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Summary	This guideline is a data archive standard for seismic data. It defines the format of data and information produced from the acquisition of multi (2D, 3D &4D) and single channel/sub bottom profiler seismic data for Marine Geophysical survey. Used correctly the guideline facilitates easy use and reuse of the data. A template to record metadata is also provided if required.
Keywords	Geology, Natural Hazards, multi channel seismic reflections systems, single channel seismic reflection systems

Change history		
Version	**Date**	**Change**
1.0	04/01/2012	First draft of document
1.1	24/01/2012	QC release
1.2	02/02/2012	INSPIRE assessment finalised; changes incorporated following QC process; Draft for MEDIN review release

1.3	30/03/2012	Changes incorporated following review process; final release
1.4	31/1/2014	Converted into updated format

1 Introduction

1.1 What are MEDIN compliant data?

There are 3 requirements to ensure that your multi and single channel seismic data are MEDIN compliant:

1) **You supply General Metadata about your data –** *See Appendix A*
2) **You supply Detailed Metadata about your data –** *This may be included in a survey/cruise report or as additional metadata – See Appendix B*
3) **Your data are in a format that MEDIN accepts –** *See Appendix C*

Example of a MEDIN compliant seismic dataset:

A file containing General Metadata (Appendix A)

A Survey Report that contains Detailed Metadata (Appendix B)

Data acquired through multi and single channel seismic techniques submitted in a well organised folder structure (Appendix C)

1.2 Scope

This guideline is a data archive standard for seismic data. It covers data acquired through multi and single channel seismic techniques. This guideline covers the raw data, methods used and the derived processed data. The guideline does not cover the derived data product track lines, contours, profiles, acoustic features and geologic feature interpretation. The guideline builds upon previous data management specification work undertaken by BGS in the Marine Survey Data Management Handbook (June 2009), the GeoSeas project and the practices of the Common Data Access Ltd (CDA) data archive, the Department of Energy and Climate Change (DECC) and the National Hydrocarbons Data Archive (NHDA).

The following Multi channel seismic techniques are covered by this guideline:

- 2D – a single seismic source and receiver array
- 3D – a multiple seismic source and/or multiple receiver array
- 4D – 2D or 3D survey shot over the same area at defined time intervals in order to ascertain and model changes over time

The following seismic sources are utilised in multi channel seismic techniques:

- Boomer (predominantly single channel use but can be used in multi channel set ups)
- Sparker
- Air gun
- Water gun
- Marine Vibrator

Data acquired through single channel seismic techniques, commonly known as sub-bottom (acoustic) profiler (SBP) covers a variety of seismic systems of differing power and frequency:

- Pinger
- Parametric Echosounder
- Chirp
- Boomer
- Sparker
- Mini Air Gun

1.3 Archiving Data

The British Geological Survey (BGS) is the MEDIN Data Archive Centre (DAC) responsible for archiving seismic data around the British Isles. Contact details are provided below.

Contact Details:

British Geological Survey

Email: offshoredata@bgs.ac.uk

Telephone: +44(0)131 6500275

1.4 Summary of the information required

A General Metadata:

This section lists the general metadata that should be provided with your data.

You can use the form here to record your General Metadata and can find additional information in Appendix A

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if your data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. If your collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

What is a Survey/Project?

A **survey** is a uniquely identifiable programme of data collection such as a research cruise, moored instrument deployment or survey event. This information is likely to be the same for all sample events (e.g. stations) and subsamples in a given data set such as a cruise. Note that in the event that these are not common to all sample events then they should be specified for each one.

A **project** is a collection of surveys that have been completed for a common purpose. For example: an environmental impact assessment composed of a number of separate surveys; scientific research composed of a number of different research cruises; a legislative monitoring programme which is conducted each year over several years. A project is usually funded by the same organization(s) for its lifetime.

Survey Information:

This information is mandatory and **must** be supplied with your data to ensure it can be reused:

1. surveyName
2. surveyType
3. surveyAbstract
4. surveyCode
5. originator
6. owner
7. surveyStartDate
8. surveyEndDate
9. timeZone
10. spatialCRS
11. positionFix
12. horizontalAccuracy

Additional items:
Please provide as much of the following information as possible to help others assess your data:

Survey Information:

1. originalCRS
2. transformation
3. depthCRS
4. verticalAccuracy
5. platformType
6. platformName
7. cruiseReportReference
8. confidentiality

Project Information:
Please provide as much of the following information as possible if your survey forms part of a wider project:

1. projectName
2. projectCode
3. projectStartDate
4. projectEndDate
5. projectWebsite

B Detailed Metadata:

This section lists the detailed metadata that should be collected with your data.

