Attachment I

Existing Environment & Impact of the Facility

I.1 Assessment of Atmospheric Emissions

I.1.1 Introduction

This section of the report deals with the issue of air quality. It will assess the level of airborne dust and particulate matter associated with the recovery facility at Foxtown.

I.1.2 Receiving Environment

The principle concern in respect of potential airborne dust emissions from the proposed development is the effect on residential amenity. Properties within the vicinity of the development are shown on Figures B.1.1 to B.2.3.

The materials to be recovered are principally "soils and stone" and inert construction and demolition waste. Any dust generated by the operation will comprise inert particulate matter. There is no evidence to suggest that dust of respirable sizes (i.e. less than 10 micrometres in diameter) could be present in concentrations to cause effects on human health.

Experience of reclamation workings indicates that mechanical activity is the most significant factor in material erosion and dust generation. Dust emanates from the placement of materials, the movement of vehicles on internal roads and unloading operations. However the effect of wind is also an important factor in dust generation and problems may arise at reclamation workings when both factors arise simultaneously.

The impact of fugitive dust will be direct, temporary and non-cumulative and largely confined to the application site.

I.1.3 Ambient Air Quality

The relatively high rainfall of the area, and experience of similar environments elsewhere in Ireland, suggests that baseline dust levels of approximately 40 mg/m^2/day to 60 mg/m^2/day would be expected for an open pastoral landscape during drier periods of the year (May to September).

In accordance with condition No. 9 of planning permission P.A. Reg. Ref. QY 48 (QC. 17.QC 2113) "total *dust deposition (soluble and insoluble) from the site operations associated with the development shall not exceed 350mg/sq.m/day, averaged over a continuous period of 30 days.*".

I.1.4 Assessment of Impacts

I.1.4.1 Direct Impacts

Fugitive dust emissions are generated wherever there is movement of dust relative to the air. The emission of fugitive dust from inert soils and stone backfilling site activities is very dependent on weather conditions. Where nuisance complaints from activities arise, they are generally as a result of a combination of specific site activities and particular weather conditions (e.g. dry, windy).

Within the application area, the following site activities may give rise to potential fugitive dust emissions:

- Internal movement of vehicles (A2-1)
- Tipping and levelling of placed materials (A2-2)
- Loading and Unloading of Vehicles (A2-2, A2-3)
- Processing Area (A2-3)

They are generally dispersed sources rather than specific point sources, and this dictates the measures required to mitigate potential dust related impacts.

The impact of fugitive dust will be direct, temporary and non-cumulative and largely confined to the application site.

The following flow diagram shows the sources of fugitive dust emissions arising on site and the methods of treatment/ abatement employed.

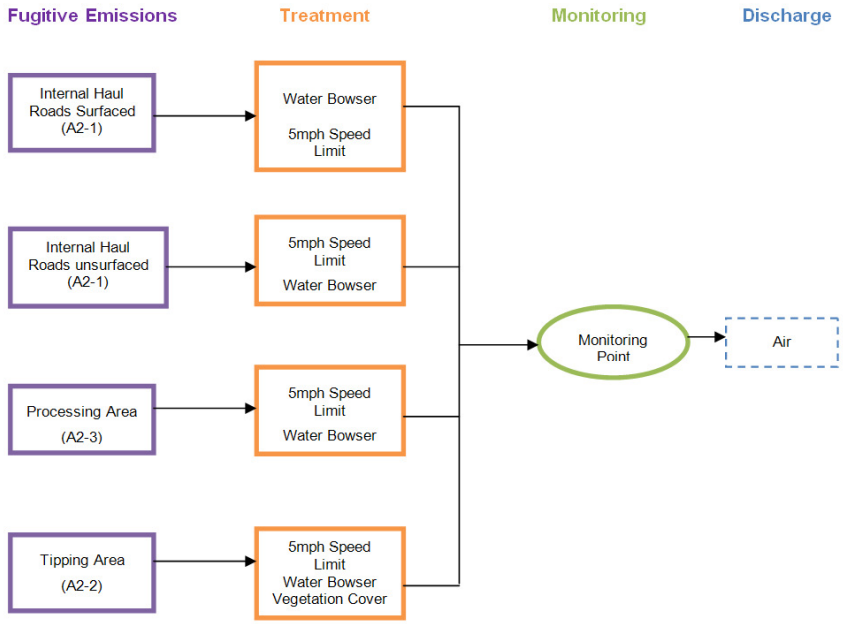


Figure I.1: Operational Activities

I.1.4.2 Indirect Impacts

Apart from the direct impact of the deposition of particulate material, there may be an associated visual impact with fugitive dust generation.

I.1.4.3 Interaction with other Impacts

There are no interactions with other impacts associated with air quality issues.

I.1.5 Abatement

A number of measures have been adopted to minimise dust emissions to the atmosphere from general site activity, internal haulage and tipping operations as follows:

- During dry weather the haul roads and stockpiles are sprayed with water to dampen any likely dust blows. A water bowser is maintained on site for this purpose.
- Consideration will be given to location of mobile plant so as to ensure that any principle dust sources cannot adversely affect sensitive off-site locations.
- Static and mobile wet dust suppression systems will be located at strategic points in the process if required.
- Drop heights are kept to a minimum by using short conveyors and maintaining stocks under the head drum load out points.
- A wheel wash facility has been installed on site and all vehicles are required to pass through the wheel wash on exiting the site.
- Main site haulage routes within the site shall be maintained with a good temporary surface.
- All internal roadways will be adequately drained, to prevent ponding.
- The operator has purchased a road sweeper and ensures that the site entrance and adjoining public roadway is regularly cleaned. The sweeper is readily available at short notice to sweep up any materials which may accidentally fall onto the public roadway.
- Suitable vegetation is to be provided on restored areas at the earliest opportunity.

It is considered given the nature of the activity, control and abatement measures and management of the existing recovery facility that emissions of pollutants (as defined in Waste Management Acts 1996 to 2003 and Air Pollution Acts 1992 and 1987 respectively) to the atmosphere are not likely to impair the environment (i.e. be injurious to public health, or have a deleterious effect on flora or fauna or damage property, or impair or interfere with amenities or with the environment).

I.1.6 Monitoring

In accordance with condition No. 9 of planning permission P.A. Reg. Ref. QY 48 (QC. 17.QC 2113) "total *dust deposition (soluble and insoluble) from the site operations associated with the development shall not exceed 350mg/sq.m/day, averaged over a continuous period of 30 days*.".

In order to comply with this condition the operator has set up a dust monitoring programme using Bergerhoff Dust Gauges. Two dust monitoring stations (A2-4, A2-5) were established at the site boundary (Refer to Environmental Monitoring Plan Figure F 1). It is proposed to commence dust monitoring during the summer months.

Dust fall is measured using the Bergerhoff method as set out in German Standard VDI 2119. The normal recommended standard for dust emissions for this type of development is that "dust deposition shall not exceed 350 mg/m^2/day measured at the site boundaries and averaged over 30 days". This limit refers to total dust (using DIN method).

The above standard is also in accordance with guidance issued by both the Department of the Environment and the EPA in relation to dust deposition monitoring for these types of developments and will continue to be applied.

This programme will allow on-going monitoring of fugitive dust emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

I.2 Assessment of Impact on Receiving Surface Water

As the only material to be imported to site is "Soil and stone" and inert construction and demolition waste there will be no source of possible contamination of surface waters.

