



Roinn na Mara agus Acmhainní Nádurtha

**WELCOME TO THE
AIRBORNE GEOPHYSICAL SURVEY
DATA RELEASE PROGRAMME
of the
EXPLORATION AND MINING DIVISION**

Phase 1

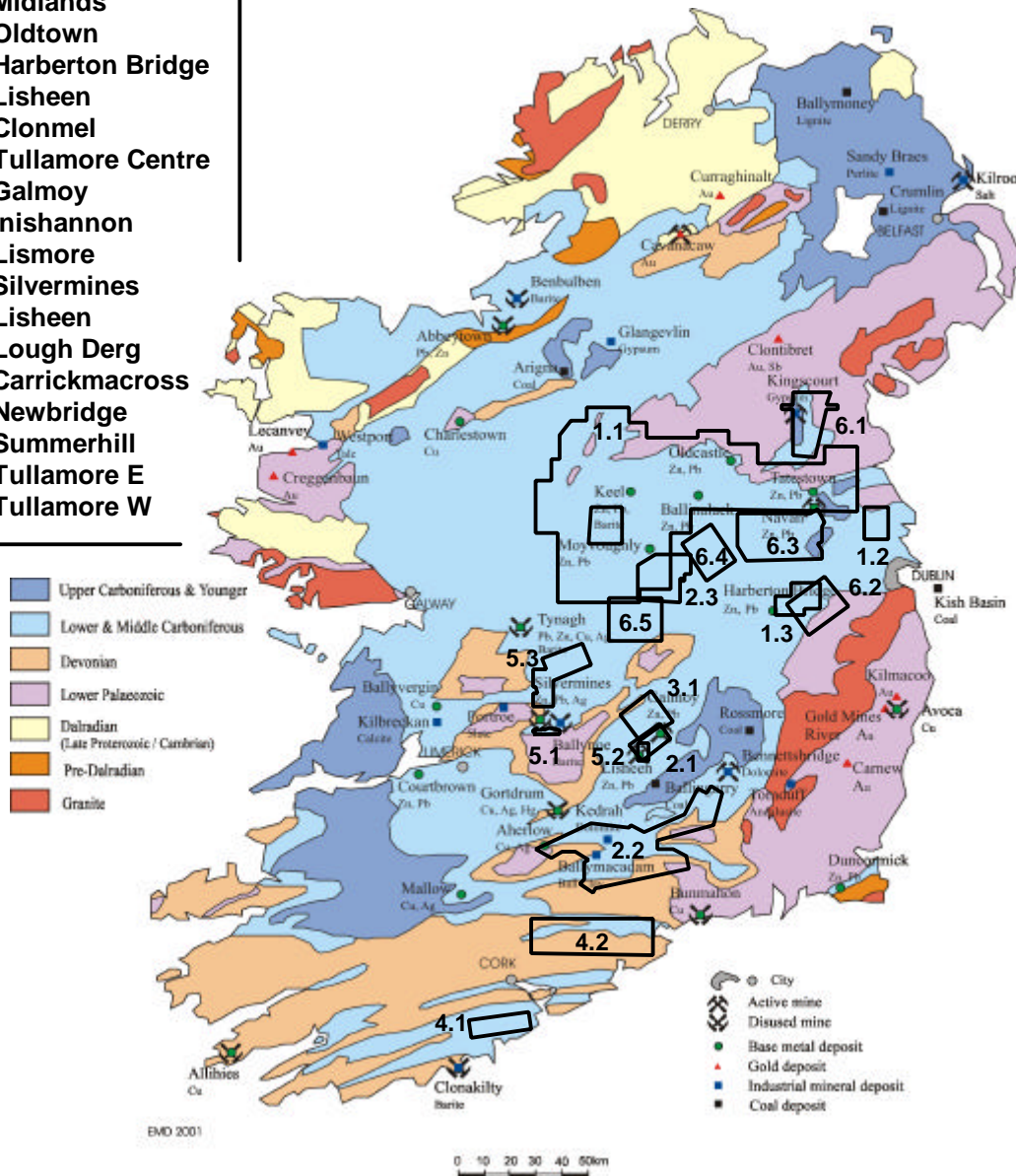
**THE MIDLANDS, OLDTOWN and
HARBERTON BRIDGE AREAS
IRELAND**

MAY 2001

AIRBORNE DATA RELEASE

The Exploration and Mining Division of the Department of Marine and Natural Resources is pleased to announce the phased release of airborne magnetic and TEM survey data acquired between 1995 and 1997 into the public domain. In fulfilment of our policy, all non-confidential digital and hardcopy data over 4 years old which was lodged with the EMD will be released. Surveys are indexed by survey and block number. Each survey will be released on a monthly basis between late May 2001 and October 2001, commencing with the Midlands, Oldtown and Harberton Bridge blocks which are available for inspection from 28th May.

