II

(Non-legislative acts)

REGULATIONS

COMMISSION REGULATION (EU) No 1253/2013

of 21 October 2013

amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (¹), and in particular Article 7(1) thereof,

Whereas:

(1) Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services (²) sets out the technical arrangements for interoperability of spatial data sets related to the spatial data themes in Annex I to Directive 2007/2/EC.

(2) In order to ensure the full interoperability of spatial data sets, it is appropriate to set out the technical arrangements for the interoperability of spatial data sets related to the spatial data themes in Annexes II and III to Directive 2007/2/EC.

(3) In order to ensure the overall consistency of the technical arrangements for the interoperability of spatial data sets included in this Regulation, the existing technical arrangements for the interoperability of spatial data sets related to the spatial data themes in Annex I to Directive 2007/2/EC should be amended.

(4) First, the requirements concerning code lists should be amended in order to allow a flexible approach for describing code list values at different levels of detail and to provide for the technical arrangements for sharing the extended code lists.

(5) Second, the restriction of spatial properties to the Simple Feature spatial schema should be relaxed in order to allow making available also 2.5D data.

(6) Third, an additional metadata element should be introduced in order to enable the identification of the spatial representation type used for a data set.

(7) Fourth, the 'Geographical grid systems' spatial data theme should be extended in order to accommodate a multi-resolution grid based on geographic coordinates.

(8) Fifth, the 'Administrative units' spatial data theme should be extended in order to describe maritime administrative units.

(9) Sixth, in order to avoid overlaps with spatial object types specified for spatial data themes of Annexes II and III to Directive 2007/2/EC, certain candidate types should be removed from the 'Administrative Units' and the 'Hydrography' spatial data themes.

(10) Regulation (EU) No 1089/2010 should therefore be amended accordingly.

(11) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 22 of Directive 2007/2/EC,

(¹) OJ L 108, 25.4.2007, p. 1.
(²) OJ L 323, 8.12.2010, p. 11.

HAS ADOPTED THIS REGULATION:

Article 1

Regulation (EU) No 1089/2010 is amended as follows:

(1) Article 2 is amended as follows:

(a) the introductory sentence is replaced by the following:

'For the purposes of this Regulation, the following definitions as well as the theme-specific definitions set out in the Annexes shall apply:'

(b) point 4 is deleted;

(c) in point 6, 'ISO 19103' is replaced by 'ISO/TS 19103:2005';

(d) in point 9, 'EN ISO 19135' is replaced by 'EN ISO 19135:2007';

(e) in point 11, 'EN ISO 19128' is replaced by 'EN ISO 19128:2008';

(f) in point 13, 'EN ISO 19115' is replaced by 'EN ISO 19115:2005/AC:2008';

(g) in point 15, 'EN ISO 19135' is replaced by 'EN ISO 19135:2007';

(h) in point 18, 'ISO 19103' is replaced by 'ISO/TS 19103:2005';

(i) the following points 21 to 30 are added:

'21. "property" means attribute or association role,

22. "union type" means a type consisting of one and only one of several alternatives (listed as member attributes), in accordance with ISO/TS 19103:2005,

23. "association class" means a type that defines additional properties on a relationship between two other types,

24. "coverage" means a spatial object that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain, in accordance with ISO 19123:2007,

25. "domain" means a well-defined set, in accordance with ISO/TS 19103:2005,

26. "range" means a set of feature attribute values associated by a function with the elements of the domain of a coverage, in accordance with EN ISO 19123:2007,

27. "rectified grid" means a grid for which there is an affine transformation between the grid coordinates and the coordinates of a coordinate reference system, in accordance with EN ISO 19123:2007,

28. "referenceable grid" means a grid associated with a transformation that can be used to convert grid coordinate values into values of coordinates referenced to an external coordinate reference system, in accordance with EN ISO 19123:2007,

29. "tessellation" means a partitioning of a space into a set of conterminous subspaces having the same dimension as the space being partitioned. A tessellation in a 2D space consists of a set of non-overlapping polygons that entirely cover a region of interest,

30. "narrower value" means a value that has a hierarchical relationship to a more general parent value.'

(2) Article 4 is amended as follows:

(a) Paragraph 1 is replaced by:

'1. For the exchange and classification of spatial objects from data sets meeting the conditions laid down in Article 4 of Directive 2007/2/EC, Member States shall use the spatial object types and associated data types, enumerations and code lists that are defined in Annexes II, III and IV for the themes the data sets relate to.'

(b) All references to 'Annex II' in points 2 and 3 are replaced by references to 'the Annexes'.

(c) In paragraph 3, the second sentence is replaced by the following: 'The enumeration and code list values are uniquely identified by language-neutral mnemonic codes for computers. The values may also include a language-specific name to be used for human interaction.'

(3) In Article 5, paragraph 4 is deleted.

(4) Article 6 is replaced by the following:

'*Article 6*

Code Lists and Enumerations

1.   Code lists shall be of one of the following types, as specified in the Annexes:

(a) code lists whose allowed values comprise only the values specified in this Regulation;

(b) code lists whose allowed values comprise the values specified in this Regulation and narrower values defined by data providers;

(c) code lists whose allowed values comprise the values specified in this Regulation and additional values at any level defined by data providers;

(d) code lists, whose allowed values comprise any values defined by data providers.

For the purposes of points (b), (c) and (d), in addition to the allowed values, data providers may use the values specified in the relevant INSPIRE Technical Guidance document available on the INSPIRE web site of the Joint Research Centre.

2.   Code lists may be hierarchical. Values of hierarchical code lists may have a more general parent value. Where the valid values of a hierarchical code list are specified in a table in this Regulation, the parent values are listed in the last column.

3.   Where, for an attribute whose type is a code list as referred to in points (b), (c) or (d) of paragraph 1, a data provider provides a value that is not specified in this Regulation, that value and its definition shall be made available in a register.

4.   Attributes or association roles of spatial object types or data types whose type is a code list may only take values that are allowed according to the specification of the code list.

5.   Attributes or association roles of spatial object types or data types that have an enumeration type may only take values from the lists specified for the enumeration type.'

(5) In paragraph 2 of Article 8 and in paragraph 1 of Article 11, the references to 'Annex II' are replaced by references to 'the Annexes'.

(6) Article 12 is amended as follows:

(a) Paragraph 1 is replaced by the following:

'1.   The value domain of spatial properties defined in this Regulation shall be restricted to the Simple Feature spatial schema as defined in Herring, John R. (ed.), *OpenGIS® Implementation Standard for Geographic information – Simple feature access – Part 1: Common architecture, version 1.2.1*, Open Geospatial Consortium, 2011, unless specified otherwise for a specific spatial data theme or type.'

(b) Paragraph 2 is amended as follows:

'SI units' is replaced by 'SI units or non-SI units accepted for use with the International System of Units'.

(7) In Article 13, the following point 6 is added:

'6. Spatial Representation Type: The method used to spatially represent geographic information.'

(8) Article 14 is amended as follows:

(a) Paragraph 2 (b) is replaced by the following:

'(b) the spatial object type(s), or sub-set thereof, that constitute(s) the content of the layer.'

(b) The following paragraph 3 is added:

'3.   For spatial object types whose objects can be further classified using a code list-valued attribute, several layers may be defined. Each of these layers shall include the spatial objects corresponding to one specific code list value. In the definition of such sets of layers in Annexes II, III and IV, all of the following requirements shall be fulfilled:

(a) the placeholder <CodeListValue> shall represent the values of the relevant code list, with the first letter in upper case;

(b) the placeholder <human-readable name> shall represent the human-readable name of the code list values;

(c) the spatial object type shall include the relevant attribute and code list, in parentheses;

(d) one example of a layer shall be given.'

(9) Annex I is amended as set out in Annex I to this Regulation.

(10) Annex II is amended as set out in Annex II to this Regulation.

(11) Annex III, as set out in Annex III to this Regulation, is added.

(12) Annex IV, as set out in Annex IV to this Regulation, is added.

Article 2

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in the Member States in accordance with the Treaties.

Done at Brussels, 21 October 2013.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Annex I to Regulation (EU) No 1089/2010 is amended as follows:

(1) The title is replaced by the following: **'Common Types, Definitions and Requirements'**.

(2) Throughout the text, and except where otherwise provided for in this Annex, the sentence 'This code list shall not be extended by Member States.' is replaced by the sentence 'The allowed values for this code list comprise only the values in the table below.'

(3) Throughout the text, in the headings of all tables that are specifying code list values, the text 'Allowed values for the code list' is replaced by the text 'Values for the code list'.

(4) Section 1 is replaced by the following Section:

'1. TYPES DEFINED IN EUROPEAN AND INTERNATIONAL STANDARDS

The following common types, used in attributes or association roles of spatial object types or data types, are defined as follows:

(1) For the types Any, Angle, Area, Boolean, CharacterString, Date, DateTime, Decimal, Distance, Integer, Length, Measure, Number, Probability, Real, RecordType, Sign, UnitOfMeasure, Velocity and Volume, the definitions given in ISO/TS 19103:2005 shall apply.

(2) For the types DirectPosition, GM_Boundary, GM_Curve, GM_MultiCurve, GM_MultiSurface, GM_Object, GM_Point, GM_Primitive, GM_Solid, GM_Surface and GM_Tin, the definitions given in EN ISO 19107:2005 shall apply.

(3) For the types TM_Duration, TM_GeometricPrimitive, TM_Instant, TM_Object, TM_Period and TM_Position, the definitions given in EN ISO 19108:2005/AC:2008 shall apply.

(4) For the type GF_PropertyType, the definitions given in EN ISO 19109:2006 shall apply.

(5) For the types CI_Citation, CI_Date, CI_RoleCode, EX_Extent, EX_VerticalExtent, MD_Distributor, MD_Resolution and URL, the definitions given in EN ISO 19115:2005/AC:2008 shall apply.

(6) For the type CV_SequenceRule, the definitions given in EN ISO 19123:2007 shall apply.

(7) For the types AbstractFeature, Quantity and Sign, the definitions given in EN ISO 19136:2009 shall apply.

(8) For the types LocalisedCharacterString, PT_FreeText and URI, the definitions given in CEN ISO/TS 19139:2009 shall apply.

(9) For the type LC_LandCoverClassificationSystem, the definitions given in ISO 19144-2:2012 shall apply.

(10) For the types GFI_Feature, Location, NamedValue, OM_Observation, OM_Process, SamplingCoverageObservation, SF_SamplingCurve, SF_SamplingPoint, SF_SamplingSolid, SF_SamplingSurface and SF_SpatialSamplingFeature, the definitions given in ISO 19156:2011 shall apply.

(11) For the types Category, Quantity, QuantityRange and Time, the definitions given in Robin, Alexandre (ed.), *OGC®SWE Common Data Model Encoding Standard, version 2.0.0*, Open Geospatial Consortium, 2011 shall apply.

(12) For the types TimeValuePair and Timeseries, the definitions given in Taylor, Peter (ed.), *OGC® WaterML 2.0: Part 1 – Timeseries, v2.0.0*, Open Geospatial Consortium, 2012 shall apply.

(13) For the types CGI_LinearOrientation and CGI_PlanarOrientation, the definitions given in CGI Interoperability Working Group, *Geoscience Markup Language (GeoSciML), version 3.0.0*, Commission for the Management and Application of Geoscience Information (CGI) of the International Union of Geological Sciences, 2011 shall apply.'

(5) Section 2 is amended as follows:

(a) In Section 2.1, the following constraints are deleted:

'**Constraints of the data type Identifier**

The localId and the namespace shall only use the following set of characters: {"A" …"Z", "a"… "z,", "0"… "9", "_", ".", "-"}, that is only letters from the Latin alphabet, digits, underscore, point, and dash are allowed.'

(b) The following sub-sections 2.2 to 2.7 are added:

'2.2 **Related Party (RelatedParty)**

An organisation or a person with a role related to a resource.

Attributes of the data type RelatedParty

Attribute	Definition	Type	Voidability
individualName	Name of the related person.	PT_FreeText	voidable
organisationName	Name of the related organisation.	PT_FreeText	voidable
positionName	Position of the party in relation to a resource, such as head of department.	PT_FreeText	voidable
contact	Contact information for the related party.	Contact	voidable
role	Roles of the party in relation to a resource, such as owner.	PartyRoleValue	voidable

Constraints of the data type RelatedParty

At least the individual, organisation or position name shall be provided.

2.3 **Contact (Contact)**

Communication channels by which it is possible to gain access to someone or something.

Attributes of the data type Contact

Attribute	Definition	Type	Voidability
address	An address provided as free text.	AddressRepresentation	voidable
contactInstructions	Supplementary instructions on how or when to contact an individual or organisation.	PT_FreeText	voidable
electronicMailAddress	An address of the organisation's or individual's electronic mailbox.	CharacterString	voidable
hoursOfService	Periods of time when the organisation or individual can be contacted.	PT_FreeText	voidable
telephoneFacsimile	Number of a facsimile machine of the organisation or individual.	CharacterString	voidable
telephoneVoice	Telephone number of the organisation or individual.	CharacterString	voidable
website	Pages provided on the World Wide Web by the organisation or individual.	URL	voidable

2.4 **Document Citation (DocumentCitation)**

Citation for the purposes of unambiguously referencing a document.

Attributes of the data type DocumentCitation

Attribute	Definition	Type	Voidability
name	Name of the document.	CharacterString	
shortName	Short name or alternative title of the document.	CharacterString	voidable
date	Date of creation, publication or revision of the document.	CI_Date	voidable
link	Link to an online version of the document	URL	voidable
specificReference	Reference to a specific part of the document.	CharacterString	voidable

2.5 **Legislation Citation (LegislationCitation)**

Citation for the purposes of unambiguously referencing a legal act or a specific part of a legal act.

This type is a sub-type of DocumentCitation.

Attributes of the data type LegislationCitation

Attribute	Definition	Type	Voidability
identification-Number	Code used to identify the legislative instrument	CharacterString	
officialDocument-Number	Official document number used to uniquely identify the legislative instrument.	CharacterString	
dateEnteredIntoForce	Date the legislative instrument entered into force.	TM_Position	
dateRepealed	Date the legislative instrument was repealed.	TM_Position	
level	The level at which the legislative instrument is adopted.	LegislationLevelValue	
journalCitation	Citation of the official journal in which the legislation is published.	OfficialJournalInformation	

Constraints of the data type LegislationCitation

If the link attribute is void, the journal citation shall be provided.

2.6 **Official Journal Information (OfficialJournalInformation)**

Full citation of the location of the legislative instrument within the official journal.

Attributes of the data type OfficialJournalInformation

Attribute	Definition	Type	Voidability
officialJournalIdentification	Reference to the location within the official journal within which the legislative instrument was published. This reference shall be comprised of three parts: — the title of the official journal — the volume and/or series number — Page number(s)	CharacterString	
ISSN	The International Standard Serial Number (ISSN) is an eight-digit number that identifies the periodical publication in which the legislative instrument was published.	CharacterString	

Attribute	Definition	Type	Voidability
ISBN	International Standard Book Number (ISBN) is an nine-digit number that uniquely identifies the book in which the legislative instrument was published.	CharacterString	
linkToJournal	Link to an online version of the official journal	URL	

2.7 **Thematic Identifier (ThematicIdentifier)**

Thematic identifier to uniquely identify the spatial object.

Attributes of the data type ThematicIdentifier

Attribute	Definition	Type	Voidability
identifier	Unique identifier used to identify the spatial object within the specified identification scheme.	CharacterString	
identifierScheme	Identifier defining the scheme used to assign the identifier.	CharacterString'	

(6) Section 4 is amended as follows:

(a) Section 4.1 is replaced by the following:

'4.1 **Condition of Facility (ConditionOfFacilityValue)**

The status of a facility with regards to its completion and use.

The allowed values for this code list comprise the values in the table below and narrower values defined by data providers.

Values for the code list ConditionOfFacilityValue

Value	Name	Definition
functional	functional	The facility is functional.
projected	projected	The facility is being designed. Construction has not yet started.
underConstruction	under construction	The facility is under construction and not yet functional. This applies only to the initial construction of the facility and not to maintenance work.
disused	disused	The facility is no longer used, but is not being or has not been decommissioned.
decommissioned	decommissioned	The facility is no longer used and is being or has been decommissioned.'

(b) In Section 4.2 Country Code (CountryCode), the sentence 'This code list shall not be extended by Member States.' is deleted.

(c) The following sub-sections 4.3 to 4.6 are added:

'4.3 **Legislation Level (LegislationLevelValue)**

The level at which a legal act or convention has been adopted.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on the INSPIRE Generic Conceptual Model.

4.4 **Party Role (PartyRoleValue)**

Roles of parties related to or responsible for a resource.

The allowed values for this code list comprise the values of the following code lists or other code lists specified by data providers:

— Role Code (CI_RoleCode): Functions performed by a responsible party, as specified in EN ISO 19115:2005/AC:2008.

— Role of a Related Party (RelatedPartyRoleValue): Classification of related party roles, as specified in the table below.

Values for the code list RelatedPartyRoleValue

Value	Name	Definition
authority	authority	A party legally mandated to supervise a resource and/or parties related to a resource.
operator	operator	A party that runs a resource.
owner	owner	A party that owns a resource, i.e., to which a resource belongs in a legal sense.

4.5 **Climate and Forecast Standard Names (CFStandardNamesValue)**

Definitions of phenomena observed in meteorology and oceanography.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on the INSPIRE Generic Conceptual Model.

4.6 **Gender (GenderValue)**

Gender of a person or group of persons.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list GenderValue

Value	Name	Definition
female	female	A person or group of persons of female gender.
male	male	A person or group of persons of male gender.
unknown	unknown	A person or group of persons of unknown gender.'

(7) The following Sections 6, 7 and 8 are added after Section 5:

'6. COVERAGE MODEL

The INSPIRE coverage model consists of the following packages:

— Coverages (Base)

— Coverages (Domain And Range)

6.1. **Coverages (Base)**

6.1.1. *Spatial object types*

The package Coverages (Base) contains the spatial object type Coverage.

6.1.1.1. Coverage (Coverage)

Spatial object that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain.

This type is abstract.

Attributes of the spatial object type Coverage

Attribute	Definition	Type	Voidability
metadata	Application specific metadata of the coverage.	Any	
rangeType	Description of the structure of the range values.	RecordType	

6.2.   **Coverages (Domain And Range)**

6.2.1.   *Spatial object types*

The package Coverages (Domain and Range) contains the following spatial object types:

— Coverage (Domain And Range Representation)

— Rectified Grid Coverage

— Referenceable Grid Coverage

6.2.1.1. Coverage (Domain And Range Representation) (CoverageByDomainAndRange)

Coverage which provides the domain and range as separate properties.

This type is a sub-type of Coverage.

This type is abstract.

Attributes of the spatial object type CoverageByDomainAndRange

Attribute	Definition	Type	Voidability
coverageFunction	Description of how range values at locations in the coverage domain can be obtained.	CoverageFunction	
domainSet	Configuration of the domain of the coverage described in terms of coordinates.	Any	
rangeSet	Set of values associated by a function with the elements of the domain of the coverage.	Any	

Constraints of the spatial object type CoverageByDomainAndRange

The grid function shall only be valid for domains that are grids.

6.2.1.2. Rectified Grid Coverage (RectifiedGridCoverage)

Coverage whose domain consists of a rectified grid.

This type is a sub-type of CoverageByDomainAndRange.

Constraints of the spatial object type RectifiedGridCoverage

The domain shall be a rectified grid.

Grid points of a RectifiedGridCoverage shall coincide with the centres of cells of the geographical grids defined in Section 2.2 of Annex II at any resolution level.

6.2.1.3. Referenceable Grid Coverage (ReferenceableGridCoverage)

Coverage whose domain consists of a referenceable grid.

This type is a sub-type of CoverageByDomainAndRange.

Constraints of the spatial object type ReferenceableGridCoverage

The domain shall be a referenceable grid.

6.2.2. *Data types*

6.2.2.1. Coverage Function (CoverageFunction)

Description of how range values at locations in the coverage domain can be obtained.

This type is a union type.

Attributes of the union type CoverageFunction

Attribute	Definition	Type	Voidability
ruleDefinition	A formal or informal description of the coverage function as text.	CharacterString	
ruleReference	A formal or informal description of the coverage function as reference.	URI	
gridFunction	Mapping rule for grid geometries.	GridFunction	

6.2.2.2. Grid Function (GridFunction)

An explicit mapping rule for grid geometries.

Attributes of the data type GridFunction

Attribute	Definition	Type	Voidability
sequenceRule	Description of how the grid points are ordered for association to the elements of the values in the range set of the coverage.	CV_SequenceRule	
startPoint	The grid point to be associated with the first record in the range set of the coverage.	Integer	

7. OBSERVATIONS MODEL

The INSPIRE observations model consists of the following packages:

— Observation References

— Processes

— Observable Properties

— Specialised Observations

7.1. **Observation References**

7.1.1. *Spatial object types*

The package Observation References contains the spatial object type Observation Set.

7.1.1.1. Observation Set (ObservationSet)

Links a set of Observations.

Attributes of the spatial object type ObservationSet

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
extent	Information about the spatial and temporal extent.	EX_Extent	

Association roles of the spatial object type ObservationSet

Association role	Definition	Type	Voidability
member	One member of the ObservationSet.	OM_Observation	

7.2.   **Processes**

7.2.1.   *Spatial object types*

The package Processes contains the spatial object type Process.

7.2.1.1.   Process (Process)

Description of an observation process.

This type is a sub-type of OM_Process.

Attributes of the spatial object type Process

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	voidable
name	Name of the Process.	CharacterString	voidable
type	Type of process.	CharacterString	voidable
documentation	Further information (online/offline) associated with the process.	DocumentCitation	voidable
processParameter	Parameter controlling the application of the process and, as a consequence its output.	ProcessParameter	voidable
responsibleParty	Individual or organisation related to the process.	RelatedParty	voidable

7.2.2.   *Data types*

7.2.2.1.   Process Parameter (ProcessParameter)

Description of the given parameter

Attributes of the data type ProcessParameter

Attribute	Definition	Type	Voidability
name	Name of the process parameter.	ProcessParameterNam-eValue	
description	Description of the process parameter.	CharacterString	

7.2.3.   *Code lists*

7.2.3.1.   Process Parameter Name (ProcessParameterNameValue)

A code list of names of process parameters.

The allowed values for this code list comprise any values defined by data providers.

7.3.   **Observable Properties**

7.3.1.   *Data types*

7.3.1.1.   Constraint (Constraint)

A constraint on some property e.g. wavelength = 200 nm.

Attributes of the data type Constraint

Attribute	Definition	Type	Voidability
constrainedProperty	The property being constrained. e.g. "colour" if the constraint is "colour = blue".	PhenomenonType-Value	
label	A human readable title for the constraint as a whole.	CharacterString	

7.3.1.2. Category Constraint (CategoryConstraint)

A constraint based on some qualifying category. e.g. colour = "red".

This type is a sub-type of Constraint.

Attributes of the data type CategoryConstraint

Attribute	Definition	Type	Voidability
comparison	A comparison operator. In the case of a category constraint it should be "equalTo" or "notEqualTo".	ComparisonOperator-Value	
value	The value of the property that is constrained e.g. "blue" (if the constrained property is colour).	CharacterString	

7.3.1.3. Range Constraint (RangeConstraint)

A numerical range constraint on some property e.g. wavelength ≥ 300 nm and wavelength ≤ 600 nm.

This type is a sub-type of Constraint.

Attributes of the data type RangeConstraint

Attribute	Definition	Type	Voidability
value	The numerical value range of the property that is constrained.	RangeBounds	
uom	Units of measure used in the constraint.	UnitOfMeasure	

7.3.1.4. Range Bounds (RangeBounds)

The start and end bounding values of a numerical range (e.g. start ≥ 50, end ≤ 99).

Attributes of the data type RangeBounds

Attribute	Definition	Type	Voidability
startComparison	The comparator used for the lower range limit (e.g. greaterThanOrEqualTo).	ComparisonOperator-Value	
rangeStart	The lower limit of the range.	Real	
endComparison	The comparator used for the upper range limit (e.g. lessThan).	ComparisonOperator-Value	
rangeEnd	The upper limit of the range.	Real	

7.3.1.5. Scalar Constraint (ScalarConstraint)

A numerical scalar constraint on some property e.g. length ≥ 1 m.

This type is a sub-type of Constraint.

Attributes of the data type ScalarConstraint

Attribute	Definition	Type	Voidability
value	The numerical value of the property that is constrained.	Real	
comparison	The comparator to be used in the constraint e.g. greaterThan.	ComparisonOperator-Value	
uom	Units of measure used in the constraint.	UnitOfMeasure	

7.3.1.6. Other Constraint (OtherConstraint)

A constraint which is not modelled in a structured way but may be described using the freetext "description" attribute.

This type is a sub-type of Constraint.

Attributes of the data type OtherConstraint

Attribute	Definition	Type	Voidability
description	A description of the constraint.	CharacterString	

7.3.1.7. Statistical Measure (StatisticalMeasure)

A description of some statistical measure e.g. "daily maximum".

Attributes of the data type StatisticalMeasure

Attribute	Definition	Type	Voidability
label	A human readable title for the statistical measure.	CharacterString	
statisticalFunction	A statistical function e.g. mean.	StatisticalFunction-TypeValue	
aggregationTime-Period	A temporal range over which a statistic is calculated. e.g. a day, an hour.	TM_Duration	
aggregationLength	A one dimensional spatial range over which a statistic is calculated, for example 1 metre.	Length	
aggregationArea	A two dimensional spatial range over which a statistic is calculated, for example 1 square metre.	Area	
aggregationVolume	A three dimensional spatial range over which a statistic is calculated, for example 1 cubic metre.	Volume	
otherAggregation	Any other type of aggregation.	Any	

Association roles of the data type StatisticalMeasure

Association role	Definition	Type	Voidability
derivedFrom	One statistical measure may be derived from another, e.g. monthly maximum temperatures may be derived from daily mean temperatures.	StatisticalMeasure	

7.3.2. *Enumerations*

7.3.2.1. Comparison Operator (ComparisonOperatorValue)

An enumeration of comparison operators (e.g. greater than)

Values for the enumeration ComparisonOperatorValue

Value	Definition
equalTo	exactly equal to
notEqualTo	not exactly equal to
lessThan	less than
greaterThan	greater than
lessThanOrEqualTo	less than or exactly equal to
greaterThanOrEqualTo	greater than or exactly equal to

7.3.3. *Code lists*

7.3.3.1. Phenomenon Type (PhenomenonTypeValue)

A code list of phenomena (e.g. temperature, wind speed).

The allowed values for this code list comprise the values of the following code lists or other code lists defined by data providers:

— Climate and Forecast Standard Names (CFStandardNamesValue): Definitions of phenomena observed in meteorology and oceanography, as specified in Section 4.5 of this Annex.

— Profile Element Parameter Name (ProfileElementParameterNameValue): Properties that can be observed to characterize the profile element, as specified in Section 3.3.8 of Annex IV.

— Soil Derived Object Parameter Name (SoilDerivedObjectParameterNameValue): Soil-related properties that can be derived from soil and other data, as specified in Section 3.3.9 of Annex IV.

— Soil Profile Parameter Name (SoilProfileParameterNameValue): Properties that can be observed to characterize the soil profile, as specified in Section 3.3.12 of Annex IV.

— Soil Site Parameter Name (SoilSiteParameterNameValue): Properties that can be observed to characterize the soil site, as specified in Section 3.3.13 of Annex IV.

— EU Air Quality Reference Component (EU_AirQualityReferenceComponentValue): Definitions of phenomena regarding air quality in the context of reporting under Union legislation, as specified in Section 13.2.1.1 of Annex IV.

— WMO GRIB Code and Flags Table 4.2 (GRIB_CodeTable4_2Value): Definitions of phenomena observed in meteorology, as specified in Section 13.2.1.2 of Annex IV.

— BODC P01 Parameter Usage (BODC_P01ParameterUsageValue): Definitions of phenomena observed in oceanography, as specified in Section 14.2.1.1 of Annex IV.

7.3.3.2. Statistical Function Type (StatisticalFunctionTypeValue)

A code list of statistical functions (e.g. maximum, minimum, mean).

The allowed values for this code list comprise any values defined by data providers.

7.4. **Specialised Observations**

7.4.1. *Spatial object types*

The package Specialised Observations contains the following spatial object types:

— Grid Observation

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type MultiPointObservation

featureOfInterest shall be a SF_SamplingCurve, SF_SamplingSurface or SF_SamplingSolid.

phenomenonTime shall be a TM_Instant

result shall be a MultiPointCoverage.

7.4.1.6. Point Time Series Observation (PointTimeSeriesObservation)

Observation that represents a time-series of point measurements of a property at a fixed location in space.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type PointTimeSeriesObservation

featureOfInterest shall be a SF_SamplingPoint.

phenomenonTime shall be a TM_Period.

result shall be a Timeseries.

7.4.1.7. Profile Observation (ProfileObservation)

Observation representing the measurement of a property along a vertical profile in space at a single time instant.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type ProfileObservation

featureOfInterest shall be a SF_SamplingCurve.

phenomenonTime shall be a TM_Instant.

result shall be a ReferenceableGridCoverage or a RectifiedGridCoverage.

Spatial domain of the result shall contain one axis and that shall be vertical.

7.4.1.8. Trajectory Observation (TrajectoryObservation)

Observation representing the measurement of a property along a meandering curve in time and space.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type TrajectoryObservation

phenomenonTime shall be a TM_Period.

result shall be a Timeseries.

each point in the result shall be a TimeLocationValueTriple.

featureOfInterest shall be a SF_Sampling Curve.

7.4.2. *Data types*

7.4.2.1. Time Location Value Triple (TimeLocationValueTriple)

A triple set of Time, location, value (measurement). For example, at a point along a trajectory.

This type is a sub-type of TimeValuePair.

Attributes of the data type TimeLocationValueTriple

Attribute	Definition	Type	Voidability
location	Geographic location where value is valid.	GM_Position	

7.5. **Requirements for Observations**

Where the OM_Observation type or any sub-type thereof is used to make data available, the following requirements shall apply:

(1) The Process type shall be used to indicate the procedure used in an OM_Observation.

(2) Where reference is made to an EnvironmentalMonitoringFacility from an OM_Observation, a parameter attribute shall be provided, whose name attribute is "relatedMonitoringFeature" and whose value attribute is of type AbstractMonitoringFeature.

(3) For all encodings that are used for all or part of an OM_Observation result, a public Application Programming Interface (API) shall be available to read the encoded file. This API shall be capable of exposing the information needed to realise INSPIRE spatial objects.

(4) If the processParameter attribute is present in the procedure property of an OM_Observation object, its value (a name) shall be included in the parameter attribute of the OM_Observation object.

8. ACTIVITY COMPLEX MODEL

The INSPIRE activity complex model contains the package Activity Complex.

8.1. **Activity Complex**

8.1.1. *Spatial object types*

The package Activity Complex contains the spatial object type Activity Complex.

8.1.1.1. Activity Complex (ActivityComplex)

A single unit, both technically and economically, under the management control of a legal entity (operator), covering activities as those listed in the Eurostat NACE classification established by Regulation (EC) No 1893/2006 of the European Parliament and of the Council (¹). Activity Complex must represent the whole area, at the same or different geographical location, managed by the same operator including all infrastructure, equipment and materials.

Attributes of the spatial object type ActivityComplex

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Thematic identifier of the activity complex.	ThematicIdentifier	
geometry	The geometry used to define the extent or position of the activity complex.	GM_Object	
function	Activities performed by the activity complex. Function is described by the activity and potentially complemented with information about inputs and outputs as result of it.	Function	
name	Descriptive name of the activity complex.	CharacterString	voidable

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(¹) OJ L 393, 30.12.2006, p. 1.

Attribute	Definition	Type	Voidability
validFrom	The time when the activity complex started to exist in the real world.	DateTime	voidable
validTo	The time when the activity complex no longer exists in the real world.	DateTime	voidable
beginLifespan-Version	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

8.1.2. *Data types*

8.1.2.1. Function (Function)

The function of something expressed as an activity and optional input and/or output.

Attributes of the data type Function

Attribute	Definition	Type	Voidability
activity	Categorized description of individual or organized set of technically related processes that are carried out by a economical unit, private or public, profit or non profit character.	EconomicActivity-Value	
input	Any classified or registered material that enters a technical and economical unit according to its function.	InputOutputValue	voidable
output	Any classified or registered material that leaves a technical and economical unit according to its function.	InputOutputValue	voidable
description	A more detailed description of the function.	PT_FreeText	voidable

8.1.2.2. Capacity (Capacity)

A quantification of an actual or potential ability to perform an activity, that typically does not change, does not change often, or does not change to a significant degree.

Attributes of the data type Capacity

Attribute	Definition	Type	Voidability
activity	Categorized description of individual or organized set of technically related processes that are carried out by a economical unit, private or public, profit or non profit character.	EconomicActivity-Value	
input	Measurable information about any classified or registered material that enters a technical and economical unit according to its function.	InputOutputAmount	
output	Measurable information about any classified or registered material that leaves a technical and economical unit according to its function.	InputOutputAmount	

Attribute	Definition	Type	Voidability
time	The duration of time to which the specified capacity refers, such as 1 year for an annual capacity.	TM_Duration	
description	A description of the capacity.	PT_FreeText	voidable

8.1.2.3. Amount Of Input Or Output (InputOutputAmount)

Type and, where available, measurable amount of a classified or registered material that enters or leaves a technical and economical unit.

Attributes of the data type InputOutputAmount

Attribute	Definition	Type	Voidability
inputOutput	A classified or registered material that enters or leaves a technical and economical unit according to its function.	InputOutputValue	
amount	The amount (such as a volume or mass) of the classified or registered material that enters or leaves a technical and economical unit.	Measure	voidable

8.1.2.4. Permission (Permission)

Official Decision (formal consent) granting authorization to operate all or part of an Activity Complex, subject to certain conditions which guarantee that the installations or parts of installations on the same site operated by the same operator comply with the requirements fixed by a competent authority. A permit may cover one or more functions and fix parameters of capacity. The term could be extended to other kind of certificates or documents of special relevance depending of the scope (e.g. ISO, EMAS, National Quality Standards, etc).

Attributes of the data type Permission

Attribute	Definition	Type	Voidability
id	Identifying reference to the permission.	ThematicIdentifier	
relatedParty	Parties related to the permission granted to the activity complex open to many different roles, such as Competent Authorities or Company among others	RelatedParty	voidable
decisionDate	Temporal reference that complements the definition of the permission.	DateTime	voidable
dateFrom	A date starting from which the permission applies and is valid.	DateTime	voidable
dateTo	A date up to which the permission applies and is valid.	DateTime	voidable
description	A description of the permission.	PT_FreeText	voidable
permittedFunction	Function/s to which the permission is granted.	Function	voidable
permittedCapacity	Maximum amounts of activity input and/or output according to the permission.	Capacity	voidable

8.1.2.5. Activity Complex Description (ActivityComplexDescription)

Additional information about an activity complex, including its description, address, contact details and related parties.

Attributes of the spatial object type ActivityComplexDescription

Association role	Definition	Type	Voidability
description	A complementary definition of the "Activity Complex" and its characteristics.	PT_FreeText	voidable
address	An address for the activity complex, i.e., an address where the activities occur.	AddressRepresentation	voidable
contact	Contact information for the activity complex.	Contact	voidable
relatedParty	Information of Parties related to the Activity Complex. It is open to many different roles, such as owners, operators or Competent Authorities.	RelatedParty	voidable

8.1.3. *Code lists*

8.1.3.1. Economic Activity (EconomicActivityValue)

Classification of economic activities.

The allowed values for this code list comprise the values of the following code lists or other code lists specified by data providers:

— EU Economic Activity Classification (EconomicActivityNACEValue): Economic activities according to Eurostat NACE Classification values, as specified in Regulation (EC) No 1893/2006 of the European Parliament and of the Council [1].

— EU Waste Statistics Economic Activity Classification (EconomicActivityWasteStatisticsValue): Classification of economic activities according to Section 8 of Annex I of Regulation (EC) No 2150/2002 [2].

— EU Waste Recovery Disposal Classification (WasteRecoveryDisposalValue): Classification of waste recovery and disposal operations according to Annexes I and II of Directive 2008/98/EC of the European Parliament and of the Council [3].

8.1.3.2. Input Or Output (InputOutputValue)

Classification of inputs or outputs.

The allowed values for this code list comprise the values of the following code lists or other code lists specified by data providers.

— EU Product Classification (ProductCPAValue): Classification of Products by Economical Activity according to Regulation (EC) No 451/2008 of the European Parliament and of the Council [4].

— EU Waste Classification (WasteValue): Classification of Wastes according to Decision 2000/532/EC [5].

8.2. **Requirements for Activity Complexes**

If a data provider uses a sub-type of ActivityComplex to make available information on the status, physical capacity, permissions and/or additional information, the relevant code lists and data types (ConditionOfFacilityValue, Capacity, Permission, ActivityComplexDescription) included in the package Activity Complex shall be used.'

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[1] OJ L 393, 30.12.2006, p. 1.
[2] OJ L 332, 9.12.2002, p. 1.
[3] OJ L 312, 22.11.2008, p. 3.
[4] OJ L 145, 4.6.2008, p. 65.
[5] OJ L 226, 6.9.2000, p. 3.

ANNEX II

Annex II to Regulation (EU) No 1089/2010 is amended as follows:

(1) Throughout the text, the sentence 'This code list shall not be extended by Member States.' is replaced by the sentence 'The allowed values for this code list comprise only the values in the table below.'.

(2) Throughout the text, in the headings of all tables that are specifying code list values, the text 'Allowed values for the code list' is replaced by the text 'Values for the code list'.

(3) In Section 1.1, the following indents are added:

'— "mean sea level" (MSL) means the average height of the surface of the sea at a tide station for all stages of the tide over a 19-year period, usually determined from hourly height readings measured from a fixed predetermined reference level (chart datum).

— "lowest astronomical tide" (LAT) means the lowest tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.'

(4) Section 1.3.3 is amended as follows:

(a) the second indent is replaced by the following:

'— For the vertical component in the free atmosphere, barometric pressure, converted to height using ISO 2533:1975 International Standard Atmosphere, or other linear or parametric reference systems shall be used. Where other parametric reference systems are used, these shall be described in an accessible reference using EN ISO 19111-2:2012.'

(b) the following indents are added:

'— For the vertical component in marine areas where there is an appreciable tidal range (tidal waters), the Lowest Astronomical Tide (LAT) shall be used as the reference surface.

— For the vertical component in marine areas without an appreciable tidal range, in open oceans and effectively in waters that are deeper than 200 meters, the Mean Sea Level (MSL) or a well-defined reference level close to the MSL shall be used as the reference surface.'.

(5) Section 2.2 is amended as follows:

(a) The first paragraph is replaced by the following:

'Either of the grids with fixed and unambiguously defined locations defined in Sections 2.2.1 and 2.2.2 shall be used as a geo-referencing framework to make gridded data available in INSPIRE, unless one of the following conditions holds:

(1) Other grids may be specified for specific spatial data themes in Annexes II-IV. In this case, data exchanged using such a theme-specific grid shall use standards in which the grid definition is either included with the data, or linked by reference.

(2) For grid referencing in regions outside of continental Europe Member States may define their own grid based on a geodetic coordinate reference system compliant with ITRS and a Lambert Azimuthal Equal Area projection, following the same principles as laid down for the grid specified in Section 2.2.1. In this case, an identifier for the coordinate reference system shall be created.'

(b) Section 2.2.1 is amended as follows:

(1) the title is replaced by 'Equal Area Grid'.

(2) the sentences 'The grid defined in this Section shall be used as a geo-referencing framework where grids with fixed and unambiguously defined locations of equal-area grid cells are required.' and 'The reference point of a grid cell shall be the lower left corner of the grid cell. ' are deleted.

(c) Section 2.2.2 is replaced by the following:

'2.2.2. *Zoned Geographic Grid*

1. When gridded data is delivered using geodetic coordinates as specified in Section 1.3 of this Annex the multi-resolution grid defined in this Section may be used as a geo-referencing framework.

2. The resolution levels are defined in Table 1.

3. The grid shall be based on the ETRS89-GRS80 geodetic coordinate reference system.

4. The origin of the grid shall coincide with the intersection point of the Equator with the Greenwich Meridian (GRS80 latitude $\varphi=0$; GRS80 longitude $\lambda=0$).

5. The grid orientation shall be south-north and west-east according to the net defined by the meridians and parallels of the GRS80 ellipsoid.

6. For grid referencing in regions outside of continental Europe data providers may define their own grid based on a geodetic coordinate reference system compliant with ITRS, following the same principles as laid down for the Pan-European Grid_ETRS89-GRS80zn. In this case, an identifier for the coordinate reference system and the corresponding identifier for the grid shall be created.

7. This grid shall be subdivided in zones. The south-north resolution of the grid shall have equal angular spacing. The west-east resolution of the grid shall be established as the product of angular spacing multiplied by the factor of the zone as defined in Table 1.

8. The grid shall be designated Grid_ETRS89-GRS80z*n_res*, where *n* represents the number of the zone and *res* the cell size in angular units, as specified in Table 1.

Table 1

Common Grid_ETRS89-GRS80: Latitude spacing (resolution level) and longitude spacing for each zone

Resolution Levels	LATITUDE SPACING (Arc seconds)	LONGITUDE SPACING (Arc seconds)					Cell size
		Zone 1 (Lat. 0°–50°)	Zone 2 (Lat. 50°–70°)	Zone 3 (Lat. 70°–75°)	Zone 4 (Lat. 75°–80°)	Zone 5 (Lat. 80°–90°)	
LEVEL 0	3 600	3 600	7 200	10 800	14 400	21 600	1 D
LEVEL 1	3 000	3 000	6 000	9 000	12 000	18 000	50 M
LEVEL 2	1 800	1 800	3 600	5 400	7 200	10 800	30 M
LEVEL 3	1 200	1 200	2 400	3 600	4 800	7 200	20 M
LEVEL 4	600	600	1 200	1 800	2 400	3 600	10 M
LEVEL 5	300	300	600	900	1 200	1 800	5 M
LEVEL 6	120	120	240	360	480	720	2 M
LEVEL 7	60	60	120	180	240	360	1 M
LEVEL 8	30	30	60	90	120	180	30 S
LEVEL 9	15	15	30	45	60	90	15 S
LEVEL 10	5	5	10	15	20	30	5 S
LEVEL 11	3	3	6	9	12	18	3 S
LEVEL 12	1,5	1,5	3	4,5	6	9	1 500 MS
LEVEL 13	1	1	2	3	4	6	1 000 MS
LEVEL 14	0,75	0,75	1,5	2,25	3	4,5	750 MS

Resolution Levels	LATITUDE SPACING (Arc seconds)	LONGITUDE SPACING (Arc seconds)					Cell size
		Zone 1 (Lat. 0°–50°)	Zone 2 (Lat. 50°–70°)	Zone 3 (Lat. 70°–75°)	Zone 4 (Lat. 75°–80°)	Zone 5 (Lat. 80°–90°)	
LEVEL 15	0,5	0,5	1	1,5	2	3	500 MS
LEVEL 16	0,3	0,3	0,6	0,9	1,2	1,8	300 MS
LEVEL 17	0,15	0,15	0,3	0,45	0,6	0,9	150 MS
LEVEL 18	0,1	0,1	0,2	0,3	0,4	0,6	100 MS
LEVEL 19	0,075	0,075	0,15	0,225	0,3	0,45	75 MS
LEVEL 20	0,03	0,03	0,06	0,09	0,12	0,18	30 MS
LEVEL 21	0,015	0,015	0,03	0,045	0,06	0,09	15 MS
LEVEL 22	0,01	0,01	0,02	0,03	0,04	0,06	10 MS
LEVEL 23	0,0075	0,0075	0,015	0,0225	0,03	0,045	7 500 MMS
LEVEL 24	0,003	0,003	0,006	0,009	0,012	0,018	3 000 MMS
FACTOR	—	1	2	3	4	6	—'

(6) Section 4 is replaced by the following:

'4.   ADMINISTRATIVE UNITS

4.1.   **Structure of the Spatial Data Theme Administrative Units**

The types specified for the spatial data theme Administrative Units are structured in the following packages:

— Administrative Units

— Maritime Units

4.2.   **Administrative Units**

4.2.1.   *Spatial object types*

The package Administrative Units contains the following spatial object types:

— Administrative Boundary

— Administrative Unit

— Condominium

4.2.1.1. Administrative Boundary (AdministrativeBoundary)

A line of demarcation between administrative units.

Attributes of the spatial object type AdministrativeBoundary

Attribute	Definition	Type	Voidability
beginLifespan-Version	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
country	Two-character country code according to the Interinstitutional style guide published by the Publications Office of the European Union.	CountryCode	

Attribute	Definition	Type	Voidability
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of border line.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
legalStatus	Legal status of this administrative boundary.	LegalStatusValue	voidable
nationalLevel	The hierarchy levels of all adjacent administrative units this boundary is part of.	AdministrativeHierarchyLevel	
technicalStatus	The technical status of the administrative boundary.	TechnicalStatusValue	voidable

Association roles of the spatial object type AdministrativeBoundary

Association role	Definition	Type	Voidability
admUnit	The administrative units separated by this administrative boundary.	AdministrativeUnit	voidable

4.2.1.2. Administrative Unit (AdministrativeUnit)

Unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.

Attributes of the spatial object type AdministrativeUnit

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
country	Two-character country code according to the Interinstitutional style guide published by the Publications Office of the European Union.	CountryCode	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometric representation of spatial area covered by this administrative unit.	GM_MultiSurface	
inspireId	External object identifier of the spatial object.	Identifier	
name	Official national geographical name of the administrative unit, given in several languages where required.	GeographicalName	
nationalCode	Thematic identifier corresponding to the national administrative codes defined in each country.	CharacterString	
nationalLevel	Level in the national administrative hierarchy, at which the administrative unit is established.	AdministrativeHierarchyLevel	

Attribute	Definition	Type	Voidability
nationalLevelName	Name of the level in the national administrative hierarchy, at which the administrative unit is established.	LocalisedCharacter-String	voidable
residenceOfAuthority	Center for national or local administration.	ResidenceOfAuthority	voidable

Association roles of the spatial object type AdministrativeUnit

Association role	Definition	Type	Voidability
administeredBy	Administrative unit established at same level of national administrative hierarchy that administers this administrative unit.	AdministrativeUnit	voidable
boundary	The administrative boundaries between this administrative unit and all the units adjacent to it.	Administrative-Boundary	voidable
coAdminister	Administrative unit established at same level of national administrative hierarchy which is co-administered by this administrative unit.	AdministrativeUnit	voidable
condominium	Condominium administered by this administrative unit.	Condominium	voidable
lowerLevelUnit	Units established at a lower level of the national administrative hierarchy which are administered by the administrative unit.	AdministrativeUnit	voidable
upperLevelUnit	Unit established at a higher level of national administrative hierarchy that this administrative unit administers	AdministrativeUnit	voidable

Constraints of the spatial object type AdministrativeUnit

Association role condominium applies only for administrative units which nationalLevel="1st order" (country level).

No unit at lowest level can associate units at lower level.

No unit at highest level can associate units at a higher level.

4.2.1.3. Condominium (Condominium)

An administrative area established independently to any national administrative division of territory and administered by two or more countries.

Attributes of the spatial object type Condominium

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
geometry	Geometric representation of spatial area covered by this condominium	GM_MultiSurface	
inspireId	External object identifier of the spatial object.	Identifier	
name	Official geographical name of this condominium, given in several languages where required.	GeographicalName	voidable

Association roles of the spatial object type Condominium

Association role	Definition	Type	Voidability
admUnit	The administrative unit administering the condominium	AdministrativeUnit	voidable

4.2.2. *Data Types*

4.2.2.1. Residence Of Authority (ResidenceOfAuthority)

Data type representing the name and position of a residence of authority.

Attributes of the data type ResidenceOfAuthority

Attribute	Definition	Type	Voidability
geometry	Position of the residence of authority.	GM_Point	voidable
name	Name of the residence of authority.	GeographicalName	

4.2.3. *Enumerations*

4.2.3.1. Legal Status (LegalStatusValue)

Description of the legal status of administrative boundaries.

Allowed values for the enumeration LegalStatusValue

Value	Definition
agreed	The edge-matched boundary has been agreed between neighbouring administrative units and is stable now.
notAgreed	The edge-matched boundary has not yet been agreed between neighbouring administrative units and could be changed.

4.2.3.2. Technical Status (TechnicalStatusValue)

Description of the technical status of administrative boundaries.

Allowed values for the enumeration TechnicalStatusValue

Value	Definition
edgeMatched	The boundaries of neighbouring administrative units have the same set of coordinates.
notEdgeMatched	The boundaries of neighbouring administrative units do not have the same set of coordinates.

4.2.4. *Code Lists*

4.2.4.1. Administrative Hierarchy Level (AdministrativeHierarchyLevel)

Levels of administration in the national administrative hierarchy. This code list reflects the level in the hierarchical pyramid of the administrative structures, which is based on geometric aggregation of territories and does not necessarily describe the subordination between the related administrative authorities.

This code list shall be managed in a common code list register.

4.3. **Maritime Units**

4.3.1. *Spatial object types*

The package Maritime Units contains the following spatial object types:

— Baseline

— Maritime Boundary

— Maritime Zone

4.3.1.1. Baseline (Baseline)

The line from which the outer limits of the territorial sea and certain other outer limits are measured.

Attributes of the spatial object type Baseline

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
beginLifespan-Version	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type Baseline

Association role	Definition	Type	Voidability
segment	Segment of a baseline.	BaselineSegment	

4.3.1.2. Maritime Boundary (MaritimeBoundary)

A line depicting the separation of any type of maritime jurisdiction.

Attributes of the spatial object type MaritimeBoundary

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometric representation of the maritime boundary.	GM_Curve	
country	The country that the maritime zone of this boundary belongs to.	CountryCode	
legalStatus	Legal status of this maritime boundary.	LegalStatusValue	voidable

Attribute	Definition	Type	Voidability
technicalStatus	The technical status of the maritime boundary.	TechnicalStatusValue	voidable
beginLifespan-Version	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

4.3.1.3. Maritime Zone (MaritimeZone)

A belt of sea defined by international treaties and conventions, where coastal State executes jurisdictional rights.

Attributes of the spatial object type MaritimeZone

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometric representation of spatial area covered by this maritime zone.	GM_MultiSurface	
zoneType	Type of maritime zone.	MaritimeZoneType-Value	
country	The country that this maritime zone belongs to.	CountryCode	
name	Name(s) of the maritime zone.	GeographicalName	voidable
beginLifeSpan-Version	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifepanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type MaritimeZone

Association role	Definition	Type	Voidability
baseline	Baseline or baselines used for the delineation of this maritime zone.	Baseline	voidable
boundary	The boundary or boundaries of this maritime zone.	MaritimeBoundary	voidable

4.3.2. *Data types*

4.3.2.1. Baseline Segment (BaselineSegment)

Segment of the baseline from which the outer limits of the territorial sea and certain other outer limits are measured.

Attributes of the data type BaselineSegment

Attribute	Definition	Type	Voidability
geometry	Geometric representation of the baseline segment.	GM_Curve	
segmentType	The baseline type used for this segment.	BaselineSegmentType-Value	

4.3.3.   *Code lists*

4.3.3.1.   Baseline Segment Type (BaselineSegmentTypeValue)

The types of baselines used to measure the breadth of the territorial sea.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list BaselineSegmentTypeValue

Value	Name	Definition
normal	normal	The normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by the coastal State.
straight	straight	The baseline for measuring the breadth of the territorial sea is the straight baseline established by joining the appropriate points.
archipelagic	archipelagic	The baseline for measuring the breadth of the territorial sea is the straight baseline joining the outermost points of the outermost islands and drying reefs of the archipelago.

4.3.3.2.   Maritime Zone Type (MaritimeZoneTypeValue)

Type of martime zone.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list MaritimeZoneTypeValue

Value	Name	Definition
internalWaters	Internal Waters	The waters on the landward side of the baselines of the territorial sea of the coastal State.
territorialSea	Territorial Sea	A belt of sea of a defined breadth not exceeding 12 nautical miles measured from the baselines determined in accordance to the United Nations Convention of Law on the Sea.
contiguousZone	Contiguous Zone	A zone contiguous to a territorial sea of a coastal State, which may not extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured.
exclusiveEconomicZone	Exclusive Economic Zone	An area beyond and adjacent to the territorial sea of a coastal State, subject to the specific legal regime under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of the United Nations Convention on Law of the Sea.
continentalShelf	Continental Shelf	A maritime zone beyond and adjacent to the a territorial sea of a coastal State whose outer boundary is determined in accordance with Article 76 of the United Nations Convention on the Law of the Sea.

4.4.   **Theme-specific Requirements**

1. Each instance of spatial object type AdministrativeUnit, except for the country level unit representing a Member State and co-administered units, shall refer exactly to one unit at a higher level of administrative hierarchy. This correspondence shall be expressed by the upperLevelUnit association role of AdministrativeUnit spatial object type.

2. Each instance of spatial object type AdministrativeUnit, except for those at the lowest level, shall refer to their respective lower level units. This correspondence shall be expressed by the lowerLevelUnit association role of AdministrativeUnit spatial object type.

3. If an administrative unit is co-administered by two or more other administrative units the association role administeredBy shall be used. The units co-administering this unit shall apply inverse role coAdminister.

4. Administrative units at the same level of administrative hierarchy shall not conceptually share common areas.

5. Instances of the spatial object type AdministrativeBoundary shall correspond to the edges in the topological structure of the complete (including all levels) boundary graph.

6. The spatial extent of a condominium may not be part of the geometry representing the spatial extent of an administrative unit.

7. Condominiums can only be administered by administrative units at country level.

4.5.   **Layers**

Layers for the spatial data theme Administrative Units

Layer Name	Layer Title	Spatial object type
AU.AdministrativeUnit	Administrative unit	AdministrativeUnit
AU.AdministrativeBoundary	Administrative boundary	AdministrativeBoundary
AU.Condominium	Condominium	Condominium
AU.Baseline	Baseline	Baseline
AU.<CodeListValue> ([1]) Example: AU.ContiguousZone	<human readable name> Example: Contiguous Zone	MaritimeZone (zoneType: MaritimeZoneTypeValue)
AU.MaritimeBoundary	Maritime boundary	MaritimeBoundary

([1]) One layer shall be made available for each code list value, in accordance with Art. 14(3).'

(7) Section 8 is amended as follows:

(a) In Section 8.2, the indent 'Hydro – Reporting' is deleted.

(b) In Section 8.5.1, the following indents are deleted:

— Hydro Power Plant

— Inundated Land

— Ocean Region

— Pipe

— Pumping Station

(c) In Section 8.5.1.4, the sentence 'This type is a candidate type to be considered by the spatial data theme Natural risk zones in Annex III to Directive 2007/2/EC.' is deleted.

(d) Sections 8.5.1.9 Hydro Power Plant (HydroPowerPlant), 8.5.1.10 Inundated Land (InundatedLand), 8.5.1.14 Ocean Region (OceanRegion), 8.5.1.15 Pipe (Pipe), 8.5.1.16 Pumping Station (PumpingStation), 8.5.4.3 Inundation (InundationValue) and 8.6 Hydro – Reporting are deleted.

(e) Section 8.5.1.19 is amended as follows:

— The sentence 'This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.' is deleted.

— The row for the attribute 'geometry' in the attribute table is replaced by the following row:

geometry	The geometry of the shore.	GM_MultiSurface	

(f) In Section 8.5.1.24, the following constraint is added after 'Constraints of the spatial object type Watercourse':

'The shores on either side of a watercourse shall be provided (using the bank property) as two separate Shore objects.'

(g) In Section 8.5.1.25, the sentence 'This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.' is deleted.

(h) In Section 8.5.4.4, the sentence 'This type is a candidate type to be considered by the spatial data theme Land cover in Annex II to Directive 2007/2/EC.' is deleted.

