Appendix A

Data Dictionary

Action Plan to Improve Effectiveness of EIA Process and Procedure in Sabah

Data Dictionary

Document Information

Project No.	62802200		
Project Title	Action Plan to Improve Effectiveness of EIA Process and Procedure in Sabah		
Subject	Data Dictionary		
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Current Revision Approvals

	Name / Title	Signature	Date
Prepared by	Siti Nurulfirdauz Binti Hashim	SNF	Apr 08, 2022
Reviewed by	Wong Lie Lie	WLL	Apr 08, 2022
Approved by	Wong Lie Lie	WLL	Apr 08, 2022

Document Revision History

Rev	Rev Date	Description of Change/ Reason for Issue	Prepared by	Checked by	Approved by
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05	Apr 08, 2022	Final Report to EPD	SNF	WLL	WLL

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CONTENTS

FIGURES

TABLES

ATTACHMENT

1 Introduction

This data dictionary is a document to guide environmental consultants for submission of spatial data to Environment Protection Department (EPD). This dictionary has been prepared primarily for the application of projects that are classified as Prescribed Activity under the Environmental Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) Order 2005 that requires submission of Proposal for Mitigation Measures (PMM) report or Environmental Impact Assessment (EIA) report.

This data dictionary is divided into three main chapters as described below:

Chapter 1: **Introduction** – Outlines the contents of this document and the basic requirements for spatial data submission including the minimum data to submit for PMM / EIA requirement, submission procedure, coordinate system, and metadata information requirement;

Chapter 2: **Shapefiles and Attributes** – Presents examples of spatial data submitted to EPD by categories (i.e., Built Environment, Demarcation, Geology, etc.). Features for each spatial data including feature name, feature type, and attributes is outlined in this chapter; and

Chapter 3: **Glossary** – Glossary of definitions for terms used in this document.

1.1 Data Submission

Consultants are required to submit spatial data during the submission of PMM or EIA reports to EPD. The spatial data submitted should correspond to the maps and figures presented in the PMM / EIA report submitted.

Unless otherwise stated or requested by EPD, consultants are required to submit the minimum spatial data as below:

1 Project location – mid-point, boundary point, boundary polygon (refer to Section 2.1);
2 Sampling stations – baseline and monitoring stations (refer to Section 2.10);
3 Proposed mitigation measures (refer to Section 2.9); and
4 Sensitive receptors and existing land use within the study area.

All spatial data shall be submitted in Borneo Rectified Skew Orthomorphic Projection (BRSO) coordinate system as detailed out in Section 1.2 and metadata information of each spatial data provided as per Section 1.3.

1.2 Coordinate System

The coordinate system for the spatial data is Borneo Rectified Skew Orthomorphic Projection (BRSO) with the parameters defined in Table 1.1.

Table 1.1   Borneo Rectified Skew Orthomorphic Parameters.

Item	Description
Name	Timbalai 1948 RSO Borneo Meters
Projection	Rectified Skew Orthomorphic Natural Origin
Longitude of Centre	115°E
Latitude of Centre	4°N
Azimuth	53°18′56.95′′ / 53.31582047908623
False Easting	0
False Northing	0
Scale Factor	0.99984
XY Plane Rotation	53.13010235415598
Datum	D Timbalai 1948
Units	Meters

1.2.1   Coordinate Transformation

Global Positioning System (GPS) and other positioning devices often utilise the Universal Transverse Mercator (UTM) System or the geocentric datum and geographic coordinate system known as the World Geodetic System (WGS) 1984. The transformation from UTM or WGS to BRSO coordinate system is to follow the transformation parameters set in the ESRI ArcGIS software as per Figure 1.1 and Table 1.2.
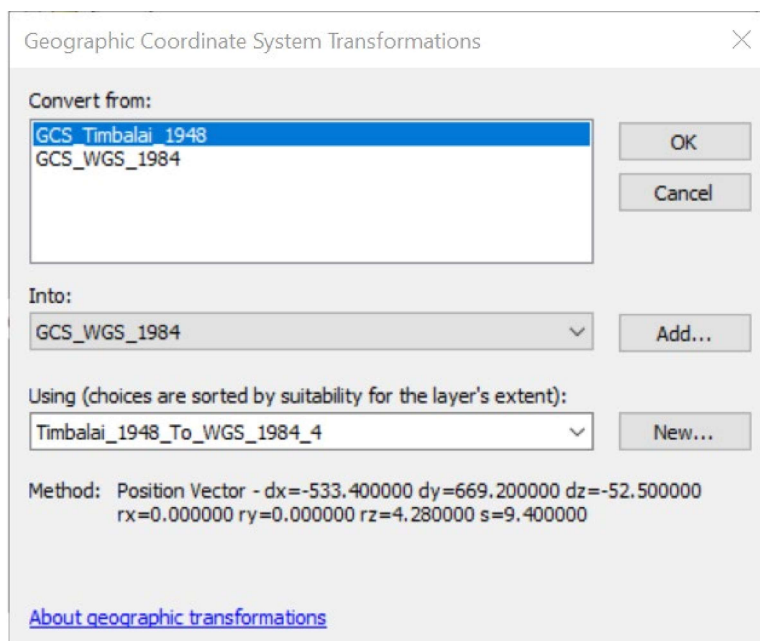

Figure 1.1   ArcGIS ESRI Software coordinate transformation dialog box between WGS and BRSO.

Table 1.2   Transformation parameters from UTM and WGS to BRSO.

Item	Parameter
Translation X (dx)	-533.4 m
Translation Y (dy)	669.2 m
Translation Z (dz)	-52.5 m
Rotation X (Rx)	0.0 "
Rotation Y (Ry)	0.0 "
Rotation Z (Rz)	4.28 "
Scale Factor	9.4 ppm

Consultants are responsible to ensure that all spatial data are defined as BRSO projection and are projected to the correct location. Generally, consultants need to confirm that the spatial data are projected to the correct location before doing any transformation. Below are Best Management Practices that can be applied by consultants to verify that the spatial data are projected to the correct location:

1   Data are based on licensed surveyor drawings and coordinates;
2   Data coincide with other shapefiles or layers from a trusted source such as shapefiles from government agencies, purchased satellite images etc.; and
3   When converting the data to Google Earth extension file (.kml/.kmz), the correct location is shown in Google Earth.

Refer to Attachment B on examples of coordinate transformation from WGS84 to BRSO using ArcGIS Software.

1.3   Metadata

Metadata is information about the data. Metadata records document the who, what, why, where, when, and how of a data resource and provide context for data consumers as to the content, extent, quality, purpose, intended use, and limitations of the resource. All spatial data must include metadata information. Minimum metadata information is as described in Table 1.3 with an example of a project boundary shapefile metadata information for a project. When using ESRI ArcGIS software, metadata information can be edited using ArcCatalog as shown in Figure 1.2.

Table 1.3 Metadata information.

