3.8 TRAFFIC

3.8.1 INTRODUCTION

This section of the EIS examines the expected volumes of traffic that will be generated as a result of the proposed development and its impact on the surrounding road network.

This traffic assessment identifies how the traffic associated with the proposed development can be accommodated on the local roads network. Where appropriate, measures to address the management of both the existing traffic and any 'new' traffic likely to be generated on the local road network are discussed.

In general, the capacity and operation of a road network, with adequate capacity/level of service is dependent on the junctions within that network. It is the operation of junctions, which ultimately determine capacity and vehicle delay on the roads network. In establishing the scope of the study it was considered that the influence of the additional traffic generated by the proposed development was not likely to be significant beyond the junctions in the immediate vicinity of the development i.e. the site entrance and Fountain Cross (junction of the R476 and the N85). Drawing 1 in Attachment 2 shows the site location.

3.8.2 EXISTING ENVIRONMENT

Road Network

The site is located on the R476 Corrofin to Ennis road. The R476 joins the N85 Ennistymon to Ennis road at Fountain town cross approximately 4km south of the site.

The R476 is a 7m wide two lane carriageway and is classified as a regional road.

The existing site is occupied by an active limestone extraction quarry and block manufacture plant. This quarry has an existing access onto the R476 which is proposed to be used by the development. The existing site access is designed in such a way to ensure that vehicles entering the site do not impede the flow of traffic on the public road. The site entrance is 29m wide and the

gates are located 12m from the edge of the R476. Plates 3.8/1 to 3.8/3 below show the existing entrance which will serve the development.

The R476 has a speed limit of 80 km/h at the site entrance. The site access has adequate sight lines in each direction (150m to the north and 350m to the south) to facilitate safe access and egress from the existing and proposed development.

Plate 3.8/1: Existing Site Entrance (12m off the R476)

Plate 3.8/2: Sight Lines south of the entrance towards the N85 (Fountain Cross)

Plate 3.8/3: Sight Lines north of the entrance towards Corrofin

The R476 joins the N85 approximately 4km south of the site at Fountain Cross. The N85 has a right turning lane for vehicles taking the R476. Plate 3.8/4 below shows the road layout at Fountain Cross.

Plate 3.8/4: Right turning lane from the N85 onto the R476 at Fountain Cross

Traffic

The R476 is a regional road with an average width of approximately 7m.

Traffic counts carried out by Clare County Council (the Council) on the R476 (just north of Fountain Cross) in 2001 indicate a 14hr count of 5035 with a HGV count of 430 (8.5%). These counts included the existing contribution from the operation of the quarry.

The above 14hr count data can be expanded to an AADT value using the NRA document RT.201 'Expansion Factors for Short Period Traffic Counts'. By using the expansion factor for the survey period 0800-2200hrs the survey data can be factored to produce a general or 'rule of thumb' range within which the actual Annual Average Daily Traffic (AADT) flow should fall. From RT.201 the appropriate expansion factor has been selected for 'rural intertown routes' for a count between 0800-2200hrs, the value of

which is 0.98±14%. Using the expansion factor the results of the traffic survey shows that the AADT on the R476 or 'adjoining highway' lies in the range (5035 x 0.98) ±14%, see Table 3.8.1 below.

Table 3.8.1: Existing Traffic Figures on the R476

Junction Approach Arm	**Existing Traffic Factored to AADT**	
	AADT (14hr Survey)	**HGV** (14hr Survey)
R476 (two way from Corrofin to Ennis)	4,243 – 5,635 (5,035)	365 - 477 (430)

The N85 has a traffic flow of 5785 (2 way) with 8.3% HGV's (National Roads Authority (NRA) Figures).

Table 3.8.2: Existing Traffic Figures on the N85

Junction Approach Arm	**Existing Traffic Factored to AADT**	
	AADT	**HGV**
N85 (two way from Ennistymon to Ennis)	5,785	480

3.8.3 PROPOSED DEVELOPMENT

General

It is proposed to develop a lime kiln on the site for the production of lime. The raw material (limestone) will be supplied by the adjacent Quarry.

It is proposed to use the existing entrance to the quarry to access the lime kiln.

Traffic from the Proposed Development

The proposed lime kiln has the capacity to generate a maximum 100,000 tonnes of lime per annum. It is proposed to supply approximately 60,000 tonnes per annum to Moneypoint Power Station for sulphur dioxide abatement.

The lime will be produced from limestone quarried on-site and therefore the only impact on the public road network will be from the delivery of raw petcoke or HFO to fuel the kiln, additional staff (approx 15) and the haulage of the finished lime product off-site.

From discussions with the site developer the trucks/tankers that will transport the finished lime product from the site will carry approximately 27 tonnes.

Transportation of 100,000 tonnes of quicklime off-site will generate 3,703 truck movements per annum. The operations will occur 24hrs/day, 7 days/week, 365 days/year. In order to be conservative in the predicted impact of traffic it is assumed that lime will be transported off-site 320 days/annum. This would give rise to approximately 12 truck loads per day.

It is envisaged that there will be a maximum of two deliveries of raw petcoke or HFO per day delivered to the site to fuel the kiln.

It is estimated that approximately 15 additional staff will be required to operate the proposed development when fully operational. This will result in an additional 15 car movements per day.

Haulage Routes

The 60,000tonnes quicklime per annum produced by the kiln will be supplied to Moneypoint power station.