(i) In Section 8.8, the table is replaced by the following table:

'Layer Type	Layer Title	Spatial object type(s)
HY.Network	Hydrographic Network	HydroNode, WatercourseLink
HY.PhysicalWaters.Waterbodies	Waterbodies	Watercourse, StandingWater
HY.PhysicalWaters.LandWaterBoundary	Land-Water Boundaries	LandWaterBoundary
HY.PhysicalWaters.Catchments	Catchments	DrainageBasin, RiverBasin
HY.PhysicalWaters.HydroPointOfInterest	Hydro Points of Interest	Rapids, Falls
HY.PhysicalWaters.ManMadeObject	Man-made Objects	Crossing, DamOrWeir, Embankment, Lock, Ford, ShorelineConstruction, Sluice
HY. PhysicalWaters.Wetland	Wetlands	Wetland
HY. PhysicalWaters.Shore	Shores	Shore'

ANNEX III

The following Annex III is added to Regulation (EU) No 1089/2010:

'*ANNEX III*

Requirements for Spatial Data Themes Listed in Annex II to Directive 2007/2/EC

1.   ELEVATION

1.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "digital elevation model" (DEM) means Digital Surface Model (DSM) or Digital Terrain Model (DTM).

(2) "digital surface model" (DSM) means a surface describing the three dimensional shape of the Earth's surface, including all static features placed on it. Temporary phenomena do not form part of the surface, but due to the technical difficulties in removing them some of these features may also be present in the surface.

(3) "digital terrain model" (DTM) means a surface describing the three dimensional shape of the Earth's bare surface, excluding as possible any other features placed on it.

(4) "elevation" means a vertically-constrained dimensional property of an spatial object consisting of an absolute measure referenced to a well-defined surface which is commonly taken as origin.

(5) "height" means an elevation property measured along a plumb line in a direction opposite to Earth's gravity field (upwards).

(6) "depth" means an elevation property measured along a plumb line in a direction coincident to Earth's gravity field (downwards).

1.2.   **Structure of the Spatial Data Theme Elevation**

The types specified for the spatial data theme Elevation are structured in the following packages:

— Elevation – Base Types

— Elevation – Grid Coverage

— Elevation – Vector Elements

— Elevation – TIN

Spatial data sets describing the morphology of land elevation shall be made available at least using the spatial object types included in the package Elevation – Grid Coverage.

Spatial data sets describing the morphology of bathymetry shall be made available at least using the spatial object types included in either the package Elevation – Grid Coverage or the package Elevation – Vector Elements.

1.3.   **Elevation – Base Types**

1.3.1.   *Enumerations*

1.3.1.1.   Elevation Property Type (ElevationPropertyTypeValue)

Enumeration type which determines the elevation property which has been measured or calculated.

Values for the enumeration ElevationPropertyTypeValue

Value	Definition
height	Elevation property measured along a plumb line in a direction opposite to Earth's gravity field (upwards).
depth	Elevation property measured along a plumb line in a direction coincident to Earth's gravity field (downwards).

1.3.1.2. Surface Type (SurfaceTypeValue)

Enumeration type which determines the elevation surface with regard to its relative adherence to the Earth's bare surface.

Values for the enumeration SurfaceTypeValue

Value	Definition
DTM	Digital terrain model.
DSM	Digital surface model.

1.4. **Elevation – Grid Coverage.**

1.4.1. *Spatial object types*

The package Elevation – Grid Coverage contains the spatial object type Elevation Grid Coverage.

1.4.1.1. Elevation Grid Coverage (ElevationGridCoverage)

Continuous coverage which uses a systematic tessellation based on a regular rectified quadrilateral grid to cover its domain, where the elevation property value is usually known for each of the grid points forming this domain.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type ElevationGridCoverage

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
domainExtent	Extent of the spatiotemporal domain of the coverage.	EX_Extent	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
propertyType	Attribute determining the elevation property represented by the elevation grid coverage.	ElevationPropertyType-Value	
surfaceType	Attribute indicating the type of elevation surface that the coverage describes in relation to the Earth's bare surface.	SurfaceTypeValue	

Association roles of the spatial object type ElevationGridCoverage

Association role	Definition	Type	Voidability
contributingElevationGridCoverage	Reference to the elevation grid coverages that compose an aggregated elevation grid coverage. The association has additional properties as defined in the association class ElevationGrid-CoverageAggregation.	ElevationGridCoverage	

Constraints of the spatial object type ElevationGridCoverage

The grid dimension shall always be 2 for an elevation grid coverage.

The domainExtent shall be at least populated with a subtype of EX_GeographicExtent.

The coordinate reference system used to reference the grid shall be provided.

All the ElevationGridCoverage instances, to which an aggregated ElevationGridCoverage instance refers, shall share the same orientation of grid axes and the same grid spacing in each direction.

The origin of the grid shall be described in two dimensions.

The values in the range set shall be described by the Float type.

1.4.2.   *Data types*

1.4.2.1.   Elevation Grid Coverage Aggregation (ElevationGridCoverageAggregation)

Geometrical characteristics of the elevation grid coverage aggregation.

This type is an association class.

Attributes of the data type ElevationGridCoverageAggregation

Attribute	Definition	Type	Voidability
contributingFootprint	Geometric representation delineating the geographic area of the elevation grid coverage that contributes to the aggregated elevation grid coverage.	GM_MultiSurface	

1.5.   **Elevation - Vector Elements**

1.5.1.   *Spatial object types*

The package Elevation – Vector Elements contains the following spatial object types:

— Elevation Vector Object

— Spot Elevation

— Contour Line

— Breakline

— Void Area

— Isolated Area

1.5.1.1.   Elevation Vector Object (ElevationVectorObject)

Elevation spatial object forming part of a vector data set, which participates in the description of the elevation property of a real world surface. It consists of an identity base for all vector objects which can be included as part of an elevation data set.

This type is abstract.

Attributes of the spatial object type ElevationVectorObject

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
localDepthDatum	Identification of a local vertical coordinate reference system not included in a registry, which is used to refer depth measurements.	ChartDatum	
propertyType	Attribute categorizing the elevation vector object as a land-elevation or a bathymetry spatial object. It determines the elevation property represented by the object.	ElevationPropertyType-Value	

1.5.1.2. Spot Elevation (SpotElevation)

Point spatial object which describes the elevation of an Earth's surface at a specific location. It provides a single elevation property value.

This type is a sub-type of ElevationVectorObject.

Attributes of the spatial object type SpotElevation

Attribute	Definition	Type	Voidability
classification	Class of spot elevation according to the LAS specification of the American Society for Photogrammetry and Remote Sensing (ASPRS).	SpotElevationClassValue	voidable
geographicalName	A geographical name that is used to identify a named land or water body's floor location in the real world, which is represented by the spot elevation spatial object.	GeographicalName	voidable
geometry	Represents the geometric properties of the spatial object.	GM_Point	
propertyValue	Value of the elevation property of the spatial object referred to a specific vertical coordinate reference system.	DirectPosition	
spotElevationType	The type of elevation spot.	SpotElevationTypeValue	voidable

Constraints of the spatial object type SpotElevation

The dimension of the property value coordinate shall be 1

The property value shall be expressed referring to a vertical coordinate reference system

1.5.1.3. Contour Line (ContourLine)

Linear spatial object composed of a set of adjoining locations characterized by having the same elevation property value. It describes, together with other contour lines present in the area, the local morphology of the Earth's surface.

This type is a sub-type of ElevationVectorObject.

Attributes of the spatial object type ContourLine

Attribute	Definition	Type	Voidability
contourLineType	The type of contour line with regard to the normal contour vertical interval (if any).	ContourLineTypeValue	voidable
downRight	Property indicating that the contour line spatial object is digitized in a way that the height of the elevation surface is lower at the right side of the line.	Boolean	voidable
geometry	Represents the geometric properties of the spatial object.	GM_Curve	
propertyValue	Value of the elevation property of the spatial object referred to a specific vertical coordinate reference system.	DirectPosition	

Constraints of the spatial object type ContourLine

The dimension of the property value coordinate shall be 1.

The property value shall be expressed referring to a vertical coordinate reference system.

1.5.1.4. Breakline (BreakLine)

A line of a critical nature which describes the shape of an elevation surface and indicates a discontinuity in the slope of the surface (i.e. an abrupt change in gradient). Triangles included within a TIN model must never cross it.

This type is a sub-type of ElevationVectorObject.

Attributes of the spatial object type BreakLine

Attribute	Definition	Type	Voidability
breakLineType	The type of break line with regard the natural or man-made real world characteristic it represents, or the specific function it has in calculating a Digital Elevation Model (DEM).	BreakLineTypeValue	
geometry	Represents the geometric properties of the spatial object.	GM_Curve	
manMadeBreak	Line which represents an elevation break due to a man-made construction present on the terrain.	Boolean	voidable

1.5.1.5. Void Area (VoidArea)

Area of the Earth's surface where the elevation model is unknown because of missing input data. This area shall be excluded from a DEM.

This type is a sub-type of ElevationVectorObject.

Attributes of the spatial object type VoidArea

Attribute	Definition	Type	Voidability
geometry	Represents the geometric properties of the spatial object.	GM_Surface	

1.5.1.6.   Isolated Area (IsolatedArea)

Delimitation of an area of the Earth's surface where an isolated part of the elevation model exists. Its outside surroundings have no elevation information.

This type is a sub-type of ElevationVectorObject.

Attributes of the spatial object type IsolatedArea

Attribute	Definition	Type	Voidability
geometry	Represents the geometric properties of the spatial object.	GM_Surface	

1.5.2.   *Data types*

1.5.2.1.   Chart Datum (ChartDatum)

Local vertical coordinate reference system which is used to refer and portray depth measurements as property values.

Attributes of the data type ChartDatum

Attribute	Definition	Type	Voidability
datumWaterLevel	Water level determining the origin of depth measurements for the chart datum.	WaterLevelValue	
offset	Relative difference between the height of each reference point and the height of the water level determining the chart datum.	Measure	
referencePoint	Geographical position(s) of: - Case A: a single point which is used to refer depth values within the geographical scope of the chart datum. - Case B: a set of points where water level measurements are performed to determine the water level of the chart datum.	GM_Point	
scope	Geographic scope in which the local depth datum is practically used.	EX_Extent	

1.5.3.   *Enumerations*

1.5.3.1.   Contour Line Type (ContourLineTypeValue)

List of possible categories of contour lines based on the equidistance parameter of the data set.

Values for the enumeration ContourLineTypeValue

Value	Definition
master	Contour at a vertical distance which is multiple to the equidistance parameter (corresponding to a certain multiple of the normal contour vertical interval) associated with the nominal scale.
ordinary	Contour at the equidistance parameter (corresponding to the normal contour vertical interval) associated with the nominal scale, and which is not a master contour.
auxiliary	A supplementary contour – not corresponding to the normal contour vertical interval – estimated or interpolated from surrounding contours, used in areas where there is insufficient height information for elevation mapping purposes or to control the creation of a digital elevation model.

1.5.4.   *Code lists*

1.5.4.1.   Breakline Type (BreakLineTypeValue)

List of possible type values for break lines based on the physical characteristics of the break line [in the elevation surface].

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

Values for the code list BreakLineTypeValue

Value	Name	Definition
bottomOfSlope	bottom of slope	Break line representing the lower boundary of an area having a constant slope in the terrain surface, typically varying approximately between 2° and 40°.
changeInSlope	change in slope	Break line representing a collection of adjoining points where the terrain has an abrupt change in slope.
flatAreaBoundary	flat area boundary	Break line that delimits an isolated part of the territory where the elevation model has to be constrained at the same elevation value.
formLine	form line	Break line representing a local direction in which the elevation surface being described takes the greatest slope.
topOfSlope	top of slope	Break line representing the upper boundary of an area having a constant slope in the terrain surface, typically varying approximately between 2° and 40°.

1.5.4.2.   Spot Elevation Classification (SpotElevationClassValue)

Possible classification values for spot elevations based on the LAS specification maintained by the American Society for Photogrammetry and Remote Sensing (ASPRS).

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Elevation.

1.5.4.3.   Spot Elevation Type (SpotElevationTypeValue)

Possible values for spot elevation points that describe a singularity of the surface.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

Values for the code list SpotElevationTypeValue

Value	Name	Definition
depression	depression	Point that represents a part of the relief of the land surface or water body's floor surface that is lower in elevation when compared to its surrounding points.
formSpot	form spot	A supplementary spot height, estimated or interpolated from surrounding heights, in areas where few contour lines or other height information exist.
generic	generic	Spot elevation spatial object not fulfilling the description of any of the other values in the current code list.
pass	pass	Lower point of a depression within a ridge alignment, generally opened along the crest line, which allow passing from one slope of the surface to another.
summit	summit	Highest point of a prominence in the relief of a land surface or a water body's floor surface.

1.6.   **Elevation - TIN**

1.6.1.   *Spatial object types*

The package "Elevation – TIN" contains the spatial object type Elevation TIN.

1.6.1.1.   Elevation TIN (ElevationTIN)

Collection of elevation spatial objects forming a particular tessellation of the space based on a Triangulated Irregular Network (TIN) according to the geometry GM_Tin defined in ISO 19107:2003. Its components are a set of control points whose elevation property values are known, and a set of break lines and stop lines.

Attributes of the spatial object type ElevationTIN

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometries	Represents the collection of geometric properties of the elevation TIN spatial object.	GM_Tin	
inspireId	External object identifier of the spatial object.	Identifier	
propertyType	Attribute determining the elevation property represented by the elevation TIN.	ElevationPropertyType-Value	
surfaceType	Attribute indicating the type of elevation surface that the elevation TIN describes in relation to the Earth's bare surface.	SurfaceTypeValue	

1.7.   **Theme-specific Requirements**

1.7.1.   *Requirements on external object identifiers*

(1) If elevation data is updated based on new source data, the updated objects shall receive a new external object identifier.

1.7.2.   *Requirements for Elevation Grid Coverages*

(1) By way of derogation from the requirement in Section 2.2 of Annex II, any grid compatible with one of the following coordinate reference systems may be used for making gridded Elevation data available:

— two-dimensional geodetic coordinates (latitude and longitude) based on a datum specified in 1.2 of Annex II and using the parameters of the GRS80 ellipsoid;

— plane coordinates using the ETRS89 Lambert Conformal Conic coordinate reference system;

— plane coordinates using the ETRS89 Transverse Mercator coordinate reference system.

The grid specified in Section 2.2.1 of Annex II shall not be used.

(2) The *domainExtent* attribute of every *ElevationGridCoverage* instance shall be at least populated with a subtype of the *EX_GeographicExtent* type.

(3) The elevation property values included within the range set of a single ElevationGridCoverage shall be referenced to one and only one vertical coordinate reference system.

(4) All the ElevationGridCoverage instances, to which an aggregated ElevationGridCoverage instance refers, shall be consistent. This means that they shall share the same range type, Coordinate Reference System and resolution. They shall also support grid alignment, i.e. the grid points in one ElevationGridCoverage instance line up with grid points of the other ElevationGridCoverage instances, so that grid cells do not partially overlap.

(5) The contributing footprints of any two ElevationGridCoverage instances referred to by the same aggregated ElevationGridCoverage instance shall be either adjacent or disjoint.

(6) The union of the contributing footprints of the ElevationGridCoverage instances referred to by the same aggregated ElevationGridCoverage instance shall determine the geographic extent (domainExtent) of the aggregated ElevationGridCoverage instance.

(7) The ElevationGridCoverage package shall be restricted to two-dimensional geometries.

(8) Information about the acquisition dates of data contained in elevation grid coverages shall be provided at least in one of the following ways:

   (a) by providing the metadata element Temporal reference for each spatial object through the metadata attribute of the spatial object type *ElevationGridCoverage;*

   (b) by providing the metadata element Temporal reference required by Regulation (EC) No 1205/2008 as a temporal extent.

1.7.3. *Requirements for Elevation Vector Data*

   (1) Where elevation vector data sets are provided using 2-D geometries, the vertical component (third dimension) shall be provided as elevation property values within the propertyValue attribute.

   (2) Where elevation vector data sets are provided using 2.5-D geometries, the elevation property values shall be only included within the third coordinate (Z) of these geometries.

1.7.4. *Requirements for Elevation TINs*

   (1) The property values included within a single instance of ElevationTIN spatial object type (TIN model) shall be referenced to one and only one vertical coordinate reference system.

   (2) Triangles intersecting a stop line shall be removed from a TIN surface, leaving holes in the surface. If coincidence occurs on surface boundary triangles, the result shall be a change of the surface boundary.

   (3) The vector spatial objects provided as components of a TIN collection shall fulfil the generic consistency rules provided for vector objects.

1.7.5. *Requirements on reference systems*

   (1) For measuring the depth of the sea floor where there is an appreciable tidal range (tidal waters), the Lowest Astronomical Tide (LAT) shall be used as reference surface.

   (2) For measuring the depth of the sea floor in marine areas without an appreciable tidal range, in open oceans and in waters that are deeper than 200 meters, the depth of the sea floor shall be referenced to the Mean Sea Level (MSL), or to a well-defined reference level close to the MSL.

   (3) The height of the reference level to which the depth of the floor of an inland water body is measured shall be referred to a gravity-related vertical reference system. This shall be the European Vertical Reference System (EVRS) for the areas within the geographical scope of EVRS, or the gravity-related vertical reference system identified by the Member State outside the scope of EVRS.

   (4) When providing an integrated land-sea elevation model, only one elevation property (either height or depth) shall be modelled, and its values shall be referenced to a single vertical coordinate reference system.

1.7.6. *Requirements on data quality and consistency*

(1) If measures other than ISO data quality measures have been used to evaluate an elevation data set, the Lineage metadata element shall include information about those measures and, if possible, a reference to an online resource where more information is available.

(2) Connected contour line spatial objects shall have the same elevation value when they are referenced to the same vertical coordinate reference system.

(3) When the elevation values of break line spatial objects are given as third coordinates (Z), the intersection point of two break line spatial objects shall have the same elevation value.

(4) When a contour line spatial object and a break line spatial object provided in the same vertical coordinate reference system intersect each other, the intersection point shall have the same elevation value (if the elevation values of break line spatial objects are given by the third (Z) coordinate).

(5) Contour line spatial objects having different elevation value shall neither intersect nor touch each other when they are referenced to the same vertical coordinate reference system.

(6) The boundary of an isolated area spatial object shall not touch the external boundary of a void area spatial object when they are referenced to the same vertical coordinate reference system.

1.8. **Layers**

Layers for the spatial data theme Elevation

Layer Name	Layer Title	Spatial object type
EL.BreakLine	Break Line	BreakLine
EL.ContourLine	Contour Line	ContourLine
EL.IsolatedArea	Isolated Area	IsolatedArea
EL.SpotElevation	Spot Elevation	SpotElevation
EL.VoidArea	Void Area	VoidArea
EL.ElevationGridCoverage	Elevation Grid Coverage	ElevationGridCoverage
EL.ElevationTIN	Elevation TIN	ElevationTIN

2. LAND COVER

2.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "classification system" means a system for assigning objects to classes, in accordance with ISO 19144-1:2012;

(2) "discrete coverage" means a coverage that returns the same feature attribute values for every direct position within any single spatial object, temporal object or spatiotemporal object in its domain, in accordance with EN ISO 19123:2007;

(3) "land cover object" means a spatial object (point, pixel or polygon) where the land cover has been observed;

(4) "legend" means the application of a classification in a specific area using a defined mapping scale and specific data set;

(5) "minimal mapping unit" means the smallest area size of a polygon allowed to be represented in a particular land cover data set;

(6) "situation" means the state of a particular land cover object at a particular point in time.

2.2. **Structure of the Spatial Data Theme Land Cover**

The types specified for the spatial data theme Land Cover are structured in the following packages:

— Land Cover Nomenclature

— Land Cover Vector

— Land Cover Raster

2.3. **Land Cover Nomenclature**

2.3.1. *Data types*

2.3.1.1. Land Cover Nomenclature (LandCoverNomenclature)

Information about reference national, institutional or local Land Cover nomenclature.

Attributes of the data type LandCoverNomenclature

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
responsibleParty	Party responsible for the development and/or maintenance of the nomenclature.	RelatedParty	
externalDescription	Document describing the nomenclature used in this data set.	DocumentCitation	voidable
embeddedDescription	An embedded encoding of the classification system according to ISO 19144-2.	LC_LandCoverClassification-System	voidable
nomenclatureCodeList	An http URI pointing to the code list attached to the nomenclature used.	URI	

Constraints of the data type LandCoverNomenclature

The embedded description or the external desciption shall be provided.

2.3.2. *Code lists*

2.3.2.1. Land Cover Class (LandCoverClassValue)

Land cover code list or classification.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values and the integer codes (to be used to represent specific land cover classes in the range of the LandCoverGridCoverage objects) specified for the Pure Land Cover Component (PureLand-CoverComponentValue) code list in the INSPIRE Technical Guidance document on Land Cover.

2.4. **Land Cover Vector**

2.4.1. *Spatial object types*

The package Land Cover Vector contains the following spatial object types:

— Land Cover Data Set

— Land Cover Unit

2.4.1.1. Land Cover Data Set (LandCoverDataset)

A vector representation for Land Cover data.

Attributes of the spatial object type LandCoverDataset

Attribute	Definition	Type	Voidability
name	Name of the Land Cover data set.	CharacterString	
inspireId	External object identifier of the spatial object.	Identifier	
extent	Contains the extent of the data set.	EX_Extent	
nomenclatureDocumentation	Information about the nomenclature used in this data set.	LandCoverNomenclature	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type LandCoverDataset

Association role	Definition	Type	Voidability
member	A Land Cover Unit being part of the data set.	LandCoverUnit	

2.4.1.2. Land Cover Unit (LandCoverUnit)

An individual element of the Land Cover data set represented by a point or surface.

Attributes of the spatial object type LandCoverUnit

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Spatial representation of the Land Cover data.	GM_Object	
landCoverObservation	Land cover information at a specific time and place.	LandCoverObservation	

Constraints of the spatial object type LandCoverUnit

Geometries shall be points or surfaces.

2.4.2. *Data types*

2.4.2.1. Land Cover Observation (LandCoverObservation)

Land Cover information interpreted at a specific time and place.

Attributes of the data type LandCoverObservation

Attribute	Definition	Type	Voidability
class	The assignment of a land cover class to a land cover unit through a classification code identifier.	LandCoverClassValue	
observationDate	The observation date associated of an observation.	DateTime	voidable
mosaic	List of classification values describing into details a land cover unit, associated with percentages.	LandCoverValue	voidable

Constraints of the spatial object type LandCoverObservation

The sum of all coveredPercentage attributes attached to each LandCoverObservation shall be lower or equal to 100.

2.4.2.2. Land Cover (LandCoverValue)

Generic class supporting Land Cover value and percentage.

Attributes of the data type LandCoverValue

Attribute	Definition	Type	Voidability
class	Assignment of a land cover spatial object to a land cover class through a classification code identifier.	LandCoverClassValue	
coveredPercentage	Fraction of the LandCoverUnit being concerned with the classification value.	Integer	voidable

2.5. **Land Cover Raster**

2.5.1. *Spatial object types*

The package Land Cover Raster contains the spatial object type Land Cover Grid Coverage.

2.5.1.1. Land Cover Grid Coverage (LandCoverGridCoverage)

A raster representation for Land Cover data.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type LandCoverGridCoverage

Attribute	Definition	Type	Voidability
name	Name of the Land Cover coverage.	CharacterString	
inspireId	External object identifier of the spatial object.	Identifier	

Attribute	Definition	Type	Voidability
extent	Contains the extent of the data set.	EX_Extent	
nomenclatureDocumentation	Information about the nomenclature used in this coverage.	LandCoverNomenclature	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type LandCoverGridCoverage

The values in the range set are restricted to Integer.

2.6.   **Theme-specific Requirements**

If an onlineDescription attribute is provided for a LandCoverNomenclature data type, the referenced online description shall define, for each class, at least a code, a name, a definition and a RGB value to be used for portrayal. If the online description describes the nomenclature for a LandCoverGridCoverage object, an integer grid code shall also be provided for each class. This code shall be used in the range of the LandCoverGridCoverage to represent the corresponding class.

2.7.   **Layers**

Layers for the spatial data theme Land Cover

Layer Name	Layer Title	Spatial object type
LC.LandCoverPoints	Land Cover Points	LandCoverUnit
LC.LandCoverSurfaces	Land Cover Surfaces	LandCoverUnit
LC.LandCoverRaster	Land Cover Raster	LandCoverGridCoverage

3.   ORTHOIMAGERY

3.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "mosaic" means an image composed of multiple overlapping or adjoining photographs or images merged together.

(2) "orthoimage aggregation" means a combination of subsets from several homogeneous orthoimage coverages forming a new orthoimage coverage.

(3) "raster" means a usually rectangular pattern of parallel scanning lines forming or corresponding to the display on a cathode ray tube, in accordance with EN ISO 19123:2007.

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3.2. **Spatial object types**

The following spatial object types are specified for the spatial data theme Orthoimagery:

— Orthoimage Coverage

— Mosaic Element

— Single Mosaic Element

— Aggregated Mosaic Element

3.2.1. *Orthoimage Coverage (OrthoimageCoverage)*

Raster image of the Earth surface that has been geometrically corrected ("orthorectified") to remove distortion caused by differences in elevation, sensor tilt and, optionally, by sensor optics.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type OrthoimageCoverage

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
domainExtent	Extent of the spatiotemporal domain of the coverage.	EX_Extent	
footprint	Geographic area enclosing valid data of the orthoimage coverage.	GM_MultiSurface	voidable
interpolationType	Mathematical method which shall be used to evaluate a continuous coverage, i.e. determine the values of the coverage at any direct position within the domain of the coverage.	InterpolationMethod-Value	
name	Free text name of the orthoimage coverage.	CharacterString	voidable
phenomenonTime	Description of the observation/acquisition extent in time of the input image(s).	TM_Period	voidable
beginLifespanVersion	Temporal position at which this version of the spatial object was inserted or changed in the spatial data set.	TM_Position	voidable
endLifespanVersion	Temporal position at which this version of the spatial object was superseded or retired from the spatial data set.	TM_Position	voidable

Association roles of the spatial object type OrthoimageCoverage

Association role	Definition	Type	Voidability
contributingOrthoimageCoverage	Reference to the orthoimage coverages that compose an aggregated orthoimage coverage. The association has additional properties as defined in the association class OrthoimageAggregation.	OrthoimageCoverage	
mosaicElement	Spatial representation of the acquisition time of a mosaicked orthoimage coverage.	MosaicElement	voidable

Constraints of the spatial object type OrthoimageCoverage

The acquisition time of the orthoimage coverage shall be provided through the phenomenonTime attribute or the mosaicElement association.

The dimension of the grid used shall always be 2.

The domainExtent attribute shall be at least populated with a subtype of EX_GeographicExtent.

The coordinate reference system used to reference the grid shall be provided.

All the OrthoimageCoverage instances, to which an aggregated OrthoimageCoverage instance refers, shall share the same orientation of grid axes and the same grid spacing in each direction.

The origin of the grid shall be described in two dimensions.

The values in the range set shall be described by the Integer type.

3.2.2.   *Mosaic Element (MosaicElement)*

Abstract type identifying both the contributing area and the acquisition time of one or several input images used to generate a mosaicked orthoimage coverage.

This type is abstract.

Attributes of the spatial object type MosaicElement

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometric representation spatially delineating the date and time of acquisition of the several input images that contribute to the final mosaic.	GM_MultiSurface	
phenomenonTime	Description of the observation/acquisition extent in time of the input image(s).	TM_Period	

3.2.3.   *Single Mosaic Element (SingleMosaicElement)*

Mosaic element relating to a single input image.

This type is a sub-type of MosaicElement.

Attributes of the spatial object type SingleMosaicElement

Attribute	Definition	Type	Voidability
imageSourceReference	Reference to the input image.	CharacterString	voidable

3.2.4.   *Aggregated Mosaic Element (AggregatedMosaicElement)*

Mosaic element relating to several input images that share the same acquisition time at a given level of definition (e.g. day, month).

This type is a sub-type of MosaicElement.

3.3. **Data types**

3.3.1. *Orthoimage Aggregation (OrthoimageAggregation)*

Geometrical characteristics of the orthoimage aggregation.

This type is an association class.

Attributes of the data type OrthoimageAggregation

Attribute	Definition	Type	Voidability
contributingFootprint	Geometric representation delineating the geographic area of an orthoimage coverage that contributes to the aggregated orthoimage coverage.	GM_MultiSurface	

3.4. **Code lists**

3.4.1. *Interpolation Method (InterpolationMethodValue)*

List of codes that identify the interpolation methods which may be used for evaluating orthoimage coverages.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list InterpolationTypeValue

Value	Name	Definition
nearestNeighbour	nearest neighbour	Nearest neighbour interpolation
bilinear	bilinear	Bilinear interpolation
biquadratic	biquadratic	Biquadratic interpolation
bicubic	bicubic	Bicubic interpolation

3.5. **Theme-specific Requirements**

3.5.1. *Requirements on external object identifiers*

(1) If an orthoimage is updated based on new source data, the updated objects shall receive a new external object identifier.

3.5.2. *Requirements for Orthoimage Coverages*

(1) By way of derogation from the requirement in Section 2.2 of Annex II, any grid compatible with one of the following coordinate reference systems may be used for making gridded Orthoimagery data available:

— two-dimensional geodetic coordinates (latitude and longitude) based on a datum specified in Section 1.2 of Annex II and using the parameters of the GRS80 ellipsoid;

— plane coordinates using the ETRS89 Lambert Conformal Conic coordinate reference system;

— plane coordinates using the ETRS89 Transverse Mercator coordinate reference system.

The grid specified in Section 2.2.1 of Annex II shall not be used.

(2) The footprint of an OrthoimageCoverage instance shall be spatially included in its geographic extent that is described through the domainExtent property.

(3) The value type of the metadata property carried by the spatial object type OrthoimageCoverage shall be set to OM_Observation when using the Observation and Measurement metadata model defined in ISO 19156:2011.

(4) All the OrthoimageCoverage instances, to which an aggregated OrthoimageCoverage instance refers, shall be consistent. This means that they shall share the same range type, Coordinate Reference System and resolution. They shall also support grid alignment, i.e. the grid points in one OrthoimageCoverage instance line up with grid points of the other OrthoimageCoverage instances, so that grid cells do not partially overlap.

(5) The contributing footprint of an OrthoimageCoverage instance referred by an aggregated Orthoimage-Coverage instance shall be spatially included in its own footprint.

(6) The contributing footprints of any two OrthoimageCoverage instances referred to by the same aggregated OrthoimageCoverage instance shall be either adjacent or disjoint.

(7) The union of the contributing footprints of the OrthoimageCoverage instances referred to by the same aggregated OrthoimageCoverage instance shall determine the footprint of the aggregated Orthoimage-Coverage instance.

3.5.3. *Requirements for mosaic elements*

(1) All the mosaic elements related to an OrthoimageCoverage instance shall be of the same type, i.e. either SingleMosaicElement or AggregatedMosaicElement.

(2) The geometries delineating any two MosaicElement instances related to the same OrthoimageCoverage instance shall be either adjacent or disjoint.

(3) The union of the geometries delineating all MosaicElement instances related to the same Orthoimage-Coverage instance shall include its footprint and be contained in its geographic domain extent.

3.5.4. *Requirements on reference systems*

(1) Data related to the spatial data theme Orthoimagery shall be restricted to two-dimensional geometries.

(2) Only two-dimensional coordinate reference systems shall be used to represent INSPIRE orthoimagery data sets.

3.5.5. *Requirements on data quality*

(1) The measures "root mean square error in X" (RMSE-x) and "root mean square error in Y" (RMSE-y) shall be provided jointly when used to assess the gridded data position of orthoimagery data.

3.6. **Layers**

Layers for the spatial data theme Orthoimagery

Layer Name	Layer Title	Spatial object type
OI.OrthoimageCoverage	orthoimage coverage	OrthoimageCoverage
OI.MosaicElement	mosaic element	MosaicElement

4. GEOLOGY

4.1. **Structure of the Spatial Data Theme Geology**

The types specified for the spatial data theme Geology are structured in the following packages:

— Geology

— Geophysics

— Hydrogeology

4.2.　**Geology**

4.2.1.　*Spatial object types*

The package Geology contains the following spatial object types:

— Anthropogenic Geomorphologic Feature

— Borehole

— Fold

— Geologic Collection

— Geologic Event

— Geologic Feature

— Geologic Structure

— Geologic Unit

— Geomorphologic Feature

— Mapped Feature

— Mapped Interval

— Natural Geomorphologic Feature

— Shear Displacement Structure

4.2.1.1.　Anthropogenic Geomorphologic Feature (AnthropogenicGeomorphologicFeature)

A geomorphologic feature (i.e., landform) which has been created by human activity.

This type is a sub-type of GeomorphologicFeature.

Attributes of the spatial object type AnthropogenicGeomorphologicFeature

Attribute	Definition	Type	Voidability
anthropogenicGeomorpho-logicFeatureType	Terms describing the type of a geomorphologic feature.	AnthropogenicGeomorpholo-gicFeatureTypeValue	

4.2.1.2.　Borehole (Borehole)

A borehole is the generalized term for any narrow shaft drilled in the ground.

Attributes of the spatial object type Borehole

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
boreholeLength	The distance along a borehole.	Quantity	voidable
elevation	The vertical height above datum of the borehole collar.	DirectPosition	voidable
location	The location of the borehole collar.	GM_Point	
purpose	The purpose for which the borehole was drilled.	BoreholePurposeValue	voidable
downholeGeometry	The downhole geometry of the borehole	GM_Curve	voidable

Association roles of the spatial object type Borehole

Association role	Definition	Type	Voidability
logElement	1-D MappedFeature instances that are logged (interpreted) intervals within a borehole.	MappedInterval	voidable

4.2.1.3.   Fold (Fold)

One or more systematically curved layers, surfaces, or lines in a rock body.

This type is a sub-type of GeologicStructure.

Attributes of the spatial object type Fold

Attribute	Definition	Type	Voidability
profileType	The type of the fold.	FoldProfileTypeValue	voidable

4.2.1.4.   Geologic Collection (GeologicCollection)

A collection of geological or geophysical objects.

Attributes of the spatial object type GeologicCollection

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
name	The name of the collection.	CharacterString	
collectionType	The type of the collection.	CollectionTypeValue	
reference	A reference for the collection.	DocumentCitation	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type GeologicCollection

Association role	Definition	Type	Voidability
geophObjectSet	A GeophObjectSet member of the geologic collection.	GeophObjectSet	voidable
geophObjectMember	A GeophObjectMember of the geologic collection.	GeophObject	voidable
boreholeMember	A Borehole member of a geologic collection.	Borehole	voidable
mapMember	A MappedFeature member of a geologic collection.	MappedFeature	voidable

4.2.1.5. Geologic Event (GeologicEvent)

An identifiable event during which one or more geological processes act to modify geological entities.

Attributes of the spatial object type GeologicEvent

Attribute	Definition	Type	Voidability
name	The name of the geologic event.	CharacterString	voidable
eventEnvironment	The physical setting within which the geologic event takes place.	EventEnvironmentValue	voidable
eventProcess	The process or processes that occurred during the geologic event.	EventProcessValue	voidable
olderNamedAge	Older boundary of the age of the geologic event.	GeochronologicEraValue	voidable
youngerNamedAge	Younger boundary of the age of the geologic event.	GeochronologicEraValue	voidable

4.2.1.6. Geologic Feature (GeologicFeature)

A conceptual geological feature that is hypothesized to exist coherently in the world.

This type is abstract.

Attributes of the spatial object type GeologicFeature

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
name	The name of the geologic feature.	CharacterString	voidable

Association roles of the spatial object type GeologicFeature

Association role	Definition	Type	Voidability
themeClass	A thematic classification of the geologic feature.	ThematicClass	voidable
geologicHistory	An association that relates one or more geologic events to a geologic feature to describe their age or geologic history.	GeologicEvent	voidable

4.2.1.7. Geologic Structure (GeologicStructure)

A configuration of matter in the Earth based on describable inhomogeneity, pattern or fracture in an earth material.

This type is a sub-type of GeologicFeature.

This type is abstract.

4.2.1.8. Geologic Unit (GeologicUnit)

A volume of rock with distinct characteristics.

This type is a sub-type of GeologicFeature.

Attributes of the spatial object type GeologicUnit

Attribute	Definition	Type	Voidability
geologicUnitType	The type of the geological unit.	GeologicUnitTypeValue	

Association roles of the spatial object type GeologicUnit

Association role	Definition	Type	Voidability
composition	Describes composition of the geologic unit.	CompositionPart	voidable

4.2.1.9. Geomorphologic Feature (GeomorphologicFeature)

An abstract spatial object type describing the shape and nature of the Earth's land surface (i.e. a landform).

This type is a sub-type of GeologicFeature.

This type is abstract.

4.2.1.10. Mapped Feature (MappedFeature)

A spatial representation of a GeologicFeature.

Attributes of the spatial object type MappedFeature

Attribute	Definition	Type	Voidability
shape	The geometry of the mapped feature.	GM_Object	
mappingFrame	The surface on which the mapped feature is projected.	MappingFrameValue	

Association roles of the spatial object type MappedFeature

Association role	Definition	Type	Voidability
specification	A description association that links the mapped feature to a notional geologic feature.	GeologicFeature	

4.2.1.11. Mapped Interval (MappedInterval)

A special kind of a mapped feature whose shape is a 1-D interval and which uses the spatial reference system of the containing borehole.

This type is a sub-type of MappedFeature.

4.2.1.12. Natural Geomorphologic Feature (NaturalGeomorphologicFeature)

A geomorphologic feature (i.e. landform) that has been created by natural Earth processes.

This type is a sub-type of GeomorphologicFeature.

Attributes of the spatial object type NaturalGeomorphologicFeature

Attribute	Definition	Type	Voidability
naturalGeomorpholo-gicFeatureType	The type of the natural geomorphologic feature.	NaturalGeomorphologic-FeatureTypeValue	
activity	The level of activity of the natural geomorphologic feature.	GeomorphologicActivity-Value	voidable

4.2.1.13. Shear Displacement Structure (ShearDisplacementStructure)

Brittle to ductile style structures along which displacement has occurred.

This type is a sub-type of GeologicStructure.

Attributes of the spatial object type ShearDisplacementStructure

Attribute	Definition	Type	Voidability
faultType	Refers to a vocabulary of terms describing the type of shear displacement structure.	FaultTypeValue	

4.2.2.   *Data types*

4.2.2.1. Composition Part (CompositionPart)

The composition of a geologic unit in terms of lithological constituents.

Attributes of the data type CompositionPart

Attribute	Definition	Type	Voidability
material	The material that comprises part or all of the geologic unit.	LithologyValue	
proportion	Quantity that specifies the fraction of the geologic unit composed of the material.	QuantityRange	voidable
role	The relationship of the composition part to the geologic unit composition as a whole.	CompositionPartRoleValue	

4.2.2.2. Thematic Class (ThematicClass)

A generic thematic classifier to enable the reclassification of Geologic Features with user defined classes appropriate to thematic maps.

Attributes of the data type ThematicClass

Attribute	Definition	Type	Voidability
themeClass	The value of the thematic class.	ThematicClassValue	
themeClassification	The used classification	ThematicClassification-Value	

4.2.3.   *Code lists*

4.2.3.1. Anthropogenic Geomorphologic Feature Type (AnthropogenicGeomorphologicFeatureTypeValue)

Types of anthropogenic geomorphologic features.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list AnthropogenicGeomorphologicFeatureTypeValue

Value	Name	Definition
artificialCollapsedDepression	artificial collapsed depression	A collapse basin, commonly a closed depression, which is the direct result of surficial subsidence associated with subsurface mining or tunneling.
artificialDrainage	artificial drainage	Human-made network built primarily to lower or control the local water table.
artificialLevee	artificial levee	An artificial embankment constructed along the bank of a watercourse or an arm of the sea, to protect land from inundation or to confine streamflow to its channel.
dredgedChannel	dredged channel	A roughly linear, deep water area formed by a dredging operation for navigation purposes
dump	dump	An area of smooth or uneven accumulations or piles of waste rock, earthy material, or general refuse that without major reclamation are incapable of supporting plants.
fill	fill	Human-constructed deposits of natural earth materials and/or waste materials used to fill a depression, to extend shore land into a body of water, or in building dams.
impactCraterAnthropogenic	impact crater (anthropogenic)	A generally circular or elliptical depression formed by hypervelocity impact of an experimental projectile or ordnance into earthy or rock material.
landfillSite	landfill site	Waste disposal site used for the controlled deposit of the waste onto or into land.
levelledLand	levelled land	A land area, usually a field, that has been mechanically flattened or smoothed to facilitate management practices such as flood irrigation.
openpitMine	openpit mine	A relatively large depression resulting from the excavation of material and redistribution of overburden associated with surficial mining operations.
pit	pit	A depression, ditch or pit excavated to furnish gravel, sand or other materials for roads or other construction purposes; a type of borrow pit.
quarry	quarry	Excavation areas, open to the sky, usually for the extraction of stone.

Value	Name	Definition
reclaimedLand	reclaimed land	A land area composed of earthy fill material that has been placed and shaped to approximate natural contours, commonly part of land-reclamation efforts after mining operations. Or a land area, commonly submerged in its native state, that has been protected by artificial structures and drained for agricultural or other purposes.
reservoirLake	reservoir lake	An inland body of permanently standing water, usually fresh, occupying a depression on the Earth's surface closed by a dam.
spoilBank	spoil bank	A bank, mound, or other artificial accumulation of rock debris and earthy dump deposits removed from ditches, strip mines, or other excavations.
subsidenceAreaAnthropogenic	subsidence area (anthropogenic)	An area subject to a process of subsidence induced by anthropogenic activities, for example subsurface mining, tunneling, hydrocarbon or groundwater production.

4.2.3.2.   Borehole Purpose (BoreholePurposeValue)

Purposes for which a borehole was drilled.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list BoreholePurposeValue

Value	Name	Definition	Parent
geologicalSurvey	geological survey	General examination of an area's geological entities.	
explorationExploitationRawMaterial	exploration and exploitation of raw material	The discovery and identification of mineral resources, including the assessment of their importance and the evaluation of their economic potential.	
explorationExploitationEnergyResources	exploration and exploitation of energy resources	Examination of the subsurface with regard to the availability of fossil energy resources and planning the extraction thereof.	
hydrocarbonProduction	hydrocarbon production	Production of petroleum oil and/or gas.	explorationExploitationRawMaterial
hydrocarbonExploration	hydrocarbon exploration	Exploration in an unproved area to test for a new field, a new pay, a deeper reservoir, or a shallower reservoir.	explorationExploitationRawMaterial
hydrocarbonAppraisal	hydrocarbon appraisal	Assessment of characteristics of a proven hydrocarbon accumulation.	explorationExploitationRawMaterial

Value	Name	Definition	Parent
geothermalEnergy	geothermal energy, geothermal heat exchangers	Exploration pertaining to the utilization of geothermal energy resources and design of geothermal heat pumps.	explorationExploitationRawMaterial
heatStorage	heat storage	Well to enable the underground to be used for heat storage.	geothermalEnergy
mineralExplorationExtraction	mineral exploration and extraction	Well drilled for the purpose of locating and/or extracting mineral resources from the subsurface, usually through the injection and/or extraction of mineral bearing fluids.	explorationExploitationRawMaterial
explorationExploitationNonmetallicMineralDeposits	exploration and exploitation of nonmetallic mineral deposits	Prospecting with regard to the availability and planning for excavation of nonmetallic mineral deposits, mainly for construction purposes, building stones, cement and ceramic or glass industry.	explorationExploitationRawMaterial
disposal	disposal	A well, often a depleted oil or gas well, into which waste fluids can be injected for safe disposal.	
explorationNaturalUndergroundStorage	exploration of natural underground storage space	Examination of the subsurface's ability to store various materials.	
waterSupply	water supply	Water supply in general.	
drinkingWaterSupply	drinking water supply	Well construction for drinking water.	waterSupply
industrialWaterSupply	industrial water supply	Well construction for industrial water supply.	waterSupply
aquaculture	aquaculture	To supply water to aquaculture purposes.	waterSupply
irrigation	irrigation	Well construction for irrigation purposes.	waterSupply
emergencyWaterSupply	emergency water supply	Well construction for emergency water supply.	waterSupply
contingencyWaterSupply	contingency water supply	Stand-by water supply in case of water deficiency.	waterSupply
geophysicalSurvey	geophysical survey	Examination of the subsurface's geophysical properties.	
shotHole	shot hole	In connection with seismic surveys explosives are loaded into shot holes.	geophysicalSurvey
flowingShot	flowing shot	A flowing shot hole is a drilled hole for seismic purposes that has entered an underground water source that has sufficient pressure to cause the hole to "overflow".	shotHole

Value	Name	Definition	Parent
hydrogeological-Survey	hydrogeological survey, water management	Examination of groundwater flow, the chemical properties of ground water, and transport of particles, solutes, and energy, as well as the management of the sustainable use of ground water resources.	
geotechnicalSurvey	geotechnical survey, construction site characterization	Geotechnical investigations performed to obtain information on the physical and mechanical properties of soil and rock around a site to design earthworks and foundations for proposed structures and for repair of distress to earthworks and structures caused by subsurface conditions.	
geochemicalSurvey	geochemical survey, analyses	Examination of chemical properties of the rock formation and /or the porosity fluids.	
pedologicalSurvey	pedological survey	Investigation to characterize types of soils.	
environmentalMonitoring	environmental monitoring	Groundwater chemistry and groundwater level is monitored.	
pollutionMonitoring	pollution monitoring	Monitoring of known pollution sites.	environmental-Monitoring
waterQualityMonitoring	water quality monitoring	Monitoring to assess the nature and distribution of pollutants and contaminants in groundwater; the nature and distribution of naturally occurring chemical constituents; subsurface hydrologic conditions, and hydraulic properties of strata as they relate to pollutant and contaminant movement.	environmental-Monitoring
groundwaterLevel-Monitoring	groundwater level monitoring	Construction of a gauge for recording groundwater level changes.	environmental-Monitoring
dewatering	dewatering	Dewatering is the removal of water from solid material or soil by wet classification, centrifugation, filtration, or similar solid-liquid separation processes. Removing or draining water from a riverbed, construction site, caisson, or mine shaft, by pumping or evaporation.	
mitigation	mitigation	Lowering of the groundwater level to prevent the groundwater table to reach polluted sites.	dewatering
remediation	remediation	Remediation in general. The removal of pollution or contaminants from groundwater, soil and other rock	

Value	Name	Definition	Parent
thermalCleaning	sparging, thermal cleaning	A kind of remediation. In situ cleaning of soil using heat, steam.	remediation
recharge	recharge	(a) Aquifer Recharge Wells: Used to recharge depleted aquifers by injecting water from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc. (b) Saline Water Intrusion Barrier Wells: Used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers. (c) Subsidence Control Wells: Used to inject fluids into a non-oil or gas-producing zone to reduce or eliminate subsidence associated with overdraft of fresh water.	

4.2.3.3. Collection Type (CollectionTypeValue)

Types of collections of geological and geophysical objects.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list CollectionTypeValue

Value	Name	Definition
boreholeCollection	borehole collection	Collection of boreholes
geologicalModel	geological model	Collection of objects for a 3D geological spatial model
geologicalMap	geological map	Collection of features for a geological map which described geological units, structures geomorphologic features, etc.
geophysicalObjectCollection	geophysical object collection	Collection of geophysical objects

4.2.3.4. Composition Part Role (CompositionPartRoleValue)

Roles that a compositional part plays in a geologic unit.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list CompositionPartRoleValue

Value	Name	Definition	Parent
onlyPart	only part	Entire described unit consists of a single part or constituent.	
partOf	part of	The geologic unit part role is not known in any greater detail.	

Value	Name	Definition	Parent
facies	facies	Represents a particular body of rock that is a lateral variant of a lithostratigraphic unit, or a variant of a lithodemic unit.	partOf
inclusion	inclusion	Geologic unit constituent is present as masses with generally sharp boundaries enclosed within a matrix of some other material.	partOf
lithosome	lithosome	A kind of rock body that has multiple occurrences in a single geologic unit. A mass of rock of uniform character, characterized by geometry, composition, and internal structure.	partOf
stratigraphicPart	stratigraphic part	A geologic unit part that occupies a particular stratigraphic position within a geologic unit.	partOf
unspecifiedPartRole	unspecified part role	Geologic unit part with unspecified role.	partOf

4.2.3.5. Event Environment (EventEnvironmentValue)

Terms for the geologic environments within which geologic events take place.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Data providers may also use the narrower values specified for this code list in the INSPIRE Technical Guidance document on Geology.

Values for the code list EventEnvironmentValue

Value	Name	Definition
earthInteriorSetting	earth interior setting	Geologic environments within the solid Earth.
earthSurfaceSetting	earth surface setting	Geologic environments on the surface of the solid Earth.
extraTerrestrialSetting	extra-terrestrial setting	Material originated outside of the Earth or its atmosphere.
tectonicallyDefinedSetting	tectonically defined setting	Setting defined by relationships to tectonic plates on or in the Earth.

4.2.3.6. Event Process (EventProcessValue)

Terms specifying the process or processes that occurred during an event.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Data providers may also use the narrower values specified for this code list in the INSPIRE Technical Guidance document on Geology.

Values for the code list EventProcessValue

Value	Name	Definition
bolideImpact	bolide impact	The impact of an extraterrestrial body on the surface of the earth.
deepWaterOxygenDepletion	deep water oxygen depletion	Process of removal of oxygen from from the deep part of a body of water.
deformation	deformation	Movement of rock bodies by displacement on fault or shear zones, or change in shape of a body of earth material.
diageneticProcess	diagenetic process	Any chemical, physical, or biological process that affects a sedimentary earth material after initial deposition, and during or after lithification, exclusive of weathering and metamorphism.
extinction	extinction	Process of disappearance of a species or higher taxon, so that it no longer exists anywhere or in the subsequent fossil record.
geomagneticProcess	geomagnetic process	Process that results in change in Earth's magnetic field.
humanActivity	human activity	Processes of human modification of the earth to produce geologic features.
magmaticProcess	magmatic process	A process involving melted rock (magma).
metamorphicProcess	metamorphic process	Mineralogical, chemical, and structural adjustment of solid rocks to physical and chemical conditions that differ from the conditions under which the rocks in question originated, and are generally been imposed at depth, below the surface zones of weathering and cementation.
seaLevelChange	sea level change	Process of mean sea level changing relative to some datum.
sedimentaryProcess	sedimentary process	A phenomenon that changes the distribution or physical properties of sediment at or near the earth's surface.
speciation	speciation	Process that results inappearance of new species.
tectonicProcess	tectonic process	Processes related to the interaction between or deformation of rigid plates forming the crust of the Earth.
weathering	weathering	The process or group of processes by which earth materials exposed to atmospheric agents at or near the Earth's surface are changed in color, texture, composition, firmness, or form, with little or no transport of the loosened or altered material. Processes typically include oxidation, hydration, and leaching of soluble constituents.

4.2.3.7. Fault Type (FaultTypeValue)

Terms describing the type of shear displacement structure.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Data providers may also use the narrower values specified for this code list in the INSPIRE Technical Guidance document on Geology.

This code list is hierarchical.

Values for the code list FaultTypeValue

Value	Name	Definition	Parent
fault	fault	A discrete surface, or zone of discrete surfaces, with some thickness, separating two rock masses across which one mass has slid past the other.	
extractionFault	extraction fault	A fault whose two sides have approached each other substantially in the direction perpendicular to the fault.	fault
highAngleFault	high angle fault	Fault that dips at least 45 degrees over more than half of its recognized extent, for which slip or separation is not explicitly specified.	fault
lowAngleFault	low angle fault	Fault that dips less than 45 degrees over more than half of the recognized extent of the fault.	fault
obliqueSlipFault	oblique slip fault	Fault with slip vector that has ratio of strike-parallel to dip-parallel displacement between 10 to 1 and 1 to 10 at at least one location along the mapped trace of the fault.	fault
reverseFault	reverse fault	Fault with dip-parallel displacement component of slip vector more than 10 times the strike-parallel component of the slip vector at at least one location along the mapped trace of the fault, and the fault dips consistently in the same direction with the hanging wall displaced up relative to the footwall over at least half the mapped trace of the fault.	fault
scissorFault	scissor fault	A fault on which there is increasing offset or separation along the strike from an initial point of no offset, with the opposite sense of offset in the opposite direction.	fault
strikeSlipFault	strike slip fault	Fault with strike-parallel displacement component of slip vector more than 10 times the dip-parallel component of the slip vector at at least one location along the mapped trace of the fault.	fault

4.2.3.8. Fold Profile Type (FoldProfileTypeValue)

Terms specifying the type of fold.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list FoldProfileTypeValue

Value	Name	Definition
anticline	anticline	A fold, general convex upward, whose core contains the stratigraphically older rocks.
antiform	antiform	Any convex-upward, concave downward fold.
syncline	syncline	A fold of which the core contains the stratigraphically younger rocks; it is generally concave upward.
synform	synform	Any fold whose limbs close at the bottom.

4.2.3.9. Geochronologic Era (GeochronologicEraValue)

Terms specifying recognised geological time units.

The allowed values for this code list comprise the values specified in Cohen, K.M., Finney, S. & Gibbard, P.L., *International Chronostratigraphic Chart, August 2012*, International Commission on Stratigraphy of the International Union of Geological Sciences, 2012 and additional values at any level defined by data providers.

Data providers may use the additional values for Pre-Cambrian rocks and Quaternary units specified in the INSPIRE Technical Guidance document on Geology.

4.2.3.10. Geologic Unit Type (GeologicUnitTypeValue)

Terms describing the type of geologic unit.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list GeologicUnitTypeValue

Value	Name	Definition	Parent
geologicUnit	geologic unit	Type of geologic unit that is unknown, unspecified, irrelevant, or some type not included in the vocabulary.	
allostratigraphicUnit	allostratigraphic unit	Geologic unit defined by bounding surfaces. Not necessarily stratified.	geologicUnit
alterationUnit	alteration unit	Geologic unit defined by alteration process.	geologicUnit
biostratigraphicUnit	biostratigraphic unit	Geologic unit defined based on fossil content.	geologicUnit
chronostratigraphicUnit	chronostratigraphic unit	Geologic unit that includes all rocks formed during a specific interval of geologic time	geologicUnit

Value	Name	Definition	Parent
geophysicalUnit	geophysical unit	Geologic unit defined by its geophysical characteristics.	geologicUnit
magnetostratigraphicUnit	magnetostratigraphic unit	Geologic unit defined by magnetic characteristics.	geophysica-lUnit
lithogeneticUnit	lithogenetic unit	Geologic unit defined by genesis. The genesis is manifested by material properties, but the material is not the defining property.	geologicUnit
artificialGround	artificial ground	Geologic unit defined by genesis involving direct human action to deposit or modify material.	lithogeneti-cUnit
excavationUnit	excavation unit	Geologic unit defined by human-made genesis involving excavation.	lithogeneti-cUnit
massMovementUnit	mass movement unit	Geologic unit produced by gravity driven, down-slope displacement of material, and characterized by the type of movement giving rise to the deposit, and by how the individual movement types present in the deposit are related in time and space.	lithogeneti-cUnit
lithologicUnit	lithologic unit	Geologic unit defined by lithology independent of relationships to other units.	geologicUnit
lithostratigraphicUnit	lithostratigraphic unit	Geologic unit defined on the basis of observable and distinctive lithologic properties or combination of lithologic properties and stratigraphic relationships.	geologicUnit
lithodemicUnit	lithodemic unit	Lithostratigraphic unit that lacks stratification	lithostrati-graphicUnit
lithotectonicUnit	lithotectonic unit	Geologic unit defined on basis of structural or deformation features, mutual relations, origin or historical evolution. Contained material may be igneous, sedimentary, or metamorphic.	geologicUnit
deformationUnit	deformation unit	Lithotectonic unit defined by deformation style or characteristic geologic structure observable in outcrop.	lithotectoni-cUnit
pedostratigraphicUnit	pedostratigraphic unit	Geologic unit that represents a single pedologic horizon in a sequence of strata (consolidated or non-consolidated).	geologicUnit
polarityChronostrati-graphicUnit	polarity chronostrati-graphic unit	Geologic unit defined by primary magnetic-polarity record imposed when the rock was deposited or crystallized during a specific interval of geologic time.	geologicUnit

4.2.3.11. Geomorphologic Activity (GeomorphologicActivityValue)

Terms indicating the level of activity of a geomorphologic feature.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list GeomorphologicActivityValue

Value	Name	Definition
active	active	A geomorphologic process that is currently in a state of action, or that has been reactivated since a conventionally short period of time.
dormant	dormant	A geomorphologic process that has not shown signs of activity since a conventionally short period of time, and that could be reactivated by its original causes, or triggered by induced causes such as anthropogenic activities.
reactivated	reactivated	A reactivated geomorphologic process is an active geomorphologic process which has been dormant.
stabilised	stabilised	A stabilized geomorphologic process is an inactive process which has been protected from its original causes by remedial measures.
inactive	inactive	A relict or fossil geomorphologic process.

