



August 2013

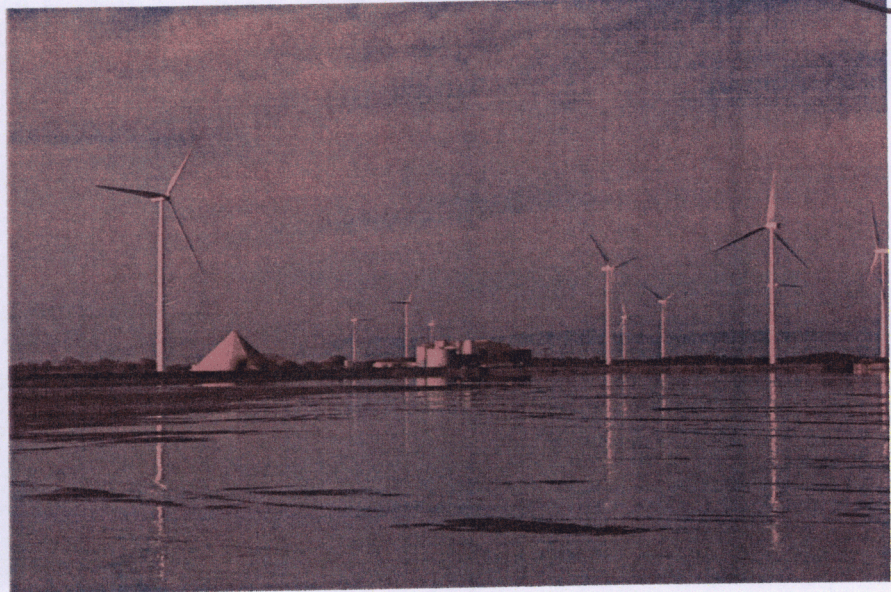
NON TECHNICAL SUMMARY

Environmental Protection
Agency
05 DEC 2013

Modification of Water Impoundment Facility at Lisheen Mine, Co. Tipperary

Submitted to:
North Tipperary County Council
Planning Authority
Civic Offices
Limerick Road
Nenagh
Co. Tipperary

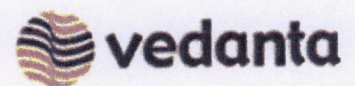
NORTH TIPPERARY CO. COUNCIL
- 8 AUG 2013
PLANNING AND DEVELOPMENT
FILE NO: 13 510 275



Report Number 11507150226.R02.NTS.A1

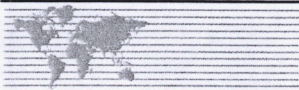
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NON TECHNICAL SUMMARY





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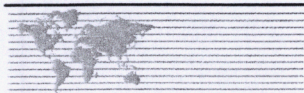


Table of Contents

1.0 INTRODUCTION	1
2.0 PROJECT DESCRIPTION.....	1
3.0 HUMAN BEINGS.....	2
4.0 ECOLOGY AND WATER	3
5.0 SOILS AND GEOLOGY	3
6.0 WATER.....	4
7.0 CLIMATE	4
8.0 AIR.....	5
9.0 NOISE.....	5
10.0 LANDSCAPE.....	5
11.0 MATERIAL ASSETS: ARCHAEOLOGY AND UTILITIES	6
12.0 CLOSURE, RESTORATION AND AFTERCARE.....	7
13.0 INTER-RELATIONSHIPS.....	7

TABLES

Table 1: Storage and Construction Volumes of Permitted Water Impoundment Facility

Table 2: Significance of Impacts on Soil and Geology

FIGURES

Figure 2.1: Site Location Map (Regional)

Figure 2.2: Site Location Map (Local)

Figure 2.3: Site layout plan for permitted water impoundment facility

Figure 2.4: Site layout plan for modification to store tailings

Figure 2.8: Final closure plan (conceptual)



1.0 INTRODUCTION

General

This Non-Technical Summary and associated Environmental Impact Statement (EIS) has been prepared in support of an application made by Lisheen Milling Ltd. (Applicant/Lisheen Mine/Lisheen) to North Tipperary County Council (NTCC) for permission to modify the use of a permitted water impoundment facility to store mine tailings at Lisheen Mine, Killoran, County Tipperary. The proposed development, which is the subject of this planning application is summarised as follows:

The development will consist of modification of the permitted water impoundment facility (permitted under An Bord Pleanála Ref. No. PL22.100093 (North Tipperary County Council Reg. Ref. PLC17663)) including use of the facility to provide for the storage and management of mine tailings within the same structure (for the purposes of extending life of mine), and associated capping and reinstatement activities. The proposed development also includes: the installation of spigots and reclaim pumps; and all other ancillary site development works.

Regional and local site location maps have been provided in Figures 2.1 and 2.2 attached. The EIS has been compiled in accordance with statutory requirements and non-statutory guidance on EIS preparation for development projects.

Brief overview of development

The permitted water impoundment facility proposed for modification is located adjoining the existing Tailings Management Facility (TMF). The structure is c. 9.0 hectare (ha.) in size and is accessed via internal haul roads within the Lisheen Mine footprint. It is proposed to place tailings in this structure over a c. 12 month period, and then to cap and restore this facility in a similar manner to the main TMF, which is currently being capped and restored.

Need for the development

Based on the most up to date estimates, it may be necessary to provide for an additional 12 months of storage for tailings in order to maximise the mine life. Based on this need, to facilitate progressive capping of the main TMF and also to minimise the footprint of the residual development following closure, the ideal solution for this contingency tailings storage is within the permitted water impoundment structure located adjoining the existing TMF. It is further noted that the design of the permitted water impoundment facility is identical in engineering terms to a structure required for the storage of tailings, and therefore suitable for modification activities, which are the subject of this planning application.

2.0 PROJECT DESCRIPTION

General

The storage and construction volumes of the permitted water impoundment facility are presented in Table 1 below.

Table 1: Storage and Construction Volumes of Permitted Water Impoundment Facility

Final water elevation metres above ordnance datum (mOD)	Crest Elevation mOD	Water and/or Tailings Storage Volumes m ³	Cumulative Months Storage for tailings
130.5	131.5	c. 390,000	10.7 months

The plan area of the permitted water impoundment facility at a crest elevation of 131.5 mOD is presented in Figure 2-3. Figure 2.4 depicts the structure once modification activities commence.



NON TECHNICAL SUMMARY

The shape of the permitted water impoundment facility is a truncated triangle with a footprint area of approximately 9.0 ha. at a crest elevation of 131.5 mOD. As highlighted previously, the dam wall is designed in a similar manner to the original main TMF design, which incorporates a composite lining system specifically designed to store both water and tailings, and consists of a high density polyethylene (HDPE) geomembrane over a geosynthetic clay liner (GCL).

Operation phase

The new tailings facility will be operated similarly to the existing TMF by discharging the tailings from spigots on the dam crest. The spigots will be opened sequentially and the tailings will be discharged uniformly over the new TMF. When tailings are deposited in the new facility it will be done at a rate of about 3,500 tonnes/day. Once placed, the tailings will have a consolidated density of about 1.9 tonnes/m³ and will thus be filling the facility at a rate of about 1,850 m³/day.

Once modification activities commence, sufficient water will remain in the structure to provide a 0.5-1 metre water buffer and to provide a suction head for the reclaim pumps. The reclaim pumps on the new facility will immediately return tailings water to the reclaim pumps on the main TMF. The pumps will be located in the southern corner of the facility. The main TMF will provide the required retention time for the settling of any dirty tailings water pumped from the adjoining new TMF cell following modification of use.

Sufficient water storage will also be retained in the main TMF to allow for flexibility in the operation and management of surface waters.

Closure Phase

The new cell will be capped with approximately 700 mm of Type B material (limestone or shaley limestone) as constructed on the existing TMF together with 300 mm of growing material consisting of 50% peat and 50% soil. The procedure would be the same as currently undertaken on the existing facility.

The key to long term closure will be the requirement to maintain the cap in a saturated condition. The cap will be initially placed on top of the tailings at 130.5 mOD and the top of the growing medium will be at approximately 131.5 mOD, at the crest elevation. If the mine closes before the tailings reach 130.5 mOD, then the cap will be lower than the crest accordingly.

Details of the closure plan are depicted in Figure 2.8 attached in this Non-Technical Summary.

3.0 HUMAN BEINGS

Land-use and social considerations

Mining and related surface ancillary activities have been undertaken at the property since the late 1990's, and there will be no change to the land use at this location as a result of the proposed modification of the permitted water impoundment facility to store tailings. With respect to social considerations, the modification of the permitted water impoundment facility will result in a positive social outcome, given that the mine will operate for an additional 12 months, which will result in extended employment at the mine facility.

In addition and as highlighted previously, the modification application will facilitate progressive capping works on the main TMF, which again results in a positive outcome from the social viewpoint.