The haulage route to be used by trucks delivering lime to Moneypoint power station will be as follows;

- R476 to the N85 at Fountain cross
- N85 to Ennis
- From Ennis the N68 to Kilrush will be used
- From Kilrush the N67 to Moneypoint power station will be used.

Haulage routes to other potential customers (maximum of 40,000 tonnes/annum) will use the regional and national roads network where possible; only using county roads for local access where required. It is envisaged that other potential customers will be based in the Clare or Limerick areas.

3.8.4 IMPACTS

Table 3.8.3 below outlines the expected increases in traffic volume on the R476 associated with the proposed development.

Junction Approach Arm	Existing Traffic Factored to AADT		Additional Daily Traffic	Forecast Increase	
	AADT (14hr Survey)	HGV (14hr Survey)		Total Traffic	HGV
R476 (two way from Corrofin to Ennis)	4,243 – 5,635 (5,035)	365 - 477 (430)	12 x 2 Lime 2 x 2 Fuel 15 x 2 Staff	58 1.4 – 1.0%	28 7.6 – 5.9%

In terms of traffic volumes this increase is insignificant and very much short of the threshold 10% increase in traffic volumes, recommended by the Institution of Highways & Transportation, which would require the a detailed investigation of traffic impact and junction performance through the use of mathematical computer modelling.

Clearly this forecast increase in traffic is practically negligible and is likely to be imperceptible to existing road users and local residents.

The existing road network has the capacity to cater for the increased traffic volumes projected.

3.8.5 MITIGATION MEASURES

The material excavated onsite during construction works will be reused onsite for landscaping and filling purposes. Therefore this will reduce the numbers of HGVs entering and exiting the proposed site during the construction phase.

Road sweeping and/or the use of wheel washers will be put in place to mitigate dispersal of debris during the construction phase.

The haul route to be used by lorries delivering lime to Moneypoint power station will be as follows;

- R476 to the N85 at Fountains cross
- N85 to Ennis
- From Ennis the N68 to Kilrush will be used
- From Kilrush the N67 to Moneypoint power station will be used.

Haul routes to other potential customers will use the regional and national roads network where possible; only using county roads for local access where required.

Only enclosed trucks/tankers will be used to transport the lime from the facility.

3.8.6 RESIDUAL IMPACT

All developments of this nature result in increased volumes of traffic in the surrounding area. Increased volumes of traffic directly affect all road users, including motorists, pedestrians and cyclists. However due to the limited number of traffic movements associated with the proposed development, it is considered that the proposed development will not materially impact on the operation of the adjacent regional road network or the national road network.

Clearly this forecast increase in traffic flow would be practically negligible.

3.9 CLIMATIC FACTORS

3.9.1 BASELINE DATA

The characterisation of the climatic conditions prevailing at the proposed Lime kiln, fuel store and ancillary buildings at Ballybrody, Ennis Co. Clare was based on desk-based information compiled from the Meteorological Service reported data.

There is no site specific climatic information available for the study area. Information was obtained from the nearest climatological station which is located at Shannon airport (26km to the south of the site). Due to topographical and elevation differences between Shannon Airport and the site, weather conditions experienced at the site may be expected to differ slightly from those given.

(1) Wind

Wind speed and the wind frequency summary table (period 1961 to 1990) for the Shannon Airport synoptic station are presented in Attachment 8. Based on this data the prevailing winds at the site are from west-southwest to the east-northeast. The site is characterised by moderate wind conditions over much of the year with the lowest monthly average levels recorded in July and August (8.6 knots; 4.4 m/s) and the highest monthly average wind conditions in February (11.1 knots; 5.7 m/s).

Table 3.9.1: Wind Speeds (knots)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
mean monthly speed	10.9	11.1	11.0	9.5	9.5	8.9	8.7	8.6	9.6	10.0	9.6	10.5	**9.8**
max. gust	82	80	65	62	61	57	52	55	93	84	64	81	**93**
max. mean 10-minute speed	55	53	44	41	39	42	33	39	60	57	45	51	**60**
mean no. of days with gales	2.1	1.2	1.4	0.5	0.5	0.1	0.0	0.1	0.6	0.9	1.0	1.5	**9.8**

(2) Precipitation & Effective Rainfall

Average monthly and annual rates of precipitation over the period of 1961 - 1990 for the Shannon Airport are presented in Table 3.9.2 overleaf.

Table 3.9.2: Precipitation Rates at Shannon Airport (mm)

Period	J	F	M	A	M	J	J	A	S	O	N	D	Ann.
mean monthly total	97.2	72.1	71.8	55.5	60.1	62.4	57.1	82.3	81.8	92.4	94.7	99.6	**926.8**
greatest daily total	29.0	33.5	28.5	29.6	27.0	29.7	42.5	35.9	35.5	33.0	33.0	50.4	**50.4**
mean no. of days with >= 0.2mm	20	16	19	16	17	16	15	18	18	20	19	20	**214**
mean no. of days with >= 1.0mm	16	12	14	11	13	11	10	13	13	15	15	16	**160**
mean no. of days with >= 5.0mm	7	5	5	4	4	4	4	5	6	6	7	7	**66**

The annual average precipitation over the 30 year period was recorded as 926.3mm. The highest mean monthly total occurs in the months of December and January. The lowest monthly total occurs in the month of July.

(3) Air Temperature

The pattern of long-term daily temperatures at Shannon Airport 1961-1990 is shown in Table 3.9.3.