- 1.1 Midlands
- 2 Oldtown
- 3 Harberton Bridge
- 2.1 Lisheen
- 2 Clonmel
- 3 Tullamore Centre
- 3.1 Galmoy
- 4.1 Inishannon
- 2 Lismore
- 5.1 Silvermines
- 2 Lisheen
- 3 Lough Derg
- 6.1 Carrickmacross
- 2 Newbridge
- 3 Summerhill
- 4 Tullamore E
- 5 Tullamore W



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EXPLORATION AND MINING DIVISION IRELAND

• LEAD • COPPER • GOLD • SILVER • BARYTES • GYPSUM • COAL • DOLOMITI

**THE NAVAN RESOURCES PLC / CECI
AIRBORNE MAGNETIC SURVEY (1995)
OVER THE MIDLANDS, OLDTOWN
AND HARBERTON BRIDGE AREAS**



**Department of the Marine
and Natural Resources**

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Compiled by

Orla Dardis

**EXPLORATION AND MINING DIVISION
MINERALS PUBLICATION MP 09/01**

MAY 2001

**ã Exploration and Mining Division 2001
Published by authority of the Minister for the Marine
and Natural Resources**

TABLE OF CONTENTS

	Page
INTRODUCTION	1
Survey Specifications	1
PROCESSING OVERVIEW AND DATA LISTING	3
Databases	4
Grids	4
Maps	4
Company Reports	5
Midlands Database Channels	5
Oldtown Database Channels	6
Harberton Bridge Database Channels	7

APPENDICES

Navan Resources Plc. Preliminary Operations Report	6pp
MIMEX Logistics Report	29pp

MAPS

Survey block outlines with Prospecting Licence Boundaries	1:250,000
Midlands Block: Preliminary TMI	1:100,000
Midlands Block: TMI	1:100,000
Midlands Block Structural Interpretation Map	1:250,000
Midlands Block: Microlevelled TMI on O.S. base	1:100,000
Oldtown Block: Final Levelled Magnetics on O.S. base	1: 50,000
Harberton Bridge Block: Final Levelled Magnetics on O.S. base	1: 50,000

C.D.

Publication and all original digital data

Introduction

Between August and November 1995 Navan Resources Plc and Carpenteria Exploration Company Ireland Ltd (CECI) flew a 26,500 line kilometre high-resolution helimagnetic survey over the Midlands. This survey is the first in a series of surveys, completed over four years ago, which are due for public release in fulfilment of the 'Open Skies' policy of the Exploration and Mining Division (EMD). The Division gratefully acknowledge the cooperation of Navan Resources Plc, particularly for releasing survey data over currently held ground, and the assistance of PGW Europe Ltd with data preparation.

At this time EMD is primarily concerned with prompt data release, so no attempt was made to reprocess or correct survey data. The data is released as submitted and no liability is accepted on the part of the EMD for data quality or accuracy. However, to facilitate ease of use additional work has been done to clarify some submitted items, and reproject various grids with several provided with an Ordnance Survey base map for ease of geographical reference purposes.

MIM Exploration Pty Ltd (MIMEX) conducted the survey using the High Sense Geophysics 'MiniMag' towed bird helicopter system. Three separate blocks were flown (see map).

- Midlands 25077 line km. 4500 sq.km
- Oldtown 649 line km. 100 sq. km
- Harberton Bridge 527 line km. 120 sq. km

Magnetics, radar altimeter and navigation data was acquired during the survey. All preliminary processing including tie line levelling, was carried out in the Irish field office by MIMEX. Final data processing was carried out by GeoImage in Australia. The data was originally submitted on Exabyte and DAT tapes. However some of these tapes could not be read so all available survey data was resubmitted on CD.

The preliminary operations report submitted with the data summarises the operation methodology and survey specifications while the logistics report outlines the data acquisition and processing procedures used by MIMEX. A listing of all digital and hardcopy data (databases, grids, maps and company reports) lodged with the Exploration and Mining Division is included in this publication and outlined below.

Survey Specifications

These were as follows:

Flight Line Spacing:	200m (Midlands & Oldtown), 300m (Harberton Bridge)
Flight Line Direction	North/South
Tie Line Spacing	1000m - 2000m
Tie Line Direction	East/West
Nominal Flying Height	Bird - 120 feet (36.4m), Helicopter - 180 feet (54.5m)
Nominal Survey Speed	140 km/h (40 m/s)
Average Sample Spacing	4m
Total Survey Area	approx. 4700 km ²
Total Line Km	approx. 26253 km
Resolution	0.0001 nT
Sensitivity	0.01 nT
Sample Rate	0.1 sec (≈ 4m)
Mounting	Towed Bird
Tow Cable Length	75 feet (23 m)
Sensor	Scintrex CS-2A, optically pumped

The GPS antenna was mounted on the tail section of the bird. The sensor height was recorded using a radar altimeter also mounted on the bird with a height accuracy of approximately ± 2 feet. Survey lines were flown using real time differentially corrected GPS positioning with an accuracy of approximately ± 2 m after post-processing. A table of heading corrections was also derived to compensate for flight direction changes during surveying. Details of the Navigation System, Magnetometer and Altimeter specifications and calibrations are provided in the MIMEX report.

