be cut back to provide a visibility splay of 2.4m x 160m. Road markings and signage at this junction are not present. A stop layout in accordance with the most up to date chapter 7 of the traffic signs manual should be installed and a stop sign should be erected in a location that does not hinder visibility splays. A warning sign should be re-installed to the east L1601 200m from the quarry entrance, warning traffic of the presence of slow moving quarry vehicles.

Visibility to the left at the entrance onto the L5612 is restricted by vegetation and the geometry of the L5612 adjacent to the entrance. It is recommended that the visibility splay be improved as much as possible by cutting back vegetation in order to allow exiting vehicles to see further around the bend. Road markings and signage at this entrance are not present. A stop layout in accordance with the most up to date chapter 7 of the traffic signs manual should be installed and a stop sign should be erected in a location that does not hinder visibility splays.

At the junction between the R152, L5613 and Gaffney Road, visibility from the L5613 onto the R152 is restricted to the left by the vertical geometry of the R152 and to the right by vegetation. It is recommended that visibility to the right be improved by trimming back vegetation so that a 3.0m x 160m visibility splay is provided. The road markings at this junction are worn and should be reinstated. Visibility from the Gaffney Road along the R152 is severely hampered by vegetation and should be improved by trimming vegetation on both the left and right of the junction.

13.3.4.2 Parking

All parking is currently accommodated within the quarry. In order to ensure public roads remain clear from obstruction, this will remain the case.

13.4 MITIGATION MEASURES

The following measures are proposed:

- Adequate parking for both cars and HGV's should continue to be provided within the quarry.
- Appropriate warning signs indicating the presence of both quarry entrances for traffic approaching from both directions should be maintained.
- Vegetation at both quarry entrances and the R152, L5613 and Gaffney Road crossroads be cut back to increase visibility splays as described in section 13.3.4.1.
- Road markings and signage be provided at the quarry entrances and road markings at the R152, L5613 and Gaffney Road crossroads are reinstated.

14 LANDSCAPE AND VISUAL IMPACT

14.1 INTRODUCTION

The Landscape and Visual Impact Assessment was undertaken by Mitchell and Associates Ltd., who are appropriately qualified and experienced landscape architects.

This section of the Environmental Report summarises the landscape and visual impact of the proposed Waste License facility to aid in the restoration of an existing excavated quarry to revert back to agricultural land. It describes the impact on the visual and landscape amenity of the subject site itself and the contiguous area. It also describes the landscape character of the subject site and its hinterland.

The application site is located within the existing Mullaghcrone Quarry site at Donore, Co. Meath. The existing site is located in the townlands of Platin and Cruicerath, which is approximately 1km south-east of Donore Village, County Meath. The site boundary is within the south-western area of Mullaghcrone Quarry. The deposition area consists of a large rectangular area (11.7 hectares), bordered by a soil and stones recovery area to the south (on lands owned by Irish Cement) and to the east and north by quarry activities. Agricultural land forms the western boundary of the site (See Figure 14.1 Site Context).

14.2 EXISTING ENVIRONMENT

The basis for the assessment follows the guidance utilised for Environmental Impact Statements:

- Guidelines on the information to be contained in Environmental Impact Statements, the Environmental Protection Agency (EPA) 2002
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements, the Environmental Protection Agency (EPA) 2003

The analysis of the site environment, taken together with its hinterland, was based on a site visit, an examination of available aerial photography, Ordnance Survey mapping data, and a detailed topographical survey of the site itself.

The significance criteria used for the visual and landscape assessment are based on those given in the 'EPA Guidelines on the information to be contained in Environmental Impact Statements - 2002 - 5. 'Glossary of Impacts', and are as follows:

Imperceptible Impact: An impact capable of measurement but without noticeable consequences.

Slight Impact: An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate Impact: An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.

Significant Impact: An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

Profound Impact: An impact which obliterates sensitive characteristics.