You can use the form here to record your Detailed Metadata and can find additional information in Appendix B. This information can be supplied in a cruise or survey report.

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

Method Information:

This information is mandatory and **must** be supplied with your data to ensure it can be reused:

1. methodID
2. systemMountingPoint[1]
3. systemMounting[1]
4. systemDetails[1]
5. configType[2]
6. sourceType
7. sourceDetails[2]
8. streamerDetails[2]
9. sourceDescription[2]
10. receiverType

Additional Items:

Please provide as much of the following information as possible to help others assess your data:

Method Information:

1. serialNumber[1]
2. systemFreqType[1]
3. systemFreq[1]
4. freqUsed[1]
5. depthRange[1]
6. penetrationCapability[1]
7. receiverDescription[2]
8. channels[2]
9. otherSystemDetails[2]
10. acquisitionSoftware
11. acquisitionSoftwareVersion
12. processingSoftware
13. processingSoftwareVersion
14. storageMedium

[1] Single Channel Seismic data only
[2] Multi Channel Seismic data only

15. storageFormat
16. seismicProducts[1]
17. surveyPersonnel
18. surveyNotes
19. proceduresUsed
20. processingOrganisation
21. processingPersonnel
22. processingNotes
23. processingQCNotes
24. qualityControlScheme

[1] Single Channel Seismic data only

C Data:

This section gives a summary of the required data content and format for

Station Information

Single Channel/Sub-Bottom Profiler Seismic Data

and

Multi Channel Seismic Data

You can find additional information in Appendix C.

Format

Seismic data are logged in a variety of industry formats according to the survey acquisition systems and software utilised by the survey organisation. Survey acquisition software that routinely log the information listed below comply with MEDIN data guidelines. See Appendix C for further details.

Guidance

What is a Station?

A station refers to a specific target location of sampling. It is useful to record the station position in addition to the data, for example if you are returning to a fixed target station as a basis for repeat replicate sample events and for repeat monitoring surveys.

Station Information:

Please provide as much of the following information as possible if your sampling takes place at defined stations:

1. stationID
2. geometry
3. primaryLatitude
4. primaryLongitude
5. secondaryLatitude
6. secondaryLongitude
7. originalCoordinates
8. positionFixMethod

Single Channel Seismic Data (Processed Sub-Bottom Profiler Data)

This information is mandatory and **must** be supplied as part of processed, gridded data (commonly used software routinely log this information):

1. dateTime
2. fixPing
3. XCoordinate
4. YCoordinate

Additional Information:

Please supply as much of the following information as possible to help others assess your data (your software may already log this information):

1. KPDistanceAlong
2. heading
3. distanceCrossCourse
4. ZCoordinate
5. soundVelocity
6. cableOutLaybackSource
7. cableOutLaybackPhone
8. referencePoint
9. SCSFile
10. geometry

Multi Channel Seismic Data

Seismic data are logged using standard industry formats; please refer to the following standards:

UK Oil and Gas Common Data Access Limited: http://www.cdal.com/cda-documents/index.cfm

National Hydrocarbons Data Archive:
http://www.bgs.ac.uk/nhda/docs/NHDA_Data_Standards_and_Formats.pdf

2 Guidance

2.1 Background to Data Guidelines

The Marine Environmental Data and Information Network (MEDIN) is working towards creating a framework of consistent standards covering the major types of data collection undertaken in the marine environment around the UK. The principle benefits of this suite of standards are:

- Allows contracting organisation to easily specify a format that data should be returned in that can be readily used and includes all relevant attributes
- Provides a consistent format for contractors to work to (rather than a different format for each contract)
- Data can be readily exported to Data Archiving Centres and other users
- Instils good practice amongst users

Each standard defines the data and information that must be stored with a particular data type to ensure it can be readily used and reused. As this type of information is specific for different data types, guidelines are developed for each type. This document describes one such format. Other standards can be accessed through www.oceannet.org.

2.2 Using this Data Guideline

The data guideline is split into sections that refer to information that should be collated at different levels as shown below:

A General Metadata
B Detailed Metadata
C Data

A General Metadata
The General Metadata tables are common to all Data Guidelines and so only need to be completed once for a survey even if a number of different techniques and data guidelines are used.
Survey - a uniquely identifiable programme of data collection such as a research cruise, moored instrument deployment or survey event
Project - a collection of surveys that have been completed for a common purpose

B Detailed Metadata
The detailed metadata are specific to a technique of data collection (e.g. trawl, grab etc) and are subsequently specific to each Data Guideline.

