



INSPIRE

Infrastructure for Spatial Information in Europe

Possible revision of Implementing Rules on data interoperability – Draft amendment text

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Creator	EC and EEA INSPIRE Team
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Identifier	MIG/9/2018/DOC4
Description	<p>This document implements the changes agreed in the 8th MIG meeting on the Implementing Rules on data interoperability, as tracked changes in the current consolidated text (including all previous amendments) of the Regulation. It also factors in the corrigenda already agreed by the MIG in 2016.</p> <p>In the preface, it provides an overview and benefits for the main changes in the text:</p> <ul style="list-style-type: none">• replacing the explicit mentioning of code list and enumeration values in the IR text with a reference to the INSPIRE registry, where these values are now managed, under the governance of the MIG;• a clarification on provision of values for voidable attributes and those attributes for which no value may exist (minimum multiplicity 0); and• a mechanism to allow additional coordinate reference systems, under the governance of the MIG. <p>This document is the result of the technical, preparatory process. It has not yet been discussed with the other Commission services.</p>
Actions	<p>MIG to:</p> <ul style="list-style-type: none">• Take note of the document• Comment and discuss during the 9th MIG meeting on the proposed implementation in the text of the agreed main changes (in the articles).• Provide written comments by end of December 2018 on the proposed implementation in the text of the agreed detailed/thematic changes (in the annexes).

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- Discuss the planning and next steps.
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Preface

This document implements the changes agreed in the 8th MIG meeting on the Implementing Rules on data interoperability as tracked changes in the current consolidated Regulation text (including all previous amendments). It also factors in the corrigenda already agreed by the MIG in 2016.

The overview table [DOC4-annex1] annexed to this document contains a description of the modifications in the IR for each change proposal submitted. The document is composed of 3 sheets, which refer to the changes proposals included in the following documents:

- the discussion paper on change proposals [DOC4-rev]¹.
- all current change proposals [DOC4-annex]¹
- all previously agreed corrigenda [DOC13 and DOC13-annex]²

In the following, we summarise the main changes to the Regulation and their benefits.

Code lists and enumerations

All code list and enumeration values are removed from the Regulation text (examples are given in points 3 and 4 of Annex I – Common Types, Definitions and Requirements).

Article 6 - Code Lists for Spatial Data Sets is modified to refer to the INSPIRE registry, to be operated by the Commission, with assistance by the INSPIRE expert group (MIG), as the place where code list values are managed.

The table [DOC4-annex2] annexed to this document describes the proposals for changes to code list values. These changes will be made following the governance procedure for code list changes already in place for the INSPIRE registry.

Benefits: Several of the received change proposals address issues with the code lists and their values included in the IRs, e.g. proposing additional values, changes in definitions of specific values or code list extensions. Since domain terminology evolves in time, further such change proposals to INSPIRE code lists can be envisioned also for the future.

The proposed IR amendment will make the process for changes in code lists and their values more flexible and faster. Contrary to the time when the IRs were first adopted, the INSPIRE Registry and its

¹ available on the 8th MIG meeting page on the MIG collaboration platform at https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/8th_meeting_of_the_MIG

² available on the 4th MIG meeting page on the MIG collaboration platform at https://ies-svn.jrc.ec.europa.eu/projects/mig-p/wiki/4th_MIG-P_meeting

formalized governance structure and procedures, now provide an alternative for managing the code lists in a transparent, yet controlled way.

NOTE As suggested in the 8th MIG meeting, also enumeration values should be managed in the registry. Since enumerations are essentially equivalent to non-extensible code lists, it is proposed to remove the notion of enumerations from the text altogether, i.e. in the definitions in Article 2 and elsewhere in the Regulation. There are currently 17 enumerations in the Regulation. The conversion from enumerations to code lists may have an impact on the currently used xml schemas (which handle code lists and enumerations differently). While the change could be implemented in a backwards-compatible way, this would complicate schemas and the implementation of client applications.

Voidability and multiplicity

Article 4(2) is reworded in order to clarify that MS do not have to provide property values if they do not exist (in the real world) and that a value "void" has to be provided if a value exists (in the real world), but is not contained in the data set (or cannot be derived from existing values at reasonable costs).

Benefits: This limited change would clarify further in the legal act the concept of voidability and what implications it has for data providers, while not having the same comprehensive consequences as the other scenarios considered.

Coordinate reference systems (CRSs)

In section 1 of Annex II (Coordinate Reference Systems), limited changes are made, in order to allow also other CRSs that are endorsed by the MIG and their management in a CRS register containing the CRS's identifiers and their geodetic codes and parameters needed to describe them and to allow conversion and transformation operations.

Benefits: This change would allow, after discussion and agreement by the MIG, to allow additional CRSs in order to lower the burden for implementers, who would then no longer have to create and maintain (store) data in both their national and INSPIRE-required CRS.

While, on the other hand, there would be additional burden on users, who might need to do coordinate transformations when bringing together data from different sources, this could be alleviated by additionally requiring that transformations from any additional CRS to the currently required INSPIRE CRS (and vice versa) would need to be implemented in widely available tools or libraries such as GDAL.

Other specific changes and corrigenda

A number of corrigenda and minor adaptations to technological and scientific evolution have been introduced as documented in detail in the overview table [DOC4-annex1] annexed to this document.