Item	Description	Example
Tags	Non-hierarchical keyword or term assigned to the information	SEIA, Reclamation, Semporna
Summary	General description of the data resource content and features	Demarcation of [project title] boundary area
Description	Detailed description of data content including how data was derived, the purpose of data, date of data created etc.	Project boundary for Proposed [project title and date]. The Project footprint will cover a total area of approximately XX hectares (XX acres) and extends at its furthest point approximately 1 km out to sea. The Project encompasses XX hectares (XX acres) of existing land, XX hectares (XX acres) of reclamation, and XX hectares (XX acres) of water space. [Source of data e.g., drawing number or land title and date, company name of surveyor or engineer responsible for the drawing]
Credits	Source of data and contact information including detail on who developed and makes the data available.	[company name] [address] [telephone and fax no] [contact person] [email of contact person]
Use limitations	Information about data limitations (if any), e.g., data access limitations, excluded geographies or content, completeness, etc.	Confidential data
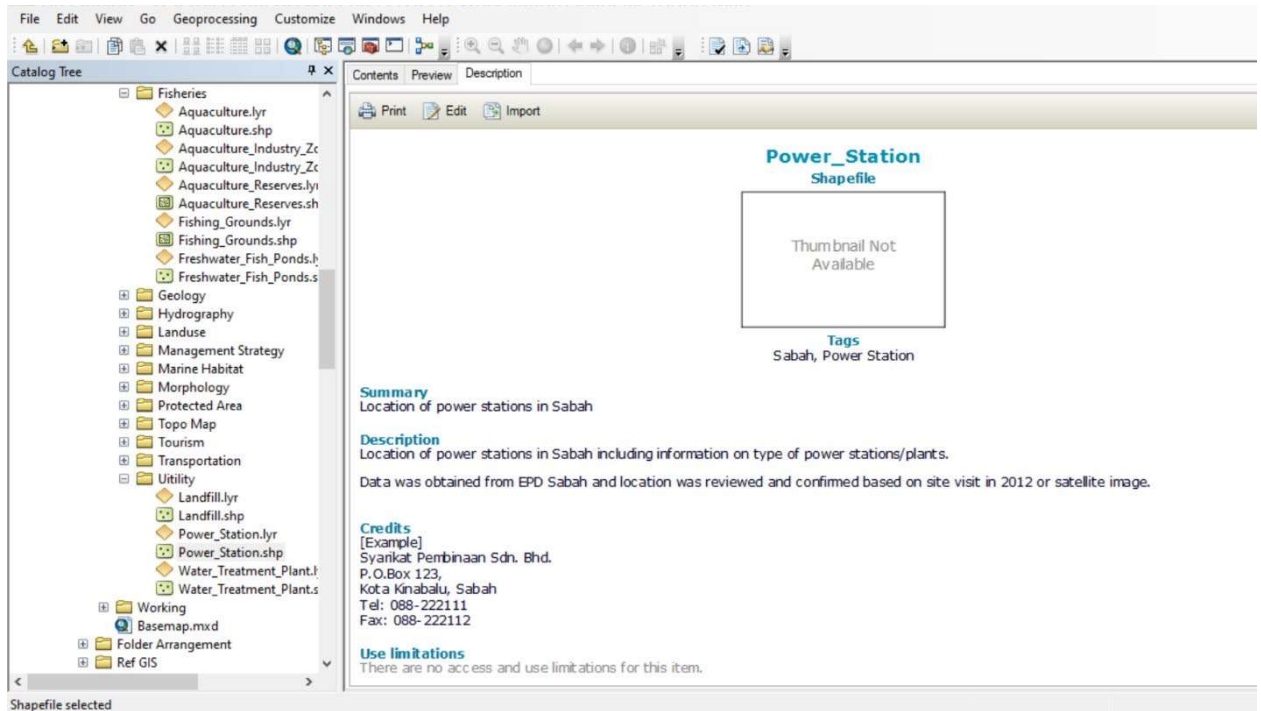
Figure 1.2   Example of metadata in ArcCatalog.

1.4   Submission Process

Spatial data shall be submitted together with the PMM / EIA report (saved in CD with the digital copy of the report). A Spatial Data Summary Sheet is to be appended with the spatial data submission. Incomplete information in the data sheet may result in discontinuation of the PMM / EIA report submission process. Refer to Attachment A for the Spatial Data Summary Sheet. This sheet can be downloaded from the EPD Website (https://epd.sabah.gov.my).

Below is the flowchart process on spatial data submission to EPD.

```
                    ┌─────────────────────┐          ┌─────────────────────┐
              ┌────→│   Submission of     │          │  Project Proponent  │
              │     │   Spatial Data      │          └─────────────────────┘
              │     └──────────┬──────────┘
              │                │                      ┌─────────────────────┐
              │     ┌──────────▼──────────┐           │         EPD         │
              │     │     Review of       │           └─────────────────────┘
              │     │   Summary Sheet     │
              │     └──────────┬──────────┘
              │         ┌──────┴──────┐
              │   ┌─────▼─────┐  ┌─────▼─────┐
              │   │ Incomplete │  │ Complete  │
              │   │Information │  │Information│
              │   └─────┬─────┘  └─────┬─────┘
              │   ┌─────▼─────┐  ┌─────▼─────┐
              │   │  Withhold  │  │ Proceed   │
              │   │  EIA/PMM   │  │ with      │
              │   │ submission │  │ EIA/PMM   │
              │   │  process   │  │submission │
              │   └─────┬─────┘  │  process  │
              │   ┌─────▼─────┐  └─────┬─────┘
              │   │   Update   │  ┌─────▼─────┐
              └───│  Summary   │  │ EIA/PMM   │
                  │   Sheet    │  │ Approval  │
                  │information │  │Conditions │
                  └───────────┘  └─────┬─────┘
```

Project Proponent

EPD

Submission of Spatial Data	
Review of Summary Sheet	
Incomplete Information	Complete Information
Withhold EIA/PMM submission process	Proceed with EIA/PMM submission process
Update Summary Sheet information	EIA/PMM Approval Conditions

Any changes required for the Spatial Data?

No — Yes

Proceed Ends

Proceed with signing the EIA/PMM Approval Conditions

Update and resubmit Spatial Data [1]

Acceptance of Spatial Data

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[1] Consultants required to resubmit the whole package of the spatial data.

2   Shapefiles and Attributes

Submission of spatial data in shapefile form (.shp) shall refer to the naming outline in this data dictionary with minimum attributes information as described below.

The sections below will outline details of each shapefile:

1. Name: name of shapefile;
2. Description: a general description of the shapefile;
3. Feature Type: selection of shapefile type either point, polygon, or polyline;
4. Attributes: naming system and minimum information required in the attribute table; and
5. Data Type: field data type when creating attributes.

Refer to Attachment C for examples of creating shapefiles and its field attributes in reference to this data dictionary using ArcGIS software.

2.1   Project Location

Name	Description	Feature Type	Attributes	Data Type
Project Area Mid-Point	Location of the project area (mid-point).	Point	Project_Ow: Project Owner / Proponent	Text (150)
			Activities: Project prescribed activity as per the Environment Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) (i.e., Agriculture, Forestry, Land Reclamation, etc.)	Text (50)
			District: District of Project location	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
			TOL: Land title number / TOL boundary	Text (50)
Project Boundary	Demarcation of project boundary	Polygon	Project_Ow: Project Owner / Proponent	Text (150)
			Activities: Project prescribed activity as per the Environment Protection Enactment (Prescribed Activities) (Environmental Impact	Text (50)

Name	Description	Feature Type	Attributes	Data Type
			Assessment) (i.e., Agriculture, Forestry, Land Reclamation, etc.)	
			District: District of Project location	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			TOL: Land title number / TOL boundary	Text (50)
Project Boundary Coordinate	Demarcation of project boundary.	Point	X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.2 Built Environment

Name	Description	Feature Type	Attributes	Data Type
Airport	Location of airports.	Point	Name: The name of the airport	Text (100)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Town	Location of towns based on topographical maps and verified on-site or based on satellite image.	Point	Name: The name of the town	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Village	Location of settlements based on topographical maps and verified based on satellite image or on-site.	Point	Name: Village name	Text (50)
			Source_inf: Source of village information	Text (100)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Palm Oil Mill (to include information in attribute where available)	Location of oil palm mills.	Point	Mill_Name: Name of the mill	Text (30)
			Owner: Name of owner	Text (60)
			District: District of the mill located	Text (30)
			Address: Mill address	Text (60)