The quality of potential visual and landscape impacts are assessed according to EPA guidelines as follows:
Positive: A change which improves the quality of the environment
Neutral: A change which does not affect the quality of the landscape
Negative: A change which reduces the quality of the environment

Potential impacts arising from a proposed development may also be considered in terms of duration as described in the EPA Guidelines:
Temporary: Impact lasting one year or less
Short-term: Impact lasting one to seven years
Medium-term: Impact lasting seven to fifteen years
Long-term: Impact lasting fifteen to sixty years
Permanent: Impact lasting over sixty years

Topography
Given the nature of the site and its associated activities the topography varies in correlation with the excavation works being carried out a particular time. The proposed waste licence area encompasses a worked out quarry area with partial restoration under the previous waste permits. The most recent site survey indicates ground levels at a low point of approximately 40 metres O.D. in the eastern portion of the site. From this low point the ground slopes steeply to the east and west to a high point of approximately 72 metres O.D. along the eastern boundary and a high point of 78 metres O.D. along the northern boundary and falling again to approximately 72 metres O.D. along the western boundary. (See Fig.14.1 Topography Map).

Slope Regime
Similar to topography the slope regime on the site is determined by the excavation works carried out over the lifetime of the quarry. The nature of the work results in very steep slopes being formed along the edges of the areas been excavated.

Vegetation
The general ground cover of the subject site has been removed as a result of the excavation works and therefore vegetation consists of the invasive scrub planting and grasses that have colonised the spoil heaps and side slopes of the excavated pits. The majority of the woody plants – i.e. trees and shrubs are confined to the hedgerows outside the site boundary forming the agricultural fields, which consist of species such as Ash and Sycamore and small tree species such as Hawthorn, Blackthorn etc., interspersed with shrubs such as Bramble.

Land Use
The general land-use in this area to the southwest of Drogheda is one of agriculture with a concentration of extractive land uses in the immediate vicinity of the application site. (Fig.14.4). The village of Donore is located approximately 1.15 kilometres to the north-west with small pockets of low-density residential development scattered throughout the landscape, a pattern typical of much of rural Ireland. Immediately to the south of the subject site there are significant areas of industrial and

extractive land-uses – in the form of the Platin Cement Plant, and its associated stone quarrying activities to the west. A railway line serving the Platin plant also runs 1km to the south-west of the site. (See Fig. 14. 3. Land Use Map)