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

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)³, and in particular Article 7(1) thereof,

Whereas:

- (1) Directive 2007/2/EC lays down general rules for the establishment of the Infrastructure for Spatial Information in the European Community. Within this infrastructure, Member States are required to make available data sets related to one or several of the Annexes in Directive 2007/2/EC and the corresponding spatial data services in conformity with the technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and services.
- (2) The technical arrangements take into account relevant user requirements, which were elicited from stakeholders through a user requirements survey and by analysing the submitted reference material and relevant Union environmental policies and policies or activities which may have an impact on the environment.
- (3) The feasibility of the technical arrangements and their proportionality in terms of the likely costs and benefits were analysed by the Commission based on the testing results reported by the stakeholders, replies from Member States through the national contact points to a request for information on cost benefit considerations and evidence from studies conducted by Member States on the costs and benefits of spatial data infrastructures at regional level.
- (4) Representatives of Member States as well as other natural or legal persons with an interest in the spatial data, including users, producers, added value service providers or any coordinating body were given the opportunity to participate in the drafting of the technical arrangements through proposed experts and to evaluate the draft implementing rules through a stakeholder consultation and testing exercise.
- (5) In order to achieve interoperability and benefit from the endeavours of users' and producers' communities, when appropriate, international standards are integrated into

³ OJ L 108, 25.4.2007, p. 1.

the concepts and definitions of the elements of spatial data themes listed in the Directive 2007/2/EC Annex I, II or III.

- (6) In order to ensure interoperability and harmonisation across spatial data themes, the Member States should meet requirements for common data types, the identification of spatial objects, metadata for interoperability, generic network model and other concepts and rules that apply to all spatial data themes.
- (7) In order to ensure the interoperability and harmonisation within one spatial data theme, the Member States should use the classifications and definitions of spatial objects, their key attributes and association roles, data types, value domains and specific rules that apply to individual spatial data theme.
- (8) Since the code list values required for the implementation of this Regulation are not included in this Regulation, this Regulation should only become applicable once these are adopted as a legal act. It is therefore appropriate to defer the applicability of this Regulation.
- (9) 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,

HAS ADOPTED THIS REGULATION:

↓ 1312/2014 Art. 1.1

Article 1

Subject Matter and Scope

1. This Regulation sets out the requirements for technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and spatial data services corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC.
2. This Regulation does not apply to the network services falling within the scope of Commission Regulation (EC) No 976/2009⁴.

↓ 1089/2010

Article 2

Definitions

↓ 1253/2013 Art. 1.1(a)

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

⁴ Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services (OJ L 274, 20.10.2009, p. 9).

↓ 1089/2010

1. 'abstract type' means a type that cannot be instantiated, but which may have attributes and association roles,
2. 'association role' means a value or object, to which a type has a relationship, as referred to in Article 8 (2b) of Directive 2007/2/EC,
3. 'attribute' means a characteristic of a type, as referred to in Article 8 (2c) of Directive 2007/2/EC,

↓ 1253/2013 Art. 1.1(b)

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↓ 1089/2010
→₁ 1253/2013 Art. 1.1(c)
→₂ 1253/2013 Art. 1.1(d)
→₃ 1253/2013 Art. 1.1(e)
→₄ 1253/2013 Art. 1.1(f)
→₅ 1253/2013 Art. 1.1(g)
→₆ 1253/2013 Art. 1.1(h)

5. 'code list' means a data type whose instances form a list of named literal values,
6. 'data type' means a descriptor of a set of values that lack identity, in accordance with →₁ ISO/TS 19103:2005 ←,
8. 'external object identifier' means a unique object identifier which is published by the responsible body, which may be used by external applications to reference the spatial object,
9. 'identifier' means a linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated, in accordance with →₂ EN ISO 19135:2007 ←,
10. 'instantiate' means to create an object that is conformant with the definition, attributes, association roles and constraints specified for the instantiated type,
11. 'layer' means a basic unit of geographic information that may be requested as a map from a server in accordance with →₃ EN ISO 19128:2008 ←,
12. 'life-cycle information' means a set of properties of a spatial object that describe the temporal characteristics of a version of a spatial object or the changes between versions,
13. 'metadata element' means a discrete unit of metadata, in accordance with →₄ EN ISO 19115:2005/AC:2008 ←,
14. 'package' means a general purpose mechanism for organizing elements into groups,

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Comment [ML1]: As suggested in the 8th MIG meeting, also enumeration values should be managed in the registry. Since enumerations are essentially equivalent to non-extensible code lists, it is proposed to remove the notion of enumerations from the text altogether.

Deleted: 7. 'enumeration' means a data type whose instances form a fixed list of named literal values. Attributes of an enumerated type may only take values from this list.¶

15. ‘register’ means a set of files containing identifiers assigned to items with descriptions of the associated items, in accordance with →₅ EN ISO 19135:2007 ←,
16. ‘spatial object type’ means a classification of spatial objects,
17. ‘style’ means a mapping from spatial object types and their properties and constraints to parameterized symbols used in drawing maps,
18. ‘sub-type of’ means a relationship between a more specific type and a more general type, where the more specific type is fully consistent with the more general type and contains additional information, as adapted from →₆ ISO/TS 19103:2005 ←,
19. ‘type’ means spatial object type or data type,
20. ‘voidable’ means that, for an attribute or association role a value of ‘void’ may be made available if no corresponding value is contained in the spatial data sets maintained by the Member States or no corresponding value can be derived from existing values at reasonable costs. If an attribute or association role is not voidable, the table cell specifying its voidability is left blank,