4.2.3.12. Lithology (LithologyValue)

Terms describing the lithology.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Data providers may also use the narrower values specified for this code list in the INSPIRE Technical Guidance document on Geology.

This code list is hierarchical.

Values for the code list LithologyValue

Value	Name	Definition	Parent
compoundMaterial	compound material	An earth material composed of an aggregation of particles of earth material, possibly including other Compound Materials.	
anthropogenicMaterial	anthropogenic material	Material known to have artificial (human-related) origin; insufficient information to classify in more detail.	compoundMaterial
anthropogenicConsolidatedMaterial	anthropogenic consolidated material	Consolidated material known to have artificial (human-related) origin.	anthropogenicMaterial
anthropogenicUnconsolidatedMaterial	anthropogenic unconsolidated material	Unconsolidated material known to have artificial (human-related) origin.	anthropogenicMaterial

Value	Name	Definition	Parent
breccia	breccia	Coarse-grained material composed of angular broken rock fragments; the fragments typically have sharp edges and unworn corners.	compoundMaterial
compositeGenesisMaterial	composite genesis material	Material of unspecified consolidation state formed by geological modification of pre-existing materials outside the realm of igneous and sedimentary processes.	compoundMaterial
compositeGenesisRock	composite genesis rock	Rock formed by geological modification of pre-existing rocks outside the realm of igneous and sedimentary processes.	compositeGenesisMaterial
faultRelatedMaterial	fault-related material	Material formed as a result of brittle faulting, composed of greater than 10 percent matrix; matrix is fine-grained material caused by tectonic grainsize reduction.	compositeGenesisMaterial
impactGeneratedMaterial	impact generated material	Material that contains features indicative of shock metamorphism, such as microscopic planar deformation features within grains or shatter cones, interpreted to be the result of extraterrestrial bolide impact. Includes breccias and melt rocks.	compositeGenesisMaterial
materialFormedInSurficialEnvironment	material formed in surficial environment	Material that is the product of weathering processes operating on pre-existing rocks or deposits, analogous to hydrothermal or metasomatic rocks, but formed at ambient Earth surface temperature and pressure.	compositeGenesisMaterial
rock	rock	Consolidated aggregate of one or more earth materials, or a body of undifferentiated mineral matter, or of solid organic material.	compoundMaterial
aphanite	aphanite	Rock that is too fine grained to categorize in more detail.	rock
sedimentaryRock	sedimentary rock	Rock formed by accumulation and cementation of solid fragmental material deposited by air, water or ice, or as a result of other natural agents, such as precipitation from solution, the accumulation of organic material, or from biogenic processes, including secretion by organisms.	rock
tuffite	tuffite	Rock consists of more than 50 percent particles of indeterminate pyroclastic or epiclastic origin and less than 75 percent particles of clearly pyroclastic origin.	rock

Value	Name	Definition	Parent
sedimentaryMaterial	sedimentary material	Material formed by accumulation of solid fragmental material deposited by air, water or ice, or material that accumulated by other natural agents such as chemical precipitation from solution or secretion by organisms.	compoundMaterial
carbonateSedimentary-Material	carbonate sedimentary material	Sedimentary material in which at least 50 percent of the primary and/or recrystallized constituents are composed of one (or more) of the carbonate minerals calcite, aragonite and dolomite, in particles of intrabasinal origin.	sedimentaryMaterial
chemicalSedimentary-Material	chemical sedimentary material	Sedimentary material that consists of at least 50 percent material produced by inorganic chemical processes within the basin of deposition. Includes inorganic siliceous, carbonate, evaporite, iron-rich, and phosphatic sediment classes.	sedimentaryMaterial
clasticSedimentaryMa-terial	clastic sedimentary material	Sedimentary material of unspecified consolidation state in which at least 50 percent of the constituent particles were derived from erosion, weathering, or mass-wasting of pre-existing earth materials, and transported to the place of deposition by mechanical agents such as water, wind, ice and gravity.	sedimentaryMaterial
nonClasticSiliceousSedi-mentaryMaterial	non-clastic siliceous sedimentary material	Sedimentary material that consists of at least 50 percent silicate mineral material, deposited directly by chemical or biological processes at the depositional surface, or in particles formed by chemical or biological processes within the basin of deposition.	sedimentaryMaterial
organicRichSedimen-taryMaterial	organic rich sedimentary material	Sedimentary material in which 50 percent or more of the primary sedimentary material is organic carbon.	sedimentaryMaterial
igneousMaterial	igneous material	Earth material formed as a result of igneous processes, e.g. intrusion and cooling of magma in the crust, volcanic eruption.	compoundMaterial
fragmentalIgneousMa-terial	fragmental igneous material	Igneous material of unspecified consolidation state in which greater than 75 percent of the rock consists of fragments produced as a result of igneous rock-forming process.	igneousMaterial
acidicIgneousMaterial	acidic igneous material	Igneous material with more than 63 percent SiO_2.	igneousMaterial
basicIgneousMaterial	basic igneous material	Igneous material with between 45 and 52 percent SiO_2.	igneousMaterial

Value	Name	Definition	Parent
igneousRock	igneous rock	Rock formed as a result of igneous processes, for example intrusion and cooling of magma in the crust, or volcanic eruption.	igneousMaterial
intermediateCompositionIgneousMaterial	intermediate composition igneous material	Igneous material with between 52 and 63 percent SiO_2.	igneousMaterial
unconsolidatedMaterial	unconsolidated material	CompoundMaterial composed of an aggregation of particles that do not adhere to each other strongly enough that the aggregate can be considered a solid in its own right.	compoundMaterial
naturalUnconsolidatedMaterial	natural unconsolidated material	Unconsolidated material known to have natural, i.e. not human-made, origin.	unconsolidatedMaterial
sediment	sediment	Unconsolidated material consisting of an aggregation of particles transported or deposited by air, water or ice, or that accumulated by other natural agents, such as chemical precipitation, and that forms in layers on the Earth's surface.	naturalUnconsolidatedMaterial

4.2.3.13. Mapping Frame (MappingFrameValue)

Terms indicating the surface on which the MappedFeature is projected.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list MappingFrameValue

Value	Name	Definition
baseOfQuaternary	base of quaternary	Base of the predominantely unconsolidated sedimentary material of Quaternary age.
surfaceGeology	surface geology	Bedrock and superficial deposits that would be visible if the overlying soil was removed or are exposed at the topographic surface.
topOfBasement	top of basement	The surface in the crust of the Earth below sedimentary or volcanic deposits, or tectonically transported rock unit.
topOfBedrock	top of bedrock	Top surface of the usually solid rock that may either be exposed at the topographic surface or covered by other unconsolidated deposits.

4.2.3.14. Natural Geomorphologic Feature Type (NaturalGeomorphologicFeatureTypeValue)

Terms describing the type of natural geomorphologic feature.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list NaturalGeomorphologicFeatureTypeValue

Value	Name	Definition
naturalGeomorphologic-Feature	natural geomorphologic feature	A geomorphologic feature produced by the natural dynamics.
drainagePattern	drainage pattern	The configuration or arrangement of stream courses in an area, including gullies or first-order channelized flow areas, higher order tributaries, and main streams.
constructionalFeature	constructional feature	Site of a landform that owes its origin, form, position, or general character to depositional (aggradational) processes, such as the accumulation of sediment
destructionalFeature	destructional feature	Site of a landform that owes its origin, form, position, or general character to the removal of material by erosion and weathering (degradation) processes resulting from the wearing-down or away of the land surface.
degradationFeature	degradation feature	A geomorphologic feature resulting from the wearing down or away, and the general lowering or reduction, of the Earth's surface by natural processes of weathering and erosion, and which may infer the processes of transportation of sediment.
relic	relic	A landform that has survived decay or disintegration, or one that has been left behind after the disappearance of the greater part of its substance such as a remnant island.
exhumedFeature	exhumed feature	Formerly buried landforms, geomorphologic surfaces, or paleosols that have been re-exposed by erosion of the covering mantle.
buriedFeature	buried feature	Landforms, geomorphologic surfaces, or paleosols covered by younger sediments.
pediment	pediment	A gently sloping erosional surface developed at the foot of a receding hill or mountain slope, commonly with a slightly concave-upward profile, that cross-cuts rock or sediment strata that extend beneath adjacent uplands.
erosional	erosional features	A land surface shaped by the action of erosion, especially by running water.
hill	hill	A generic term for an elevated area of the land surface, rising at least 30 metres to as much as 300 metres above surrounding lowlands, usually with a nominal summit area relative to bounding slopes, a well-defined, rounded outline and slopes that generally exceed 15 percent.
interfluve	interfluve	A geomorphologic component of hills consisting of the uppermost, comparatively level or gently sloped area of a hill; shoulders of back wearing hill slopes can narrow the upland or merge resulting in a strongly convex shape.

Value	Name	Definition
crest	crest	A geomorphologic component of hills consisting of the convex slopes (perpendicular to the contour) that form the narrow, roughly linear top area of a hill, ridge, or other upland where shoulders have converged to the extent that little or no summit remains; dominated by erosion, slope wash and mass movement processes and sediments
headSlope	head slope	A geomorphologic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainage way, resulting in converging overland water flow.
sideSlope	side slope	A geomorphologic component of hills consisting of a laterally planar area of a hillside, resulting in predominantly parallel overland water flow. Contour lines generally form straight lines.
noseSlope	nose slope	A geomorphologic component of hills consisting of the projecting end (laterally convex area) of a hillside, resulting in predominantly divergent overland water flow; contour lines generally form convex curves.
freeFace	free face	A geomorphologic component of hills and mountains consisting of an outcrop of bare rock that sheds rock fragments and other sediments to, and commonly stands more steeply than the angle of repose of, the colluvial slope immediately below; most commonly found on shoulder and back slope positions, and can comprise part or all of a nose slope or side slope.
baseSlope	base slope	A geomorphologic component of hills consisting of the concave to linear slope (perpendicular to the contour) which, regardless of the lateral shape, is an area that forms an apron or wedge at the bottom of a hillside dominated by colluvial and slope wash processes and sediments
mountain	mountain	A generic term for an elevated area of the land surface, rising more than 300 metres above surrounding lowlands, usually with a nominal summit area relative to bounding slopes and generally with steep sides (greater than 25 percent slope) with or without considerable bare-rock exposed.
mountaintop	mountaintop	A geomorphologic component of mountains consisting of the uppermost, comparatively level or gently sloped area of mountains, characterized by relatively short, simple slopes composed of bare rock, residuum, or short-transport colluvial sediments.
mountainslope	mountainslope	A part of a mountain between the summit and the foot.
mountainflank	mountainflank	A geomorphologic component of mountains characterized by very long, complex back slopes with comparatively high slope gradients and composed of highly-diverse colluvial sediment mantles, rock outcrops or structural benches.

Value	Name	Definition
mountainbase	mountainbase	A geomorphologic component of mountains consisting of the strongly to slightly concave colluvial apron or wedge at the bottom of mountain slopes.
depression	depression	Any relatively sunken part of the Earth's surface; especially a low-lying area surrounded by higher ground.
plain	plain	Any flat area, large or small, at a low elevation; specifically an extensive region of comparatively smooth and level or gently undulaing land, having few or no prominent surface irregularities but sometimes having a considerable slope, and usually at a low elevation with reference to surrounding areas.
tectonicStructural	tectonic and structural features	Geomorphologic landscapes and landforms related to regional or local bedrock structures, or crustal movement; and geomorphologic landscapes and landforms related dominantly to water erosion but excluding perennial, channel flow (i.e. fluvial, glacio-fluvial), or eolian erosion.
volcanic	volcanic features	Geomorphologic landscapes and landforms related to the deep seated (igneous) processes by which magma and associated gases rise through the crust and are extruded onto the earth's surface and into the atmosphere.
hydrothermal	hydrothermal features	Geomorphologic landscapes and landforms related to hydrothermal processes.
erosionSurface	erosion surface	Geomorphologic landscapes and landforms related dominantly to water erosion but excluding perennial channel flow (i.e. fluvial, glaciofluvial) or eolian erosion.
slopeGravitational	slope and gravitational features	Geomorphologic landscapes and landforms related to slope environments; geomorphologic landscapes and landforms developed under the action of the gravitational force.
nivalPeriglacialPermafrost	nival, periglacial and permafrost features	Geomorphologic landscapes and landforms related to snow, non-glacial, cold climate environments; geomorphologic landscapes and landforms occurring in the vicinity of glaciers and ice sheets; geomorphologic landscapes and landforms related to ground, soil, or rock that remains at or below 0° C for at least two years.
glacial	glacial, glaciofluvial, glaciolacustrine and glaciomarine features	Geomorphologic landscapes and landforms related to to glacial, glaciofluvial, glaciolacustrine and glaciomarine environments.
eolian	eolian features	Geomorphologic landscapes and landforms related to wind-dominated environments.
marineLittoralCoastalWetland	marine, littoral and coastal wetlands features	Geomorphologic landscapes and landforms related to wave or tidal dynamics developed in marine, shallow marine, near-shore and littoral zone environments, and those related to vegetated and / or shallow wet areas

Value	Name	Definition
karstChemicalWeathering	karst and chemical weathering features	Geomorphologic landscapes and landforms dominated by mineral dissolution, and commonly, subsurface drainage.
alluvialFluvial	alluvial and fluvial features	Geomorphologic landscapes and landforms dominantly related to concentrated water flow (channel flow).
lacustrine	lacustrine features	Geomorphologic landscapes and landforms related to inland permanent water bodies (lakes).
impact	impact features	Geomorphologic landscapes and landforms related to the impact of extraterrestrial material on the Earth's surface.

4.2.3.15. Thematic Class (ThematicClassValue)

Values for thematic classification of geologic features.

The allowed values for this code list comprise any values defined by data providers.

4.2.3.16. Thematic Classification (ThematicClassificationValue)

List of thematic classifications for geologic features.

The allowed values for this code list comprise any values defined by data providers.

4.3. **Geophysics**

4.3.1. *Spatial object types*

The package Geophysics contains the following spatial object types:

— Campaign

— Geophysical Measurement

— Geophysical Object

— Geophysical Object Set

— Geophysical Profile

— Geophysical Station

— Geophysical Swath

4.3.1.1. Campaign (Campaign)

Geophysical activity extending over a limited time range and limited area for producing similar geophysical measurements, processing results or models.

This type is a sub-type of GeophObjectSet.

Attributes of the spatial object type Campaign

Attribute	Definition	Type	Voidability
campaignType	Type of activity to produce data.	CampaignTypeValue	
surveyType	Type of geophysical survey.	SurveyTypeValue	
client	Party for which data was created.	RelatedParty	voidable
contractor	Party by which data was created.	RelatedParty	voidable

Constraints of the spatial object type Campaign

The shape attribute shall be of type GM_Surface.

4.3.1.2. Geophysical Object (GeophObject)

A generic class for geophysical objects.

This type is a sub-type of SF_SpatialSamplingFeature.

This type is abstract.

Attributes of the spatial object type GeophObject

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
citation	Citation of geophysical documentation.	DocumentCitation	
projectedGeometry	2D projection of the feature to the ground surface (as a representative point, curve or bounding polygon) to be used by an INSPIRE view service to display the spatial object location on a map.	GM_Object	
verticalExtent	Vertical extent of the range of interest.	EX_VerticalExtent	voidable
distributionInfo	Distribution metadata.	MD_Distributor	voidable
largerWork	Identifier of a larger work data set, typically a campaign or project.	Identifier	voidable

Constraints of the spatial object type GeophObject

The projectedGeometry attribute shall be of type GM_Point, GM_Curve or GM_Surface.

4.3.1.3. Geophysical Measurement (GeophMeasurement)

A generic spatial object type for geophysical measurements.

This type is a sub-type of GeophObject.

This type is abstract.

Attributes of the spatial object type GeophMeasurement

Attribute	Definition	Type	Voidability
relatedModel	Identifier of the geophysical model that was created from the measurement.	Identifier	voidable
platformType	Platform from which the measurement was carried out.	PlatformTypeValue	
relatedNetwork	Name of a national or international observation network to which the facility belongs, or to which measured data is reported.	NetworkNameValue	voidable

4.3.1.4. Geophysical Object Set (GeophObjectSet)

A generic class for collections of geophysical objects.

This type is a sub-type of SF_SpatialSamplingFeature.

Attributes of the spatial object type GeophObjectSet

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
citation	Citation of geophysical documentation.	DocumentCitation	
verticalExtent	Vertical extent of the range of interest.	EX_VerticalExtent	voidable
distributionInfo	Distribution metadata.	MD_Distributor	voidable
projectedGeometry	2D projection of the feature to the ground surface (as a representative point, curve or bounding polygon) to be used by an INSPIRE view service to display the spatial object on a map.	GM_Object	
largerWork	Identifier of a larger work data set.	Identifier	voidable

Constraints of the spatial object type GeophObjectSet

The projectedGeometry attribute shall be of type GM_Point, GM_Curve or GM_Surface.

4.3.1.5. Geophysical Profile (GeophProfile)

A geophysical measurement spatially referenced to a curve.

This type is a sub-type of GeophMeasurement.

Attributes of the spatial object type GeophProfile

Attribute	Definition	Type	Voidability
profileType	Type of geophysical profile.	ProfileTypeValue	

Constraints of the spatial object type GeophProfile

The shape attribute shall be of type GM_Curve.

4.3.1.6. Geophysical Station (GeophStation)

Geophysical measurement spatially referenced to a single point location.

This type is a sub-type of GeophMeasurement.

Attributes of the spatial object type GeophStation

Attribute	Definition	Type	Voidability
stationType	Type of geophysical station.	StationTypeValue	
stationRank	Geophysical stations may be part of a hierarchical system. Rank is proportional to the importance of a station.	StationRankValue	voidable

Constraints of the spatial object type GeophStation

The shape attribute shall be of type GM_Point.

4.3.1.7. Geophysical Swath (GeophSwath)

A geophysical measurement spatially referenced to a surface.

This type is a sub-type of GeophMeasurement.

Attributes of the spatial object type GeophSwath

Attribute	Definition	Type	Voidability
swathType	Type of geophysical swath.	SwathTypeValue	

Constraints of the spatial object type GeophSwath

The shape attribute shall be of type GM_Surface.

4.3.2. *Code lists*

4.3.2.1. Campaign Type (CampaignTypeValue)

A type of geophysical campaign.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list CampaignTypeValue

Value	Name	Definition
measurement	measurement	Field data acquisition campaign.

4.3.2.2. Network Name (NetworkNameValue)

A name of geophysical network.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list NetworkNameValue

Value	Name	Definition
GSN	GSN	Global Seismographic Network
IMS	IMS	IMS Seismological network
INTERMAGNET	INTERMAGNET	International Real-time Magnetic Observatory Network
UEGN	UEGN	Unified European Gravity Network
WDC	WDC	World Data Center

4.3.2.3. Platform Type (PlatformTypeValue)

A platform on which data acquisision was carried out.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list PlatformTypeValue

Value	Name	Definition
ground	ground	Ground based measurement.
landVehicle	land vehicle	Measurement carried out from a land vehicle.
fixedWingAirplane	fixed-wing airplane	Measurement carried out from fixed-wing airplane.
helicopter	helicopter	Measurement carried out from helicopter.
seafloor	seafloor	Seafloor-based measurement.
researchVessel	research vessel	Measurement carried out from a ship.
satellite	satellite	Measurement carried out from satellite.

4.3.2.4. Profile Type (ProfileTypeValue)

Type of geophysical profile.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ProfileTypeValue

Value	Name	Definition
boreholeLogging	borehole logging	Geophysical measurement along the axis of a borehole carried out with a special logging device.
multielectrodeDCProfile	multi-electrode dc profile	DC resistivity and/or chargability (IP) measurement carried out along a profile with a larger set of electrodes. Also known as 2D resistivity tomography.
seismicLine	seismic line	Geophysical measurement used to record acoustic response of seismic sources along a line in order to define seismic properties in a cross section of the earth.

4.3.2.5. Station Rank (StationRankValue)

A rank of geophysical station.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list StationRankValue

Value	Name	Definition
observatory	observatory	Permanent monitoring facility with continuous observation schedule.
secularStation	secular station	Base station to record long term time variations of the observed physical field.

Value	Name	Definition
1stOrderBase	1st order base	Highest precision base station maintained by some authority. It is used to tie relative measurements to absolute network by third party observers.
2ndOrderBase	2nd order base	High precision base station of lower importance maintained by an authority. It is used to tie relative measurements to absolute network by third party observers.

4.3.2.6. Station Type (StationTypeValue)

A type of geophysical station.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list StationTypeValue

Value	Name	Definition
gravityStation	gravity station	Geophysical station to observe gravitational field.
magneticStation	magnetic station	Geophysical station to observe magnetic field.
seismologicalStation	seismological station	Geophysical station to observe strong motion seismological events (earthquake) or ambient noise.
verticalElectricSounding	vertical electric sounding	Geophysical station to measure underground electric resistivity and/or chargeability (IP) changes in depth using 4 electrodes (AMNB) and direct current. Also known as VES.
magnetotelluricSounding	magnetotelluric sounding	Geophysical station to measure underground electric resistivity changes using natural electromagnetic field variations. Also known as MT sounding.

4.3.2.7. Survey Type (SurveyTypeValue)

A type of geophysical survey or data set.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list SurveyTypeValue

Value	Name	Definition
airborneGeophysicalSurvey	airborne geophysical survey	Campaign of airborne geophysical measurements.
groundGravitySurvey	ground gravity survey	Campaign of ground gravity measurements.
groundMagneticSurvey	ground magnetic survey	Campaign of ground magnetic measurements.
3DResistivitySurvey	3D resistivity survey	Campaign of 3D Multielectrode DC measurements.
seismologicalSurvey	seismological survey	Campaign of seismological measurements.

4.3.2.8. Swath Type (SwathTypeValue)

A type of geophysical swath.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list SwathTypeValue

Value	Name	Definition
3DSeismics	3d seismics	Geophysical measurement used to record acoustic response of seismic sources over an area in order to define 3D seismic property distribution in a volume of the earth.

4.4. **Hydrogeology**

4.4.1. *Spatial object types*

The package Hydrogeology contains the following spatial object types:

— Active Well

— Aquiclude

— Aquifer

— Aquifer System

— Aquitard

— Groundwater Body

— Hydrogeological Object

— Man-made Hydrogeological Object

— Natural Hydrogeological Object

— Hydrogeological Unit

4.4.1.1. Active Well (ActiveWell)

A well influencing the groundwater resources of the aquifer.

This type is a sub-type of HydrogeologicalObjectManMade.

Attributes of the spatial object type ActiveWell

Attribute	Definition	Type	Voidability
activityType	The type of activity carried out by the well.	ActiveWellTypeValue	

Association roles of the spatial object type ActiveWell

Association role	Definition	Type	Voidability
groundWaterBody	The GroundWaterBody from which the ActiveWell extracts groundwater resources.	GroundWaterBody	voidable

Association role	Definition	Type	Voidability
environmentalMonitoringFacility	The related EnvironmentalMonitoringFacility.	EnvironmentalMonitoring-Facility	voidable
borehole	The Borehole upon which the ActiveWell is based.	Borehole	voidable

4.4.1.2. Aquiclude (Aquiclude)

An impermeable body of rock or stratum of sediment that acts as a barrier to the flow of groundwater.

This type is a sub-type of HydrogeologicalUnit.

4.4.1.3. Aquifer (Aquifer)

A wet underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which groundwater can be usefully extracted using a water well.

This type is a sub-type of HydrogeologicalUnit.

Attributes of the spatial object type Aquifer

Attribute	Definition	Type	Voidability
aquiferType	The type of aquifer.	AquiferTypeValue	
mediaType	The classification of the medium in which the groundwater flow occurs.	AquiferMediaTypeValue	
isExploited	Indicates if groundwater from aquifer is exploited by wells or intakes.	Boolean	voidable
isMainInSystem	Indicates if aquifer is the main useful aquifer in the aquifer system.	Boolean	voidable
vulnerabilityToPollution	An index value or interval of values determining the potential degree of aquifer risk arising from the geological structure, hydrogeological conditions and the existence of real or potential source of contamination.	QuantityValue	voidable
permeabilityCoefficient	The volume of an incompressible fluid that will flow in unit time through a unit cube of a porous substance across which a unit pressure difference is maintained.	QuantityValue	voidable
storativityCoefficient	The ability of an aquifer to store water.	QuantityValue	voidable
hydroGeochemical-RockType	The rock type with respect to the soluble rock components and their hydrogeochemical influence on groundwater.	HydroGeochemical-RockTypeValue	voidable

Association roles of the spatial object type Aquifer

Association role	Definition	Type	Voidability
aquitard	The Aquitard(s) that separates the Aquifer.	Aquitard	voidable
hydrogeologicalObject	The HydrogeologicalObject(s) related to the aquifer.	HydrogeologicalObject	voidable
aquiferSystem	The specific AquiferSystem where the Aquitard occurs.	AquiferSystem	voidable

4.4.1.4.   Aquifer System (AquiferSystem)

A collection of aquifers and aquitards, which together constitute the environment of groundwater - "communicating vessels", that are filled or can be filled with water.

This type is a sub-type of HydrogeologicalUnit.

Attributes of the spatial object type AquiferSystem

Attribute	Definition	Type	Voidability
isLayered	Indicates if the AquiferSystem consists of more than one layer.	Boolean	voidable

Association roles of the spatial object type AquiferSystem

Association role	Definition	Type	Voidability
aquitard	The Aquitard(s) contained within the AquiferSystem.	Aquitard	voidable
aquiclude	An Aquiclude enclosing the Aquifer-System.	Aquiclude	voidable
aquifer	The Aquifer(s) contained in the Aquifer-System.	Aquifer	voidable

4.4.1.5.   Aquitard (Aquitard)

A saturated, but poorly permeable bed that impedes groundwater movement.

This type is a sub-type of HydrogeologicalUnit.

Attributes of the spatial object type Aquitard

Attribute	Definition	Type	Voidability
approximatePermeabilityCoefficient	The volume of an incompressible fluid that will flow in unit time through a unit cube of a porous substance across which a unit pressure difference is maintained.	QuantityValue	voidable
approximateStorativityCoefficient	The ability of an aquifer to store water.	QuantityValue	voidable

Association roles of the spatial object type Aquitard

Association role	Definition	Type	Voidability
aquiferSystem	The AquiferSystem of which the Aquitard is a part.	AquiferSystem	voidable
aquifer	The Aquifers separated by the Aquitard.	Aquifer	voidable

4.4.1.6.   Groundwater Body (GroundWaterBody)

A distinct volume of groundwater within an aquifer or system of aquifers, which is hydraulically isolated from nearby groundwater bodies.

Attributes of the spatial object type GroundWaterBody

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
approximateHorizontalExtend	The geometry defining the boundary of the GroundWaterBody.	GM_Surface	voidable
conditionOfGroundWaterBody	The approximate degree of change to groundwater as a result of human activity.	ConditionOfGroundwaterValue	
mineralization	One of the main chemical characteristics of water. A value is a sum of all water chemical concentration components.	WaterSalinityValue	voidable
piezometricState	Specifies the piezometric state of the GroundwaterBody water table.	PiezometricState	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type GroundWaterBody

Association role	Definition	Type	Voidability
activeWell	The ActiveWell which changes the state of the GroundwaterBody through the extraction of groundwater resources.	ActiveWell	voidable
aquiferSystem	The AquiferSystem which includes the GroundWaterBody.	AquiferSystem	voidable
hydrogeologicalObjectNatural	A HydrogeologicalObjectNatural interacting with the GroundwaterBody.	HydrogeologicalObjectNatural	voidable
observationWell	The observation wells which monitor the GroundWaterBody	EnvironmentalMonitoringFacility	voidable

4.4.1.7.   Hydrogeological Object (HydrogeologicalObject)

An abstract class for man-made facilities or natural features that have an interaction with the hydrogeological system.

This type is abstract.

Attributes of the spatial object type HydrogeologicalObject

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	The geometry defining the spatial location of the HydrogeologicalObject.	GM_Primitive	
name	The name or code of the Hydrogeologi-calObject.	PT_FreeText	voidable
description	The description of the Hydrogeological-Object.	PT_FreeText	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type HydrogeologicalObject

Association role	Definition	Type	Voidability
aquifer	The Aquifer within which the Hydrogeo-logicalObject occurs.	Aquifer	voidable

4.4.1.8.   Man-made Hydrogeological Object (HydrogeologicalObjectManMade)

A man-made hydrogeological object.

This type is a sub-type of HydrogeologicalObject.

This type is abstract.

Attributes of the spatial object type HydrogeologicalObjectManMade

Attribute	Definition	Type	Voidability
validFrom	Official date and time the hydrogeo-logical object was/will be legally estab-lished.	DateTime	voidable
validTo	Date and time at which the hydrogeo-logical object legally ceased/will cease to be used.	DateTime	voidable
statusCode	A code defining the formal status of a man-made hydrogeological object.	StatusCodeTypeValue	voidable

4.4.1.9.   Natural Hydrogeological Object (HydrogeologicalObjectNatural)

Hydrogeological object which was created by natural processes.

This type is a sub-type of HydrogeologicalObject.

Attributes of the spatial object type HydrogeologicalObjectNatural

Attribute	Definition	Type	Voidability
naturalObjectType	The type of natural hydrogeological object.	NaturalObjectType-Value	
waterPersistence	The degree of persistence of water flow.	WaterPersistenceValue	voidable
approximateQuanti-tyOfFlow	An approximate value defining the water yield in a natural hydrogeological object.	QuantityValue	voidable

Association roles of the spatial object type HydrogeologicalObjectNatural

Association role	Definition	Type	Voidability
groundWaterBody	The GroundWateBody with which the natural hydrogeological object interacts.	GroundWaterBody	voidable

4.4.1.10. Hydrogeological Unit (HydrogeologicalUnit)

A part of the lithosphere with distinctive parameters for water storage and conduction.

This type is a sub-type of GeologicUnit.

Attributes of the spatial object type HydrogeologicalUnit

Attribute	Definition	Type	Voidability
description	The description of the Hydrogeologica-lUnit.	PT_FreeText	voidable
approximateDepth	The approximate depth of the Hydrogeo-logicalUnit occurrence.	QuantityValue	voidable
approximateThickness	The approximate thickness of the Hydro-geologicalUnit.	QuantityValue	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type HydrogeologicalUnit

Association role	Definition	Type	Voidability
geologicStructure	Relates one or many HydrogeologicalU-nit(s) to a GeologicStructure.	GeologicStructure	voidable

4.4.2. *Data types*

4.4.2.1. Hydrogeological Surface (HydrogeologicalSurface)

A surface that represents the interpolated groundwater table or other surface, for a local or regional area.

This type is a union type.

Attributes of the union type HydrogeologicalSurface

Attribute	Definition	Type	Voidability
surfaceRectifiedGrid	A surface whose domain is a rectified grid.	RectifiedGridCoverage	
surfaceReference-ableGrid	Surface whose domain consists of a referenceable grid.	ReferenceableGrid-Coverage	
surfacePointCollection	Hydrogeological surface represented by collection of observations in points.	PointObservationCol-lection	

4.4.2.2. Piezometric State (PiezometricState)

The piezometric state of a GroundWaterBody

Attributes of the data type PiezometricState

Attribute	Definition	Type	Voidability
observationTime	Date and time of groundwater state observation.	DateTime	
piezometricSurface	A surface that represents the level to which water will rise in tightly cased wells.	HydrogeologicalSurface	

4.4.2.3. Quantity Value (QuantityValue)

A data container with a single quantity value or a range of quantity values.

This type is a union type.

Attributes of the union type QuantityValue

Attribute	Definition	Type	Voidability
singleQuantity	Scalar component with decimal representation and a unit of measure used to store value of a continuous quantity.	Quantity	
quantityInterval	Decimal pair for specifying a quantity range with a unit of measure.	QuantityRange	

4.4.3. *Code lists*

4.4.3.1. Active Well Type (ActiveWellTypeValue)

Types of active wells.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ActiveWellTypeValue

Value	Name	Definition
exploitation	exploitation	The extraction of groundwater from an aquifer for various purposes (domestic, industrial, water supply intake and other)
recharge	recharge	(a) Aquifer Recharge Wells: Used to recharge depleted aquifers by injecting water from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc. (b) Saline Water Intrusion Barrier Wells: Used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers. (c) Subsidence Control Wells: Used to inject fluids into a non-oil or gas-producing zone to reduce or eliminate subsidence associated with overdraft of fresh water.
dewatering	dewatering	The removal of water from solid material or soil from an aquifer for the purpose of lowering the water table, e.g. during the site development phase of a major construction project due to a high water table. Usually involves the use of "dewatering" pumps.
decontamination	decontamination	Well used in remediation schemes that reduce the pollution in an aquifer.
disposal	disposal	A well, often a depleted oil or gas well, into which waste fluids can be injected for disposal. Disposal wells typically are subject to regulatory requirements to avoid the contamination of freshwater aquifers.
waterExploratory	water exploratory	A well drilled to search for new groundwater.
thermal	thermal	A well used to extract thermal supply water for various thermal purposes (e.g. balneology).
observation	observation	A well used for observation purposes.

4.4.3.2. Aquifer Media Type (AquiferMediaTypeValue)

Values describing the characteristics of the aquifer medium.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list AquiferMediaTypeValue

Value	Name	Definition
fractured	fractured	Fractured aquifers are rocks in which the groundwater moves through cracks, joints or fractures in otherwise solid rock
porous	porous	Porous media are those aquifers consisting of aggregates of individual particles such as sand or gravel. and the groundwater flow occurs in and moves through the openings between the individual grains.

Value	Name	Definition
karstic	karstic	Karstic aquifers are fractured aquifers where the cracks and fractures have been enlarged by solution, forming large channels or even caverns.
compound	compound	A combination of a porous, karstic and/or fractured aquifer
karsticAndFractured	karstic and fractured	A combination of both karstic and fractured aquifer
porousAndFractured	porous and fractured	A combination of both porous and fractured aquifer

4.4.3.3.   Aquifer Type (AquiferTypeValue)

Types of aquifers.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list AquiferTypeValue

Value	Name	Definition
confinedSubArtesian	confined subartesian	An aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. The water level does not rise above the ground surface.
confinedArtesian	confined artesian	An aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above. The water level rises above the ground surface, yielding a flowing well.
unconfined	unconfined	An aquifer containing water that is not under pressure. The water level in a well is the same as the water table outside the well.

4.4.3.4.   Condition Of Groundwater (ConditionOfGroundwaterValue)

Values indicating the approximate degree of change which has taken place on the natural state of groundwater.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ConditionOfGroundwaterValue

Value	Name	Definition
natural	natural	Groundwater quantity or quality is dependent only on natural factors.
lightlyModified	lightly modified	Groundwater quantity or quality is dependent mostly on natural factors, but with some influence through human activity
modified	modified	Groundwater quantity or quality is modified by human activity.
stronglyModified	strongly modified	Groundwater quantity or quality is modified by human activity and the values of a number of parameters exceed the drinking water standards.
unknown	unknown	The natural state of groundwater condition is unknown.

4.4.3.5.   Hydrogeochemical Rock Type (HydroGeochemicalRockTypeValue)

Values describing the hydrogeochemical condition of the groundwater environment.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list HydroGeochemicalRockTypeValue

Value	Name	Definition
silicatic	silicatic	Silicatic hydrochemical type of groundwater.
carbonatic	carbonatic	Carbonatic hydrochemical type of groundwater.
sulfatic	sulfatic	Sulfatic hydrochemical type of groundwater.
chloridic	chloridic	Chloridic hydrochemical type of groundwater.
organic	organic	Organic hydrochemical type of groundwater.

4.4.3.6.   Natural Object Type (NaturalObjectTypeValue)

Types of natural hydrogeological objects.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list NaturalObjectTypeValue

Value	Name	Definition
spring	spring	Any natural situation where groundwater flows to the surface of the earth. Thus, a spring is a site where the aquifer surface meets the ground surface.
seep	seep	A moist or wet place where groundwater reaches the earth's surface from an underground aquifer.
swallowHole	swallow hole	A natural depression or hole in the Earth's surface, also known as a sink, shake hole, sinkhole, swallow hole, swallet, doline or cenote, it is mostly caused by karst processes – the chemical dissolution of carbonate rocks or suffusion processes for example in sandstone.
fen	fen	Low land that is covered wholly or partly with water and that usually has peaty alkaline soil and characteristic flora (as of sedges and reeds).
notSpecified	not specified	Unspecified places where groundwater meets the surface.

4.4.3.7.   Status Code Type (StatusCodeTypeValue)

Values describing the statuses of man-made hydrogeological objects.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list StatusCodeTypeValue

Value	Name	Definition
abandonedDry	abandoned, dry	Abandoned because of lack of water.
abandonedInsufficient	abandoned, insufficient water	Abandoned because of insufficient amount of water.
abandonedQuality	abandoned, poor water quality	Abandoned because of water quality reasons.
deepened	deepened	Depth of boring increased.
new	new	Borehole constructed on a site not previously used.
notInUse	not in use	No longer used for any purpose.
reconditioned	reconditioned	Well that has been subject to remedial works to improve its functioning.
standby	standby	Abstraction used only when others are not available.
unfinished	unfinished	Boring or construction not completed.
unknown	unknown	Status not known or defined.

4.4.3.8. Water Persistence (WaterPersistenceValue)

Types of hydrological persistence of water.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list WaterPersistenceValue

Value	Name	Definition
intermittent	intermittent	Filled and/or flowing for part of the year.
seasonal	seasonal	Filled and/or flowing for particular seasons of the year, e.g. autumn/winter.
perennial	perennial	Filled and/or flowing continuously throughout the year as its bed lies below the water table.
notSpecified	not specified	The type of hydrological persistence of water not specified.
ephemeral	ephemeral	Filled and/or flowing during and immediately after precipitation.

4.4.3.9. Water Salinity (WaterSalinityValue)

A code list indicating salinity classes in water.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list WaterSalinityValue

Value	Name	Definition
ultraFreshWater	ultra fresh water	Water with very low salinity. The salinity is equivalent or nearly equivalent to that of rainwater.
freshWater	fresh water	Freshwater refers to bodies of water such as ponds, lakes, rivers and streams containing low concentrations of dissolved salts.
brackishWater	brackish water	Brackish water is water that has more salinity than fresh water, but not as much as seawater. It may result from mixing of seawater with fresh water, as in estuaries, or it may occur in brackish fossil aquifers.
salineWater	saline water	Saline water is water that contains a significant concentration of dissolved salts. Seawater has a salinity of roughly 35 000 ppm, equivalent to 35 g/L.
brineWater	brine water	Brine water is saturated or nearly saturated with salt.

4.5.   **Layers**

Layers for the spatial data theme Geology

Layer Name	Layer Title	Spatial object type
GE.GeologicUnit	Geologic Units	MappedFeature (spatial objects whose specification property is of type GeologicUnit)
GE. <CodeListValue> (¹) Example: GE.ShrinkingAndSwelling Clays	<human readable name> Example: Shrinking and swelling clays	MappedFeature (spatial objects whose specification property is of type GeologicFeature and which are classified (using the themeClass property) according to the same thematic classification) (themeClassification: ThematicClassificationValue)
GE.GeologicFault	Geologic Faults	MappedFeature (spatial objects whose specification property is of type ShearDisplacementStructure)
GE.GeologicFold	Geologic Folds	MappedFeature (spatial objects whose specification property is of type Fold)
GE.GeomorphologicFeature	Geomorphologic Features	MappedFeature (spatial objects whose specification property is of type GeomorphologicFeature)
GE.Borehole	Boreholes	Borehole
GE.Aquifer	Aquifers	MappedFeature (spatial objects whose specification property is of type Aquifer)
GE.Aquiclude	Aquicludes	MappedFeature (spatial objects whose specification property is of type Aquiclude)
GE.Aquitard	Aquitards	MappedFeature (spatial objects whose specification property is of type Aquitard)
GE.AquiferSystems	Aquifer Systems	MappedFeature (spatial objects whose specification property is of type AquiferSystem)

Layer Name	Layer Title	Spatial object type
GE.Groundwaterbody	Groundwater Bodies	Groundwaterbody
GE.ActiveWell	Active Wells	ActiveWell
GE. <CodeListValue> (²) Example: GE.gravityStation	<human readable name> Example: Gravity Stations	GeophStation (stationType: StationTypeValue)
GE. <CodeListValue> (³) Example: GE.seismicLine	<human readable name> Example: Seismic Lines	GeophStation (profilType: ProfileTypeValue)
GE. <CodeListValue> (⁴) Example: GE.groundGravitySurvey	<human readable name> Example: Ground Gravity Surveys	GeophStation (surveyType: SurveyTypeValue)
GE. <CodeListValue> (⁵) Example: GE.groundMagneticSurvey	<human readable name> Example: Ground Magnetic Surveys	Campaign (surveyType: SurveyTypeValue)
GE.Geophysics.3DSeismics	3D Seismics	GeophSwath

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(²) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(³) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(⁴) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(⁵) One layer shall be made available for each code list value, in accordance with Art. 14(3).'

ANNEX IV

The following Annex IV is added to Regulation (EU) No 1089/2010:

'ANNEX IV

Requirements for Spatial Data Themes Listed in Annex III to Directive 2007/2/EC

1.   STATISTICAL UNITS

1.1.   **Structure of the Spatial Data Theme Statistical Units**

The types specified for the spatial data theme Statistical Units are structured in the following packages:

— Statistical Units Base

— Statistical Units Vector

— Statistical Units Grid

1.2.   **Statistical Units Base**

1.2.1.   *Spatial object types*

The package Statistical Units Base contains the spatial object type Statistical Unit.

1.2.1.1.   Statistical Unit (StatisticalUnit)

Unit for dissemination or use of statistical information.

This type is abstract.

1.3.   **Statistical Units Vector**

1.3.1.   *Spatial object types*

The package Vector contains the following spatial object types:

— Vector Statistical Unit

— Area Statistical Unit

— Statistical Tesselation

— Evolution

1.3.1.1.   Vector Statistical Unit (VectorStatisticalUnit)

Statistical unit represented as a vector geometry (point, line or surface).

This type is a sub-type of StatisticalUnit.

Attributes of the spatial object type VectorStatisticalUnit

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Descriptive unique object identifier applied to spatial objects in a defined information theme.	ThematicIdentifier	
country	The code of the country the object belongs to.	CountryCode	
geographicalName	Possible geographical names of the object.	GeographicalName	
validityPeriod	The period when the statistical unit is supposed to be preferably used and not.	TM_Period	

Attribute	Definition	Type	Voidability
referencePeriod	The period when the data is supposed to give a picture of the territorial division in statistical units.	TM_Period	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type VectorStatisticalUnit

Association role	Definition	Type	Voidability
geometry	Geometrical representations of the vector statistical unit.	VectorStatisticalUnit-Geometry	
evolutions	All the evolutions the statistical unit has encountered.	Evolution	voidable

Constraints of the spatial object type VectorStatisticalUnit

Vector statistical units with a reference geometry instance of *GM_MultiSurface* must be instances of the specialised class *AreaStatisticalUnit*.

1.3.1.2. Area Statistical Unit (AreaStatisticalUnit)

Vector statistical unit with a surfacic reference geometry.

This type is a sub-type of VectorStatisticalUnit.

Attributes of the spatial object type AreaStatisticalUnit

Attribute	Definition	Type	Voidability
areaValue	The area of the reference geometry.	Area	
landAreaValue	The area of the above-water part.	Area	voidable
livableAreaValue	The area of the livable part.	Area	voidable

Association roles of the spatial object type AreaStatisticalUnit

Association role	Definition	Type	Voidability
administrativeUnit	Administrative units used to build the area statistical unit.	AdministrativeUnit	voidable
lowers	The area statistical units of the next lower level.	AreaStatisticalUnit	voidable
uppers	The area statistical units of the next upper level.	AreaStatisticalUnit	voidable
successors	Successors of the area statistical unit.	AreaStatisticalUnit	voidable
predecessors	Predecessors of the area statistical unit.	AreaStatisticalUnit	voidable
tesselation	The tesselation composed of units.	StatisticalTessellation	voidable

Constraints of the spatial object type AreaStatisticalUnit

The reference geometry of an area statistical units should be a *GM_MultiSurface.*

1.3.1.3.   Statistical Tesselation (StatisticalTessellation)

A tesselation composed of area statistical units.

Attributes of the spatial object type StatisticalTessellation

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	

Association roles of the spatial object type StatisticalTessellation

Association role	Definition	Type	Voidability
units	The units composing a tesselation.	AreaStatisticalUnit	voidable
lower	The immediately lower statistical tessellation.	StatisticalTessellation	voidable
upper	The immediately upper statistical tessellation.	StatisticalTessellation	voidable

1.3.1.4.   Evolution (Evolution)

Representation of vector statistical unit evolution.

Attributes of the spatial object type Evolution

Attribute	Definition	Type	Voidability
date	The date when the change occured.	DateTime	
evolutionType	The type of evolution.	EvolutionTypeValue	
areaVariation	The area variation during the evolution. This attribute has to be populated only if the type is "change".	Area	voidable
populationVariation	The population variation during the evolution. This attribute has to be populated only if the type is "change".	Integer	voidable

Association roles of the spatial object type Evolution

Association role	Definition	Type	Voidability
finalUnitVersions	All the final unit versions concerned by the evolution.	VectorStatisticalUnit	voidable
units	All the units concerned by the evolution.	VectorStatisticalUnit	voidable
initialUnitVersions	All the initial unit versions concerned by the evolution.	VectorStatisticalUnit	voidable

Constraints of the spatial object type Evolution

Evolution representations shall be consistent with the versions of the concerned objects.

An evolution with a typeValue "creation" shall not have any initial unit versions and only one final one.

An evolution with a typeValue "deletion" shall have one initial unit version and no final one.

An evolution with a typeValue "aggregation" shall have at least two initial unit versions (the units to be aggregated) and a single final one (the resulting aggregation).

An evolution with a typeValue "change" shall have one initial unit version and one final one.

An evolution with a typeValue "splitting" shall have a single initial unit version (the unit to split), and at least two final ones (the units resulting from the splitting).

1.3.2. *Data types*

1.3.2.1. Vector Statistical Unit Geometry (VectorStatisticalUnitGeometry)

A geometrical representation for vector statistical units.

Attributes of the data type VectorStatisticalUnitGeometry

Attribute	Definition	Type	Voidability
geometry	The geometry.	GM_Object	
geometryDescriptor	The statistical unit geometry descriptor.	GeometryDescriptor	

1.3.2.2. Geometry Descriptor (GeometryDescriptor)

A descriptor for vector statistical unit geometry.

Attributes of the data type GeometryDescriptor

Attribute	Definition	Type	Voidability
geometryType	The geometry type.	GeometryTypeValue	
mostDetailedScale	The most detailed scale the generalised geometry is supposed to be suitable for (expressed as the inverse of an indicative scale).	Integer	
leastDetailedScale	The least detailed scale the generalised geometry is supposed to be suitable for (expressed as the inverse of an indicative scale).	Integer	

Constraints of the data type GeometryDescriptor

The *mostDetailedScale* and *leastDetailedScale* fields shall be provided only for geometry descriptors with a type *generalisedGeometry*

If provided, *mostDetailedScale* shall be smaller than *leastDetailedScale*

1.3.3. *Code lists*

1.3.3.1. Geometry Type (GeometryTypeValue)

The code values for the geometry types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list **GeometryTypeValue**

Value	Name	Definition
referenceGeometry	reference geometry	The described geometry is the reference geometry.
pointLabel	point label	The described geometry is a point geometry for labeling.
centerOfGravity	center of gravity	The described geometry is a point geometry located at the center of gravity of the unit.
generalisedGeometry	generalised geometry	A generalised geometry of the statistical unit.
other	other	Other kind of geometry type.

1.3.3.2. Evolution Type (EvolutionTypeValue)

The code values for evolution types.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Statistical Units.

1.4. **Statistical Units Grid**

1.4.1. *Spatial object types*

The package Grid contains the following spatial object types:

— Statistical Grid Cell

— Statistical Grid

1.4.1.1. Statistical Grid Cell (StatisticalGridCell)

Unit for dissemination or use of statistical information that is represented as a grid cell.

This type is a sub-type of StatisticalUnit.

Attributes of the spatial object type StatisticalGridCell

Attribute	Definition	Type	Voidability
code	A cell code.	CharacterString	voidable
geographicalPosition	The grid cell lower left corner geographical position.	DirectPosition	voidable
gridPosition	The grid cell position within the grid based on the grid coordinates.	GridPosition	voidable
geometry	The grid cell geometry.	GM_Surface	voidable

Association roles of the spatial object type StatisticalGridCell

Association role	Definition	Type	Voidability
lowers	The immediately lower statistical grid cells.	StatisticalGridCell	voidable
upper	The immediately upper statistical grid cell.	StatisticalGridCell	voidable
grid	The grid made up of cells.	StatisticalGrid	

Constraints of the spatial object type StatisticalGridCell

The cell position shall be within the grid, according to its width and height.

At least one of the attributes code, geographicalPosition, gridPosition or geometry shall be provided.

Where several spatial representations are provided (code, geographicalPosition, gridPosition and geometry), they shall be consistent.

The code shall be composed of:

(1) A coordinate reference system part, represented by the word **CRS**, followed by the EPSG code.

(2) A resolution and position part:

— If the coordinate reference system is projected, the word **RES** followed by the grid resolution in meters and the letter **m**. Then, the letter **N** followed by the northing value in meters, and the letter **E** followed by the easting value in meters.

— If the coordinate reference system is not projected, the word **RES** followed by the grid resolution in degree-minute-second, followed by the word **dms**. Then the word **LON** followed by the longitude value in degree-minute-second, and word **LAT** followed by the latitude value in degree-minute-second.

For both cases, the given position shall be the position of the lower left cell corner.

1.4.1.2. Statistical Grid (StatisticalGrid)

A grid composed of statistical cells.

Attributes of the spatial object type StatisticalGrid

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
EPSGCode	The EPSG code to identify the grid Coordinate Referencing System.	Integer	
resolution	The grid resolution.	StatisticalGridResolution	
origin	The position of the origin point of the grid in the specified coordinate reference system (if defined).	DirectPosition	
width	The grid width, in cell number (if defined).	Integer	
height	The grid height, in cell number (if defined).	Integer	

Association roles of the spatial object type StatisticalGrid

Association role	Definition	Type	Voidability
cells	The cells composing a grid.	StatisticalGridCell	
lower	The immediately lower statistical grid.	StatisticalGrid	voidable
upper	The immediately upper statistical grid.	StatisticalGrid	voidable

Constraints of the spatial object type StatisticalGrid

If the coordinate reference system is a projected one, the resolution shall be a length. Otherwise, it shall be an angle.

1.4.2.   *Data types*

1.4.2.1.   Grid Position (GridPosition)

A grid cell position within a grid.

Attributes of the data type GridPosition

Attribute	Definition	Type	Voidability
x	The position of the cell on the horizontal axis, starting from the left side, toward the right, from 0 to the grid width -1.	Integer	
y	The position of the cell on the vertical axis, starting from the bottom toward the top, from 0 to the grid height -1.	Integer	

1.4.2.2.   Statistical Grid Resolution (StatisticalGridResolution)

A statistical unit resolution value.

This type is a union type.

Attributes of the union type StatisticalGridResolution

Attribute	Definition	Type	Voidability
lengthResolution	A distance resolution.	Length	
angleResolution	An angle resolution.	Angle	

1.5.   **Theme-specific Requirements**

(1) At least the geometry of statistical units, for which statistical data are made available under INSPIRE, shall be made available as well. This requirement applies to INSPIRE themes that refer to statistical units.

(2) For pan-European usage, the Equal Area Grid defined in Section 2.2.1 of Annex II shall be used.

(3) Statistical data shall refer to their statistical unit through the unit's external object identifier (inspireId) or thematic identifier (for vector units) or the unit's code (for grid cells).

(4) Statistical data shall refer to a specific version of a statistical unit.

1.6.   **Layers**

Layers for the spatial data theme Statistical Units

Layer Name	Layer Title	Spatial object type
SU.VectorStatisticalUnit	Vector statistical units	VectorStatisticalUnit
SU.StatisticalGridCell	Statistical grid cells	StatisticalGridCell

2.   BUILDINGS

2.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "2D data" means data where the geometry of spatial objects is represented in two-dimensional space.

(2) "2.5D data" means data where the geometry of spatial objects is represented in three-dimensional space with the constraint that, for each (X,Y) position, there is only one Z.

(3) "3D data" means data where the geometry of spatial objects is represented in three-dimensional space.

(4) "building component" means any sub-division or element of a building.

2.2. **Structure of the Spatial Data Theme Buildings**

The types specified for the spatial data theme Buildings are structured in the following packages:

— Buildings Base

— Buildings 2D

— Buildings 3D

2.3. **Buildings Base**

2.3.1. *Spatial object types*

The package Buildings Base contains the following spatial object types:

— Abstract Construction

— Abstract Building

— Building

— Building Part

2.3.1.1. Abstract Construction (AbstractConstruction)

Abstract spatial object type grouping the semantic properties of buildings, building parts.

This type is abstract.

Attributes of the spatial object type AbstractConstruction

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
name	Name of the construction.	GeographicalName	voidable
dateOfConstruction	Date of construction.	DateOfEvent	voidable
dateOfDemolition	Date of demolition.	DateOfEvent	voidable
dateOfRenovation	Date of last major renovation.	DateOfEvent	voidable
elevation	Vertically-constrained dimensional property consisting of an absolute measure referenced to a well-defined surface which is commonly taken as origin (geoïd, water level, etc.).	Elevation	voidable
externalReference	Reference to an external information system containing any piece of information related to the spatial object.	ExternalReference	voidable
heightAboveGround	Height above ground.	HeightAboveGround	voidable

Attribute	Definition	Type	Voidability
conditionOfCon-struction	Status of construction.	ConditionOfConstruc-tionValue	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

2.3.1.2.   Abstract Building (AbstractBuilding)

Abstract spatial object type grouping the common semantic properties of the spatial object types Building and BuildingPart.

This type is a sub-type of AbstractConstruction.

This type is abstract.

Attributes of the spatial object type AbstractBuilding

Attribute	Definition	Type	Voidability
buildingNature	Characteristic of the building that makes it generally of interest for mappings applications. The char-acteristic may be related to the physical aspect and/or to the function of the building.	BuildingNatureValue	voidable
currentUse	Activity hosted within the building. This attribute addresses mainly the buildings hosting human activities.	CurrentUse	voidable
numberOfDwellings	Number of dwellings.	Integer	voidable
numberOfBuildingUnits	Number of building units in the building. A BuildingUnit is a subdivision of Building with its own lockable access from the outside or from a common area (i.e. not from another BuildingUnit), which is atomic, functionally independent, and may be separately sold, rented out, inherited, etc.	Integer	voidable
numberOfFloorsAbove-Ground	Number of floors above ground.	Integer	voidable

2.3.1.3.   Building (Building)

A Building is an enclosed construction above and/or underground, used or intended for the shelter of humans, animals or things or for the production of economic goods. A building refers to any structure permanently constructed or erected on its site.