Method – Details of any method or instruments used to collect the data

C Data

The tables in the Appendices outline the data fields, a description and, where available, a controlled vocabulary and/or format which should be used to store the data. Each field is either mandatory, conditional or optional as indicated by M, C, or O respectively. Conditional means that the field must be completed if a value is known
In the event that historical data which does not have all the necessary mandatory fields is being configured into this guideline, then it is permissible to use the following entry terms:

Term	Description
unknown	The correct value is not known to and not computable by the creator of this information. However a correct value probably exists.
inapplicable	There is no appropriate value. To be used in cases where metadata elements cannot be set null due to schema constraints.

In some cases it may be necessary to extend this guideline for a specific purpose such as a specific exchange of data between applications or to fulfil the needs of a specific project. This is permissible, however we advise that the broad structure and format is maintained and that where possible controlled vocabularies are used. As any extension to the structure and format may be useful for other organisations please inform MEDIN of further agreements.

2.3 Controlled Vocabularies

MEDIN makes use of controlled vocabularies (sometimes called “Term Lists”) to ensure that information provided alongside data is unambiguous. The available catalogues of controlled vocabularies used for this MEDIN data guideline are provided primarily by SeaDataNet, the International Council for the Sea (ICES) and EPSG. If a term is not available in a recommended list then please contact MEDIN to arrange for the term to be added.

The SeaDataNet list may be viewed at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp. By clicking on the list any term may be searched for by using the drop-down menus or all terms viewed by clicking search. The terms may be viewed in groups of 15 or may be downloaded into an excel file.

The ICES Controlled Vocabularies are available at http://vocab.ices.dk/
Use the search box to find term lists, you can also select the theme you require to filter your search. The results are shown for the selected list and may be downloaded into MS Excel by selecting the Excel symbol at the top right of the list.

The EPSG database of coordinate reference systems (http://www.epsg-registry.org/) provides a dictionary of reference systems with a code for each entry. In brief, to find a code, enter the title (e.g. WGS 84) into the ‘Name’ field and click search. The name, code and further information is displayed. If you are looking for a specific type of reference system such as ‘vertical’ then click in the ‘Type’ box, hover over coordinate reference system and click on vertical and then click the search button and all recorded vertical reference systems are shown. If you want to search for a reference system in a particular part of the world (e.g. Northern Ireland Grid) the you may do so by submitting a term to the ‘Area’ box or fill out the lat and longs then click search. The website also provides a database of the reference systems and web services to access the information.

2.4 Relationship between MEDIN data guidelines and MEDIN discovery metadata

The MEDIN discovery metadata format is aimed at allowing the non-informed user to discover data sets and it is likely that one 'discovery' data set record will contain a large range of data types that are in turn covered by a range of data guidelines. To enable individuals to reuse data of a specific nature (e.g. benthic invertebrate data) then related information must be collected (e.g. data owner, reference systems used etc). Some of the information which is collected in the General Metadata in a data guideline is also required to create a discovery metadata record. Who creates the MEDIN discovery record for a dataset is case specific and dependant on the organisation, and the relationship it has with a Data Archive Centre. However it is intended that the information collected at the 'Survey Information' level is reused for creating a MEDIN discovery metadata record. Further details are available on the MEDIN website which demonstrate clearly which fields in the MEDIN Data Guidelines can be reused for which elements in the MEDIN Discovery Metadata Standard.

2.5 Updates and Feedback

If you have any comments or feedback on this guidelines please contact enquiries@oceannet.org . Standards develop over time and it is likely that this standard will change in the future. We advise that you return to the MEDIN website to identify new versions and that you sign up to the MEDIN Standards e-mail listing (e-mail enquiries@oceannet.org) and Marine Data News to be kept informed of developments.

Appendix A

General Metadata:

This section describes the general metadata that should be provided with your data.

You can use the form here to record your General Metadata

The General Metadata fields are common throughout all MEDIN data guidelines and only need to be given once and referenced if your data set is composed of many data types and therefore conforms to a number of MEDIN Data Guidelines. If your collection of data forms part of a wider project or time series then the **Project Information** must be recorded but if the work is a small survey then project details may not be required.

A.1 Guidance:

Detailed descriptions and examples are given below to help you create General Metadata to accompany your data.