The nearest watercourse to the application site is the Boycetown River which is approximately 750m from the boundary of the site.

There are no surface water courses adjoining the site. Surface water-off within the site percolates to ground through the floor of the sand and gravel pit into the underlying limestone bedrock. There is no discharge of surface water run-off from the site. It is not considered necessary to monitor surface water in the area

Table I.1(i) Ambient SURFACE WATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: **NOT APPLICABLE**

Parameter	Results (mg/l)				Sampling method[2] (grab, drift etc.)	Normal Analytical Range[2]	Analysis method / technique
	Date	Date					
pH							
Electrical conductivity EC							
Ammoniacal nitrogen NH_4-N							
Chemical oxygen demand							
Biochemical oxygen demand							
Dissolved oxygen DO							
Calcium Ca							
Cadmium Cd							
Chromium Cr							
Chloride Cl							
Copper Cu							
Iron Fe							
Lead Pb							
Magnesium Mg							
Manganese Mn							
Mercury Hg							

Surface Water Quality (Sheet 2 of 2) **NOT APPLICABLE**

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Nickel Ni							
Potassium K							
Sodium Na							
Sulphate SO_4							
Zinc Zn							
Total alkalinity (as $CaCO_3$)							
Total organic carbon TOC							
Total oxidised nitrogen TON							
Nitrite NO_2							
Nitrate NO_3							
Faecal coliforms (/100mls)							
Total coliforms (/100mls)							
Phosphate PO_4							

I.3 Assessment of Impact of Sewage Discharge.

There is no discharge from the site to any sewer system in the area. The site is serviced by an existing toilet facility, septic tank and percolation area.

I.4 Assessment of impact of ground/groundwater emissions

I.4.1 Geological Setting

I.4.1.1 Soils & Subsoils

The South Eastern River Basin District (RBD) Teagasc Subsoils Mapping for the area shows the Foxtown area to be underlain by Glaciofluvial Sands and Gravels and Esker sands and Gravels (Refer to Figure I.4.1). An extensive moronic ridge (Galtrim), much of which was removed as a result of quarrying, originally dominated the topography of the surrounding townlands of Foxtown, Mitchelstown, Ballynamona and Basketstown townlands.

I.4.1.2 Bedrock Geology

The publication 'Geology of Meath Geological Survey of Ireland, 1994) is accompanied by a 1:100,000 scale map 13 which indicates that the lands under consideration are underlain by the Lucan Formation (DUIL Dinantian Upper Impure Limestones - Refer to Figure I.4.2).

The Lucan Formation is the most westerly and the most extensive of the Fingal Group. The Limestone consists in lower part of graded calciturbidites, which are commonly conglomeratic, and interbedded shales.

The site is underlain by dark grey, well bedded, cherty, grade limestones and calcareous shales of the Lucan Formation. The overlying fluvial deposits of sand and gravel have largely been worked out.

I.4.2 Hydrogeological Setting

I.4.2.1 Aquifer Classification

The aquifer classification for the bedrock in the area is classified as a locally important aquifer (LM) - Bedrock which is generally unproductive except for local zones (Refer to Figure I.4.3). As stated above the site is underlain by dark grey, well bedded, cherty, grade limestones and calcareous shales of the Lucan Formation. The overlying fluvial deposits of sand and gravel have largely been worked out. Bedrock is known to outcrop on the pit floor.

I.4.2.2 Expected Groundwater Flow Direction

The groundwater flows in a north to north-easterly direction towards the Boycetown River which is c. 750m distant.

I.4.2.3 Groundwater Abstractions

A well search on the online GSI well database indicated results for 2 wells within about 250m of the site (Refer to Figure I.4.4). i.e.

Well c. 250 m to North of site

GSI Code:	2625SEW038
Well Type:	Borehole
Depth (meters):	61
Depth to Rock Confidence:	Bedrock Met
Drill Date:	30-Dec-1899
Easting:	285580
Northing:	252870
Locational Accuracy (meters):	to 20m
Townland:	WINDTOWN
County:	Meath
Six Inch Sheet No.:	37
Well Use:	Industrial use
General Comments:	Well located behind washing plant
Buffer (meters):	0
DPTH_RCK_M:	4.6

Existing Well on site (GW1)

GSI Code:	2625SEW038
Well Type:	Borehole
Depth (meters):	61
Depth to Rock Confidence:	Bedrock Met
Drill Date:	30-Dec-1899
Easting:	285580
Northing:	252870
Locational Accuracy (meters):	to 20m
Townland:	WINDTOWN
County:	Meath
Six Inch Sheet No.:	37
Well Use:	Industrial use
General Comments:	Well located behind washing plant
Buffer (meters):	0
DPTH_RCK_M:	4.6

There are three wells within the site at Foxtown. The locations of these wells are shown on the attached Environmental Monitoring Plan Figure F 1.0.

Well No	Comments	NGR	Ground Water Levels m AOD
			February 2008
GW1	Well House Supply for quarry processing plant	E285603 N252921	72.8
GW2	Supply for Wheelwash, Dug Well	E285379 N253198	67.7
GW3	Supply for Readymix Plant (Not in use)	E285674 N252942	69

Groundwater Quality analysis for GW1 was conducted in January 2009 by Euro Environmental Services Drogheda. Results are provided in Attachment I.4.2.3.1.

It is proposed to monitor these three available wells in accordance with the conditions as attached to the waste licence for the facility. Refer also to Table F5 with respect to suite of parameters and monitoring frequency.

No source protection areas where identified within c. 2km of the site (Refer to Figure I.4.4). Therefore the site is not subject to the restrictions or requirements of a groundwater source protection zone.

Attachment I.4.2.3.1.

Groundwater Quality analysis conducted in January 2009

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email info@euroenv.ie

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

Customer	John Sheils JSPE 3 Athlumney Castle Navan County Meath	*Lab Report Ref. No.*	4001/001/01
		Date of Receipt	29/01/2009
		Date Testing Commenced	29/01/2009
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		*Date of Report*	05/02/2009
Customer Ref	GW1 29/01/09	*Sample Type*	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Alkalinity (Total)	102	Colorimetry	311.66	mg/L CaCO3	UKAS
Ammonia	114	Colorimetry	<0.06	mg/L as N	
Arsenic	177	ICPMS	<0.96	ug/L	
Barium	177	ICPMS	49.1	ug/L	
Boron	177	ICPMS	24.7	ug/L	
Cadmium	177	ICPMS	<0.09	ug/L	
Calcium	184	ICPMS	139.50	mg/L	
Chloride	100	Colorimetry	52.41	mg/L	UKAS
Chromium	177	ICPMS	1.2	ug/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	32	no/ 100ml	
Conductivity	112	Electrometry	834.0	uscm -1@25C	UKAS
Copper	177	ICPMS	0.5	ug/L	
Cyanide	145	Colorimetry	<5	ug/L	
Dissolved Oxygen (mg/l)	715	DO Meter	7.3	mg/L	
Fluoride	115	Colorimetry	0.17	mg/L	
Iron (Total)	177	ICPMS	60.5	ug/L	
Lead	177	ICPMS	<0.38	ug/L	
Magnesium	184	ICPMS	14.91	mg/L	UKAS
Manganese	177	ICPMS	2.3	ug/L	
Mercury	178	ICPMS	<0.2	ug/L	
Nickel	177	ICPMS	0.6	ug/L	
Nitrate	103	Colorimetry	7.34	mg/L as N	
Nitrite	118	Colorimetry	<0.003	mg/L as N	
Nitrogen (Total Oxidised)	151	Colorimetry	7.34	mg/L as N	UKAS