↓ 1253/2013 Art. 1.1(i)

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,

↓ 1312/2014 Art. 1.2

31. 'end point' means the internet address used to directly call an operation provided by a spatial data service,

32. 'access point' means an internet address containing a detailed description of a spatial data service, including a list of end points to allow its execution,

33. 'Invocable spatial data service' means all of the following:

(a) a spatial data service with metadata which fulfils the requirements of Commission Regulation (EC) No 1205/2008⁵,

(b) a spatial data service with at least one resource locator that is an access point,

(c) a spatial data service in conformity with a documented and publicly available set of technical specifications providing the information necessary for its execution,

34. 'interoperable spatial data service' means an invocable spatial data service which fulfils the requirements of Annex VI,

35. 'harmonised spatial data service' means an interoperable spatial data service which fulfils the requirements of Annex VII,

36. 'conformant spatial data set' means a spatial data set which fulfils the requirements of this Regulation,

37. 'operation' means an action supported by a spatial data service,

38. 'interface' means the named set of operations that characterise the behaviour of an entity as defined by ISO 19119:2005.

↓ 1089/2010

Article 3

Common Types

Types that are common to several of the themes listed in Annexes I, II and III to Directive 2007/2/EC shall conform to the definitions and constraints and include the attributes and association roles set out in Annex I.

⁵ Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata (OJ L 326, 4.12.2008, p. 12)

Article 4

Types for the Exchange and Classification of Spatial Objects

↓ 1253/2013 Art. 1.2(a)

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.

↓ 1089/2010
→₁ 1253/2013 Art. 1.2(b)

2. When exchanging spatial objects, Member States shall comply with the definitions and constraints and provide values for all attributes and association roles set out for the relevant spatial object types and data types in →₁ the Annexes ←. For attributes and association roles, for which no value exists, Member States may omit the value. For attributes and association roles, for which a corresponding value exists, but this value is not contained in the spatial data sets maintained by a Member State or cannot be derived from existing values at reasonable costs, Member States shall provide a value of 'void'.

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↓ 102/2011 Art. 1.1(a)
→₁ 1253/2013 Art. 1.2(b)
→₂ 1253/2013 Art. 1.2(c)

Comment [ML2]: Proposed to move this into Article 6.

Deleted: 3. The enumerations and code lists used in attributes or association roles of spatial object types or data types shall comply with the definitions and include the values set out in →₁ the Annexes ←.

Deleted: →₂ 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. ←

↓ 102/2011 Art. 1.1(b)

↓ 1089/2010

Article 5

Types

1. For all types defined in this Regulation, a language-neutral name for computers is given between parentheses in the title of the section specifying the requirements for that type. This language-neutral name shall be used for referring to the corresponding type in the definition of an attribute or association role.

2. Types that are a sub-type of another type shall also include all this type's attributes and association roles.

3. Abstract types shall not be instantiated.

↓ 1253/2013 Art. 1.3

↓ 1253/2013 Art. 1.4

Article 6

↓ 1312/2014 Art. 1.3(a)

Code Lists for Spatial Data Sets

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↓ 1253/2013 Art. 1.4
→₁ 1312/2014 Art. 1.3(b)

1. The code lists used in attributes of spatial object types or data types shall comply with the definitions set out in the Annexes.

Comment [ML3]: As suggested in the 8th MIG meeting, also enumeration values should be managed in the registry. Since enumerations are essentially equivalent to non-extensible code lists, it is proposed to remove the notion of enumerations from the text altogether.

2. Each code list specifies the values which may be used by Member States for the attributes associated with the code list.

Comment [ML4]: will ?

3. The Commission shall establish and operate an INSPIRE code list register at Community level for managing the code list values. It shall be assisted by the INSPIRE expert group in the maintenance and update of the code list values.

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4. →₁ Code lists shall be one of the following types: ←

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(a) code lists whose values comprise only the values specified in the INSPIRE code list register;

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(b) code lists whose values comprise the values specified in the INSPIRE code list register and narrower values defined by data providers;

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(c) code lists whose values comprise the values specified in the INSPIRE code list register and additional values at any level defined by data providers;

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

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5. Code lists may be hierarchical. Values of hierarchical code lists may have a more general parent value.

Comment [ML5]: This is no longer required if we include the reference to the registry.

6. 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 the INSPIRE code list register, that value, definition and label shall be made available in another register.

Deleted: 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}

Deleted: 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.

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↓ 1089/2010
→₁ 1253/2013 Art. 1.5

Comment [ML6]: there cannot be any associations to code lists.

Comment [ML7]: Replaced by point 2.

Deleted: 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.¶

Article 7

Encoding

1. Every encoding rule used to encode spatial data shall conform to EN ISO 19118. In particular, it shall specify schema conversion rules for all spatial object types and all attributes and association roles and the output data structure used.
2. Every encoding rule used to encode spatial data shall be made available.

Article 8

Updates

1. Member States shall make available updates of data on a regular basis.
2. All updates shall be made at the latest 6 months after the change was applied in the source data set, unless a different period is specified for a specific spatial data theme in →₁ the Annexes ←.

↓ 1312/2014 Art. 1.4

3. The updates of data shall be made available to all related spatial data services according to the deadline specified in paragraph 2.