Survey Information:
This information **must** be supplied with your data to ensure it can be reused:

Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
surveyName	M	Title of the survey	Free text;	2004 CCW Menai Strait benthic monitoring survey
surveyType	M	Category of survey for use in subsequent searching for certain types of surveys.	Controlled Vocabulary; OGP SSDM WORK_CATEGORY Domain;	Geophysical and Hi-Res Seismic (Analogue and Digital Survey) **Or** Free text; Oceanographic; benthic biology; fish stock

	surveyAbstract	M	Brief description of the purpose of the survey and other types of measurements that were made for the survey.	Free text;	Survey was the first in a series of 3 in 2010 whose specific aim was to identify sites suitable for further monitoring. Geophysical techniques were used in combination with grabs and cores to assess seabed type.
	surveyCode	M	A unique code for the survey to allow links to be built between this and sample event data, (the cruise identifier code could be used). To ensure uniqueness, it is recommended that the website of the organization responsible for the work is used followed by a unique code designated by the responsible organization.	Free text;	http://www.noc.ac.uk/JCR3022; http://www.bennett.ac.uk/RIBJULY_03_01
	originator	M	The organization that has created the dataset. If the organization is not in EDMO please contact enquiries@oceannet.org to add it. If a person who is not associated with any organization generated the data then please provide the name in the sample event table.	Controlled vocabulary: European Directory of Marine Organizations at http://seadatanet.maris2.nl/edmo/	28: Centre for Environment, Fisheries and Aquaculture Science, Lowestoft Laboratory 2588: ABP Marine Environmental Services Ltd
	owner	M	Organization that owns the data set. If the organization is not in EDMO please contact enquiries@oceannet.org to add it.	Controlled vocabulary: European Directory of Marine Organizations at http://seadatanet.maris2.nl/edmo/ ;	78: Department of Environment Fisheries and Rural Affairs 53: BP Exploration and Production

	surveyStartDate	M	The date and time that the survey started.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-01-24 12:33:00
	surveyEndDate	C	The date and time that the survey ended. May be left null if the survey is ongoing.	Date or DateTime; yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-02-16 16:33:00
	timeZone	M	Give the time zone in which the date and time of the data acquisition is made (preferably Coordinated Universal Time (UTC))	Free text;	UTC
	spatialCRS	M	Spatial coordinate reference system. Describes the system of spatial referencing. i.e. the datum used to supply the decimal latitudes and longitudes. (See section 1.4 on accessing controlled vocabulary lists). There are additional fields to indicate the datum of the original data if the coordinates have been transformed.	Controlled vocabulary: EPSG Geodetic Parameter Dataset at http://www.epsg-registry.org/	**WGS84** code: EPSG::7030; **British National Grid** (projected) code: EPSG::27700; **ETRS89 / UTM zone 28N** code: EPSG::25828; **ETRS89 / UTM zone 29N** code: EPSG::25829; **ED50** code: EPSG::4230; **UTM31N** code: EPSG::23031
	positionFix	M	Position fix method and source. Give the method and source of the position fix instrument.	Free text;	Differential GPS taken from the ships navigation equipment. 4 point satellite fix achieved
	horizontal Accuracy	M	Horizontal positional accuracy. How accurate the spatial positions are likely to be.	Decimal; units = metres	15.2

Additional Items:
Please provide as much of the following information as possible to help others assess you data:

Survey Information:

Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
originalCRS	C	Datum of original coordinate if different from the one used to supply data.	Controlled vocabulary: EPSG Geodetic Parameter Dataset at http://www.epsg-registry.org/ or other defined coordinate reference system register;	
transformation	C	Transformation used to create decimal degrees if transformation undertaken.	Free text;	Data was converted from OSGB to WGS84 in ArcGIS using the petroleum transformation.
depthCRS	C	Depth coordinate reference system. Give the reference to which the depth has been calculated e.g. Ordnance Datum Newlyn; Highest Astronomical Tide. Mandatory if seabed depths are given for each sample. See section 1.4 on accessing controlled vocabulary lists.	Controlled vocabulary: EPSG Geodetic Parameter Dataset at http://www.epsg-registry.org/;	**Ordnance Datum Newlyn** code: EPSG::5701 **Malin Head height** code: EPSG::5731
vertical Accuracy	C	Vertical positional accuracy. How accurate the vertical resolution is. Must be provided if seabed depths are given.	Decimal; units = metres	0.5