Economic activity

As a result of this proposed development, there will be a direct positive knock-on effect to the wider economy in the vicinity of Lisheen Mine. Approximately 400 employees will maintain employment for an additional 12 months, resulting in continued significant contributions to the public exchequer through tax and universal social payments. In addition, royalties of 3.5% of revenues will also be contributed to the Dept. of Communications, Energy and Natural Resources.



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Traffic

The proposed modification activities will not give rise to any additional traffic movements during the operation phase, as all tailings will be pumped via pipeline to the permitted water impoundment facility/new TMF cell within the existing mine site. Ancillary traffic relating to closure activities will not impact the public road network. Therefore no impacts from traffic activities will occur.

Mitigation

Given that the Site will operate for an additional 12 months as a result of this application, this will allow Lisheen Mine some additional time to prepare for mine closure. Whilst this application is concerned with keeping the facility open for an extended period, the following activities are being undertaken by Lisheen Mine in the run up to closure:

- Discussions with industrial operators to re-use the plant footprint, surface infrastructure and workforce;
- Capping activities on the main TMF;
- Fisheries / hatchery operations; and
- Playing / leisure facilities post closure.

4.0 ECOLOGY AND WATER

Given that the overall status of both the Drish and Rossesstown Rivers are considered *Poor* and that the Q rating for ecological status is considered *Poor*, it would be important to ensure that the current mine water treatment is in place and operating at full capacity at all stages of the proposed modification development for current and future discharges.

In order to improve and protect the ecological status downstream of Lisheen in both rivers, optimisation of the existing treatment of the water discharging from Lisheen Mine is required and additional treatment is recommended as a precautionary measure specifically in relation to the post closure water discharge. The main mitigation measure to reduce the potential impacts on water quality, to no significance, is the provision of a wetland treatment system which will be agreed with Inland Fisheries, in terms of detailed design and implementation, once formal closure activities commence. The monitoring data from the current wetland treatment system can be used to design the wetland system for closure.

5.0 SOILS AND GEOLOGY

The significance of potential impacts on the receiving soil and geology environment as a result of this proposed modification application are summarised in Table 2 below.



NON TECHNICAL SUMMARY

Table 2: Significance of Impacts on Soil and Geology

Attribute	Status	Magnitude of Impact
Geohazards/Geotechnical	The design of the permitted structure incorporates a composite liner, comprising rockfill and a high density polyethylene liner (Section 2.0). An analysis on slope stability has been undertaken, which demonstrates appropriate factors of safety.	Small adverse
Geological Heritage	The proposed modification application from storage of water to storage of tailings and water will not have an impact on the integrity of the Derryville Bog complex.	Negligible
Economic Geology	The proposed modification activities will facilitate the continued extraction of ore from the Lisheen Mine for an additional 12 months.	Major beneficial
Agricultural Soils	The capping materials proposed for restoration of the new cell will consist of the re-use of excavated peat and glacial till, sourced from stockpiles on the Lisheen Mine site.	Minor beneficial
Made Ground	The proposed modification application will have no impact on the made ground status of the permitted water impoundment facility.	Negligible

6.0 WATER

Water is discussed in Section 4.0 of the Non-Technical Summary and Chapter 6.0 of the EIS.

7.0 CLIMATE

Various elements of both the operational and closure phases of the proposed development have the potential to impact on the receiving air and climate. Potential air impacts and associated mitigation measures relating to dust deposition are addressed in Chapter 8.0 (Air).

Emissions from vehicles during the closure phase can add to the receiving air environment. Little or no vehicle movements will be undertaken during the operational phase, as tailings will be transported to the application site via pipeline. It is anticipated that the capping works on the Application Site will have an expected duration of approximately four months. During this period, the following mitigation measures will be put in place to limit vehicle and plant emissions:

- No vehicles or plant will be left idling unnecessarily;
- Vehicles and plant will be well maintained;
- Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations;
- All vehicles will hold a current Department of Environment certificate where required; and
- Queuing or parking of vehicles outside the site, both during and before the site opens.



NON TECHNICAL SUMMARY

Growth media (peat and soil) will primarily be sourced from stockpiles adjoining the permitted water impoundment facility. Rockfill material will also be sourced locally to help reduce any associated carbon footprint.

The adoption of these mitigation measures will ensure that the resulting impact significance is no greater than slight.

8.0 AIR

Recorded dust (general particulate) values at the closest residential receptors for the assessment period 2008 to 2012 generally remained at or below the IPPCL limit of 150 mg/m²/day.

An assessment of very fine particulate dust (PM10) and metals in dust was also undertaken. Results indicated that there were no exceedences outside of the Lisheen Mine site for the relevant assessment years.

Based on the above findings, the potential for significant adverse impacts to local air quality as a result of emissions from tailings placement and subsequent capping activities is low, as the separation distance between the source and the nearest receptors is considered to be sufficient. Consequently, impacts to local air quality are considered not significant.

9.0 NOISE

Existing baseline reports of the noise environment at Lisheen Mine between 2008 and 2012 demonstrate that the operational phase can operate within relevant EPA guidance and licence limits (55 dB LAeq).

During the operational phase, the noise level due to the proposed pump will be at least 10 dB below the existing ambient level at the nearest NSRs, and will therefore be inaudible. The noise impact during this phase is therefore considered to be not significant.

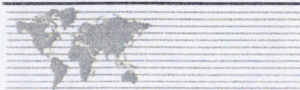
During the capping/closure phase, the predicted noise level of 53 dB LAeq meets the agreed daytime noise limit of 55 dB with 2 dB of 'headroom'. There will be no capping activities during the night-time period, resulting in the 45 dB noise limit also being met. The impact of noise from the capping/closure phase is therefore considered to be not significant.

Noise mitigation measures will be incorporated into the Site design, management and working practices. Through implementation of the following mitigation measures it is considered that the operational and capping activities will have no impact at nearby NSRs.

- All haul roads to be kept clean and maintained in a good state of repair;
- Heavy goods vehicles entering and leaving the site will have tailgates securely fastened;
- Plant will be operated in a proper manner with respect to minimising noise emissions;
- Plant will be subject to regular maintenance; and
- Plant will be fitted with effective exhaust silencers, and maintained in good working order.

10.0 LANDSCAPE

The crest height of the permitted water impoundment structure is 131.5 mOD and the maximum height of the tailings as a result of its modification will reach 130.5 mOD. It is noted that all of the surrounding visual receptors are located more than 10 m below the crest height at the prevailing ground level, and views into the impoundment structure are not afforded. Thus, the tailings material will not be visible above the crest of



the permitted impoundment structure and there will be no additional visual effects arising at surrounding receptors as a result of the proposed modification activities.

11.0 MATERIAL ASSETS: ARCHAEOLOGY AND UTILITIES

Archaeology

The permitted water impoundment facility is currently permitted under Planning Permission Ref. No. PCL17663 and ABP ref. No. PL22.100093. Given that the structure is permitted, an Archaeology Impact Assessment was screened out of the Environmental Impact Assessment process.

Notwithstanding this, additional information is provided in the EIS on the context of the permitted water impoundment facility in terms of its archaeological and cultural heritage setting. This information was previously submitted to NTCC in a document entitled 'Environmental Impact Assessment and Appropriate Assessment Screening Report' submitted on 17 May 2013.

The Department of Arts Heritage and Gaeltacht subsequently issued licences to commence preservation by record works at the permitted water impoundment facility. These preservation works commenced in June 2013 and a copy of the Archaeological Report on these excavations will be forwarded to the Planning Authority once completed.

Utilities

A wind turbine owned and operated by Bord Gáis Energy (BGE) is located in the vicinity of the Application Site. This wind turbine is c. 3.0 megawatt and was constructed in c. 2008. The location of the wind turbine is depicted in Figure 2.2 attached.

Detailed consultations were undertaken with BGE regarding the permitted water impoundment facility. During these consultations, the following potential issues were identified and discussed:

- Maintenance access to turbine blades during operation and closure of the modified structure;
- Protection of underground services during any site works;
- Dust monitoring during operation and closure phases of proposed modification activities; and
- Potential vibration effects of plant movements during closure activities.

As a result, the following mitigation measures were agreed by BGE and Lisheen Mine;

- Design Risk Assessment and Preliminary Health and Safety Plan to be provided to BGE;
- Lisheen Mine to provide access for maintenance of turbine;
- Design and constructability reviews to be undertaken with the contractors;
- Vibration monitoring to be undertaken during any works;
- Full review of underground cables and action plan to protect these utilities;
- Dust monitoring, including liaison with Vestas, (turbine manufacturer); and
- Appropriate site fencing.

Once the above mitigation measures are adopted, it is expected that residual impacts due to the operational and closure phases of the project on Utilities in the vicinity of the Application Site will be slight to imperceptible.



12.0 CLOSURE, RESTORATION AND AFTERCARE

Provisions for the planned closure of the mine were initially identified in the original planning application at Lisheen in 1996/1997. Lisheen Mine has subsequently updated the Closure Restoration and Aftercare Management Plan (CRAMP) in 2009 and again in 2013, in accordance with their planning permissions and licences for the Site.