↓ 1089/2010
→₁ 1253/2013 Art. 1.5

Article 9

Identifier Management

1. The data type Identifier defined in Section 2.1 of Annex I shall be used as a type for the external object identifier of a spatial object.
2. The external object identifier for the unique identification of spatial objects shall not be changed during the life-cycle of a spatial object.

Article 10

Life-cycle of Spatial Objects

1. Different versions of the same spatial object shall always be instances of the same spatial object type.

2. The namespace and localId attributes of the external object identifier shall remain the same for different versions of a spatial object.
3. Where the attributes beginLifespanVersion and endLifespanVersion are used, the value of endLifespanVersion shall not be before the value of beginLifespanVersion.

Article 11

Temporal Reference Systems

1. The default temporal reference system referred to in point 5 of part B of the Annex to Commission Regulation (EC) No 1205/2008⁶ shall be used, unless other temporal reference systems are specified for a specific spatial data theme in →₁ the Annexes ←.
2. If other temporal reference systems are used, these shall be specified in the data set metadata.

Article 12

Other Requirements & Rules

↓ 1253/2013 Art. 1.6(a)

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.
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↓ 1089/2010
→₁ 1253/2013 Art. 1.6(b)
→₂ 1253/2013 Art. 1.7

2. All measurement values shall be expressed using →₁ SI units or non-SI units accepted for use with the International System of Units ←, unless specified otherwise for a specific spatial data theme or type.
3. Where the attributes validFrom and validTo are used, the value of validTo shall not be before the value of validFrom.
4. In addition, all theme-specific requirements set out in Annex II shall apply.

Article 13

Metadata required for Interoperability

The metadata describing a spatial data set shall include the following metadata elements required for interoperability:

⁶ OJ L 326, 4.12.2008, p. 12.

1.	Coordinate Reference System	:	Description of the coordinate reference system(s) used in the data set.
2.	Temporal Reference System	:	Description of the temporal reference system(s) used in the data set. This element is mandatory only if the spatial data set contains temporal information that does not refer to the default temporal reference system.
3.	Encoding	:	Description of the computer language construct(s) specifying the representation of data objects in a record, file, message, storage device or transmission channel.
4.	Topological Consistency	:	Correctness of the explicitly encoded topological characteristics of the data set as described by the scope. This element is mandatory only if the data set includes types from the Generic Network Model and does not assure centreline topology (connectivity of centrelines) for the network.
5.	Character Encoding	:	The character encoding used in the data set. This element is mandatory only if an encoding is used that is not based on UTF-8.
→ ₂ 6. ←	→ ₂ Spatial Representation Type ←	→ ₂ : ←	→ ₂ The method used to spatially represent geographic information. ←

Article 14

Portrayal

1. For the portrayal of spatial data sets using a view network service as specified in Commission Regulation No 976/2009⁷, the following shall be available:
 - (a) the layers specified in Annex II for the theme or themes the data set is related to;
 - (b) for each layer at least a default portrayal style, with as a minimum an associated title and a unique identifier.
2. For each layer, Annex II defines the following:
 - (a) a human readable title of the layer to be used for display in user interface;

⁷ OJ L 274, 20.10.2009, p. 9.

↓ 1253/2013 Art. 1.8(a)

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

↓ 1253/2013 Art. 1.8(b)

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.
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↓ 1312/2014 Art. 1.5

Article 14a

Requirements for invocable spatial data services

Not later than 10 December 2015, Member States shall provide the invocable spatial data services metadata in conformity with the requirements set out in Annex V.

Article 14b

Interoperability arrangements and harmonisation requirements for invocable spatial data services

The invocable spatial data services relating to the data contained in at least one conformant spatial data set shall fulfil the interoperability requirements set out in Annexes V and VI and, where practicable, the harmonisation requirements set-out in Annex VII.

↓ 1089/2010

Article 15

Entry into force

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

It shall apply from 15 December 2010.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

ANNEX I

↓ 1253/2013 Art. 1.9 and Annex I.1

COMMON TYPES, DEFINITIONS AND REQUIREMENTS

↓ 1253/2013 Art. 1.9 and Annex I.4

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_Position, 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 type AbstractFeature, 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,

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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.

↓ 1089/2010

2. COMMON DATA TYPES

2.1. Identifier (*Identifier*)

External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.

Attributes of the data type Identifier

Attribute	Definition	Type	Voidability
localId	A local identifier, assigned by the data provider. The local identifier is unique within the namespace, that is no other spatial object carries the same unique identifier.	CharacterString	
namespace	Namespace uniquely identifying the data source of the spatial object.	CharacterString	
versionId	The identifier of the particular version of the spatial object, with a maximum length of 25 characters. If the specification of a spatial object type with an external object identifier includes life-cycle information, the version identifier is used to distinguish between the different versions of a spatial object. Within the set of all versions of a spatial object, the version identifier is unique.	CharacterString	voidable

↓ 1253/2013 Art. 1.9 and Annex I.5(a)

↓ 1253/2013 Art. 1.9 and Annex I.5(b)

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
identificationNumber	Code used to identify the legislative instrument	CharacterString	
officialDocumentNumber	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	
ISBN	International Standard Book Number (ISBN) is a 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	

↓ 1089/2010

3. COMMON CODE LISTS

↓ 1253/2013 Art. 1.9 and Annex I.6(a)

3.1. Vertical Position (*VerticalPositionValue*)

The relative vertical position of a spatial object.