Name	Description	Feature Type	Attributes	Data Type
			MOD: Mode of discharge	Text (50)
			Date: Date of information	Date
			Capacity: Capacity of the mill	Long Integer (6)
			CT_Person: Contact person	Text (50)
			No Tel and Fax: Telephone and Fax no.	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Hospital	Location of hospitals.	Point	Name: The name of the hospital.	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Clinic	Location of clinics.	Point	Name: The name of the clinic.	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Industry	Location of industries.	Point	Name: Name of industry	Text (50)
			Owner: Name of owner / company in charge	Text (150)
			Type: Industry type	Text (50)
			Production: Specific production of the industry	Text (100)
			Address: Industry address	Text (100)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Livestock Farm	Location of livestock farms.	Point	Farm_Owner: Name of owner	Text (30)
			Farm_Name: Name of farm/company	Text (30)
			Location: Farm address (village name/location)	Text (60)
			Type: Livestock type	Text (50)

Name	Description	Feature Type	Attributes	Data Type
4			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Residential Building	Building or property designated for use as premises for dwelling units or home.	Point	Name: Name of residential building	Text (50)
			Type: Usage and type of building used for residential purposes.	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Commercial Building	Building or property designated for use as premises for business related activities such as trading and services.	Point	Name: Name of building	Text (50)
			Type: Usage and type of building used for commercial related activities.	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Educational Building	Building or premises designated for education-related activities.	Point	Name: Name of building	Text (50)
			Type: Usage of a religious building	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Building of Worship	A building or premises used as a place of worship, religious talks and other related activities.	Point	Name: Name of building	Text (50)
			Type: The level of an educational institution	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Cemetery	A place for the burial of the dead.	Point	Name: Name of cemetery	Text (50)
			Type: Type of a burial ground (e.g., Muslim, Christian, Chinese etc.)	Text (50)
			X: BRSO Easting	Double (15,6)

Name	Description	Feature Type	Attributes	Data Type
			Y: BRSO Northing	Double (15,6)

2.3 Demarcation

Name	Description	Feature Type	Attributes	Data Type
Administrative Boundary	Type of boundaries in Sabah.	Polyline	Boundary: Boundary name	Text (50)
			Type: Type of boundary	Text (50)
Anchorage Area	Location of anchor areas.	Polygon	Location: Name of the location area	Text (30)
			Type: Type of anchorage area	Text (30)
Sabah District	Demarcation of districts in Sabah.	Polygon	Name: District Name	Text (30)
			Type: Location of district either coastal or interior	Text (30)
			Area_Ha: Area in hectare	Double (10,2)
Sabah Island	Islands of Sabah.	Polygon	Name: Name of the island	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			Populated: Yes/No	Text (20)
			District: District where the island is located	Text (30)
			Tourism: Yes/No	Text (20)

2.4 Fisheries

Name	Description	Feature Type	Attributes	Data Type
Aquaculture	Aquaculture locations.	Point	Type: Type of aquaculture	Text (20)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Aquaculture Industry Zone	Boundary of Aquaculture Industry Zone (AIZ) or Zon Industri Akuakultur	Polygon	Area_Ha: Area in ha	Double (10,2)
			Location: River name	Text (30)

Name	Description	Feature Type	Attributes	Data Type
	(ZIA) by Fisheries Department.			
Fishing Ground	Fishing areas.	Polygon	Area: Area in hectare	Double (10,2)
			Category: Fishing category	Text (50)
Freshwater Fish Ponds	Freshwater fish pond locations.	Polygon	Location: Address of the pond	Text (50)
			Type: Type of fish pond	Text (30)
			District: Location of the fish pond	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Fish Landing	Location of fish landing jetties.	Point	Name: Name of the jetty	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.5 Geology

Name	Description	Feature Type	Attributes	Data Type
Erosion	Erosion observation / occurrences.	Point	Name: Location of erosion	Text (30)
			Severity: Severity of erosion	Text (20)
			Erosion: Either erosion or accretion	Text (20)
Geology	Geology in Sabah.	Polygon	Properties: Rock properties	Text (50)
			Type: Geology type	Text (50)
Soil Suitability	Suitability of soil for agriculture development.	Polygon	Type: Soil type	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			Potential: Yes/No for development potential	Text (20)
Soil Association	Type of soil material.	Polygon	Material: Type of material	Text (50)
			Area: Area in hectare	Double (10,2)

Name	Description	Feature Type	Attributes	Data Type
			District: District of the material found	Text (30)

2.6   Hydrography

Name	Description	Feature Type	Attributes	Data Type
Beach Category	Categorisation of beach area.	Polyline	Length: Length of the category	Double (10,2)
			Category: Category of the beach (eg. rocky, sand (good/poor))	Text (20)
River	Location of rivers.	Polyline	River_Name: Name of river	Text (50)
			District: Location of river	Text (30)
			Length: Length in meter	Long Integer (9)
			Catchment: Name of catchment area	Text (50)
Catchment Area/ Sub-catchment	An area of land that falls within a water catchment reserve boundary.	Polygon	Name: Name to identify a water catchment reserve area	Text (50)
			Area_ha: Measurement of the area in hectare	Double (10,2)
			River: Name of the river of the catchment	Text (50)
Water Intake	Water intake locations.	Point	Location: Location of the water intake	Text (50)
			Source: Source of the water intake	Text (30)
			District: District of water intake	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Tagal	Location of tagal.	Polygon	Location: Location of the tagal	Text (50)
			River: Name of the tagal river	Text (50)
			Area_ha: Area of tagal in hectare	Double (10,2)
Lighthouse	Location of lighthouses.	Point	Name: Name of the lighthouse location	Text (30)
			X: BRSO Easting	Double (15,6)

Name	Description	Feature Type	Attributes	Data Type
			Y: BRSO Northing	Double (15,6)
Offshore Cable	A line as cable layout.	Polyline	Type: Type of cable	Text (50)
Offshore Platform	Location of platforms.	Point	Name: Name of the platform	Text (30)
Sea Ports	Location of ports.	Point	Name: Name of the port	Text (50)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Jetty	Location of jetties.	Point	Name: Name of the jetty	Text (30)
			Type: Jetty type	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.7 Hypsography

Name	Description	Feature Type	Attributes	Data Type
Spot Height	Locations where height has been determined with respect to a vertical datum.	Point	Value: Spot height value in meter	Double (10,2)
Contour Line	The topographic height / elevation of the area.	Polyline	Value: Contour line value in meter	Double (10,2)
Slope	Location of slope area.	Polygon	Value: Slope gradient in degrees	Double (10,2)

2.8 Land Use

Name	Description	Feature Type	Attributes	Data Type
Existing Land use		Polygon	Type: Type of land use	Text (50)

Name	Description	Feature Type	Attributes	Data Type
	Current land use of the site or existing land use which involved activities, or, new completed development.		Area_ha: Measurement of the area in hectare	Double (10,2)
			Source: Source of the existing land use	Text (50)
Committed Land use	An area of approved land use planning application (within the planning permission expiry date) and has yet to be commenced / carried-out.	Polygon	Type: Type of land use *(refer to MS 1759* on list of land use type description)*	Text (50)
			Area_ha: Measurement of the area in hectare	Double (10,2)
			Source: Source of the zoning land use	Text (50)

MS1759 Malaysian Standard Geographic Information/Geomatics Feature and Attribute Codes (http://ms1759.mygeoportal.gov.my)

2.9   Marine Habitat

Name	Description	Feature Type	Attributes	Data Type
Seagrass	Location of known seagrass beds.	Polygon	Location: Name of location	Text (30)
			Source: Source of info / Survey date	Text (30)
			Remark: Seagrass species	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
Coral (to include information in attribute where available)	Location of known coral reefs.	Polygon	Location: Name of coral location	Text (30)
			Live Coral: Live coral percentage	Double (10,2)
			Dead Coral: Dead coral percentage	Double (10,2)
			Soft Coral: Soft coral percentage	Double (10,2)
			Rubble: Rubble percentage	Double (10,2)
			Algae: Algae percentage	Double (10,2)