	platformType	O	The platform type (e.g. Research Vessel) from which the sampling device was deployed.	Controlled vocabulary: SeadataNet Platform Classes, **Table L06** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp;	31: Research Vessel; 13: beach/intertidal zone structure; 48: mooring; 71: human
	platformName	C	Mandatory if a vessel was used for the survey. The name of the ship from which the sampling device was deployed. If your ship is not on the list please contact accessions@ices.dk	Controlled vocabulary: ICES Reference Codes, **Table SHIPC** at http://vocab.ices.dk/	74LG: Lough Foyle AA30: Unspecified Ship 74E9: Cefas Endeavour AA36: Unspecified Fishing Vessel AA33: Unspecified Self-Propelled Small Boat
	cruiseReport Reference	O	Cruise report or boat log reference if applicable.	Free text; in reference format.	Litt, E.J. 2009. PHiXT 4. 30 July to 2 August 2009 RV Prince Madog POL Coastal Observatory Liverpool Bay Cruise Report. POL Coastal Observatory, Liverpool.
	confidentiality	O	Note if the survey is confidential	Free text;	Restricted access; Public;

Project Information:
Please provide as much of the following information as possible if your survey forms part of a wider project

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	projectName	M	The nationally/ internationally accepted version of the project name.	Free text;	North Hoyle Windfarm EIA; Rapid Climate Change; Dogger Bank pSAC Monitoring Programme; EA Bathing Water Monitoring
	projectCode	M	Provide a code to uniquely identify the project and allow links to be made between the tables. To ensure uniqueness, it is recommended that the website of the data owner is used, followed by a unique code which should reflect the code used by the funding organization where possible. e.g. contract code.	Free text;	http://www.dassh.ac.uk/ME102; http://www.bodc.ac.uk/RCC;
	projectStart Date	M	The date that the project started which is from when the funding was in place to start. Use the 1st of the month if the exact date is not known.	Date; yyyy-mm-dd;	2001-01-24; 1973-01-01
	projectEndDate	C	The date that the project finished or is due to finish. Use the 1st of the month if the exact date is not known.	Date; yyyy-mm-dd;	2007-01-24; 1976-01-01
	projectWebsite	C	If a project website exists give the address. This should be the web address of the environmental survey and not, in the case of environmental impact assessments, the engineering development.	URL;	http://www.noc.soton.ac.uk/rapid/rapid.php

Appendix B

Detailed Metadata:

This section describes the detailed metadata that should be collected with your single or multi channel seismic data. It contains specific information about the methods used, the people/organisations that carried out the work and any calibrations that have been applied to the data.

You can use the form here to record your Detailed Metadata or it may be supplied in a cruise or survey report.

The Detailed Metadata fields are specific to each data guideline and should be completed for each type of data. The information requested here may be supplied as additional metadata or may be supplied in a cruise or survey report.

B.1 Guidance:

Detailed descriptions and examples are given below to help you create Detailed Metadata to accompany your data.

Method Information:

This information **must** be supplied with your data to ensure it can be reused:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	methodID	**M**	Method Identifier. A unique code for the methods to allow links to be built between this and sample event data.	Free text;	MBES4376, 02465, 02896
	systemMounting Point[1]	**M**	State the mounting of the system: Hull, Bow, Side, Pole/Rig, ROV, AUV, Towed	Free text;	Hull Mounted
	systemMounting[1]	**M**	Give details of SSS mounting arrangement and any additional positioning system utilised	Free text;	Geo-Spark 1kJ sub-tow spread with Simrad UBSL system

[1] Single Channel Seismic data only

systemDetails[1]	**M**	State the name and number of the SBP system used: manufacturer, and model	Controlled Vocabulary; SeaDataNet SeaVOX Device Catalogue, **Table L22** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp; or Free text if new system	6 & 16kJ Controlled Vocabularyspread
configType[2]	**M**	State the type of seismic configuration used	Controlled Vocabulary: SeaDataNet, Geo-Seas Seismic Survey Dimensionality, Table GS9 at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp	SR2D or Free text 2DHR, OBC, OBS, VSP
sourceType	**M**	Seismic Source Type	Controlled Vocabulary; SeaDataNet seismic source types, **Table L05** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp	airgun
sourceDetails[2]	**M**	State the source mounting details and ID for the (each) vessel. Use ship code and a numbering system to encode each source, direction starboard to port.	Free text; list separated by semi-colon if more than one source	0614-1 Starboard Source, 0614-2-Port Source