Signed : Donna Heslin

Date : 05/02/09

Donna Heslin - Laboratory Manager

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of EURO environmental services
Results contained in this report relate only to the samples tested

EURO
environmental
services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email info@euroenv.ie

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

Customer	John Sheils JSPE 3 Athlumney Castle Navan County Meath	*Lab Report Ref. No.*	4001/001/01
		Date of Receipt	29/01/2009
		Date Testing Commenced	29/01/2009
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		*Date of Report*	05/02/2009
Customer Ref	GW1 29/01/09	*Sample Type*	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
pH	110	Electrometry	7.1	pH Units	UKAS
Phosphate (Total)	166	Digestion/ Colorimetry	0.037	mg/L as P	UKAS
Potassium	184	ICPMS	0.98	mg/L	UKAS
Selenium	177	ICPMS	4.2	ug/L	
Silver	177	ICPMS	<0.33	ug/L	
Sodium	184	ICPMS	25.44	mg/L	UKAS
Sulphate	119	Colorimetry	22.37	mg/L as SO4	UKAS
Temperature	715	DO Meter	Ambient	degrees C	
Total Organic Carbon	316	TOC analyser (NPOC)	1.09	mg/L	
Zinc	177	ICPMS	<4.6	ug/L	

Signed : Donna Heslin ***Date :*** 05/02/09

Donna Heslin - Laboratory Manager

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of EURO environmental services
Results contained in this report relate only to the samples tested

I.4.2.4 Groundwater Vulnerability

Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities.

The entire land surface is divided into four vulnerability categories - extreme **(E)**, high **(H)**, moderate **(M)** and low **(L)** - based on the geological and hydrogeological factors described above. This subdivision is shown on a groundwater vulnerability map. The map shows the vulnerability of the first groundwater encountered (in either sand/gravel aquifers or in bedrock) to contaminants released at depths of 1-2 m below the ground surface.

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Table 1. Vulnerability Mapping Guidelines

The Eastern Interim Vulnerability mapping for the area (Refer to Figure I.4.5) indicates that the area where locally important aquifer (LM) is located is classified with a rating of High (H).

I.4.3 Assessment of Impacts & Mitigation

I.4.3.1 Soils & Geology

All soils on site have been stripped due to sand and gravel extraction in the past.

The lands are to be restored to Forestry by importation and recovery of inert materials in accordance with a phased restoration scheme.

It is proposed to reclaim the lands to a condition / gradient suitable for forestry. Good quality imported soil will be conserved wherever possible to provide the subsoil/top-soil capping. These topsoil's/subsoil's will be handled under dry conditions to minimise

compaction. For the purpose of restoration to agricultural/forestry the restored soil profile (capping) shall comprise 300mm topsoil over 1200-1350mm of subsoil.

The applicant is an experienced earthmoving contractor. Soils will be handled in accordance with accepted guidelines and good practice.

Good quality soil material for final capping will be placed in temporary storage areas. Topsoil and subsoil will be stockpiled separately to maintain the integrity of the soil.

To ensure that damage to these materials is kept to a minimum, movement and placement of topsoil and subsoil for final restoration will only take place during appropriate weather conditions and when the soils are in the optimum condition. This optimum soil condition may be described as moist but friable. No soils will be moved when they are too dry or when there are unusually windy weather conditions. This will help to prevent erosion and any consequential creation of dust. Conversely, soils will not be handled in wet conditions or when the moisture content of the soils is too high. This will ensure that smearing of the soils does not take place and that the soil retains its structure.

Progressive restoration involving grass seeding of restored area's will be carried out on a staged basis to reduce the effects of soil erosion, windblown dust, to aid ground stabilisation and as an effective means of weed control.

In general the overall amount of inert construction and demolition waste within on-site is very small and the material has been well emplaced and well separated and sorted. In an overall sense, the amount of construction and demolition material is estimated at less than 5%. Providing storage and restoration of the soil are carried out in an appropriate manner, the restoration of the site should replenish quality of the land for forestry/agricultural purposes.

The final land restoration scheme will ultimately allow the site to be returned to a condition whereby there will be negligible residual impact on the surrounding environment due to the backfilling of the site. It is planned to minimise, eliminate or decrease long-term ecological and visual impacts on the environment through the implementation of the final restoration scheme.

I.4.3.2 Groundwater

As stated above the vulnerability rating within the site is high given the nature of the sand and gravel deposits (which have largely been removed) directly overlying bedrock. As the only material to be imported to site is "Soil and stone" and inert construction and demolition waste there will be no source of possible contamination of groundwater waters.

The natural drainage pattern existing on site (quarry area) means that rain water falling on the site percolates through the existing soil strata (sand and gravel) to the underlying Limestone bedrock.

The wash-water from the existing wheel-wash is recycled within self contained holding tank settlement tanks.

The applicants propose to use the existing toilet facility within the sand and gravel pit. The location of the toilet, septic tank and percolation area is shown on the attached Figure D.1.1 near the southern entrance to the sand and gravel pit. This facility is adequate to meet the continued requirements of the existing development given that the facility will be operated by the existing staff of two to three.

Our client is proposing to replace the existing bunded fuel storage tank on site with a mobile double skinned (integrated bunding) fuel bowser to refuel mobile plant on site. The bowser will be provided with a Spill tray and spill kit.

Oil and Waste oil products are stored under cover. All oil barrels and lubricants will be stored on spill pallets/ spill trays. Waste oils are disposed of by a licensed waste contractor and removed off site. Spill kits will also be maintained on site and the Company will put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation. The wash-water is recycled through a system of containment tanks. The tanks will be periodically cleaned and the silt will be used within the restoration of the site.

The site has a designated area for the quarantine of any inappropriate materials which may be found within loads accepted at the site. Skips have been provided within the designated quarantine area for the temporary storage of any inappropriate materials discovered (e.g. glass, plastic, timber, steel, etc). The materials are routinely removed by a licensed waste disposal contractor to an appropriate disposal facility.

A groundwater monitoring programme will also be put in place to ensure that there is no impact on water quality as a result of the recovery operations (Refer to Table I.4.(i) below.

It is envisaged that the inert materials used for the restoration of the site will not cause a pollution risk to the ground/groundwater in the area of the site.

Table I.4(i) GROUNDWATER QUALITY

(Sheet 1 of 2) Monitoring Point/ Grid Reference: **GW1, GW2, GW3** (Refer to Attachment I.4.2.3.1. for Groundwater Quality Analysis)

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
pH							
Temperature							
Electrical conductivity EC							
Ammoniacal nitrogen NH_4-N							
Dissolved oxygen DO							
Residue on evaporation (180°C)							
Calcium Ca							
Cadmium Cd							
Chromium Cr							
Chloride Cl							
Copper Cu							
Cyanide Cn, total							
Iron Fe							
Lead Pb							
Magnesium Mg							
Manganese Mn							
Mercury Hg							
Nickel Ni							
Potassium K							
Sodium Na							

GROUNDWATER QUALITY (SHEET 2 OF 2) (REFER TO ATTACHMENT I.4.2.3.1. FOR GROUNDWATER QUALITY ANALYSIS)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Phosphate PO_4							
Sulphate SO_4							
Zinc Zn							
Total alkalinity (as $CaCO_3$)							
Total organic carbon TOC							
Total oxidised nitrogen TON							
Arsenic As							
Barium Ba							
Boron B							
Fluoride F							
Phenol							
Phosphorus P							
Selenium Se							
Silver Ag							
Nitrite NO_2							
Nitrate NO_3							
Faecal coliforms (/100mls)							
Total coliforms (/100mls)							
Water level (m OD)							