Name	Description	Feature Type	Attributes	Data Type
			Seagrass: Seagrass percentage cover	Double (10,2)
			Sand: Percentage of sand area	Double (10,2)
			Others: Percentage of other substrate cover	Double (10,2)
			Source: Source of data	Text (30)
			Survey_Typ: Survey method used	Text (30)
Marine Animals	Sightings of marine animals by villagers / observers and literature search.	Point	Types: Marine animal type	Text (30)
			Locations: Marine animal location	Text (50)
			Remark: Source of data	Text (30)
Turtle Nesting Sites	Location of turtle nesting sites.	Point	Location: Turtle nesting site location	Text (30)
			Source: Source of information	Text (30)

2.10   Mitigation Measures

It is noted that mitigation measures are unique to each Project. Below are examples of mitigation measures generally shown in EIA / PMM report figures. Naming system shall be edited accordingly to the type of mitigation measures; however, the minimum attributes to be shown for each feature type (i.e., point, polygon or polyline) shall apply. All mitigation measures must correspond to the information and maps presented in the submitted EIA / PMM.

Name	Description	Feature Type	Attributes	Data Type
• Wash Bay • Silt Trap • Sewage Treatment Plant • Traffic Sign	Examples of mitigation measures shown in point form.	Point	X: BRSO Easting Y: BRSO Northing	Double (15,6)
• Earthworks Phase • Sediment Basin • Stockpile Area • Turfing	Examples of mitigation measures shown in polygon form. Earthworks Phase is mandatory for Projects that	Polygon	Area_Ha: Area in hectare	Double (10,2)

Name	Description	Feature Type	Attributes	Data Type
	include earthwork acitivites.			
• Drain • Silt Fence • Silt Curtain • Perimeter Hoarding • Bund • Revetment	Examples of mitigation measures shown in line form.	Polyline	Length: Length in meter	Double (10,2)

2.11 Monitoring Stations

Name	Description	Feature Type	Attributes	Data Type
Baseline *to rename based on type of sampling (e.g. Water Quality Baseline, Air Quality Baseline, etc.)	Locations of the sampling stations for baseline data.	Point	Name: Name of the station	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
			Date: Date of sampling	Date
Monitoring *to rename based on type of monitoring (e.g. Water Quality Monitoring, Air Quality Monitoring, etc.)	Locations of the proposed monitoring stations (during construction phase).	Point	Name: Name of the station	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
			Frequency: Proposed frequency of sampling (e.g., daily, weekly, monthly etc.)	Text (50)
Hydrological stations / DID Stations	Location of hydrological / DID stations.	Point	Station_no: Hydrological/ DID station number	Double (10,2)
			Name: Name of the station	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
			Date: Date of data availability	Date
DOE Stations	Location of DOE stations.	Point	Location: Area of the station	Text (50)
			Name: Station number and name	Text (50)

Name	Description	Feature Type	Attributes	Data Type
*to rename for other agencies stations (e.g. DID Stations, Air Quality Monitoring, etc.)			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.12 Protected Area

Name	Description	Feature Type	Attributes	Data Type
Forest Reserve	Gazetted forest reserves.	Polygon	Area_Ha: Area in hectare	Double (10,2)
			Class: Forest reserve class	Double (10,2)
			Name: Forest reserve name	Text (150)
Wildlife Sanctuary	Boundaries of wildlife sanctuary area under Wildlife Department.	Polygon	Name: Wildlife Sanctuary name	Text (100)
			Area_Ha: Area in hectares	Double (10,2)
Marine Protected Areas	Location of marine protected areas.	Polygon	Name: MPA name	Text (100)
			Area_Ha: Area in hectares	Double (10,2)

2.13 Tourism

Name	Description	Feature Type	Attributes	Data Type
Hotel	Location of accommodations.	Point	Name: Hotel name	Text (50)
			Address: Hotel address	Text (100)
			Tel No: Telephone	Text (30)
			Rated: Star rating system	Text (20)
			No of Rooms: No of hotel rooms	Long Integer (6)
			District: District where the hotel is located	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

Name	Description	Feature Type	Attributes	Data Type
Recreational Area	Location for recreational areas.	Point	District: District where the area is located	Text (30)
			Name: Recreational area name	Text (100)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Dive Site	Location for Dive Sites.	Point	Name: Dive site name	Text (50)
			Source: Source of info	Text (250)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Historical Site	Area of historical significance.	Point	Name: Name of historical site	Text (100)
			Category: MS1759 category of historical site	Text (100)
			Location: Location of historical site.	Text (100)
			Status: Gazetted status	Text (100)
			Remarks: Comments and historical remarks.	Text (250)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.14   Transportation

Name	Description	Feature Type	Attributes	Data Type
Road	A line as a road accessed by the public for transportation.	Polyline	Name: Name of the road	Text (50)
			Type: Type or classification of road	Text (30)
Railway Station	Location of railway stations.	Point	Town: Town of the railway station	Text (30)
			District: District of the railway station	Text (30)
			Station: Railway station name	Text (50)
			X: BRSO Easting	Double (15,6)

Name	Description	Feature Type	Attributes	Data Type
			Y: BRSO Northing	Double (15,6)
Railway Tracks	A line as railway tracks for transportation in the mainland.	Polyline	Name: Name of tracks	Text (30)
			Destination: Tracks destination to and from	Text (50)

2.15 Utility

Name	Description	Feature Type	Attributes	Data Type
Landfill	Location of landfills.	Polygon / Point	Name: Location of the landfill area	Text (50)
			Area_ha: Area in hectares	Double (10,2)
Power Station	Location of power stations.	Point	Name: Name of the power station	Text (50)
			Location: Location of the power station	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Water Treatment Plant	Location of structures built for treatment of raw water.	Point	Name: Name of the water treatment plant	Text (50)
			Location: Location of the water treatment plant.	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)
Centralised Sewerage Treatment Plants	Location of centralised sewerage treatment plants.	Point	Name: Name of the centralised sewerage treatment plant	Text (50)
			Location: Location of the centralised sewerage treatment plant	Text (30)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

2.16   Vegetation

Name	Description	Feature Type	Attributes	Data Type
Mangrove	Location of known mangrove areas.	Polygon	Location: Name of mangrove location	Text (30)
			Area_Ha: Area in hectare	Double (10,2)
			Remark: Mangrove species / percentage cover / heath	Text (50)
Vegetation	Location of plant community which means all ground cover by plants or vegetated.	Polygon	Area_Ha: Area in hectare	Double (10,2)
			Type : Vegetation type	Text (30)
Wetland	Wetland areas.	Polygon	Area_Ha: Area of wetland in hectare	Double (10,2)
			Name: Type of wetland name	Text (100)
			Type: Classification of the wetland	Text (50)

3 Glossary

"ArcCatalog" ArcCatalog is an application in the ArcGIS suite used to manage geographic data – similar to windows file explorer.

"Attributes" Descriptive information about features or elements of a database. For a database feature like census tract, attributes might include many demographic facts including total population, average income, and age. In statistical parlance, an attribute is a 'variable', whereas the database feature represents an 'observation' of the variable.

"Field" (Attribute Table) An attribute field (or item) are characteristics used to describe each feature in a geographic data set usually viewed as columns in a table.

"Geographic information system (GIS)" the organised activity by which people measure aspects of geographic phenomena and processes; represent these measurements, usually in the form of a computer database, to emphasize spatial themes, entities and relationships; operate upon these representations to produce more measurements and to discover new relationships by integrating disparate sources; and transform these representations to conform to other frameworks of entities and relationships. These activities reflect the larger context (institutions and cultures) in which these people carry out their work. In turn, the GIS may influence these structures.