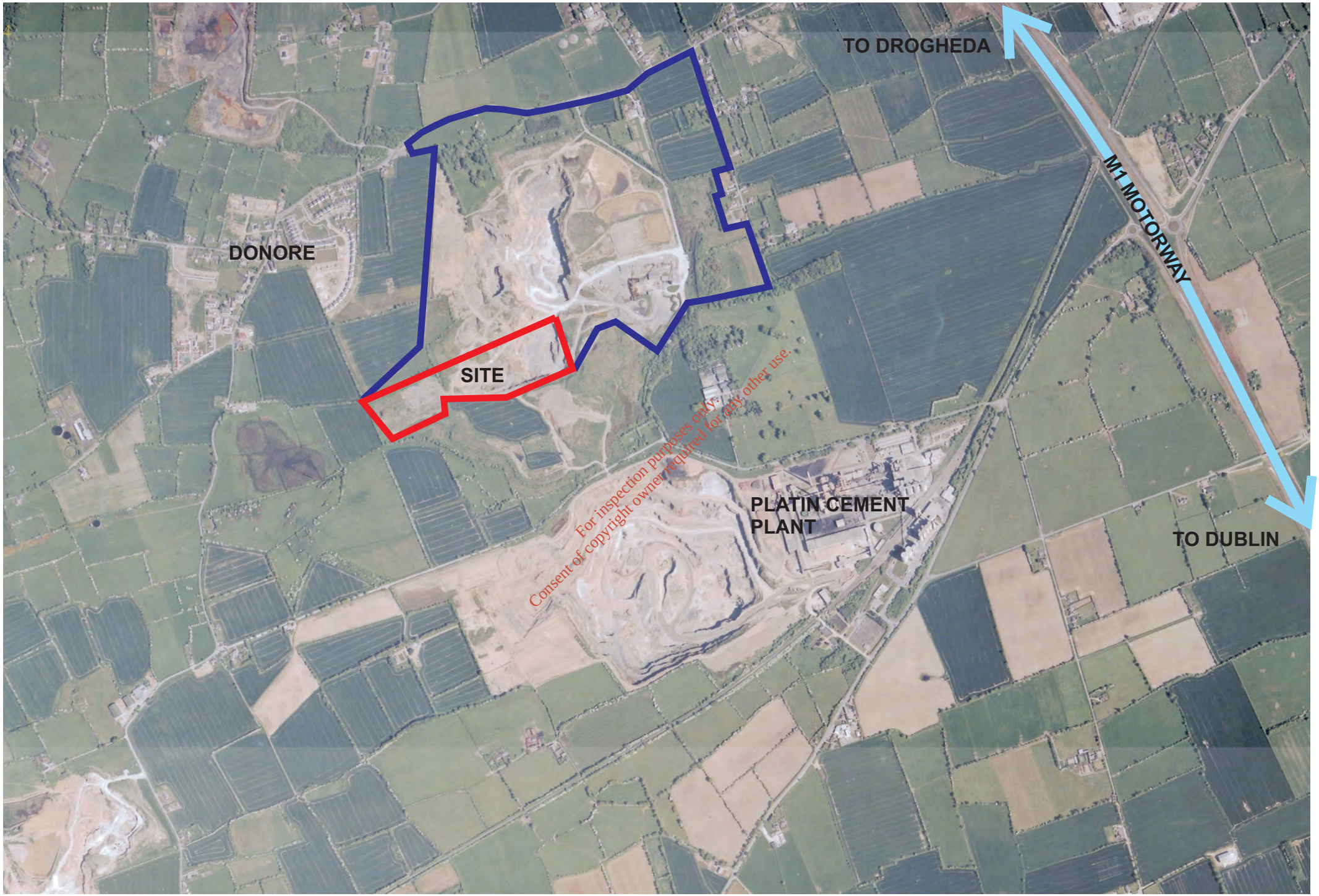
Visual Analysis

The subject site itself is visually unremarkable being part of a much larger site used for extractive purposes. The visual character is typical of a quarry of this nature with the primary visual feature being the screening berms colonised by recolonising vegetation, access tracks for machinery and the steep side slopes of the quarried areas. The surrounding landscape outside the boundary of the quarry generally consists of a series of small-scaled agricultural paddocks with hedgerows typical of much of the landscape of this part of County Meath. Immediately to the south of the application site is a portion of land which has been previously filled and restored by Irish Cement Ltd.

Views in towards the site are obstructed by the existing topography and hedgerows of the surrounding agricultural land. Views out from the application site are also limited being confined to views towards the agricultural land to the west and views to the south-east towards Platin Cement Plant where the red and white striped chimney stacks of the Plant are visible (See Plate 1 and Plate 2). The immediate site hinterland is visually dominated by the industrial complex at Platin Cement works, which consists of an array of tall silos and associated industrial sheds. (See Fig.14.4 Visual Analysis Map).

Do Nothing Scenario

Should the Waste Licence not be granted for the proposed development and the quarry remain unfilled, the site will remain in its present state as an open quarried area which will in time become overgrown with invasive scrub vegetation.