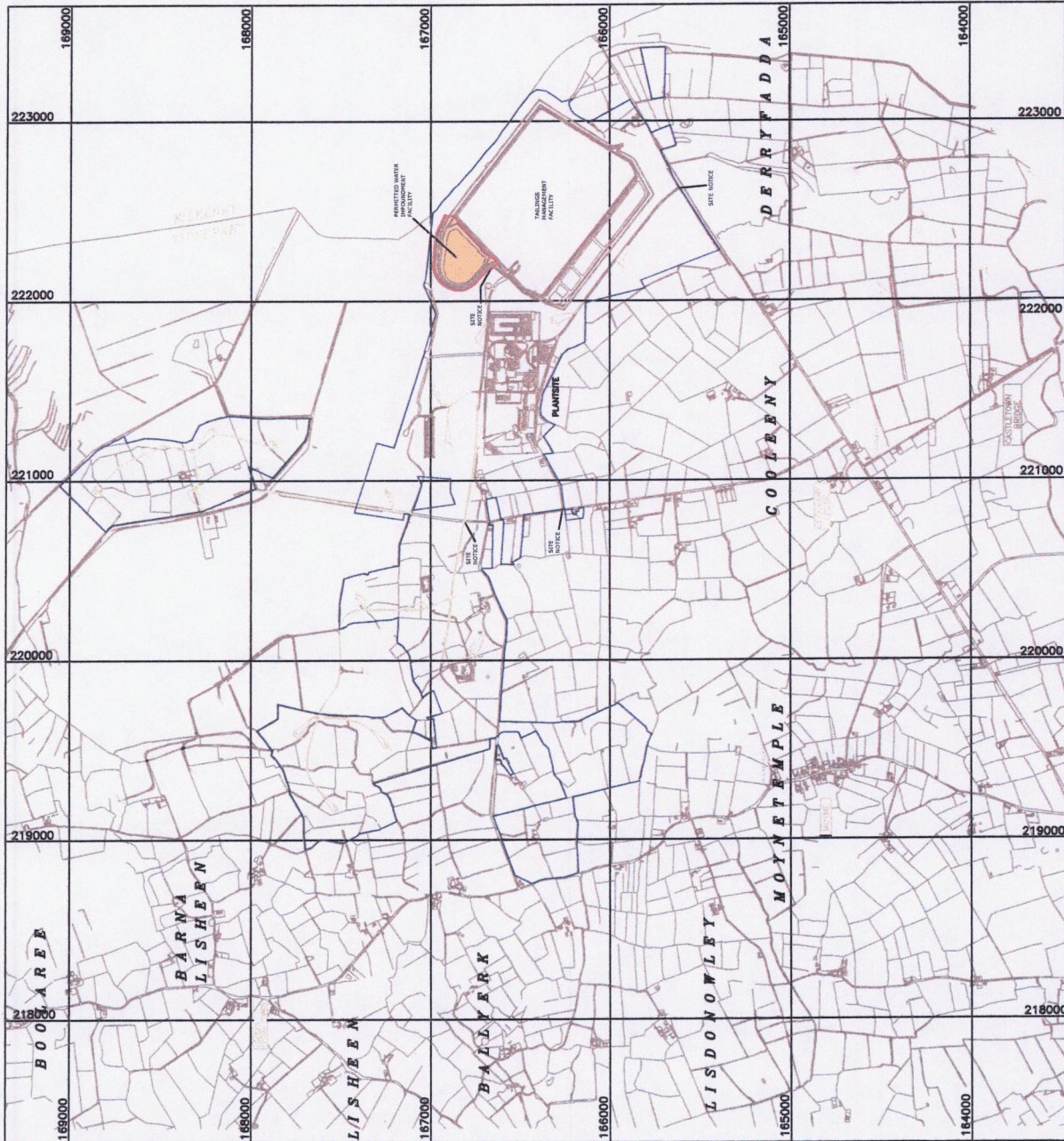
The consequences of implementing the proposed modification activities at the permitted water impoundment facility in the context of the current CRAMP are reviewed in Chapter 12.0 of the EIS. This Chapter supports the view that the proposed modification activities will have no adverse effect on arrangements for progressive mine closure described within the Lisheen CRAMP.

13.0 INTER-RELATIONSHIPS

Interactions/inter-relationships between various aspects of the environmental impact assessment for the proposed modification activities at the Application Site, including both operation and closure phases are addressed in Chapter 13.0 of the EIS.



FIGURES



LEGEND


— APPLICATION SITE BOUNDARY

— LANDS UNDER CONTROL OF APPLICANT

NOTE

COORDINATES ARE IN METRES RELATIVE TO IRISH NATIONAL GRID

O.S. MAPS - TIPPERARY SHEETS 30 & 36 (parts)



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TEL: 408.8741 • FAX: 408.8742 • www.golder.com

Client: Lisheen Milling Ltd.

Location: Killoren, Thurles, Co. Tipperary.

Project: Planning Application

Project number
11 5071 5 0226

File Location
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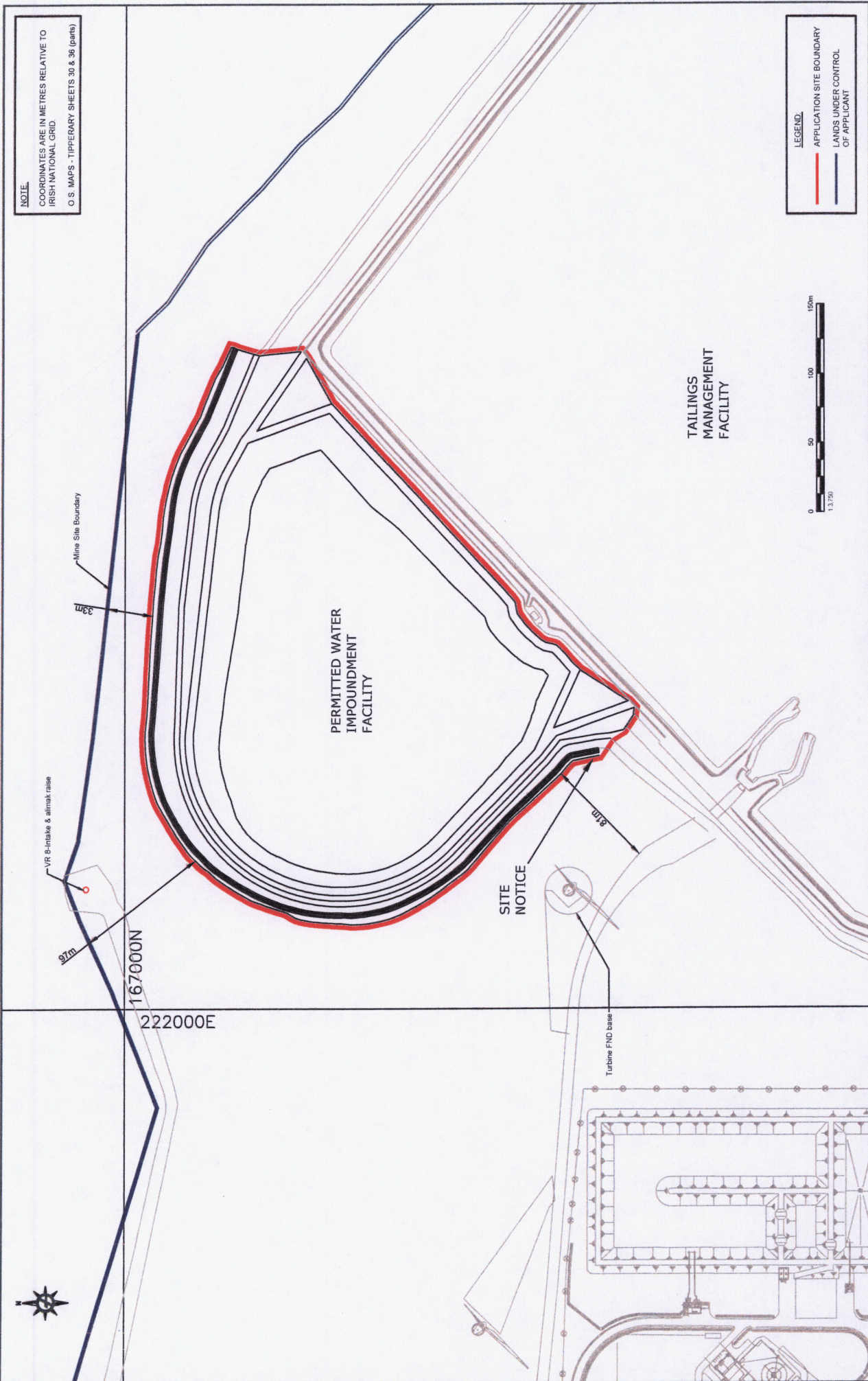
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AR0056013

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Checked by	To North Tipperary County Council	Aug. '13	B	
Reviewed by				Scale
CW				1:37,500 A4