Attachment I.4. Figures

Figure I.4.1 **Teagasc Subsoils Mapping**

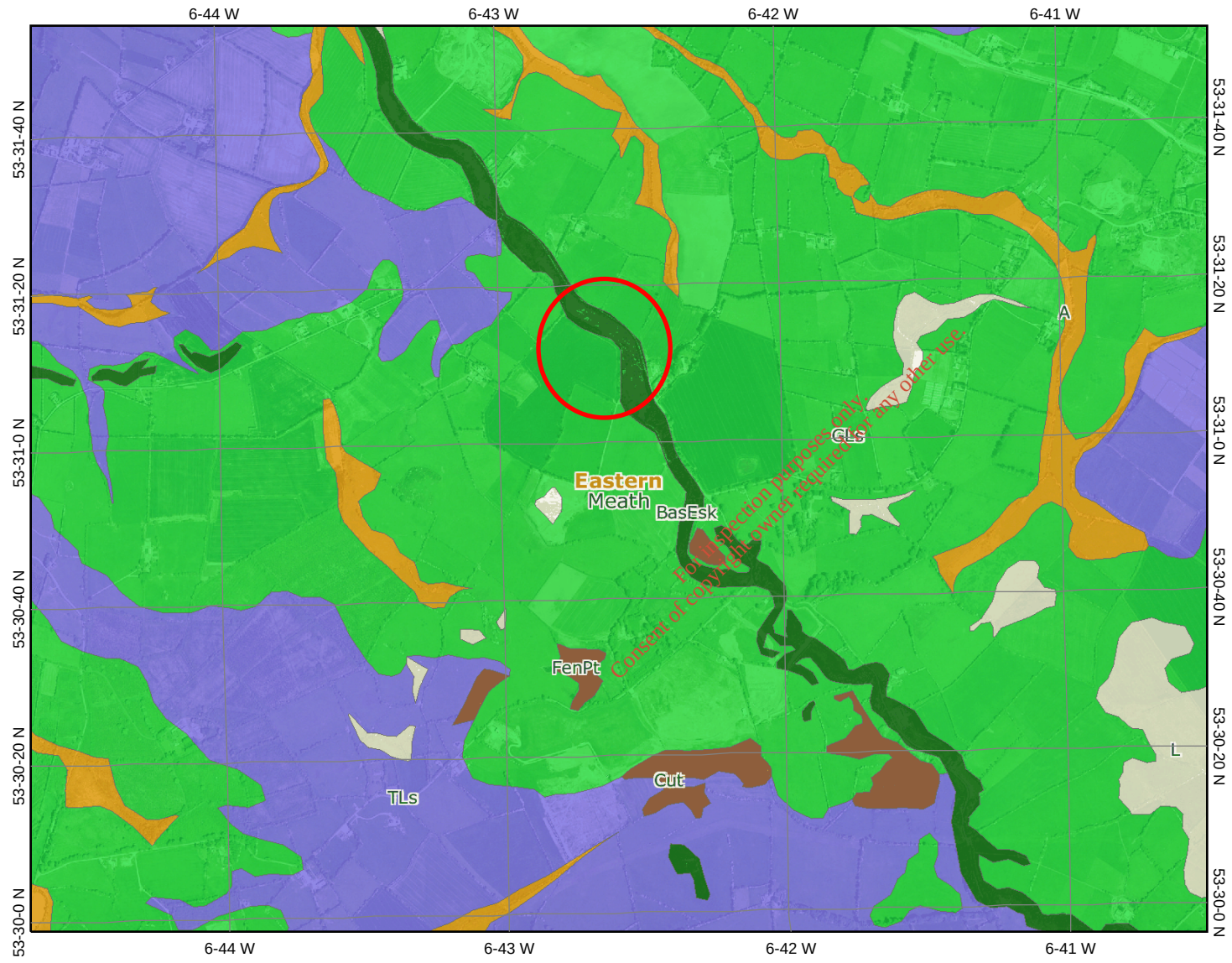
Figure I.4.2 **Bedrock Geology Map**

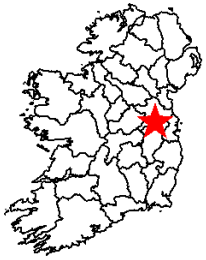
Figure I.4.3 **Aquifer Map**

Figure I.4.4 **Groundwater Well Data/Source Protection Areas -**

Figure I.4.5 **The Eastern Interim Vulnerability Mapping**

Teagasc Soils Mapping - Figure I.4.1





Legend

Eastern RBD Subsoils

- Alluvium
- Beach sands and gravels
- Bedrock outcrop and subcrop
- Esker sands and gravels
- Glaciofluvial sands and gravels
- Irish Sea till
- Lake sediments
- Made ground
- Marine/estuarine silts and clays
- Marsh
- Peat
- Scree
- Till derived chiefly from Cambrian sandstones and shales
- Till derived chiefly from Devonian sandstones
- Till derived chiefly from Lower Palaeozoic rocks
- Till derived chiefly from Namurian rocks
- Till derived chiefly from basic igneous rocks
- Till derived chiefly from cherts
- Till derived chiefly from granite
- Till derived chiefly from limestone
- Till derived chiefly from metamorphic rocks
- Water
- Windblown sands
- RBD Boundaries
- County Boundaries