This type is a sub-type of AbstractBuilding.

This type is abstract.

Association roles of the spatial object type Building

Association role	Definition	Type	Voidability
parts	The building parts the building is composed of.	BuildingPart	voidable

2.3.1.4. Building Part (BuildingPart)

A BuildingPart is a sub-division of a Building that might be considered itself as a building.

This type is a sub-type of AbstractBuilding.

This type is abstract.

2.3.2. *Data types*

2.3.2.1. Current Use (CurrentUse)

This data type enables to detail the current use(s).

Attributes of the data type CurrentUse

Attribute	Definition	Type	Voidability
currentUse	The current use.	CurrentUseValue	
percentage	The proportion, given as a percentage, devoted to this current use.	Integer	

Constraints of the data type CurrentUse

The total of all percentages shall be less or equal to 100.

2.3.2.2. Date Of Event (DateOfEvent)

This data type includes the different possible ways to define the date of an event.

Attributes of the data type DateOfEvent

Attribute	Definition	Type	Voidability
anyPoint	A date and time of any point of the event, between its beginning and its end.	DateTime	voidable
beginning	Date and time when the event begun.	DateTime	voidable
end	Date and time when the event ended.	DateTime	voidable

Constraints of the data type DateOfEvent

At least one of the attributes beginning, end or anyPoint shall be supplied.

If provided, the beginning attribute shall not be after the anyPoint attribute and the end attribute, and the anyPoint attribute shall not be after the end attribute.

2.3.2.3. Elevation (Elevation)

This data type includes the elevation value itself and information on how it was measured.

Attributes of the type Elevation

Attribute	Definition	Type	Voidability
elevationReference	Element where the elevation was measured.	ElevationReferenceValue	
elevationValue	Value of the elevation.	DirectPosition	

2.3.2.4.   External Reference (ExternalReference)

Reference to an external information system containing any piece of information related to the spatial object.

Attributes of the data type ExternalReference

Attribute	Definition	Type	Voidability
informationSystem	Uniform Resource Identifier of the external information system.	URI	
informationSystemName	The name of the external information system.	PT_FreeText	
reference	Thematic identifier of the spatial object or of any piece of information related to the spatial object.	CharacterString	

2.3.2.5.   Height Above Ground (HeightAboveGround)

Vertical distance between a low and a high reference.

Attributes of the data type HeightAboveGround

Attribute	Definition	Type	Voidability
heightReference	Element used as the high reference.	ElevationReferenceValue	voidable
lowReference	Element used as the low reference.	ElevationReferenceValue	voidable
status	The way the height has been captured.	HeightStatusValue	voidable
value	Value of the height above ground.	Length	

Constraints of the data type HeightAboveGround

The value of HeightAboveGround shall be in meters.

2.3.2.6.   Building Geometry 2D (BuildingGeometry2D)

This data types includes the geometry of the building and metadata information about which element of the building was captured and how.

Attributes of the data type BuildingGeometry2D

Attribute	Definition	Type	Voidability
geometry	2D or 2.5D geometric representation.	GM_Object	
horizontalGeometryEstimatedAccuracy	The estimated absolute positional accuracy of the (X,Y) coordinates of the building geometry, in the INSPIRE official Coordinate Reference System. Absolute positional accuracy is defined as the mean value of the	Length	voidable

Attribute	Definition	Type	Voidability
	positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is considered as the corresponding true position.		
horizontalGeometryReference	Element of the building that was captured by (X,Y) coordinates.	HorizontalGeometryReferenceValue	
referenceGeometry	The geometry to be taken into account by view services, for portrayal.	Boolean	
verticalGeometryEstimatedAccuracy	The estimated absolute positional accuracy of the Z coordinates of the building geometry, in the INSPIRE official Coordinate Reference System. Absolute positional accuracy is defined as the mean value of the positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
verticalGeometryReference	Element of the building that was captured by vertical coordinates.	ElevationReferenceValue	

Constraints of the data type BuildingGeometry2D

Geometry shall be of type GM_Point or GM_Surface or GM_MultiSurface.

The value of horizontalGeometryEstimatedAccuracy shall be given in meters.

For exactly one item of BuildingGeometry, the value of the attribute referenceGeometry shall be "true".

The value of verticalGeometryEstimatedAccuracy shall be given in meters.

2.3.3. *Code lists*

2.3.3.1. Building Nature (BuildingNatureValue)

Values indicating the nature of a building.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list BuildingNatureValue

Value	Name	Definition
arch	arch	A man-made structure in the form of an arch.
bunker	bunker	A facility, partly underground, intended for or used by the military either for location of command/control centers or for troop encampment.
canopy	canopy	An overhead roof providing shelter to things below. Canopies may be free standing frameworks over which a covering is attached or may be linked or suspended to the outside of a building.

Value	Name	Definition
caveBuilding	cave building	A space hosting human or economic activity which is usually enclosed within rock with the addition of man-made exterior walls and which may contain structures comparable to the interior structures of freestanding buildings.
chapel	chapel	A Christian place of worship, usually smaller than a church.
castle	castle	A large ornate or fortified building usually constructed for the purpose of a private residence or security.
church	church	Building or structure whose primary aim is to facilitate the religious practice of a Christian community.
dam	dam	A permanent barrier across a watercourse used to impound water or to control its flow.
greenhouse	greenhouse	A building that is often constructed primarily of transparent material (for example: glass), in which temperature and humidity can be controlled for the cultivation and/or protection of plants.
lighthouse	lighthouse	A tower designed to emit light from a system of lamps and lenses.
mosque	mosque	Building or structure whose primary aim is to facilitate the religious practice of a Muslim community.
shed	shed	A building of light construction, which usually has one or more open sides, that is typically used for storage.
silo	silo	A large storage structure, generally cylindrical, used for storing loose materials.
stadium	stadium	A place or venue for sports, concerts or other events and consists of a field or stage either partly or completely surrounded by a structure designed to allow spectators to stand or sit and view the event.
storageTank	storage tank	A container usually for holding liquids and compressed gases.
synagogue	synagogue	Building or structure whose primary aim is to facilitate the religious practice of a Jewish or Samaritan community.
temple	temple	Building or structure whose primary aim is to facilitate religious practices.
tower	tower	A relatively tall, narrow structure that may either stand alone or may form part of another structure.
windmill	windmill	A building which converts the energy of the wind into rotational motion by means of adjustable sails or blades.
windTurbine	wind turbine	A tower and associated equipment that generates electrical power from wind.

2.3.3.2. Condition Of Construction (ConditionOfConstructionValue)

Values indicating the condition of a construction.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ConditionOfConstructionValue

Value	Name	Definition
declined	declined	The construction cannot be used under normal conditions, though its main elements (walls, roof) are still present.
demolished	demolished	The construction has been demolished. There are no more visible remains.
functional	functional	The construction is functional.
projected	projected	The construction is being designed. Construction has not yet started.
ruin	ruin	The construction has been partly demolished and some main elements (roof, walls) have been destroyed. There are some visible remains of the construction.
underConstruction	under construction	The construction is under construction and not yet functional. This applies only to the initial construction of the construction and not to maintenance work.

2.3.3.3.   Current Use (CurrentUseValue)

Values indicating the current use.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

Values for the code list CurrentUseValue

Value	Name	Definition	Parent value
residential	residential	The building (or building component) is used for residential purpose.	
individualResidence	individual residence	The building (or building component) hosts only one dwelling.	residential
collectiveResidence	collective residence	The building (or building component) hosts more than one dwelling.	residential
twoDwellings	two dwellings	The building (or building component) hosts two dwellings.	collectiveResidence
moreThanTwoDwelling	more than two dwellings	The building (or building component) hosts at least 3 dwellings.	collectiveResidence
residenceForCommunities	residence for communities	The building (or building component) hosts a residence for communities.	residential
agriculture	agriculture	The building (or building component) is used for agricultural activities.	
industrial	industrial	The building (or building component) is used for secondary sector activities (industrial).	

Value	Name	Definition	Parent value
commerceAndServices	commerce and services	The building (or building component) is used for any service activities. This value addresses the buildings and building components dedicated to tertiary sector activities (commercial and services).	
office	office	The building (or building component) hosts offices.	commerceAndServices
trade	trade	The building (or building component) hosts trade activities.	commerceAndServices
publicServices	public services	The building (or building component) hosts public services. Public services are tertiary services provided for the benefit of the citizens.	commerceAndServices
ancillary	ancillary	A building (or building component) of small size that is used only in connection with another larger building (or building component) and generally does not inherit the same function and characteristics as the building (or building component) it is linked to.	

2.3.3.4.   Elevation Reference (ElevationReferenceValue)

List of possible elements considered to capture a vertical geometry.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ElevationReferenceValue

Value	Name	Definition
aboveGroundEnvelope	above ground envelope	The elevation has been captured at the level of the maximum extent of the above ground envelope of the construction.
bottomOfConstruction	bottom of construction	The elevation has been captured at the bottom of the usable part of the construction.
entrancePoint	entrance point	The elevation has been captured at the entrance of the construction, generally the bottom of entrance door.
generalEave	general eave	The elevation has been captured at eave level, anywhere between the lowest and the highest eave levels of the construction.
generalGround	general ground	The elevation has been captured at ground level, anywhere between the lowest and the highest ground points of the construction.
generalRoof	general roof	The elevation has been captured at roof level, anywhere between the lowest edge roof level and the top of the construction.
generalRoofEdge	general roof edge	The elevation has been captured at roof edge level, anywhere between the lowest and the highest roof edges of the construction.
highestEave	highest eave	The elevation has been captured at the highest eave level of the construction.

Value	Name	Definition
highestGroundPoint	highest ground point	The elevation has been captured at the highest ground point of the construction.
highestPoint	highest point	The elevation has been captured at the highest point of the construction, including the installations, such as chimneys and antennas.
highestRoofEdge	highest roof edge	The elevation has been captured at the highest roof edge level of the construction.
lowestEave	lowest eave	The elevation has been captured at the lowest eave level of the construction.
lowestFloorAboveGround	lowest floor above ground	The elevation has been captured at the level of the lowest floor above ground.
lowestGroundPoint	lowest ground point	The elevation has been captured at the lowest ground point level of the construction.
lowestRoofEdge	lowest roof edge	The elevation has been captured at the lowest roof edge level of the construction.
topOfConstruction	top of construction	The elevation has been captured at the top level of the construction.

2.3.3.5.   Height Status (HeightStatusValue)

Values indicating the method used to capture a height.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list HeightStatusValue

Value	Name	Definition
estimated	estimated	The height has been estimated and not measured.
measured	measured	The height has been (directly or indirectly) measured.

2.3.3.6.   Horizontal Geometry Reference (HorizontalGeometryReferenceValue)

Values indicating the element considered to capture a horizontal geometry.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list HorizontalGeometryReferenceValue

Value	Name	Definition
aboveGroundEnvelope	above ground envelope	The building horizontal geometry has been captured using the above ground envelope of the building, i.e. the maximum extent of the building above ground.
combined	combined	The building horizontal geometry has been obtained from the combination of the geometries of its building parts with the geometries of the building parts using different horizontal geometry references.

Value	Name	Definition
entrancePoint	entrance point	The building geometry is represented by a point located at the entrance of the building.
envelope	envelope	The building horizontal geometry has been captured using the whole envelope of the building, i.e. the maximum extent of the building above and under ground.
footPrint	foot print	The building horizontal geometry has been captured using the footprint of the building, i.e. its extent at ground level.
lowestFloorAboveGround	lowest floor above ground	The building horizontal geometry has been captured using the lowest floor above ground of the building.
pointInsideBuilding	point inside building	The building horizontal geometry is represented by a point located within the building.
pointInsideCadastralParcel	point inside cadastral parcel	The building horizontal geometry is represented by a point located within the parcel the building belongs to.
roofEdge	roof edge	The building horizontal geometry has been captured using the roof edges of the building.

2.4.   **Buildings 2D**

2.4.1.   *Spatial object types*

The package Buildings 2D contains the following spatial object types:

— Building

— Building Part

2.4.1.1.   Building (Building)

A Building is an enclosed construction above and/or underground, used or intended for the shelter of humans, animals or things or for the production of economic goods. A building refers to any structure permanently constructed or erected on its site.

This type is a sub-type of Building of the Buildings Base package.

Attributes of the spatial object type Building

Attribute	Definition	Type	Voidability
geometry2D	2D or 2,5D geometric representation of the building.	BuildingGeometry2D	

Constraints of the spatial object type Building

Exactly one geometry2D attribute shall be a reference geometry, i.e. a geometry2D with a referenceGeometry attribute set to "true".

The parts of the building shall be represented using the BuildingPart type of the Buildings2D package.

2.4.1.2. Building Part (BuildingPart)

A BuildingPart is a sub-division of a Building that might be considered itself as a building.

This type is a sub-type of BuildingPart of the Buildings Base package.

Attributes of the spatial object type BuildingPart

Attribute	Definition	Type	Voidability
geometry2D	2D or 2,5D geometric representation of the building part.	BuildingGeometry2D	

Constraints of the spatial object type BuildingPart

Exactly one geometry2D attribute must be a reference geometry, i.e. the referenceGeometry attribute must be "true".

2.5. **Buildings 3D**

2.5.1. *Spatial object types*

The package Buildings 3D contains the following spatial object types:

— Building

— Building Part

2.5.1.1. Building (Building)

A Building is an enclosed construction above and/or underground, used or intended for the shelter of humans, animals or things or for the production of economic goods. A building refers to any structure permanently constructed or erected on its site.

This type is a sub-type of Building in the Buildings Base package.

Attributes of the spatial object type Building

Attribute	Definition	Type	Voidability
geometry2D	2D or 2,5D geometric representation.	BuildingGeometry2D	voidable
geometry3DLoD1	3D geometric representation at level of detail (LoD) 1, consisting of the generalized representation of the outer boundary by vertical lateral surfaces and horizontal base polygons.	BuildingGeo- metry3DLoD1	—
geometry3DLoD2	3D geometric representation at level of detail (LoD) 2, consisting of the generalized representation of the outer boundary by vertical lateral surfaces and a prototypical roof shape or cover (from a defined list of roof shapes)	BuildingGeo- metry3DLoD2	—
geometry3DLoD3	3D geometric representation at level of detail (LoD) 3, consisting of the detailed representation of the outer boundary (including protrusions, facade elements and window recesses) as well as of the roof shape (including dormers, chimneys).	BuildingGeo- metry3DLoD	—

Attribute	Definition	Type	Voidability
geometry3DLoD4	3D geometric representation at level of detail (LoD) 4, consisting of the detailed representation of the outer boundary (including protrusions, facade elements, and window recesses) as well as of the roof shape (including dormers, chimneys).	BuildingGeometry3DLoD	—

Constraints of the spatial object type Building

If a Building does not have any BuildingParts, at least the geometry3DLoD1 or geometry3DLoD2 or geometry3DLoD3 or geometry3DLoD4 attributes shall be provided.

The parts of the building shall be represented using the BuildingPart type of the Buildings3D package.

2.5.1.2.   Building Part (BuildingPart)

A BuildingPart is a sub-division of a Building that might be considered itself as a building.

This type is a sub-type of BuildingPart in the Buildings Base package.

Attributes of the spatial object type BuildingPart

Attribute	Definition	Type	Voidability
geometry2D	2D or 2,5D geometric representation.	BuildingGeometry2D	voidable
geometry3DLoD1	3D geometric representation at level of detail (LoD) 1, consisting of the generalized representation of the outer boundary by vertical lateral surfaces and horizontal base polygons.	BuildingGeometry3DLoD1	—
geometry3DLoD2	3D geometric representation at level of detail (LoD) 2, consisting of the generalized representation of the outer boundary by vertical lateral surfaces and a prototypical roof shape or cover (from a defined list of roof shapes).	BuildingGeometry3DLoD2	—
geometry3DLoD3	3D geometric representation at level of detail (LoD) 3, consisting of the detailed representation of the outer boundary (including protrusions, facade elements and window recesses) as well as of the roof shape (including dormers, chimneys).	BuildingGeometry3DLoD	—
geometry3DLoD4	3D geometric representation at level of detail (LoD) 4, consisting of the detailed representation of the outer boundary (including protrusions, facade elements, and window recesses) as well as of the roof shape (including dormers, chimneys).	BuildingGeometry3DLoD	—

Constraints of the spatial object type BuildingPart

At least one of the geometry3DLoD1 or geometry3DLoD2 or geometry3DLoD3 or geometry3DLoD4 attributes shall be provided.

2.5.2.   *Data types*

2.5.2.1.   Building Geometry3D LoD (BuildingGeometry3DLoD)

Data type grouping the 3D geometry of a building or building part and the metadata information attached to this geometry.

Attributes of the data type BuildingGeometry3DLoD

Attribute	Definition	Type	Voidability
geometryMultiSurface	Representation of the outer boundary by a MultiSurface, which may - in contrast to a solid representation - not be topologically clean. In particular, the ground surface may be missing.	GM_MultiSurface	
geometrySolid	Representation of the outer boundary by a solid.	GM_Solid	
terrainIntersection	Line or multi-line where the spatial object (Building, BuildingPart,.) touches the terrain representation.	GM_MultiCurve	voidable
horizontalGeometryEstimatedAccuracy	The estimated absolute positional accuracy of the (X,Y) coordinates of the geometry, in the INSPIRE official Coordinate Reference System. Absolute positional accuracy is defined as the mean value of the positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
verticalGeometryEstimatedAccuracy	The estimated absolute positional accuracy of the Z-coordinate of the geometry, in the INSPIRE official Coordinate Reference System. Absolute positional accuracy is defined as the mean value of the positional uncertainties for a set of positions where the positional uncertainties are defined as the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
verticalGeometryReference3DBottom	Height level to which the lower height of the model (Z-value of the lower horizontal polygon) refers to.	ElevationReferenceValue	

Constraints of the data type BuildingGeometry3DLoD

Either the geometryMultiSurface or the geometrySolid attribute shall be provided.

2.5.2.2. Building Geometry3D LoD1 (BuildingGeometry3DLoD1)

Data type grouping the specific metadata attached to the 3D geometry, when provided by a LoD1 representation.

This type is a sub-type of BuildingGeometry3DLoD.

Attributes of the data type BuildingGeometry3DLoD1

Attribute	Definition	Type	Voidability
horizontalGeometryReference	Element captured by the (X,Y) coordinates of the LoD1 MultiSurface or Solid geometry.	HorizontalGeometryReferenceValue	

Attribute	Definition	Type	Voidability
verticalGeometryReference3DTop	Height level to which the upper height of the model (Z-value of the upper horizontal polygon) refers to.	ElevationReferenceValue	

Constraints of the data type BuildingGeometry3DLoD1

The horizontalGeometryReference attribute shall not take the value entrancePoint, pointInsideBuilding or pointInsideCadastralParcel.

2.5.2.3.   Building Geometry3D LoD2 (BuildingGeometry3DLoD2)

Data type grouping the specific metadata attached to the 3D geometry, when provided by a LoD2 representation.

This type is a sub-type of BuildingGeometry3DLoD.

Attributes of the data type BuildingGeometry3DLoD2

Attribute	Definition	Type	Voidability
horizontalGeometryReference	Element captured by the coordinates (X,Y) of the LoD2 MultiSurface or Solid geometry.	HorizontalGeometryReferenceValue	

Constraints of the data type BuildingGeometry3DLoD2

The horizontalGeometryReference attribute shall not take the value entrancePoint, pointInsideBuilding or pointInsideCadastralParcel.

2.6.   **Theme-specific Requirements**

(1) By way of derogation from article 12(1), the value domain of spatial properties used in the *Buildings 3D* package shall not be restricted.

2.7.   **Layers**

Layers for the spatial data theme Buildings

Layer Name	Layer Title	Spatial object type
BU.Building	Buildings	Building (of the Buildings 2D package)
BU.BuildingPart	Building Parts	BuildingPart (of the Buildings 2D package)

No layers are defined for the Buildings 3D package.

3.   SOIL

3.1.   **Spatial object types**

The following spatial object types are specified for the spatial data theme Soil:

— Derived Soil Profile

— Observed Soil Profile

— Profile Element

— Soil Body

— Soil Derived Object

— Soil Horizon

— Soil Layer

— Soil Plot

— Soil Profile

— Soil Site

— Soil Theme Coverage

— Soil Theme Descriptive Coverage

3.1.1. *Derived Soil Profile (DerivedSoilProfile)*

A non-point-located soil profile that serves as a reference profile for a specific soil type in a certain geographical area.

This type is a sub-type of SoilProfile.

Association roles of the spatial object type DerivedSoilProfile

Association role	Definition	Type	Voidability
isDerivedFrom	Link to one or more observed soil profiles from which this profile has been derived.	ObservedSoilProfile	voidable

3.1.2. *Observed Soil Profile (ObservedSoilProfile)*

A representation of a soil profile found on a specific location which is described on the basis of observations in a trial pit or with a borehole.

This type is a sub-type of SoilProfile.

Association roles of the spatial object type ObservedSoilProfile

Association role	Definition	Type	Voidability
location	The location of an observed profile is the soilplot.	SoilPlot	

3.1.3. *Profile Element (ProfileElement)*

An abstract spatial object type grouping soil layers and / or horizons for functional/operational aims.

This type is abstract.

Attributes of the spatial object type ProfileElement

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
particleSizeFraction	Mineral part of the soil, fractioned on the basis of size (diameter), limits of the particles. It indicates how much of the mineral soil material is composed of soil particles of the specified size range.	ParticleSizeFractionType	voidable

Attribute	Definition	Type	Voidability
profileElementDepthRange	Upper and lower depth of the profile element (layer or horizon) measured from the surface (0 cm) of a soil profile (in cm).	RangeType	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type ProfileElement

Association role	Definition	Type	Voidability
isPartOf	Link to the soil profile which the profile element constitutes.	SoilProfile	
profileElementObservation	Observation of a soil property for characterizing the profile element (layer or horizon).	OM_Observation	voidable

Constraints of the spatial object type ProfileElement

To fill the featureOfInterest property of the profile element observations of a ProfileElement object, that same ProfileElement object shall be used.

The observedProperty of the profile element observation shall be specified using a value from the ProfileElementParameterNameValue code list.

The result of the profile element observation shall be of one of the following types: Number; RangeType; CharacterString.

3.1.4. *Soil Body (SoilBody)*

Part of the soil cover that is delineated and that is homogeneous with regard to certain soil properties and/or spatial patterns.

Attributes of the spatial object type SoilBody

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	The geometry defining the boundary of the Soil Body.	GM_MultiSurface	
soilBodyLabel	Label to identify the soil body according to the specified reference framework (metadata).	CharacterString	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type SoilBody

Association role	Definition	Type	Voidability
isDescribedBy	Link to a derived soil profile that characterizes the soil body, possibly in combination with other derived soil profiles. The association has additional properties as defined in the association class DerivedProfilePresenceInSoilBody.	DerivedSoilProfile	voidable

3.1.5. *Soil Derived Object (SoilDerivedObject)*

A spatial object type for representing spatial objects with soil-related property derived from one or more soil and possibly other non soil properties.

Attributes of the spatial object type SoilDerivedObject

Attribute	Definition	Type	Voidability
geometry	The geometry defining the soil derived object.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	

Association roles of the spatial object type SoilDerivedObject

Association role	Definition	Type	Voidability
isBasedOnSoilDerived-Object	Link to a soil derived object on whose properties the derived value is based.	SoilDerivedObject	voidable
isBasedOnObservedSoil-Profile	Link to an observed soil profile on whose properties the derived value is based.	ObservedSoilProfile	voidable
isBasedOnSoilBody	Link to a soil body on whose properties the derived value is based.	SoilBody	voidable
soilDerivedObjectOb-servation	Observation of a soil property for characterizing the soil derived object.	OM_Observation	voidable

Constraints of the spatial object type SoilDerivedObject

To fill the featureOfInterest property of the soil derived object observation, the same SoilDerivedObject object shall be used.

The observedProperty of the soil derived object observation shall be specified using a value from the SoilDerivedObjectParameterNameValue code list.

The result of the soil derived object observation shall be of one of the following types: Number; RangeType; CharacterString.

3.1.6. *Soil Horizon (SoilHorizon)*

Domain of a soil with a certain vertical extension, more or less parallel to the surface and homogeneous for most morphological and analytical characteristics, developed in a parent material layer through pedogenic processes or made up of in-situ sedimented organic residues of up-growing plants (peat).

This type is a sub-type of ProfileElement.

Attributes of the spatial object type SoilHorizon

Attribute	Definition	Type	Voidability
FAOHorizonNotation	Designation of the soil horizon.	FAOHorizonNota-tionType	voidable
otherHorizonNotation	Designation of the soil horizon according to a specific classification system.	OtherHorizonNota-tionType	voidable

3.1.7.   *Soil Layer (SoilLayer)*

Domain of a soil with a certain vertical extension developed through non-pedogenic processes, displaying a change in structure and/or composition to possibly over- or underlying adjacent domains, or a grouping of soil horizons or other sub-domains with a special purpose.

This type is a sub-type of ProfileElement.

Attributes of the spatial object type SoilLayer

Attribute	Definition	Type	Voidability
layerType	Assignation of a layer according to the concept that fits its kind.	LayerTypeValue	
layerRockType	Type of the material in which the layer developed.	LithologyValue	voidable
layerGenesisProcess	Last non-pedogenic process (geologic or anthropogenic) that coined the material composition and internal structure of the layer.	EventProcessValue	voidable
layerGenesisEn-vironment	Setting in which the last non-pedogenic process (geologic or anthropogenic) that coined the material composition and internal structure of the layer took place.	EventEnvironmentValue	voidable
layerGenesisProcessState	Indication whether the process specified in layerGenesisProcess is on-going or ceased in the past.	LayerGenesisProcess-StateValue	voidable

Constraints of the spatial object type SoilLayer

The attributes layerGenesisProcess, layerGenesisEnvironment, layerGenesisProcessState and layerRockType shall only be provided where the layerType is of the value "geogenic".

3.1.8.   *Soil Plot (SoilPlot)*

A spot where a specific soil investigation is carried out.

Attributes of the spatial object type SoilPlot

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
soilPlotLocation	A reference to a location on the earth; it can be a point location identified by coordinates or a description of the location using text or an identifier.	Location	
soilPlotType	Gives information on what kind of plot the observation of the soil is made on.	SoilPlotTypeValue	

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type SoilPlot

Association role	Definition	Type	Voidability
locatedOn	Link to the soil site on which the soil plot is located or to which the soil plot is belonging.	SoilSite	voidable
observedProfile	Link to the observed soil profile for which the soil plot provides location information.	ObservedSoilProfile	voidable

3.1.9.   *Soil Profile (SoilProfile)*

A description of the soil that is characterized by a vertical succession of profile elements.

This type is abstract.

Attributes of the spatial object type SoilProfile

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
WRBSoilName	Identification of the soil profile.	WRBSoilNameType	voidable
otherSoilName	Identification of the soil profile according to a specific classification scheme.	OtherSoilNameType	voidable
localIdentifier	Unique identifier of the soil profile given by the data provider of the data set.	CharacterString	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type SoilProfile

Association role	Definition	Type	Voidability
isDescribedBy	The profile elements (layers and/or horizons) constituting the soil profile.	ProfileElement	voidable
soilProfileObservation	Observation of a soil property for characterizing the soil profile.	OM_Observation	voidable

Constraints of the spatial object type SoilProfile

To fill the featureOfInterest property of the soil profile observations of a SoilProfile object, that same Soil-Profile object shall be used.

The observedProperty of the soil profile observation shall be specified using a value from the SoilProfile-ParameterNameValue code list.

The result of the soil profile observation shall be of one of the following types: Number; RangeType; CharacterString.

3.1.10.   *Soil Site (SoilSite)*

An area within a larger survey, study or monitored area, where a specific soil investigation is carried out.

Attributes of the spatial object type SoilSite

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	The geometry defining the soil site.	GM_Object	
soilInvestigationPurpose	Indication why a survey was conducted.	SoilInvestigationPurposeValue	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type SoilSite

Association role	Definition	Type	Voidability
isObservedOnLocation	Link to a location(s) where the soil site has been investigated.	SoilPlot	voidable
soilSiteObservation	Observation of a soil property for characterizing the soil site.	OM_Observation	voidable

Constraints of the spatial object type SoilSite

To fill the featureOfInterest property of the soil site observations of a SoilSite object, that same SoilSite object shall be used.

The observedProperty of the soil site observation shall be specified using a value from the SoilSiteParameterNameValue code list.

The result of the soil site observation shall be of one of the following types: Number; RangeType; CharacterString.

The result of the soil site observation shall be of type SoilObservationResult.

3.1.11.   *Soil Theme Coverage (SoilThemeCoverage)*

A spatial object type that holds values for a property based on one or more soil and possibly non soil parameters within its spatial, temporal or spatiotemporal domain.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type SoilThemeCoverage

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	
domainExtent	The attribute domainExtent shall contain the extent of the spatiotemporal domain of the coverage. Extents may be specified in both space and time.	EX_Extent	
validTimeFrom	The ValidTime specifies the time window for which measurements have been captured to calculate the thematic soil property relevant for that period. The start time defines when the period began.	Date	voidable
validTimeTo	The ValidTime specifies the time window for which measurements have been captured to calculate the thematic soil property relevant for that period. The end time defines when the period stopped.	Date	voidable
soilThemeParameter	A soil-related property (soil theme) that is represented by this coverage.	SoilThemeParameterType	

Association roles of the spatial object type SoilThemeCoverage

Association role	Definition	Type	Voidability
isDescribedBy	This association allows for a certain SoilThemeCoverage to have a related Coverage which does not have a meaning without the base coverage.	SoilThemeDescriptiveCoverage	voidable

Constraints of the spatial object type SoilThemeCoverage

The rangeSet values shall be of one of the following types: Number; RangeType; CharacterString.

3.1.12.   *Soil Theme Descriptive Coverage (SoilThemeDescriptiveCoverage)*

A spatial object type that is associated to the soil theme coverage and holds additional information on values of a property of the soil theme coverage.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type SoilThemeDescriptiveCoverage

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	
domainExtent	The attribute domainExtent shall contain the extent of the spatiotemporal domain of the coverage. Extents may be specified in both space and time.	EX_Extent	
soilThemeDescriptive-Parameter	A descriptive property for the soil-related property (soil theme) that is represented by its associated SoilThemeCoverage.	SoilThemeDescriptive-ParameterType	

Association roles of the spatial object type SoilThemeDescriptiveCoverage

Association role	Definition	Type	Voidability
isDescribing	This association allows for a certain SoilThemeCoverage to have a related Coverage which does not have a meaning without the base coverage.	SoilThemeCoverage	

Constraints of the spatial object type SoilThemeDescriptiveCoverage

The rangeSet values shall be of one of the following types: Number; RangeType; CharacterString.

3.2.   **Data types**

3.2.1.   *Derived Profile Presence In Soil Body (DerivedProfilePresenceInSoilBody)*

Data type indicating the percentage range (expressed by a lower and upper boundary) occupied by the derived profile in the soil body.

This type is an association class.

Attributes of the data type DerivedProfilePresenceInSoilBody

Attribute	Definition	Type	Voidability
derivedProfilePercenta-geRange	Interval that defines the minimum and maximum percentage of the area of the soil body represented by a specific derived soil profile.	RangeType	voidable

3.2.2.   *FAO Horizon Notation Type (FAOHorizonNotationType)*

A classification of a horizon according to the Horizon classification system specified in *Guidelines for soil description, 4th edition,* Food and Agriculture Organization of the United Nations, Rome, 2006.

Attributes of the data type FAOHorizonNotationType

Attribute	Definition	Type	Voidability
FAOHorizonDiscon-tinuity	Number used to indicate a discontinuity in the horizon notation.	Integer	

Attribute	Definition	Type	Voidability
FAOHorizonMaster	Symbol of the master part of the horizon notation.	FAOHorizonMaster-Value	
FAOPrime	A prime and double prime may be used to connotate the master horizon symbol of the lower of two (prime) or three (double prime) horizons having identical Arabic-numeral prefixes and letter combinations.	FAOPrimeValue	
FAOHorizonSubor-dinate	Designations of subordinate distinctions and features within the master horizons and layers are based on profile characteristics observable in the field and are applied during the description of the soil at the site.	FAOHorizonSubordi-nateValue	
FAOHorizonVertical	Order number of the vertical subdivision in the horizon notation.	Integer	
isOriginalClassification	Boolean value to indicate whether the FAO horizon notation was the original notation to describe the horizon.	Boolean	

3.2.3. *Other Horizon Notation Type (OtherHorizonNotationType)*

A classification of a soil horizon according to a specific classification system.

Attributes of the data type OtherHorizonNotationType

Attribute	Definition	Type	Voidability
horizonNotation	Notation characterizing the soil horizon according to a specified classification system.	OtherHorizonNotation-TypeValue	
isOriginalClassification	Boolean value to indicate whether the specified horizon notation system was the original notation system to describe the horizon.	Boolean	

3.2.4. *Other Soil Name Type (OtherSoilNameType)*

An identification of the soil profile according to a specific classification scheme.

Attributes of the data type OtherSoilNameType

Attribute	Definition	Type	Voidability
soilName	Name of the soil profile according to a specific classification scheme.	OtherSoilNameType-Value	
isOriginalClassification	Boolean value to indicate whether the specified classification scheme was the original classification scheme to describe the profile.	Boolean	

3.2.5. *Particle Size Fraction Type (ParticleSizeFractionType)*

Share of the soil that is composed of mineral soil particles of the size within the size range specified.

Attributes of the data type ParticleSizeFractionType

Attribute	Definition	Type	Voidability
fractionContent	Percentage of the defined fraction.	Number	
fractionParticleSizeRange	Upper and lower limit of the particle size of the defined fraction (expressed in µm).	RangeType	

3.2.6.   *Range Type (RangeType)*

A range value defined by an upper limit and a lower limit.

Attributes of the data type RangeType

Attribute	Definition	Type	Voidability
upperValue	Value defining the upper limit of a specific property.	Real	
lowerValue	Value defining the lower limit of a specific property.	Real	
uom	The unit of measure that is used to express the values of the range.	UnitOfMeasure	

Constraints of the data type RangeType

At least one of the values shall not be empty.

3.2.7.   *Soil Theme Descriptive Parameter Type (SoilThemeDescriptiveParameterType)*

A data type providing a descriptive property for the soil-related property (soil theme) that is represented by its associated SoilThemeCoverage.

Attributes of the data type SoilThemeDescriptiveParameterType

Attribute	Definition	Type	Voidability
soilThemeDescriptiveParameterName	Name of the parameter to provide extra information on the values of the related SoilThemeCoverage.	CharacterString	
uom	The unit of measure that is used to express the soilThemeDescriptiveParameter.	UnitOfMeasure	

3.2.8.   *Soil Theme Parameter Type (SoilThemeParameterType)*

A soil-related property (soil theme) that is represented by this coverage. It is composed of a parameter name coming from a code list SoilDerivedObjectParameterNameValue and a Unit of Measure used for expressing that parameter.

Attributes of the data type SoilThemeParameterType

Attribute	Definition	Type	Voidability
soilThemeParameterName	Name of the parameter represented by the soilThemeCoverage.	SoilDerivedObjectParameterNameValue	
uom	the unit of measure that is used to express the soilThemeParameter.	UnitOfMeasure	

3.2.9. *WRB Qualifier Group Type (WRBQualifierGroupType)*

A data type to define the group of a qualifier and its possible specifier(s), its place and position with regard to the World Reference Base (WRB) Reference Soil Group (RSG) it belongs to according to *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

Attributes of the data type WRBQualifierGroupType

Attribute	Definition	Type	Voidability
qualifierPlace	Attribute to indicate the placement of the Qualifier with regard to the WRB reference soil group (RSG). The placement can be in front of the RSG i.e. "prefix" or it can be behind the RSG i.e. "suffix".	WRBQualifierPlaceValue	
qualifierPosition	Number to indicate the position of a qualifier with regard to the WRB reference soil group (RSG) it belongs to and with regard to its placement to that (RSG) i.e. as a prefix or a suffix.	Integer	
WRBqualifier	Name element of WRB, second level of classification.	WRBQualifierValue	
WRBspecifier	Code that indicates the degree of expression of a qualifier or the depth range to which the qualifier applies.	WRBSpecifierValue	

3.2.10. *WRB Soil Name Type (WRBSoilNameType)*

An identification of the soil profile according to the *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

Attributes of the data type WRBSoilNameType

Attribute	Definition	Type	Voidability
WRBQualifierGroup	The group of a qualifier and its possible specifier(s), its place and position with regard to the WRBReferenceSoilGroup it belongs to.	WRBQualifierGroupType	
WRBReferenceSoilGroup	First level of classification of the World Reference Base for Soil Resources.	WRBReferenceSoilGroupValue	
isOriginalClassification	Boolean value to indicate whether the WRB classification system was the original classification system to describe the soil profile.	Boolean	

Association roles of the data type WRBSoilNameType

Association role	Definition	Type	Voidability
over	An association to indicate that in the WRB classification a soil profile covers another developed, older soil.	WRBSoilNameType	

3.3. **Code lists**

3.3.1. *FAO Horizon Master (FAOHorizonMasterValue)*

A code list of the master part of the horizon designation.

The allowed values for this code list comprise only the values specified in *Guidelines for soil description, 4th edition*, Food and Agriculture Organization of the United Nations, Rome, 2006, pp. 67-77.

3.3.2. *FAO Horizon Subordinate (FAOHorizonSubordinateValue)*

A code list of designations of subordinate distinctions and features within the master horizons and layers which are based on profile characteristics observable in the field and are applied during the description of the soil at the site.

The allowed values for this code list comprise only the values specified in *Guidelines for soil description, 4th edition*, Food and Agriculture Organization of the United Nations, Rome, 2006, pp. 67-77.

3.3.3. *FAO Prime (FAOPrimeValue)*

A prime and double prime may be used to connotate the master horizon symbol of the lower of two (prime) or three (double prime) horizons having identical Arabic-numeral prefixes and letter combinations.

The allowed values for this code list comprise only the values specified in *Guidelines for soil description, 4th edition*, Food and Agriculture Organization of the United Nations, Rome, 2006, pp. 67-77.

3.3.4. *Other Horizon Notation Type (OtherHorizonNotationTypeValue)*

A classification of a soil horizon according to a specific classification system.

The allowed values for this code list comprise any values defined by data providers.

3.3.5. *Other Soil Name Type (OtherSoilNameTypeValue)*

An identification of the soil profile according to a specific classification scheme.

The allowed values for this coded list comprise any values defined by data providers.

3.3.6. *Layer Genesis Process State (LayerGenesisProcessStateValue)*

An indication whether the process specified in layerGenesisProcess is ongoing or has ceased.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list LayerGenesisProcessStateValue

Value	Name	Definition
ongoing	on-going	The process has started in the past and is still active.
terminated	terminated	The process is no longer active.

3.3.7. *Layer Type (LayerTypeValue)*

A classification of a layer according to the concept that fits the purpose.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list LayerTypeValue

Value	Name	Definition
depthInterval	depth interval	Fixed depth range where soil is described and/or samples are taken.
geogenic	geogenic	Domain of the soil profile composed of material resulting from the same, non-pedogenic process, e.g. sedimentation, that might display an unconformity to possible over- or underlying adjacent domains.

Value	Name	Definition
subSoil	subsoil	Natural soil material below the topsoil and overlying the unweathered parent material.
topSoil	topsoil	Upper part of a natural soil that is generally dark coloured and has a higher content of organic matter and nutrients when compared to the (mineral) horizons below excluding the humus layer.

3.3.8. *Profile Element Parameter Name (ProfileElementParameterNameValue)*

Properties that can be observed to characterize the profile element.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

Values for the code list ProfileElementParameterNameValue

Value	Name	Definition	Parent value
chemicalParameter	chemical parameter	Chemical parameters observed to characterize the profile element.	
physicalParameter	physical parameter	Physical parameters observed to characterize the profile element.	
biologicalParameter	biological parameter	Biological parameters observed to characterize the profile element.	
organicCarbonContent	organic carbon content	Portion of the soil measured as carbon in organic forms, excluding living macro and mesofauna and living plant tissue.	chemical-Parameter
nitrogenContent	nitrogen content	total nitrogen content in the soil, including both the organic and inorganic forms.	chemical-Parameter
pHValue	pH value	pH value of the profile element.	chemical-Parameter
cadmiumContent	cadmium content	Cadmium content of the profile element.	chemical-Parameter
chromiumContent	chromium content	Chromium content of the profile element.	chemical-Parameter
copperContent	copper content	Copper content of the profile element.	chemical-Parameter
leadContent	lead content	Lead content of the profile element.	chemical-Parameter
mercuryContent	mercury content	Mercury content of the profile element.	chemical-Parameter
nickelContent	nickel content	Nickel content of the profile element.	chemical-Parameter

3.3.9. *Soil Derived Object Parameter Name (SoilDerivedObjectParameterNameValue)*

Soil-related properties that can be derived from soil and other data.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

Values for the code list SoilDerivedObjectParameterNameValue

Value	Name	Definition	Parent value
chemicalParameter	chemical parameter	Chemical parameters that can be derived from other soil data.	
physicalParameter	physical parameter	Physical parameters that can be derived from other soil data.	
biologicalParameter	biological parameter	Biological parameters that can be derived from other soil data.	
potentialRootDepth	potential root depth	Potential depth of the soil profile where roots develop (in cm).	physical-Parameter
availableWaterCapacity	available water capacity	Amount of water that a soil can store that is usable by plants, based on the potential root depth.	physical-Parameter
carbonStock	carbon stock	The total mass of carbon in soil for a given depth.	chemical-Parameters
waterDrainage	water drainage	Natural water drainage class of the soil profile.	physical-Parameter
organicCarbonContent	organic carbon content	Portion of the soil measured as carbon in organic form, excluding living macro and mesofauna and living plant tissue.	chemical-Parameter
nitrogenContent	nitrogen content	Total nitrogen content in the soil, including both the organic and inorganic forms.	chemical-Parameter
pHValue	pH value	pH value of the soil derived object.	chemical-Parameter
cadmiumContent	cadmium content	Cadmium content of the soil derived object.	chemical-Parameter
chromiumContent	chromium content	Chromium content of the soil derived object.	chemical-Parameter
copperContent	copper content	Copper content of the soil derived object.	chemical-Parameter
leadContent	lead content	Lead content of the soil derived object.	chemical-Parameter
mercuryContent	mercury content	Mercury content of the soil derived object.	chemical-Parameter
nickelContent	nickel content	Nickel content of the soil derived object.	chemical-Parameter
zincContent	zinc content	Zinc content of the soil derived object.	chemical-Parameter

3.3.10.   *Soil Investigation Purpose (SoilInvestigationPurposeValue)*

A code list of possible values indicating the reasons for conducting a survey.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list SoilInvestigationPurposeValue

Value	Name	Definition
generalSoilSurvey	general soil survey	Soil characterisation with unbiased selection of investigation location.
specificSoilSurvey	specific soil survey	Investigation of soil properties at locations biased by a specific purpose.

3.3.11. *Soil Plot Type (SoilPlotTypeValue)*

A code list of terms specifying on what kind of plot the observation of the soil is made.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list SoilPlotTypeValue

Value	Name	Definition
borehole	borehole	Penetration into the sub-surface with removal of soil/rock material by using, for instance, a hollow tube-shaped tool, in order to carry out profile descriptions, sampling and/or field tests.
sample	sample	Exacavation where soil material is removed as a soil sample without doing any soil profile description.
trialPit	trial pit	Excavation or other exposition of the soil prepared to carry out profile descriptions, sampling and/or field tests.

3.3.12. *Soil Profile Parameter Name (SoilProfileParameterNameValue)*

Properties that can be observed to characterize the soil profile.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

Values for the code list SoilProfileParameterNameValue

Value	Name	Definition	Parent value
chemicalParameter	chemical parameter	Chemical parameters observed to characterize the soil profile.	
physicalParameter	physical parameter	Physical parameters observed to characterize the soil profile.	
biologicalParameter	biological parameter	Biological parameters observed to characterize the soil profile.	
potentialRootDepth	potential root depth	Potential depth of the soil profile where roots develop (in cm).	physicalParameter
availableWaterCapacity	available water capacity	Amount of water that a soil can store that is usable by plants, based on the potential root depth.	physicalParameter
carbonStock	carbon stock	The total mass of carbon in soil for a given depth.	chemicalParameters
waterDrainage	water drainage	Natural internal water drainage class of the soil profile.	physicalParameter

3.3.13.   *Soil Site Parameter Name (SoilSiteParameterNameValue)*

Properties that can be observed to characterize the soil site.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

Values for the code list SoilSiteParameterNameValue

Value	Name	Definition
chemicalParameter	chemical parameter	Chemical parameters observed to characterize the soil site.
physicalParameter	physical parameter	Physical parameters observed to characterize the soil site.
biologicalParameter	biological parameter	Biological parameters observed to characterize the soil site.

3.3.14.   *WRB Qualifier Place (WRBQualifierPlaceValue)*

A code list of values indicating the placement of the Qualifier with regard to the WRB reference soil group (RSG). The placement can be in front of the RSG i.e. "prefix" or it can be behind the RSG i.e. "suffix".

The allowed values for this code list comprise only the values "prefix" and "suffix", according to the naming rules specified in *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

3.3.15.   *WRB Qualifiers (WRBQualifierValue)*

A code list of possible qualifiers of the World Reference Base for Soil Resources.

The allowed values for this code list comprise only the values specified in *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

3.3.16.   *WRB Reference Soil Group (RSG) (WRBReferenceSoilGroupValue)*

A code list of possible reference soil groups (i.e. first level of classification of the World Reference Base for Soil Resources).

The allowed values for this code list comprise only the values specified in *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

3.3.17.   *WRB Specifiers (WRBSpecifierValue)*

A code list of possible specifiers.

The allowed values for this code list comprise only the values specified in *World reference base for soil resources 2006, first update 2007*, World Soil Resources Reports No. 103, Food and Agriculture Organization of the United Nations, Rome, 2007.

3.4.   **Theme-specific Requirements**

(1) The values of the first level hierarchical code lists ProfileElementParameterNameValue, SoilDerivedObject-ParameterNameValue, SoilProfileParameterNameValue, SoilSiteParameterNameValue (chemicalParameter, biologicalParameter, physicalParameter) serve only the purpose of structuring; onlythe lower-level values shall be used.

(2) When an additional descriptive parameter for the soil derived object is needed, the parameter attribute of the OM_Observation spatial object type shall be used.

(3) Only one Other Horizon Notation Type classification shall be used for a dataset.

(4) Only one Other Soil Name Type classification shall be used for a dataset.

3.5.   **Layers**

Layers for the spatial data theme Soil

Layer Name	Layer Title	Spatial object type
SO.SoilBody	Soils	SoilBody
SO.ObservedSoilProfile	Observed Soil Profiles	ObservedSoilProfile, SoilPlot
SO.SoilSite	Soil Sites	SoilSite
SO. <CodeListValue> (¹) Example: SO. OrganicCarbonContent	<human readable name> Example: Organic Carbon Content	SoilDerivedObject (basePhenomenon: SoilDerivedObjectParameterNameValue)
SO.<CodeListValue>Coverage (²) Example: SO. OrganicCarbonContentCoverage	<human readable name> Example: Organic Carbon Content Coverage	SoilThemeCoverage (soilThemeParameter / soilThemeParameterName: SoilDerivedObjectParameterNameValue)

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(²) One layer shall be made available for each code list value, in accordance with Art. 14(3).

4.   LAND USE

4.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definition shall apply:

(1) "existing land use" means an objective depiction of the use and functions of a territory as it has been and effectively still is in real life.

(2) "gridded existing land use" means an objective depiction as a regular orthorectified grid (image) of the use and functions of a territory as it has been and effectively still is in real life.

(3) "Hierarchical INSPIRE Land Use Classification System (HILUCS)" means a multi-level classification system for Land Use whose use is mandatory at the most appropriate level.

(4) "minimum unit of interest" means the smallest polygonal area for the land use objects taken into consideration in the data set.

(5) "planned land use" means spatial plans, defined by spatial planning authorities, depicting the possible utilization of the land in the future.

(6) "sampled existing land use" means an objective depiction of the use and functions of a territory [as it has been and effectively still is] in real life as observed in sampled location.

(7) "zoning" means a partition where the planned land use is depicted, making explicit the rights and prohibitions regarding new constructions that apply within each partition element.

4.2.   **Structure of the Spatial Data Theme Land Use**

The types specified for the spatial data theme Land Use are structured in the following packages:

— Land Use Nomenclature

— Existing land use

— Gridded existing land use

— Sampled existing land use

— Planned land use

4.3. **Land Use Nomenclature**

4.3.1. *Data types*

4.3.1.1. HILUCS Percentage (HILUCSPercentage)

Percentage of land use object that is covered by this HILUCS presence.

Attributes of the data type HILUCSPercentage

Attribute	Definition	Type	Voidability
hilucsValue	HILUCS category for this HILUCS percentage.	HILUCSValue	
percentage	Percentage of land use object that is covered by this HILUCS presence.	Integer	

4.3.1.2. HILUCS Presence (HILUCSPresence)

Presence of one or several HILUCS values in an area, indicated either as the percentage covered for each value or as the values listed in their order of importance.

This type is a union type.

Attributes of the union type HILUCSPresence

Attribute	Definition	Type	Voidability
orderedList	ordered list of land use value presence	HILUCSValue	
percentageList	list of percentage of land use value	HILUCSPercentage	

4.3.1.3. Specific Percentage (SpecificPercentage)

Percentage of a land use object that is covered by a specific presence.

Attributes of the data type SpecificPercentage

Attribute	Definition	Type	Voidability
specificValue	Specific value category for this specific percentage.	LandUseClassification-Value	
percentage	Percentage of a land use object that is covered by this specific presence.	Integer	

4.3.1.4. Specific Presence (SpecificPresence)

Presence of one or several land use classification values in an area according to the code list provided by the data provider, indicated either as the percentage covered for each value or as the values listed in their order of importance.

This type is a union type.

Attributes of the union type SpecificPresence

Attribute	Definition	Type	Voidability
orderedList	ordered list of land use value	LandUseClassification-Value	
percentageList	list of percentage of land use value	SpecificPercentage	

4.3.2.   *Code lists*

4.3.2.1.   HILUCS (HILUCSValue)

List of land use categories to be used in INSPIRE Land Use.

The allowed values for this code list comprise only the values specified in the table below.

This code list is hierarchical.