Fig 2.1

NOTE

COORDINATES ARE IN METRES RELATIVE TO
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LEGEND

APPLICATION SITE BOUNDARY
LANDS UNDER CONTROL
OF APPLICANT

Drawing

Date	Version	Title
July '13	A	SITE LOCATION MAP
Aug. '13	B	(Local)
		Scale
		1:3,750 A4

Client:	Lisheen Milling Ltd.
Location:	Killoran, Thurles, Co. Tipperary.
Project:	Planning Application

Project number	11 5071 5 0228
File Location	P:\PROJECTS\MINING\11 5071 5 0228 - Weland Construction - Graphical Planning\DWG\A02.dwg
ORDNANCE SURVEY IRELAND LICENCE NUMBER	AR0056013

Created By	POB
Issue to	To Lisheen Mine
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Reviewed by	CW

Issue to	To North Tipperary County Council
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Fig 2.2



VR 8-Intake & allinmak raise

97m

167000N

222000E

Mine Site Boundary

Perimeter Interceptor Channel

Service road

Ramp

Crest
(Elevation 131.5)

126.0

136.5

PERMITTED WATER
IMPOUNDMENT
FACILITY

Crest
(Elevation 131.5)

Existing embankment crest
(Elevation 136.5)

TAILINGS
MANAGEMENT
FACILITY

Water Reclamation Pump & Pipework
from Permitted Water Impoundment
Facility connects to main TMF

Ramp

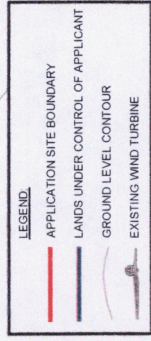
136.5

Turbine FND base

Site
Notice

81m

Approximate location of spillway
- subject to detailed design upon closure



NOTES

- COORDINATES ARE IN METRES RELATIVE TO IRISH NATIONAL GRID
- LEVELS ARE IN METRES RELATIVE TO O.S. DATUM MALIN HEAD
- REFER TO FIG 2.5 FOR CROSS SECTION DETAILS
- O.S. MAPS - TIPPERARY SHEETS 30 & 36 (parts)


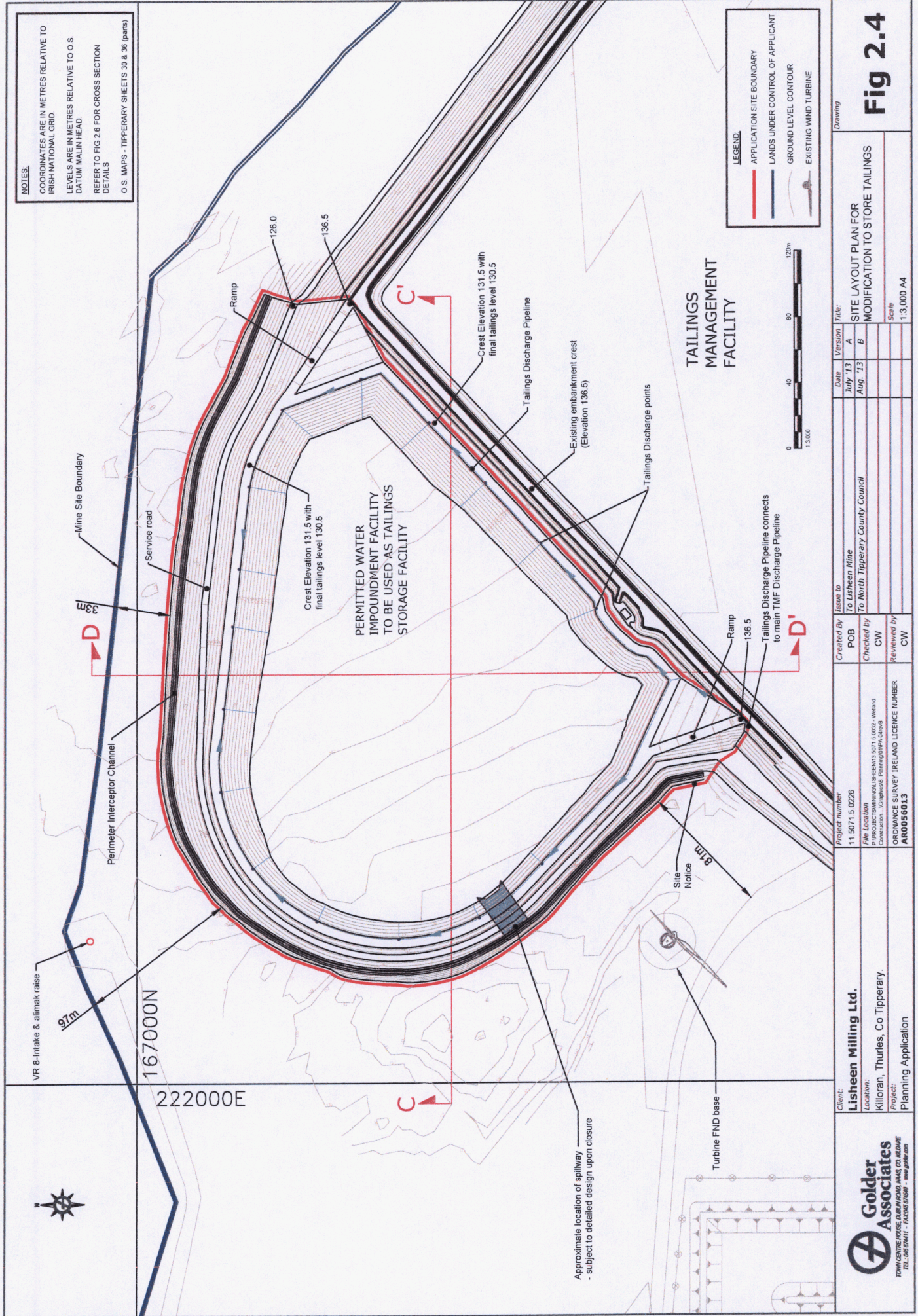
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Checked by: CW		To: To North Tipperary County Council		Version: A	
Reviewed by: CW		Date: Aug. '13		Version: B	
ORANANCE SURVEY IRELAND LICENCE NUMBER: AR0055013		Drawing Title: SITE LAYOUT PLAN FOR PERMITTED WATER IMPOUNDMENT FACILITY		Scale: 1:3,000 A4	

Fig 2.3





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Location: Killoren, Thurles, Co. Tipperary.		File Location: P:\PROJECTS\MINING\KILLOREN\11 5071 5 0226 - Wetland Construction - 10/04/2011\11 5071 5 0226.dwg		Created By: POB		Date: July '13		FINAL CLOSURE PLAN	
Project: Planning Application		ORNDANCE SURVEY IRELAND LICENCE NUMBER: AR0056013		Checked by: CW		Date: Aug. '13		(Conceptual)	
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Fig 2.8

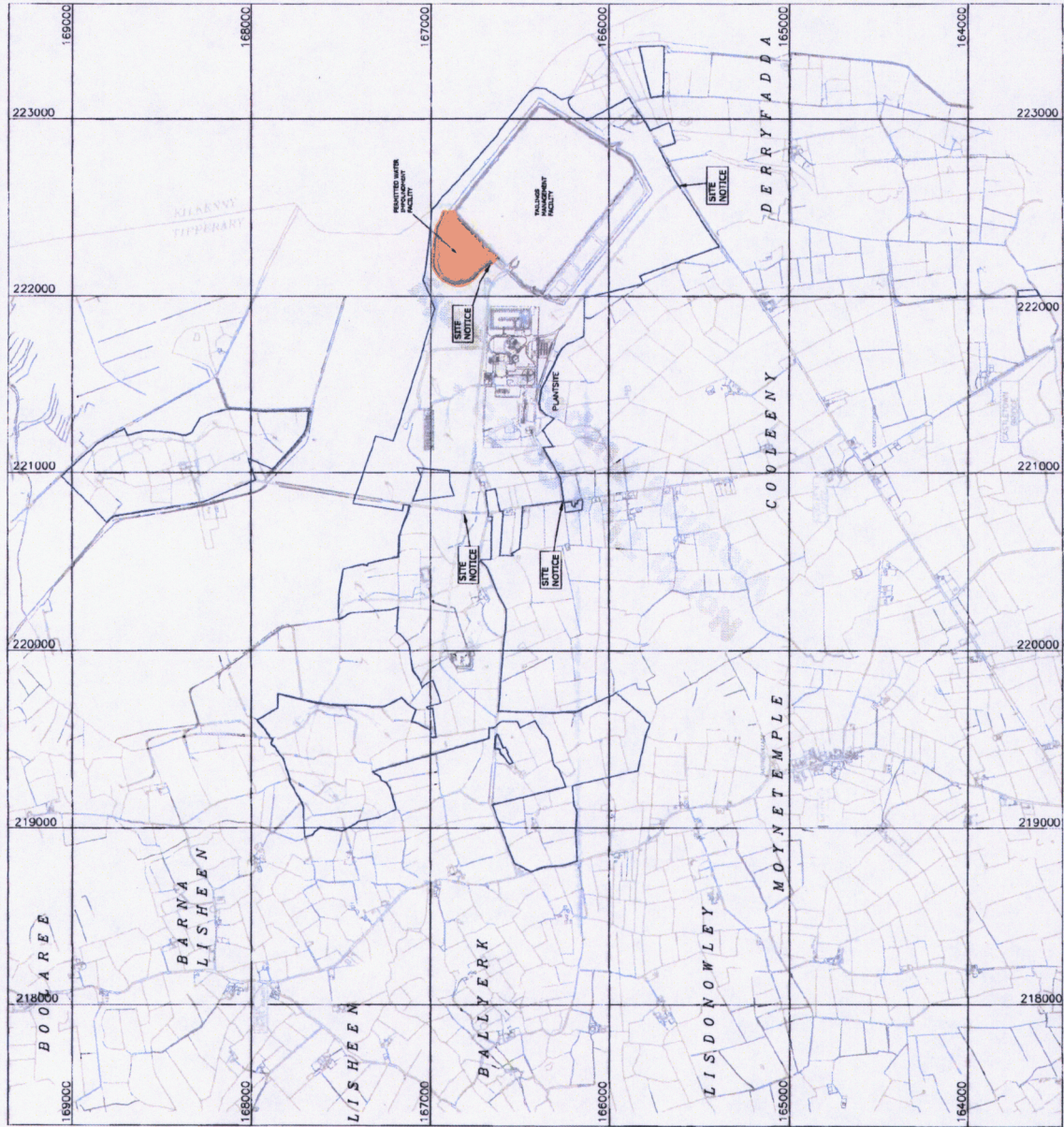
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Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 56 2 2616 2000