Processing Overview and Data Listing

The information provided in this section was derived from the submitted reports, examination of the data sets and communication with Navan Resources Plc.

All preliminary processing up to and including tie line levelling was carried out in the Irish field office by MIMEX. Final micro-levelling was done in Brisbane by Geolmage using the Intrepid micro-levelling software. GeoImage reprocessed the data from its raw stage. It is not clear if the GeoImage database or the preliminary MIMEX database (processed in Ireland) was the dataset submitted to EMD. For the Midlands block, the submitted GeoImage TMI grid was filtered and enhanced relative to the final magnetic channel in the database.

During processing, IGRF and diurnal effects were removed from the data and a heading correction applied. No IGRF channel exists in the Midlands block database and therefore it is not clear at what stage the IGRF was removed. The diurnal was subtracted from the data. Average base station readings were then added to approximate the total field (Midlands 48870.199 nT, Oldtown 48828.932 nT, Harberton Bridge 48843.051 nT). According to the MIMEX report, during the processing, the data was profile edited to remove data spikes resulting from spurious noise and culture. There appears to have been little culture removal carried out.

Where insufficient information rendered submitted grids unusable, the grids were reproduced by EMD. Files with ‘_emd’ in the filename were created in EMD. In the MIMEX report (section 7.3) there seems to have been some confusion regarding the correct coordinate system to use and various systems are listed. The coordinate system of the GeoImage grids supplied by Navan Resources Plc for the Midlands block (see section 7.3 and 7.9 of the MIMEX report) could not be reproduced. These grids seem to have been created using the UTM_X and UTM_Y channels of the Midlands database. No documentation for the database channels was submitted for the survey but where possible the database channels are described.

To provide the GeoImage grids in a usable coordinate system a TM65 datum UTM 29N projection was assumed. The grids were then reprojected to ING coordinates. A shift was then applied (Easting -54 m, Northing $+20$ m) based on the average error, to render the grids in a usable coordinate system. Both the original and reprojected grids are supplied. The reprojected grids have a ‘_emd’ label and the error in position is estimated at approximately ± 20 m. For all grids, a grid cell size of 25% of the survey line spacing was used.

Databases

The databases were supplied in Geosoft Database Format (GDB). They can be supplied as ASCII xyz on request.

Database	Number of Channels	Approx. Size (Mb)	File Name
Midlands	21	197	midlands
Oldtown	22	25	oldtown
Harberton Bridge	21	21	harberton

Grids

The following grids are available, reproduced where required by EMD.

Block	Grid	Grid Name
Midlands	Microlevelled TMI (unknown coordinate system)	Ulmag.grd
Midlands	Microlevelled TMI (ING)	Ulmag_emd.grd
Midlands	Microlevelled TMI reduced to pole (unknown coordinate system)	Ulrtp.grd
Midlands	Microlevelled TMI reduced to pole (ING)	Ulrtp_emd.grd
Midlands	1 st vertical derivative of microlevelled data (unknown coordinate system)	U11vd.grd
Midlands	1 st vertical derivative of microlevelled data (ING)	U11vd_emd.grd
Midlands	Low pass filtered cut off at 2.5 cycles/km with roll off (unknown coordinate system)	Ullp25.grd
Midlands	Low pass filtered cut off at 2.5 cycles/km with roll off (ING)	Ullp25_emd.grd
Midlands	Low pass filtered cut off at 6 cycles/km (unknown coordinate system)	Ullp6.grd
Midlands	Low pass filtered cut off at 6 cycles/km (ING)	Ullp6_emd.grd
Oldtown	Final levelled magnetics	oldt_tmi_emd.grd
Harberton Bridge	Final levelled magnetics	harb_tmi_emd.grd

Maps

- As supplied by Navan Resources Plc / CECI.

Survey Block Outlines with Prospecting Licenses	1:250,000	File Name: outline&pls.tif
Preliminary TMI for Midlands Block (for original data, no IGRF removal)	1:100,000	File Name: tmi_preliminary.tif
TMI for Midlands Block	1:100,000	File Name: tmi.tif
Structural interpretation map with magnetic lineaments	1:250,000	File Name: NR95_mag_linears.tif NR95_mag_linears.dxf

As supplied by EMD with an Ordnance Survey base (using 1:50,000 O.S. Sheets).