TABLE 3.9.3: LONG-TERM DAILY AIR TEMPERATURE AT SHANNON AIRPORT (1961-1990). °C

	J	F	M	A	M	J	J	A	S	O	N	D	ann
Mean daily max.	8.2	8.5	10.5	12.7	15.3	17.9	19.4	19.2	17.2	14.2	10.4	8.9	**13.5**
mean daily min.	2.6	2.7	3.6	4.8	7.3	10.1	12.0	11.7	10.1	8.0	4.5	3.6	**6.8**
mean	5.4	5.6	7.0	8.8	11.3	14.0	15.7	15.5	13.6	11.1	7.5	6.3	**10.1**
Absolute max.	14.0	14.8	20.2	22.2	25.6	31.6	30.6	28.7	25.5	21.8	18.2	15.2	**31.6**
absolute min.	-11.2	-9.8	-7.8	-4.1	-0.9	1.5	5.2	2.9	1.3	-1.4	-6.1	-8.3	**-11.2**

Air temperatures range from a mean monthly temperature of 5.0 C in January to 15.7 C in July. The average annual temperature (30 year average) is approximately 10.1 C.

3.9.2 ENVIRONMENTAL IMPACTS

No direct impacts on the climate (wind & rain patterns and ambient air temperatures) of the area are envisaged therefore no specific mitigation measures are proposed.

3.10 LANDSCAPE & VISUAL IMPACTS

3.10.1 INTRODUCTION

This section looks at the potential visual impact of the proposed lime kiln at Ballybrody, Ennis, Co. Clare. This section outlines the existing character of the site and surrounding area, the impact of the proposed development on the character of the landscape and mitigation measures to minimise the visual impact of the proposed development.

3.10.2 ASSESSMENT METHODOLOGY

The assessment of the potential impact on the landscape is based on the guidelines set out in the "Guidelines for Information to be Contained in Environmental Impact Statements" published by the Environmental Protection Agency (EPA), March 2002.

EXISTING LANDSCAPE

The Existing Landscape is described using the following terminology:

(i) Context

Areas from which the existing site can be seen were noted. Particular attention was paid to views from designated tourism routes and view points, residences, hotels, amenities, monuments and archaeological sites.

(ii) Character

The site is assessed and described as it is perceived both from within the site and from outside the site in the wider landscape. The intensity and character of the landscape are also described.

(iii) Significance

This addresses the significance of the existing landscape and examines the level of intrusion on designated views, designated landscape and designated landscape amenity areas.

(iv) Sensitivity

This section addresses the changes that would alter the character of the environment.

POTENTIAL IMPACTS

The potential impacts of the proposed development, including the "do nothing" option are assessed using the above criteria. Where potential negative impacts are predicted mitigation measures are recommended to reduce the visual intrusiveness of the proposed development.

The "**Quality**" of the visual impact of the proposed development was assessed using the following terminology:

(i) Positive Impact
A change which improves the quality of the environment (for example, by increasing species diversity, or the improving reproductive capacity of an ecosystem, or removing nuisances or improving amenities).

(ii) Neutral Impact
A change which does not affect the quality of the environment.

(iii) Negative Impact
A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property by causing nuisance).

The **"Significance"** of the visual impacts are ranked using the following terminology:

(i) Imperceptible Impact
An impact capable of measurement but without noticeable consequences.

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

(iii) Moderate Impact
An impact that alters the character environment in a manner that is consistent with existing or emerging trends.

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

(v) Profound Impact
An impact which obliterates sensitive character characteristics.

The **"Duration"** of the visual impact was rated as follows:

Description of Impact	Duration
Temporary Impact	Impact lasting for 1 year of less
Short-term Impact	Impact lasting 1 to 7 years
Medium-term Impact	Impact lasting 7 to 15 years
Long-term Impact	Impact lasting 15 to 60 years
Permanent Impact	Impact lasting >60 years

3.10.3 EXISTING ENVIRONMENT

LANDSCAPE CONTEXT

The site is located within an existing operational limestone quarry (Ryan's Bros Ltd) on the R476 between the village Corrofin and Ennis in Co. Clare. The site will occupy an area of between 6 to 7 acres on the south eastern side of the quarry site. The quarry site itself is spread across approximately 270acres. The lime kiln site comprises mostly of bare rock with some woodland and interspaced with spoil heaps from the operation of the quarry. Drawing 1 attachment 2 indicates the site location on an Aerial photograph of the site. The site is to be accessed from the existing quarry entrance onto the R476 Corrofin to Fountain cross road. The nearest large town is Ennis which is located approximately 6km to the south of the site.

Site Visibility

The lime kiln site is relatively flat and does not have any features that distinguish it from the surrounding quarry area. The highest point of the quarry site (on the western boundary) is visible from a wide area to the east and south east. However its visibility is limited from many locations due to the drumlin landscape of the area i.e. intervening drumlins.

A significant portion of the quarry is screened from the west and south west as the quarry boundary does not extend beyond the brow of the hill. The following photographs indicate the lime kiln site location and place it within the context of the existing quarry.