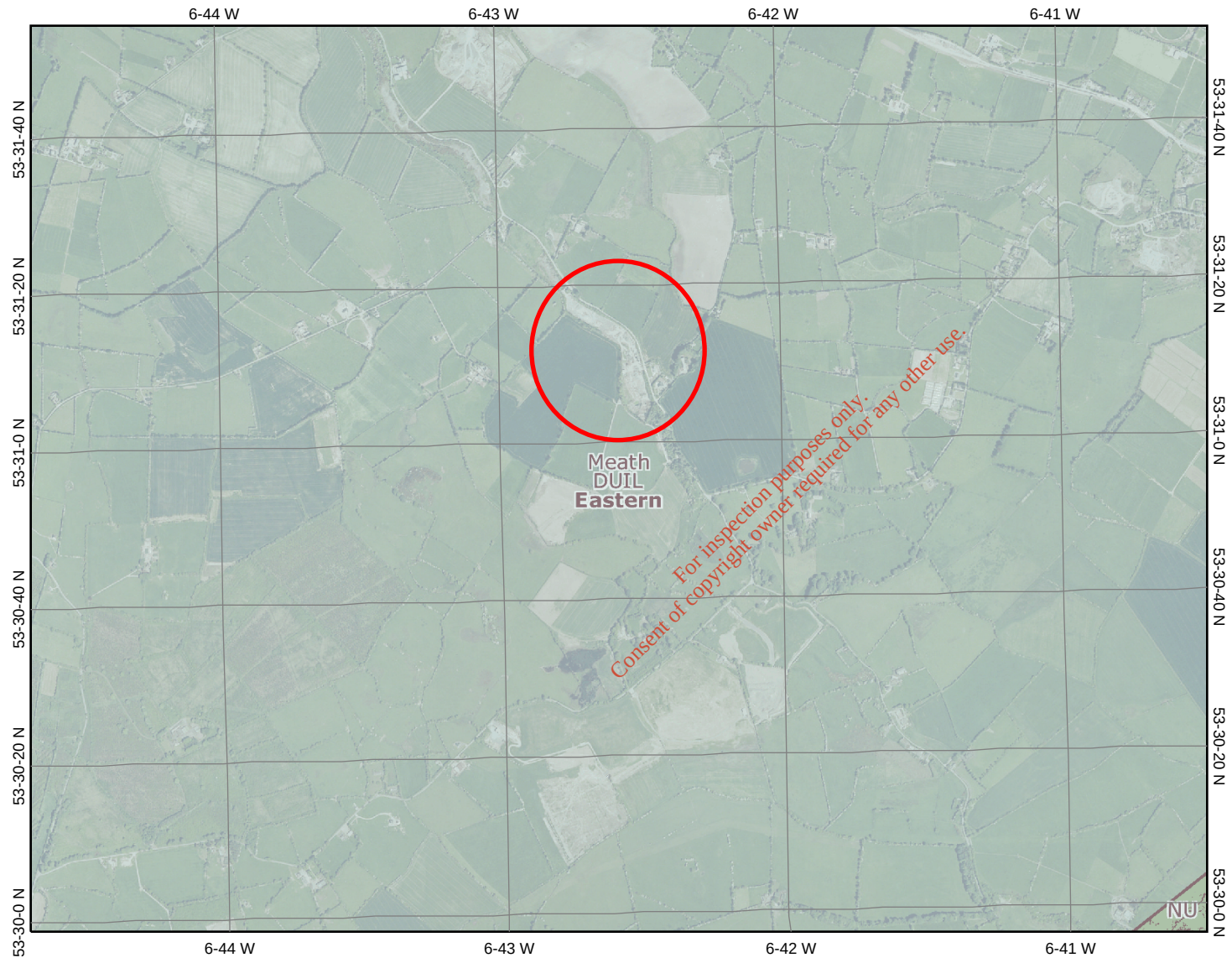
Scale: 1:25,000

Map center: 285582, 252486

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

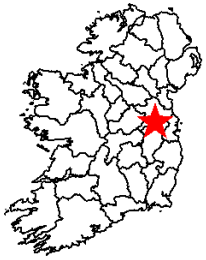
Snapshot Date: 11-Feb-2009

Bedrock Geology Map - Figure I.4.2



0 650 1300 1950 m.

Map center: 285582, 252486



Legend

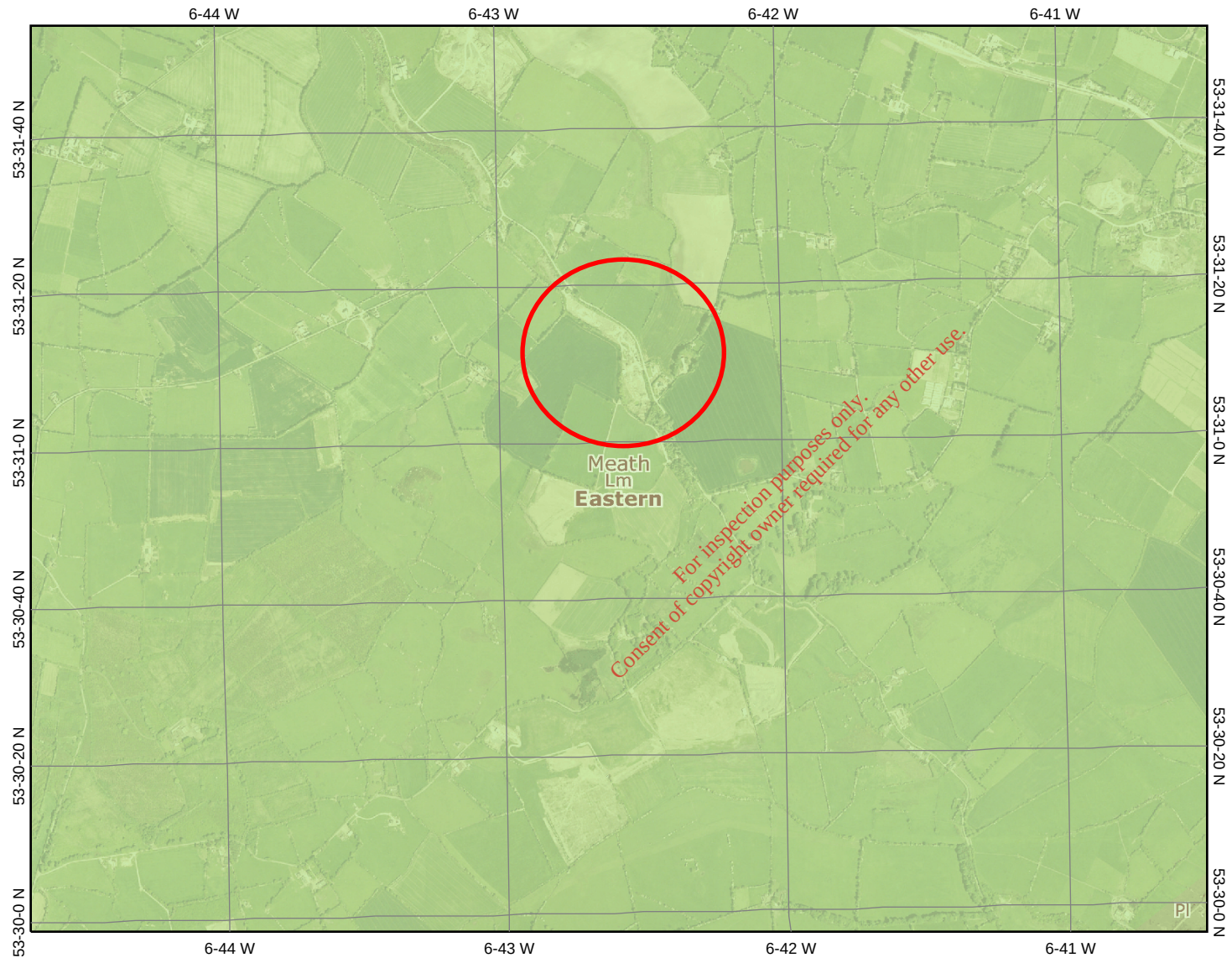
- Bedrock Faults 100k
- National Draft Generalised Bedrock Map
- BV - Basalts and other Volcanic rocks
- CM - Cambrian Metasediments
- DDL - Dinantian Dolomitised Limestones
- DESSL - Dinantian early Sandstones, Shales and Limestones
- DKS - Devonian Kiltorcan type Sandstones
- DLIL - Dinantian Lower Impure Limestones
- DMSC - Dinantian Mudstones and Sandstones Cork Group
- MSSL - Dinantian Mixed Sandstones, Shales and Limestones
- DORS - Devonian Old Red Sandstones
- DPBL - Dinantian Pure Bedded Limestones
- DPUL - Dinantian Pure Unbedded Limestones
- DS - Dinantian Sandstones
- DSL - Dinantian Shales and Limestones
- DUIL - Dinantian Upper Impure Limestones
- GII - Granites and other Igneous Intrusive rocks
- NSA - Namurian Sandstones
- NSH - Namurian Shales
- NU - Namurian Undifferentiated
- OM - Ordovician Metasediments
- OV - Ordovician Volcanics
- PM - Precambrian Marbles
- PQGS - Precambrian Quartzites, Gneisses and Schists
- PTMG - Permo Triassic Mudstones and Gypsum
- PTS - Permo Triassic Sandstones

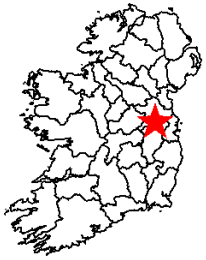
Scale: 1:25,000

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Snapshot Date: 11-Feb-2009

Aquifer map - Figure I.4.3





Legend

National Draft Bedrock Aquifer Map

- Rf - Regionally Important Aquifer - Fissured bedrock
- Rk - Regionally Important Aquifer - Karstified
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Unclassified
- RBD Boundaries
- County Boundaries

0 650 1300 1950 m.