Values for the code list HILUCSValue

Value	Name	Definition	Parent value
1_PrimaryProduction	primary production	Areas where the manufacturing industries aggregate, package, purify or process the primary products close to the primary producers are included, especially if the raw material is unsuitable for sale or difficult to transport long distances.	
1_1_Agriculture	agriculture	Production of crop (plants, fungi, etc.) and animal products for food, for sale, own consumption or industrial purposes. It includes plants for biofuels and growing of crops in open fields as well as in greenhouses. Also set-aside fallow land in the crop rotation belongs to this class. The preparation of products for the primary markets is included, field construction (e.g. agricultural land terracing, drainage, preparing rice paddies etc.) as well as landscape care and maintenance.	1_PrimaryProduction
1_1_1_CommercialAgriculturalProduction	commercial agricultural production	Arable land, permanent crops and grasslands in agricultural use (both sown and natural grassland). The products can be used for human or animal feed or bio-energy production.	1_1_Agriculture
1_1_2_FarmingInfrastructure	farming infrastructure	Farm dwellings, animal husbandry infrastructure (animal dwellings and processing infrastructure linked to farms), manure storage and other farming infrastructure (e.g. buildings linked to plant handling and processing in farms).	1_1_Agriculture
1_1_3_AgriculturalProductionForOwnConsumption	agricultural production for own consumption	Production of plants or animals for own consumption (kitchen gardens, private animal sheds etc.)	1_1_Agriculture
1_2_Forestry	forestry	Production of round wood and other wood based primary products. Besides the production of timber, forestry activities result in products that undergo little processing, such as firewood, charcoal and round wood used in an unprocessed form (e.g. pit-props, pulpwood etc.). Forest tree nurseries, storage and transport areas linked to logging, trees and woody plants for bio fuels are also included. These activities can be carried out in natural or planted forests.	1_PrimaryProduction

Value	Name	Definition	Parent value
1_2_1_ForestryBasedOnShortRotation	forestry based on short rotation	Forestry areas where the rotation period of a tree generation is 50 years or less, after which the forest is regenerated naturally or artificially with planting or seeding. Tree plantations (pulp-wood production) and wood used for biomass production also belong to this class.	1_2_Forestry
1_2_2_ForestryBasedOnIntermediateOrLongRotation	forestry based on intermediate or long rotation	Forestry areas where the rotation period of a tree generation is over 50 years after which the forest is regenerated naturally or artificially with planting or seeding.	1_2_Forestry
1_2_3_ForestryBasedOnContinuousCover	forestry based on continuous cover	Forestry areas where forest management and regeneration is based on continuous growing of trees.	1_2_Forestry
1_3_MiningAndQuarrying	mining and quarrying	Mining and quarrying in the form of the extraction of minerals and materials occurring naturally as solids (coal, ores, gravel, sand, salt), liquids (petroleum), gases (natural gas) or biomass (peat). Extraction can be achieved by different methods such as underground or surface mining or extraction, well operation etc.	1_PrimaryProduction
1_3_1_MiningOfEnergyProducingMaterials	mining of energy producing materials	Mining and extraction of coal, lignite, peat, petroleum, natural gas, uranium and thorium.	1_3_MiningAndQuarrying
1_3_2_MiningOfMetalOres	mining of metal ores	Mining of iron and other non-ferrous metal ores (except uranium and thorium).	1_3_MiningAndQuarrying
1_3_3_OtherMiningAndQuarrying	other mining and quarrying	Quarrying of stone, sand, clay, chemical, fertilizer minerals, the production of salt and other mining and quarrying.	1_3_MiningAndQuarrying
1_4_AquacultureAndFishing	aquaculture and fishing	Professional fishing and aquaculture.	1_PrimaryProduction
1_4_1_Aquaculture	aquaculture	Fish hatcheries and managed grow-out sites.	1_4_AquacultureAndFishing
1_4_2_ProfessionalFishing	professional fishing	Water areas used for professional fishing.	1_4_AquacultureAndFishing
1_5_OtherPrimaryProduction	other primary production	Professional hunting, gathering of wild growing non-wood forestry products, husbandry of migratory animals and any other primary production not included in the values 1_1_Agriculture, 1_2_Forestry, 1_3_MiningAndQuarrying, 1_4_AquacultureAndFishing or any of their narrower values.	1_PrimaryProduction

Value	Name	Definition	Parent value
1_5_1_Hunting	hunting	Professional hunting. The areas can be fenced or open.	1_5_OtherPrimaryProduction
1_5_2_ManagementOf-MigratoryAnimals	management of migratory animals	Keeping and feeding migratory animals such as reindeer and deer.	1_5_OtherPrimaryProduction
1_5_3_PickingOfNatu-ralProducts	picking of natural products	Picking up natural non wood based products such as non-cultivated berries, mosses, lichen etc.) for commercial purposes	1_5_OtherPrimaryProduction
2_SecondaryProduction	secondary production	Industrial and manufacturing activities which take the output of the primary sector and manufacture finished goods and intermediate products for other business. It also includes the storage and transport areas linked directly to manufacturing activities. The branches of industries covered by this class are the processing of food, textile, leather, wood and wood product, pulp, paper, publishing, printing, recording, petroleum and other fuels, chemicals, chemical products, man-made fibers, rubber and plastic products, non metallic mineral products, basic metals and metal products, fabricated metal product, machinery and equipment, electrical and optical equipments, transport equipment and furniture.	
2_1_RawIndustry	raw industry	Industrial activities transforming the output primary sector into manufactured raw products.	2_Secondary-Production
2_1_1_Manufacturing-OfTextileProducts	manufacturing of textile products	Preparation and spinning of textile fibres, sewing threads, textile weaving, tanning and dressing of leather.	2_1_RawIndustry
2_1_2_Manufacturing-OfWoodAndWood-BasedProducts	manufacturing of wood and wood based products	Sawmilling and planning of wood, manufacturing of veneer sheets, plywood, laming boards, fibre boards, carpentry and joinery, cork, straw and plaiting products.	2_1_RawIndustry
2_1_3_Manufacturing-OfPulpPaperAndPaper-Products	manufacturing of pulp paper and paper products	Manufacturing of pulp, paper, paperboard, paper based sanitary goods, wallpapers.	2_1_RawIndustry
2_1_4_Manufacturing-OfCokeRefinedPetro-leumProductsAndNu-clearFuel	manufacturing of coke refined petroleum products and nuclear fuel	Manufacturing coke, refined petroleum and processing of nuclear fuel.	2_1_RawIndustry
2_1_5_Manufacturing-OfChemicalsChemical-ProductsManMadeFibers	manufacturing of chemicals chemical products man made fibers	Manufacturing of basic chemicals, agro-chemicals, paints, pharmaceuticals, soap, detergents, glues, other chemical products and man-made fibers.	2_1_RawIndustry

Value	Name	Definition	Parent value
2_1_6_Manufacturing-OfBasicMetalsAndFabricatedMetals	manufacturing of basic metals and fabricate metals	Manufacturing, processing and casting of iron, steel and basic precious and non-ferrous metals. It also includes the manufacturing of metal products.	2_1_RawIndustry
2_1_7_Manufacturing-OfNonMetallicMineral-Products	manufacturing of non-metallic mineral products	Manufacturing glass, bricks, ceramics, concrete, cement, lime, plaster, cutting and shaping of stone and other non-metallic mineral products.	2_1_RawIndustry
2_1_8_Manufacturing-OfRubberPlasticProducts	manufacturing of rubber plastic products	Manufacturing of tyres, tubes, plastic packing good and other rubber and plastic products.	2_1_RawIndustry
2_1_9_Manufacturing-OfOtherRawMaterials	manufacturing of other raw materials	Production of raw materials not included in any other of the narrower values of 2_1_RawIndustry.	2_1_RawIndustry
2_2_HeavyEndProduct-Industry	heavy end product industry	Activities transforming raw manufactured products into heavy manufactured products.	2_Secondary-Production
2_2_1_Manufacturing-OfMachinery	manufacturing of machinery	Manufacturing of production, agricultural, forestry and other machinery (excluding aircrafts and vehicles), weapons, ammunition and domestic appliances.	2_2_HeavyEndProduct-Industry
2_2_2_Manufacturing-OfVehiclesAndTransportEquipment	manufacturing of vehicles and transport equipment	Manufacturing of motor vehicles, aircrafts, spacecrafts, ships, boats, railway and tramway equipment, motorcycles, bicycles and other transport equipment.	2_2_HeavyEndProduct-Industry
2_2_3_Manufacturing-OfOtherHeavyEndProducts	manufacturing of other heavy end products	Production of other heavy end products not included in any other of the narrower values of 2_2_HeavyEndProductIndustry.	2_2_HeavyEndProduct-Industry
2_3_LightEndProduct-Industry	light end product industry	Activities transforming raw manufactured products into light manufactured products.	2_Secondary-Production
2_3_1_Manufacturing-OfFoodBeveragesAndTobaccoProducts	manufacturing of food beverages and tobacco products	Manufacturing of meat, fish, fruit and vegetables, oils and fats or derived products, dairy products, grain mill and starch products, prepared animal feeds, other food products, beverages and tobacco products.	2_3_LightEndProductIndustry
2_3_2_Manufacturing-OfClothesAndLeather	manufacturing of clothes and leather	Manufacturing of wearing apparel, leather clothes, dressing, accessories, dyeing of fur and manufacturing of fur products, luggage, bags, saddlery and footwear.	2_3_LightEndProductIndustry

Value	Name	Definition	Parent value
2_3_3_PublishingAnd-Printing	publishing and printing	Publishing and printing of books, newspapers, journals and the publishing and reproduction of sound recordings.	2_3_LightEndProductIndustry
2_3_4_Manufacturing-OfElectricalAndOpticalEquipment	manufacturing of electrical and optical equipment	Manufacturing of office machinery, computers, motors, generators, electricity distribution and control apparatus, wires and cables, accumulators, batteries, lamps, radios, TVs, phones, electronic valves and tubes, medical, precision and optical instruments, watches and other electrical and optical equipment.	2_3_LightEndProductIndustry
2_3_5_Manufacturing-OfOtherLightEndProducts	manufacturing of other light end products	Manufacturing of furniture, jewellery, musical instruments, sports goods, games, toys and other miscellaneous products.	2_3_LightEndProductIndustry
2_4_EnergyProduction	energy production	Production of energy.	2_Secondary-Production
2_4_1_NuclearBasedEnergyProduction	nuclear based energy production	Nuclear power plants.	2_4_Energy-Production
2_4_2_FossilFuelBasedEnergyProduction	fossil fuel based energy production	Power plants using fossil fuels (coal, oil, natural gas, peat and other fossil fuels).	2_4_Energy-Production
2_4_3_BiomassBasedEnergyProduction	biomass based energy production	Combustion power plants using biomass based fuels (wood and other plant based solid and liquid fuels, biogas and other biofuels).	2_4_Energy-Production
2_4_4_RenewableEnergyProduction	renewable energy production	Hydro-, solar, wind, thermal (aero, geo and hydro), tidal, wave etc. energy and other renewable energy (except biomass energy, which is covered by the value 2_4_3_BiomassBasedEnergyProduction).	2_4_Energy-Production
2_5_OtherIndustry	other industry	Production of other industrial products not included in any other of the narrower values of 2_SecondaryProduction.	2_Secondary-Production
3_TertiaryProduction	tertiary production	Services that are products for other businesses and consumers both private and public services. It encompasses whole sale and retail trade, repair services, hotels and restaurants, financial services, real estate, business services, rental services, public administration, defence and social security, education, health and social work and other community, social and personal services.	

Value	Name	Definition	Parent value
3_1_CommercialServices	commercial services	Provision of commercial services.	3_TertiaryProduction
3_1_1_WholesaleAndRetailTradeAndRepairOfVehiclesAndPersonalAndHouseholdGoods	wholesale and retail trade and repair of vehicles and personal and household goods	Wholesale and retail sale of motor vehicles, fuel, agricultural raw materials, live animals, ores, metals, chemicals, timber, machinery, ships, furniture, household goods, textiles, food, beverages, tobacco products, pharmaceutical products, second hand goods, other products, waste and scrap. This class also includes the repair of vehicles, personal and household goods.	3_1_CommercialServices
3_1_2_RealEstateServices	real estate services	Provision of real estate and renting services.	3_1_CommercialServices
3_1_3_AccommodationAndFoodServices	accommodation and food services	Hotel, holiday village, camping site, restaurant, bar and canteen services.	3_1_CommercialServices
3_1_4_OtherCommercialServices	other commercial services	Other commercial services not included in any other of the narrower values of 3_1_CommercialServices, such as beauty and wellbeing services.	3_1_CommercialServices
3_2_FinancialProfessionalAndInformationServices	financial professional and information services	Provision of financial, professional or information services.	3_TertiaryProduction
3_2_1_FinancialAndInsuranceServices	financial and insurance services	Provision of banking, credit, insurance, and other financial services.	3_2_FinancialProfessionalAndInformationServices
3_2_2_ProfessionalTechnicalAndScientificServices	professional technical and scientific services	IT consulting, data processing, research and development, legal, accountancy, business management, architectural, engineering, advertising, testing, investigation, consulting, and other professional services.	3_2_FinancialProfessionalAndInformationServices
3_2_3_InformationAndCommunicationServices	information and communication services	Publishing, sound recording, TV-programme, motion picture, radio broadcasting, post and telecommunication, computer and data processing services.	3_2_FinancialProfessionalAndInformationServices
3_2_4_AdministrativeAndSupportServices	administrative and support services	Travel agency, rental, cleaning, security and other administrative and support services.	3_2_FinancialProfessionalAndInformationServices
3_2_5_OtherFinancialProfessionalAndInformationServices	other financial professional and information services	Other financial, professional and information services not included in any other of the narrower values of 3_2_FinancialProfessionalAndInformationServices.	3_2_FinancialProfessionalAndInformationServices

Value	Name	Definition	Parent value
3_3_CommunityServices	community services	Provision of services for the community.	3_TertiaryProduction
3_3_1_PublicAdministrationDefenceAndSocialSecurityServices	public administration defence and social security services	Provision of generic administrative, defence, justice, public security, fire and compulsory social security services.	3_3_CommunityServices
3_3_2_EducationalServices	educational services	Provision of primary, secondary, higher, adult and other educational services.	3_3_CommunityServices
3_3_3_HealthAndSocialServices	health and social services	Provision of human and animal health and social work services.	3_3_CommunityServices
3_3_4_ReligiousServices	religious services	Provision of religious services.	3_3_CommunityServices
3_3_5_OtherCommunityServices	other community services	Other community services e.g. cemeteries.	3_3_CommunityServices
3_4_CulturalEntertainmentAndRecreationalServices	cultural entertainment and recreational services	Provision of cultural, entertainment or recreational services.	3_TertiaryProduction
3_4_1_CulturalServices	cultural services	Provision of artistic, library, museum, zoos, botanical gardens, historical sites and other cultural services.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_2_EntertainmentServices	entertainment services	Amusement parks, theme parks, betting and gambling activities and other entertainment services.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_3_SportsInfrastructure	sports infrastructure	Sports infrastructure, such as stadiums, sports halls, swimming pools, fitness facilities, ski resorts, golf courses and other sports infrastructure.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_4_OpenAirRecreationalAreas	open air recreational areas	Open air recreational areas, e.g. urban parks, playgrounds, national parks, and natural areas used for recreational purposes.	3_4_CulturalEntertainmentAndRecreationalServices
3_4_5_OtherRecreationalServices	other recreational services	Other recreational services not included in any of the other narrower values of 3_4_CulturalEntertainmentAndRecreationalServices.	3_4_CulturalEntertainmentAndRecreationalServices
3_5_OtherServices	other services	Provision of other services not included in any of the other narrower values of 3_TertiaryProduction.	3_TertiaryProduction

Value	Name	Definition	Parent value
4_TransportNetworks-LogisticsAndUtilities	transport networks logistics and utilities	Basic infrastructure and networks of the society. All the other sectors are using the infrastructure and networks to produce the goods and services and they are also vital for residential areas. It includes water supply, collection, treatment and recycling of sewage and waste, transport, networks, storage and communication.	
4_1_TransportNetworks	transport networks	Infrastructure related to transport.	4_Transport-NetworksLogisticsAndUtilities
4_1_1_RoadTransport	road transport	Areas used for road transport, e.g. roads, parking areas, service stations.	4_1_Trans-portNetworks
4_1_2_RailwayTransport	railway transport	Areas used for rail transport, e.g. rails, railway stations and yards etc.	4_1_Trans-portNetworks
4_1_3_AirTransport	air transport	Areas used for air transport, e.g. airports and related services.	4_1_Trans-portNetworks
4_1_4_WaterTransport	water transport	Areas used for water transport, e.g. ports, rivers, docks and related services.	4_1_Trans-portNetworks
4_1_5_OtherTransport-Network	other transport network	Areas used for other transport not included in any of the other narrower values of 4_1_TransportNetworks.	4_1_Trans-portNetworks
4_2_LogisticalAndStor-ageServices	logistical and storage services	Areas used for separate (not linked directly to industries) storage services and logistical services.	4_Transport-NetworksLogisticsAndUtilities
4_3_Utilities	utilities	Infrastructure related to utilities.	4_Transport-NetworksLogisticsAndUtilities
4_3_1_ElectricityGa-sAndThermalPowerDis-tributionServices	electricity gas and thermal power distribution services	Areas used for distribution of electricity, gas and thermal energy, including the pipelines used for transporting oil and gas.	4_3_Utilities
4_3_2_WaterAndSewa-geInfrastructure	water and sewage infrastructure	Areas used for the extraction, collection, purification storage and distribution of water, collection and treatment of sewage (including the pipelines).	4_3_Utilities
4_3_3_WasteTreatment	waste treatment	Areas used for the collection, treatment and recycling of waste.	4_3_Utilities
4_3_4_OtherUtilities	other utilities	Areas used for other utilities not included in any of the other narrower values of 4_3_Utilities.	4_3_Utilities

Value	Name	Definition	Parent value
5_ResidentialUse	residential use	Areas used dominantly for housing of people. The forms of housing vary significantly between, and through, residential areas. These areas include single family housing, multi-family residential, or mobile homes in cities, towns and rural districts if they are not linked to primary production. It permits high density land use and low density uses. This class also includes residential areas mixed with other non-conflicting uses and other residential areas.	
5_1_PermanentResidentialUse	permanent residential use	Residential areas dominated by detached houses surrounded by gardens and/or yards, a mix of single houses, semi-detached houses, terraced houses, town houses, row houses and blocks of flats used as permanent residence.	5_ResidentialUse
5_2_ResidentialUseWithOtherCompatibleUses	residential use with other compatible uses	Residential areas mixed with other non-conflicting uses (e.g. various services, light industries etc.).	5_ResidentialUse
5_3_OtherResidentialUse	other residential use	Areas dominantly used for temporary dwellings (camps of migrant people), holiday residences (summer cottages), etc.	5_ResidentialUse
6_OtherUses	other uses	Areas not included in the values 1_PrimaryProduction, 2_SecondaryProduction 3_TertiaryProduction 4_TransportNetworksLogisticsAndUtilities, 5_ResidentialUse or any of their narrower values, or areas under construction.	
6_1_TransitionalAreas	transitional areas	Areas under construction. This class is used only for existing land use and not for planned land use.	6_OtherUses
6_2_AbandonedAreas	abandoned areas	Abandoned agricultural, residential and industrial, transport and basic infrastructure areas. The area belongs to the abandoned class if it is not in use and can no longer be used for the original purpose without major reparation or renovation work.	6_OtherUses
6_3_NaturalAreasNotInOtherEconomicUse	natural areas not in other economic use	Areas which are in natural state and not in other economic use.	6_OtherUses
6_3_1_LandAreasNotInOtherEconomicUse	land areas not in other economic use	Areas which are in natural state, e.g. woodland, shrubland, grassland, wetland, bare land, which are not in any other socio-economic use. This includes the areas with a planning status "natural area". Protected areas can belong to this class or, if other uses are present, also to other classes. Protected areas are always tagged with a supplementary regulation status "protected area".	6_3_NaturalAreasNotInOtherEconomicUse

Value	Name	Definition	Parent value
6_3_2_WaterAreas-NotInOtherEconomicU-se	water areas not in other economic use	Water areas which are not in any other socio-economic use.	6_3_Natural-AreasNotI-nOtherEcon-omicUse
6_4_AreasWhereAny-UseAllowed	areas where any use allowed	Areas where any use is allowed in the Planned land use (PLU).	6_OtherUses
6_5_AreasWithoutAny-SpecifiedPlannedUse	areas without any specified planned use	Areas where no use is specified in the Planned land use (PLU), e.g. areas outside the scope of the plan.	6_OtherUses
6_6_NotKnownUse	not known use	Areas where the land use is unknown.	6_OtherUses

4.3.2.2.   Land Use Classification (LandUseClassificationValue)

List of land use categories to be used in INSPIRE Land Use and agreed at a national or local level.

The allowed values for this code list comprise any values defined by data providers.

4.4.   **Existing Land Use**

4.4.1.   *Spatial object types*

The package existing land use contains the following spatial object types:

— Existing Land Use Data Set

— Existing Land Use Object

4.4.1.1.   Existing Land Use Data Set (ExistingLandUseDataSet)

An existing land use data set is a collection of areas for which information on existing (present or past) land uses is provided.

Attributes of the spatial object type ExistingLandUseDataSet

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
extent	Boundary of the geometrical union of all the instances of the spatial object typeExistingLandUseObject.	GM_MultiSurface	
name	Human readable name of the data set.	CharacterString	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the existing land use data set started to exist in the real world.	DateTime	voidable
validTo	The time from which this existing land use data set no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type ExistingLandUseDataSet

Association role	Definition	Type	Voidability
member	Reference to the LandUseObjects which belong to this ExistingLandUseDataSet	ExistingLandUseObject	

4.4.1.2.   Existing Land Use Object (ExistingLandUseObject)

An existing land use object describes the land use of an area having a homogeneous combination of land use types.

Attributes of the spatial object type ExistingLandUseObject

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometric representation of spatial area covered by this object.	GM_MultiSurface	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
hilucsPresence	Actual presence of a land use category according to HILUCS within the object.	HILUCSPresence	voidable
hilucsLandUse	Land use HILUCS classes that are present in this existing land use object.	HILUCSValue	
specificLandUse	Land Use Category according to the nomenclature specific to this data set.	LandUseClassification-Value	voidable
specificPresence	Actual presence of a land use category within the object.	SpecificPresence	voidable
observationDate	The observation date associated to a description.	Date	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type ExistingLandUseObject

Association role	Definition	Type	Voidability
dataSet	Existing land use data set to which this land use object belongs.	ExistingLandUseDataSet	

4.5.   **Gridded Land Use**

4.5.1.   *Spatial object types*

The package gridded land use contains the spatial object type Existing Land Use Grid.

4.5.1.1. Existing Land Use Grid (ExistingLandUseGrid)

An existing land use grid is a collection of pixels for which information on existing (present or past) land use is provided. The HILUCS system shall be used for classification.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type ExistingLandUseGrid

Attribute	Definition	Type	Voidability
name	Human readable name of the data set.	CharacterString	
inspireId	External object identifier of the spatial object.	Identifier	
extent	Contains the extent of the data set.	EX_Extent	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	First date at which this grid is a valid representation of reality.	DateTime	voidable
validTo	The time from which the grid is no longer a valid representation of reality.	DateTime	voidable

Constraints of the spatial object type ExistingLandUseGrid

The rangeSet values shall be of type CategoryOrNilReason.

Range is based on either HILUCS or on a specific land use classification system defined by the data provider.

4.6. **Sampled Land Use**

4.6.1. *Spatial object types*

The package sampled land use contains the following spatial object types:

— Existing Land Use Sample

— Sampled Existing Land Use Data Set

4.6.1.1. Existing Land Use Sample (ExistingLandUseSample)

Description of the existing land use that is present at the specific location.

Attributes of the spatial object type ExistingLandUseSample

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
location	Location where the land use sample is taken.	GM_Point	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
hilucsLandUse	Land use HILUCS classes that are present in this existing land use sample.	HILUCSValue	
hilucsPresence	Actual presence of a land use category according to HILUCS within the object.	HILUCSPresence	voidable
specificLandUse	Land Use Category according to the nomenclature specific to this data set.	LandUseClassification-Value	voidable
observationDate	The observation date associated to a description.	Date	voidable
specificPresence	Actual presence of a land use category within the object.	SpecificPresence	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type ExistingLandUseSample

Association role	Definition	Type	Voidability
dataset	Data set to which this sample belongs.	SampledExistingLand-UseDataSet	

4.6.1.2. Sampled Existing Land Use Data Set (SampledExistingLandUseDataSet)

A sampled existing land use data set is a collection of locations for which information on existing (present or past) land uses is provided.

Attributes of the spatial object type SampledExistingLandUseDataSet

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
extent	The convex hull of all the instances of the spatial object type ExistingLand-UseSample.	GM_MultiSurface	
name	Human readable name of the data set.	CharacterString	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	First date at which this data set is valid in reality.	DateTime	voidable
validTo	The time from which the data set no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type SampledExistingLandUseDataSet

Association role	Definition	Type	Voidability
member	Reference to the members of the sampled existing land use data set.	ExistingLandUseSample	

4.7.   **Planned Land Use**

4.7.1.   *Spatial object types*

The package planned land use contains the following spatial object types:

— Official Documentation

— Spatial Plan

— Supplementary Regulation

— Zoning Element

4.7.1.1. Official Documentation (OfficialDocumentation)

The official documentation that composes the spatial plan; it may be composed of the applicable legislation, the regulations, cartographic elements, descriptive elements that may be associated with the complete spatial plan, a zoning element or a supplementary regulation. In some Member States the actual textual regulation will be part of the data set (and can be put in the regulationText attribute), in other Member States the text will not be part of the data set and will be referenced via a reference to a document or a legal act. At least one of the three voidable values shall be provided.

Attributes of the spatial object type OfficialDocumentation

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
legislationCitation	Reference to the document that contains the text of the regulation.	LegislationCitation	voidable
regulationText	Text of the regulation.	CharacterString	voidable
planDocument	Citation of scanned plans and structural drawings, which may be geo-referenced or not.	DocumentCitation	voidable

Constraints of the spatial object type OfficialDocumentation

At least one of the attributes legislationCitation, regulationText or planDocument shall be populated with a non-void value.

4.7.1.2. Spatial Plan (SpatialPlan)

A set of documents that indicates a strategic direction for the development of a given geographic area, states the policies, priorities, programmes and land allocations that will implement the strategic direction and influences the distribution of people and activities in spaces of various scales. Spatial plans may be developed for urban planning, regional planning, environmental planning, landscape planning, national spatial plans, or spatial planning at the Union level.

Attributes of the spatial object type SpatialPlan

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	

Attribute	Definition	Type	Voidability
extent	Geometrical union of all the instances of the spatial object typesZoningElement and SupplementaryRegulation. When a SpatialPlan is only composed of a document, the attribute extent is the border of the cartographic image that contains the land use information (i.e. the land use map extent).	GM_MultiSurface	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
officialTitle	Official title of the spatial plan.	CharacterString	
levelOfSpatialPlan	Level of the administrative units covered by the plan.	LevelOfSpatialPlanValue	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	First date at which this spatial plan is valid in reality.	DateTime	voidable
validTo	The time from which the spatial plan no longer exists in the real world.	DateTime	voidable
alternativeTitle	Alternative (unofficial) title of the spatial plan.	CharacterString	voidable
planTypeName	Name of the type of plan that the Member State has given to the plan.	PlanTypeNameValue	
processStepGeneral	General indication of the step of the planning process that the plan is undergoing.	ProcessStepGeneral-Value	voidable
backgroundMap	Identification of the background map that has been used for constructing this plan.	BackgroundMapValue	voidable
ordinance	Reference to relevant administrative ordinance.	OrdinanceValue	voidable

Association roles of the spatial object type SpatialPlan

Association role	Definition	Type	Voidability
officialDocument	Link to the official documents that relate to the spatial plan.	OfficialDocumentation	voidable
member	Reference to the ZoningElements which belong to this SpatialPlan	ZoningElement	
restriction	Links to supplementary regulations providing information and/or limitations on the use of land/water that supplements the zoning as part of this spatial plan.	SupplementaryRegula-tion	

4.7.1.3. Supplementary Regulation (SupplementaryRegulation)

A spatial object (point, line or polygon) of a spatial plan that provides supplementary information and/or limitation on the use of land/water, necessary for spatial planning reasons or to formalise external rules defined in legal text.

Attributes of the spatial object type SupplementaryRegulation

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometry of the piece of land on which the supplementary regulation applies.	GM_Object	
validFrom	First date at which this version of this supplementary regulation is valid in reality.	DateTime	voidable
validTo	The date from which the supplementary regulation is no longer valid.	DateTime	voidable
regulationNature	Legal nature of the land use regulation.	RegulationNatureValue	
specificSupplementary-Regulation	Reference to a category of supplementary regulation provided in a specific nomenclature of supplementary regulations provided by the data provider.	SpecificSupplementary-RegulationValue	voidable
supplementaryRegula-tion	Code of the supplementary regulation from the hierarchical supplementary regulation code list agreed at the European level.	SupplementaryRegula-tionValue	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
processStepGeneral	General indication of the step of the planning process that the supplementary regulation is undergoing.	ProcessStepGeneral-Value	voidable
backgroundMap	Identification of the background map that has been used for constructing the supplementary regulation.	BackgroundMapValue	voidable
dimensioningIndication	Specifications about the dimensioning that are added to the dimensioning of the zoning elements that overlap the geometry of the supplementary regulation.	DimensioningIndica-tionValue	voidable
inheritedFromOther-Plans	Indication whether the supplementary regulation is inherited from another spatial plan.	Boolean	voidable
specificRegulationNa-ture	Legal nature of the land use regulation from a national perspective.	CharacterString	voidable
name	Official name of the supplementary regulation	CharacterString	voidable

Association roles of the spatial object type SupplementaryRegulation

Association role	Definition	Type	Voidability
officialDocument	Link to the textual regulations that correspond to this supplementary regulation.	OfficialDocumentation	voidable
plan	Link to the plan this supplementary regulation is part of.	SpatialPlan	

4.7.1.4. Zoning Element (ZoningElement)

A spatial object which is homogeneous regarding the permitted uses of land based on zoning which separate one set of land uses from another.

Attributes of the spatial object type ZoningElement

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometry of this zoning element.	GM_MultiSurface	
validFrom	The date when the phenomenon started to exist in the real world.	DateTime	voidable
validTo	The time from which the phenomenon no longer exists in the real world.	DateTime	voidable
hilucsLandUse	Land use class that is dominant in this land use object.	HILUCSValue	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
hilucsPresence	Actual presence of a land use category within the object.	HILUCSPresence	voidable
specificLandUse	Land Use Category according to the nomenclature specific to this data set.	LandUseClassificationValue	voidable
specificPresence	Actual presence of a land use category within the object.	SpecificPresence	voidable
regulationNature	Legal nature of the land use indication.	RegulationNatureValue	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
processStepGeneral	General indication of the step of the planning process that the zoning element is undergoing.	ProcessStepGeneralValue	voidable
backgroundMap	Identification of the background map that has been used for constructing this zoning element.	BackgroundMapValue	voidable
dimensioningIndication	Specifications about the dimensioning of the urban developments.	DimensioningIndicationValue	voidable

Association roles of the spatial object type ZoningElement

Association role	Definition	Type	Voidability
plan	SpatialPlan which this ZoningElement belongs to.	SpatialPlan	
officialDocument	Textual Regulation that is part of this zoning element.	OfficialDocumentation	voidable

4.7.2.   *Data types*

4.7.2.1.   Background Map (BackgroundMapValue)

Information regarding the map that has been used as a background in the definition of a spatial plan, a zoning element or a supplementary regulation.

Attributes of the data type BackgroundMapValue

Attribute	Definition	Type	Voidability
backgroundMapDate	Date of the background map used.	DateTime	
backgroundMapReference	Reference to the background map that has been used.	CharacterString	
backgroudMapURI	URI referring to service that provides background map.	URI	voidable

4.7.2.2.   Character-valued Dimensioning Indication (DimensioningIndicationCharacterValue)

Dimensioning indication whose value is of type CharacterString.

This type is a sub-type of DimensioningIndicationValue.

Attributes of the data type DimensioningIndicationCharacterValue

Attribute	Definition	Type	Voidability
value	Value of the dimension indications.	CharacterString	

4.7.2.3.   Integer-valued Dimensioning Indication (DimensioningIndicationIntegerValue)

Dimensioning indication whose value is of type integer.

This type is a sub-type of DimensioningIndicationValue.

Attributes of the data type DimensioningIndicationIntegerValue

Attribute	Definition	Type	Voidability
value	Value of the dimension indications.	Integer	

4.7.2.4.   Measure-valued Dimensioning Indication (DimensioningIndicationMeasureValue)

Dimensioning indication whose value is a measure.

This type is a sub-type of DimensioningIndicationValue.

Attributes of the data type DimensioningIndicationMeasureValue

Attribute	Definition	Type	Voidability
value	Value of the dimension indications.	Measure	

4.7.2.5. Real-valued Dimensioning Indication (DimensioningIndicationRealValue)

Dimensioning indication whose value is a floating point number.

This type is a sub-type of DimensioningIndicationValue.

Attributes of the data type DimensioningIndicationRealValue

Attribute	Definition	Type	Voidability
value	Value of the dimension indications.	Real	

4.7.2.6. Dimensioning Indication (DimensioningIndicationValue)

Specifications about the dimensioning of the urban developments.

Attributes of the data type DimensioningIndicationValue

Attribute	Definition	Type	Voidability
indicationReference	Description of the dimension indication.	CharacterString	

4.7.2.7. Ordinance (OrdinanceValue)

Reference to administrative ordinance. Ordinance is a regulation/rule that is adopted by an authority that is legally mandated to take such ordinance.

Attributes of the data type OrdinanceValue

Attribute	Definition	Type	Voidability
ordinanceDate	Date of the relevant administrative ordinance.	DateTime	
ordinanceReference	Reference to relevant administrative ordinance.	CharacterString	

4.7.3. *Code lists*

4.7.3.1. Level Of Spatial Plan (LevelOfSpatialPlanValue)

Territorial hierarchy of plan.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list LevelOfSpatialPlanValue

Value	Name	Definition
infraLocal	infra-local	A plan that covers only part of a municipality.
local	local	Plan at municipal level, corresponding to the lower level of administration equivalent to LAU2 as laid down in Annex III to Regulation (EC) No 1059/2003 of the European Parliament and of the Council ([1]).

Value	Name	Definition
supraLocal	supra-local	A plan that overlaps several municipalities (entirely or partially).
infraRegional	infra-regional	A plan that overlaps several infra-administrative units in one administrative region.
regional	regional	Plan at regional level (equivalent to NUTS2 of EUROSTAT nomenclature of statistical units as established in Regulation (EC) No 1059/2003).
supraRegional	supra-regional	A plan that overlaps several administrative regions.
national	national	Plan at Member State level.
other	other	Other level of spatial plan.

(^{1}) OJ L 154, 21.6.2003, p. 1.

4.7.3.2. Process Step General (ProcessStepGeneralValue)

General indication of the step in the planning process that the plan is undergoing.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ProcessStepGeneralValue

Value	Name	Definition
adoption	in the process of adoption	Plan in the process of being legally adopted.
elaboration	under elaboration	Plan under elaboration.
legalForce	legally binding or active	Plan already adopted and being legally binding or active.
obsolete	obsolete	Plan having been substituted by another plan, or not being any longer in force.

4.7.3.3. Regulation Nature (RegulationNatureValue)

Legal nature of the land use indication.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list RegulationNatureValue

Value	Name	Definition
bindingForDevelopers	binding for developers	The land use indication is binding only for the entity in charge of developing an area.
bindingOnlyForAuthorities	binding only for authorities	The land use indication is binding only for certain authorities.
generallyBinding	generally binding	The land use indication is binding for everybody.
nonBinding	not binding	The land use indication is not binding.
definedInLegislation	defined in legislation	The land use indication is defined by the legislation.

4.7.3.4.　　Plan Type Name (PlanTypeNameValue)

Types of plans as defined in the Member States. The allowed values for this code list comprise any values defined by data providers.

4.7.3.5.　　Specific Supplementary Regulation (SpecificSupplementaryRegulationValue)

Category of supplementary regulation provided in a specific nomenclature of supplementary regulations provided by the data provider.

The allowed values for this code list comprise any values defined by data providers.

4.7.3.6.　　Supplementary Regulation (SupplementaryRegulationValue)

Types of conditions and constraints in spatial plans.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Land Use.

4.8.　　**Theme-specific Requirements**

(1) Any Land Use data sets shall assign to each polygon, pixel or location a land use type from the Hierarchical INSPIRE Land Use Classification System (HILUCS) at the most appropriate and detailed level of the hierarchy.

(2) The spatial object type CoverageByDomainAndRange must only be of subtypes of GridCoverage.

(3) Where a zone has been established to regulate planned land use and defined within a legally binding spatial plan, it falls within the scope of the Land Use theme and shall be encoded as a Supplementary-Regulation. However, if the zone has been established by legislative requirement but not defined within a legally binding spatial plan, then it shall be encoded as a ManagementRestrictionOrRegulationZone.

(4) Based on the INSPIRE horizontal coordinate reference system, each Member State shall define a projection or a set of projections suitable for working with the underlying cadastral parcels on national territory and cross-border areas where applicable for a SpatialPlan. A projection is suitable if it offers few linear alterations (ideally less than 50 cm per 500 m) and so enables users to measure distances and surfaces in meaningful way. This projection or set of projections has to be defined in agreement with neighbouring countries. This projection or set of projections must be well documented to allow the conversion from and to the common Coordinate Reference System. The documentation shall be provided according to ISO 19111, which states how a projected coordinate reference system must be described.

(5) The use of the common metadata element "Spatial Resolution" (according to Section 6.2 of part B of the Annex to Regulation (EC) No 1205/2008) shall be restricted to providing a resolution distance.

(6) Data providers shall include the following keywords in addition to the mandatory keywords defined in Regulation (EC) No 1205/2008/EC:

(a) One of the following language-neutral keywords to describe the type of land use data set: ExistingLandUse, SampledExistingLandUse, GriddedExistingLandUse, PlannedLandUse.

(b) If the data set contains SpatialPlan objects, one keyword describing the level of the administrative units covered by the plan, as defined in the LevelOfSpatialPlan code list.

4.9.　　**Layers**

Layers for the spatial data theme Land Use

Layer Name	Layer Title	Spatial object type
LU.ExistingLandUse	Existing Land Use objects according to the Hierarchical INSPIRE Land Use Classification System at the most appropriate level	ExistingLandUseObject
LU.SpatialPlan	Extent of a spatial plan	SpatialPlan

Layer Name	Layer Title	Spatial object type
LU.ZoningElement	Spatial planning Zoning objects according to the Hierarchical INSPIRE Land Use Classification System at the most appropriate level	ZoningElement
LU.SupplementaryRegulation	Regulations that supplement the zoning and that affect the use of land	SupplementaryRegulation

5.   HUMAN HEALTH AND SAFETY

5.1.   **Spatial object types**

The following spatial object types are specified for the spatial data theme Human Health and Safety:

— Health Statistical Data

— Biomarker

— Disease

— General Health Statistic

— Health Services Statistic

— Environmental Health Determinant Measure

— Environmental Health Determinant Statistical Data

5.1.1.   *Health Statistical Data (HealthStatisticalData)*

Human health related data, from recorded diseases and related health problems (according to internationally accepted code lists, such as ICD-10), expressed as morbidity and mortality, to data on general health status (BMI, self perceived health, etc.), data on health care services (health care expenditure, day cases, etc.), and data on biomarkers; these are statistical indices aggregated at different statistical units, collected/reported in different population groups. Inclusion of human biomonitoring data provides an opportunity to explore potential direct or indirect links between human health and the environment.

This type is abstract.

Association roles of the spatial object type HealthStatisticalData

Association role	Definition	Type	Voidability
aggregationUnit	Statistical unit to which health statistical data refers.	StatisticalUnit	

5.1.2.   *Biomarker (Biomarker)*

A biomarker (of exposure) is the concentration of a chemical, its metabolite or the product of an interaction between a chemical and some target molecule or cell that is measured in a compartment in an organism.

This type is a sub-type of HealthStatisticalData.

Attributes of the spatial object type Biomarker

Attribute	Definition	Type	Voidability
biomarkerName	It is the unique identifier for a biomarker, providing information on the chemical that is determined and the matrix in which the chemical was determined.	BiomarkerType	
biomarkerStatistical-Parameter	The statistical summary of a human biomonitoring study, representing the most important statistical features of a biomarker measured in that particular study.	BiomarkerStatistical-ParameterType	
referencePeriod	The time period to which data is referred to.	ReferencePeriodType	
ageRange	Age interval of a specific subpopulation expressed as starting age and an interval, both alternatively expressed in years, months or weeks.	AgeRangeType	
gender	Gender of the population considered.	GenderValue	

Association roles of the spatial object type Biomarker

Association role	Definition	Type	Voidability
refersTo	biomarker data described by metadata	BiomarkerThematic-Metadata	

5.1.3. *Disease (Disease)*

Statistical information related to pathologies linked directly or indirectly to the quality of environment.

This type is a sub-type of HealthStatisticalData.

Attributes of the spatial object type Disease

Attribute	Definition	Type	Voidability
ageRange	Age interval of a specific subpopulation expressed as starting age and an interval, both alternatively expressed in years, months or weeks.	AgeRangeType	voidable
diseaseMeasure	Different ways how data on diseases and related health problems in a population can be reported.	DiseaseMeasure	
gender	Gender of the population considered.	GenderValue	voidable
referencePeriod	The time period to which data is referred to.	ReferencePeriodType	
pathology	Pathology type.	ICDValue	
COD	Data on causes of death (COD) that provide information on mortality patterns and form a major element of public health information.	CODValue	

Constraints of the spatial object type Disease

The COD attribute shall be provided only if the diseaseMeasureType attribute of diseaseMeasure takes a value that represents mortality.

At least one of pathology and COD attributes must not be empty.

5.1.4.   *General Health Statistic (GeneralHealthStatistics)*

Numbers about some aspects of health related to a population or an area. For the purpose of this data model, "general health" data include issues such as self-perceived health, demographic distribution of various health problems, smokers, etc., expressed as raw numbers, rates, percentage, stratified by gender, age, and/or socio-economic, cultural, ethnic or other factors.

This type is a sub-type of HealthStatisticalData.

Attributes of the spatial object type GeneralHealthStatistics

Attribute	Definition	Type	Voidability
ageRange	Age interval of a specific subpopulation expressed as starting age and an interval, both alternatively expressed in years, months or weeks.	AgeRangeType	voidable
gender	Gender of the population considered.	GenderValue	voidable
generalHealthName	Health status indicator.	GeneralHealthType-Value	
generalHealthValue	A numerical expression of a health index/indicator.	Real	
referencePeriod	The time period to which data is referred to.	ReferencePeriodType	

5.1.5.   *Health Services Statistic (HealthServicesStatistic)*

Health Care/Services statistical data on NUTS 1 and 2 level and municipality.

This type is a sub-type of HealthStatisticalData.

Attributes of the spatial object type HealthServicesStatistic

Attribute	Definition	Type	Voidability
healthServiceType	Type of health services.	HealthServicesType-eValue	
healthServiceValue	Number of the type considered.	Real	
referencePeriod	The time period to which data is referred to.	ReferencePeriodType	

5.1.6.   *Environmental Health Determinant Measure (EnvHealthDeterminantMeasure)*

A raw measurement performed at some place that is of interest for human health determinant analysis.

Attributes of the spatial object type EnvHealthDeterminantMeasure

Attribute	Definition	Type	Voidability
location	The location of the measurement.	GM_Object	
type	The type of environmental health determinant.	EnvHealthDeterminant-TypeValue	
measureTime	The time period when the measure has been performed.	TM_Period	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the information will start being used.	DateTime	voidable
validTo	The time when the information will stop being used.	DateTime	voidable

5.1.7. *Environmental Health Determinant Statistical Data (EnvHealthDeterminantStatisticalData)*

A statistical data of interest for human health determinant analysis, resulting from the aggregation of raw measurements located within a statistical unit.

This type is a sub-type of HealthStatisticalData.

Attributes of the spatial object type EnvHealthDeterminantStatisticalData

Attribute	Definition	Type	Voidability
statisticalMethod	The type of statistical method used to aggregate the raw measurement data on the statistical unit.	StatisticalAggregation-MethodValue	
type	The type of environmental health determinant.	EnvHealthDeterminant-TypeValue	

Association roles of the spatial object type EnvHealthDeterminantStatisticalData

Association role	Definition	Type	Voidability
measure	The measures	Measure	

5.2. **Data types**

5.2.1. *Age (Age)*

Persons' age can be expressed in various ways (for instance, years for adults, months or weeks for infants).

This type is a union type.

Attributes of the union type Age

Attribute	Definition	Type	Voidability
month	Time period.	Integer	

Attribute	Definition	Type	Voidability
week	Time period.	Integer	
year	Time period.	Integer	

5.2.2.   *Age Range (AgeRangeType)*

Age interval of a specific subpopulation expressed as starting age and an interval, both alternatively expressed in years, months or weeks.

Attributes of the data type AgeRangeType

Attribute	Definition	Type	Voidability
startAge	Beginning of age interval.	Age	
range	Duration of age interval.	Age	

5.2.3.   *Biomarker Statistical Parameter (BiomarkerStatisticalParameterType)*

A set of statistical features of a biomarker measured for one specific biomarker.

Attributes of the data type BiomarkerStatisticalParameterType

Attribute	Definition	Type	Voidability
geometric Mean	The geometric mean.	Measure	
CI95ofGM	95 % confidence interval of the geometric mean.	Measure	
P50	The 50th Percentile, or median value. Value below which 50 percent of the observations may be found.	Measure	
P90	The 90th percentile. The value below which 90 percent of the observations may be found.	Measure	
P95	The 95th percentile. The value below which 95 percent of the observations may be found.	Measure	
CI95ofP95	95 % confidence interval of the 95th percentile.	Measure	
maximum	The highest biomarker value determined in an individual participant in the biomonitoring survey.	Measure	
pinLOD	Proportion of individuals with undetectable levels of tested parameter (below limit of detection).	Real	
LOQ	Limit of quantification.	Real	
numberOfParticipants	The number of participants that have provided samples that have contributed to the calculation of the biomarker statistical parameter.	Integer	

5.2.4. *Biomarker Thematic Metadata (BiomarkerThematicMetadata)*

Thematic Metadata describing the purpose of the study,the target population and the characteristic of the studied areas.

Attributes of the data type BiomarkerThematicMetadata

Attribute	Definition	Type	Voidability
studyType	The aim of the study (hypothesis driven, general population survey, opportunistic) when these choices are predefined.	PT_FreeText	
areaType	The characteristics of the sampling area (urban, rural, semi-urban) when these choices are predefined in a human biomonitoring study.	PT_FreeText	
specificSubPopulation	The characteristics of the sampled population with respect to age, gender, and other population characteristics when these choices are predefined in a human biomonitoring survey.	PT_FreeText	
mean Age	The mean age of the specific sub population.	Age	

Association roles of the data type BiomarkerThematicMetadata

Association role	Definition	Type	Voidability
describedBy	Metadata that are linked to biomarker data	Biomarker	

5.2.5. *Biomarker Type (BiomarkerType)*

A biomarker is defined both by a quantified or determined chemical (e.g. cadmium, lead) or its metabolite, and a matrix (e.g. blood, urine) that is used for quantification; for example - cadmium in urine, lead in blood.

Attributes of the data type BiomarkerType

Attribute	Definition	Type	Voidability
chemical	Identification of the compound by name or abbreviation, chemical formula, CAS-PubChem or any other number that is quantified by the measurement.	ChemicalValue	
matrix	Type of biological material or body compartment that is sampled to determine or quantify a biomarker.	MatrixValue	

5.2.6. *Disease Measure (DiseaseMeasure)*

Different ways in which data on diseases and related health problems in a population can be reported.

Attributes of the data type DiseaseMeasure

Attribute	Definition	Type	Voidability
diseaseMeasureType	Different ways how data on diseases and related health problems in a population can be reported.	DiseaseMeasureType-Value	
value	Value of the measured disease indicator.	Real	

5.2.7.   *Reference Period (ReferencePeriodType)*

The time period to which the data refer.

Attributes of the data type ReferencePeriodType

Attribute	Definition	Type	Voidability
startDate	Start of reference period.	Date	
endDate	End of reference period.	Date	

5.2.8.   *Concentration Measure (Concentration)*

A measure of concentration of a specified component in a specified media.

This type is a sub-type of Measure.

Attributes of the type Concentration

Attribute	Definition	Type	Voidability
uom	The unit of measure.	UomConcentration	

5.2.9.   *Unit Of Measure For Concentration (UomConcentration)*

A unit of measure for concentration of a specified component within a specified media.

This type is a sub-type of UnitOfMeasure.

Attributes of the type UomConcentration

Attribute	Definition	Type	Voidability
component	The component whose concentration is measured.	ComponentTypeValue	
media	The media in which the concentration is measured.	MediaTypeValue	

5.2.10.   *Noise Measure (NoiseMeasure)*

A measure of noise intensity.

This type is a sub-type of Measure.

Attributes of the type NoiseMeasure

Attribute	Definition	Type	Voidability
uom	A unit of measure for noise intensity.	UomNoise	

5.2.11.   *Noise Unit Of Measure (UomNoise)*

A unit of measure for noise intensity.

This type is a sub-type of UnitOfMeasure.

Attributes of the type UomNoise

Attribute	Definition	Type	Voidability
source	The noise source type.	NoiseSourceTypeValue	

5.3.   **Code lists**

5.3.1.   *Cause Of Death (CODValue)*

Data on causes of death (COD) provide information on mortality patterns and form a major element of public health information.

The allowed values for this code list comprise only the values specified in the European Shortlist for Causes of Death published by Eurostat.

5.3.2.   *Chemical (ChemicalValue)*

Name of the chemical substance.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.3.   *Environment Health Component Type (ComponentTypeValue)*

Particular component type (chemical substance, biological species, etc) whose concentration in an environmental media is measured.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety, in particular for components related to ground water quality, lake water quality, river water quality, ambient air quality and bathing water quality.

5.3.4.   *Disease Measure Type (DiseaseMeasureTypeValue)*

Different ways how data on diseases and related health problems in a population can be reported.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.5.   *Environment Health Determinant Type (EnvHealthDeterminantTypeValue)*

Type of environmental health determinant.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.6.   *General Health Type (GeneralHealthTypeValue)*

Type of health status indicator.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.7.   *Health Services Type (HealthServicesTypeValue)*

Type of health care indicator.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.8. *International Classification Of Diseases (ICDValue)*

Disease as defined in the International Classification of Diseases, 10th revision.

The allowed values for this code list comprise only the values specified in the 10th Revision of the International Statistical Classification of Diseases and Related Health Problems, published by the World Health Organization.

5.3.9. *Matrix (MatrixValue)*

Type of human tissue or compartment for biomarker measurement.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.10. *Environmental Health Media Type (MediaTypeValue)*

The media in which the concentration of a health component is measured.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.11. *Noise Source Type (NoiseSourceTypeValue)*

The noise source type values.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.3.12. *Statistical Aggregation Method (StatisticalAggregationMethodValue)*

The types of statistical methods used to aggregate raw measurement data on the statistical unit.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Human Health and Safety.

5.4. **Theme-specific Requirements**

(1) Statistical information on the spatial data theme Human Health and Safety must refer to spatial objects as defined in the spatial data theme Statistical Units.

(2) Where possible, the ICDValue code list shall be used to identify the disease name.

(3) Raw measurement data shall be based on ISO/TS 19103:2005.

(4) Health determinant statistical data shall be modelled as health statistical data characterized by a measurement value based on ISO/TS 19103:2005 and a statistical aggregation method.

(5) Health determinant coverages shall be represented using the spatial object types defined in Section 6 of Annex I. For continuous coverages, a subtype of the CoverageByDomainAndRange class shall be used whose domain is restricted to measurement values based on ISO/TS 19103:2005.

5.5. **Layers**

Layers for the spatial data theme Human Health and Safety

Layer Name	Layer Title	Spatial object type
HH.HealthStatisticalData	Health statistical data	StatisticalUnit
HH.HealthDeterminant-Measure	Health determinant measure	EnvHealthDeterminantMeasure

6. UTILITY AND GOVERNMENTAL SERVICES

6.1. **Structure of the Spatial Data Theme Utility and Governmental Services**

The types specified for the spatial data theme Utility and Governmental Services are structured in the following packages:

— Common Utility Network Elements

— Electricity Network

— Oil-Gas-Chemicals Network

— Sewer Network

— Thermal Network

— Water Network

— Environmental Management Facilities

— Administrative And Social Governmental Services

6.2. **Common Utility Network Elements**

6.2.1. *Spatial object types*

The package Common Utility Network Elements contains the following spatial object types:

— Utility Network

— Utility Network Element

— Utility Link Set

— Utility Node

— Utility Node Container

— Appurtenance

— Cabinet

— Cable

— Duct

— Manhole

— Pipe

— Pole

— Tower

6.2.1.1. Utility Network (UtilityNetwork)

Collection of network elements that belong to a single type of utility network.

Attributes of the spatial object type UtilityNetwork

Attribute	Definition	Type	Voidability
utilityNetworkType	The type of utility network or the utility network theme.	UtilityNetworkType-Value	
authorityRole	Parties authorized to manage a utility network, such as maintainers, operators or owners.	RelatedParty	
utilityFacilityReference	Reference to a facility activity complex that is linked to this utility network.	ActivityComplex	voidable
disclaimer	Legal text describing confidentiality clauses applying to the utility network information.	PT_FreeText	voidable

Association roles of the spatial object type UtilityNetwork

Association role	Definition	Type	Voidability
networks	A single sub-network that can be considered as part of a higher-order utility network.	UtilityNetwork	voidable

Constraints of the spatial object type UtilityNetwork

All utility networks shall have an external object identifier.

6.2.1.2. Utility Network Element (UtilityNetworkElement)

Abstract base type representing a utility network element in a utility network. Every element in a utility network provides some function that is of interest in the utility network.

This type is abstract.

Attributes of the spatial object type UtilityNetworkElement

Attribute	Definition	Type	Voidability
currentStatus	The status of a utility object with regards to its completion and use.	ConditionOfFacility-Value	voidable
validFrom	The time when the utility network element started to exist in the real world.	DateTime	voidable
validTo	The time from which the utility network element no longer exists in the real world.	DateTime	voidable
verticalPosition	Vertical position of the utility object relative to ground.	VerticalPositionValue	voidable
utilityFacilityReference	Reference to an activity complex that is linked (related) to this utility network element.	ActivityComplex	voidable
governmentalService-Reference	Reference to a governmental service object that is linked (related) to this utility network element.	GovernmentalService	voidable

6.2.1.3.　Utility Link Set (UtilityLinkSet)

A collection of link sequences and or individual links that has a specific function or significance in a utility network.

This type is a sub-type of UtilityNetworkElement.

This type is a sub-type of LinkSet.

This type is abstract.

Attributes of the spatial object type UtilityLinkSet

Attribute	Definition	Type	Voidability
utilityDeliveryType	Utility delivery network e.g. transport, distribution, collection.	UtilityDeliveryType-Value	voidable
warningType	Overground visible warning mechanism used to indicate an underground utility network element.	WarningTypeValue	voidable

Constraints of the spatial object type UtilityLinkSet

A utility link set must be composed of links and or link sequences that all belong to the same network.

All utility link sets shall have an external object identifier.

6.2.1.4.　Utility Link (UtilityLink)

A linear spatial object that describes the geometry and connectivity of a utility network between two points in the network.

This type is a sub-type of UtilityNetworkElement.

This type is a sub-type of Link.

6.2.1.5.　Utility Link Sequence (UtilityLinkSequence)

A linear spatial object, composed of an ordered collection of utility links, which represents a continuous path in the utility network without any branches. The element has a defined beginning and end and every position on the utility link sequence is identifiable with one single parameter.

This type is a sub-type of UtilityNetworkElement.

This type is a sub-type of LinkSequence.

6.2.1.6.　Utility Node (UtilityNode)

A point spatial object which is used for connectivity.

This type is a sub-type of UtilityNetworkElement.

This type is a sub-type of Node.

This type is abstract.

Constraints of the spatial object type UtilityNode

All utility nodes have an external object identifier.

6.2.1.7.   Utility Node Container (UtilityNodeContainer)

A point spatial object which is used for connectivity, and also may contain other spatial objects (not necessarily belonging to the same utility network).

This type is a sub-type of UtilityNetworkElement.

This type is abstract.

Attributes of the spatial object type UtilityNodeContainer

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Location of the utility node container.	GM_Point	

Association roles of the spatial object type UtilityNodeContainer

Association role	Definition	Type	Voidability
nodes	Contained utility nodes.	UtilityNode	voidable

6.2.1.8.   Appurtenance (Appurtenance)

An appurtenance is a node object that is described by its type (via the attribute appurtenanceType).

This type is a sub-type of UtilityNode.

Attributes of the spatial object type Appurtenance

Attribute	Definition	Type	Voidability
appurtenanceType	Type of appurtenance according to the INSPIRE appurtenance type classification.	AppurtenanceType-Value	voidable
specificAppurtenance-Type	Type of appurtenance according to a domain-specific classification.	SpecificAppurtenance-TypeValue	voidable

6.2.1.9.   Cabinet (Cabinet)

Simple cabinet object which may carry utility objects belonging to either single or multiple utility networks.

This type is a sub-type of UtilityNodeContainer.

6.2.1.10.   Cable (Cable)

A utility link or link sequence used to convey electricity or data from one location to another.

This type is a sub-type of UtilityLinkSet.

This type is abstract.

6.2.1.11.   Duct (Duct)

A utility link or link sequence used to protect and guide cable and pipes via an encasing construction.

This type is a sub-type of UtilityLinkSet.

Attributes of the spatial object type Duct

Attribute	Definition	Type	Voidability
ductWidth	The width of the duct.	Length	voidable

Association roles of the spatial object type Duct

Association role	Definition	Type	Voidability
cables	A duct may contain one or more cables.	Cable	voidable
ducts	A single duct or set of ducts that constitute the inner-duct.	Duct	voidable
pipes	The set of pipes that constitute the duct bank.	Pipe	voidable

Constraints of the spatial object type Duct

The multiplicity of the utilityDeliveryType attribute shall be 0.

6.2.1.12. Manhole (Manhole)

Simple container object which may contain either single or multiple utility networks objects.

This type is a sub-type of UtilityNodeContainer.

6.2.1.13. Pipe (Pipe)

A utility link or link sequence for the conveyance of solids, liquids, chemicals or gases from one location to another. A pipe can also be used as an object to encase several cables (a bundle of cables) or other (smaller) pipes.

This type is a sub-type of UtilityLinkSet.

Attributes of the spatial object type Pipe

Attribute	Definition	Type	Voidability
pipeDiameter	Pipe outer diameter.	Measure	voidable
pressure	The maximum allowable operating pressure at which a product is conveyed through a pipe.	Measure	voidable

Association roles of the spatial object type Pipe

Association role	Definition	Type	Voidability
cable	Cable contained by the pipe.	Cable	voidable
pipe	Pipe contained by the pipe.	Pipe	voidable

6.2.1.14. Pole (Pole)

Simple pole (mast) object which may carry utility objects belonging to either single or multiple utility networks.

This type is a sub-type of UtilityNodeContainer.

Attributes of the spatial object type Pole

Attribute	Definition	Type	Voidability
poleHeight	The height of the pole.	Length	voidable

6.2.1.15. Tower (Tower)

Simple tower object which may carry utility objects belonging to either single or multiple utility networks.

This type is a sub-type of UtilityNodeContainer.

Attributes of the spatial object type Tower

Attribute	Definition	Type	Voidability
towerHeight	The height of the tower.	Length	voidable

6.2.2. *Code lists*

6.2.2.1. Appurtenance Type (AppurtenanceTypeValue)

Classification of appurtenances.

The allowed values for this code list comprise the values of the following code lists or other code lists specified by data providers:

— Electricity Appurtenance Type (ElectricityAppurtenanceTypeValue): Classification of electricity appurtenances, as specified in Section 6.3.2.1.

— Oil, Gas and Chemicals Appurtenance Type (OilGasChemicalsAppurtenanceTypeValue): Classification of oil, gas and chemicals appurtenances, as specified in Section 6.4.2.1.

— Sewer Appurtenance Type (SewerAppurtenanceTypeValue): Classification of sewer appurtenances, as specified in Section 6.5.2.1.

— Thermal Appurtenance Type (ThermalAppurtenanceTypeValue): Classification of thermal appurtenances, as specified in Section 6.6.2.1.

— Water Appurtenance Type (WaterAppurtenanceTypeValue): Classification of water appurtenances, as specified in Section 6.7.2.1.