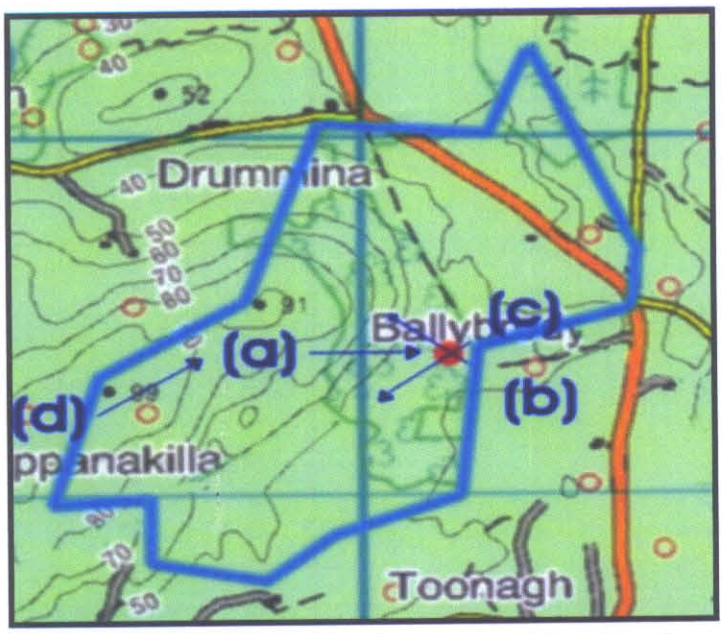


Plate 3.10/1: Camera angles of the proposed lime kiln site

Plate 3.10/1 above indicates the locations and angles from which the following site photographs were taken.

Plate 3.10/2: Camera angle (a) View east towards N476 and dwelling houses

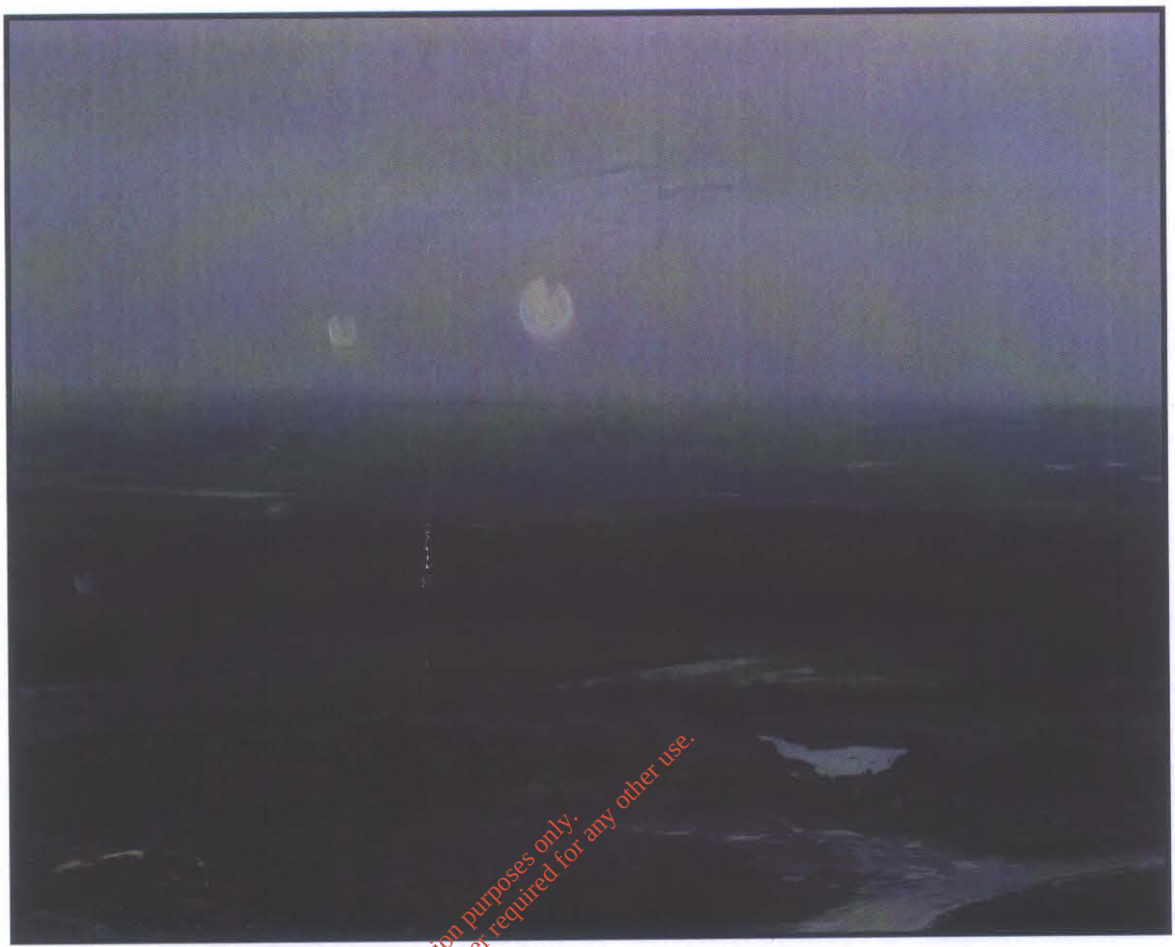
The view indicates the drumlin topography of the surrounding landscape, the positioning of the kiln in line with the existing hill directly to the east of the site and the nature of the existing site.

Photograph 3.10/3: Camera angle (b) View to the north west of the kiln site towards to active face of the existing quarry.

The active face of the quarry is not visible in this plate as it is screened by the spoil heaps to the right of the plate. This view indicates the mixture of scrub, rock and spoils heaps that cover the proposed lime kiln location. It also illustrates the backdrop of the area and the existing visual impact of the quarrying operation.

Photograph 3.10/4: Camera angle (c) towards the west south west woodland area on the existing quarry site.

This plate indicates the woodland area that is located on the south western side of the existing quarry site. The view is an area adjacent to the kiln location.



Photograph 3.10/4: Camera angle (d) towards the north east and woodland area adjacent to the existing quarry site.