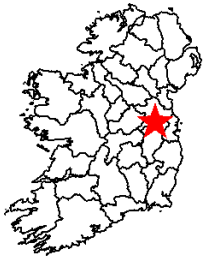
Scale: 1:25,000

Map center: 285582, 252486

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Snapshot Date: 11-Feb-2009

Groundwater Well Data/Source Protection Areas - Figure I.4.4



Legend

- Wells Accuracy within 10m to 50m
- RBD Boundaries
- County Boundaries

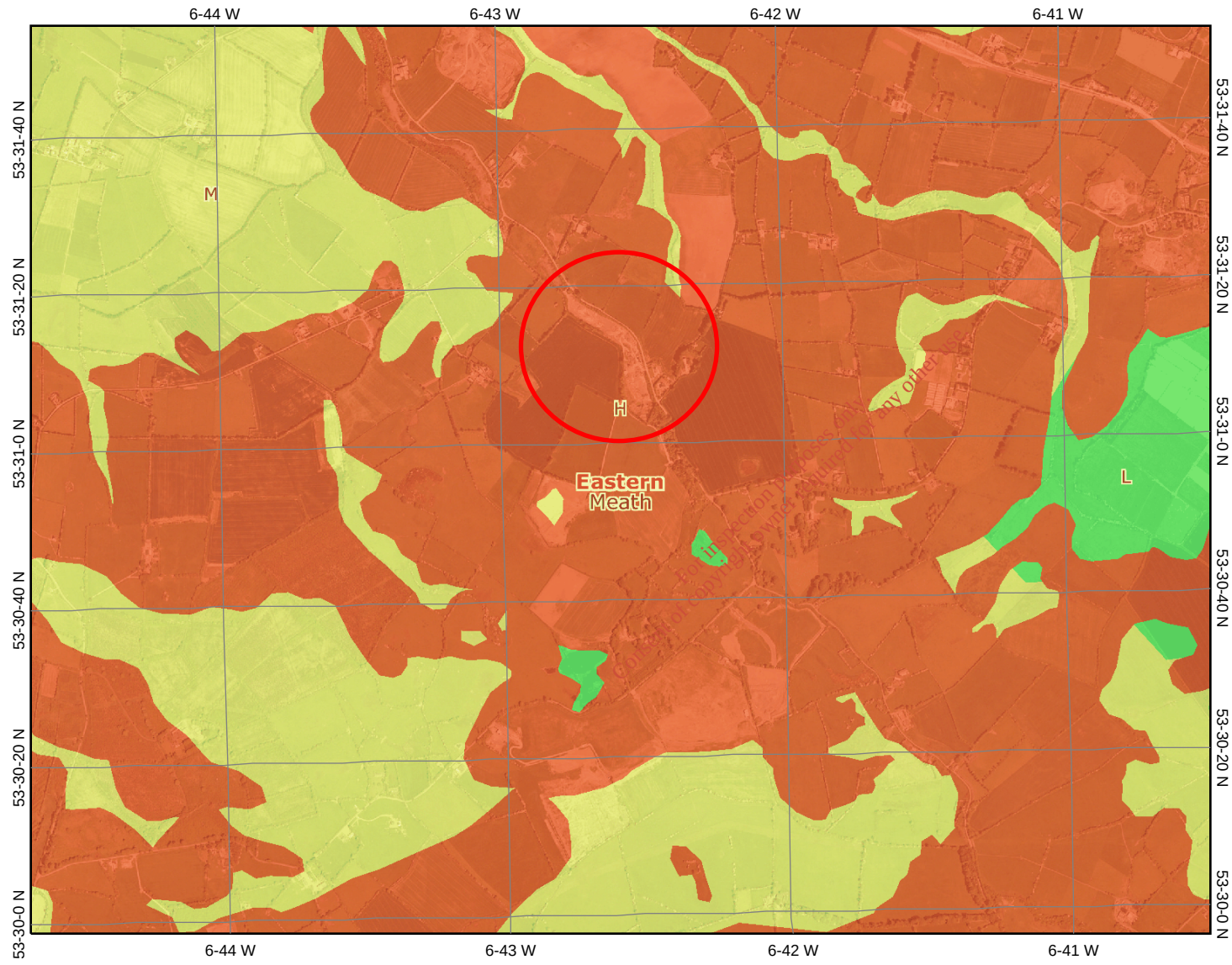
Scale: 1:25,000

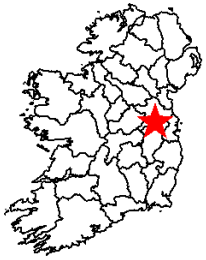
Map center: 285582, 252486

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Snapshot Date: 11-Feb-2009

The Eastern Interim Vulnerability Mapping - Figure I.4.5





Legend

Eastern Interim Vulnerability

- E (Rock near Surface or Karst)
- E - Extreme
- H - High
- M - Moderate
- L - Low
- HL - High to Low. Only an interim study took place.
- Water
- RBD Boundaries
- County Boundaries

Scale: 1:25,000

Map center: 285582, 252486

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Snapshot Date: 11-Feb-2009

I.5 Ground and/or groundwater contamination

I.5.1 Ground Contamination

It is envisaged that the inert materials used for the restoration of the site will not cause a pollution risk to the ground/groundwater in the area of the site.

J Sheils Planning & Environmental Ltd carried out a ground investigation study of the lands currently under restoration. This report provides a description of the geological character of the already-infilled subsoils on the site. Trial pits and a visual assessment of the site were completed in the field (Refer to Attachment I.5 – Trial Pit Logs). Trial pit locations are highlighted in the Attached Figure I 5.1 - Soil Investigation Plan.

The overlying sand and gravel deposits have largely been extracted from within the area comprising the application area for the waste management licence down to a depth of c.1 m above the water table. Bedrock was known to outcrop on the pit floor but is now largely obscured by the backfilling operations. Backfilling of the pit subject to the existing waste management permit has been taking place since 2007. The pit floor has been filled to a depth of c, 2m above the water table in Phase 1 (Refer to Figure B.2.1). The backfill material is reasonably consistent comprising clean Brown Silts / Clays with gravels that have mostly originated from Dublin. Inert construction and demolition waste only accounts for <5% of the fill material.