[1]Single Channel Seismic data only
[2] Multi Channel Seismic data only

	streamerDetails[2]	**M**	Document streamers used, linking to source number(s)	Free text; list separated by semi-colon if more than one source and streamer array or more than one streamer for a source	0614-1 Starboard Streamer - Upper 240 ch; 0614-1-Starboard Streamer Lower 240 ch; 0614-2-Port-120 ch
	source Description[2]	**M**	Give details of source mounting arrangment and any additional positioning system utilised.	Free text; list separated by semi-colon if more than one source	0614-1 Sercel GI Gun with DGPS buoy
	receiverType	**M**	Type of seismic reciever	Controlled Vocabulary; SeaDataNet Geo-Seas Seismic Receiver Types, **Table GSB** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp	Streamers

Additional Items:
Please provide as much of the following information as possible to help others assess you data:

Method Information:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	serialNumber[1]	**C**	Single channel only: State the serial number of the system	Free text;	1234567a
	systemFreqType[1]	**O**	State the system frequency setting capability	Free text;	Single, Swept (Chirp), Single with Swept (Chirp)
	systemFreq[1]	**O**	The quoted primary frequency (frequencies) of the system	Free text; units=kHz	15-20

[1] Single Channel Seismic data only

freqUsed[1]	**O**	State frequency/frequencies used	Free text; Units=kHz; separated by semi-colon if more than one used	15
depthRange[1]	**O**	Operating depth range of system	Free text; units=metres	<100m
penetration Capability[1]	**O**	Seabed penetration capability for the system	Free text; units=metres	<20-11000m
receiver Description[2]	**C**	Give details about the streamers along with any additional information	Free text; list separated by semi-colon if more than one source	Starboard streamers 120m long with tailbuoy and gyrocompass at centre; Port streamer 50m long with tailbuoy
channels[2]	**C**	Total number of channels for the survey	Integer;	96
otherSystem Details[2]	**O**	State any other notable details	Free text;	Front navigation float
acquisition Software	**O**	State data acquisition software used	Free text; separated by semi-colon if more than one software type used e.g. topside systems	IC-View data acquisition
acquisition SoftwareVersion	**O**	State data acquisition software version used	Free text; separated by semi-colon if more than one software type used e.g. topside systems	v 3.8.3
processing Software	**O**	State processing software used	Free text; separated by semi-colon if more than one software type used;	CodaOctopus data processing
processing SoftwareVersion	**O**	State processing software version used	Free text; separated by semi-colon if more than one software type used;	12.1

[1]Single Channel Seismic data only
[2] Multi Channel Seismic data only

	storageMedium	**O**	The storage medium used for the data	Free text;	1TB Portable Hard drive DVD Dell Precision R5500 4TB RAID 5 external hard drive
	storageFormat	**O**	Data format for logged data	Free text;	SEG-Y; JSF
	seismic Products[2]	**O**	Seismic products output/provided	Controlled Vocabulary; SeaDataNet Geo-Seas Seismic Data Product Types, **Table GSA** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp	Migrated
	survey Personnel	**O**	Names or the personnel who were involved in collecting and processing the data	Free text; full personnel names separated by semi-colon if a team collated the data;	Joe Bloggs; Brian Begger online surveyors and Jane Smith Data Processor
	surveyNotes	**O**	Any further notes on the acquisition that may be of relevance to data acquisition and processing.	Free text;	Due to rough weather the survey ceased for WOW at date/time, recommenced at date/time
	proceduresUsed	**O**	Any written methodology used should be referenced and linked. If the methodology is not referenced then provide a full description here.	Free text;	Methodology follows<survey company> operating guidelines from internal quality management system
	processing Organisation	**C**	The organization(s) that processed the data if different from the collector identified in 2.2 Originator. Contact MEDIN to add an organization to this list	Controlled vocabulary: European Directory of Marine Organizations at http://seadatanet.maris2.nl/edmo/	2588 ABP Marine Environmental Services Ltd

processing Personnel	**O**	Names of the personnel who were involved in processing the MBES data	Free text; personnel name(s) separated by semi-colon if more than one personnel involved; indicate organisation name in brackets if more than one organisation involved.	John Doe; Henry Rice (MEConsulting) QINSy Data Processing; Harriet Smith (MarineConsult) Charting; Jamie Creed (MarineConsult) Quality Control
processing Notes	**O**	Any further notes on data processing that may be of relevance e.g. line specific notes	Free text;	Streamer and source positioning by least squares adjustment of combined network of acoustic ranges. Depths uncorrected for speed of sound.
processingQC Notes	**O**	Any further notes on data processing quality that may be of relevance	Free text;	QC procedure applied using Integrated Management System procedures
qualityControl Scheme	**O**	Description of any quality control scheme that data were audited under during the processing	Free text;	Data audited using outcomes defined in scope of work

Data

This section gives a summary of the required data content and format for:

Station Information

Single Channel/Sub-Bottom Profiler Seismic Data

The forms here indicate which fields your multi channel or single channel seismic/sub bottom profiler dataset should contain.