6.2.2.2. Specific Appurtenance Type (SpecificAppurtenanceTypeValue)

Domain-specific classification of appurtenances.

The allowed values for this code list comprise any values defined by data providers.

6.2.2.3. Utility Delivery Type (UtilityDeliveryTypeValue)

Classification of utility delivery types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list UtilityDeliveryTypeValue

Value	Name	Definition
collection	collection	Description of a type of utility network delivering its utility product via collection (e.g. for sewer utility networks, collecting sewer water from customers)

Value	Name	Definition
distribution	distribution	Description of a type of utility network delivering its utility product via mainly local distribution (e.g. local distribution of electricity), connecting directly to consumers
private	private	Description of a type of utility network delivering its utility product via a small private network (e.g. owned by a private company)
transport	transport	Description of a type of utility network delivering its utility product via a large transport network (e.g. to convey oil-gas-chemicals products over larger distances)

6.2.2.4.   Utility Network Type (UtilityNetworkTypeValue)

Classification of utility network types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list UtilityNetworkTypeValue

Value	Name	Definition
electricity	electricity	Electricity networks.
oilGasChemical	oil, gas or chemical	Oil, gas or chemical networks.
sewer	sewer	Sewer networks.
water	water	Water networks.
thermal	thermal	Thermal networks.
telecommunications	telecommunications	Telecommunications networks.

6.2.2.5.   Warning Type (WarningTypeValue)

Classification of warning types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list WarningTypeValue

Value	Name	Definition
net	net	Warning net for protection of cables and pipes.
tape	tape	Caution tape (also known as warning tape) is a resilient plastic tape of a signal colour or highly contrasting colour combination (such as yellow-black or red-white).
concretePaving	concrete paving	A set or paving of pavers or tiles in concrete material covering cables or pipes.

6.3. **Electricity Network**

6.3.1. *Spatial object types*

The package Electricity Network contains the spatial object type Electricity Cable.

6.3.1.1. Electricity Cable (ElectricityCable)

A utility link or link sequence used to convey electricity from one location to another.

This type is a sub-type of Cable.

Attributes of the spatial object type ElectricityCable

Attribute	Definition	Type	Voidability
operatingVoltage	The utilization or operating voltage by the equipment using the electricity.	Measure	voidable
nominalVoltage	The nominal system voltage at the point of supply.	Measure	voidable

6.3.2. *Code lists*

6.3.2.1. Electricity Appurtenance Type (ElectricityAppurtenanceTypeValue)

Classification of electricity appurtenances.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ElectricityAppurtenanceTypeValue

Value	Name	Definition
electricityNode	electricity network node	Node in an electricity network.
capacitorControl	capacitor control	Capacitor control.
connectionBox	connection box	Connection box.
correctingEquipment	correcting equipment	Power factor correcting equipment.
deliveryPoint	delivery point	Delivery point.
dynamicProtectiveDevice	dynamic protective device	Dynamic protective device.
fuse	fuse	Fuse.
generator	generator	Generator.
loadTapChanger	load tap changer	Load tap changer.
mainStation	main station	Main station.
netStation	net station	Net station.
networkProtector	network protector	Network protector.
openPoint	open point	Open point.
primaryMeter	primary meter	Primary meter.
recloserElectronicControl	recloser electronic control	Recloser electronic control.
recloserHydraulicControl	recloser hydraulic control	Recloser hydraulic control.

Value	Name	Definition
regulatorControl	regulator control	Regulator control.
relayControl	relay control	Relay control.
sectionalizerElectronicControl	sectionalizer electronic control	Sectionalizer electronic control.
sectionalizerHydraulicControl	sectionalizer hydraulic control	Sectionalizer hydraulic control.
streetLight	street light	Street light.
subStation	sub station	Sub station.
switch	switch	Switch.
transformer	transformer	Transformer.
voltageRegulator	voltage regulator	Voltage regulator.
detectionEquipment	detection equipment	Detection Equipment
monitoringAndControlEquipment	monitoring and control equipment	Monitoring And Control Equipment

6.4. Oil-Gas-Chemicals Network

6.4.1. *Spatial object types*

The package Oil-Gas-Chemicals Network contains the spatial object type Oil, Gas and Chemicals Pipe.

6.4.1.1. Oil, Gas and Chemicals Pipe (OilGasChemicalsPipe)

A pipe used to convey oil, gas or chemicals from one location to another.

This type is a sub-type of Pipe.

Attributes of the spatial object type OilGasChemicalsPipe

Attribute	Definition	Type	Voidability
oilGasChemicalsProductType	The type of oil, gas or chemicals product that is conveyed through the oil, gas, chemicals pipe.	OilGasChemicalsProductTypeValue	voidable

6.4.2. *Code lists*

6.4.2.1. Oil, Gas and Chemicals Appurtenance Type (OilGasChemicalsAppurtenanceTypeValue)

Classification of oil, gas, chemicals appurtenances.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list OilGasChemicalsAppurtenanceTypeValue

Value	Name	Definition
pump	Pump	Pump
gasStation	Gas station	Gas station

Value	Name	Definition
oilGasChemicalsNode	oil, gas and chemicals network node	Node in an oil, gas and chemicals network
compression	Compression	Compression
terminal	Terminal	Terminal
deliveryPoint	Delivery point	Delivery point
frontier	Frontier	Frontier
productionRegion	Production region	Production Region
plant	Plant	Plant
pumpingStation	Pumping station	Pumping Station
storage	Storage	Storage
marker	Marker	Marker

6.4.2.2.   Oil, Gas and Chemicals Product Type (OilGasChemicalsProductTypeValue)

Classification of oil, gas and chemicals products.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Utilities and Governmental Services.

6.5.   **Sewer Network**

6.5.1.   *Spatial object types*

The package Sewer Network contains the spatial object type Sewer Pipe.

6.5.1.1.   Sewer Pipe (SewerPipe)

A sewer pipe used to convey wastewater (sewer) from one location to another.

This type is a sub-type of Pipe.

Attributes of the spatial object type SewerPipe

Attribute	Definition	Type	Voidability
sewerWaterType	Type of sewer water.	SewerWaterTypeValue	voidable

6.5.2.   *Code lists*

6.5.2.1.   Sewer Appurtenance Type (SewerAppurtenanceTypeValue)

Classification of sewer appurtenances.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list SewerAppurtenanceTypeValue

Value	Name	Definition
anode	anode	Anode.
barrel	barrel	Barrel.

Value	Name	Definition
barScreen	bar screen	Bar screen.
catchBasin	catch basin	Catch basin.
cleanOut	clean out	Clean out.
dischargeStructure	discharge structure	Discharge structure.
meter	meter	Meter.
pump	pump	Pump.
regulator	regulator	Regulator.
scadaSensor	scada sensor	SCADA sensor.
thrustProtection	thrust protection	Thrust protection.
tideGate	tide gate	Tide gate.
sewerNode	sewer network node	Node in a sewer network.
connection	connection	Connection.
specificStructure	specific structure	Specific structure.
mechanicAndElectromechanicEquipment	mechanic and electromechanic equipment	Mechanic and electromechanic equipment.
rainwaterCollector	rainwater collector	Rainwater collector.
watertankOrChamber	watertank or chamber	Watertank or chamber.

6.5.2.2. Sewer Water Type (SewerWaterTypeValue)

Classification of sewer water types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list SewerWaterTypeValue

Value	Name	Definition
combined	combined	Combined sewer water.
reclaimed	reclaimed	Reclaimed sewer water.
sanitary	sanitary	Sanitary sewer water.
storm	storm	Storm sewer water.

6.6. **Thermal Network**

6.6.1. *Spatial object types*

The package Thermal Network contains the spatial object typeThermal Pipe.

6.6.1.1.   Thermal Pipe (ThermalPipe)

A pipe used to disseminate heating or cooling from one location to another.

This type is a sub-type of Pipe.

Attributes of the spatial object type ThermalPipe

Attribute	Definition	Type	Voidability
thermalProductType	The type of thermal product that is conveyed through the thermal pipe.	ThermalProductType-Value	voidable

6.6.2.   *Code lists*

6.6.2.1.   Thermal Appurtenance Type (ThermalAppurtenanceTypeValue)

Classification of thermal appurtenances.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Utilities and Governmental Services.

6.6.2.2.   Thermal Product Type (ThermalProductTypeValue)

Classification of thermal products.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Utilities and Governmental Services.

6.7.   **Water Network**

6.7.1.   *Spatial object types*

The package Water Network contains the spatial object type Water Pipe.

6.7.1.1.   Water Pipe (WaterPipe)

A water pipe used to convey water from one location to another.

This type is a sub-type of Pipe.

Attributes of the spatial object type WaterPipe

Attribute	Definition	Type	Voidability
waterType	Type of water.	WaterTypeValue	voidable

6.7.2.   *Code lists*

6.7.2.1.   Water Appurtenance Type (WaterAppurtenanceTypeValue)

Classification of water appurtenances.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list WaterAppurtenanceTypeValue

Value	Name	Definition
waterNode	water network node	Node in a water network.
anode	anode	Anode.

Value	Name	Definition
clearWell	clear well	Clear well.
controlValve	control valve	Control valve.
fitting	fitting	Fitting.
hydrant	hydrant	Hydrant.
junction	junction	Junction.
lateralPoint	lateral point	Lateral point.
meter	meter	Meter.
pump	pump	Pump.
pumpStation	pump station	Pump station.
samplingStation	sampling station	Sampling station.
scadaSensor	scada sensor	SCADA sensor.
storageBasin	storage basin	Storage basin.
storageFacility	storage facility	Enclosed storage facility.
surgeReliefTank	surge relief tank	Surge relief tank.
systemValve	system valve	System valve.
thrustProtection	thrust protection	Thrust protection.
treatmentPlant	treatment plant	Treatment plant.
well	well	Production well.
pressureRelieveValve	pressure relieve valve	Pressure relieve valve.
airRelieveValve	air relieve valve	Air relieve valve.
checkValve	check valve	Check valve.
waterExhaustPoint	water exhaust point	Water exhaust point.
waterServicePoint	water service point	Water service point.
fountain	fountain	Fountain.
fireHydrant	fire hydrant	Fire hydrant.
pressureController	pressure controller	Pressure controller.
vent	vent	Vent.
recoilCheckValve	recoil check valve	Recoil check valve.
waterDischargePoint	water discharge point	Water discharge point.

6.7.2.2.   Water Type (WaterTypeValue)

Classification of water types.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list WaterTypeValue

Value	Name	Definition
potable	potable	Potable water.
raw	raw	Raw water.
salt	salt	Salt water.
treated	treated	Treated water.

6.8.   **Environmental Management Facilities**

6.8.1.   *Spatial object types*

The package Environmental Management Facilities contains the spatial object type Environmental Management Facility.

6.8.1.1.   Environmental Management Facility (EnvironmentalManagementFacility)

A physical structure designed, built or installed to serve specific functions in relation to environmental material flows, such as waste or waste water flows, or a delimited area of land or water used to serve such functions.

This type is a sub-type of ActivityComplex.

Attributes of the spatial object type EnvironmentalManagementFacility

Attribute	Definition	Type	Voidability
type	The type of facility, such as installation or site.	EnvironmentalManagementFacilityTypeValue	voidable
serviceHours	Service hours of the facility.	PT_FreeText	voidable
facilityDescription	Additional information on an Environmental Management Facility, including its address, contact details, related parties and a free text description.	ActivityComplexDescription	voidable
physicalCapacity	A quantification of an actual or potential ability to perform an activity.	Capacity	voidable
permission	Official Decision (formal consent) granting authorization to operate all or part of an Environmental Management Facility	Permission	voidable
status	The status of the Environmental Management Facility, such as operational or decommissioned.	ConditionOfFacilityValue	voidable

Association roles of the spatial object type EnvironmentalManagementFacility

Association role	Definition	Type	Voidability
parentFacility	A parent facility, i.e., a facility to which this facility belongs.	EnvironmentalManagementFacility	voidable

6.8.2. *Code lists*

6.8.2.1. Environmental Facility Classification (EnvironmentalManagementFacilityTypeValue)

Classification of environmental facilities, e.g. as sites and installations.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

Values for the code list EnvironmentalManagementFacilityTypeValue

Value	Name	Definition
site	Site	All land at a distinct geographic location under the management control of an organisation covering activities, products and services.
installation	Installation	A technical unit, such as machinery, an apparatus, a device, a system installed, or a piece of equipment placed in position or connected for use.

6.9. **Administrative And Social Governmental Services**

6.9.1. *Spatial object types*

The package Administrative and Social Governmental Services contains the spatial object type Governmental Service.

6.9.1.1. Governmental Service (GovernmentalService)

Administrative and social governmental services such as public administrations, civil protection sites, schools and hospitals provided by Public Administrative Bodies or by private institutions as far as they are covered by the scope of Directive 2007/2/EC. This scope is mapped to the values of the corresponding code list ServiceTypeValue.

Attributes of the spatial object type GovernmentalService

Attribute	Definition	Type	Voidability
areaOfResponsibility	The spatial responsibility of a service instance.	AreaOfResponsibility-Type	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
pointOfContact	Contains necessary information to get access to a service and/or initial information regarding a service.	Contact	voidable
serviceLocation	Location where the service is offered.	ServiceLocationType	
serviceType	Type of an administrative and governmental service.	ServiceTypeValue	

6.9.2.   *Data types*

6.9.2.1.   Area Of Responsibility Type (AreaOfResponsibilityType)

Set of types for the description of spatial responsibility.

This type is a union type.

Attributes of the data type AreaOfResponsibilityType

Attribute	Definition	Type	Voidability
areaOfResponsibility-ByAdministrativeUnit	Administrative unit describing the geographic extent of the responsibility of a service.	AdministrativeUnit	
areaOfResponsibilityBy-NamedPlace	Geographical object describing the geographic extent of the responsibility of a service.	NamedPlace	
areaOfResponsibilityBy-Network	Part of a network describing the geographic extent of the competence of a service.	NetworkReference	
areaOfResponsibilityBy-Polygon	Polygon describing the geographic extent of the responsibility of a service.	GM_MultiSurface	

6.9.2.2.   Service Location Type (ServiceLocationType)

Set of types of references to locate a service.

This type is a union type.

Attributes of the union type ServiceLocationType

Attribute	Definition	Type	Voidability
serviceLocationByAddress	Location of the service by referring to an address.	Address	
serviceLocationByBuilding	Location of the service by referring to a building.	Building	
serviceLocationByActivityComplex	Location of the service by referring to an activity complex.	ActivityComplex	
serviceLocationByGeometry	Location of the service by referring to a geometry.	GM_Object	
serviceLocationByUtilityNode	Location of the service by referring to a node related to a utility network (water, electricity, etc.), e.g. hydrant or emergency call point.	UtilityNode	

6.9.3.   *Code lists*

6.9.3.1.   Service Type (ServiceTypeValue)

Code list containing a classification of governmental services.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

Values for the code list ServiceTypeValue

Value	Name	Definition	Parent Value
publicAdministratio-nOffice	public administration office	Public administration offices (not further differentiated).	
generalAdministratio-nOffice	general administration office	General administration offices, e.g. town halls.	publicAdmin-istrationOffice
specializedAdministra-tionOffice	specialized administration office	Specialized administration offices which can not be allocated to the following areas: social service, education, health, environmental protection, public order and safety (e. g. surveying administration).	publicAdmin-istrationOffice
publicOrderAndSafety	public order and safety	Services concerned with public order and safety.	
administrationForPub-licOrderAndSafety	administration for public order and safety	Administration offices concerned with public order and safety.	publicOrde-rAndSafety
policeService	police service	Services concerned with police affairs.	publicOrde-rAndSafety
fireProtectionService	fire-protection service	Services concerned with fire-prevention and fire-fighting affairs; operation of regular and auxiliary fire brigades and of other fire-prevention and fire-fighting services maintained by public authorities; operation or support of fire-prevention and fire-fighting training programmes.	publicOrde-rAndSafety
fireStation	fire station	Services concerned with a station housing fire fighters, their equipment and vehicles.	fireProtection-Service
siren	siren	Stationary device, often electrically operated, for producing a penetrating sound for warning the public.	fireProtection-Service
hydrant	hydrant	Special water access points of water supply networks that are specifically designed and built to serve as on-site water sources for fire fighting and other emergency services.	fireProtection-Service
antiFireWaterProvision	anti-fire water provision	Location, installation or designated area from where water for fire-fighting is provided.	fireProtection-Service
fireDetectionAndObser-vationSite	fire detection and observation site	Location, facility, construction or device for the detection and observation of fires.	fireProtection-Service
rescueService	rescue service	Services dedicated to the search-and-rescue of people, animals and goods in emergency situations.	publicOrde-rAndSafety

Value	Name	Definition	Parent Value
rescueStation	rescue station	Services concerned with the housing of technical staff, equipment and auxiliary elements of land rescue teams.	rescueService
rescueHelicopterLandingSite	Rescue helicopter landing site	A designated area from which rescue helicopters can take off and land.	rescueService
marineRescueStation	marine rescue station	Services on the coast providing buildings, mooring areas or piers to host marine rescue teams and their equipment, boats and other marine crafts.	rescueService
civilProtectionSite	civil protection site	Site offering protection and shelter from disasters and emergency situations to the civilian population.	publicOrderAndSafety
emergencyCallPoint	emergency call point	Location of telephones in a box or on a post for the use of motorists in the event of an emergency situation.	publicOrderAndSafety
standaloneFirstAidEquipment	standalone First Aid equipment	First Aid element or set of elements or equipment made available to anyone who may need them, located in highly visible and accessible places.	publicOrderAndSafety
defence	defence	Services concerned with military defence.	publicOrderAndSafety
barrack	barrack	Services concerned with the provision of buildings used especially for lodging soldiers in garrison.	defence
camp	camp	Place usually away from urban areas where tents or simple buildings (as cabins) are erected for shelter or for temporary residence or instruction of military forces.	defence
environmentalProtection	environmental protection	Services concerned with the administration, supervision, inspection, operation or support of activities relating to the protection and conservation of the environment.	
administrationForEnvironmentalProtection	administration for environmental protection	Administration offices concerned with environmental protection.	environmentalProtection
environmentalEducationCentre	environmental education centre	Institution engaged in developing programs and material to increase awareness about the environment and sustainable development.	environmentalProtection
health	health	Services concerned with health issues.	

Value	Name	Definition	Parent Value
administrationForHealth	administration for health	This item comprises establishments primarily engaged in the regulation of activities of agencies that provide health care and overall administration of health policy.	health
medicalProductsAppliancesAndEquipment	medical products, appliances and equipment	Services concerned with medicaments, prostheses, medical appliances and equipment and other health-related products obtained by individuals or households, either with or without a prescription, usually from dispensing chemists, pharmacists or medical equipment suppliers. They are intended for consumption or use outside a health facility or institution.	health
outpatientService	outpatient service	Medical, dental and paramedical services delivered to outpatients by medical, dental and paramedical practitioners and auxiliaries. The services may be delivered at home, in individual or group consulting facilities, dispensaries or the outpatient clinics of hospitals and the like. Outpatient services include the medicaments, prostheses, medical appliances and equipment and other health-related products supplied directly to outpatients by medical, dental and paramedical practitioners and auxiliaries.	health
generalMedicalService	general medical service	General medical services delivered by general medical clinics and general medical practitioners.	outpatientService
specializedMedicalServices	specialized medical services	Specialized medical services delivered by specialized medical clinics and specialist medical practitioners. Specialized medical clinics and specialist medical practitioners differ from general medical clinics and general medical practitioners in that their services are limited to treatment of a particular condition, disease, medical procedure or class of patient.	outpatientService
paramedicalService	paramedical service	Provision of paramedical health services to outpatients; Administration, inspection, operation or support of health services delivered by clinics supervised by nurses, midwives, physiotherapists, occupational therapists, speech therapists or other paramedical personnel and of health services delivered by nurses, midwives and paramedical personnel in non-consulting rooms, in patients' homes or other non-medical institutions.	outpatientService

Value	Name	Definition	Parent Value
hospitalService	hospital service	Services concerned with hospitalization. Hospitalization is defined as occurring when a patient is accommodated in a hospital for the duration of the treatment. Hospital day-care and home-based hospital treatment are included, as are hospices for terminally ill persons. Hospitals are defined as institutions which offer in-patient care under direct supervision of qualified medical doctors.	health
generalHospital	general hospital	Hospital services that do not limit their services to a particular medical speciality.	hospitalService
specializedHospital	specialized hospital	Hospital services that limit their services to a particular medical speciality.	hospitalService
nursingAndConvalescentHomeService	nursing and convalescent home service	In-patient services to persons recovering from surgery or a debilitating disease or condition that requires chiefly monitoring and administering of medicaments, physiotherapy and training to compensate for loss of function or rest.	hospitalService
medicalAndDiagnosticLaboratory	medical and diagnostic laboratory	This item comprises establishments primarily engaged in providing analytic or diagnostic services, including body fluid analysis and diagnostic imaging, generally to the medical profession or the patient on referral from a health practitioner.	health
education	education	Services concerned with educational affairs. These services include military schools and colleges where curricula resemble those of civilian institutions, police colleges offering general education in addition to police training.	
administrationForEducation	administration for education	Administration offices concerned with educational matters.	education
earlyChildhoodEducation	early childhood education	Services concerned with pre-primary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 0.	education
primaryEducation	primary education	Services concerned with primary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 1.	education
lowerSecondaryEducation	lower secondary education	Services concerned with lower secondary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 2.	education

Value	Name	Definition	Parent Value
upperSecondaryEducation	upper secondary education	Services concerned with upper secondary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 3.	education
postSecondaryNonTertiaryEducation	post-secondary non-tertiary education	Services concerned with post-secondary non-tertiary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 4.	education
shortCycleTertiaryEducation	short-cycle tertiary education	Services concerned with short-cycle tertiary education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 5.	education
bachelorOrEquivalentEducation	bachelor or equivalent education	Services concerned with bachelor or equivalent education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 6.	education
masterOrEquivalentEducation	master or equivalent education	Services concerned with master or equivalent education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 7.	education
doctoralOrEquivalentEducation	doctoral or equivalent education	Services concerned with doctoral or equivalent education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 8.	education
educationNotElsewhereClassified	education not elsewhere classified	Services concerned with education not elsewhere classified in ISCED-2011 (International Standard Classification of Education, 2011 revision), referred to as ISCED-2011 level 9.	education
subsidiaryServicesToEducation	subsidiary services to education	Subsidiary services to education, services concerned with transportation, food, lodging, medical and dental care and related subsidiary services chiefly for students regardless of level.	education
socialService	social service	Services concerned with social protection.	
administrationForSocialProtection	administration for social protection	Administration offices concerned with matters of social protection.	socialService
specializedServiceOfSocialProtection	specialized service of social protection	Various specialized services concerned with transport, home-, day- and holiday-care for the disabled and people in need of care. Services specifically concerned with education and employment of people with disabilities.	socialService
housing	housing	Services concerned with any home, residence, facility, or premises which provide temporary, interim or permanent housing to various groups of persons.	socialService

Value	Name	Definition	Parent Value
childCareService	child care service	Services concerned with the day care of children.	socialService
charityAndCounselling	charity and counselling	Institutions and services providing benefits in kind and/or counselling for the needy, e.g. people who are un-employed, the socially deprived, dis-aster victims, victims of assault and abuse, potential suicides, etc.	socialService

6.10. **Layers**

Layers for the spatial data theme Utility and Governmental Services

Layer Name	Layer Title	Spatial object type
US.UtilityNetwork	Utility Network	Appurtenance, Manhole, Tower, Pole, Cabi-net, Duct, Pipe
US.ElectricityNetwork	Electricity Network	Electricity Cable, Appurtenance (if included in an electricity network)
US. OilGasChemicalsNetwork	Oil, Gas or Chemicals Net-work	OilGasChemicalsPipe, Appurtenance (if in-cluded in an oil, gas or chemicals network)
US.SewerNetwork	Sewer Network	SewerPipe, Appurtenance (if included in a sewer network)
US.ThermalNetwork	Thermal Network	ThermalPipe, Appurtenance (if included in a thermal network)
US.WaterNetwork	Water Network	WaterPipe, Appurtenance (if included in a water network)
US. <CodeListValue> (¹) Example: US.PoliceService	<human readable name> Example: Police Service	GovernmentalService (serviceType: ServiceTypeValue)
US.EnvironmentalManage-mentFacility	Environemental Management Facility	EnvironmentalManagementFacility

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).

7. ENVIRONMENTAL MONITORING FACILITIES

7.1. **Spatial object types**

The following spatial object types are specified for the spatial data theme Environmental Monitoring Facilities:

— Abstract Monitoring Feature

— Abstract Monitoring Object

— Environmental Monitoring Activity

— Environmental Monitoring Facility

— Environmental Monitoring Network

— Environmental Monitoring Programme

— Observing Capability

— Operational Activity Period

7.1.1. *Abstract Monitoring Feature (AbstractMonitoringFeature)*

An abstract base class for environmental monitoring features in the real world (EnvironmentalMonitoring-Network, EnvironmentalMonitoringFacility).

This type is a sub-type of AbstractMonitoringObject.

This type is abstract.

Attributes of the spatial object type AbstractMonitoringFeature

Attribute	Definition	Type	Voidability
reportedTo	Information on the involvement of the AbstractMonitoringFeature in reporting.	ReportToLegalAct	voidable

Association roles of the spatial object type AbstractMonitoringFeature

Association role	Definition	Type	Voidability
involvedIn	EnvironmentalMonitoringActivity(s) in which the AbstractMonitoringFeature is involved.	EnvironmentalMonitor-ingActivity	voidable
hasObservation	Observation of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities at this AbstractMonitoringFeature.	OM_Observation	voidable

Constraints of the spatial object type AbstractMonitoringFeature

If observation(s) are attached to an AbstractMonitoringFeature this shall have an ObservingCapability attached to it. The ObservingCapability shall reference the same Domain, Phenomenon and ProcessUsed as the observation(s).

7.1.2. *Abstract Monitoring Object (AbstractMonitoringObject)*

An abstract base class for environmental monitoring objects.

This type is abstract.

Attributes of the spatial object type AbstractMonitoringObject

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
name	Plain text denotation of the Abstract-MonitoringObject.	CharacterString	voidable
additionalDescription	Plain text description of additional information not fitting in other attributes.	CharacterString	voidable
mediaMonitored	Monitored environmental medium.	MediaValue	
legalBackground	The legal context, in which the management and regulation of the AbstractMonitoringObject is defined.	LegislationCitation	voidable

Attribute	Definition	Type	Voidability
responsibleParty	Responsible party for the Abstract-MonitoringObject.	RelatedParty	voidable
geometry	Geometry associated to the Abstract-MonitoringObject. For mobile facilities the geometry represents the area the facility is expected to measure in.	GM_Object	
onlineResource	A link to an external document providing further information on the AbstractMonitoringObject.	URL	voidable
purpose	Reason for which the AbstractMonitoringObject has been generated.	PurposeOfCollection-Value	voidable

Association roles of the spatial object type AbstractMonitoringObject

Association role	Definition	Type	Voidability
observingCapability	A link pointing to the explicit capability of an AbstractMonitoringObject. This provides a clear link between the observed property, the procedure used as well as the location of the measurement	ObservingCapability	voidable
broader	A link pointing to a broader Abstract-MonitoringObject (a higher level in a hierarchical structure). The association has additional properties as defined in the association class Hierarchy.	AbstractMonitoringObject	voidable
narrower	A link pointing to narrower Abstract-MonitoringObject(s) (a lower level in a hierarchical structure). The association has additional properties as defined in the association class Hierarchy.	AbstractMonitoringObject	voidable
supersedes	In a genealogy, the AbstractMonitoringObject(s) that has (have) been deactivated/replaced by another one.	AbstractMonitoringObject	voidable
supersededBy	In a genealogy, the newly active AbstractMonitoringObject(s) that replaces (replace) the superseded one.	AbstractMonitoringObject	voidable

7.1.3. *Environmental Monitoring Activity (EnvironmentalMonitoringActivity)*

Specific set of AbstractMonitoringFeatures used for a given domain in a coherent and concise timeframe, area and purpose. Usually the information collected is treated as one time step in a long term monitoring programme. It is a concrete realisation of a given EnvironmentalMonitoringProgramme.

Attributes of the spatial object type EnvironmentalMonitoringActivity

Attribute	Definition	Type	Voidability
activityTime	Lifespan of the EnvironmentalMonitoringActivity.	TM_Object	voidable
activityConditions	Textual description of the EnvironmentalMonitoringActivity.	CharacterString	voidable

Attribute	Definition	Type	Voidability
boundingBox	Bounding box in which the EnvironmentalMonitoringActivity takes place.	GM_Boundary	voidable
responsibleParty	Responsible party for the EnvironmentalMonitoringActivity.	RelatedParty	voidable
inspireId	External object identifier of the spatial object.	Identifier	
onlineResource	A link to an external document providing further information on the EnvironmentalMonitoringActivity.	URL	voidable

Association roles of the spatial object type EnvironmentalMonitoringActivity

Association role	Definition	Type	Voidability
setUpFor	EnvironmentalMonitoringProgramme(s) for which the EnvironmentalMonitoringActivity is set up.	EnvironmentalMonitoringProgramme	voidable
uses	Specific set of AbstractMonitoringFeature(s) involved in an EnvironmentalMonitoringActivity.	AbstractMonitoringFeature	voidable

7.1.4. *Environmental Monitoring Facility (EnvironmentalMonitoringFacility)*

A georeferenced object directly collecting or processing data about objects whose properties (e.g. physical, chemical, biological or other aspects of environmental conditions) are repeatedly observed or measured. An environmental monitoring facility can also host other environmental monitoring facilities.

This type is a sub-type of AbstractMonitoringFeature.

Attributes of the spatial object type EnvironmentalMonitoringFacility

Attribute	Definition	Type	Voidability
representativePoint	Representative location for the EnvironmentalMonitoringFacility.	GM_Point	voidable
measurementRegime	Regime of the measurement	MeasurementRegimeValue	voidable
mobile	Indicate whether the EnvironmentalMonitoringFacility is mobile (repositionable) during the acquisition of the observation.	Boolean	voidable
resultAcquisitionSource	Source of result acquisition.	ResultAcquisitionSourceValue	voidable
specialisedEMFType	Categorisation of EnvironmentalMonitoringFacilities generally used by domain and in national settings.	SpecialisedEMFTypeValue	voidable
operationalActivityPeriod	The period(s) during which the EnvironmentalMonitoringFacility has been up and running.	TM_Object	voidable

Association roles of the spatial object type EnvironmentalMonitoringFacility

Association role	Definition	Type	Voidability
relatedTo	Any Thematic Link to an Environmental Monitoring Facility. The association has additional properties as defined in the association class AnyDomainLink.	EnvironmentalMonitoringFacility	voidable
belongsTo	A link pointing to the EnvironmentalMonitoringNetwork(s) this EnvironmentalMonitoringFacility pertains to. The association has additional properties as defined in the association class NetworkFacility.	EnvironmentalMonitoringNetwork	voidable

Constraints of the spatial object type EnvironmentalMonitoringFacility

Geometry and representativePoint cannot both be empty.

7.1.5.　*Environmental Monitoring Network (EnvironmentalMonitoringNetwork)*

Administrative or organisational grouping of EnvironmentalMonitoringFacilities managed the same way for a specific purpose, targeting a specific area. Each network respects common rules aiming at ensuring coherence of the observations, especially for purposes of EnvironmentalMonitoringFacilities, mandatory parameters selection, measurement methods and measurement regime.

This type is a sub-type of AbstractMonitoringFeature.

Attributes of the spatial object type EnvironmentalMonitoringNetwork

Attribute	Definition	Type	Voidability
organisationLevel	Level of legal organisation the EnvironmentalMonitoringNetwork is affiliated with.	LegislationLevelValue	voidable

Association roles of the spatial object type EnvironmentalMonitoringNetwork

Association role	Definition	Type	Voidability
contains	A link pointing to the EnvironmentalMonitoringFacility(s) included in this EnvironmentalMonitoringNetwork. The association has additional properties as defined in the association class NetworkFacility.	EnvironmentalMonitoringFacility	voidable

7.1.6.　*Environmental Monitoring Programme (EnvironmentalMonitoringProgramme)*

Framework based on policy relevant documents defining the target of a collection of observations and/or the deployment of AbstractMonitoringFeatures on the field. Usually an Environmental Monitoring Programme has a long term perspective over at least a few years.

This type is a sub-type of AbstractMonitoringObject.

Association roles of the spatial object type EnvironmentalMonitoringProgramme

Association role	Definition	Type	Voidability
triggers	EnvironmentalMonitoringActivity(s) triggered by the EnvironmentalMonitoringProgramme.	EnvironmentalMonitoringActivity	voidable

7.1.7. *Observing Capability (ObservingCapability)*

Explicit capability of an AbstractMonitoringObject.

Attributes of the spatial object type ObservingCapability

Attribute	Definition	Type	Voidability
observingTime	Describes the time period that observations can be expected from this AbstractMonitoringObject. Can be only a start time for running measurements or an interval.	TM_Object	voidable
processType	The type of object used for describing the process.	ProcessTypeValue	voidable
resultNature	State of the provided result.	ResultNatureValue	voidable
onlineResource	A link to an external document providing further information about an ISO 19156 "Observations and Measurements" compliant data model used to store or exchange Observations and Measurements acquired.	URL	voidable

Association roles of the spatial object type ObservingCapability

Association role	Definition	Type	Voidability
observedProperty	The property being observed or measured at this AbstractMonitoringObject.	GF_PropertyType	
featureOfInterest	This feature is the real-world object whose properties are under observation, or is a feature intended to sample the real-world object.	GFI_Feature	voidable
procedure	Link to the Process used to generate the result. The OM_Process shall be suitable for the observed property. As a corollary, details of the observed property are constrained by the procedure used.	OM_Process	

7.2. **Data types**

7.2.1. *Any Domain Link (AnyDomainLink)*

Any domain relevant link to an EnvironmentalMonitoringFacility that is not hierarchical or associated with a notion of genealogy.

This type is an association class.

Attributes of the data type AnyDomainLink

Attribute	Definition	Type	Voidability
Comment	Additional information on the domain link.	CharacterString	voidable

7.2.2.   *Hierarchy (Hierarchy)*

Hierarchical link between AbstractMonitoringObjects.

This type is an association class.

Attributes of the data type Hierarchy

Attribute	Definition	Type	Voidability
linkingTime	Time period of the link.	TM_Object	voidable

7.2.3.   *Network Facility (NetworkFacility)*

Link between EnvironmentalMonitoringNetwork and EnvironmentalMonitoringFacility.

This type is an association class.

Attributes of the data type NetworkFacility

Attribute	Definition	Type	Voidability
linkingTime	Time period of the link.	TM_Object	voidable

7.2.4.   *Report To Legal Act (ReportToLegalAct)*

Information on the involvement of an AbstractMonitoringFeature in reporting. The information is specific per submitted reporting envelope and not per obligation/agreement.

Attributes of the data type ReportToLegalAct

Attribute	Definition	Type	Voidability
legalAct	LegalAct which is reported to.	LegislationCitation	
reportDate	Time of reporting.	DateTime	voidable
reportedEnvelope	Link to the reported data set according to the date indicated in the attribute reportDate.	URI	voidable
observationRequired	Indicates whether an observation is required for the AbstractMonitoring-Feature.	Boolean	voidable
observingCapability-Required	Indicates whether the observingCapability is required for the AbstractMoni-toringFeature.	Boolean	voidable
description	Additional information on the actual data reported.	CharacterString	voidable

7.3.   **Code lists**

7.3.1.   *Measurement Regime (MeasurementRegimeValue)*

Categories for different types of the MeasurementRegime.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Environmental Monitoring Facilities.

7.3.2. *Media (MediaValue)*

Categories for different types of media.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Environmental Monitoring Facilities.

7.3.3. *Process Type (ProcessTypeValue)*

Categories for different process types.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Environmental Monitoring Facilities.

7.3.4. *Purpose Of Collection (PurposeOfCollectionValue)*

Categories for different purposes of collections.

The allowed values for this code list comprise any values defined by data providers.

7.3.5. *Result Acquisition Source (ResultAcquisitionSourceValue)*

Categories for different types of the ResultAcquisitionSource.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Environmental Monitoring Facilities.

7.3.6. *Result Nature (ResultNatureValue)*

State of the result of an observation.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Environmental Monitoring Facilities.

7.3.7. *Specialised EMF Type (SpecialisedEMFTypeValue)*

Categories for different types of EnvironmentalMonitoringFacilities.

The allowed values for this code list comprise any values defined by data providers.

7.4. **Layers**

Layers for the spatial data theme Environmental Monitoring Facilities

Layer Name	Layer Title	Spatial object type
EF.EnvironmentalMonitoring-Facilities	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility
EF.EnvironmentalMonitoring-Networks	Environmental Monitoring Networks	EnvironmentalMonitoringNetwork
EF.EnvironmentalMonitoring-Programmes	Environmental Monitoring Programmes	EnvironmentalMonitoringProgramme

8.   PRODUCTION AND INDUSTRIAL FACILITIES

8.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "emission" means the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the facility into the air, water or soil.

(2) "production" means an activity consisting of a series of actions or operations in a productive context.

8.2.   **Spatial object types**

The following spatial object types are specified for the spatial data theme Production and Industrial Facilities:

— Production Facility

— Production Installation

— Production Installation Part

— Production Site

— Production Plot

— Production Building

8.2.1.   *Production Facility (ProductionFacility)*

One or more installations on the same site operated by the same natural or legal person, designed, built or installed to serve specific production or industrial purposes, comprehending all infrastructure, equipment and materials.

This type is a sub-type of ActivityComplex.

Attributes of the spatial object type ProductionFacility

Attribute	Definition	Type	Voidability
surfaceGeometry	Spatial property of the spatial object.	GM_Surface	voidable
riverBasinDistrict	Code identifier and/or name assigned to the basin district of a watercourse.	RiverBasinDistrictValue	
status	The state or condition of the facility, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable

Association roles of the spatial object type ProductionFacility

Association role	Definition	Type	Voidability
groupedBuilding	Buildings managed by the production facility.	ProductionBuilding	voidable
groupedPlot	Plots managed by the production facility.	ProductionPlot	voidable
hostingSite	Sites at a distinct geographic location where the production facility is located.	ProductionSite	voidable
groupedInstallation	Installations technically or legally part of the production facility.	ProductionInstallation	voidable

8.2.2. *Production Installation (ProductionInstallation)*

A technical unit, such as machinery, apparatus, devices or equipment placed in position or connected for use.

Attributes of the spatial object type ProductionInstallation

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Thematic object identifier.	ThematicIdentifier	
pointGeometry	Spatial property of the spatial object.	GM_Point	
surfaceGeometry	Spatial property of the spatial object.	GM_Surface	voidable
name	Official denomination or proper or conventional name of the installation.	CharacterString	voidable
description	Descriptive statement about the installation.	CharacterString	voidable
status	The state or condition of the installation, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable
type	Special kind of an installation, denoting the operative function which has to be performed.	InstallationType	voidable

Association roles of the spatial object type ProductionInstallation

Association role	Definition	Type	Voidability
groupedInstallationPart	Minor Installations technically or legally part of an Installation	ProductionInstallationPart	voidable

8.2.3. *Production Installation Part (ProductionInstallationPart)*

A single engineered facility that performs specific functionalities related with a production activity.

This level of description covers specific parts of the production installation which must be registered by the legal mandate of the competent authorities, including points of emission as chimneys (for pollutants) or tanks (for special products).

Attributes of the spatial object type ProductionInstallationPart

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Thematic object identifier.	ThematicIdentifier	
pointGeometry	Spatial property of the spatial object.	GM_Point	
surfaceGeometry	Spatial property of the spatial object.	GM_Surface	voidable
name	Official denomination or proper or conventional name of the installation part.	CharacterString	voidable

Attribute	Definition	Type	Voidability
description	Descriptive statement about the installation part.	CharacterString	voidable
status	The state or condition of the installation part, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable
type	Special kind of an installation part, denoting the operative function which has to be performed.	InstallationPartType	voidable
technique	Method to reduce pollutant concentration due to the emissions of a technical component, typically a chimney.	PollutionAbatement-TechniqueValue	voidable

8.2.4.   *Production Site (ProductionSite)*

All land at a distinct geographic location where the production facility was, is, or is intended to be located. This includes all infrastructure, equipment and materials.

Attributes of the spatial object type ProductionSite

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Thematic object identifier.	ThematicIdentifier	
geometry	Spatial property of the spatial object.	GM_MultiSurface	
sitePlan	Descriptive statement about the project concerning the configuration and organisation of the production site.	DocumentCitation	voidable
name	Official denomination or proper or conventional name of the site.	CharacterString	voidable
description	Descriptive statement about the site.	CharacterString	voidable
status	The state or condition of the site, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable

8.2.5.   *Production Plot (ProductionPlot)*

A portion of land or water part of a facility destined to functional purposes.

Attributes of the spatial object type ProductionPlot

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Thematic object identifier.	ThematicIdentifier	

Attribute	Definition	Type	Voidability
geometry	Spatial property of the spatial object.	GM_Surface	
status	The state or condition of the plot, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable

8.2.6.   *Production Building (ProductionBuilding)*

Artificial construction, part of the production facility that is useful to host or provide shelter for activities development.

Attributes of the spatial object type ProductionBuilding

Attribute	Definition	Type	Voidability
thematicId	Thematic object identifier.	ThematicIdentifier	
typeOfBuilding	Classified description of the production and industrial building.	TypeOfProductionBuildingValue	voidable
status	The state or condition of the production and industrial building, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.	StatusType	voidable
geometry	Spatial property of the spatial object.	GM_Object	voidable

Association roles of the spatial object type ProductionBuilding

Association role	Definition	Type	Voidability
building	Representation of the production building in a Buildings data set.	AbstractBuilding	voidable

Constraints of the spatial object type Production Building

The geometry shall be provided if the building property is empty.

8.3.   **Data types**

8.3.1.   *Status Type (StatusType)*

The state or condition of a technical component, with regard to the functional and operational order, in which it is arranged for a limited or extended time period.

Attributes of the data type StatusType

Attribute	Definition	Type	Voidability
statusType	The state or condition of a technical component referring to a list of predefined potential values.	ConditionOfFacilityValue	
description	Descriptive statement about the declared status.	CharacterString	voidable
validFrom	The starting time of validity for a status type.	Date	voidable
validTo	The ending time of validity for a status type.	Date	voidable

8.4.   **Code lists**

8.4.1.   *Pollution Abatement Technique (PollutionAbatementTechniqueValue)*

Methods for reducing pollutant concentration due to the emissions of a technical component, typically a chimney.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list PollutionAbatementTechniqueValue

Value	Name	Definition
gravitation	gravitation	Pollutant abatement by gravitation
dustScrubbers	dust scrubbers	Pollutant abatement through dust scrubbers
filtration	filtration	Pollutant abatement by filtration
condensation	condensation	Pollutant abatement by condensation
adsorption	adsorption	Pollutant abatement by adsorption

8.4.2.   *Installation Type (InstallationTypeValue)*

Values denoting the operative function which has to be performed by an installation.The allowed values for this code list comprise any values defined by data providers.

8.4.3.   *Installation Part Type (InstallationPartTypeValue)*

Values denoting the operative function which has to be performed by an installation part.The allowed values for this code list comprise any values defined by data providers.

8.4.4.   *River Basin District (RiverBasinDistrictValue)*

Code identifiers and/or names assigned to river basin districts.The allowed values for this code list comprise any values defined by data providers.

8.4.5.   *Type of Production Building (TypeOfProductionBuildingValue)*

Classification of production and industrial buildings.

The allowed values for this code list comprise any values defined by data providers.

8.5.   **Layers**

Layers for the spatial data theme Production and Industrial Facilities

Layer Name	Layer Title	Spatial object type
PF.ProductionSite	Production And Industrial Site	ProductionSite
PF. <CodeListValue> (^{1}) *Example: PF.Manufacturing*	<human readable name> *Example: Manufacturing*	ProductionFacility *(activity: EconomicActivityValue)*
PF.ProductionPlot	Production And Industrial Parcel	ProductionPlot
PF.ProductionInstallation	Production And Industrial Installation	ProductionInstallation
PF.ProductionInstallationPart	Production And Industrial Installation Part	ProductionInstallationPart

Layer Name	Layer Title	Spatial object type
PF.ProductionBuilding	Production and Industrial Building	ProductionBuilding

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).

9. AGRICULTURAL AND AQUACULTURE FACILITIES

9.1. **Definitions**

In addition to the definitions set out in Article 2, the following definition shall apply:

(1) "Agriculture" means the set of process and activities consisting in cultivating soils, producing crops and rearing animals; it includes harvesting, milking, breeding animals and keeping animals for farming purposes. According to Council Regulation(EC) No 73/2009 maintaining the land in good agricultural and environmental condition shall be considered as an agricultural activity.

(2) "Livestock" refers to animals being bred and/or raised for use or profit (covered by the activities defined under NACE codes A.1.4. and A.1.5).

(3) "Aquaculture" means the set of activities and techniques related to the production, breeding and treatment of fish, molluscs, seaweed and other kinds of aquatic resources (vegetables or animal).

9.2. **Spatial object types**

The following spatial object types are specified for the spatial data theme Agricultural and Aquaculture Facilities:

— Holding

— Site

9.2.1. *Holding (Holding)*

The whole area and all infrastructures included on it, covering the same or different "sites", under the control of an operator to perform agricultural or aquaculture activities.

This type is a sub-type of ActivityComplex.

Association roles of the spatial object type Holding

Attribute	Definition	Type	Voidability
contains	The Sites that are part of the specified Holding.	Site	

Constraints of the spatial object type Holding

At least one of the function attributes of the Holding spatial object shall be provided using the EconomicActivityNACEValue code list (for the activity attribute of the Function data type).

9.2.1.1. Site (Site)

All land at the same or distinct geographic location under the management control of a holding covering activities, products and services. This includes all infrastructure, equipment and materials.

Attributes of the spatial object type Site

Attribute	Definition	Type	Voidability
geometry	The geometry defining the extent or position of the site.	GM_Object	

Attribute	Definition	Type	Voidability
activity	The classification of the economic activity of the site, according to the NACE rev. 2.0 coding.	EconomicActivityNACEValue	
includesAnimal	Presence of Animals in the Site.	FarmAnimalSpecies	voidable

9.3.   **Data types**

9.3.1.   *Farm Animal Species (FarmAnimalSpecies)*

Identifies an animal or group of animals (Livestock or Aquaculture) of the same species kept on the specific site.

Attributes of the data type FarmAnimalSpecies

Attribute	Definition	Type	Voidability
livestock	Presence of livestock species in the site.	LivestockSpeciesValue	voidable
aquaculture	Presence of aquaculture species in the site.	AquacultureSpeciesValue	voidable

9.4.   **Code lists**

9.4.1.   *Livestock Species (LivestockSpeciesValue)*

Classification of livestock species.

The allowed values for this code list comprise the values specified in Annex II to Regulation (EC) No 1165/2008 (¹) and additional values at any level defined by data providers.

9.4.2.   *Aquaculture Species (AquacultureSpeciesValue)*

Classification of aquaculture species.

The allowed values for this code list comprise only the values specified in the February 2012 version of the ASFIS (Aquatic Sciences and Fisheries Information System) List of Species for Fishery Statistics Purposes published by the Food and Agriculture Organization of the United Nations.

9.5.   **Layers**

Layers for the spatial data theme Agricultural and Aquaculture Facilities

Layer Name	Layer Title	Spatial object type
AF. AgriculturalHolding	Agricultural Holding	Holding (spatial objects whose activity attribute has the value = "A1 - Crop and animal production, hunting and related service activities" (from the EconomicActivityNACEValue code list) or a narrower value)
AF. AquacultureHolding	Aquaculture Holding	Holding (spatial objects whose activity attribute has the value "A3 - Fishing and aquaculture activities" (from the EconomicActivityNACEValue code list) or a narrower value)
AF.Site	Agricultural and Aquaculture Sites	Site

(¹) OJ L 321, 1.12.2008, p. 1.

10.   POPULATION DISTRIBUTION – DEMOGRAPHY

10.1.   **Spatial object types**

The following spatial object type is specified for the spatial data theme Population Distribution – Demography: Statistical Distribution.

10.1.1.   *Statistical Distribution (StatisticalDistribution)*

Set of measures describing how a phenomenon is spread within some part of the 2D world.

Attributes of the spatial object type StatisticalDistribution

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
areaOfDissemination	The part of the 2D world the StatisticalDataDistribution describes.	GM_Surface	
universe	When distribution is related to a subset of the population and not the population in its whole, the literal description of the way this subset was defined.	PT_FreeText	
domain	The part of statistical knowledge the data refers to.	PT_FreeText	
measure	The measure concerned by the distribution.	VariableValue	
measurementMethod	The description of the statistic measurement method.	StatisticsMeasurementMethodValue	
measurementUnit	The unit of the measurement.	UnitOfMeasure	
notCountedProportion	The proportion of population of the area of interest that is not counted in any of its spatial components.	Number	
periodOfMeasurement	The date or period the observation has been taken, the data was collected.	TM_Period	
periodOfReference	The period when the data is supposed to give a picture of the area of interest.	TM_Period	
periodOfValidity	The period in which the data remains relevant.	TM_Period	
beginLifeSpanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifeSpanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
generalStatus	The status of the statistical data distribution.	StatisticalDataStatusValue	

Association roles of the spatial object type StatisticalDistribution

Association role	Definition	Type	Voidability
value	The statistical values composing the distribution.	StatisticalValue	
classification	Additional classifications used to split a total value of the described phenomenon. The StatisticalDistribution object will provide actually several distributions, one for each item of the used classification. When no classification is provided, the statistical value is the total population.	Classification	

10.2.   **Data types**

10.2.1.   *Classification (Classification)*

A classification used for a statistical distribution.

Attributes of the data type Classification

Attribute	Definition	Type	Voidability
type	The classification type.	ClassificationTypeValue	

Association roles of the data type Classification

Association role	Definition	Type	Voidability
item	The items composing the classification.	ClassificationItem	

10.2.2.   *Classification Item (ClassificationItem)*

An item composing a classification.

Attributes of the data type ClassificationItem

Attribute	Definition	Type	Voidability
type	The classification item type.	ClassificationItemType-Value	

10.2.3.   *Statistical Value (StatisticalValue)*

The pieces of datum of the distribution.

Attributes of the data type StatisticalValue

Attribute	Definition	Type	Voidability
value	The value for the piece of datum.	Number	
specialValue	Some conventional string when value for the piece of datum cannot be provided: missing value, value hidden because of confidentiality.	SpecialValue	
conventionallyLocated-Proportion	The proportion of population counted in the piece of datum but that cannot actually be physically located anywhere within the area of interest.	Number	

Attribute	Definition	Type	Voidability
approximatelyLocated-PopulationProportion	The proportion of population count that doesn't follow the common rule for location. "Population" can be persons if persons are counted, dwellings if the StatisticalDatadistribution is about dwellings, etc.	Number	
comment	Free style comment about the value.	PT_FreeText	
flags	A set of one-character encoded comments about the data.	PT_FreeText	
periodOfMeasurement	The collection period of the statistical value. This period overrides the period specified in the associated statistical distribution.	TM_Period	voidable
status	The status of the statistical data.	StatisticalDataStatus-Value	

Association roles of the data type StatisticalValue

Association role	Definition	Type	Voidability
dimensions	The part of the world the piece of datum refers to. Dimensions contains a description of the geographic location (2D dimension) together with possible additional dimensions when population counts are produced simultaneously for different individual characteristics.	Dimensions	

Constraints of the data type StatisticalValue

Either the value or the specialValue attribute shall be provided.

10.2.4. *Dimensions (Dimensions)*

The identification of what the piece of datum refers to in terms of geographic location or individual characteristics.

Association roles of the data type Dimensions

Association role	Definition	Type	Voidability
spatial	The spatial dimension of the statistical value.	StatisticalUnit	
thematic	The thematic dimensions of the statistical value.	ClassificationItem	

10.3. **Code lists**

10.3.1. *Classification Type (ClassificationTypeValue)*

Code values for classification types.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Population Distribution.

10.3.2. *Classification Item Type (ClassificationItemTypeValue)*

Code values for classification items.

The allowed values for this code list comprise the values of the following code lists or other code lists defined by data providers:

— Age By 5 Years (AgeBy5YearsValue): Code values for age by 5 years classification items, as specified in the table below.

Values for the code list AgeBy5Years

Value	Name	Definition
0-5	0-5	0 to less than 5
5-10	5-10	5 to less than 10
10-15	10-15	10 to less than 15
15-20	15-20	15 to less than 20
20-25	20-25	20 to less than 25
25-30	25-30	25 to less than 30
30-35	30-35	30 to less than 35
35-40	35-40	35 to less than 40
40-45	40-45	40 to less than 45
45-50	45-50	45 to less than 50
50-55	50-55	50 to less than 55
55-60	55-60	55 to less than 60
60-65	60-65	60 to less than 65
65-70	65-70	65 to less than 70
70-75	70-75	70 to less than 75
75-80	75-80	75 to less than 80
80-85	80-85	80 to less than 85
85-90	85-90	85 to less than 90
90+	90	90 and more
90-95	90-95	90 to less than 95
95+	95	95 and more
95-100	95-100	95 to less than 100
100+	100	100 and more

— Age By Year (AgeByYearValue): Code values for age by year classification items, including one value for each one-year interval. The first value shall be "0-1" with the label "0-1" and the definition "0 to less than 1 year", and the last value shall be "100+" with label "100+" and the definition "100 years or older".

— NACE Code (NACECodeValue): Classification of economic activities according to Eurostat NACE, as specified in Regulation (EC) No 1893/2006 of the European Parliament and of the Council and narrower values defined by data providers.

— Gender (GenderValue): Gender of a person or group of persons, as specified in Section 4.6 of Annex I.

10.3.3.   *Variable (VariableValue)*

Code values for variable names.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Population Distribution − Demography.

10.3.4.   *Statistics Measurement Method (StatisticsMeasurementMethodValue)*

Code values for statistics measurement method.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list StatisticsMeasurementMethodValue

Value	Name	Definition
count	count	A simple count.
relativeCount	relative count	A ratio combining two different kinds of statistical population.
percentage	percentage	A proportion expressed as a ratio whose denominator is 100.
median	median	The median.

10.3.5.   *Status of Statistical Data (StatisticalDataStatusValue)*

Code values for status.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list StatisticalDataStatusValue

Value	Name	Definition
definitive	definitive	A definitive statistical data value.
final	final	A final statistical data value.
preliminary	preliminary	A preliminary statistical data value.
provisional	provisional	A provisional statistical data value.
semiDefinitive	semi-definitive	A semi-definitive statistical data value.

10.3.6.   *Special Value (SpecialValue)*

Code values for special values.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list SpecialValue

Value	Name	Definition
confidential	confidential	The value is not provided for confidentiality reasons.
unknown	unknown	The value could have been measured but was not.
notApplicable	not applicable	The value would not have any sense.

10.4.   **Layers**

No layers are defined for the spatial data theme Population Distribution and Demography.

11.   AREA MANAGEMENT/RESTRICTION/REGULATION ZONES AND REPORTING UNITS

11.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definition shall apply:

(1) "manage" means plan, perform, monitor and control activities to achieve specific legally defined environmental objectives.

(2) "restrict" means prohibit or limit certain activities, to only be performed within specific bounds and/or time periods, in order to achieve a certain purpose according to legally defined responsibilities or obligations.

(3) "regulate" means monitor and control certain activities (to permit, promote, prohibit, or restrict) to achieve a legally defined environmental objectives. A regulated activity may require that if the environmental status is degraded then particular actions must be enacted to restore good environmental status.

(4) "report" means evaluate the effectiveness of environmental policies and publish data and information (i.e. spatial data, observations, statistics, indicators) that can be used to assess progress towards maintaining or improving good environmental status and achievement of policy objectives.