3.1.1. Condition of Facility (*ConditionOfFacilityValue*)

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

↓ 1089/2010

3.2. Country Code (*CountryCode*)

Country code as defined in the Interinstitutional style guide published by the Publications Office of the European Union.

↓ 1253/2013 Art. 1.9 and Annex I.6(b)

↓ 102/2011 Art. 1.3 and Annex I.3

↓ 1253/2013 Art. 1.9 and Annex I.6(c)

3.3. Legislation Level (*LegislationLevelValue*)

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

3.4. Party Role (*PartyRoleValue*)

Roles of parties related to or responsible for a resource.

The 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.
- Role of a Related Party (*RelatedPartyRoleValue*): Classification of related party roles.

Comment [ML8]: All enumerations in the documents should be converted into non-extensible code lists, as shown in this example.

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3.1. . Vertical Position (*VerticalPositionValue*)¶
The relative vertical position of a spatial object.¶
Allowed values for the enumeration *VerticalPositionValue* ...

Comment [ML8]: All enumerations in the documents should be converted into non-extensible code lists, as shown in this example.

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Comment [ML9]: All code list (and enumeration) values in the document should be removed, as shown as examples in this section.

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Values for the code list *ConditionOfFacilityValue*¶
Value ...

Comment [ML9]: All code list (and enumeration) values in the document should be removed, as shown as examples in this section.

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Deleted: The allowed values for this code list are the two-letter country codes listed in the Interinstitutional style guide published by the Publications Office of the European Union.¶

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Deleted: 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

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3.5. *Climate and Forecast Standard Names (CFStandardNamesValue)*

Definitions of phenomena observed in meteorology and oceanography.

3.6. *Gender (GenderValue)*

Gender of a person or group of persons.

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Deleted: The allowed values for this code list comprise only the values specified in the table below. Values for the code list *GenderValue* Value

↓ 1089/2010

5. **GENERIC NETWORK MODEL**

5.1. *Spatial Object Types*

5.1.1. *Cross Reference (CrossReference)*

Represents a reference between two elements in the same network.

<i>Association roles of the spatial object type CrossReference</i>			
Association role	Definition	Type	Voidability
element	The cross referenced elements	NetworkElement	

5.1.2. *Generalised Link (GeneralisedLink)*

Abstract base type representing a linear network element that may be used as a target in linear referencing.

This type is a sub-type of NetworkElement.

This type is abstract.

5.1.3. *Grade Separated Crossing (GradeSeparatedCrossing)*

Indicator which of two or more intersecting elements is/are below and which is/are above, to be used if elevation coordinates are not present or cannot be trusted.

This type is a sub-type of NetworkElement.

<i>Association roles of the spatial object type GradeSeparatedCrossing</i>			
Association role	Definition	Type	Voidability
element	Sequence of crossing links. The order reflects their elevation; the first link is the lower link.	Link	

5.1.4. *Link (Link)*

Curvilinear network element that connects two positions and represents a homogeneous path in the network. The connected positions may be represented as nodes.

This type is a sub-type of GeneralisedLink.

This type is abstract.

<i>Attributes of the spatial object type Link</i>			
Attribute	Definition	Type	Voidability
centrelineGeometry	The geometry that represents the centreline of the link.	GM_Curve	
fictitious	Indicator that the centreline geometry of the link is a straight line with no intermediate control points – unless the straight line represents the geography in the resolution of the data set appropriately.	Boolean	

<i>Association roles of the spatial object type Link</i>			
Association role	Definition	Type	Voidability
endNode	The optional end node for this link. The end node may be the same instance as the start node.	Node	
startNode	The optional start node for this link.	Node	

5.1.5. *Link Sequence (LinkSequence)*

A network element which represents a continuous path in the network without any branches. The element has a defined beginning and end and every position on the link sequence is identifiable with one single parameter such as length.

This type is a sub-type of GeneralisedLink.

This type is abstract.

<i>Attributes of the spatial object type LinkSequence</i>			
Attribute	Definition	Type	Voidability
link	The ordered collection of directed links that	DirectedLink	

	constitute the link sequence.		
--	-------------------------------	--	--

5.1.6. *Link Set (LinkSet)*

A collection of link sequences and/or individual links that has a specific function or significance in a network.

This type is a sub-type of NetworkElement.

This type is abstract.

<i>Association roles of the spatial object type LinkSet</i>			
Association role	Definition	Type	Voidability
link	The set of links and link sequences that constitute the link set.	GeneralisedLink	

5.1.7. *Network (Network)*

A network is a collection of network elements.

<i>Attributes of the spatial object type Network</i>			
Attribute	Definition	Type	Voidability
geographicalName	Geographical name for this network.	GeographicalName	voidable

<i>Association roles of the spatial object type Network</i>			
Association role	Definition	Type	Voidability
elements	The collection of elements that constitutes the network.	NetworkElement	

5.1.8. *Network Area (NetworkArea)*

A 2-dimensional element in a network.

This type is a sub-type of NetworkElement.

This type is abstract.

<i>Attributes of the spatial object type NetworkArea</i>			
Attribute	Definition	Type	Voidability
geometry	Represents the geometric properties of the area	GM_Surface	

5.1.9. Network Connection (*NetworkConnection*)

Represents a logical connection between two or more network elements in different networks.

This type is a sub-type of NetworkElement.