Land in ownership of applicant

Application Site

Fig. 14.1 SITE CONTEXT

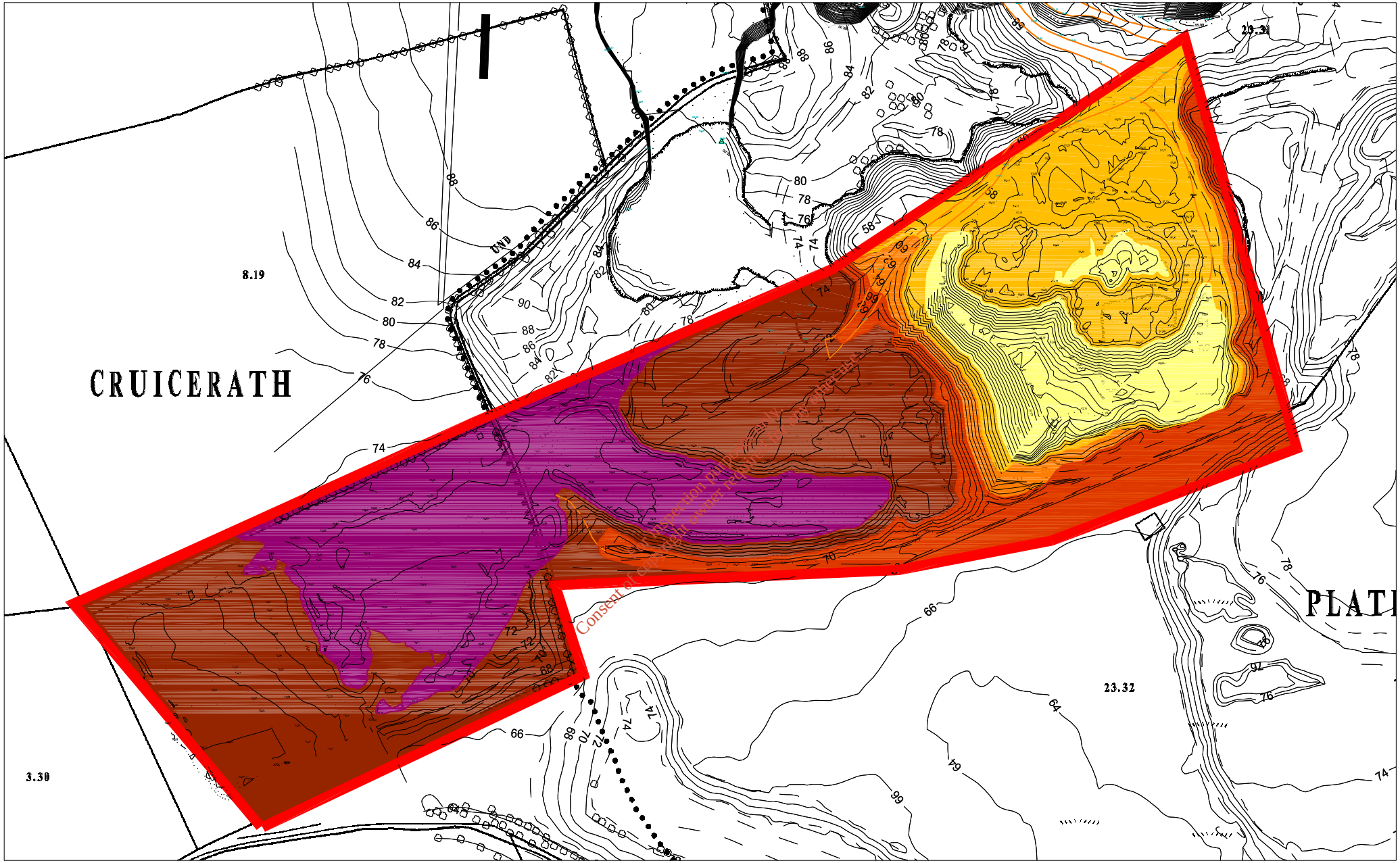
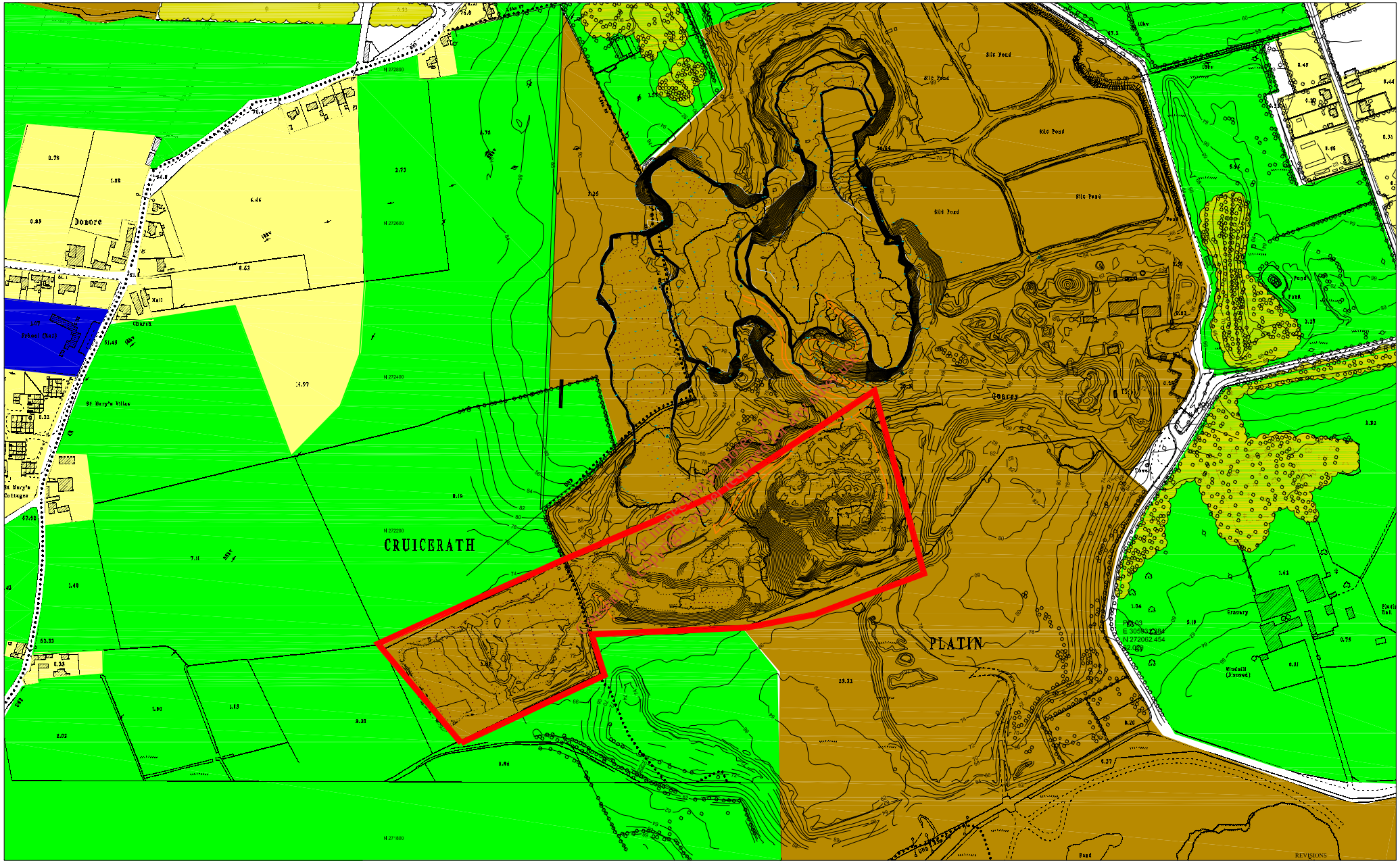