Attachment I.5.1.1

TRIAL PIT LOGS

TP 1	Description	
0 – 4m	Firm Brown Silts / Clays with gravels Water rapid seepage @ 2.5m B.G.L. Minor Timber, Plastic, Steel concrete blocks <5% (1 to 2%),	
TP 2	**Description**	
0 – 3m	Gravels & Silts with clays Water seepage @ 2.5m B.G.L. Minor Timber, Plastic, Steel concrete blocks <5% (1 to 2%),	

TP 3	Description	
0 – 2m	Firm Brown Silts / Clays with gravels Water rapid seepage @ 2.5m B.G.L. Minor Timber, Plastic, Steel concrete blocks <5% (2%)	
2 – 3.5m	Firm Brown Silts / Clays with gravels Minor Timber, Plastic, Steel concrete blocks <5% (2%),	

TP 4	Description	
0 – 3.3m	Mottled brown/black tills with gravel &cobbles occasional red bricks...	
3.3 – 4m	Brown indigenous Silts with gravels and cobbles Water Seepage	

I.5.2 Groundwater Contamination

Risks to groundwater on site relate primarily to the use of hydrocarbon liquids.

With respect to the existing waste permitted area the following measures are in place/proposed:

- A mobile double skinned (integrated bunding) fuel bowser will be used to refuel mobile plant on site.
- Re-fuelling and maintenance of mobile plant will take place with due care and diligence to avoid spillages.
- Waste oil products are stored within the existing container on site. Waste oils are disposed of by a licensed waste contractor and removed off site.
- All oil barrels and lubricants are stored on spill pallets/ spill trays. .
- The operator will put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation.
- A groundwater monitoring programme will also be put in place to ensure that there is no impact on water quality as a result of the recovery operations (Refer to Table I.4.(i) above.

I.6 Noise Impact.

I.6.1 Introduction

This section of the report deals with the issue of noise. It will assess the levels of noise associated with the existing recovery facility at Foxtown.

I.6.2 Methodology

The noise assessment was undertaken in accordance with ISOl996/l-Acoustics-Description and Measurement of Environmental Noise Part l (First Edition. 1982); Part 2, 1987(E); and Part 3, 1996-3:1987(E).

Supervised monitoring was carried out using a Pulsur Model 33 Sound Level Meter, which was calibrated using a Cirrus CR:511E 1kHz Calibrator. Where possible, traffic counts were undertaken during the monitoring period on the adjoining public roads.

I.6.3 Receiving Environment

The lands are being restored to agricultural use by importation and recovery of inert materials in accordance with a phased restoration scheme. Designated internal haul roads are used to direct site traffic to the current tipping area. A bulldozer is used to appropriately grade and compact the material to the desired profile as shown by the detailed plans and sections (Refer to Figures B.2.4 and B.2.5).

The principle concern in respect of potential noise emissions from the development is the effect on residential amenity. Properties within the vicinity of the development are shown on Figure B.2.2.

Noise monitoring to date has shown that site activity at the existing facility are within accepted thresholds for this type of development (Refer to Section I.6.4 below).

I.6.4 Ambient Noise levels

Periodic noise monitoring is carried out at nearby residences and site boundaries adjoining same (Refer to Figure F.1.). Continuous noise monitoring is carried out in accordance with ISO 1996/1 – 1982 “Acoustics – Description and Measurement of Environmental Noise” using a Larson Davis Model 812 Sound Level Meter which was calibrated using a Larson Davis Acoustic Calibrator CAL 200.

Noise Measurement Parameters

During the survey the following environmental noise parameters ($L_{Aeq,T}$, $L_{A10,T}$, $L_{A90,T}$) were measured. These are defined below:

$L_{Aeq,T}$ is the "A-weighted" equivalent continuous steady sound level during the sample period and effectively represents an "average" value.

$L_{A10,T}$ is the "A-weighted" noise level that is exceeded for 10% of the specific measurement period (T). This parameter is typically used to quantify traffic noise.

$L_{A90,T}$ is the "A-weighted" noise level that is exceeded for 90% of the specific measurement period (T). This parameter is typically used to quantify background noise.

All noise levels are quoted in dB (A) relative to a sound pressure of 20KPa.

Noise monitoring was undertaken on 13th May 2008 at 3 noise sensitive locations (NSLs) locations as shown by the attached Environmental Monitoring Plan Figure F.1.

Normal quarry operations including processing of extracted sand and gravel and backfilling of workings were being undertaken throughout the monitoring periods.

The following table provides details with respect to the equipment in operation at the quarry during noise monitoring.

Plant & Equipment	Location	Comments
Crushing Plant	Processing Area	Crushing plant in operation for duration of noise monitoring.
Loading Shovel	Processing Area	Loading shovel feeding crushing plant for duration of monitoring period.
Trucks	Processing Area	Intermittent noise - trucks loading out with Sand and Gravel
Trucks	Backfilling Area – Phase 1	Intermittent noise - trucks delivering inert soils for backfilling
Excavator	Backfilling Area – Phase 1	Intermittent noise - excavator placing inert soils into area under restoration

Weather Conditions

Dry, warm and sunny with light south-westerly breeze.

Noise results

The results of the noise monitoring were as follows:

Noise Monitoring Results - Location N4

NSL	Monitoring Period	dB L_{Aeq}, T	dB L_{A10}, T	dB L_{A90}, T	Traffic Count (County Road)	
					HGV's	Cars/Vans
4	10:25 to 10:40	54	58	52	2	4

Noise monitoring station N4 was established close to the existing sit entrance and nearest noise sensitive receptor. The crushing plant and loading shovel was clearly audible. Noise associated with crushing, mobile plant and trucks' serving another inert waste recovery operation to the north was also audible at this location. The observer did not detect a tonal or impulsive component. The processing plant area was screened from the monitoring location by the intervening roadside boundary hedgerows and final pit face.

Noise Monitoring Results - Location N5

NSL	Monitoring Period	dB L_{Aeq}, T	dB L_{A10}, T	dB L_{A90}, T	Traffic Count (County Road)	
					HGV's	Cars/Vans
3	11:13 to 11:28	56	54	44	1	2

Noise monitoring station N5 was established c.110 metres to the east of the south east corner of the site. The crushing plant and loading shovel were audible. Noise associated with crushing, mobile plant and trucks' serving another inert waste recovery operation to the north was also audible at this location. The observer did not detect a tonal or impulsive component. The processing plant area was screened from the monitoring location by the intervening roadside boundary hedgerows and final pit face.

Noise Monitoring Results - Location N6

NSL	Monitoring Period	dB L_{Aeq}, T	dB L_{A10}, T	dB L_{A90}, T	Traffic Count (County Road)	
					HGV's	Cars/Vans
2	10:50to 11:05	55	53	42	2	4

Noise monitoring station N6 was established on the public road adjoining two residences 400 metres to the north of the site boundary. There was no discernible noise associated with the operations at Kiernan Sand and Gravel Ltd's facility. Noise associated with crushing, mobile plant and trucks' serving another inert waste recovery operation to the

north was also audible at this location. The observer did not detect a tonal or impulsive component.

The site is well removed from these noise sensitive locations (c. 400m) and there is significant screening afforded by the pit face and intervening topography and vegetation. At Station N6, noise levels were affected by passing traffic on the local road. The L_{A90} results are more representative of the noise levels at this location without the influence of road traffic noise.

Assessment of Results

The noise levels associated with the day-to-day quarrying/backfilling activity when measured in the vicinity of the noise sensitive locations (NSL 4 to 6) were in compliance with the limit of 55 dB (A) Leq specified in Condition No.6 of Planning Permission P.Ref. QY/48. For your information the quarry operator is in the process of relocating the semi-mobile crushing plant to the north of the site being about c. 400 from the nearest noise sensitive Location (NSL1). This will result in a significant reduction in noise levels at the nearest noise sensitive locations.