Attributes of the spatial object type NetworkConnection

Attribute	Definition	Type	Voidability
type	Categorisation of the network connection.	ConnectionTypeValue	voidable

Association roles of the spatial object type NetworkConnection

Association role	Definition	Type	Voidability
element	Network elements in different networks	NetworkElement	

Constraints of the spatial object type NetworkConnection

All elements have to be in different networks

5.1.10. Network Element (*NetworkElement*)

Abstract base type representing an element in a network. Every element in a network provides some function that is of interest in the network.

This type is abstract.

<i>Attributes of the spatial object type NetworkElement</i>			
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	DateTime	voidable

	retired in the spatial data set.		
inspireId	External object identifier of the spatial object.	Identifier	

<i>Association roles of the spatial object type NetworkElement</i>			
Association role	Definition	Type	Voidability
inNetwork	The networks in which a network element is a member.	Network	voidable

5.1.11. *Network Property (NetworkProperty)*

Abstract base type representing phenomena located at or along a network element. This base type provides general properties to associate the network-related phenomena (network properties) with the network elements.

This type is abstract.

<i>Attributes of the spatial object type NetworkProperty</i>			
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	
networkRef	Spatial reference of the network-related property.	NetworkReference	voidable

5.1.12. *Node (Node)*

Represents a significant position in the network that always occurs at the beginning or the end of a link.

This type is a sub-type of NetworkElement.

This type is abstract.

<i>Attributes of the spatial object type Node</i>			
Attribute	Definition	Type	Voidability
geometry	The location of the node.	GM_Point	

<i>Association roles of the spatial object type Node</i>			
Association role	Definition	Type	Voidability
spokeEnd	The links that enter the node.	Link	voidable
spokeStart	The links that leave the node.	Link	voidable

5.2. Data Types

5.2.1. Directed Link (*DirectedLink*)

A link either in its positive or negative direction.

<i>Attributes of the data type DirectedLink</i>			
Attribute	Definition	Type Voidability	Voidability
direction	Indicates if the directed link agrees (positive) or disagrees (negative) with the positive direction of the link.	Sign	

<i>Association roles of the data type DirectedLink</i>			
Association role	Definition	Type	Voidability
link	The link	Link	

5.2.2. Link Reference (*LinkReference*)

A network reference to a linear network element.

This type is a sub-type of NetworkReference.

Attributes of the data type LinkReference

Attribute	Definition	Type	Voidability
applicableDirection	The directions of the generalised link to which the reference applies. In cases where a property does not apply to a direction along a link, but represents a phenomenon <i>along</i> a link, 'inDirection' refers to the right side in the direction of the link.	LinkDirectionValue	voidable

Constraints of the data type LinkReference

Linear reference targets must be linear network elements. That is, if linear referencing is used or direction is relevant, the target of the network reference shall be a link or a link sequence.

5.2.3. *Network Reference (NetworkReference)*

A reference to a network element.

<i>Association roles of the data type NetworkReference</i>			
Association role	Definition	Type	Voidability
element	The referenced network element.	NetworkElement	

5.2.4. *Simple Linear Reference (SimpleLinearReference)*

A network reference that is restricted to part of a linear network element. The part is the part of the network element between fromPosition and toPosition.

This type is a sub-type of LinkReference.

<i>Attributes of the data type SimpleLinearReference</i>			
Attribute	Definition	Type	Voidability
fromPosition	The start position of the linear element, expressed as the distance from the start of the linear network element along its curve geometry.	Length	
offset	An offset from the centreline geometry of the generalised link, where applicable; a positive offset is to the right in the direction of the link, a negative offset is to the left.	Length	voidable

toPosition	The end position of the linear element, expressed as the distance from the start of the linear network element along its curve geometry.	Length	
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5.2.5. Simple Point Reference (*SimplePointReference*)

A network reference that is restricted to a point on a linear network element. The point is the location on the network element at the position atPosition along the network.

This type is a sub-type of LinkReference.

<i>Attributes of the data type SimplePointReference</i>			
Attribute	Definition	Type	Voidability
atPosition	Position of the point, expressed as the distance from the start of the linear network element along its curve geometry.	Length	
offset	An offset from the centreline geometry of the generalised link, where applicable; a positive offset is to the right in the direction of the link, a negative offset is to the left.	Length	voidable

5.3. Code Lists

5.3.1. Connection Type (*ConnectionTypeValue*)

Types of connections between different networks.

↓ 1253/2013 Art. 1.9 and Annex I.2

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

↓ 102/2011 Art. 1.3 and Annex I.4

<i>Values for the code list ConnectionTypeValue</i>	
Value	Definition
crossBorderConnected	Connection between two network elements in different networks of the same type, but in adjacent areas. The referenced network elements represent the different, but spatially connected real-world phenomena.
crossBorderIdentical	Connection between two network elements in different networks of the same type, but in adjacent areas. The referenced network

	elements represent the same real-world phenomena.
intermodal	Connection between two network elements in different transport networks that use a different transport mode. The connection represents a possibility for the transported media (people, goods, etc) to change from one transport mode to another.

↓ 1089/2010

5.3.2. *Link Direction (LinkDirectionValue)*

List of values for directions relative to a link

↓ 1253/2013 Art. 1.9 and Annex I.2

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

↓ 102/2011 Art. 1.3 and Annex I.5

<i>Values for the code list LinkDirectionValue</i>	
Value	Definition
bothDirections	In both directions.
inDirection	In direction of the link.
inOppositeDirection	In the opposite direction of the link.