This angle highlights the visual nature of the existing quarry operation and the woodland area to the north west of the existing quarry site.

LANDSCAPE CHARACTER

County Clare possesses a high diversity of landscapes, reflecting a wide range of landscape forms and elements that have been influenced by various human activities over time. Lough Derg provides a natural boundary to the east and is fed by numerous rivers and streams, many of which weave their way through the extensive drumlin belt in the eastern part of the county. Other watercourses include Graney, which rises from Lough Graney, nestled within the uplands of the Sliabh Aughties.

Considerable contrasts emerge between the east and west of the county, with extensive limestone area composed of lower limestone pavements, pastures and loughs fringing the distinctive Burren uplands. The Fergus River, which rises above the Corrofin, is a key landscape influence in the central part of the county, flowing through the county town of Ennis and feeding into the extensive Fergus estuary with its numerous islands and historical settlements. The Shannon estuary and its widening into the Atlantic has a profound influence along the south of the county, creating inlets and smaller estuaries. The Atlantic influence is seen along the extensive coastline, particularly in the rocky and dramatic coast on the north of loop head and indeed further along the coast in features such as coastal stacks and islands. The human impacts are evidenced along the Atlantic, with the high number of defensive promontory forts that provide distinctive punctuations along the coastal landscape.

The landscape character of this part of county Clare is rural in nature with agriculture remaining the main activity within the county. However there are also areas of existing coniferous forestry in the area e.g. to the north west of the site. The site is located near the R476 8km north of Ennis town and 6km south of Corrofin.

The character of the site is dominated by the operation of the existing limestone quarry. The lime kiln site has been cleared of overburden in the past and is littered by small and large spoil heaps with some limited working of the area.

Site Description

The site is an irregular shape and occupies an area of approximately 6-7 acres. The site is surrounded on three sides (west, north and south) by the existing quarry. To the east the site is bounded by agricultural grazing land beyond which lies the R476 Corrofin to Ennis road. There are a number of residential dwellings along the R476. The site consists of areas of rock, spoil, scrubland and some woodland.

SIGNIFICANCE

The operation of the existing limestone quarry has significantly altered the landscape from its previous use. It has also altered the visual context of the proposed location as the site is located within the quarry site and surrounded on three sites by the visual impact of the quarry operation. However the remainder of the views in the area are rural in nature and have remained relatively unchanged. Views towards the site from residential dwellings and roads to the east and south east of the site are dominated by existing views of the quarry.

SENSITIVITY

The proposed development involves the construction of the lime kiln and ancillary buildings. The lime kiln height from ground level is approximately 48m from base level. The height and dimension of the twin shaft kiln itself has the potential to impact on the visual nature of the site. Due to the existing quarrying and associated process activities, the landscape is dominated by bare rock with areas of scrub and woodland.

3.10.4 IMPACT ASSESSMENT

DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development site is located within an existing quarry in the townland of Ballybrody, Ennis, Co. Clare. The proposed limekiln is to be located on the site of an existing operational limestone quarry. The site is located in the central region of County Meath, ca. 6 km south from the village of Corrofin, (see Figure 2.1/1). The development footprint of the site is small compared to the boundaries of the existing quarry. The proposed development will entail the erection of a limekiln and ancillary buildings, such as fuels storage and loading buildings. The total area of the site is approximately 6 to 7 acres.

Access to the proposed limekiln location is through the entrance to the existing quarry from the R476. The R476 runs in a northerly direction from Ennis in the south to Corrofin in the North.

THE DO-NOTHING IMPACT

If the site were to be left in its existing state, colonisation of the bare rock and spoil areas would take place over a period of time. This process would be slow due to the lack of suitable overburden to promote plant growth.