"Global Positioning System (GPS)" A satellite based device that records x,y,z coordinates and other data. Ground locations are calculated by signals from satellites orbiting the Earth. GPS devices can be taken into the field to record data while walking, driving, or flying.

"Layer" A logical set of thematic data described and stored in a map library. Layers act as digital transparencies that can be laid atop one another for viewing or spatial analysis.

"Line" Lines represent geographic features too narrow to be displayed as an area at a given scale, such as contours, street centerlines, or streams.

"Map" Cartography; a hand-drawn or printed document describing the spatial distribution of geographical features in terms of a recognisable and agreed symbolism. Digital; the collection of digital information about a part of the earth's surface.

"Point" A single x,y coordinate that represents a geographic feature or too small to be displayed as a line or area at that scale

"Polygon" A representation of an area defined by lines that make up its boundary. For example, it may represent a building footprint, parcel, city limits, or country's boundary.

"Projection" A mathematical model that transforms the locations of features on the Earth's surface (sphere) to locations on a two-dimensional surface (flat map).

"Spatial data" Spatial data is also known as geospatial data. Geospatial Data or geographic information is data or information that identifies the geographic location of features and boundaries on earth, such as natural or man-made features, oceans, and more. Spatial data is usually stored as coordinates and topology and can be mapped. Spatial data is often accessed, manipulated or analysed using Geographic Information Systems (GIS).

[Source: Malaysia Geospatial Data Infrastructure (MyGDI)]

ATTACHMENTS

Attachment A

Spatial Data Summary Sheet

LAMPIRAN RINGKASAN DATA GEOSPATIAL (DIGITAL)
Spatial Data Summary Sheet

(Sila lengkapkan dan lampirkan bersama laporan EIA/PMM anda)

Tajuk Projek **:** _____
Project Title _____
_____

Nama Syarikat **:** _____
Company Name
_____

Nama Pegawai
Bertanggungjawab **:**
Person in Charge of Data _____

Tel. : **E-mel :**
Tel. : _____ *E-mail:* _____

Sistem Koordinat **:** Borneo Rectified Skew Orthomorphic Projection (BRSO)
Coordinate System

SENARAI DATA SHAPEFILE / *List of shapefiles*		
(sila senaraikan nama-nama *shapefiles*. Item 1 hingga 4 adalah wajib untuk penyerahan laporan PMM/EIA – sila rujuk Kamus Data /*Data Dictionary*)		
1. Lokasi Projek *Project Location* Sila rujuk *Data Dictionary* bahagian 2.1	Tandakan (✓) di petak yang disediakan. 1. Project Area Mid-Point ☐ 2. Project Boundary ☐ 3. Project Boundary Coordinate ☐	☐ Untuk Kegunaan Pejabat Catatan:
2. Stesen Persampelan *Sampling Stations* Sila rujuk *Data Dictionary* bahagian 2.10		☐ Catatan:
3. Cadangan Langkah Mitigasi *Proposed Mitigation Measures* Sila rujuk *Data Dictionary* bahagian 2.9		☐ Catatan:

4. Reseptor Sensitif dan Guna Tanah Sedia Ada *Sensitive Receptors and Existing Land use* Sila rujuk *Data Dictionary* bahagian 2.7 dan bahagian lain yang berkaitan		☐ Catatan:
5. Lain-lain *Others*		☐ Catatan:

Untuk Kegunaan Pejabat Sahaja

Semakan Data	Ya / Tidak
Disemak Oleh	
Tarikh	
Catatan	

LAMPIRAN RINGKASAN DATA GEOSPATIAL (DIGITAL)
Spatial Data Summary Sheet

(Sila lengkapkan dan lampirkan bersama laporan EIA/PMM anda)

Tajuk Projek *Project Title*	**:**	Proposed Earthworks Activities and Residential Development on Land Title NT.123456 with an area of 40 hectare in Kota Kinabalu District
Nama Syarikat *Company Name*	**:**	Syarikat Pembinaan Sdn. Bhd.
Nama Pegawai Bertanggungjawab *Person in Charge of Data*	**:**	Norina Binti Johan _

Tel. : 088 – 112 000   ***E-mel :*** Norina_pembinaan@gmail.com
Tel. :   *E-mail:*

Sistem Koordinat   **:**   Borneo Rectified Skew Orthomorphic Projection (BRSO)
Coordinate System

SENARAI DATA SHAPEFILE / *List of shapefiles[1]*
(sila senaraikan nama-nama *shapefiles*. Item 1 hingga 4 adalah wajib untuk penyerahan laporan PMM/EIA – sila rujuk Kamus Data /*Data Dictionary*)

	Tandakan (✓) di petak yang disediakan.	Untuk Kegunaan Pejabat
1. Lokasi Projek *Project Location* Sila rujuk *Data Dictionary* bahagian 2.1	1. Project Area Mid-Point [√] 2. Project Boundary [√] 3. Project Boundary Coordinate [√]	[ ] Catatan:
2. Stesen Persampelan *Sampling Stations* Sila rujuk *Data Dictionary* bahagian 2.10	1. Air Quality Baseline 2. Noise Baseline 3. Water Quality Monitoring 4. Air Quality Monitoring 5. Noise Monitoring	[ ] Catatan:
6. Cadangan Langkah Mitigasi *Proposed Mitigation Measures* Sila rujuk *Data Dictionary* bahagian 2.9	1. Earth Drain 2. Hoarding 3. Silt Fence 4. Wash Bay	[ ] Catatan:

---

[1] Data yang disenaraikan adalah contoh dan tidak mewakili senarai akhir untuk diserahkan kepada JPAS. Contoh shapefiles ini boleh dimuat turun dari Laman Web JPAS (https://epd.sabah.gov.my) atau boleh dipohon daripada Sektor Penilaian, JPAS untuk rujukan.

5. Reseptor Sensitif dan Guna Tanah Sedia Ada *Sensitive Receptors and Existing Land use* Sila rujuk *Data Dictionary* bahagian 2.7 dan bahagian lain yang berkaitan	1. Village 2. Industry 3. Road 4. Existing Land Use *Example list [2]*	☐ Catatan:
5. Lain-lain *Others*		☐ Catatan:

Untuk Kegunaan Pejabat Sahaja

Semakan Data	Ya / Tidak
Disemak Oleh	
Tarikh	
Catatan	

---

[2] The shapefiles listed in this sheet are an example list and does not represent the final list to be submitted to EPD. Examples of these shapefiles can be downloaded from EPD Website (https://epd.sabah.gov.my) or can be requested from the Assessment Sector, EPD for reference.

Attachment B

Coordinate Transformation using ArcGIS

1   Introduction

This section shows an example on coordinate transformation from WGS84 to BRSO using ArcGIS software.