↓ 1253/2013 Art. 1.9 and Annex I.7

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.	ProcessParameterNameValue	
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. Abstract Observable Property (AbstractObservableProperty)

An abstract class that represents an observable property (or phenomenon).

This type is abstract.

Attributes of the data type AbstractObservableProperty

<u>Attribute</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>label</u>	<u>A human readable title for the observable property.</u>	<u>CharacterString</u>	

7.3.1.2. Composite Observable Property (CompositeObservableProperty)

A composite of multiple Observable Properties.

This type is a sub-type of AbstractObservableProperty.

Attributes of the data type CompositeObservableProperty

<u>Attribute</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>count</u>	<u>Number of components in this composite.</u>	<u>Integer</u>	

Association roles of the data type CompositeObservableProperty

<u>Association role</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>component</u>	<u>Observable properties which together compose the same observable property, for example U,V winds.</u>	<u>AbstractObservableProperty</u>	

7.3.1.3. Observable Property (ObservableProperty)

Represents a single observable property e.g. 'temperature'.

This type is a sub-type of AbstractObservableProperty.

Attributes of the data type ObservableProperty

<u>Attribute</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>basePhenomenon</u>	The phenomenon that the <u>Observable Property description builds upon</u>	<u>PhenomenonTypeValue</u>	
<u>uom</u>	The unit of measure	<u>UnitOfMeasure</u>	

Association roles of the data type ObservableProperty

<u>Association role</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>restriction</u>	A constraint applied to the <u>Observable Property</u> .	<u>Constraint</u>	
<u>statisticalMeasure</u>	Statistical measure applied to the <u>Observable Property</u> , e.g. 'daily mean temperature'.	<u>StatisticalMeasure</u>	

7.3.1.4. Constraint (Constraint)

Deleted: 1

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

Attributes of the data type Constraint

<u>Attribute</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>constrainedProperty</u>	The property being constrained. e.g. 'colour' if the constraint is 'colour = blue'.	<u>PhenomenonTypeValue</u>	
<u>label</u>	A human readable title for the constraint as a whole.	<u>CharacterString</u>	

7.3.1.5. Category Constraint (CategoryConstraint)

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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'.	ComparisonOperatorValue	
value	The value of the property that is constrained e.g. 'blue' (if the constrained property is colour).	CharacterString	

7.3.1.6. Range Constraint (RangeConstraint)

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A numerical range constraint on some property e.g. wavelength \geq 300 nm and wavelength \leq 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	

7.3.1.7. Range Bounds (RangeBounds)

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The start and end bounding values of a numerical range (e.g. start \geq 50, end \leq 99).

Attributes of the data type RangeBounds

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

	range.		
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7.3.1.8. Scalar Constraint (ScalarConstraint)

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A numerical scalar constraint on some property e.g. length \geq 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.	ComparisonOperatorValue	
uom	Units of measure used in the constraint.	UnitOfMeasure	

7.3.1.9. Other Constraint (OtherConstraint)

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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	

7.3.1.10. Statistical Measure (StatisticalMeasure)

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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.	StatisticalFunctionTypeValue	

aggregationTimePeriod	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
- Grid Series Observation
- Point Observation
- Point Observation Collection
- Multi Point Observation
- Point Time Series Observation
- Profile Observation
- Trajectory Observation

7.4.1.1. Grid Observation (GridObservation)

Observation representing a gridded field at a single time instant.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type GridObservation

featureOfInterest shall be a SF_SamplingSolid or SF_SamplingSurface.

phenomenonTime shall be a TM_Instant.

result shall be a RectifiedGridCoverage or RefererencableGridCoverage.

7.4.1.2. Grid Series Observation (GridSeriesObservation)

Observation representing an evolving gridded field at a succession of time instants.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type GridSeriesObservation

featureOfInterest shall be a SF_SamplingSolid.

phenomenonTime shall be a TM_Period.

result shall be a RectifiedGridCoverage or a ReferenceableGridCoverage.

7.4.1.3. Point Observation (PointObservation)

Observation that represents a measurement of a property at a single point in time and space.

This type is a sub-type of SamplingCoverageObservation.

Constraints of the spatial object type PointObservation

featureOfInterest shall be a SF_SamplingPoint.

phenomenonTime shall be a TM_Instant.

7.4.1.4. Point Observation Collection (PointObservationCollection)

A collection of Point Observations.

This type is a sub-type of ObservationSet.

Constraints of the spatial object type PointObservationCollection

Each member shall be a PointObservation.

7.4.1.5. Multi Point Observation (MultiPointObservation)

Observation that represents a set of measurements all made at exactly the same time but at different locations.

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 Council⁸. 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	Function	

⁸ OJ L 393, 30.12.2006, p. 1.

	potentially complemented with information about inputs and outputs as result of it.		
name	Descriptive name of the activity complex.	CharacterString	voidable
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
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

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.	EconomicActivityValue	
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
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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.	EconomicActivityValue	
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	
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
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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 Council⁹.
- EU Waste Statistics Economic Activity Classification (EconomicActivityWasteStatisticsValue): Classification of economic activities according to Section 8 of Annex I of Regulation (EC) No 2150/2002¹⁰.
- 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 Council¹¹.

⁹ OJ L 393, 30.12.2006, p. 1.

¹⁰ OJ L 332, 9.12.2002, p. 1.

¹¹ OJ L 312, 22.11.2008, p. 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 Council¹².
- EU Waste Classification (WasteValue): Classification of Wastes according to Decision 2000/532/EC¹³.