I.6.5 Assessment of Impacts

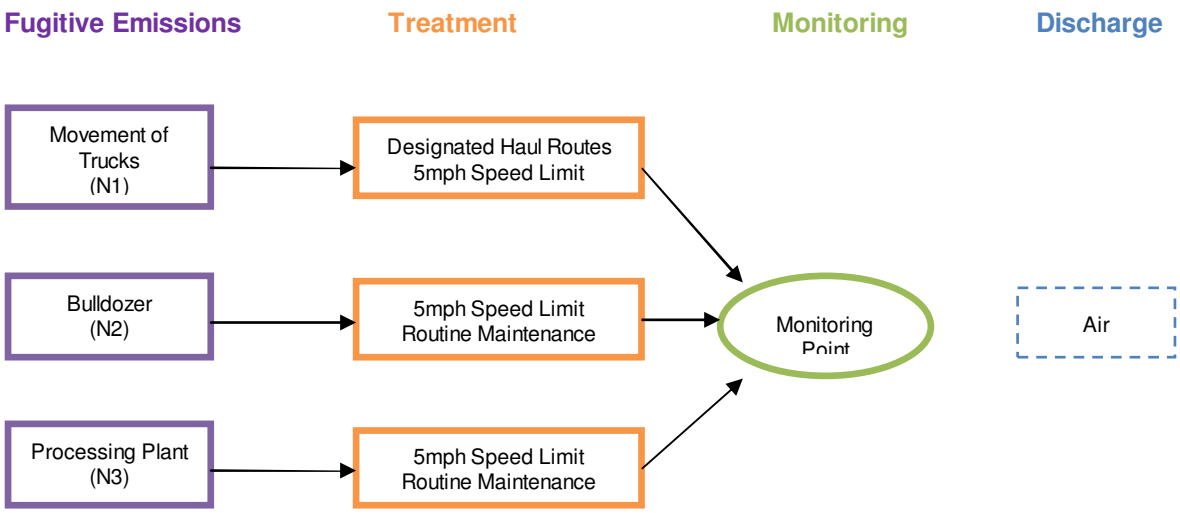
I.6.5.1 Direct Impacts

The main source of noise and vibration on site is from:

- Movement of trucks on internal haul roads and tipping of material (N1)
- Bulldozer placing and grading the infill material (N2)
- Processing Plant (N3)

Given the nature of the development the location of the above will vary dependent on area of site being restored (Refer to Figure B.2.1). Relevant details with respect to noise sources are provided in Table E.5.(i).

The following flow diagram shows the main sources of noise emissions arising on site and the methods of treatment/abatement employed.



The existing facility has been in operation under Waste Management Permit since 2007. Environmental noise monitoring has been carried out at this location in compliance with both the terms of the Waste Management Permit and planning permission pertaining to the site. Noise monitoring to date has shown that noise levels due to site activity are within acceptable thresholds for this type of development. Given that site activity will in general be further removed from the nearest noise sensitive locations the overall impact with respect to noise will be further reduced with respect to the continuance of operations.

I.6.5.2 Indirect Impacts

The main noise sources in the area are from the CR-468 County Road and a number of nearby inert soil recovery operations and pits.

Noise monitoring to date has shown that site activity at the existing facility are within accepted thresholds for this type of development (Refer to Section I.6.4 above).

I.6.5.3 Interaction with other Impacts

There are no interactions with other impacts associated with noise at the site.

I.6.6 Abatement

Noise resulting from the operations can be kept to acceptable levels by the implementation of good design, effective operation and management and by the adoption of 'best practices'. Reducing noise at source wherever possible is the most effective way of minimising the impact but barriers and screens between noise source and receptor can also be used to very good effect.

A number of noise containment measures are proposed:

- The provision of temporary peripheral screen banks to screen site activities from outside views as necessary.
- General site activity will be within the existing pit and below the level of the nearest residences.
- The use of designated haul roads to ensure that site traffic is removed from nearest noise sensitive receptors.
- Regular maintenance of all plant and machinery is an integral part of site management and is important in helping to minimise noise impact.
- All plant and equipment will conform to noise emission limits set out in Statutory Instrument No. 320 of 1998 European Communities Construction Plant and Equipment-Permissible Noise Levels (Regulations, 1998) and amendment set out in Statutory Instrument No. 359 of 1996.

I.6.7 Monitoring

The operator has established an environmental monitoring programme to include noise monitoring. Noise levels will continue to be monitored in accordance with ISO 1996/1 – 1982 (E) *"Acoustics – Description and measurement of environmental noise"*.

It is proposed to continue to carryout noise monitoring at the three locations (N4 to N6) and include the nearest noise sensitive locations (Refer to Figure F.1). It is proposed to carryout noise monitoring on a bi-annual basis.

In accordance with the Environmental Protection Agency Integrated Pollution Control Licensing Guidance note for Noise in relation to Scheduled Activities 2nd Edition (2006) *"the noise attributable to on-site activities should not generally exceed a free-field LAr,T value of 55 dB by daytime (08:00 – 22:00), at any noise sensitive location. During night-time (22:00 – 08:00), the noise attributable to on-site activities should not exceed a free-field LAeq, T value of 45 dB*".

It is therefore considered that the above EPA threshold should be applied for this development as this limit is a recognised standard within the industry and is a limit that is set by most of the Local Authorities. These levels are consistent with guidance issued by the Department of the Environment: "*Quarries and Ancillary Activities – Guidelines for Planning Authorities (2004) DOEHLG*" and the EPA "*Environmental Management in the Extractive Industry (Non-Scheduled Minerals) Environmental Management Guidelines (2006)".*

The results of monitoring to date shows that the development can comply with the noise level threshold as specified and as a consequence the development will have no significant effects regards noise levels in the area.

This programme will allow on-going monitoring of noise emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

Through implementation of the proposed mitigation measures it is considered the development will continue to have no significant effects with regard to noise levels on the local residences, their property, livestock and amenity.

I.7 Assessment of Ecological Impacts & Mitigation Measures

The site currently forms part of an active sand and gravel pit and as such there are no undisturbed lands that will be affected by the continuation of the progressive restoration of the site using imported inert materials.

The lands are currently being restored to agricultural use by importation and recovery of inert materials in accordance with a phased restoration scheme. There are no natural habitats within the area under restoration considered worthy of conservation. No significant or likely impacts on the ecology of the area are anticipated. As such it is not considered necessary to provide further description of the existing ecology in this case.

The site is not included within any area of scientific interest, nor has any special amenity order (e.g. Natural Heritage Area, Special Area of Conservation) been made in relation to any site or area within the vicinity.

It is proposed to reclaim the lands to a condition / gradient suitable for forestry. Good quality imported soil will be conserved wherever possible to provide the subsoil/top-soil capping. These topsoil's/subsoil's will be handled under dry conditions to minimise compaction. For the purpose of restoration to agricultural/forestry the restored soil profile (capping) shall comprise 300mm topsoil over 1200-1350mm of subsoil.

Progressive restoration involving planting/grass seeding of restored area's shall be carried out on a staged basis to reduce the effects of soil erosion, windblown dust, to aid ground stabilisation and as an effective means of weed control. On completion of each phase of development final restoration including grading, seeding and landscaping will be carried out. Final restoration is dependent on the availability of good topsoil/subsoil and subject to suitable weather conditions. The final contours and topography for the site is shown by the Final Landform Plan Figure B.2.4 and Cross Sections B.2.5.

The final landform will comprise a ridge running northwest to southeast which will be similar in profile to the original esker ridge that ran through the lands (Refer to Figure B.2.4).