FIG. 14.2 TOPOGRAPHY MAP



Legend:

- agricultural land
- residential
- quarry / extractive use
- institutional
- scrub woodland
- application boundary

north

FIG. 14.3 LAND USE MAP

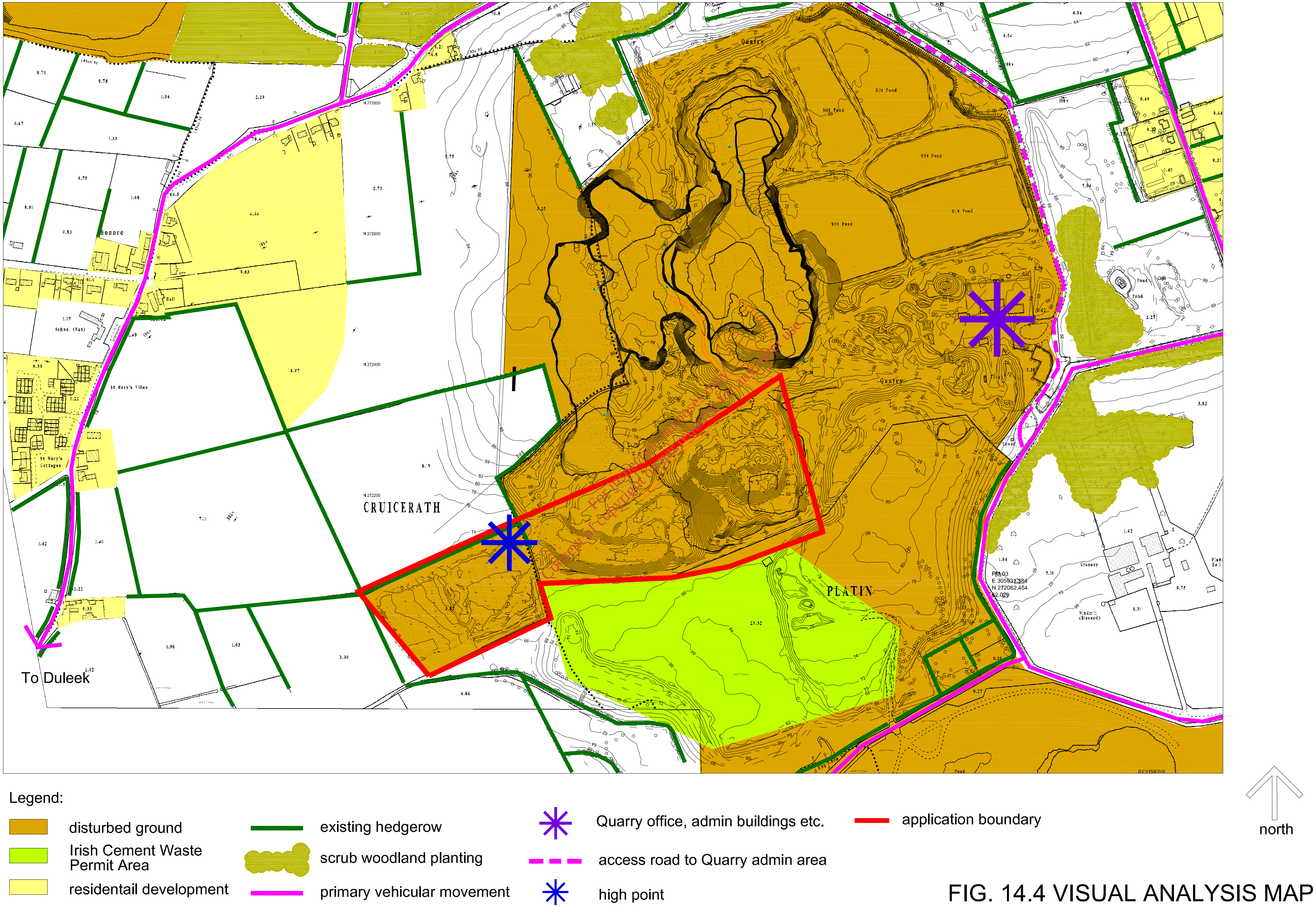


FIG. 14.4 VISUAL ANALYSIS MAP

14.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the filling of the quarried area with fill material from the adjacent excavated ground which will be graded to imitate a naturally formed 'hillock', to a maximum elevation of 83m O.D., to blend with the surrounding undulating agricultural landscape. It will revert back to agricultural use with new hedgerow planting installed along the boundary utilizing native tree species.

(See Landscape Restoration Plan Drawing. in Appendix 14.1)

14.4 POTENTIAL IMPACTS

In landscape and visual terms the proposed development will have a positive impact in varying degrees upon the inter-related aspects, as follows:-

- The perceived character of the area;
- The existing views; and
- Its visual and recreational amenity.

Impact on Landscape Character

The application site presents as an area of disturbed ground due to the quarrying activities which forms part of a larger area of disturbed ground. This portion of the quarry will now be restored to agricultural land similar to the existing agricultural land surrounding the site.

The restoration will have a positive visual impact on the existing landscape character of the area.

Impact on Views

As the application site is not visible from the surrounding road network the impact on views in towards the restored landfill will be imperceptible. However, there will be a positive and significant impact on views from within the quarry lands themselves with the open quarried area being replaced with grassland.

Impact on Visual/Recreational Amenity

The subject site, at present has a low level of visual amenity and no level of recreational amenity. The proposed restoration will constitute a significant and neutral impact on the visual amenity of the area and will have no impact on the recreational amenity of the area.

14.5 MITIGATION MEASURES

The overall visual impact of the development will be reduced in the following important ways:-

- Through the grading of the restored landfill to mimic a natural mound in the agricultural landscape.
- Through insertion of hedgerow planting along the boundary of the application site using similar tree species to the existing hedgerows in the area.

14.6 PREDICTED IMPACT

The development will have a significant and neutral impact on the visual amenity of the area. The existing low visually amenity value of the quarry will be replaced by an agricultural field similar to the surrounding agricultural land with hedgerow planting to provide a new ecological habitat to the wildlife in the area.

14.7 RESIDUAL IMPACT

The proposed hedgerow planting will be subject to on-going maintenance strategies and monitoring, to ensure the satisfactory establishment of the planting installation and therefore the effectiveness of its screening potential over time.

14.8 SUMMARY

The application site presents as small portion of a larger tract of land containing deep excavations and disturbed ground due to the ongoing quarrying activities in the area. The proposed restoration will form part of an ongoing restoration plan over the lifespan of the quarry when all the disturbed land will eventually be restored to agriculture or similar usage. The restoration to agricultural land will have a moderate and positive landscape and visual impact on the receiving environment.