The data content and format are specific to each data guideline and the relevant data guideline should be consulted for each type of data.

C.1 Well Organised Data

Where geophysical survey data are supplied to a Data Archive Centre (DAC), it is recommended that the data are incorporated within a standard documented folder structure as this reduces data archiving costs. For an example folder structure refer to the BGS Offshore Acquisition Folder Structure at http://www.bgs.ac.uk/downloads/start.cfm?id=2256.

An inventory of files and their respective sizes, and supply formats and media should be provided to the DAC. It is very important that a link can be made between the bathymetry data files and the bathymetry metadata information.

C.2 Data Format

Seismic data are logged in a variety of industrial formats according to the survey acquisition software utilised by the survey organisation.

Single Channel Seismic Data

Post-stack processed SEG-Y and/or TIFF are the preferred formats for data exchange with the Geology and Geophysics Data Archive Centre (BGS); where possible raw data should be supplied with processed data. Where navigation files are supplied with the data, P1/90 is the preferred format.

The SEG-Y (post 2000) format can be viewed at:
http://www.seg.org/documents/10161/77915/seg_y_rev1.pdf

UK Oil and Gas P-formats (for P1/90 navigation format):
http://www.ogp.org.uk/publications/geomatics-committee/p-formats-for-the-exchange-of-positioning-data/

Processed SBP data may be provided in GIS formats compliant with the following geometries/data types:

- TIFF/GeoTIFF at 300 dpi to depict sections of records. It is recommended that the file names reflect the survey and content of the file. TIFF files should be provided with accompanying geo-reference information in *.tfw format.

Due to the large size of digital SBP data files it is accepted that one survey will be constituted of several files of a manageable size.

Multi Channel Seismic Data
The following common industry formats are preferred for ingestion by the Geology and Geophysics Data Archive Centre (BGS):

- SEG-D
- SEG-Y (Including seismic velocity profiles)
- SEG RODE
- TIFF encapsulated SEG-D
- Scanned TIFF4 or JPEG for conventional and variable-density/dual polarity/rectified seismic sections (minimum resolution 400dpi, preferably 600dpi).
- Seismic velocity data (tables) in Esso V2, Shell V6 and ASCII

SEG standards can be viewed at:
http://www.seg.org/resources/publications/misc/technical-standards

As part of this process, survey metadata and navigation information is submitted with the seismic data itself in UK Oil and Gas P-formats, which is standard Industry practice (see http://info.ogp.org.uk/geodesy/p-formats.html). CDA specify the following standards for the following items:

- 2D Sail Lines - P1/90
- 3D Sail Lines – P1/90
- 3D bin grids – P6/98
- 3D bin centres – P1/90
- 3D OBC - SPS

SPS format can be downloaded from the SEG web site at:
www.seg.org/documents/10161/77915/seg_sps_rev0.doc

C.3 Guidance

Station Information

If your data collection took place at target stations, this information **must** be supplied with your data to ensure it can be reused:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	stationID	M	Station identifier. A unique identifier for the station.	Free text.	Stanton_Bank_station_4 (point); EastChan_Innerdover_se04; Liverpool_Dublin_ferry_route1 (transect); Lagan_Estuary (area)

	geometry	M	Description of station spatial form. Describe if the the fixed station is a point, transect (curve) or an area (surface).	Controlled Vocabulary; SeadataNet Geospatial Feature Type, **Table L021** at http://seadatanet.maris2.nl/v_bodc_vocab/welcome.aspx/;	004: Point; 003: Curve; 005: Surface;
	primaryLatitude	M	The primary latitude of the station must be given in decimal degrees. For a point this field is set to the point latitude; for a transect it is set to the latitude of the start of the transect; for an area it is set to the southern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	54.5837
	primaryLongitude	M	The primary longitude of the station must be given in decimal degrees. For a point this field is set to the point longitude; for a transect it is set to the longitude of the start of the transect; for an area it is set to the western edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-5.5837
	positionFix Method	M	Give the method and source of the position fix instrument	Free text;	Differential GPS taken from the ships navigation equipment. 4 point satellite fix achieved.