THE LIME KILN

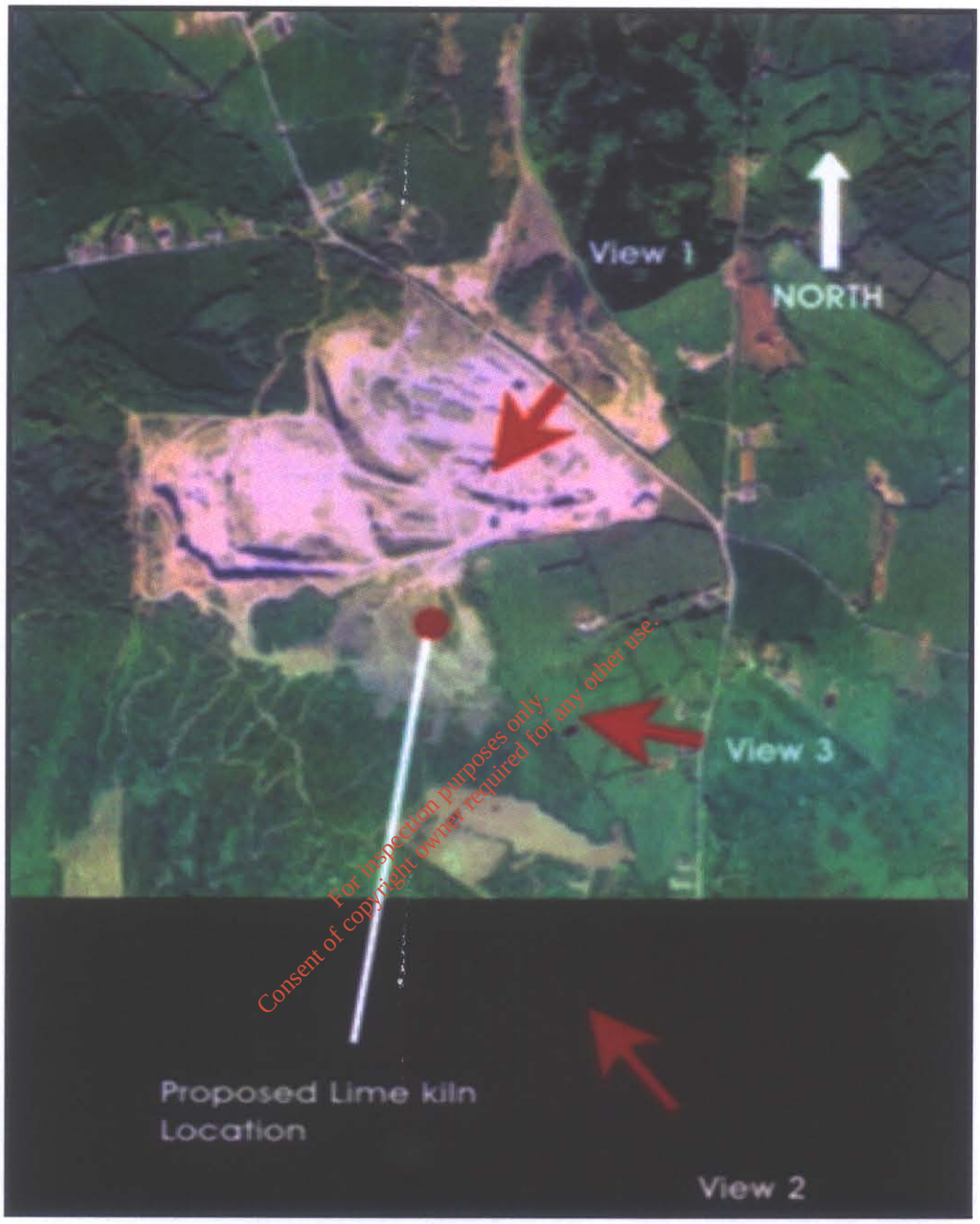


Plate 3.10/5 Photomontage views

Photomontage No.	Viewpoint Location	Approximate Distance from Proposed lime kiln (m)
View 1	Entrance	475
View 2	Toonagh village	850
View 3	Sensitive receptor	470

The photomontages are included in attachment 6.

PHOTOMONTAGE 1 - View From the Entrance to the kiln location

This photomontage view indicates the potential visual impact of the lime kiln on road users passing the quarry boundary and entrance. The view is in a south westerly direction indicating the impact on the skyline of the existing quarry buildings as well as the proposed lime kiln. The impact would be described as neutral (blends in with the existing buildings). Its significance would be described as slight. It causes a noticeable change in the landscape but without affecting its sensitivities. The duration of the impact would be long-term.

PHOTOMONTAGE 2 - View From Toonagh village north towards Lime kiln

This photomontage view indicates the potential impact from the nearest population cluster (Toonagh village). This view is to the north west, towards the quarry and the lime kiln location. Due to the height of the proposed kiln it is possible to see the top of the shafts from this location. The impact would be described as slightly negative due to the visibility of the upper part of the kiln. The significance of the visual impact would be ranked as slight as only a very small part of the kiln will be visible from this location. The duration of the visual impact would be long-term.

PHOTOMONTAGE 3 – View from Dwelling house on the R476 west to the lime kiln

This view (view 3) highlights the visual impact from a dwelling house located on the R476. The view is towards the west and onto the existing quarry operational area as well as the kiln location. The distance to the kiln base is approximately 470m from the dwelling house. Berms are proposed for the eastern and southern sides of the site boundaries. These berms will reach a height of approximately 5m. These will serve to screen out the low lying buildings and the movements of trucks at the site. The quality of the visual impact would be described as slightly negative. The significance of the visual impact would be slight, taking into the account the already existing exposed rock and quarry operational area that is viewed from this site. The duration of impact would be long term.

It is important to note that the proposed lime kiln is to be located in an area that has a distinctly industrial landscape as a result of the existing quarry operations.

3.10.4 MITIGATION MEASURES

A number of mitigation measures are proposed to lessen the potential visual impact of the proposed lime kiln. These include:

- Screenings of truck movements by construction of berms (sourced from the existing spoil at the site) The constructed berms will blend naturally with the existing quarry landscape

- Spoil from the existing site will be used in the construction of the berms in order that correct blending of the berms will take place with the existing landscape

- Location of the site the site is in an industrial area, the sensitivity of the landscape is lower and the impact significance will be lower than in a purely rural landscape.

- Light colours will be used on elevated structures, such as the stacks, to reduce their prominence and hence visual impact.

- Location of the kiln on the lower levels of the site to reduce the visual prominence of the structure

- Location of the kiln in an area that makes use of the existing quarry backdrop to the west and north west and the existing hill to the east of the site

- Existing hedgerows along the site boundary will be retained and additional planting will increase the level of screening available. Wherever possible, hedgerows within the site itself will be retained.

3.10.5 CONCLUSION

The construction and operation of the proposed lime kiln and ancillary facilities will have a 'slight negative' impact on the receiving environment i.e. 'An impact which causes noticeable changes in the character of the environment without affecting its sensitivities'. This slight negative impact has to be viewed in the context of the surrounding area and in particular the operation of an existing lime stone quarry adjacent to the site.