(5) "reporting unit" means a spatial object that provides the spatial reference for any non-spatial data exchanged under environmental reporting obligations.

(6) "legal instrument" means a document that specifies legal obligations, including, but not limited to, international conventions, laws and legal acts or implementing regulations at any administrative level.

(7) "integrated coastal zone management" means a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts.

(8) "climate" means the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. These quantities are most often surface variables such as temperature, precipitation and wind.

11.2.   **Spatial object types**

The following spatial object type is specified for the spatial data theme Area management/restriction/regulation zones and reporting units: Management Restriction Or Regulation Zone.

11.2.1.   *Management Restriction Or Regulation Zone (ManagementRestrictionOrRegulationZone)*

Area managed, restricted or regulated in accordance with a legal requirement related to an environmental policy or a policy or activity that may have an impact on the environment at any level of administration (international, European, national, regional and local).

Attributes of the spatial object type ManagementRestrictionOrRegulationZone

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
thematicId	Descriptive unique object identifier applied to spatial objects in a defined information theme.	ThematicIdentifier	voidable
name	A geographical name that is used to identify the management, restriction or regulation zone in the real world. It provides a "key" for implicitly associating different representations of the object.	GeographicalName	voidable
geometry	The geometry representing the spatial extent of the spatial object.	GM_Object	
zoneType	High level classification defining the type of management, restriction or regulation zone.	ZoneTypeCode	
specialisedZoneType	Additional classification value which further specialises the type of management, regulation or restriction zone relevant to the domain.	SpecialisedZoneType-Code	voidable
environmentalDomain	Classification of the environment domain(s) for which, through the establishment of the zone, certain environmental objectives shall be reached.	EnvironmentalDomain	
designationPeriod	Time period defining when the management, restriction or regulation zone was legally designated or became effective in the real world.	TM_Period	voidable
competentAuthority	Description of the organisation(s) responsible for managing, restricting or regulating measures or activities within the zone.	RelatedParty	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type ManagementRestrictionOrRegulationZone

Association role	Definition	Type	Voidability
legalBasis	Reference to, or citation of, the legal instrument or document that required the establishment of the zone.	LegislationCitation	voidable
relatedZone	Reference to a related management, regulation or restriction zone.	ManagementRestrictionOrRegulationZone	voidable
plan	Reference to, or citation of a plan (management or action plan) that describes the environmental objectives and measures that shall be undertaken in the zone to protect the environment.	DocumentCitation	voidable

Constraints of the spatial object type ManagementRestrictionOrRegulationZone

At least the most specific legal instrument that required the establishment of zone shall be provided using the legalBasis association role.

The role attribute of the competentAuthority shall take the value "authority".

11.3.　**Code lists**

11.3.1.　*Zone Type Code (ZoneTypeCode)*

High-level classification defining the type of Management, Restriction or Regulation Zone.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ZoneTypeCode

Value	Name	Definition
airQualityManagementZone	air quality management zone	Part of the territory of a Member State, as delimited by that Member State for the purposes of air quality assessment and management.
noiseRestrictionZone	noise restriction zone	An area delimited by a competent authority to manage and mitigate noise pollution. This includes agglomerations and quiet areas (in agglomerations and open country) as defined in the Directive 2002/49/EC of the European Parliament and of the Council.
animalHealthRestrictionZone	animal health restriction zone	Restriction zones established for the control and eradication of notifiable animal diseases
prospectingAndMiningPermitArea	prospecting and mining permit area	The area on which the prospection or extraction of any mineral has been authorised and for which that right or permit is granted.
regulatedFairwayAtSeaOrLargeInlandWater	regulated fairway at Sea or large inland water	Regulated navigation areas port-to-port established to organise traffic, prevent accident and pollution and to support management and planning.
restrictedZonesAroundContaminatedSites	restricted zones around contaminated sites	Zones established to protect human, plant and animal health and control movement and development within a contaminated site.
areaForDisposalOfWaste	area for disposal of waste	Area affected by disposal of waste as defined in Article 3(19) of Directive 2008/98/EC (¹).
coastalZoneManagementArea	coastal zone management area	Area in which integrated coastal zone management takes place.
drinkingWaterProtectionArea	drinking water protection area	Area in which waste water leakage, use of fertilizer or pesticides, or establishment of waste disposal sites are prohibited.
nitrateVulnerableZone	nitrate vulnerable zone	Areas of land which drain into polluted or threatened waters and which contribute to nitrate pollution.

Value	Name	Definition
marineRegion	marine region	Marine regions and their subregions are sea regions designated under international, Union, national or sub-national legislation for the purpose of assessment, management and regulation.
riverBasinDistrict	river basin district	Area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, identified under Article 3(1) of Directive 2000/60/EC (²) as the main unit for management of river basins.
bathingWaters	bathing waters	Coastal waters or inland waters (rivers, lakes) explicitly authorised, or not prohibited for recreational bathing by large numbers of people.
floodUnitOfManagement	flood unit of management	Area of land and sea, identified under Directive 2007/60/EC of the European Parliament and Council (³) as the main unit for management when an alternative to the River Basin Districts or Sub-Districts are chosen.
waterBodyForWFD	water body under the Water Framework Directive (2000/60/EC)	The "water body" is a coherent sub-unit in the river basin (district) to which the environmental objectives of the Directive 2000/60/EC must apply. The identification of water bodies is based on geographical and hydrological determinants. This includes surface (river, lake, transitional and coastal) and ground water bodies.
sensitiveArea	sensitive area	Water bodies identified as sensitive areas, as defined in Annex II to Directive 91/271/EEC (⁴).
designatedWaters	designated waters	Marine, coastal or surface waters designated by Member States as needing protection or improvement in order to support fish life.
plantHealthProtectionZone	plant health protection zone	Protection zone within which protective measures are established against the introduction of organisms harmful to plants or plant products and against their spread.
forestManagementArea	forest management area	Area designated for the sustainable management of forest resources and functions.

(¹) OJ L 312, 22.11.2008, p. 3.
(²) OJ L 327, 22.12.2000, p. 1.
(³) OJ L 288, 6.11.2007, p. 27.
(⁴) OJ L 135, 30.5.1991, p. 40.

11.3.2.   *Specialised Zone Type Code (SpecialisedZoneTypeCode)*

Additional classification value that defines the specialised type of zone.

The allowed values for this code list comprise any values defined by data providers.

11.3.3.   *Environmental Domain (EnvironmentalDomain)*

Environmental domain, for which environmental objectives can be defined.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list EnvironmentalDomain

Value	Name	Definition
soil	soil	The top layer of the land surface of the earth that is composed of disintegrated rock particles, humus, water and air.
noise	noise	Sound which is unwanted, either because of its effects on humans, its effect on fatigue or malfunction of physical equipment, or its interference with the perception or detection of other sounds.
naturalResources	natural resources	A feature or component of the natural environment that is of value in serving human needs, e.g. soil, water, plant life, wildlife, etc. Some natural resources have an economic value (e.g. timber) while others have a "non-economic" value (e.g. scenic beauty).
climateAndClimateChange	climate and climate change	State of the climate and/or change in this state that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.
healthProtection	health protection	Measures or devices designed to reduce the risk of harm to human health posed by pollutants or other threatening conditions in the ecosystem.
air	air	A predominantly mechanical mixture of a variety of individual gases forming the earth's enveloping atmosphere.
water	water	Common liquid (H_2O) which forms rain, rivers, the sea, etc., and which makes up a large part of the bodies of organisms.
waste	waste	Material, often unusable, left over from any manufacturing, industrial, agricultural or other human process; material damaged or altered during a manufacturing process and subsequently left useless.
natureAndBiodiversity	nature and biodiversity	Active management of the earth's natural resources and environment to ensure their quality is maintained and that they are wisely used.
sustainableDevelopment	sustainable development	Development that provides economic, social and environmental benefits in the long term having regard to the needs of living and future generations.
landUse	land use	The term land use deals with the spatial aspects of all human activities on the land and with the way in which the land surface is adapted, or could be adapted, to serve human needs.

11.4. **Theme-specific Requirements**

11.4.1. *Management Restriction Or Regulation Zones*

(1) Where the geometry of the spatial object is derived from another spatial object, the geometries of the two objects shall be consistent.

(2) If the geometries of the spatial objects in a ManagementRestrictionOrRegulationZone data set are derived from the geometries of spatial objects in another data set, then this source data set (including its version) shall be described as part of the lineage metadata element.

(3) Data providers shall include the following keywords in addition to the mandatory keywords defined in Regulation (EC) 1205/2008:

(a) One or several keywords describing the high-level classification of the zone type(s) included in the data set, as defined in ZoneTypeCode code list.

(b) One or several keywords describing the official document number(s) of the legal instrument(s) under which the zone(s) included in the data set is (are) established. For Union legislation, the CELEX number shall be used.

11.4.2. *Reporting Units*

(1) Spatial objects acting as reporting units shall be defined and made available according to the requirements of their respective INSPIRE spatial data theme(s).

(2) Where environmental reporting data, to establish a spatial reference, refers to real-world entities that are made available as spatial objects in accordance with this Regulation, the reporting data shall include an explicit reference to those spatial objects.

11.4.3. *Cross-theme requirements*

(1) If an area has been established exclusively to manage, regulate and restrict activities to conserve nature, biodiversity and cultural heritage, it shall be made available as a ProtectedSite spatial object. If a zone has been established to deliver multiple objectives, including the conservation of nature, biodiversity and cultural heritage, it shall be made available as a ManagementRestrictionOrRegulationZone spatial object.

(2) Where a zone has been established to regulate planned land use and defined within a legally binding spatial plan, it falls within the scope of the Land Use theme and shall be encoded as a Supplementary-Regulation. However, if the zone has been established by legislative requirement but not defined within a legally binding spatial plan, then it shall be encoded as a ManagementRestrictionOrRegulationZone.

11.5. **Layers**

Layers for the spatial data theme Area Management / Restriction / Regulation Zones and Reporting Units

Layer Name	Layer Title	Spatial object type
AM.<CodeListValue> (¹) Example: AM.AirQualityManagementZone	<human readable name> Example: Air Quality Management Zone	ManagementRestrictionOrRegulationZone (zoneType: ZoneTypeCode)

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).

12. NATURAL RISK ZONES

12.1. **Definitions**

In addition to the definitions set out in Article 2, the following definition shall apply:

(1) "risk" means the combination of the consequences of an event (hazard) and the associated likelihood/probability of its occurrence, in accordance with ISO/IEC 31010:2009.

(2) "hazard" means a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

(3) "exposure" means people, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

(4) "vulnerability" means the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

12.2.   **Spatial object types**

The following spatial object types are specified for the spatial data theme Natural Risk Zones:

— Abstract Exposed Element

— Abstract Hazard Area

— Abstract Observed Event

— Abstract Risk Zone

— Exposed Element Coverage

— Exposed Element

— Hazard Area

— Hazard Coverage

— Observed Event Coverage

— Observed Event

— Risk Coverage

— Risk Zone

12.2.1.   *Abstract Exposed Element (AbstractExposedElement)*

People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

This type is abstract.

Attributes of the spatial object type AbstractExposedElement

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	identifier	
beginLifeSpanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifeSpanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
validFrom	The time when the exposed element started to exist in the real world.	DateTime	voidable
validTo	The time from which the exposed element no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type AbstractExposedElement

Association role	Definition	Type	Voidability
sourceOfSpatialRepresentation	The source object which is used to represent the exposed element.	AbstractFeature	voidable

Constraints of the spatial object type AbstractExposedElement

If the sourceOfSpatialRepresentation association role is empty, the geometry of the AbstractExposedElement spatial object shall be provided.

12.2.2. *Abstract Hazard Area (AbstractHazardArea)*

An area affected by a natural hazard.

This type is abstract.

Attributes of the spatial object type AbstractHazardArea

Attribute	Definition	Type	Voidability
beginLifeSpanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
determinationMethod	Specifies if the hazard area result is delineated after modelling or determined after interpretation.	DeterminationMethodValue	
endLifeSpanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	identifier	
typeOfHazard	A generic classification and a specific classification of the type of natural hazard.	NaturalHazardClassification	
validityPeriod	The time frame for which the model applies.	TM_Period	voidable

Association roles of the spatial object type AbstractHazardArea

Association role	Definition	Type	Voidability
source	The observed event that triggered the modelling of a hazard area.	AbstractObservedEvent	voidable

12.2.3. *Abstract Observed Event (AbstractObservedEvent)*

A natural phenomenon relevant to the study of natural hazards which occurred or is currently occurring and which has been observed.

This type is abstract.

Attributes of the spatial object type AbstractObservedEvent

Attribute	Definition	Type	Voidability
beginLifeSpanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable

Attribute	Definition	Type	Voidability
endLifeSpanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	Identifier	
nameOfEvent	Common name of the observed event.	CharacterString	voidable
typeOfHazard	A generic classification and a specific classification of the type of hazard.	NaturalHazardClassification	
validFrom	The time when the observed event started to exist in the real world.	DateTime	voidable
validTo	The time from which the observed event no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type AbstractObservedEvent

Association role	Definition	Type	Voidability
isMonitoredBy	The environmental program which monitors the observed event	EnvironmentalMonitoringActivity	voidable

12.2.4.   *Abstract Risk Zone (AbstractRiskZone)*

A risk zone is the spatial extent of a combination of the consequences of an event (hazard) and the associated probability/likelihood of its occurrence.

This type is abstract.

Attributes of the spatial object type AbstractRiskZone

Attribute	Definition	Type	Voidability
beginLifeSpanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifeSpanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
inspireId	External object identifier of the spatial object.	identifier	
sourceOfRisk	A generic classification and a specific classification of the type of hazard which is the source of risk.	NaturalHazardClassification	
validityPeriod	Future finite time frame where the model applies.	TM_Period	voidable

Association roles of the spatial object type AbstractRiskZone

Association role	Definition	Type	Voidability
exposedElement	The element that is within a hazardous area	AbstractExposedElement	voidable
source	The hazard which is considered for the creation of the risk zone object.	AbstractHazardArea	voidable

12.2.5.   *Exposed Element Coverage (ExposedElementCoverage)*

A coverage representing continuous information about exposed elements.

This type is a sub-type of AbstractExposedElement

This type is a sub-type of CoverageByDomainAndRange.

Attributes of the spatial object type ExposedElementCoverage

Attribute	Definition	Type	Voidability
typeOfElement	A classification of the exposed element.	ExposedElementClassifi-cation	voidable

Constraints of the spatial object type ExposedElementCoverage

The range set shall be the level, or intensity, of the vulnerability assessment.

The domain shall be a rectified grid or referenceable grid.

12.2.6.   *Exposed Element (ExposedElement)*

Discrete spatial object representing an exposed element.

This type is a sub-type of AbstractExposedElement.

Attributes of the spatial object type ExposedElement

Attribute	Definition	Type	Voidability
geometry	Geometric representation of the ex-posed element.	GM_Object	
assessmentOfVulner-ability	Assessment of the vulnerability of the exposed element.	VulnerabilityAssess-ment	voidable

12.2.7.   *Hazard Area (HazardArea)*

Discrete spatial objects representing a natural hazard.

This type is a sub-type of AbstractHazardArea.

Attributes of the spatial object type HazardArea

Attribute	Definition	Type	Voidability
geometry	Geometric representation of spatial ex-tent covered by the hazard area.	GM_Surface	
likelihoodOfOccurrence	A general concept relating to the chance of an event occurring.	LikelihoodOfOccurren-ce	voidable
magnitudeOrIntensity	An expression of the magnitude or the intensity of a phenomenon.	LevelOrIntensity	voidable

12.2.8.   *Hazard Coverage (HazardCoverage)*

A coverage representing continuous information about a type of natural hazard.

This type is a sub-type of AbstractHazardArea.

This type is a sub-type of CoverageByDomainAndRange.

Constraints of the spatial object type HazardCoverage

The range set shall be described by magnitude or intensity, or by the likelihood of occurence.

The domain shall be a rectified grid or referenceable grid.

12.2.9.   *Observed Event Coverage (ObservedEventCoverage)*

A coverage representing continuous information about observed events.

This type is a sub-type of AbstractObservedEvent

This type is a sub-type of CoverageByDomainAndRange.

Constraints of the spatial object type ObservedEventCoverage

The range set shall be described by magnitude or intensity, or by the likelihood of occurence.

The domain shall be a rectified grid or referenceable grid.

12.2.10.   *Observed Event (ObservedEvent)*

Discrete spatial objects representing natural phenomenon relevant to the study of natural hazards which occurred, or is currently occurring, and which has been observed.

This type is a sub-type of AbstractObservedEvent.

Attributes of the spatial object type ObservedEvent

Attribute	Definition	Type	Voidability
geometry	Geometric representation of the spatial extent covered by the observed event.	GM_Object	
magnitudeOrIntensity	An expression of the magnitude or the intensity of a phenomenon.	LevelOrIntensity	voidable

12.2.11.   *Risk coverage (RiskCoverage)*

A coverage representing continuous information about intensity or level of risk.

This type is a sub-type of AbstractRiskZone.

This type is a sub-type of CoverageByDomainAndRange.

Constraints of the spatial object type RiskCoverage

The range set shall be described by level or intensity.

The domain shall be a rectified grid or referenceable grid.

12.2.12.   *Risk Zone (RiskZone)*

Discrete spatial objects representing the spatial extent of a combination of the consequences of an event (hazard) and the associated probability/likelihood of its occurrence.

This type is a sub-type of AbstractRiskZone.

Attributes of the spatial object type RiskZone

Attribute	Definition	Type	Voidability
geometry	Geometric representation of spatial extent covered by this risk zone.	GM_Surface	

Attribute	Definition	Type	Voidability
levelOfRisk	The level of risk is an assessment of the combination of the consequences of an event (hazard) and the associated probability/likelihood of the occurrence of the event.	LevelOrIntensity	voidable

12.3. Data types

12.3.1. *Exposed Element Classification (ExposedElementClassification)*

This class provides piece of information about the nature of the exposed element which is relevant to risk analysis.

Attributes of the data type ExposedElementClassification

Attribute	Definition	Type	Voidability
exposedElementCategory	A generic classification of the types of element that are exposed to a risk.	ExposedElementCategoryValue	
specificExposedElementType	An additional denomination of exposed element according to a nomenclature that is specific to the data set.	SpecificExposedElementTypeValue	voidable

12.3.2. *Level Or Intensity (LevelOrIntensity)*

Quantitative or qualitative assessment of either risk, hazard or vulnerability.

Attributes of the data type LevelOrIntensity

Attribute	Definition	Type	Voidability
qualitativeValue	A qualitative assessment of the level or intensity.	CharacterString	voidable
quantitativeValue	A quantitative assessment of the level or intensity.	Measure	voidable
assessmentMethod	A citation to the method used to express the level or intensity.	DocumentCitation	voidable

Constraints of the data type LevelOrIntensity

Either the qualitative value or the quantitative value shall be provided.

12.3.3. *Likelihood Of Occurrence (LikelihoodOfOccurrence)*

Likelihood is a general concept relating to the chance of an event occurring.

Attributes of the data type LikelihoodOfOccurrence

Attribute	Definition	Type	Voidability
qualitativeLikelihood	A qualitative assessment of the likelihood of occurrence of a hazard.	CharacterString	voidable
quantitativeLikelihood	A frequency of occurence or return period of a hazard phenomenon.	QuantitativeLikelihood	voidable
assessmentMethod	A citation to the method used to express the likelihood.	DocumentCitation	voidable

Constraints of the data type LikelihoodOfOccurrence

Either the qualitative likelihood or the quantitative likelihood shall be provided.

12.3.4.   *Natural Hazard Classification (NaturalHazardClassification)*

This class provides piece of information about the nature of the natural hazard as well as the type of hazard which is the source of risk.

Attributes of the data type NaturalHazardClassification

Attribute	Definition	Type	Voidability
hazardCategory	A generic classification of types of natural hazards.	HazardCategoryValue	
specificHazardType	Additional classification of the natural hazard that further specifies the hazard type according to a nomenclature that is specific to this data set.	SpecificHazardType-Value	voidable

12.3.5.   *Quantitative Likelihood (QuantitativeLikelihood)*

A frequency of occurrence or return period of a hazard phenomenon.

Attributes of the data type QuantitativeLikelihood

Attribute	Definition	Type	Voidability
probabilityOfOccurrence	The probability of occurrence of a hazard event, expressed as a value between 0 and 1.	Probability	voidable
returnPeriod	Long-term average interval of time or number of years within which an event will be equalled or exceeded.	Number	voidable

12.3.6.   *Vulnerability Assessment (VulnerabilityAssessment)*

Assessment of the vulnerability.

Attributes of the data type VulnerabilityAssessment

Attribute	Definition	Type	Voidability
sourceOfVulnerability	The type of hazard for which the vulnerability is assessed.	NaturalHazardClassification	
levelOfVulnerability	Level of vulnerability.	LevelOrIntensity	voidable
magnitudeOrIntensityOfHazard	An expression of the magnitude or the intensity of a phenomenon.	LevelOrIntensity	voidable
typeOfElement	A classification of the exposed element.	ExposedElementClassification	voidable

12.4.   **Enumerations**

12.4.1.   *Determination Method (DeterminationMethodValue)*

An enumeration to describe the method used to define the area of hazard or risk.

Values for the enumeration DeterminationMethodValue

Value	Definition
modelling	The area has been computed according to a model.
indirectDetermination	The area has been defined by interpretation of available data and/or information.

12.5. **Code lists**

12.5.1. *Exposed Element Category (ExposedElementCategoryValue)*

A classification of the exposed element.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list ExposedElementCategoryValue

Value	Name	Definition	Parent value
social	social	Anything related to people or groups of people.	
people	people	The presence of human beings.	social
community	community	A complex relation between human beings acting as a whole or as a unit.	social
political	political	Any object relevant to political affairs.	social
socialService	social service	Any service provided to people.	social
economic	economic	Any object related to property, economics or monetary issues.	
property	property	Any object subject to ownership, such as a house.	economic
infrastructure	infrastructure	Any object considered as a structure providing a service, such as a road, a bridge, a military facility, etc.	economic
economicActivity	economic activity	Any object representing an economic activity, such as an industry.	economic
ruralLandUse	rural land use	Any non-urban object that is dedicated to any given use.	economic
environmental	environmental	An area subject to a given protection level, such as a natural park.	
waterBody	water body	Any significant accumulation of water.	environmental
protectedArea	protected area	An area that is protected	environmental
pollutionSource	source of pollution	An object that contains pollutants.	environmental
heritage	heritage	Anything related to relevant objects from a cultural or heritage perspective.	
culturalAsset	cultural asset	Any object considered to be relevant from a cultural perspective, such as a stadium, a theatre, a museum, etc.	heritage

Value	Name	Definition	Parent value
historicalAsset	historical asset	Any object with a historical relevance.	heritage
worldHeritageSite	world heritage site	A place (such as a forest, mountain, lake, desert, monument, building, complex, or city) that is listed by the UNESCO as of special cultural or physical significance.	heritage

12.5.2. *Natural Hazard Category (NaturalHazardCategoryValue)*

A generic classification of types of natural hazards.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

Values for the code list NaturalHazardCategoryValue

Value	Name	Definition	Parent value
geologicalHydrological	geological / hydrological	Processes that have a geological (geosphere) or hydrological (hydrosphere) nature (or origin).	
tsunami	tsunami	Long wave disruption in a large water body reaching emerged land.	geologicalHydrological
volcanic	volcanic	An opening, or rupture, in the Earth's crust that allows hot magma, ash and gases to escape.	geologicalHydrological
earthquake	earthquake	Earthquake hazards involve the propagation of elastic waves at or near the surface after the release of tectonic stress or other natural sources, such as volcanic explosions or meteorite impacts.	geologicalHydrological
subsidenceAndCollapse	subsidence and collapse	Subsidence and collapse involve mainly vertical downwards ground movement of the surface of the Earth due to different processes of rock or soil weathering or rock compaction to a point where the rock structure cannot bear its own load (collapse) or causing relatively slow downwards movements (subsidence).	geologicalHydrological
landslide	landslide	Processes of downhill slope movements of soil, rock, and organic materials related to different types of ground failure.	geologicalHydrological
snowAvalanche	snow avalanche	A snow mass with typically a volume greater than 100 m^3 and a minimum length of 50 meters that slides rapidly downhill.	geologicalHydrological
flood	flood	Processes of inundation of usually dry (emerged) land, or temporary covering by water of land not normally covered by water.	geologicalHydrological

Value	Name	Definition	Parent value
toxicOrRadioactive	toxic or radioactive	Processes related to the nature of substances that might pose a threat to human health.	geologicalHydrological
meteorologicalClimatological	meteorological / climatological	Processes that have a meteorological (atmospheric) or climatic (changes in the long-run of environmental variables) nature (or origin).	
drought	drought	Sustained and extensive occurrence of below-average water availability, caused by climate variability.	meteorologicalClimatological
extremeTemperature	extreme temperature	An abnormal temperature rise or decrease lasting longer than usual temperature rise or drop.	meteorologicalClimatological
tornadosAndHurricanesStrongWinds	tornados, hurricanes and strong winds	Violent (high speed) winds.	meteorologicalClimatological
lightning	lightning	Discharge of atmospheric electricity.	meteorologicalClimatological
stormSurge	storm surge	Water pushed from the sea onto the land caused by an atmospheric disruption such as a hurricane or a rapid change in atmospheric pressure.	meteorologicalClimatological
fires	fires	This category includes all types of processes that involve the occurrence and spreading of fire.	
forestFireWildfire	forest fires or wild fires	Fire occurrence and spreading on vegetated land.	fires
undergroundFires	underground fires	Fire spreading below the surface, typically occurring in peat rich soils.	fires
biological	biological	Processes that are directly linked to living organisms or products produced by living organisms.	
infestation	infestation	Abnormal population increase of living organisms.	biological
epidemic	epidemic	An outbreak of a disease that spreads rapidly among individuals in an area or population.	
allergens	allergens	Biological products or substances (such as pollen) that might cause allergy over a large number of people.	biological
cosmic	cosmic	Processes from outer space.	
meteoriteImpact	meteorite impact	Solid materials from outer space reaching the Earth.	cosmic
magneticDisruption	magnetic disruption	Disturbances of the magnetic field of the Earth.	cosmic
solarAndCosmicRadiation	solar and cosmic radiations	Radiation from outer space (UV, gamma ray, etc).	cosmic

12.5.3.   *Specific Exposed Element Type (SpecificExposedElementTypeValue)*

An additional denomination of exposed elements.

The allowed values for this coded list comprise any values defined by data providers.

12.5.4.   *Specific Hazard Type (SpecificHazardTypeValue)*

An additional classification of the natural hazard.

The allowed values for this coded list comprise any values defined by data providers.

12.6.   **Theme-specific Requirements**

(1) Where a RiskZone is associated with a HazardArea, the RiskZone and the HazardArea shall overlap.

(2) Where a RiskZone is associated with an ExposedElement, the ExposedElement shall overlap with the RiskZone.

12.7.   **Layers**

Layers for the spatial data theme Natural Risk Zones

Layer Name	Layer Title	Spatial object type
NZ.RiskZone	Risk Zones	RiskZone
NZ.RiskZoneCoverage	Risk Zones Coverage	RiskZoneCoverage
NZ. <CodeListValue> (¹) Example: NZ.Landslide	<human readable name> Example: Landslides	HazardArea, HazardAreaCoverage (typeOfHazard: NaturalHazardCategoryValue)
NZ. <CodeListValue> (²) Example: NZ.Flood	<human readable name> Example: Floods	ObservedEvent, ObservedEventCoverage (typeOfHazard: NaturalHazardCategoryValue)
NZ.ExposedElement	Exposed Elements	ExposedElement
NZ.ExposedElementCoverage	Exposed Element Coverage	ExposedElementCoverage

(¹) One layer shall be made available for each code list value, in accordance with Art. 14(3).
(²) One layer shall be made available for each code list value, in accordance with Art. 14(3).

13.   ATMOSPHERIC CONDITIONS AND METEOROLOGICAL GEOGRAPHICAL FEATURES

13.1.   **Structure of the Spatial Data Themes Atmospheric Conditions and Meteorological Geographical Features**

The types specified for the spatial data themes Atmospheric Conditions and Meteorological Geographical Features are structured in the following packages:

— Atmospheric Conditions and Meteorological Geographical Features

— Specialised Observations (specified in Section 7.4 of Annex I)

— Processes (specified in Section 7.2 of Annex I)

— Observable Properties (specified in Section 7.3 of Annex I)

13.2.   **Atmospheric Conditions and Meteorological Geographical Features**

13.2.1.   *Code lists*

13.2.1.1.   EU Air Quality Reference Component (EU_AirQualityReferenceComponentValue)

Definitions of phenomena regarding air quality in the context of reporting under Union legislation.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Atmospheric Conditions and Meteorological Geographical Features.

13.2.1.2.   WMO GRIB Code and Flags Table 4.2 (GRIB_CodeTable4_2Value)

Definitions of phenomena observed in meteorology.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Atmospheric Conditions and Meteorological Geographical Features.

13.3.   **Theme-specific Requirements**

(1) By way of derogation from the requirements of Section 2.2 of Annex II, gridded data related to the themes Atmospheric Conditions and Meteorological Geographical Features may be made available using any appropriate grid.

(2) Data related to the themes Atmospheric Conditions or Meteorological Geographical Features shall be made available using the types defined in Specialised Observations package in Annex I, the OM_Observation spatial object type or sub-types thereof.

(3) The observed property of an OM_Observation shall be identified by an identifier from the EU Air Quality Reference Component, the WMO GRIB Code & Flags Table 4.2, the Climate and Forecast Standard Names vocabularies or another appropriate vocabulary.

13.4.   **Layers**

No layers are specified for the themes Atmospheric Conditions and Meteorological Geographical Features.

14.   OCEANOGRAPHIC GEOGRAPHICAL FEATURES

14.1.   **Structure of the Spatial Data Theme Oceanographic Geographical Features**

The types specified for the spatial data theme Oceanographic Geographical Features are structured in the following packages:

— Oceanographic Geographical Features

— Specialised Observations (specified in Section 7.4 of Annex I)

— Processes (specified in Section 7.2 of Annex I)

— Observable Properties (specified in Section 7.3 of Annex I)

— Observation References (specified in Section 7.1 of Annex I)

14.2.   **Oceanographic Geographical Features**

14.2.1.   *Code lists*

14.2.1.1.   BODC P01 Parameter Usage (BODC_P01ParameterUsageValue)

Definitions of phenomena observed in oceanography.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Oceanographic Geographical Features.

14.3.   **Theme-specific Requirements**

(1) By way of derogation from the requirements of Section 2.2. of Annex II, gridded data related to the theme Oceanographic Geographical Features may be made available using any appropriate grid.

(2) Data related to the theme Oceanographic Geographical Features shall be made available using the following types defined in the Specialised Observations package in Annex I: PointObservation, PointTimeSeries-Observation, MultiPointObservation, GridObservation, GridSeriesObservation, PointObservationCollection.

(3) The observed property of an OM_Observation shall be identified by an identifier from the BODC P01 Parameter Usage or Climate and Forecast Standard Names vocabularies.

14.4. **Layers**

Layers for the spatial data theme Oceanographic Geographical Features

Layer Name	Layer Title	Spatial object type
OF.PointObservation	Oceanographic Point Observation	PointObservation
OF.PointTimeSeriesObservation	Oceanographic Point Time-series Observation	PointTimeSeriesObservation
OF.MultiPointObservation	Oceanographic Multipoint Observation	MultiPointObservation
OF.GridObservation	Oceanographic Grid Observation	GridObservation
OF.GridSeriesObservation	Oceanographic Grid Series Observation	GridSeriesObservation

15. SEA REGIONS

15.1. **Spatial object types**

The following spatial object types are specified for the spatial data theme Sea Regions:

— Sea Area

— Sea

— Marine Circulation Zone

— Intertidal Area

— Shoreline

— Shore Segment

— Coastline

— Marine Contour

— Marine Layer

— Sea Bed Area

— Sea Surface Area

15.1.1. *Sea Area (SeaArea)*

An area of sea defined according to its physical and chemical characteristics. It may have multiple geometries (extent) to represent different tidal states.

This type is a sub-type of HydroObject.

Attributes of the spatial object type SeaArea

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
seaAreaType	Type of the sea area according to the classifications in the SeaAreaTypeClassificationValue code list, e.g. estuary.	SeaAreaTypeClassificationValue	
extent	The extent of the sea area at a particular tidal state.	MarineExtent	
parameterValue	A value of some parameter assigned to the sea area. E.g. Annual Mean Sea Surface Temperature = 12 degrees Celsius.	ParameterValuePair	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type SeaArea

Association role	Definition	Type	Voidability
subArea	Sea Areas can consist of sub areas, e.g. a Sea Area defining all European seas could be an aggregation of multiple Sea Areas (North Sea, Mediterranean Sea etc.).	SeaArea	

15.1.2. *Sea (Sea)*

Extent of sea at High Water (meanHighWater).

This type is a sub-type of SeaArea.

Attributes of the spatial object type Sea

Attribute	Definition	Type	Voidability
extent	The extent of the Sea at Mean High Water.	MarineExtent	

Constraints of the spatial object type Sea

Sea is defined at Mean High Water. This constraint can be relaxed if there is not significant tidal variation in water level.

15.1.3. *Marine Circulation Zone (MarineCirculationZone)*

A sea area defined by its physical and chemical circulation patterns. Typically used for management and reporting of the marine environment or marine environmental classification.

This type is a sub-type of SeaArea.

Attributes of the spatial object type MarineCirculationZone

Attribute	Definition	Type	Voidability
zoneType	The type of the Marine Circulation Zone, e.g. sedimentCell.	ZoneTypeValue	
extent	The extent of the Marine Circulation Zone at a particular tidal state.	MarineExtent	

15.1.4.　*Intertidal Area (InterTidalArea)*

The part of the marine environment that is exposed (not covered in water) during a normal tidal cycle; defined as the difference between any high and any low water level.

This type is a sub-type of Shore.

Attributes of the spatial object type InterTidalArea

Attribute	Definition	Type	Voidability
lowWaterLevel	The low water level which was used to define the lower limit of the Intertidal Area, e.g. "meanLowWater".	WaterLevelValue	
highWaterLevel	The high water level which was used to define the upper limit of the Intertidal Area, e.g. "meanHighWater".	WaterLevelValue	

15.1.5.　*Shoreline (Shoreline)*

Any Boundary between a Sea Area and land.

This type is a sub-type of HydroObject.

Attributes of the spatial object type Shoreline

Attribute	Definition	Type	Voidability
segment	A section of shoreline.	ShoreSegment	
waterLevel	The water level used when defining this shoreline (e.g. meanHighWater).	WaterLevelValue	voidable

15.1.6.　*Shore Segment (ShoreSegment)*

A Shore Segment is a section of shoreline.

Attributes of the spatial object type ShoreSegment

Attribute	Definition	Type	Voidability
geometry	The geometry of the ShoreSegment.	GM_Curve	
shoreClassification	The primary type of the shore segment, taken from the ShoreTypeClassificationValue code list.	ShoreTypeClassificationValue	voidable
shoreStability	The primary stability type of the shore segment, taken from the ShoreStabilityValue code list.	ShoreStabilityValue	voidable

15.1.7.　*Coastline (Coastline)*

A special case of a shoreline defined as the shoreline at Mean High Water (MHW). Where there is not significant variation in water level, Mean Sea Level (MSL) can be used as a substitute for MHW.

This type is a sub-type of Shoreline.

Constraints of the spatial object type Coastline

Coastline is a special case of shoreline at Mean High Water Level (MHW). Coastline is the boundary between land and sea to be used for viewing, discovery and general purpose applications where a land/marine boundary is required. Where there is no significant variation in water level, Mean Sea Level (MSL) can be used as a substitute for MHW.

15.1.8.　*Marine Contour (MarineContour)*

A set of isolines representing the value of some phenomenon at a particular time.

Attributes of the spatial object type MarineContour

Attribute	Definition	Type	Voidability
isoline	Isoline used to generate the contour.	MarineIsoline	
phenomenon	The property represented by the iso-lines (e.g. wave height).	AbstractObservablePro-perty	
validTime	The time at which this contour is representative.	TM_Instant	

Association roles of the spatial object type MarineContour

Association role	Definition	Type	Voidability
sourceObservations	Used to link to a collection of under-lying observations which were used to define a marine contour.	ObservationSet	

15.1.9.　*Marine Layer (MarineLayer)*

A Marine Layer describes any layer that may cover any part of a sea surface or sea bottom.

This type is abstract.

Attributes of the spatial object type MarineLayer

Attribute	Definition	Type	Voidability
geometry	Geometry of the marine layer.	GM_Object	
validTime	Time period for which the marine layer is valid.	TM_Period	

Association roles of the spatial object type MarineLayer

Association role	Definition	Type	Voidability
subLayer	A marine layer may have a sub-layer, for example an Oil Slick may have a main slick with several smaller sub-slicks.	MarineLayer	

Constraints of the spatial object type MarineLayer

A Marine Layer can be represented as either a surface or a point. The point type geometry reflects the reality that many Marine Layers are identified by point observations.

15.1.10. *Sea Bed Area (SeaBedArea)*

An area of the sea bed with some identified type of cover, e.g. an area of vegetation or sediment type.

This type is a sub-type of MarineLayer.

Attributes of the spatial object type SeaBedArea

Attribute	Definition	Type	Voidability
surfaceType	Surface type of sea bed.	SeaBedCoverValue	

15.1.11. *Sea Surface Area (SeaSurfaceArea)*

An area of the sea surface with some type of cover, e.g. an area of sea ice.

This type is a sub-type of MarineLayer.

Attributes of the spatial object type SeaSurfaceArea

Attribute	Definition	Type	Voidability
surfaceType	Surface type of sea area.	SeaSurfaceClassifica-tionValue	

15.2. **Data types**

15.2.1. *Marine Extent (MarineExtent)*

The extent of a sea area for a given tidal state.

Attributes of the data type MarineExtent

Attribute	Definition	Type	Voidability
geometry	The geometry of the Marine Extent.	GM_MultiSurface	
waterLevel	Water level at which the extent is valid.	WaterLevelValue	

15.2.2. *Marine Isoline (MarineIsoline)*

An isoline representing a particular value of some marine physical or chemical phenomenon such as temperature, salinity or wave height.

Attributes of the data type MarineIsoline

Attribute	Definition	Type	Voidability
geometry	Geometry of the isolines.	GM_MultiCurve	
value	Values attributed to the isolines.	Measure	

15.2.3. *Parameter Value Pair (ParameterValuePair)*

A parameter value pair contains a value of some observed property, e.g. Annual Mean Sea Surface Temperature.

Attributes of the data type ParameterValuePair

Attribute	Definition	Type	Voidability
parameter	A definition of the observed parameter (e.g. mean temperature).	AbstractObservableProperty	
value	The value of the observed parameter, e.g. 12 degrees Celsius.	Measure	
validTime	The time for which the attributed value is valid. This may be a time instant or a duration.	TM_Object	Voidable

15.3. **Code lists**

15.3.1. *Sea Area Type Classification (SeaAreaTypeClassificationValue)*

Classification type of the SeaArea, e.g. estuary, openOcean.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.3.2. *Sea Bed Cover (SeaBedCoverValue)*

Types of cover found on sea beds.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.3.3. *Sea Surface Classification (SeaSurfaceClassificationValue)*

Types of sea surface layers found on sea surfaces.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.3.4. *Shore Stability (ShoreStabilityValue)*

Types of the stability of shore segments.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.3.5. *Shore Type Classification (ShoreTypeClassificationValue)*

Types of shore segments.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.3.6. *Zone Type (ZoneTypeValue)*

Types of marine circulation zones.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Sea Regions.

15.4.   **Theme-specific Requirements**

(1) The Sea spatial object type shall be used to describe identified, named areas of sea (or ocean). Artificial reporting units are excluded from this requirement.

(2) The MarineExtent of a Sea spatial object shall have a waterlevel value equal to "MeanHighWater", unless there is no appreciable change in the Sea extent due to tides, in which case a value of "MeanSeaLevel" may be used.

(3) The low water level used to define an IntertidalArea shall be provided as a value of the lowWaterLevel attribute. The level shall be a low water level.

(4) The code lists defined in the spatial data theme Oceanographic Geographical Features shall be used to identify phenomena represented by MarineContour spatial object types.

(5) SeaAreas shall be represented as 2-dimensional geometries.

15.5.   **Layers**

Layers for the spatial data theme Sea Regions

Layer Name	Layer Title	Spatial object type
SR.SeaArea	Sea Area	SeaArea
SR.Sea	Sea	Sea
SR.MarineCirculationZone	Marine Circulation Zone	MarineCirculationZone
SR.InterTidalArea	Intertidal Area	InterTidalArea
SR.MarineContour	Marine Contour	MarineContour
SR.Shoreline	Shoreline	Shoreline
SR.Coastline	Coastline	CoastLine
SR.SeaSurfaceArea	Sea surface area	SeaSurfaceArea
SR.SeaBedArea	Sea bed area	SeaBedArea

16.   BIO-GEOGRAPHICAL REGIONS

16.1.   **Spatial object types**

The following spatial object type is specified for the spatial data theme Bio-geographical Regions: Bio-geographical Region.

16.1.1.   *Bio-geographical Region (Bio-geographicalRegion)*

An area in which there are relatively homogeneous ecological conditions with common characteristics.

Attributes of the spatial object type Bio-geographicalRegion

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	The geometry defining the ecological region.	GM_MultiSurface	
regionClassification	Region class code, according to a classification scheme.	RegionClassification-Value	
regionClassification-Scheme	Classification scheme used for classifying regions.	RegionClassification-SchemeValue	

Attribute	Definition	Type	Voidability
regionClassificationLevel	The classification level of the region class.	RegionClassificationLevelValue	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

16.2. **Code lists**

16.2.1. *Region Classification Level (RegionClassificationLevelValue)*

Codes defining the classification level of the region class.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list RegionClassificationLevelValue

Value	Name	Definition
international	International	This is a region classification on the international level.
local	Local	This is a region classification on the local level.
national	National	This is a region classification on the national level.
regional	Regional	This is a region classification on the regional level.

16.2.2. *Region Classification Scheme (RegionClassificationSchemeValue)*

Codes defining the various bio-geographical regions.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Bio-geographical Regions.

16.2.3. *Region Classification (RegionClassificationValue)*

Codes used to define the various bio-geographical regions.

The allowed values for this code list comprise the values of the following code lists or other code lists defined by data providers:

— Environmental Stratification Classification (EnvironmentalStratificationClassificationValue): Codes for the climatic stratification of the environment in the Union, as specified in Metzger, M.J., Shkaruba, A.D., Jongman, R.H.G. & Bunce, R.G.H., *Descriptions of the European Environmental Zones and Strata*. Alterra, Wageningen, 2012.

— Marine Strategy Framework Directive Classification (MarineStrategyFrameworkDirectiveClassificationValue): Codes for the Marine Stategy Framework Directive classification, as listed in Article 4 of Directive 2008/56/EC (¹).

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(¹) OJ L 164, 25.6.2008, p. 19.

— Natura 2000 And Emerald Bio-geographical Region Classification (Natura2000AndEmeraldBio-geographicalRegionClassificationValue): Codes for the classification of bio-geographical regions, as specified in the Code List for Bio-geographical Regions, Europe 2011, published on the web site of the European Environment Agency.

— Natural Vegetation Classification (NaturalVegetationClassificationValue): Codes for the natural vegetation classification, as specified in the main formations in Bohn, U., Gollub, G., and Hettwer, C., *Map of the natural vegetation of Europe: scale 1:2,500,000, Part 2: Legend*, Bundesamt für Naturschutz (German Federal Agency for Nature conservation), Bonn, 2000.

16.3.   **Layers**

Layer for the spatial data theme Bio-Geographical Regions

Layer Name	Layer Title	Spatial object type
BR.Bio-geographicalRegion	Bio-geographical Regions	Bio-geographicalRegion

17.   HABITATS AND BIOTOPES

17.1.   **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "biotope" means a region of relatively uniform environmental conditions, occupied by a given plant community and its associated animal community.

(2) "habitat" means the locality in which a plant or animal naturally grows or lives. It can be either the geographical area over which it extends, or the particular station in which a specimen is found. A habitat is characterized by a relative uniformity of the physical environment and fairly close interaction of all the biological species involved.

(3) "habitat type (or biotope type)" means an abstract type classified to describe habitats or biotopes that are common in some characteristics on a certain level of detail. Commonly used classification criteria may refer to vegetation structure (as woodland, pastures, heathland) or to abiotic features such as running waters, limestone rocks or sand dunes, but also to relevant phases or stages of the life-cycle of a certain species or ecological guild, like wintering areas, nesting areas or wandering corridors etc.

(4) "distribution (of habitat types)" means a collection of spatial objects where the habitat type occurs, giving information on the occurrence of one specific habitat type in time or space across analytical units. It is usually depicted or modelled based on other spatial objects used as analytical units, for instance across grid-cells (very frequently), bio-geographical regions, nature conservation sites or administrative units.

(5) "habitat feature" means a habitat in terms of its exact location, size (area or volume) and biological information (e.g. occurring habitat types, structural traits, lists of species, vegetation types).

(6) "species" means a taxonomic category ranking immediately below a genus and including closely-related and morphologically similar individuals which actually or potentially inbreed. In the context of the theme Habitats and Biotopes, "species" means all animal species, plant species or fungi species relevant to describe a habitat.

(7) "vegetation" means the plants of an area considered in general or as communities, but not taxonomically. Vegetation can also be defined as the total plant cover in a particular area or on the Earth as a whole.

(8) "vegetation type" means plants (or total mass of plant life) of a given area considered in general or as plant communities, but not taxonomically.

17.2.   **Spatial object types**

The following spatial object type is specified for the spatial data theme Habitats and Biotopes: Habitat.

17.2.1. *Habitat (Habitat)*

Geographical areas characterised by specific ecological conditions, processes, structure, and functions that physically support the organisms that live there.

Attributes of the spatial object type Habitat

Attribute	Definition	Type	Voidability
geometry	The extent of the habitat based on natural boundaries.	GM_Object	
habitat	The identifier for a habitat class, defined and described in an international, national or local habitat classification scheme.	HabitatTypeCoverType	
habitatSpecies	List of species which occur in or constitute a certain habitat at the time of mapping.	HabitatSpeciesType	voidable
habitatVegetation	List of vegetation types (according to a local vegetation classification scheme) which constitute a certain habitat.	HabitatVegetationType	voidable
inspireId	External object identifier of the spatial object.	Identifier	

17.3. **Data types**

17.3.1. *Habitat Species Type (HabitatSpeciesType)*

Species which occur in a certain habitat at the time of mapping.

Attributes of the data type HabitatSpeciesType

Attribute	Definition	Type	Voidability
localSpeciesName	Scientific name plus author used in national nomenclature with its national taxonomic concept.	LocalNameType	voidable
referenceSpeciesScheme	Reference list defining a nomenclatural and taxonomical standard to which all local species names and taxonomic concepts shall be mapped.	ReferenceSpeciesSchemeValue	
referenceSpeciesId	Identifier of one of the reference lists given by the referenceSpeciesScheme.	ReferenceSpeciesCodeValue	

17.3.2. *Habitat Type Cover Type (HabitatTypeCoverType)*

Habitat type according to an international, national or local habitat classifications scheme.

Attributes of the data type HabitatTypeCoverType

Attribute	Definition	Type	Voidability
areaCovered	The area covered by a certain habitat type within the provided geometry of the habitat spatial object.	Area	voidable
lengthCovered	The length covered by a certain habitat type within the provided geometry of a habitat spatial object.	Length	voidable

Attribute	Definition	Type	Voidability
volumeCovered	The volume of a certain habitat type within the provided geometry of a habitat spatial object.	Volume	voidable
referenceHabitatTypeId	Habitat type unique identifier (code) according to one Pan-European classification scheme.	ReferenceHabitatType-CodeValue	
referenceHabitatType-Scheme	One of the Pan-European classification schemes that are widely used in Europe.	ReferenceHabitatType-SchemeValue	
localHabitatName	Habitat type according to a local habitat classification scheme.	LocalNameType	voidable
referenceHabitatType-Name	Name of a habitat type according to one Pan-European classification scheme.	CharacterString	voidable

17.3.3.   *Habitat Vegetation Type (HabitatVegetationType)*

Vegetation type which occurs in a certain habitat.

Attributes of the data type HabitatVegetationType

Attribute	Definition	Type	Voidability
localVegetationName	Vegetation class (vegetation type) according to a local classification scheme. Natural language name according to a local vegetation classification scheme.	LocalNameType	

17.3.4.   *Local Name Type (LocalNameType)*

Name according to a local classification scheme.

Attributes of the data type LocalNameType

Attribute	Definition	Type	Voidability
localScheme	Uniform resource identifier of a local classification scheme.	CharacterString	
localNameCode	Natural language name according to a local classification scheme.	LocalNameCodeValue	
qualifierLocalName	The relation between the local name and the corresponding name in the Pan-European schema.	QualifierLocalNam-eValue	voidable
localName	Name according to a local classification scheme.	CharacterString	voidable

17.4.   **Code lists**

17.4.1.   *Qualifier Local Name (QualifierLocalNameValue)*

List of values that specify the relation between a locally used name and a name used at the pan-European level.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list QualifierLocalNameValue

Value	Name	Definition
congruent	congruent	The local type is conceptually the same as its related Pan-European type.
excludes	excludes	The Pan-European habitat type is conceptually not a subtype of its related local type.
includedIn	included in	The local type is conceptually a subtype of its related Pan-European type.
includes	includes	The Pan-European habitat type is conceptually a subtype of its related local type.
overlaps	overlaps	There is a certain overlap between the local type and its related Pan-European type according to their respective definitions, but none of the other specific relationships (congruent, excludes, included in, includes) holds.

17.4.2. *Reference Habitat Type Code (ReferenceHabitatTypeCodeValue)*

Values used in the Pan-European habitat classification schemes.

The allowed values for this code list comprise the values of the following code lists:

— EUNIS Habitat Type Code (EunisHabitatTypeCodeValue): Classification of habitat types according to the EUNIS Biodiversity database, as specified in the EUNIS habitat types classification published on the web site of the European Environment Agency.

— Habitats Directive Code (HabitatsDirectiveCodeValue): Classification of habitat types according to Annex I to Directive 92/43/EEC.

— Marine Strategy Framework Directive Code (MarineStrategyFrameworkDirectiveCodeValue): Classification of habitat types according to table 1 of Annex III to Directive 2008/56/EC.

17.4.3. *Reference Habitat Type Scheme (ReferenceHabitatTypeSchemeValue)*

This value defines which pan-European habitat classification scheme has been used.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ReferenceHabitatTypeSchemeValue

Value	Name	Definition
eunis	Eunis	EUNIS habitat classification.
habitatsDirective	Habitats directive	Classification of habitats according to Annex I to Directive 92/43/EEC.
marineStrategyFrameworkDirective	Marine strategy framework directive	Classification of habitats according to table 1 of Annex III to Directive 2008/56/EC.

17.4.4. *Local Name Code (LocalNameCodeValue)*

Identifier taken from any local classification scheme.

The allowed values for this code list comprise any values defined by data providers.

17.5. **Theme-specific Requirements**

(1) It is mandatory to make available at least one habitat type according to a (pan-european) referenceHabitatTypeScheme listed in the ReferenceHabitatTypeSchemeValue code list. This encoding is intended to allow for queries on habitat types on a pan-European harmonized level.

17.6. **Layers**

Layer for the spatial data theme Habitats and Biotopes

Layer Name	Layer Title	Spatial object type
HB.Habitat	Habitat	Habitat

18. SPECIES DISTRIBUTION

18.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "aggregation" means the grouping of multiple objects into a class or cluster.

(2) "amalgamation" means the combination of multiple objects in a single structure.

18.2. **Spatial object types**

The following spatial object types are specified for the spatial data theme Species Distribution:

— Species Distribution Data Set

— Species Distribution Unit

18.2.1. *Species Distribution Data Set (SpeciesDistributionDataSet)*

This data set is a collection of individual spatial objects (units) in a distribution of species.

Attributes of the spatial object type SpeciesDistributionDataSet

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
domainExtent	The geographic extent of the domain of the feature collection.	GM_MultiSurface	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
name	Name of a specific data set provided for Species Distribution.	CharacterString	voidable

Association roles of the spatial object type SpeciesDistributionDataSet

Association role	Definition	Type	Voidability
member	Individual spatial object in a collection of spatial objects.	SpeciesDistributionUnit	
documentBasis	Reference to or citation of a document describing a campaign or a legal act which is the basis for the data set.	DocumentCitation	voidable

18.2.2. *Species Distribution Unit (SpeciesDistributionUnit)*

Occurrence of animal and plant species aggregated by grid, region, administrative unit or other analytical unit.

Attributes of the spatial object type SpeciesDistributionUnit

Attribute	Definition	Type	Voidability
geometry	The geometry of each unit in a collection.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
distributionInfo	The description of the subject of distribution (occurrences or population), the indication of the count of observations or population size of the particular species, species group or taxon rank and its distribution or isolation within the species distribution unit.	DistributionInfoType	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
speciesName	Identifier and scientific name, including the author, taken from an international reference list, optionally completed by a locally used name and its taxonomic concept relationship to the reference name.	SpeciesNameType	

Association roles of the spatial object type SpeciesDistributionUnit

Association role	Definition	Type	Voidability
spatialObject	A reference to another spatial object defining the spatial extent of a distribution unit.	AbstractFeature	voidable

Constraints of the spatial object type SpeciesDistributionUnit

If geometry has no value, a reference to a spatial object needs to be provided.

18.3. **Data types**

18.3.1. *Distribution Info Type (DistributionInfoType)*

The description of the status of the subject of distribution within the species distribution unit, including the indication of the abundance by counting, estimation or calculation of the number of occurrences or population size of the particular species.

Attributes of the data type DistributionInfoType

Attribute	Definition	Type	Voidability
occurrenceCategory	The species population density in the species distribution unit.	OccurrenceCategory-Value	
residencyStatus	Information on the status of residency of a species regarding nativeness versus introduction and permanency.	ResidencyStatusValue	voidable

Attribute	Definition	Type	Voidability
populationSize	A range value indicating the counted, estimated or calculated occurrences or population sizes, using an upper and a lower limit.	PopulationSizeType	
sensitiveInfo	Boolean value that indicates whether the location of a specific species is sensitive.	Boolean	voidable
populationType	The permanency of populations, particularly with regard to migratory species within a given species distribution unit.	PopulationTypeValue	voidable
collectedFrom	The date when the collecting of the original species occurrence data started.	Date	voidable
collectedTo	The date when the collecting of the original species occurrence data stopped.	Date	voidable

18.3.2. *Population Size Type (PopulationSizeType)*

A range value indicating the counted, estimated or calculated occurrences or population sizes, which is defined by an upper and a lower limit.

Attributes of the data type PopulationSizeType

Attribute	Definition	Type	Voidability
countingMethod	Method of providing a number for the indication of the abundance of a species within a specific species distribution unit.	CountingMethodValue	
countingUnit	What has been counted, estimated or calculated when compiling information on the abundance of a species within the species distribution unit.	CountingUnitValue	
populationSize	A range value indicating the counted, estimated or calculated occurrences or population sizes using upper and lower bounds.	RangeType	

18.3.3. *Range Type (RangeType)*

Value indicating the upper and lower limits of the counting, estimation or calculation of occurrences.

Attributes of the data type RangeType

Attribute	Definition	Type	Voidability
upperBound	The upper limit of the range. If the value of this attribute is null and lowerBound is populated, this implies that the value is between the lowerBound and infinity.	Integer	
lowerBound	The lower limit of the range. If the value of this attribute is null and upperBound is populated, this implies that the value is between the upperBound and zero.	Integer	

18.3.4. *Species Name Type (SpeciesNameType)*

Identifier and scientific name, including the author, taken from an international reference list, optionally completed by a locally used name and its taxonomic concept relationship to the reference name.