solutions@golder.com
www.golder.com

Golder Associates Ireland Limited
Town Centre House
Dublin Road
Naas
Co. Kildare
Ireland
T: +353 45 87 4411



LEGEND:
APPLICATION SITE BOUNDARY
LANDS UNDER CONTROL
OF APPLICANT

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Drawing

Date	Version	Title
July '13	A	SITE LOCATION MAP
Aug '13	B	(Regional)

Scale
1:12,500 A1

Created By	Issue to	Project number
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CW	To North Tipperary County Council	PROPOSED MILLING FACILITY 11.5071.6.0228 - Milling Construction - Milling Plant - Planning & Development
CW	Checked by	ORDNANCE SURVEY IRELAND LICENCE NUMBER AR0036013
CW	Reviewed by	

Client:
Lisheen Milling Ltd.
Location:
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Project:
Planning Application

**Golder Associates**
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PA01

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FILE NO: 13 510 275

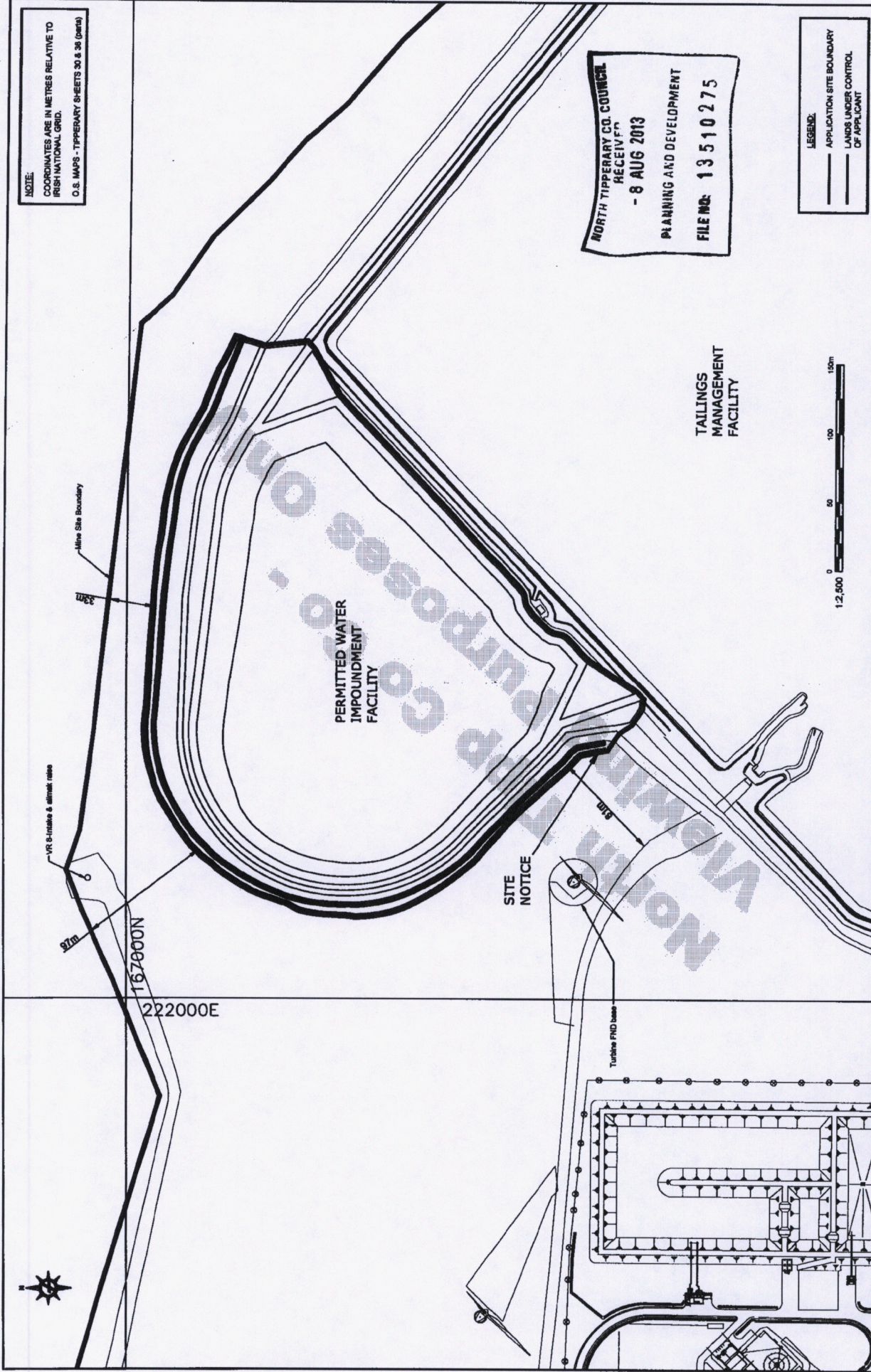
LEGEND:
— APPLICATION SITE BOUNDARY
— LANDS UNDER CONTROL
OF APPLICANT


PA02

Drawing

SITE LOCATION MAP
(Local)

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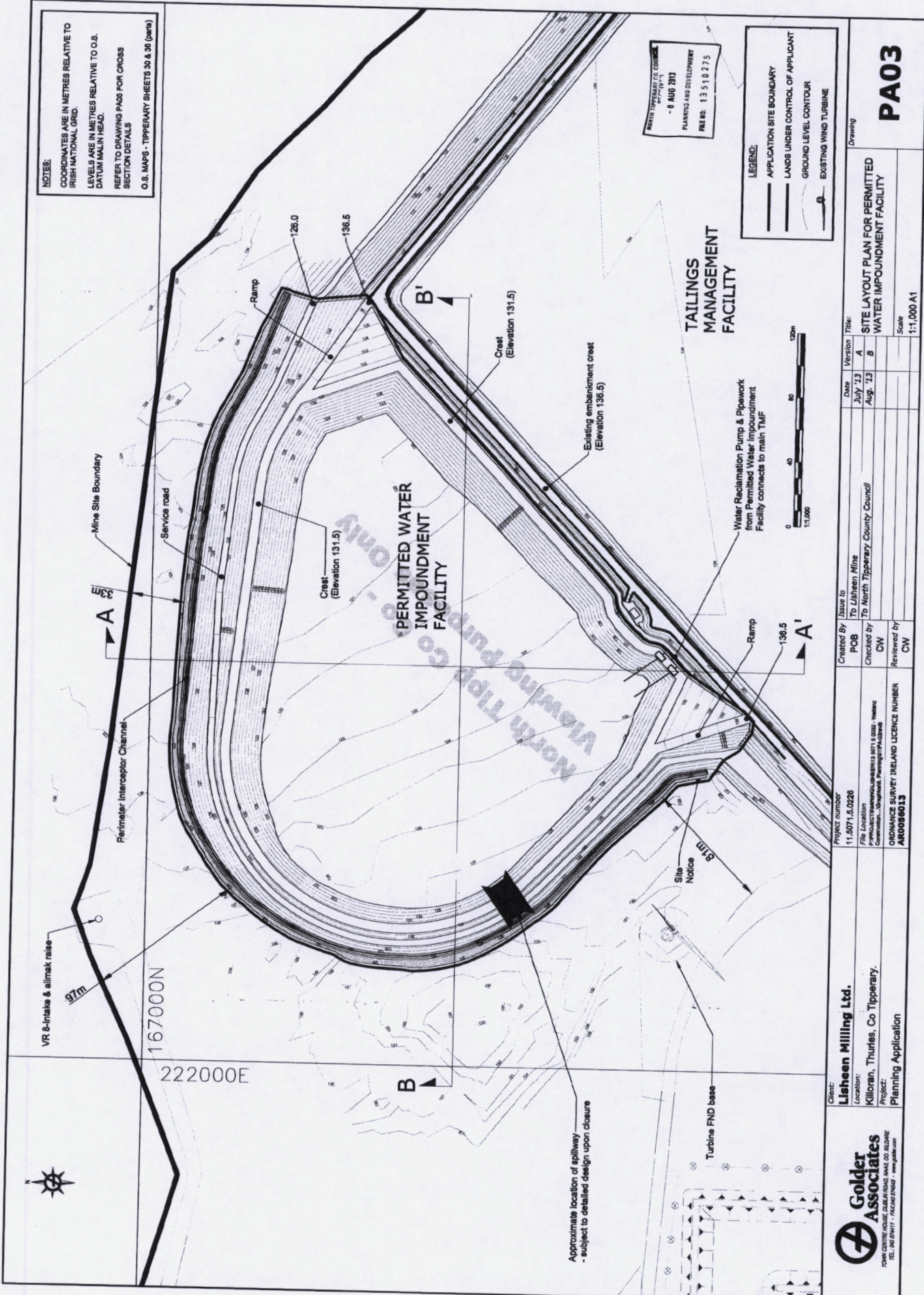