The lime kiln site is located in an industrial setting due to the existing back drop of quarrying activities. There are existing tall site infrastructure in place at the quarry which set the context for the development of the lime kiln. It is contended that although the visual impact of the lime kiln is slightly negative, the location of this development against the industrial landscape background of the existing quarry works lowers the sensitivity of the landscape and therefore the visual impact. Taking this factor into account, the potential visual impact of the lime kiln is deemed to be slight but acceptable in the proposed context.

3.11 CULTURAL HERITAGE

3.11.1 BASELINE CULTURAL HERITAGE ASSESSMENT

Cultural Heritage, in respect of a project, is assumed to include all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area. The Cultural Heritage of the area was examined through an Archaeological, Architectural and Historical study. The Archaeological and Architectural study involved a documentary search and field inspection of the area, while the Historical study involved a documentary search. A field inspection and archaeological impact assessment was carried out on the limekiln site in June 2004 by Headland Archaeology Ltd. This is included in attachment 7.

The study involves documentary search and on-site field inspection of the area. As part of a documentary search, the following sources were examined from which a list of sites and areas of archaeological potential was compiled:

- The site area and archaeological sites in the vicinity were examined by a qualified archaeologist;
- Register of monuments and places constraint pams and lists in the Archaeological Survey of Ireland
- Sites and monuments record files in the national monuments section (formerly Duchas)
- National Museum of Ireland – Topographical Files.

From the preceding Paper Survey, a list of archaeological sites/sites of archaeological interest was compiled for detailed inspection during the field inspection. The recorded archaeological sites surrounding the proposed site are illustrated in Figure 2 of the attached Archaeological impact assessment (Attachment 7)

(1) History of the Vicinity

The townland of Ballybrody lies in the parish of Dysert. The townland is bordered by Drummeer to the north, Drummina to the north and west, Tonnagh commons to the west and south west, Tonnagh to the south and Caherclanchy to the east. The name of the townland originates from the MacBruaideadha or the MacBrodys. They are remembered as a literary family who became attached to the ruling O'Briain and composed much verse in their favour, and particularly in respect of Donnachadh, the 4th Earl of Thomond. They also assembled in a didactive form the genealogy of many other prominent clans which included the O'Deas, O'Gormans, O'Gradys and O'Quinns. Many of these family bards experienced hard times during the 15th and 16th centuries and were witness to many distressing events. They endured the loss of their patrons and a decline in the schools of poetry, often deprived of their position and the security and dignity that went with it. All these events found expression in their historical poetry and provided insights into the changes in the lives of the people following the trauma of the Plantations. The Mac Bruaideadha home was sited in the Townland of Ballybrody, a few miles from the village of Ruan, in the once extensive Toonagh Estate. No remnants are now to be seen, for this learned family lost all their lands during the 17th century while it is said that their literary possessions were scattered far and wide

(2) Archaeology

No above ground features of archaeological potential were identified at the site. However the proposed development is located within a wider landscape that is rich in archaeological monuments. The density of the recorded archaeological sites in the wider landscape demonstrates continued human activity in the area from early historic times onwards. A number of other archaeological sites within the vicinity of the proposed development as shown in Figure 2 of the attached report and detailed in Table 3.11.1

Table 3.11.1: Archaeological Sites within Study Area			
Name	**Type**	**Location**	**Impact**
CLO25-191	Cashel	Hill-top ca. 05 km from site	None
CLO25-111	Enclosure	west of Site	None
CLO25-121	Enclosure	North east of Site	None
CLO25-124	Earthwork	0.4 km east of site	None
CLO25-119	Enclosure	118 m east of site	None
CLO25-122	Enclosure	1 km east of site	None
CLO25-201	Enclosure	1 km east of site	None
CLO25-198	Enclosure	1 km east of site	None

Neither the walkover survey nor the paper survey of the proposed extraction area indicated the presence of any previously unrecorded archaeological sites.

3.11.2 Environmental Impacts

As outlined in the attached report it is concluded that based on the assessment of the relevant literary and cartographic sources, the proposed development is located within an area of rich archaeological value. However, it is concluded that the proposed development will not impact on any sub-surface archaeological features at the site as the site was previously quarried for lime extraction. Also there is no impacted predicted on any of the identified archaeological sites in the area.

3.11.3 Mitigation Measures

Based on the results of the assessment there are no mitigation measures proposed with regard to this development.

3.12 MATERIAL ASSETS

This section looks at the effect of the development on the worth or the material assets of the locality through the following headings;

(1) The change effected on the urban structure/the change in the value of the property in the area;

(2) Effects to amenity areas and areas of natural beauty.

(3) Architectural and archaeological heritage

The positive effects of the development (i.e. the provision of sustainable employment and provision of air emission abatement product) must be considered in conjunction with the detrimental effects, if any, on the environs.

(1) <u>The change effected on the urban structure/the change in the value of property</u>

The urban/urban structure of a locality may be adversely affected by a development which is either unhealthy or unsuitable, both in its location and/or magnitude i.e. the siting of chemical industry close to a school or a built up area.

The siting of this activity within the townland of Ballybrody, Ennis County Clare is considered to be suitable for the following reasons:

- The development is in character with the activities currently carried out at the site, i.e. the area surrounding the proposed development site is being used for limestone extraction and processing. The existing quarry has submitted an application for registration under Section 261 of the Planning and Development Act 2000. The existing quarry has received planning permission for the installation of a concrete batching plant (Planning no.).

- It is considered that in view of the strategic location of the development site, in terms of its relatively close location to the Moneypoint Power station, this lime kiln proposal is significant in ensuring the supply of quicklime to the power station for the abatement of facilities.