Midlands	Microlevelled TMI	1: 100,000	File Name: mid_emd.tif
Oldtown	Final levelled magnetics	1: 50,000	File Name: oldt_emd.tif
Harberton Bridge	Final levelled magnetics	1: 50,000	File Name: harb_emd.tif

Company Reports

Two reports are available (see Appendices).

Navan Resources Plc	Preliminary Operations Report (6 pp)	File Name: NRprelim_ops_dd.pdf
MIMEX	Logistics Report (29 pp)	File Name: MIMEXlogistics_dd.pdf

Midlands Database Channels

CHANNEL NAME	DESCRIPTION	UNITS
X	ING coordinate system (TM projection, Airy Modified 1849 Datum)	metres
Y	ING coordinate system (TM projection, Airy Modified 1849 Datum)	metres
FIDUCIAL	FIDUCIAL	seconds
UTM_X	WGS84 UTM 29N ???	metres
UTM_Y	WGS84 UTM 29N ???	metres
RAD_ALT	Radar Altimeter	feet
GPS_HT	DGPS Altitude	feet
WKSEC	seconds of the week	sec
PDOP	satellite parameter	?
SATS	satellite coverage	
BASE_COR	?	feet?
BASE_ALT	?	?
DOS_CLK	?	?
LAT	Latitude (Airy Modified 1849 Datum)	decimal degrees
LON	Longitude (Airy Modified 1849 Datum)	decimal degrees
RAW_MAG	Raw uncorrected Magnetics	NanoTeslas
DIURNAL	Diurnal Reading	NanoTeslas
MAG_COR	Diurnal corrected Mag [RAW_MAG - DIURNAL]	NanoTeslas
SURVEY_MAG	Diurnal corrected Total Mag [MAG_COR+48870.199]	NanoTeslas
SURVEY_MAG_HEADED	Heading Corrected Mag	NanoTeslas
LEVELLED_MAG	Final levelled Mag channel	NanoTeslas

Oldtown Database Channels

CHANNEL NAME	DESCRIPTION	UNITS
X	ING coordinate system (TM projection, Airy Modified 1839 Datum)	metres
Y	ING coordinate system (TM projection, Airy Modified 1839 Datum)	metres
UTM_X	WGS84 UTM 29N ?	metres
UTM_Y	WGS84 UTM 29N ?	metres
RAD_ALT	in ft	feet
GPS_HT	in ft	feet
WKSEC	seconds of the week	sec
PDOP	satellite parameter	?
SATS	no of satellites	
BASE_COR	in feet?	feet?
BASE_ALT	?	?
DOS_CLK	?	?
LAT	Latitude (Airy Modified 1839 Datum)	decimal degrees
LON	Longitude (Airy Modified 1839 Datum)	decimal degrees
RAW_MAG	Raw uncorrected Magnetics	NanoTeslas
DIURNAL	Diurnal Reading	NanoTeslas
IGRF	IGRF	NanoTeslas
MAG_COR	Diurnal corrected Mag [RAW_MAG - DIURNAL]	NanoTeslas
SURVEY_MAG	Diurnal corrected total Mag [MAG_COR+48828.932]	NanoTeslas
SURVEY_MAG_HEADED	Heading Corrected Mag	NanoTeslas
MAG_IGRF	IGRF corrected Mag [Survey_Mag_Headed -IGRF]	NanoTeslas
LEVELLED_MAG	Final levelled Mag channel	NanoTeslas

Harberton Bridge Database Channels

CHANNEL NAME	DESCRIPTION	UNITS
X	ING coordinate system (TM projection, Airy Modified 1839 Datum)	metres
Y	ING coordinate system (TM projection, Airy Modified 1839 Datum)	metres
UTM_X	WGS84 UTM 29N ?	metres
UTM_Y	WGS84 UTM 29N ?	metres
RAD_ALT	in ft	feet
GPS_HT	in ft	feet
WKSEC	seconds of the week	sec
PDOP	satellite parameter	?
SATS	no of satellites	
BASE_ALT	?	?
DOS_CLK	?	?
LAT	Latitude (Airy Modified 1839 Datum)	decimal degrees
LON	Longitude (Airy Modified 1839 Datum)	decimal degrees
RAW_MAG	Raw uncorrected Magnetics	NanoTeslas
DIURNAL	Diurnal Reading	NanoTeslas
IGRF	IGRF	NanoTeslas
MAG_COR	Diurnal corrected Mag [RAW_MAG - DIURNAL]	NanoTeslas
SURVEY_MAG	Diurnal corrected Total Mag [MAG_COR+48843.051]	NanoTeslas
SURVEY_MAG_HEADED	Heading Corrected Magnetics	NanoTeslas
MAG_IGRF	IGRF corrected Mag [Survey_Mag_Headed -IGRF]	NanoTeslas
LEVELLED_MAG	Final levelled Mag channel	NanoTeslas