<div><div>Golders Associates</div><div>PO Box 1000, Kesh, Co. Mayo Tel: 084-96111 • Fax: 084-96112 • Email: gass@golders.ie</div></div>		<div>Client: Lishleen Milling Ltd.</div> <div>Location: Kiloran, Thurles, Co Tipperary.</div> <div>Project: Planning Application</div>	<div>Project number 11.5071.5.0228</div> <div>Site Location To North Tipperary County Council</div> <div>Ordnance Survey Ireland Licence Number A000560615</div>	<div>Issue to To Lishleen Mine</div> <div>Created By POB</div> <div>Checked by CW</div> <div>Reviewed by CW</div>	<div>Date July '13 Aug. '13</div> <div>Version A B</div> <div>Scale 1:2,500 A3</div>	<div>Title: SITE LOCATION MAP (Local)</div>
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NOTES:
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 IRISH NATIONAL GRID.
 LEVELS ARE IN METRES RELATIVE TO O.S.
 DATUM (M.A.S. 1929).
 REFER TO DRAWING PAGE FOR CROSS
 SECTION DETAILS
 O.S. MAPS - TYPICAL SHEETS 30 & 36 (parts)

DESIGN PREPARED BY: GOLDER
 - 8 AUG 2013
 PLANNING AND DEVELOPMENT
 FILE NO: 13 518 275

- LEGEND:**
- APPLICATION SITE BOUNDARY
 - LANDS UNDER CONTROL OF APPLICANT
 - GROUND LEVEL CONTOUR
 - EXISTING WIND TURBINE



Client:		Lisheen Milling Ltd.		PA03	
Location:		Kiloran, Thurles, Co Tipperary.		Site Layout Plan for Permitted Water Impoundment Facility	
Project:		Planning Application		Scale: 1:1,000 A1	
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Created by:		POB		Date:	
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Issue to:		To North Tipperary County Council		Version:	
Issue to:		To Lisheen Mine		Date:	
Issue to:		To North Tipperary County Council		Date:	

NOTES:

COORDINATES ARE IN METRES RELATIVE TO
IRISH NATIONAL GRID.
LEVELS ARE IN METRES RELATIVE TO O.S.
DATUM MAIN HEAD.
REFER TO DRAWING PA08 FOR CROSS
SECTION DETAILS
O.S. MAPS - TIPPERARY SHEETS 30 & 36 (parts)

PLANNING AND DEVELOPMENT
FILE NO. 13-10275
- 8 AUG 2013

LEGEND:

- APPLICATION SITE BOUNDARY
- LANDS UNDER CONTROL OF APPLICANT
- GROUND LEVEL CONTOUR
- EXISTING WIND TURBINE

Drawing

PA04

SITE LAYOUT PLAN FOR
MODIFICATION TO STORE TAILINGS

Scale
1:1,000 A1

Date Version Title

July 13 A
Aug. 13 B

Created By

POB

Issue to

To Lishkeen Mine

Checked by

CW

Reviewed by

CW

Project number

11.5071.5.0228

Site location

PROPOSED TAILINGS STORAGE FACILITY

Ordinance Survey Ireland Licence Number

AR0086013

Client:

Lisheen Milling Ltd.

Location:

Killoran, Thurles, Co. Tipperary.

Project:

Planning Application

Client:

Lisheen Milling Ltd.

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Client:

Lisheen Milling Ltd.

Location:

Killoran, Thurles, Co. Tipperary.

Project:

Planning

NOTES:
DIMENSIONS ARE IN METRES.
LEVELS ARE IN METRES RELATIVE TO O.S.
DATUM MALIN HEAD.



Client: **Lisheen Milling Ltd.**
Location: **Killoran, Thurles, Co. Tipperary.**
Project: **Planning Application**

Project number: **11.50715.0226**
File Location: **PROJECTS\KINGSLAND\11.50715.0226 - Wound Construction - Vireonika\11.50715.0226 & Malin**
ORDNANCE SURVEY IRELAND LICENCE NUMBER: **AR0056013**

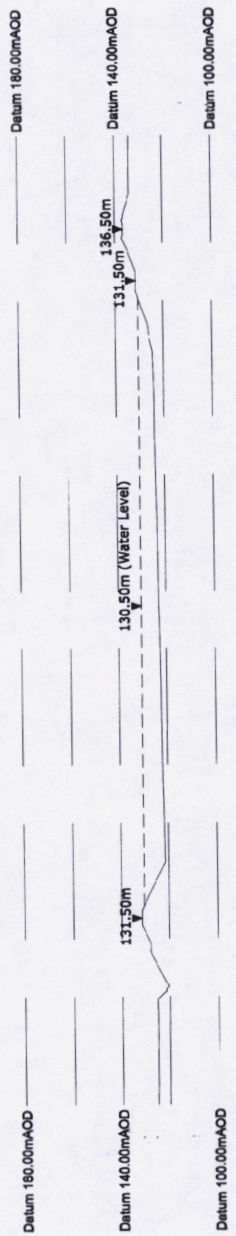
Created By: **POB**
Checked by: **CW**
Reviewed by: **CW**

Issue to: **To Lisheen Nine**
To North Tipperary County Council

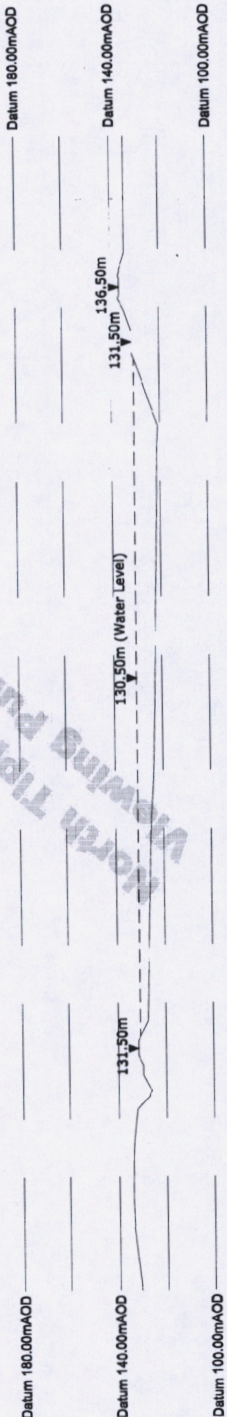
Date: **July '13**
Version: **A**
Title: **SECTIONS A-A' & B-B' (See Drawing PA03 for section locations)**

PA05

Drawing



Section A-A'



Section B-B'

Revised: **13 AUG 2013**
PLANNING AND DEVELOPMENT
FILE NO: **13.510.715**



NOTES:
DIMENSIONS ARE IN METRES.
LEVELS ARE IN METRES RELATIVE TO O.S.
DATUM MALIN HEAD.