Additional Items:
Please provide as much of the following information as possible to help others assess your data:

	Field Title	MCO	Description	Recommended Controlled Vocabulary or Format	Examples
	secondary Latitude	C	The secondary latitude of the station must be given in decimal degrees. For a point this field is not required; for a transect, it is set to the latitude of the end of the transect; for an area it is set to the northern edge of the box. Units are positive North.	Decimal degrees; minimum of four decimal places.	55.7393
	secondary Longitude	C	The secondary longitude of the station must be given in decimal degrees. For a point this field is not required; for a transect it is set to the longitude of the end of the transect; for an area it is set to the eastern edge of the box. Units are positive east (West is negative, East is positive).	Decimal degrees; minimum of four decimal places.	-3.7394
	original Coordinates	C	Original coordinates and coordinate transformation technique. If coordinates were transformed from a different reference system into decimal degrees then the original coordinate and original coordinate reference system should be given, the method used to transform stated and any differences in the relative (significant figures) of the original transformation explained.	Free text;	SX498476, Coordinates were transformed from British National Grid using in house software 'BODC_transform'. The number of significant figures was reduced to 4 decimal degrees in line with the accuracy of the coordinate and transformation technique.

Single Channel Seismic/Sub Bottom Profiler Data

Survey acquisition software that routinely log this information comply with MEDIN standards and such data is considered to comply with MEDIN guidelines.

This information **must** be supplied with your data to ensure it can be reused:

Single Channel Seismic Data	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	dateTime	**M**	Date and time of data collection	yyyy-mm-dd or yyyy-mm-dd hh:mm:ss	2009-01-24 13:33:00
	fixPing	**M**	Numerical fix number applicable	Integer	
	XCoordinate	**M**	Longitude or Easting of the ping/fix according to defined coordinate reference system for survey. For longitude, east is positive and west is negative.	Decimal degrees; at least six decimal places or Decimal Number; Units = metres	-3.476363, 234865.55
	YCoordinate	**M**	Latitude or Northing of the ping/fix according to defined coordinate reference system for survey. For latitude, north is positive and south is negative.	Decimal degrees; at least six decimal places or Decimal Number; Units = metres	54.583736, 5963487.00

Additional Items:
Please provide as much of the following information as possible to help others assess your data:

	Field Title	M C O	Description	Recommended Controlled Vocabulary or Format	Examples
	KPDistance Along	**O**	Chainage according to kilometre post (KP) scheme or length and direction of programmed line/transect. May be negative value if data logging commences before start of line is reached.	Decimal kilometres for KP scheme, or decimal metres for distance scheme	1.005 or 1005

	heading	**C**	Vessel heading at fix/ping, where logged	Decimal ; units = degrees	125.6
	distanceCross Course	**C**	Distance of fish from programmed line/transect where logged from Ultra Short Baseline (USBL) position	Decimal ; Units = metres. A convention of positive/negative values is followed according to the left/right of line	
	ZCoordinate	**C**	Depth of fish, if system is not hull mounted, where logged	Decimal ; units=metres	-12.6
	soundVelocity	**O**	Sound velocity	Decimal ; units=m/s	1500
	cableOut LaybackSource	**O**	Layback if Ultra Short Baseline (USBL) positioning is not used	Decimal; units=metres	21.6
	referencePoint	**O**	Reference point can be stated to explicitly discriminate between Common Reference Point (CRP) or Fish Position	Free text;	fish position
	SCSFile	**O**	Option to provide link to SCS file logged at position	Free text; File name or hyperlink	pinger1234.sgy
	geometry	**C**	Storage of geometry	Controlled Vocabulary; SeadataNet Geospatial Feature Type, **Table L02** at http://seadatanet.maris2.nl/v_bodc_vocab_v2/welcome.asp;	Point

Multi Channel Seismic Data

Multi Channel Seismic Data are logged using standard industry formats; please refer to the following standards:

UK Oil and Gas Common Data Access Limited: http://www.cdal.com/cda-documents/index.cfm

National Hydrocarbons Data Archive:
http://www.bgs.ac.uk/nhda/docs/NHDA_Data_Standards_and_Formats.pdf

The term seismic data covers the following (based on NHDA Archive Handbook):

Field Data:

- Raw field seismic trace data
- Raw field navigation data
- Processed field navigation data

Pre-stack data:

- Unprocessed gathers
- Processed gathers
- Move-out data
- Pre-stack deconvolved data
- Pre-stack migrated gathers

Post-stack data:

- Raw stack unfiltered data
- Raw stack filtered data
- Raw migrated data
- Final post-stack data
- Specially processed data
- Seismic sections

Velocity data:

- Seismic velocity data and analysis (profile and tables)