Below is the flowchart process on how to export a shapefile with WGS84 coordinate system into a BRSO defined shapefile.
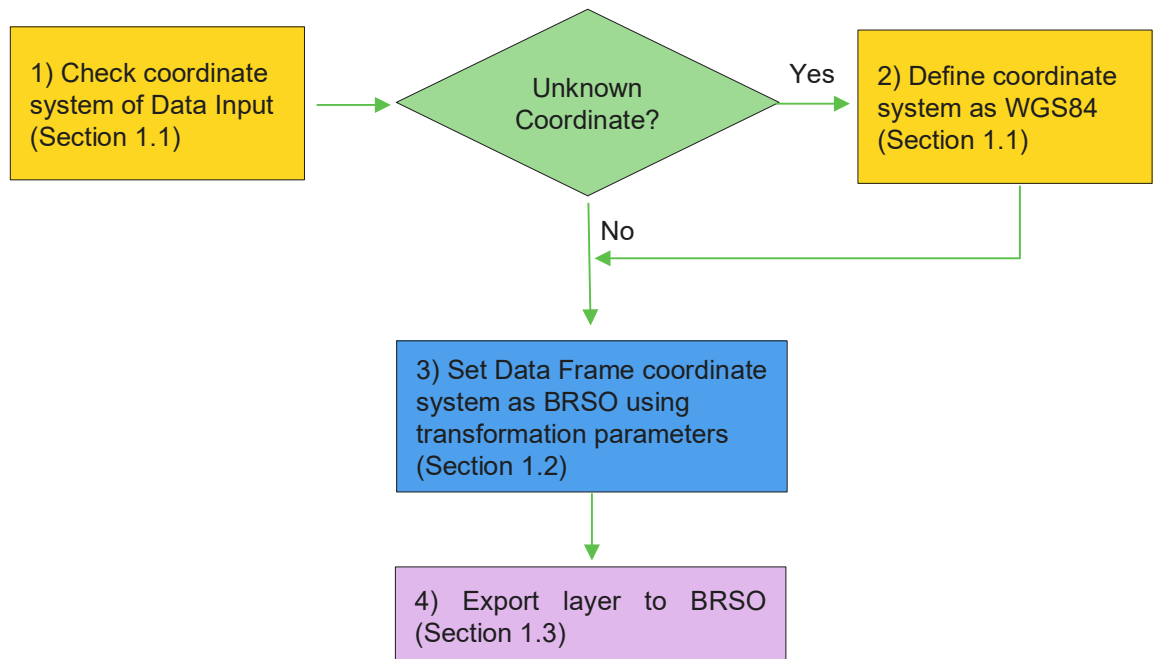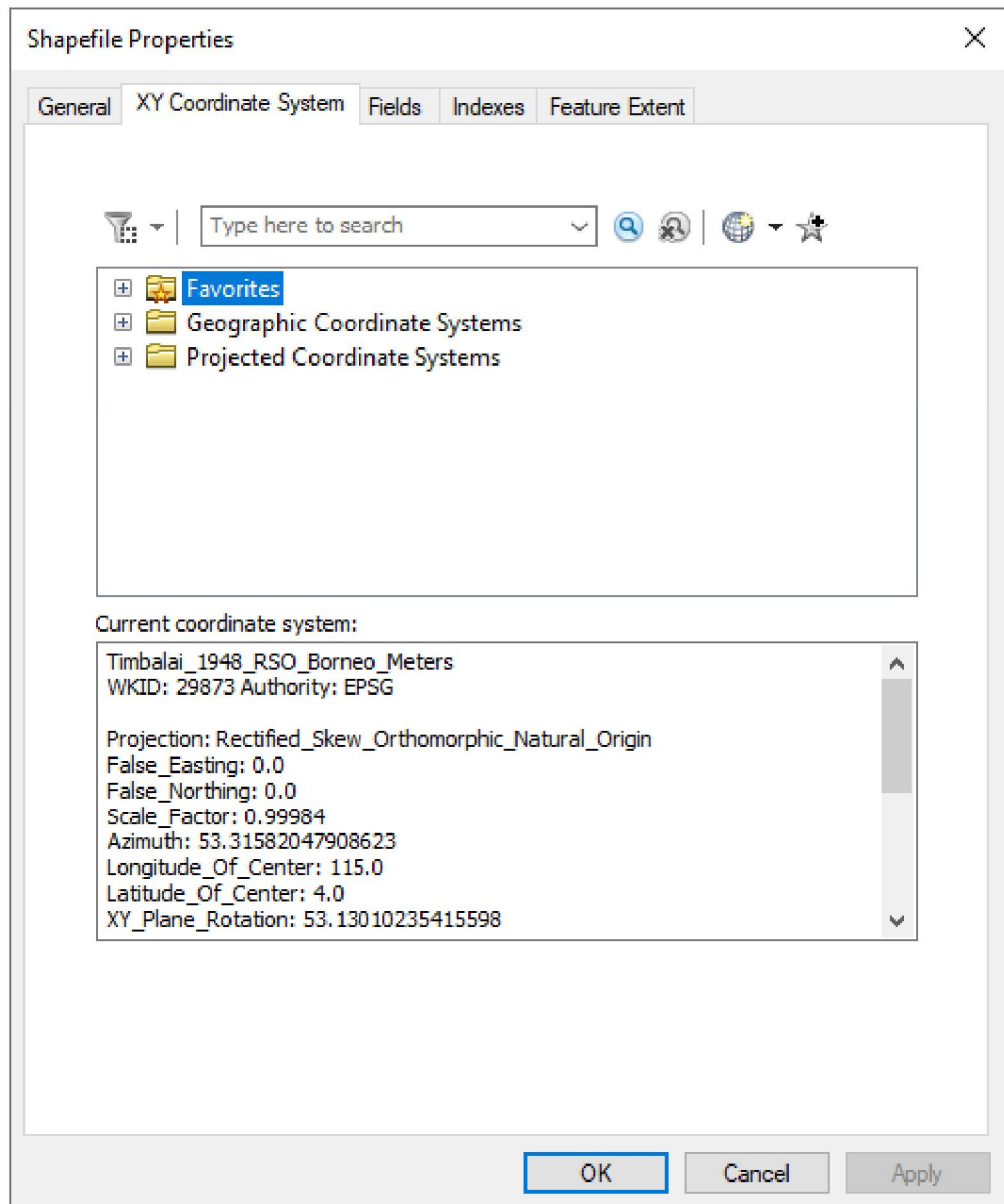
1.1 Input Coordinate System

The first step is to check the coordinate system of the data input. This could be done in either ArcCatalog or ArcMap. Check the coordinate system of the layer in the map or catalog individually by right-clicking on the name of the layer > Properties and click the Source tab (if using ArcMap) or XY Coordinate System tab (if using ArcCatalog). Below is an example from ArcMap. The Coordinate System of the layer is displayed in the Data Source box.
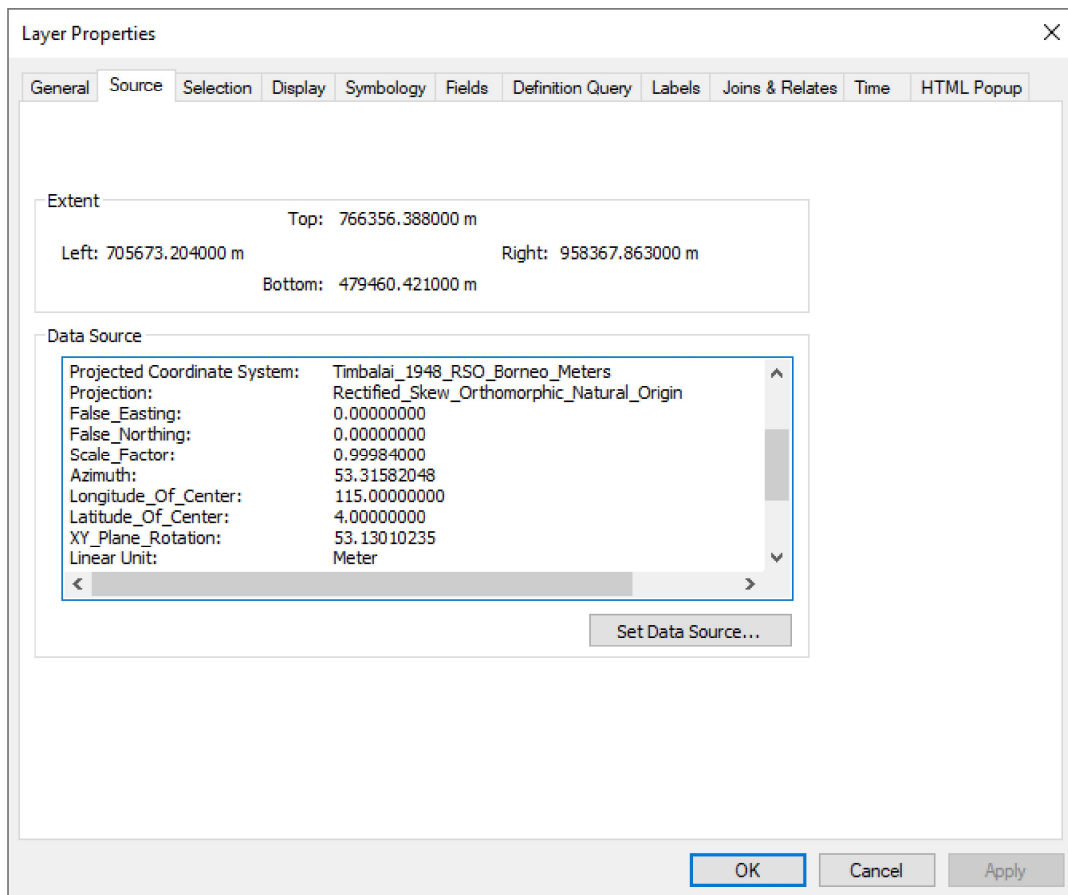
If the value is shown as *Unknown*, the layer needs to be defined with its coordinate system. This can be done in ArcCatalog.