15 INTERACTION OF THE FOREGOING

This Environmental Impact Statement (EIS) has been prepared by TOBIN Consulting Engineers on behalf of Roadstone for a waste licence facility at Mullaghcrone Quarry and will accompany a waste licence application to the EPA.

The potential environmental impacts of the proposed waste licence, including the measures proposed to mitigate these impacts have been outlined in this report. This section discusses the potential for interaction between impacts of the different environmental aspects.

15.1 HUMAN BEINGS / SOCIO ECONOMIC

Human Beings will interact with other environmental topics given the nature of the waste licence facility.

There will be minimal loss of wildlife habitat if the application is granted. The majority of habitat within the waste licence infilling footprint is comprised of recolonising bare ground and spoil and bare ground. The restoration planting proposals will provide a quantity and a range of habitats in excess of that present in the existing environment. Furthermore, natural recolonisation of flora and fauna will occur from surrounding areas. After use strategies have been detailed within this document. See Landscape Restoration Plan in Chapter 14.

Noise and dust control will be in accordance with the EPA guidelines and the applicant will ensure compliance with any specific conditions imposed by the EPA. There will be no changes to the microclimate.

Social and travel patterns, pedestrian or otherwise, will not be disrupted by the use of the waste licence facility as no roads or pedestrian ways will be altered.

The operations within the site will secure employment already in place from the previous and existing waste permits.

15.2 FLORA AND FAUNA

The subject lands largely comprise of recolonising bare ground and spoil and bare ground. Dust impacts on adjacent habitats and fauna are expected to be minor as dust control will be in accordance with EPA guidelines.

15.3 SOIL / GEOLOGY AND HYDROGEOLOGY

There will be an impact on soils due to the proposed waste licence of the quarry. However over the lifetime of the previous soil and stones permits and existing C&D waste permits there has been an alteration to the geological environment and such current conditions are envisaged to continue. The impact of the existing facilities is considered to be low. The infilled area will be used to restore the former quarry area and to screen the site from its surrounding environment.

Dust mitigation measures are identified to mitigate the potential for dust generation from the proposed waste licence facility.

15.4 WATER

The proposed waste licence area will not go below the water table and will remain a dry working area. The proposed waste licence facility will not result in the generation of additional impacts on the wider environment.

15.5 AIR QUALITY AND CLIMATE

The proposed waste licence facility will have no effect on the microclimate in the immediate vicinity of the site. Dust impacts on adjacent habitats and fauna are expected to be minor as dust control will be in accordance with strict EPA guidelines.

Dust suppression measures and an established vehicle wheel wash are proposed to mitigate the impact of wind blown dust around the site. These measures will reduce the impact on human beings and material assets in the community. The waste licence area will adhere to a dust control regime in accordance with the demands of the EPA.

15.6 NOISE AND VIBRATION

Noise will emanate from the working of the machinery as a result of the continuing works, operation of the infilling process, and from the associated vehicular movements.

Noise level thresholds shall be in adherence with the DoEHLG guidelines and EPA standards.

15.7 LANDSCAPE & VISUAL ASSESSMENT

A number of landscape & visual impacts interact with both the local human population, and flora and fauna. These interactions are discussed in Section 14 above.

15.8 CULTURAL HERITAGE & ARCHAEOLOGY

No direct or indirect impacts warranting specific mitigation were identified during the course of the cultural heritage assessment.

15.9 TRAFFIC AND ROAD ASSESSMENT

Traffic generated from the site will not have a significant impact on traffic on the R152 or the local roads at the quarry entrance. The traffic assessment illustrates that the junction between the R152 and the roads leading to the waste licence facility can accommodate the continued operation of the quarry up to and including 2034. Mitigation measures have been included in section 13. . These measures will ensure that road safety for all road users is maintained.

Dust control measures have been proposed with respect to the access route.

15.10 CONCLUSION

While there is potential for the above impacts to interact and result in a cumulative impact, it is unlikely that any of these cumulative impacts will result in significant environmental degradation.

It should be noted that throughout the EIS potential interaction between various environmental criteria are discussed. The baseline assessment for this project was completed prior to the design of the waste licence facility, which allowed for the optimisation of the site layout design, within the overall application

area. Avoidance of impacts was used throughout the design of the proposed facility. The impact and mitigation measures proposed are designed to further ameliorate the impact of the continuing works and the proposed waste licence facility on the wider environment.