- The proposed development does not require any modifications to the existing telecommunications or electricity supplies to the area.

- The proposed development does not require water as part of the process. Therefore there will be no impact on existing water supplies.

- Access to the site is along a proposed internal haul road through the quarry site. This will exit the site at the existing site entrance which is onto the Regional R476 road. It has been shown in the traffic assessment conducted that the proposed development will not have a significant adverse impact on the local road network. Comparison of the number of proposed traffic movements with the existing road traffic indicate that the development will not have a significant impact on traffic movement.(refer to §3.8: Traffic)

- The proposed development is located within the boundaries of the existing quarry. Therefore there will be no disturbances to existing hedgerows along the edge of the quarry site. In addition to this, a screening berm/embankment will be constructed of existing spoil at the site, along the eastern and southern boundaries of the site within the quarry to reduce the potential impacts of the development (refer to §3.10: Landscape & Visual Impacts). These will be planted with native flora to improve the visual vista.

- There is no agricultural significance to the land on the site area (refer to §3.3.2: Soil & Geology/Soil Description). The temporary change in land usage is not considered a significant impact. It is proposed to clear the area of spoil heaps prior to the introduction of the site infrastructure. Following decommissioning at the end of the life time of the site, the area will be covered with a soil layer and allowed to naturally reseed. This would be an improvement of the quality of the existing site.

- It is unlikely that the proposed development will cause a decrease in adjoining property values as the surrounding area is currently used for the extraction and processing of limestone, the site itself is presently bare rock and spoil heaps and also that the current property market is strong. In addition, the developer's policy of good planning and careful site screening will mitigate any diminution of material assets.

(2) Effects to Amenity Areas and Areas of Natural Beauty

The proposed development site and the immediate surroundings are not designated as a Natural Heritage Area or a proposed candidate Special Area of Conservation (pSAC), nor is it designated under any of the other nature conservation or landscape designations currently used in Ireland.

In summary, it is contended that the material asset values will not be significantly affected by the proposed development as the environmental impacts (air, noise and water pollution, traffic impacts) of the proposed activity are shown to be minimal. In addition, any impacts are temporary and the area will be restored to its natural state after quicklime production has ceased.

(3) Architectural and archaeological heritage

There were no architectural sites identified on the site. The archaeological heritage of the area was assessment with the Cultural Heritage §3.11. The construction of the proposed development will not impact on any sub-surface archaeological material or features as the site was previously quarried for lime extraction. Therefore, the potential to identify any sub-surface features and material of archaeological significance no longer exists. Neither will there be a predicted impact on any of the eight previously recorded archaeological sites within the surrounding landscape.

3.13 INTERACTIONS OF THE FOREGOING

All environmental factors are inter-related to some extent. As defined in the Environmental Protection Agency 'Guidelines on the Information to be Contained in Environmental Impact Statements', a cumulative effect is defined as '*.the addition of many small impacts to create one larger, more significant impact*'. A synergistic impact occurs where *'the resultant impact is of greater significance than the sum of its constituents*'. Cumulative and synergistic effects are, therefore, those which result from the incremental effect of an action when added to other past, present, and reasonably foreseeable actions. The European Communities Environmental Impact Assessment (Amendment) Regulations, 1998, demand that an EIS describes the impacts and likely significant effects on the interaction between any of the following principal elements of the environment media.

- human beings
- flora
- fauna
- soil
- water
- air
- climate
- the landscape

Tables 2.1.1 and 2.1.2 on page 9 highlight the impacts and effects on interactions between these media and identifies the sections of the EIS where the interactions are addressed.

3.13.1 HUMAN BEINGS: AIR/TRAFFIC/LANDSCAPE

Dust emissions, noise emissions and process emissions from the proposed development site have the *potential* to impact on human beings in the vicinity of the site. Impacts from stack emissions have the potential of being the most significant impact of the proposed development. The potential impact and mitigation measures to prevent the aforementioned impacts are given in § 3.6: Air.

The proposed development will be constructed and shall operate in accordance with the BATNEEC principle, thus reducing any *potential* impacts.

Minor inconvenience with regard to traffic constraints may be encountered during the construction of the site and improvements on the roadway. However these impacts will only be experienced over a short period of time.

The visual impact of the facility has the potential to affect human beings. This is examined in the context of the existing landscape. Additionally mitigation proposals are outlined in § 3.10: Landscape & Visual Impacts. It is considered that restoration of the site will ameliorate this and any future impacts.

3.13.2 Flora & Fauna: Soil & Geology/Air

Minor impacts will be encountered by the flora and fauna due to the temporary loss of habitat within the proposed lime kiln location. This habitat however, is not considered ecologically significant (refer to §3.2: Flora & Fauna). In addition, screening embankments developed on the site will enhance the flora and faunal biodiversity of the area by creating a new niche to the area.

The migration of dust emissions can have negative impacts on vegetation surrounding the site, however this impact is localised and the vegetation impacted on, is again of low ecological value. Mitigation measures proposed for the amelioration of this impact are outlined in § 3.6: Air.

The design, construction and operation of the proposed lime kiln development are in line with best practice, with the lime kiln itself being best available technology. Adherence to the operational guidelines and the mitigation measures outlined will ensure that significant inputs to and subsequent contamination of environmental media do not occur during normal and/or emergency conditions.

It is concluded that the environmental impact of the project is not significant and the overall impact of the project is beneficial in significantly contributing to the national strategic plan of SO_2 emission reduction.