Attributes of the data type SpeciesNameType

Attribute	Definition	Type	Voidability
referenceSpeciesId	Identifier of one of the reference lists given by the referenceSpeciesScheme.	ReferenceSpeciesCodeValue	
referenceSpeciesScheme	Reference list defining a nomenclatural and taxonomical standard to which all local names and taxonomic concepts shall be mapped.	ReferenceSpeciesSchemeValue	
referenceSpeciesName	The scientific name used in the authorized ReferenceSpeciesScheme.	CharacterString	voidable
localSpeciesId	Identifier used in national nomenclature.	LocalSpeciesNameCodeValue	voidable
localSpeciesScheme	Name of local species classification scheme (bibliographic reference).	CharacterString	voidable
localSpeciesName	Scientific name used in national nomenclature with its national taxonomic concept.	CharacterString	voidable
qualifier	Specifies the taxonomic concept relationship between local species identifier and the reference species identifier.	QualifierValue	voidable

18.4. **Code lists**

18.4.1. *Counting Method (CountingMethodValue)*

Method for producing numbers indicating the abundance of a species within an aggregation unit.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list CountingMethodValue

Value	Name	Definition
counted	counted	The units defined by the countUnitValues have been counted.
estimated	estimated	The units defined by the countUnitValues have been estimated.
calculated	calculated	The units defined by the countUnitValues have been calculated using a modelling technique.

18.4.2. *Counting Unit (CountingUnitValue)*

The defined unit used to express a counted or estimated number indicating the abundance of a species in a SpeciesDistributionUnit.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified for one of the following code lists in the INSPIRE Technical Guidance document on Species Distribution:

— General Counting Unit (GeneralCountingUnitValue): The unit used to express a counted or estimated number indicating the abundance within a SpeciesAggregationUnit (e.g. occurrences or the population size).

— Article 17 Counting Unit (Article17CountingUnitValue): The unit used for reporting pursuant to Article 17 of Directive 92/43/EEC. This unit expresses a counted or estimated number indicating the abundance within a species distribution unit (e.g. occurrences or the population size).

18.4.3. *Local Species Name Code (LocalSpeciesNameCodeValue)*

Species identifier taken from any local classification scheme.

The allowed values for this code list comprise any values defined by data providers.

18.4.4. *Occurrence Category (OccurrenceCategoryValue)*

The species population density in the SpeciesDistributionUnit.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list OccurrenceCategoryValue

Value	Name	Definition
common	Common	The species is regarded as common in the SpeciesDistributionUnit by the data provider.
rare	Rare	The species is regarded as rare in the SpeciesDistributionUnit by the data provider.
veryRare	Very rare	The species is regarded as very rare in the SpeciesDistributionUnit by the data provider.
present	Present	The species is present in the SpeciesDistributionUnit.
absent	Absent	The species has been searched for but not found in the SpeciesDistributionUnit.

18.4.5. *Population Type (PopulationTypeValue)*

The permanency of populations, particularly with regard to migratory species within a given species distribution unit.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Species Distribution.

18.4.6. *Qualifier (QualifierValue)*

This value defines the relation between the taxonomic concepts of a local species name and the reference species name given by reference species identifier or by a reference species scheme.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list QualifierValue

Value	Name	Definition
congruent	Congruent	The taxonomic concepts are identical.
includedIn	Included in	The taxonomic concept of the localSpeciesName is included in the concept of the referenceSpeciesName.

Value	Name	Definition
includes	Includes	The taxonomic concept of the localSpeciesName includes the concept of the referenceSpeciesName.
overlaps	Overlaps	The taxonomic concepts partially overlap, but each one has a part that is not included in the other.
excludes	Excludes	The taxonomic concepts exclude each other.

18.4.7.   *Reference Species Code (ReferenceSpeciesCodeValue)*

Reference lists containing species identifiers.

The allowed values for this code list comprise the values of the following code lists:

— EU-Nomen Code (EuNomenCodeValue): Reference lists containing the EU-Nomen species identifiers, as specified in the Pan-European Species directories Infrastructure available through the EU-Nomen portal.

— EUNIS Species Code (EunisSpeciesCodeValue): Reference lists containing the EUNIS species identifiers, as specified in EUNIS Biodiversity database published on the web site of the European Environment Agency.

— Nature Directives Code (NatureDirectivesCodeValue): Reference lists containing nature directives species identifiers, as specified in the Reference Portal for Natura 2000 as defined in Commission Implementing Decision 2011/484/EU.

18.4.8.   *Reference Species Scheme (ReferenceSpeciesSchemeValue)*

Reference lists defining a nomenclatural and taxonomical standard to which local names and taxonomic concepts can be mapped.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list ReferenceSpeciesSchemeValue

Value	Name	Definition
eunomen	Eunomen	Names and taxonomic concepts as defined by the Pan European Species Inventory, published by the EU-Nomen portal.
eunis	Eunis	Names and taxonomic concepts as defined by the EUNIS Species list.
natureDirectives	Nature directives	Names and taxonomic concepts as defined by the species lists in Directives 2009/147/EC (Birds Directive) and 92/43/EEC (Habitats Directive).

18.4.9.   *Residency Status (ResidencyStatusValue)*

Category of the residency of the occurrences or estimated population within a given aggregation unit.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Species distribution.

18.5.   **Theme-specific Requirements**

(1) Where grid representations of species distributions are needed, the Grid_ETRS89-LAEA as defined in Section 2.2.1 of Annex II shall be used.

(2) For SpeciesDistributionUnit spatial objects,

    (a) if a species has not been actively searched for, the distributionInfo attribute shall be void with reason "unknown",

    (b) and if a species has been actively searched for, but has not been found, the value of the attribute occurenceCategory of DistributionInfoType shall be "absent".

(3) If the geometries of the spatial objects in aSpeciesDistributionUnit data set are derived from the geometries of spatial objects in another data set, then this source data set (including its version) shall be described as part of the lineage metadata element.

18.6. **Layer**

Layer for the spatial data theme Species Distribution

Layer Name	Layer Title	Spatial object type
SD.<CodeListValue> ([1]) Example: SD.SulaBassana	Species Distribution (of <human readable name>) Example: Species Distribution (of Sula bassana)	SpeciesDistributionUnit (speciesName / referenceSpeciesId: ReferenceSpeciesCodeValue)

([1]) One layer shall be made available for each code list value, in accordance with Art. 14(3).

19. ENERGY RESOURCES

19.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(4) "energy resource" means a concentration or occurrence of an energy source which may have been present, is present or may be present in the future.

(5) "fossil fuels" means a form of non-renewable primary energy formed by natural processes such as the anaerobic decomposition of buried dead organisms, which contains high percentages of carbon and includes coal, crude oil, and natural gas.

(6) "primary energy" means energy that has not been subjected to any conversion or transformation process.

(7) "non-renewable energy" means natural resources which, due to long-term formation, cannot be produced, grown, generated, or used on a scale which can sustain its consumption rate.

(8) "energy from renewable sources" means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases, in accordance with Article 2 of Directive 2009/28/EC of the European Parliament and of the Council ([1]).

(9) "waste as energy resources" means a fuel that may consist of many different materials coming from combustible industrial, institutional, hospital and household waste such as rubber, plastics, waste fossil oils and other similar commodities. It is either solid or liquid in form, renewable or non-renewable, biodegradable or non-biodegradable.

19.2. **Structure of the Spatial Data Theme Energy Resources**

The types specified for the spatial data theme Energy Resources are structured in the following packages:

— Energy Resources Base

— Energy Resources Vector

— Energy Resources Coverage

([1]) OJ L 140, 5.6.2009, p. 16.

19.3.   **Energy Resources Base**

19.3.1.   *Data types*

19.3.1.1.   Vertical Extent Range Type (VerticalExtentRangeType)

Value indicating the upper and lower bounds of the height/depth range.

Attributes of the data type VerticalExtentRangeType

Attribute	Definition	Type	Voidability
lowerBound	Value indicating the lower bound of the height/depth range.	Length	voidable
upperBound	Value indicating the upper bound of the height/depth range.	Length	

Constraints of the data type VerticalExtentRangeType

Value of lowerBound shall be expressed in meters.

Value of upperBound shall be expressed in meters.

19.3.1.2.   Vertical Extent Type (VerticalExtentType)

Vertical dimensional property consisting of an absolute measure or range of measures referenced to a well-defined vertical reference level which is commonly taken as origin (ground level, mean sea level, etc.).

Attributes of the data type VerticalExtentType

Attribute	Definition	Type	Voidability
verticalExtent	Extent of the vertical dimension, represented by a scalar or by a range of values.	VerticalExtentValue	
verticalReference	Reference level that was chosen to determine the vertical height/depth.	VerticalReferenceValue	

19.3.1.3.   Vertical Extent Value (VerticalExtentValue)

Either a single number or a range of height/depth values to describe the height/depth position of an Energy Resource.

This type is a union type.

Attributes of the union type VerticalExtentValue

Attribute	Definition	Type	Voidability
range	Range of numbers representing the height or depth range of an Energy Resource.	VerticalReferenceRangeType	
scalar	Number representing the height or depth of an Energy Resource.	Length	

Constraints of the union type VerticalExtentValue

Value of scalar shall be expressed in meters.

19.3.2.   *Code lists*

19.3.2.1.   Classification and Quantification Framework (ClassificationAndQuantificationFrameworkValue)

Values for the most widely used classification schemes to classify and quantify energy resources.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Energy Resources.

19.3.2.2.   Fossil Fuel Class (FossilFuelClassValue)

Values indicating the various levels of fossil fuel resources.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Energy Resources.

19.3.2.3.   Renewable and Waste (RenewableAndWasteValue)

Types of renewable and waste resources.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list RenewableAndWasteValue

Value	Name	Definition
biogas	biogas	A gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass.
geothermal	geothermal	Energy available as heat emitted from within the Earth's crust, usually in the form of hot water or steam. This energy production is the difference between the enthalpy of the fluid produced in the production borehole and that of the fluid eventually disposed of. It is exploited at suitable sites for electricity generation or directly as heat.
hydro	hydro power	Potential and kinetic energy of water converted into electricity in hydroelectric plants.
industrialWaste	industrial waste	Waste of industrial non-renewable origin (solids or liquids) combusted directly for the production of electricity and/or heat.
liquidBiofuels	liquid biofuels	Liquid biofuels are biogasoline, bio-diesels or other biofuels directly used as fuel.
municipalSolidWaste	municipal solid waste	Waste produced by households, industry, hospitals and the tertiary sector which contains biodegradable materials that are incinerated at specific installations.
solarPhotovoltaic	solar photovoltaic	Sunlight converted into electricity by the use of solar cells usually made of semi-conducting material which, when exposed to light, will generate electricity.

Value	Name	Definition
solarThermal	solar thermal	Heat from solar radiationthat can consist of solar thermal-electric plants or of equipment for the production of heat.
solidBiomass	solid biomass	Covers organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation.
tideWaveOcean	tide, wave, ocean	Mechanical energy derived from tidal movement, wave motion or ocean current and exploited for electricity generation.
wind	wind	Kinetic energy of wind exploited for electricity generation in wind turbines.

19.3.2.4. Fossil Fuel (FossilFuelValue)

Types of fossil fuels.

The allowed values for this code list comprise only the values specified in the table below.

Values for the code list FossilFuelValue

Value	Name	Definition
hardCoal	hard coal	Black, combustible, solid, organic fossil sediment often referred to as High Rank, due to their high calorific value, or Black Coals, given their physical characteristic. This category includes anthracite, coking coal and other bituminous coal.
lowRankCoal	low-rank coal	Combustible brown to black organic fossil sediment which are non-agglomerating and are often referred to as Low Rank Coals due to their lower calorific value or Brown Coals, due to their physical characteristics. This category includes both sub-bituminous coals and lignite.
peat	peat	A combustible soft, porous or compressed, sedimentary deposit of plant origin with high water content (up to 90 % in the raw state), easily cut, of light to dark brown colour.
crudeOil	crude oil	Crude oil is a mineral oil of natural origin comprising a mixture of hydrocarbons and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperature and pressure and its physical characteristics (density, viscosity, etc.) are highly variable.
naturalGas	natural gas	Gases occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane.
naturalGasLiquids	natural gas liquids	Liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas processing plants.

Value	Name	Definition
oilSands	oil sands	Oil sands, tar sands or, more technically, bituminous sands, are loose sand or partially consolidated sandstone saturated with a dense and extremely viscous form of petro-leum technically referred to as bitumen.
oilShales	oil shales	Oil shale, also known as kerogen shale, is an organic-rich fine-grained sedimentary rock containing kerogen (immature hydrocar-bons).

19.3.2.5. Vertical Reference (VerticalReferenceValue)

Values indicating the reference level of the vertical extent.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Energy Re-sources.

19.4. **Energy Resources Vector**

19.4.1. *Spatial object types*

The package Energy Resources Vector contains the following spatial object types:

— Vector Energy Resource

— Fossil Fuel Resource

— Renewable And Waste Resource

19.4.1.1. Vector Energy Resource (VectorEnergyResource)

A vector spatial object defining an inferred or observable spatial extent of a resource that can be or has been used as a source of energy.

This type is abstract.

Attributes of the spatial object type VectorEnergyResource

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
geometry	Geometric representation of spatial ex-tent covered by this energy resource.	GM_Object	
classificationAndQuan-tificationFramework	A reference classification scheme to classify and quantify energy resources.	ClassificationAndQuan-tificationFramework-Value	
verticalExtent	Vertical dimensional property consist-ing of an absolute measure or range of measures referenced to a well-de-fined vertical reference level which is commonly taken as origin (ground level, mean sea level, etc.).	VerticalExtentType	voidable

Attribute	Definition	Type	Voidability
exploitationPeriod	The exploitationPeriod defines the start and, if applicable, the end date of the application.	ExploitationPeriodType	voidable
reportingAuthority	Organisation responsible for reporting on the estimated and produced energy resources.	RelatedParty	voidable
resourceName	The name of the energy resource.	GeographicalName	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

19.4.1.2. Fossil Fuel Resource (FossilFuelResource)

A spatial object defining an inferred or observable spatial extent of a resource that can be or has been used as a source of fossil fuel energy. The most common fossil fuel types are coal, natural gas and crude oil.

This type is a sub-type of VectorEnergyResource.

Attributes of the spatial object type FossilFuelResource

Attribute	Definition	Type	Voidability
resource	Type and amount of fossil fuel resources in a single spatial object.	FossilFuelResourceType	
dateOfDiscovery	The date the energy source was discovered.	TM_Position	voidable

19.4.1.3. Renewable And Waste Resource (RenewableAndWasteResource)

A spatial object defining an inferred or observable spatial extent of a resource that can be or has been used as a source of renewable energy or waste.

This type is a sub-type of VectorEnergyResource.

Attributes of the spatial object type RenewableAndWasteResource

Attribute	Definition	Type	Voidability
capacity	Energy capacity of a renewable energy resource within the spatial extent.	Measure	voidable
dateOfDetermination	Date on which the capacity of the resource has been determined.	TM_Position	voidable
typeOfResource	The type of renewable energy or waste resource.	RenewableAndWasteValue	

19.4.2.　*Data types*

19.4.2.1.　Calorific Range Type (CalorificRangeType)

Value indicating the upper and lower bounds of the calorific range of the energy resource.

Attributes of the data type CalorificRangeType

Attribute	Definition	Type	Voidability
lowerBound	Value indicating the lower bound of the calorific range.	Measure	
upperBound	Value indicating the upper bound of the calorific range.	Measure	

19.4.2.2.　Calorific Value Type (CalorificValueType)

Value or range of values describing the calorific value of an Energy Resource.

This type is a union type.

Attributes of the union type CalorificValueType

Attribute	Definition	Type	Voidability
calorificRange	A range of calorific values describing the calorific value of an Energy Resource.	CalorificRangeType	
calorificScalar	Measure quantifying the calorific property of an Energy Resource.	Measure	

19.4.2.3.　Exploitation Period Type (ExploitationPeriodType)

The exploitationPeriod defines the start and, if applicable, the end date of the exploitation or application.

Attributes of the data type ExploitationPeriodType

Attribute	Definition	Type	Voidability
beginTime	The time when the exploitation started.	TM_Position	
endTime	The time when the exploitation ended.	TM_Position	

19.4.2.4.　Fossil Fuel Measure (FossilFuelMeasure)

Amount of resources according to the specific categorisation.

Attributes of the data type FossilFuelMeasure

Attribute	Definition	Type	Voidability
amount	Amount of resource present in the spatial object.	Measure	
dateOfDetermination	Date on whichthe resource was quantified.	TM_Position	
resourceClass	Category indicating the different confidence of fossil fuel resource, like initially in place, proven reserves, contingent.	FossilFuelClassValue	

19.4.2.5. Fossil Fuel Resource Type (FossilFuelResourceType)

Type and amount of resource according to specific categorisation.

Attributes of the data type FossilFuelResourceType

Attribute	Definition	Type	Voidability
calorificValue	Each fossil fuel resource is characterised by its own calorific value, i.e. the quantity of energy available in a unit of mass.	CalorificValueType	voidable
quantity	Amount of resource according to the specific categorisation.	HydrocarbonMeasure	voidable
typeOfResource	Type of fossil fuel.	FossilFuelValue	

19.5. **Energy Resources Coverage**

19.5.1. *Spatial object types*

The package Energy Resources Coverage contains the spatial object type Renewable And Waste Potential Coverage.

19.5.1.1. Renewable And Waste Potential Coverage (RenewableAndWastePotentialCoverage)

Function that returns an energy potential value from its range for any direct position within its spatial, temporal or spatio-temporal domain.

This type is a sub-type of RectifiedGridCoverage.

Attributes of the spatial object type RenewableAndWastePotentialCoverage

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
potentialType	There are various types of potential energy, each associated with a particular type of power.	PotentialTypeValue	
typeOfResource	Type of renewable and waste resource to which the measured phenomenon is applicable.	RenewableAndWasteValue	
domainExtent	The attribute domainExtent shall contain the extent of the spatiotemporal domain of the coverage. Extents may be specified in both space and time.	EX_Extent	
assessmentMethod	A reference to the method used to assess the energy resource potential.	DocumentCitation	voidable
name	Name of the coverage.	CharacterString	voidable
validTime	The time period for which this coverage is representative.	TM_Period	voidable
verticalExtent	A number or a range of height/depth values to describe the height/depth for which the range set values are valid.	VerticalExtentType	voidable

Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Constraints of the spatial object type RenewableAndWastePotentialCoverage

The rangeSet values shall be of type Measure.

19.5.2. *Code lists*

19.5.2.1. Potential Type (PotentialTypeValue)

Types of potential energy from renewable and waste resources.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified for one of the following code lists in the INSPIRE Technical Guidance document on Energy Resources:

— Geothermal Potential (GeothermalPotentialValue): Types of potential geothermal energy.

— Hydro Potential (HydroPotentialValue): Types of potential hydro energy.

— Solar Potential (SolarPotentialValue): Types of potential solar energy.

— Tidal Potential (TidalPotentialValue): Types of potential tidal energy.

— Wind Potential (WindPotentialValue): Types of potential wind energy.

19.6. **Theme-specific Requirements**

Where the geometry of the spatial object is derived from another spatial object, the geometries of the two objects shall be consistent.

19.7. **Layers**

Layers for the spatial data theme Energy Resources

Layer Name	Layer Title	Spatial object type
ER. FossilFuelResource	Fossil Fuel Resources	FossilFuelResource
ER.RenewableAndWasteResource	Renewable And Waste Resources	RenewableAndWasteResource
ER.RenewableAndWastePotentialCoverage	Renewable And Waste Potential Coverage	RenewableAndWastePotentialCoverage

20. MINERAL RESOURCES

20.1. **Definitions**

In addition to the definitions set out in Article 2, the following definitions shall apply:

(1) "commodity" means a material of economic interest in an earth resource.

(2) "mine" means an excavation for the extraction of mineral deposits, including underground workings and open-pit workings (also called open-sky mines) for the extraction of metallic commodities, as well as open workings for the extraction of industrial minerals, (which are commonly referred to as quarries).

(3) "mining activity" means the process of extracting metallic or non-metallic mineral deposits from the Earth.

20.2. **Structure of the Spatial Data Theme Mineral Resources**

The types specified for the spatial data theme Mineral Resources are structured in the following packages:

— Mineral Resources

— Geology (for the spatial object type MappedFeature, specified in Section 4.2.1.10 of Annex III)

20.3. **Mineral Resources**

The package Mineral Resources contains the following spatial object types:

— Earth Resource

— Mineral Occurrence

— Commodity

— Exploration Activity

— Mining Feature

— Mining Feature Occurrence

— Mine

— Mining Activity

20.3.1. *Spatial object types*

20.3.1.1. Earth Resource (EarthResource)

The kinds of observable or inferred phenomena required to classify economic and non economic earth resources.

This type is a sub-type of GeologicFeature.

This type is abstract.

Attributes of the spatial object type EarthResource

Attribute	Definition	Type	Voidability
dimension	The size/volume of the earth resource.	EarthResourceDimension	voidable
expression	An indicator of whether an EarthResource appears on the surface or has been detected under cover rocks.	Category	voidable
form	The orebody's typical physical and structural relationship to wallrocks and associated rocks.	Category	voidable
linearOrientation	The linear orientation of the Earth Resource.	CGI_LinearOrientation	voidable
planarOrientation	The planar orientation of the Earth Resource.	CGI_PlanarOrientation	voidable
shape	The typical geometrical shape of the Earth Resource.	Category	voidable

Attribute	Definition	Type	Voidability
sourceReference	The source reference for the Earth Resource.	DocumentCitation	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanversion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type EarthResource

Association role	Definition	Type	Voidability
oreAmount	The estimated or calculated amount of ore with the identification of the commodities contained and their grade.	OreMeasure	voidable
explorationHistory	Chronological list of surveys undertaken to better define the potential of a mineral occurrence.	ExplorationActivity	voidable
classification	Classification of the EarthResource.	MineralDepositModel	voidable
resourceExtraction	One or more periods of mining activity of the earth resource.	MiningActivity	voidable
commodityDescription	The commodities present in the resource ranked by importance order	Commodity	

20.3.1.2. Mineral Occurrence (MineralOccurrence)

A mineral accumulation in the lithosphere.

This type is a sub-type of EarthResource.

Attributes of the spatial object type MineralOccurrence

Attribute	Definition	Type	Voidability
type	The type of mineral occurrence.	MineralOccurrenceTypeValue	
endusePotential	The end-use potential of the mineral.	EndusePotentialValue	voidable

20.3.1.3. Commodity (Commodity)

The material of economic interest in the EarthResource.

Attributes of the spatial object type Commodity

Attribute	Definition	Type	Voidability
commodityImportance	The importance of the deposit for the commodity.	ImportanceValue	voidable
commodity	The earth resource commodity.	CommodityCodeValue	
commodityRank	The rank of the commodity.	Integer	voidable

Association roles of the spatial object type Commodity

Association role	Definition	Type	Voidability
source	The deposit/resource from which the commodity comes.	EarthResource	

20.3.1.4. Exploration Activity (ExplorationActivity)

A period of exploration activity.

Attributes of the spatial object type ExplorationActivity

Attribute	Definition	Type	Voidability
activityDuration	Period, or extent in time, of the exploration activity.	TM_Period	
activityType	The type of exploration activity.	ExplorationActivity-TypeValue	
explorationResult	The result of the exploration activity.	ExplorationResultValue	

20.3.1.5. Mining Feature (MiningFeature)

Spatial object type grouping the common properties of mines and mining activities.

This type is abstract.

Attributes of the spatial object type MiningFeature

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	

20.3.1.6. Mining Feature Occurrence (MiningFeatureOccurrence)

A spatial representation of a MiningFeature.

Attributes of the spatial object type MiningFeatureOccurrence

Attribute	Definition	Type	Voidability
shape	The geometry of the MiningFeature.	GM_Object	

Association roles of the spatial object type MiningFeatureOccurrence

Association role	Definition	Type	Voidability
specification	Indicates the MiningFeature that the MiningFeatureOccurrence specifies.	MiningFeature	

20.3.1.7. Mine (Mine)

An excavation carried out for the extraction of mineral deposits.

This type is a sub-type of MiningFeature.

Attributes of the spatial object type Mine

Attribute	Definition	Type	Voidability
mineName	Data type indicating the Mine Name and whether it is the preferred name.	MineName	
status	Operational status value of the mine.	MineStatusValue	
sourceReference	The source reference for the mine.	DocumentCitation	voidable
startDate	Date on which the mine commenced operation.	TM_Instant	voidable
endDate	Date on which the mine ceased operation.	TM_Instant	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	DateTime	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable

Association roles of the spatial object type Mine

Association role	Definition	Type	Voidability
relatedMine	A related mine.	Mine	voidable
relatedActivity	The MiningActivity associated with the Mine.	MiningActivity	

20.3.1.8. Mining Activity (MiningActivity)

The process of extracting metallic, non-metallic mineral or industrial rock deposits from the Earth.

This type is a sub-type of MiningFeature.

Attributes of the spatial object type MiningActivity

Attribute	Definition	Type	Voidability
activityDuration	Period, or extent in time, of the mining activity.	TM_Period	
activityType	The type of mining activity.	MiningActivityType-Value	
oreProcessed	The amount of ore processed by the activity.	Quantity	voidable
processingType	The type of processing carried out during the mining activity.	ProcessingActivityType-Value	

Association roles of the spatial object type MiningActivity

Association role	Definition	Type	Voidability
associatedMine	The mine where the mining activity takes or took place.	Mine	voidable
deposit	The deposit to which the mining activity is associated.	EarthResource	voidable

20.3.2. *Data types*

20.3.2.1. Commodity Measure (CommodityMeasure)

A measure of the amount of the commodity based on a Reserve, Resource or Endowment calculation.

Attributes of the data type CommodityMeasure

Attribute	Definition	Type	Voidability
commodityAmount	The amount of the commodity.	QuantityRange	voidable
cutOffGrade	The cut-off grade used for calculating the commodity measure.	QuantityRange	voidable
grade	The grade of the commodity.	QuantityRange	voidable

Association roles of the data type CommodityMeasure

Association role	Definition	Type	Voidability
commodityOfInterest	The commodity to which the CommodityMeasure refers.	Commodity	

20.3.2.2. Earth Resource Dimension (EarthResourceDimension)

The size and volume of the earth resource.

Attributes of the data type EarthResourceDimension

Attribute	Definition	Type	Voidability
area	The area of the Earth Resource.	QuantityRange	voidable
depth	The depth of the Earth Resource.	QuantityRange	voidable
length	The length of the Earth Resource.	QuantityRange	voidable
width	The width of the Earth Resource.	QuantityRange	voidable

20.3.2.3. Endowment (Endowment)

The quantity of a mineral (or a group of minerals for industrial rocks) in accumulations (deposits) meeting specified physical characteristics such as quality, size and depth.

This type is a sub-type of OreMeasure.

Attributes of the data type Endowment

Attribute	Definition	Type	Voidability
includesReserves	A flag indicating if the estimate includes the reserves value.	Boolean	voidable
includesResources	A flag indicating if the estimate includes the resources value.	Boolean	voidable

20.3.2.4. Mine Name (MineName)

A data type indicating the Mine Name and whether it is the preferred name.

Attributes of the data type MineName

Attribute	Definition	Type	Voidability
isPreferred	A boolean operator indicating if the value in mineName is the preferred name of the mine.	Boolean	
mineName	The name of the mine.	CharacterString	

20.3.2.5. Mineral Deposit Model (MineralDepositModel)

Systematically arranged information describing the essential attributes of a class of mineral deposits. It may be empirical (descriptive) or theoretical (genetic).

Attributes of MineralDepositModel

Attribute	Definition	Type	Voidability
mineralDepositGroup	A grouping of mineral deposits defined by generic characteristics.	MineralDepositGroup-Value	
mineralDepositType	Style of mineral occurrence or deposit.	MineralDepositType-Value	voidable

20.3.2.6. Ore Measure (OreMeasure)

The estimate of the Reserve, Resource or Endowment ore amount.

This type is abstract.

Attributes of the data type OreMeasure

Attribute	Definition	Type	Voidability
classificationMethodUsed	Means of calculating the measurement.	ClassificationMethodUsedValue	
date	Date of calculated or estimated value.	TM_GeometricPrimitive	
dimension	Size of the body used in the calculation.	EarthResourceDimension	voidable
ore	Amount of ore.	QuantityRange	
proposedExtractionMethod	The method proposed to extract the commodity.	Category	voidable
sourceReference	The reference for the OreMeasure values.	DocumentCitation	

Association roles of the data type OreMeasure

Association role	Definition	Type	Voidability
measureDetails	A measure of the amount of each commodity, based on a reserve, resource or endowment calculation.	CommodityMeasure	

20.3.2.7.　Reserve (Reserve)

The economically mineable part of a Measured and/or Indicated Mineral Resource.

This type is a sub-type of OreMeasure.

Attributes of the data type Reserve

Attribute	Definition	Type	Voidability
category	The level of confidence of the estimate.	ReserveCategoryValue	

20.3.2.8.　Resource (Resource)

An accumulation of material of intrinsic economic interest in or on the Earth's crust in such form, quality and quantity that there are reasonable prospects for economic extraction.

This type is a sub-type of OreMeasure.

Attributes of the data type Resource

Attribute	Definition	Type	Voidability
category	Indication of whether the resource is measured, indicated or inferred.	ResourceCategoryValue	
includesReserves	A flag indicating whether the estimate of resources includes reserve values.	Boolean	voidable

20.3.3.　*Code lists*

20.3.3.1.　Classification Method Used (ClassificationMethodUsedValue)

Codes indicating the means used to calculate the ore measurement.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ClassificationMethodUsedValue

Value	Name	Definition
JORCcode	JORC code	The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves.
NI43-101	NI 43-101	National Instrument 43-101 (the "NI 43-101" or the "NI") is a mineral resource classification scheme used for the public disclosure of information relating to mineral properties in Canada.
CIMstandards	CIM standards	The CIM Definition Standards on Mineral Resources and Reserves (CIM Definition Standards) establish definitions and guidelines for the reporting of exploration information, mineral resources and mineral reserves in Canada.
SAMRECcode	SAMREC code	The South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves.

Value	Name	Definition
IMMReportingCode	IMM Reporting Code	The Code for Reporting of Mineral Resources and Mineral Reserves sets out minimum standards, recommendations and guidelines for Public Reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves in the United Kingdom, Ireland and Europe.
SMEGuide	SME Guide	A guide for reporting exploration information, mineral resources, and mineral reserves – USA.
IIMChCode	IIMCh Code	Certification Code for Exploration Prospects, Mineral Resources & Ore Reserves. This Code is the result of a Collaboration Agreement between the Institution of Mining Engineers of Chile (IIMCh) and the Ministry of Mining.
peruvianCode	Peruvian Code	This Code was prepared by a Joint Committee formed by members of the Lima Stock Exchange and by professionals dedicated to the exploration and evaluation of mineral resources.
CRIRSCOCode	CRIRSCO Code	The International Template for Reporting of Exploration Results, Mineral Resources and Mineral Reserves of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) integrates the minimum standards being adopted in national reporting codes worldwide with recommendations and interpretive guidelines for the public reporting of exploration results, mineral resources and mineral reserves.
UNFCCode	UNFC Code	The United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) is a universally applicable scheme for classifying/evaluating energy and mineral reserves and resources - it is the successor to UNFC-2004.
SECGuide	SEC Guide	Description of Property by Issuers Engaged or to be Engaged in Significant Mining Operations. Developed by the United States Securities and Exchange Commission.
PERCCode	PERC Code	The Pan European Reserves and Resources Reporting Committee (PERC) Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (further referred to as "the Code") sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in the United Kingdom, Ireland and Europe.

Value	Name	Definition
russianCode	Russian Code	Currently effective in Russia is the Code approved by the Decree of the Ministry of Natural Resources, RF No 278 of 11 December, 2006. Full title of the Document: Classification of resources/reserves and prognostic resources of solid minerals.
historicResourceEstimate	Historic resource estimate	Term for resource estimation before "standard codes" (e.g. JORC etc.)

20.3.3.2. Commodity Code (CommodityCodeValue)

Values indicating the type of commodity.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Mineral Resources.

20.3.3.3. Enduse Potential (EndusePotentialValue)

Values indicating the end-use potential of the mineral.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list EndusePotentialValue

Value	Name	Definition	Parent
metallicMinerals	metallic minerals	Mineral occurrences including any type of metallic mineral.	
preciousMetals	precious metals	Mineral occurrences including Silver; Gold; Platinoids in general.	metallicMinerals
baseMetals	base metals	Mineral occurrences including Aluminium; Copper; Lead; Lead + Zinc; Tin; Zinc	metallicMinerals
ironFerroalloyMetals	iron and ferro-alloy metals	Mineral occurrences including Cobalt; Chromium; Iron; Manganese; Molybdenum; Niobium; Nickel; Vanadium; Tungsten.	metallicMinerals
specialityAndRareMetals	speciality and rare metals	Mineral occurrences including Beryllium; Bismuth; Cadmium; Germanium, Gallium; Hafnium; Mercury; Indium; Lithium; Rubidium, Cesium; Rhenium; Rare Earths (undifferentiated); Antimony; Selenium; Tantalum; Tellurium; Titanium (ilmenite, rutile); Zirconium (zircon, baddeleyite).	metallicMinerals
nonMetallicMinerals	non-metallic minerals	Mineral occurrences including any type of non-metallic mineral.	
buildingRawMaterial	building raw material	Mineral occurrences including Aggregate; Dimension & ornamental stones (granite, gabbro, travertine, etc.); Gypsum, anhydrite; Cement limestone; Limestone for lime; Marble.	nonMetallicMinerals

Value	Name	Definition	Parent
ceramicAndRefractory	ceramic and refractory	Mineral occurrences including common clays (brick, tile); White-firing clays (refractory and ceramic clays); Dolomite; Feldspar, nepheline; Kaolin; Andalusite group (andalusite, kyanite, sillimanite).	nonMetallic-Minerals
chemicalMinerals	chemical minerals	Mineral occurrences including Borates; Barite; Fluorite; Magnesium (magnesite); Sodium sulphate; Sodium carbonate (trona); Pyrite; Sulphur; Rock salt; Strontium; Zeolites.	nonMetallic-Minerals
energyCoverMinerals	energy cover minerals	Mineral occurrences including Bituminous sandstone/limestone, oil shale; Coal; Lignite; Peat; Thorium; Uranium.	nonMetallic-Minerals
fertilizer	fertilizer	Mineral occurrences including Phosphate; Potash (sylvite, carnalite).	nonMetallic-Minerals
preciousAndSemi-PreciousStones	precious and semi-precious stones	Mineral occurrences including Diamond (industrial and gemstone); Emerald; Ruby, Sapphire, Corundum (gemstone); Beryls, quartz, tourmalines, garnets, topaz, peridot, zircon, etc. (gemstones).	nonMetallic-Minerals
specialityAndOtherIndustrialMinerals	speciality and other industrial rocks and minerals	Mineral occurrences including Abrasives: garnet, staurolite, corundum; Asbestos (antophyllite, chrysotile, crocidolite); Attapulgite, sepiolite (clay); Bentonite (clay); Limestone, calcite (filler); Diatomite (kieselguhr); Graphite; Mica; Perlite; Quartz (massive / block for ferrosilicon); Quartz, optical & piezoelectrical use; Silica sand; Talc, pyrophyllite; Vermiculite; Wollastonite.	nonMetallic-Minerals
recycledWaste	recycled waste	Mineral occurrences including metals or minerals coming from mining waste treatment.	

20.3.3.4.   Exploration Activity Type (ExplorationActivityTypeValue)

Types of exploration activity carried out.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This code list is hierarchical.

Values for the code list ExplorationActivityTypeValue

Value	Name	Definition	Parent
regionalReconnaissance	regional reconnaissance	Regional investigation to identify anomalies (geochemical, geophysical, mineralogical) and discover occurrences.	
hammerProspectingAndGeologicalReconnaissance	hammer prospecting and geological reconnaissance	Drafting of a very preliminary geological map with the main formations and the main structures, including the location of discovered mineral showings.	regionalReconnaissance

Value	Name	Definition	Parent
regionalGeochemistry	regional geochemistry	The detection of abnormal concentrations of chemical elements in superficial water, soils or organisms, usually accomplished by instrumental, spot-test, or rapid techniques which are applicable in the field.	regionalReconnaissance
airborneGeophysics	airborne geophysics	Exploration technique based on the detection of anomalous physical characteristics of a ground.	regionalReconnaissance
regionalHeavyMineralSampling	regional heavy mineral sampling	Prospecting with a hand-held washing tool, usually shaped like a plate or a flat cone, at the bottom of which the densest fractions of a soil, a stream sediment are collected.	regionalReconnaissance
detailedSurfaceExploration	detailed surface exploration	Detailed surface exploration to delineate anomalies and describe occurrences in their refined geological context.	
geologicalMappingAndSampling	geological mapping and sampling	Detailed geological mapping of the area(s) of interest.	detailedSurfaceExploration
detailedGeochemistry	detailed geochemistry	Detailed surveys (often on a grid) with the most appropriate method, in order to confirm and better delineate and characterize geochemical anomalies identified during the previous phase.	detailedSurfaceExploration
detailedGeophysics	detailed geophysics	Detailed surveys (often on a grid) with the most appropriate method, in order to confirm and better delineate and characterize geophysical anomalies identified during the previous phase.	detailedSurfaceExploration
detailedHeavyMineralSampling	detailed heavy mineral sampling	Detail prospecting in a local scale with a hand-held washing tool, usually shaped like a plate or a flat cone, at the bottom of which the densest fractions of a soil, a stream sediment are collected.	detailedSurfaceExploration
subsurfaceExploration	subsurface exploration	Subsurface exploration using the low costs techniques (trenching, destructive drilling, etc.), of resources appraisal.	
trenchingChannelSampling	removal of overburden, trenching, channel sampling	Shallow ditch from which a sample can be taken and a geological observation made.	subsurfaceExploration
augerDrilling	auger drilling	Drilling of a cylindrical hole with an ad hoc tool in order to collect a rock sample, or to carry out a physical measurement or a geological observation. By extension, designates also the drill hole, whatever the latter's purpose. In this case drilling is performed by means of an auger, i.e. with a helical screw which is driven into the ground with rotation.	subsurfaceExploration

Value	Name	Definition	Parent
percussionDrilling	percussion drilling	Drilling of a cylindrical hole with an ad hoc tool in order to collect a rock sample, or to carry out a physical measurement or a geological observation. By extension, designates also the drill hole, whatever the latter's purpose. In this case, drilling is performed with a percussion tool.	subsurfaceExploration
assesmentOfResource	assesmantof the resource	The aim of this phase is the (still rough) delineation of the envelope of an orebody. Logging of cores, sampling of mineralized sections to better understand the distinctive features of the deposit, the physical properties of the ore, and finally to lead to a first (still approximate) calculation of the resource.	
reconnaissancePercussionDrilling	reconnaissance percussion drilling	The assessment of the resource using percussion drilling, sometimes on a grid with a wide mesh. The aim of this phase is the (still rough) delineation of the envelope of an orebody. Drill logging, sampling of mineralized sections to better understand the distinctive features of the deposit, the physical properties of the ore, and finally to lead to a first (still approximate) calculation of the resource.	assesmentOfResource
reconnaissanceCoreDrilling	reconnaissance core drilling	Drilling of a cylindrical hole with an ad hoc tool in order to collect a rock sample, or to carry out a physical measurement or a geological observation. By extension, designates also the drill hole, whatever the latter's purpose. Boreholes are drilled by coring. This technique is used to collect undisturbed rock cylinders and allows to confirm/to precise results from percussion drilling.	assesmentOfResource
geologicalInterpretation	geological interpretation	Compilation and synthesis of all the available geological information in order to get an as precise as possible model of the mineral resource.	assesmentOfResource
oreBeneficiationTest	ore beneficiation tests	Technique designed to treat run of mine material.	assesmentOfResource
approximateResourceCalculation	approximate calculation of the resource	Rough evaluation of the tonnage and grade essentially based on drill holes information, by correlation and interpolation of intersected mineralized sections.	assesmentOfResource
evaluationOfOreDeposit	evaluation of the ore deposit	This the final phase of evaluation leading to the final yes/no mining decision.	

Value	Name	Definition	Parent
systematicReconnaissanceCoreDrilling	systematic reconnaissance core drilling	The evaluation of the ore deposit with the aim of getting very detailed information on the whole deposit and best quality samples. This the final phase of evaluation leading to the final yes/no mining decision	evaluationOfOreDeposit
miningWorkings	mining workings	Reconnaissance workings aimed at getting a better understanding of the deposit, and allowing to get large ore samples for detailed beneficiation tests.	evaluationOfOreDeposit
geostatisticalEstimates	geostatistical estimates	Technique based on probability theory that is used to compute regionalized variables, the values of which depend on their position in space, such as the metal content or grade in a deposit.	evaluationOfOreDeposit
feasibilityStudyReport	feasibility study and report	Technical economic study aimed at assessing the possibility to launching a mine venture.	evaluationOfOreDeposit
miningPilot	mining pilot	Intermediate phase between laboratory tests and actual plant.	evaluationOfOreDeposit

20.3.3.5. Exploration Result (ExplorationResultValue)

Values indicating the result of the exploration activity.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ExplorationResultValue

Value	Name	Definition
isolatedMineralizedStones	isolated mineralized stones, showings, occurrences, altered areas	Identification of possible markers of a mineralized area.
anomalies	anomalies	Anomaly or anomalous area which geophysical or geochemical properties are different from areas around and which might indicate the presence of a mineralizing process in the vicinity.
keyMineralsIdentification	identification of key minerals	Identification of particular minerals which may indicate a possible mineralized area or accompany a mineralizing process.
detailedProspectMap	detailed prospect map with location of mineralized areas	A detailed map with location of all the mineralized occurrences whatever their size and representation of their relationships with lithology, structures, alteration zones, anomalous areas, sampling analysis results.
structuredAnomalies	structured anomalies	Narrowing of the area under mineral prospection, and a more detailed internal structure

Value	Name	Definition
prospectBoundariesRefinement	prospect boundaries refinement	Progressively reducing the surface area until the discovery of a mineral deposit.
primaryReconnaissanceMineralization	mineralization primary reconnaissance	The first attempts to see (removal of overburdens, trenching) or to intercept (auger, subsurface percussion drilling), and to sample primary mineralization.
indicatedMineralization	mineralization indicated	The first attempts to roughly delineate the ore body, using reconnaissance drilling (percussion and then core drilling), to sample it in detail, and to approximately evaluate the resource using geological interpretation, beneficiation tests.
indicatedOreDeposit	ore deposit indicated	The presence of an ore body has been demonstrated using systematic core drilling and sometimes some preliminary mining workings. The external geometry of the ore body and its internal structure (including ore grade distribution) starts to be well-known.
indicatedAndEstimatedOreDeposit	ore deposit indicated and estimated	Refinement of previous knowledge using statistical tools allowing for example interpolations between drill holes, and definition of enriched areas.
feasibilityStudyForMiningDecision	feasibility study report available for mining decision	Technical economic study aimed at assessing the possibility to launching a mine venture.
industrialTest	industrial test	Intermediate phase between laboratory tests and actual plant.

20.3.3.6.   Importance (ImportanceValue)

Values indicating the importance of the commodity for the Earth Resource.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Mineral Resources.

20.3.3.7.   Mine Status (MineStatusValue)

Values indicating the operational status of the mine.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list MineStatusValue

Value	Name	Definition	Parent
operating	operating	A mine is operating.	
operatingContinuously	operating continuously	A mine is operating continuously.	operating
operatingIntermittently	operating intermittently	A mine is operating intermittently.	operating
notOperating	not operating	A mine is not operating.	

Value	Name	Definition	Parent
closed	closed	A mine can be closed for technical, economical or technico-economical reasons.	notOperating
abandoned	abandoned	A mine is abandoned.	notOperating
careAndMaintenance	care and maintenance	A mine is under care and maintenance.	notOperating
retention	retention	A mine can be kept unexploited until the price of contained commodity(ies) makes it economical.	notOperating
historic	historic	An "old" mine which has been exploited before 1900.	notOperating
underDevelopment	under development	Under development.	
construction	under construction	Under construction.	underDevelopment
pendingApproval	pending approval	A mine waiting for the exploitation authorization, generally given by a State Mining Engineering Department.	underDevelopment
feasibility	feasibility	Technical economic study aimed at assessing the possibility to launching a mine venture.	underDevelopment

20.3.3.8. Mineral Deposit Group (MineralDepositGroupValue)

Values indicating the grouping of mineral deposits on the basis of their generic characteristics.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list MineralDepositGroupValue

Value	Name	Definition
organic	organic	Organic deposits result from the concentration of organic matter on, or close to the surface, by sedimentation and early diagenesis.
residualOrSurficial	residual/surficial	Surficial processes are the physical and chemical phenomena which cause concentration of ore material within the regolith, generally by removal of chemical constituents by aqueous leaching. This includes laterite deposits and residual or eluvial deposits.
placer	placer	Placer deposits represent concentrations of heavy minerals of certain elements, particularly of Au, U, and PGE, by sedimentary processes.
continentalSedimentAndVolcanics	continental sediments and volcanics	Mineral deposits associated with sediments or volcanic material on continental crust. They form where volcanic rocks and ash layers react with alkaline groundwater, and may also crystallize in post-depositional environments over periods ranging from thousands to millions of years in shallow marine basins.

Value	Name	Definition
sedimentHosted	sediment-hosted	Sediment-hosted deposits can be divided into two major subtypes. The first subtype is clastic-dominated lead-zinc ores, which are hosted in shale, sandstone, siltstone, or mixed clastic rocks, or occur as carbonate replacement, within a clastic-dominated sedimentary rock sequence. This subtype includes deposits that have been traditionally referred to as sedimentary exhalative (SEDEX) deposits. The second subtype of sediment-hosted Pb-Zn deposits is the Mississippi Valley-type that occurs in platform carbonate sequences, typically in passive-margin tectonic settings.
chemicalSediment	chemical sediment	Mineral deposits, mainly Fe or Mn, of sedimentary origin which originated as chemical precipitates from ancient ocean water. The process of accumulating these sedimentary deposits is controlled by the physicochemical properties inherent in iron and manganese.
marineVolcanicAssociation	marine volcanic association	Mineral deposits formed in a marine volcanic environment. Magmatic and hydrothermal fluids react with sea water for giving volcanogenic massive sulphides (VMS), which are at the origin stratiform deposits of Cu, Zn, Pb, Ag, Au.
epithermal	epithermal	Epithermal deposits occur largely in volcano-plutonic arcs associated with subduction zones, with ages similar to those of volcanism. The deposits form at shallow depth, less than 1 km, in the temperature range of 50°-200 °C, are hosted mainly by volcanic rocks, and occur mainly as veins.
veinBrecciaStockwork	vein, breccia and stockwork	It is a systematic group with special occurrence of mineral deposits in a finite volume within a rock. Vein: Fracture filling deposits which often have great lateral and/or depth extent but which are usually very narrow. Breccia: A fissure containing numerous wall-rock fragments, with mineral deposits in the interstices. Stockwork: a complex system of structurally controlled or randomly oriented veins.
manto	manto	Manto ore deposits are defined by a strict stratigraphic control on their distribution, generally within a porous formation within a structural trap site. The source of ore within manto deposits is considered to be interformational, from a sedimentary source within an adjacent sedimentary basin, or from ore fluids driven off from intrusive rocks.
skarn	skarn	Mineral deposits formed by replacement of limestone by ore and calc-silicate minerals, usually adjacent to a felsic or granitic intrusive body.

Value	Name	Definition
porphyry	porphyry	Porphyry deposits are intrusion-related, large tonnage low grade mineral deposits with metal assemblages that may include all or some of copper, molybdenum, gold and silver. The genesis of these deposits is related to the emplacement of intermediate to felsic, hypabyssal, generally porphyritic intrusions that are commonly formed at convergent plate margins.
ultramaficOrMafic	ultramafic / mafic	Mineral deposits related to mafic and ultra-mafic plutonism and resulting from magmatic processes such as fractional crystallisation. The main types of deposits are chromite and platinoids in ophiolitic peridotites, titanum within anorthosites, nickel, copper and platinoïds in ultramafic complexes.
carbonatite	carbonatites	Carbonatites are intrusive carbonate-mineral-rich igneous rocks, many of which contain distinctive abundances of apatite, magnetite, barite, and fluorite, that may contain economic or anomalous concentrations of rare earth elements, phosphorus, niobium, uranium, thorium, copper, iron, titanium, barium, fluorine, zirconium, and other rare or incompatible elements. They may also be sources of mica or vermiculite. Carbonatites may form central plugs within zoned alkalic intrusive complexes, or as dikes, sills, breccias, and veins.
pegmatite	pegmatite	Pegmatites tend to occur in the aureoles of granites in most cases, and are usually granitic in character, often closely matching the compositions of nearby granites. Pegmatites should thus represent exsolved granitic material which crystallises in the country rocks. However, an origin of pegmatite fluids by devolatilisation (dewatering) of metamorphic rocks is also envisaged. Pegmatites are coarse-grained rocks, mainly composed of quartz, feldspar and mica and are important because they often contain rare earth minerals and gemstones, such as aquamarine, tourmaline, topaz, fluorite, apatite and corundum, often along with tin and tungsten minerals, among others.
metamorphicHosted	metamorphic-hosted	Mineral deposits associated to deep metamorphism, more than ten km, in a context in which carbonic and aqueous fluids may give birth to gold veins.
gemsOrSemipreciousStones	gems and semi-precious stones	A piece of mineral, which, in cut and polished form, is used to make jewelry or other adornments.
industrialRocks	industrial rocks	Industrial minerals are geological materials which are mined for their commercial value, which are not fuel minerals and are not sources of metallic minerals. They are used in their natural state or after beneficiation either as raw materials or as additives in a wide range of applications.

20.3.3.9. Mineral Deposit Type (MineralDepositTypeValue)

Values indicating the style of mineral occurrence or deposit.

The allowed values for this code list comprise any values defined by data providers.

Data providers may use the values specified in the INSPIRE Technical Guidance document on Mineral Resources.

20.3.3.10. Mineral Occurrence Type (MineralOccurrenceTypeValue)

The type of mineral occurrence.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list MineralOccurrenceTypeValue

Value	Name	Definition
mineralDeposit	mineral deposit	A mass of naturally occurring mineral material, e.g. metal ores or non-metallic minerals, usually of economic value, without regard to mode of origin. Accumulations of coal and petroleum may or may not be included.
oreDeposit	ore deposit	The naturally occurring material from which a mineral or minerals of economic value can be extracted at a reasonable profit.
occurrence	occurrence	Any ore or economic mineral in any concentration found in bedrock or as float.
prospect	prospect	An area that is a potential site of mineral deposits, based on preliminary exploration, previous exploration. A geologic or geophysical anomaly, especially one recommended for additional exploration.
province	province	Geologic provinces classified by mineral resources.
district	district	Geologic districts classified by mineral resources.
field	field	A region or area that possesses or is characterized by a particular mineral resource.
lode	lode	A mineral deposit consisting of a zone of veins, veinlets, disseminations, or planar breccias.

20.3.3.11. Mining Activity Type (MiningActivityTypeValue)

The type of mining activity, processing activity, or production.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list MiningActivityTypeValue

Value	Name	Definition
adit	adit	A horizontal passage from the surface into a mine.

Value	Name	Definition
alluvial	alluvial	Said of a placer formed by the action of running water, as in a stream channel or alluvial fan; also, said of the valuable mineral, e.g. gold or diamond, associated with an alluvial placer.
decline	decline	Passage or adit driven on a decline from the surface to provide access to a mine.
diggings	diggings	A term applied in the western U.S. to diggings for gold or other precious minerals located on a bar or in the shallows of a stream, and worked when the water is low.
dredging	dredging	A form of open pit mining in which the digging machinery and processing plant are situated on a floating barge or hull.
multiple	multiple	A multiple activity.
openPit	open pit	An open-sky excavation (also open-sky mine) for the extraction of metallic ores and /or commodities.
openPitAndUnderground	open pit and underground	Covers both the open pit and underground mining activity.
quarry	quarry	Open workings, usually for the extraction of stone.
reworking	reworking	New mining activities carried out on already explored mines.
shaft	shaft	A vertical or inclined excavation through which a mine is worked.
sluicing	sluicing	Concentrating heavy minerals, e.g., gold or cassiterite, by washing unconsolidated material through boxes (sluices) equipped with riffles that trap the heavier minerals on the floor of the box.
solutionMining	solution mining	(a) The in-place dissolution of water-soluble mineral components of an ore deposit by permitting a leaching solution, usually aqueous, to trickle downward through the fractured ore to collection galleries at depth. b) The mining of soluble rock material, esp. salt, from underground deposits by pumping water down wells into contact with the deposit and removing the artificial brine thus created.
surfaceMining	surface mining	Broad category of mining in which soil and rock overlying the mineral deposit (the overburden) are removed.

Value	Name	Definition
surfaceMiningAndUnderground	surface mining and underground	Covers both surface and underground mining.
underground	underground	An underground excavation for the extraction of mineral deposits, in contrast to surface excavations

20.3.3.12. Processing Activity Type (ProcessingActivityTypeValue)

Values indicating the type of processing carried out during a mining activity.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Data providers may also use the narrower values specified for this code list in the INSPIRE Technical Guidance document on Mineral Resources.

Values for the code list ProcessingActivityTypeValue

Value	Name	Definition
physicalTreatment	physical treatment	Sorting process using physical separation methods.
physicalChemicalTreatment	physical chemical treatment	Sorting process combining physical and chemical separation methods.
chemicalTreatment	chemical treatment	Sorting process using chemical separation methods.
unknownTreatment	unknown treatment	Sorting process – treatment is unknown.

20.3.3.13. Reserve Category (ReserveCategoryValue)

The level of confidence of the estimate of the reserve.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ReserveCategoryValue

Value	Name	Definition
provedOreReserves	proved ore reserves	A "Proved Ore Reserve" is the economically mineable part of a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined.
probableOreReserves	probable ore reserves	A "Probable Ore Reserve" is the economically mineable part of an Indicated, and in some circumstances, a measured mineral resource. It includes diluting materials and allowances for losses which may occur when the material is mined.
provedAndProbableOreReserves	proved and probable ore reserves	Covers both the Proved Ore Reserves and Probable Ore Reserves.
inaccessibleDocumentation	inaccessible documentation	Ore reserve without any accessible documentation.

20.3.3.14. Resource Category (ResourceCategoryValue)

Indication whether the resource is measured, indicated or inferred.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

Values for the code list ResourceCategoryValue

Value	Name	Definition
measuredMineralResource	measured mineral resource	The part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence.
indicatedMineralResource	indicated mineral resource	The part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence.
inferredMineralResource	inferred mineral resource	The part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity.
measuredAndIndicatedMineralResource	measured and indicated mineral resource	A combination of measured mineral resource and indicated mineral resource.
measuredIndicatedAndInferredMineralResource	measured, indicated and inferred mineral resource	A combination of measured mineral resource, indicated mineral resource and inferred mineral resource.
indicatedAndInferredMineralResource	indicated and inferred mineral resource	A combination of indicated mineral resource and inferred mineral resource.
poorlyDocumented	poorly documented	Poorly estimated or documented mineral resource.

20.4.　**Theme-specific Requirements**

The type MappedFeature specified in Section 4.2.1.10 of Annex III shall be used to describe the geometric properties of MineralOccurrence spatial objects.

20.5.　**Layers**

Layers for the spatial data theme Mineral Resources

Layer Name	Layer Title	Spatial object type
MR.Mine	Mines	MiningFeatureOccurrence
MR.MineralOccurrence	Mineral Occurrences	MappedFeature (spatial objects whose specification property is of type MineralOccurrence)'