16 EXPLANATION OF TECHNICAL TERMS

AADT: Average annual daily traffic

Aggregates: Particles of rock which, when brought together in a bound or unbound condition, form part or whole of a building or civil engineering structure.

Ambient Noise: The total sound in a given situation at a given time usually made up of sound from many sources.

A-weighting: Normal hearing covers the frequency (pitch) range from about 20 Hz to 20,000 Hz. but sensitivity is greatest between about 500Hz and 5,000 Hz'. The 'A-weighting', is an electric al circuit built into noise meters to mimic this characteristic of the human being.

Barony, Parish, Townland: These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the county. The origins of these divisions are believed to be in the Early Medieval/Christian Period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500)

BAT: Best Available Techniques

BH: Borehole

Blast Ratio: The amount of work per unit of explosive measured in tonnes of rock per kilogram of explosives detonated

BOD: Biological Oxygen Demand

Burden: The distance measured at right angles between a row of holes and the free face, or between rows of holes.

COD: Chemical Oxygen Demand

CSO: Central Statistics Office

cSPA: Candidate Special Area of Conservation

Decibel (dB): The logarithmic measure of sound level. 0dB is the threshold of normal hearing; l40dB is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions.

dB(A): Decibels measured on sound level meter incorporating a frequency weighting (A-weighting) which, differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessments of loudness. A change of 3dB(A) is

the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of a sound.

DED: District Electoral Division

Delay Interval: The time between successive detonation of detonators.

DoEHLG: Department of the Environment, Heritage and Local Government

DMRB: Design Manual for Roads and Bridges

EIA: Environmental Impact Assessment

EIS: Environmental Impact Statement

EMS: Environmental Management System

EPA: Environmental Protection Agency

Frequency (Hz): the number of cycles per second of vibration usually expressed in Hertz (Hz)

ghg: Greenhouse Gas

gph: Gallons per Hour

GSI: Geological Survey of Ireland

Hertz (Hz): Unit of a frequency (pitch) of a second. Formerly called cycles per second.

HGVs: Heavy Goods Vehicles

ICF: Irish Concrete Federation

IDA: Industrial Development Agency

Impulsive noise: A noise, which is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

ISO: International Standards Organization

Km: Kilometres

L_{10}: The sound level exceeded for 10% of the time over a given period; similarly L_{90} = 90%

LAP: Local Area Plans

L_{AeqT} : The equivalent continuous sound level - the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period (T). Used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{ArT}: The equivalent continuous sound level corrected for tonal or impulsive character where these are present. The measurement time intervals typically used are one hour by day or 15 minutes by night.

LEA: Local Electoral Area

Material Assets: In the context of this document, refers mainly to property, architectural and archaeological heritage.

mbgl: Meters Below Ground Level

MIC: Maximum Instantaneous Charge

MM: Millimetres

mOD: Metres above Ordnance Datum

Mitigation: reduction, making less severe; in the context of this document, lessening the impact of the quarry on the environment.

MW: Monitoring Well

NDP: National Development Plan

NHA: Natural Heritage Area

NPWS: National Park and Wildlife Services

NRA: National Roads Authority

NSAI: National Standards Authority of Ireland

NSS: National Spatial Strategy

OPW: Office of Public Works

OS: Ordnance Survey

Peak Particle Velocity (PPV): the maximum rate of change of particle displacement, measured in millimetres per second (mm/sec).

pHNA: Proposed Natural Heritage Area
QHNS: Quarterly National Household Survey

RFC: Ratio of Flow to Capacity Value

RPG's: Regional Planning Guidelines

RMP: Record of Monuments and Places

Scaled Distance: The blast/receiver separation distance divided by the square root of the maximum instantaneous charge weight.

Shot: is a borehole complete with primed charge and stemming.

SLM: Sound Level Meter

SPA: Special Protection Area

SPG's: Strategic Planning Guidelines

SW: Surface Water Monitoring Point

TA: Transport Assessment

Tonality: The degree to which a noise contains audible pure tones. Broad-band noise is generally less annoying than noise with identifiable tones.

TRL: Transport Research Laboratory

UKAS: United Kingdom Accreditation Service

Vibration: A rapid linear motion of a particle or of an elastic solid about an equilibrium position

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