1   In ArcCatalog, click the shapefile whose coordinate system you want to define.
2   Click the File menu and click Properties.
3   Click the XY Coordinate System tab.
4   Navigate to and select the coordinate system you want to use.
5   The coordinate system's parameters are listed in the Current coordinate system text box. You can double-click the coordinate system for more information.
6   Click OK on the Shapefile Properties dialog box.

Shapefile Properties ✕

General | **XY Coordinate System** | Fields | Indexes | Feature Extent

Type here to search ∨

⊞ ⭐ **Favorites**
⊞ 📁 Geographic Coordinate Systems
⊞ 📁 Projected Coordinate Systems

Current coordinate system:

```
Timbalai_1948_RSO_Borneo_Meters
WKID: 29873 Authority: EPSG

Projection: Rectified_Skew_Orthomorphic_Natural_Origin
False_Easting: 0.0
False_Northing: 0.0
Scale_Factor: 0.99984
Azimuth: 53.31582047908623
Longitude_Of_Center: 115.0
Latitude_Of_Center: 4.0
XY_Plane_Rotation: 53.13010235415598
```

OK | Cancel | Apply

1.2   Data Frame Coordinate System

Set the ArcMap Data Frame with the desired coordinate system for the data output. For this example of transformation from WGS84 to BRSO, the Data Frame will be set to BRSO.

1   Right-click the data frame name and choose Properties to bring up the Data Frame Properties dialog box.
2   Click the Coordinate System tab and navigate to the desired coordinate system for your map display.
3   Click the Transformations button at the bottom of the dialog. The Geographic Coordinate Systems Transformations dialog box appears.
4   Click Convert from GCS_WGS_1984 Into: GCS_Timbalai_1948.
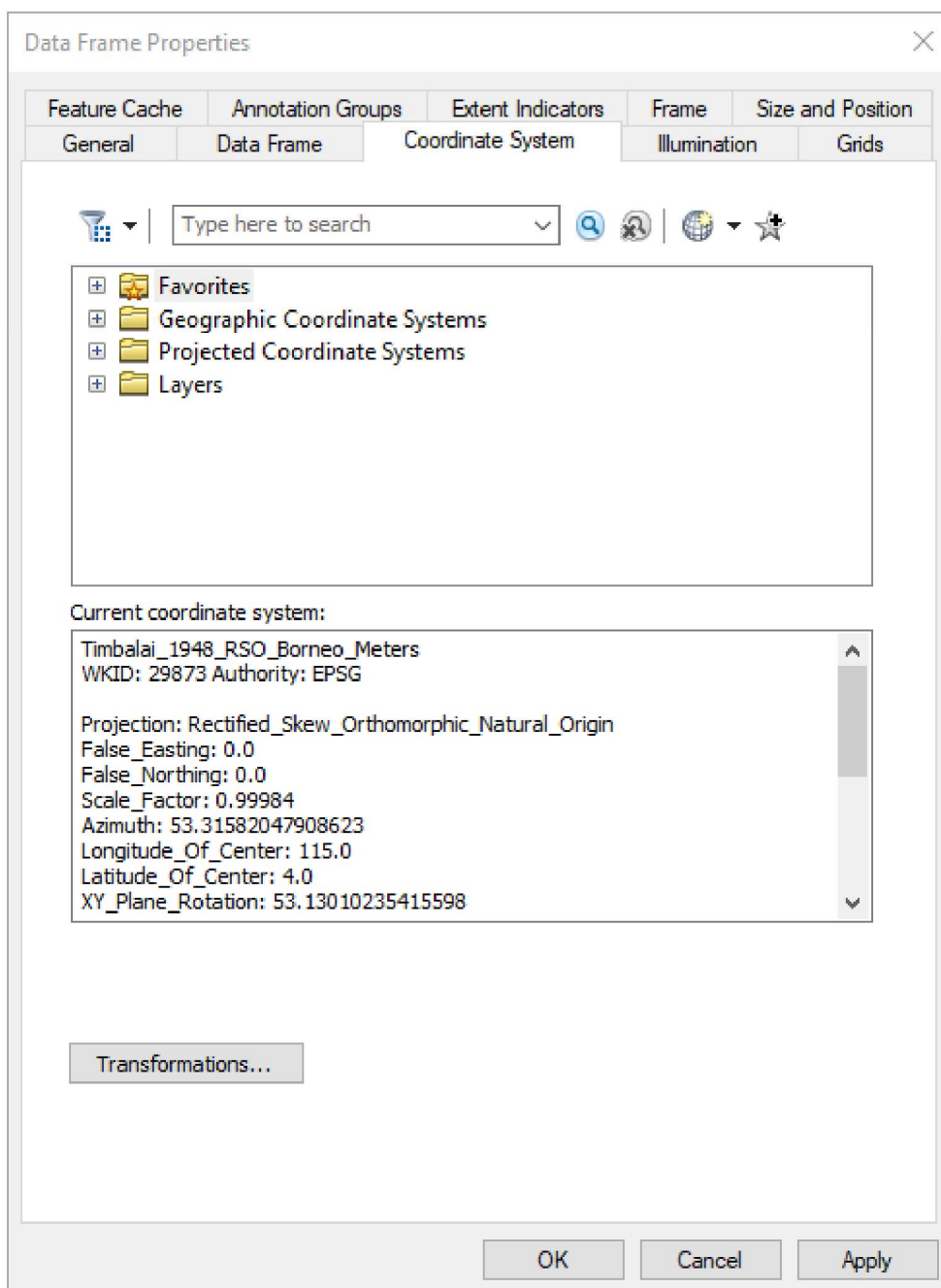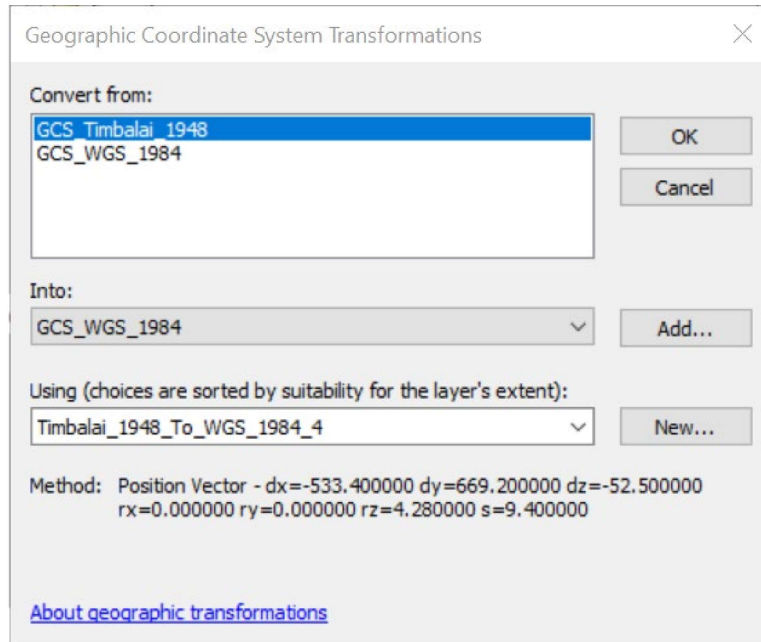
1.3 Export Data Output

Export the WGS84 layer as a BRSO layer.