TOWN CENTRE HOUSE, DUBLIN ROAD, MALIN CO. DONEGAL
TEL: +353 (0)28 25411 - FAX: +353 (0)28 25412 - www.golder.com

Client: **Lisheen Milling Ltd.**
Location: **Killoran, Thurles, Co. Tipperary.**
Project: **Planning Application.**

Project number: **11.5071-S.0226**
File Location: **P:\PROJECTS\WINDING\LISHEEN\13.07.13 - Revised Construction... (Gephos & Mennell) \LMS & Malin\B**
ORDNANCE SURVEY (IRELAND) LICENCE NUMBER: **AB0056013**

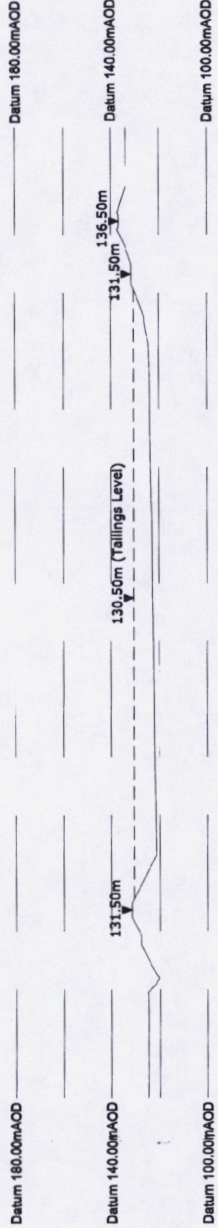
Created By: **POB**
Checked by: **CW**
Reviewed by: **CW**

Issue To: **To Lisheen Mine**
To North Tipperary County Council

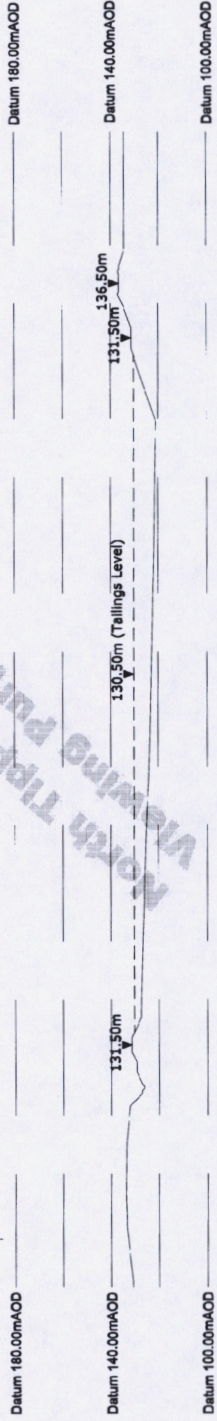
Date: **July '13**
Version: **A**
Title: **SECTIONS C-C' & D-D' (See Drawing PA04 for section locations)**

Scale: **1:1,000 A1**

Drawing: **PA06**



Section C-C'

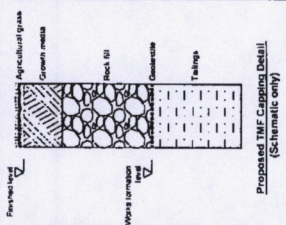
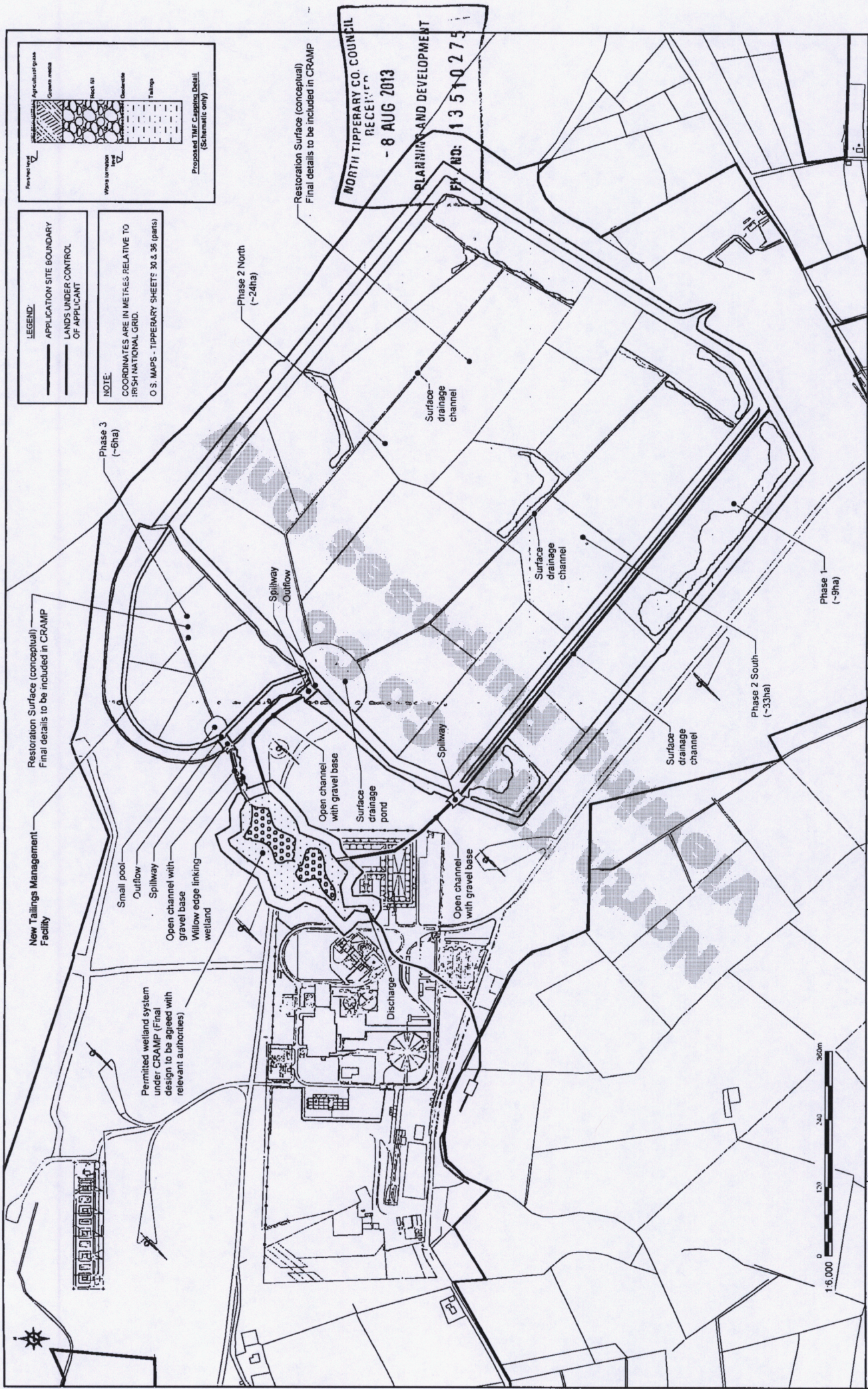


Section D-D'

North Tipperary County Council
- 8 AUG 2013
FILE NO: 13.510.275







LEGEND:
 — APPLICATION SITE BOUNDARY
 — LANDS UNDER CONTROL OF APPLICANT

NOTE:
 COORDINATES ARE IN METRES RELATIVE TO IRISH NATIONAL GRID.
 O.S. MAPS - TIPPERARY SHEETS 30 & 36 (parts)

Client: Lisheen Milling Ltd. Location: Killoren, Thurles, Co Tipperary	Project number: 11-5071 5 0228 File Location: P:\GIS\GIS\TIPPERARY\GIS\11-5071 5 0228 - WARD C:\Users\j.murphy\Documents\Planning\11-5071 5 0228	Created By: POB Checked by: CW Reviewed by: CW	Issue ID: To Lisheen Mine To North Tipperary County Council	Date: July 13 Aug. 13		Version: A B		Title: FINAL CLOSURE PLAN (Conceptual)		Scale: 1:6,000 A3	PA08

DIMENSIONS ARE IN MILLIMETRES.
LEVELS ARE IN METRES RELATIVE
DATUM MALIN HEAD.