1 In the ArcMap, right-click the layer in the table of contents and click Data > Export Data.
2 Click the option for the output coordinate system you want to use. In this case, use the same coordinate system as the data frame.
3 Click the browse button and navigate to a location to save the exported data.
4 Type the name for the output data source.
5 Click the Save as type arrow and choose the output type. [Shapefile]
6 Click Save and then click OK.
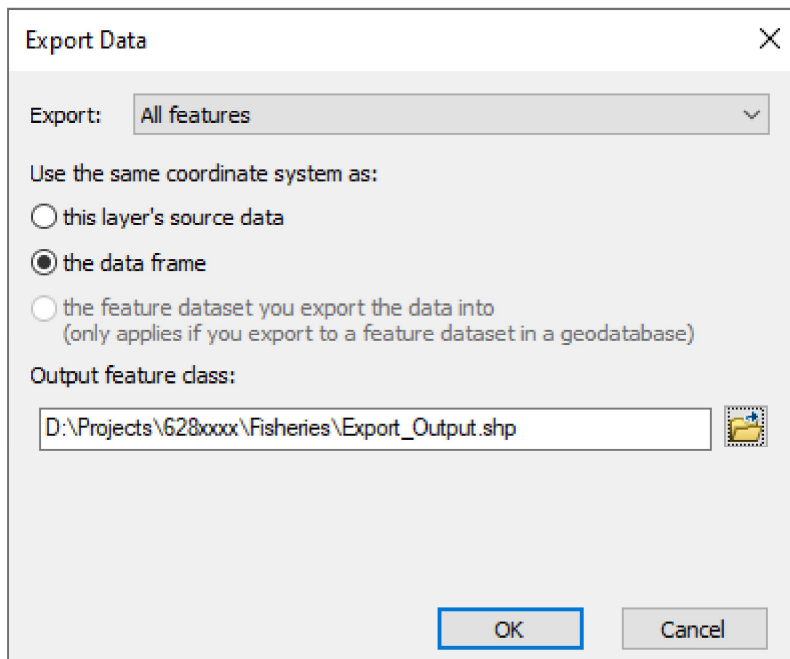
Attachment C

Creating Shapefiles and Fields using ArcGIS

Introduction

This section shows example on how to create shapefiles in reference to the shapefiles and attributes outline in Section 2 of this data dictionary using ArcGIS software.
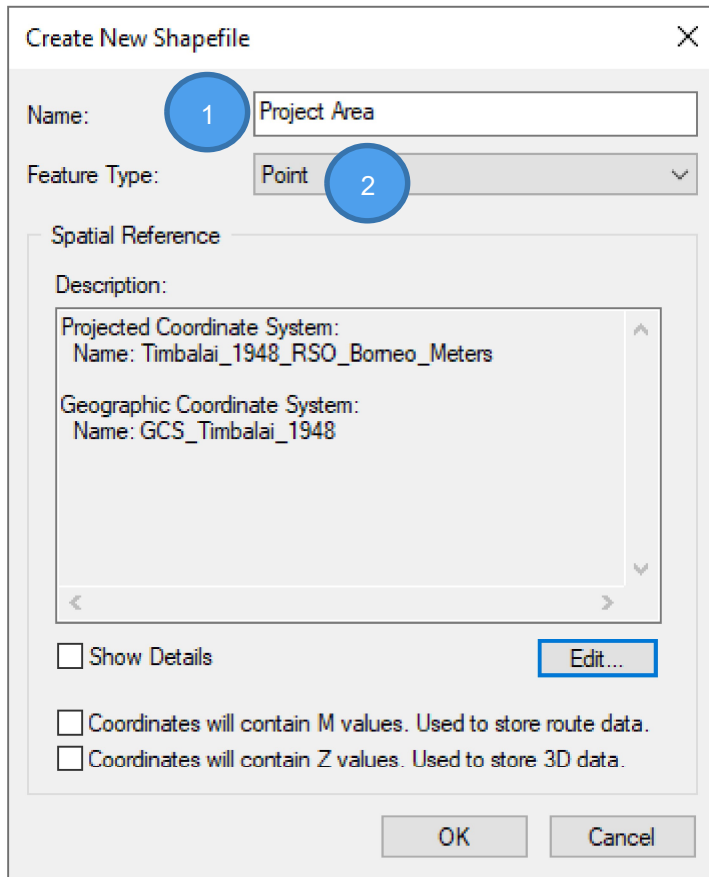
Shapefiles

You can create new shapefiles in ArcCatalog or by using the Create Feature Class tool.

1. In ArcCatalog, select a folder or folder connection in the Catalog tree.
2. Click the File menu, point to New, then click Shapefile.
3. Click in the **Name** text box and type a name for the new shapefile.
4. Click the **Feature Type** drop-down arrow and click the type of geometry the shapefile will contain.
5. Click Edit to define the shapefile's coordinate system.
6. Click OK.

This example refers to Section 2.1 for creating Project Area shapefile. In the Create New Shapefile dialog box, name the shapefile, choose the feature type, and set the coordinate system. In this case, the name and feature type shall refer to item 1 and 2 of the table below while the coordinate system will be set as BRSO as per Section 1.2.

Name ①	Description	Feature Type	Attributes	Data Type
Project Area	Location of project area (mid-point).	Point ②	Project_Ow: Project Owner / Proponent	Text (150)
			Activities: Project prescribed activity as per the Environment Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) (i.e., Agriculture, Forestry, Land Reclamation, etc.)	Text (50)
			District: District of Project location	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

Attributes

For the shapefile field or attribute, you can add fields to your attribute table using ArcCatalog or ArcMap. In ArcCatalog, you need to open the layer or table's Properties dialog box and add the field to the list on the Fields tab. In ArcMap, you can add a field through the attribute table of a layer or through the Catalog window by accessing the same Properties dialog box and Fields tab. Inside either application you can also use the Add Field geoprocessing tool.

1. In ArcMap, right-click the table or layer in the table of contents and choose Open Attribute Table.
2. Click the Table Options button ⊞ in the table window.
3. Click Add Field.
4. Type the name of the field.
5. Click the Type arrow and click the field type.
6. Set any other field properties as necessary.
7. Click OK.

This example refers to Section 2.1 for creating a Project Area shapefile. To update the attribute table of the created shapefile refer to item 3 and 4 of the table below.

Name	Description	Feature Type	Attributes ③	Data Type
Project Area	Location of project area (mid-point).	Point	Project_Ow: Project Owner / Proponent	Text (150)
			Activities: Project prescribed activity as per the Environment Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) (i.e., Agriculture, Forestry, Land Reclamation, etc.) ④	Text (50)
			District: District of Project location	Text (50)
			Area_Ha: Area in hectare	Double (10,2)
			X: BRSO Easting	Double (15,6)
			Y: BRSO Northing	Double (15,6)

Add Field ✕

Name: Project_Ow ③

Type: Text ④ ⌄

Field Properties

Length   150 ④

OK   Cancel