NORTH TIPPERARY CO. COUNCIL
RECEIVED

- 8 AUG 2013

PLANNING AND DEVELOPMENT

FILE NO: 13510275

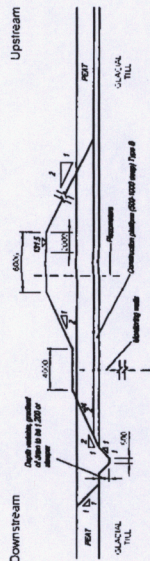
APPLICATION SITE BOUNDARY

LANDS UNDER CONTROL OF APPLICANT

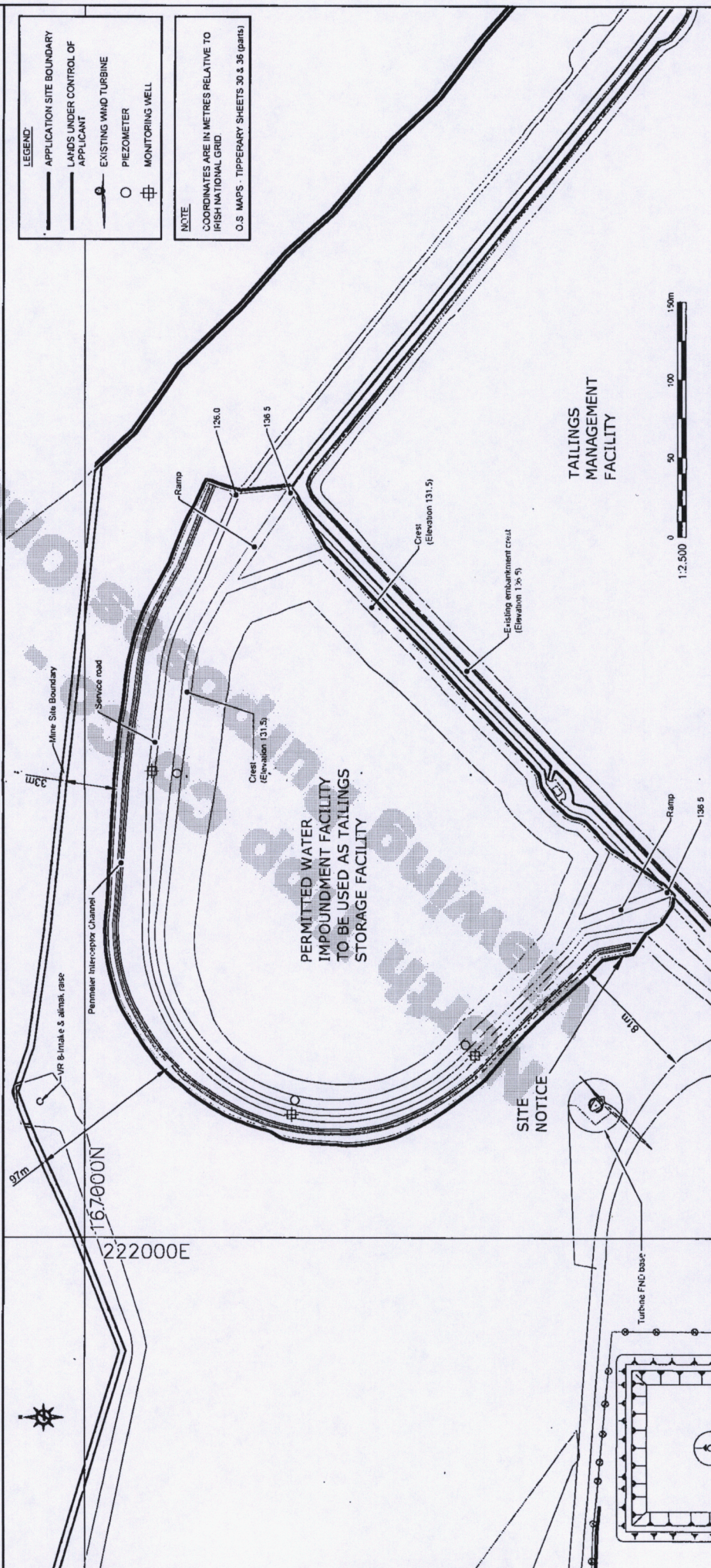
[illegible] MONITORING WELL

NOTE

COORDINATES ARE IN METRES RELATIVE TO
BRITISH NATIONAL GRID.



TYPICAL SECTION SHOWING INSTRUMENTATION INSTALLATION DETAILS
(Scale: 1/500 AS)



Conclusion

Title: PLAN & SECTION SHOWING INSTRUMENTATION

Date	Version	Title:
July '13	A	PLAN
July '13	B	INST
		Scale
		1:2.5

[illegible]

County Council
County Council

Issue to	
To North Tipperary	
To North Tipperary	

Created By POB	
Checked by CW	
Reviewed by CW	BER

ENTR 5071 5 0032 Westland
Young CPA-Qualified

Project number
11507150226

Site Location
PROJECTSUNJING, SHE
Construction, Graphical, Planning


ORDNANCE SURVEY IR
AR0056013

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Application

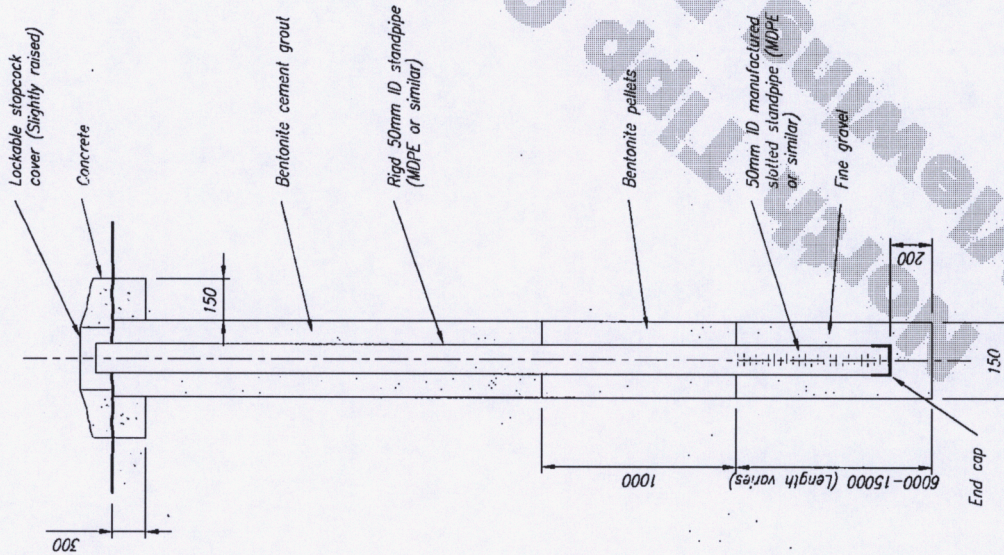
Client:	Lisheer
Location:	Killoran,
Project:	Planning

**Goldier
Associates**
DUBLIN ROAD, NAAS, CO. KILDARE
TEL: 01-845 874548 • www.goldier.com

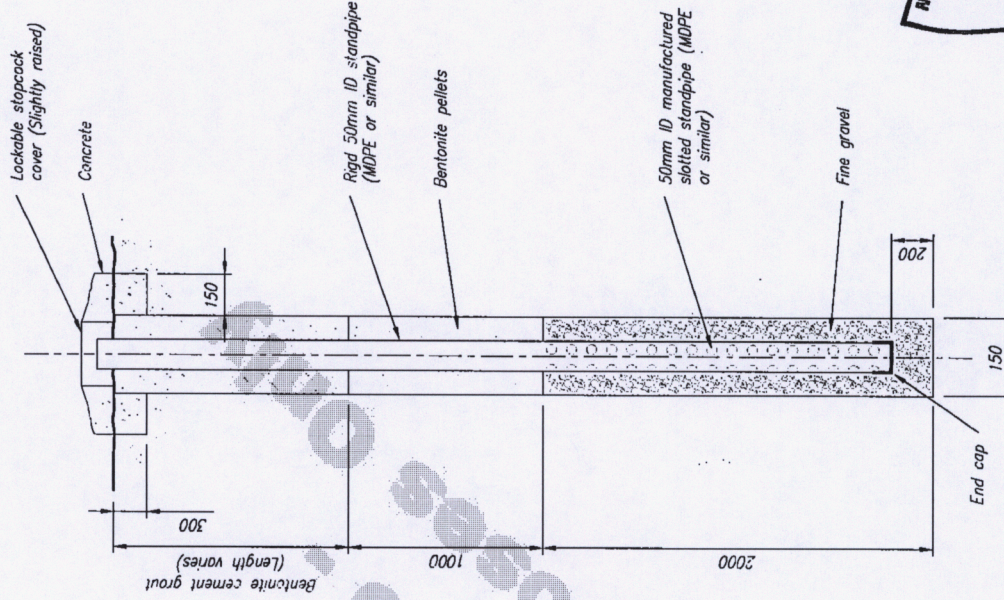


TOWN CENTRE HOUSING ASSOCIATION
TEL: 045 674411 - FAX: 045 674412

PA09




MONITORING WELL



PIEZOMETER

NOTE:
DIMENSIONS ARE IN MILLIMETRES.

NORTH TIPPERARY CO. COUNCIL
RECEIVED
- 8 AUG 2013
PLANNING AND DEVELOPMENT
FILE NO: 13 510 275

 Golder Associates <small>TOWN CENTRE HOUSE, DUBLIN ROAD, MAKEE CO. DUBLINE TEL: 01 454 6411 - FAX: 01 454 6412 - www.golder.com</small>	Client: Lisheen Milling Ltd.		Project number: 11.5071.5.02.26	Created By: POB	Issue to: To Lisheen Milling	Date: July '13	Version: A	PA10
	Location: Killoran, Thurles, Co Tipperary.		File Location: P:\PROJECTS\MINING\KILLORAN\11.5071.5.02.26 - VEHICULAR CONSTRUCTION\11.5071.5.02.26\11.5071.5.02.26.dwg	Checked by: CW	To North Tipperary County Council	Aug. '13	B	
	Project: Planning Application		ORDNANCE SURVEY IRELAND LICENCE NUMBER: AR00056013	Reviewed by: CW		Scale	Schematic only	