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.

↓ 1089/2010

¹² OJ L 145, 4.6.2008, p. 65.

¹³ OJ L 226, 6.9.2000, p. 3.

ANNEX II

REQUIREMENTS FOR SPATIAL DATA THEMES LISTED IN ANNEX I TO DIRECTIVE 2007/2/EC

1. COORDINATE REFERENCE SYSTEMS

1.1. Definitions

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

- ‘datum’ means a parameter or set of parameters that define the position of the origin, the scale, and the orientation of a coordinate system, in accordance with EN ISO 19111,
- ‘geodetic datum’ means a datum describing the relationship of a coordinate system to the Earth, in accordance with EN ISO 19111,
- ‘coordinate system’ means a set of mathematical rules for specifying how coordinates are to be assigned to points, in accordance with EN ISO 19111,
- ‘coordinate reference system’ means a coordinate system which is related to the real world by a datum, in accordance with EN ISO 19111. This definition includes coordinate systems based on geodetic or Cartesian coordinates and coordinate systems based on map projections.
- ‘map projection’ means a change of coordinates, based on a one-to-one relationship, from a geodetic coordinate system to a plane, based on the same datum, in accordance with EN ISO 19111,
- ‘compound coordinate reference system’ means a coordinate reference system using two other independent coordinate reference systems, one for the horizontal component and one for the vertical component, to describe a position, in accordance with EN ISO 19111,
- ‘geodetic coordinate system’ means a coordinate system in which position is specified by geodetic latitude, geodetic longitude and (in the three-dimensional case) ellipsoidal height, in accordance with EN ISO 19111,

↓ 1253/2013 Art. 1.10 and Annex II.3

- ‘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.

1.2. *Datum for three-dimensional and two-dimensional coordinate reference systems*

For the three-dimensional and two-dimensional coordinate reference systems and the horizontal component of compound coordinate reference systems used for making spatial data sets available, the datum shall be the datum of the European Terrestrial Reference System 1989 (ETRS89) in areas within its geographical scope, or the datum of the International Terrestrial Reference System (ITRS) or other geodetic coordinate reference systems compliant with ITRS in areas that are outside the geographical scope of ETRS89. Compliant with the ITRS means that the system definition is based on the definition of the ITRS and there is a well documented relationship between both systems, according to EN ISO 19111.

Deleted:

1.3. *Coordinate Reference Systems*

Spatial data sets shall be made available using at least one of the coordinate reference systems specified in sections 1.3.1, 1.3.2 and 1.3.3, unless one of the conditions specified in section 1.3.4 holds.

1.3.1. *Three-dimensional Coordinate Reference Systems*

- Three-dimensional Cartesian coordinates based on a datum specified in 1.2 and using the parameters of the Geodetic Reference System 1980 (GRS80) ellipsoid.
- Three-dimensional geodetic coordinates (latitude, longitude and ellipsoidal height) based on a datum specified in 1.2 and using the parameters of the GRS80 ellipsoid.

1.3.2. *Two-dimensional Coordinate Reference Systems*

- Two-dimensional geodetic coordinates (latitude and longitude) based on a datum specified in 1.2 and using the parameters of the GRS80 ellipsoid.
- Plane coordinates using the ETRS89 Lambert Azimuthal Equal Area coordinate reference system.
- Plane coordinates using the ETRS89 Lambert Conformal Conic coordinate reference system.
- Plane coordinates using the ETRS89 Transverse Mercator coordinate reference system.

1.3.3. *Compound Coordinate Reference Systems*

1. For the horizontal component of the compound coordinate reference system, one of the coordinate reference systems specified in section 1.3.2 shall be used.
2. For the vertical component, one of the following coordinate reference systems shall be used:
 - For the vertical component on land, the European Vertical Reference System (EVRS) shall be used to express gravity-related heights within its geographical scope. Other vertical reference systems related to the Earth gravity field shall be used to express gravity-related heights in areas that are outside the geographical scope of EVRS.

↓ 1253/2013 Art. 1.10 and Annex II.4(a)

- 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.

↓ 1253/2013 Art. 1.10 and Annex II.4(b)

- 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.

↓ 1089/2010

1.3.4. *Other Coordinate Reference Systems*

Exceptions, where other coordinate reference systems than those listed in 1.3.1, 1.3.2 or 1.3.3 may be used, are:

1. Other coordinate reference systems may be specified for specific spatial data themes in this Annex or by endorsement of the EC expert group on INSPIRE maintenance and implementation.
2. For regions outside of continental Europe, Member States may define suitable coordinate reference systems.

The geodetic codes and parameters needed to describe these other coordinate reference systems and to allow conversion and transformation operations shall be documented and an identifier shall be created in a coordinate systems register established and operated by the Commission, according to EN ISO 19111 and ISO 19127.

1.4. *Coordinate Reference Systems used in the View Network Service*

For the display of spatial data sets with the view network service as specified in Regulation No 976/2009, at least the coordinate reference systems for two-dimensional geodetic coordinates (latitude, longitude) shall be available.

1.5. *Coordinate Reference System Identifiers*

1. Coordinate reference system parameters and identifiers shall be managed in one or several common registers for coordinate reference systems.

2. Only identifiers contained in a common register shall be used for referring to the coordinate reference systems listed in this Section.

2. GEOGRAPHICAL GRID SYSTEMS

2.1. Definitions

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

- ‘grid’ means a network composed of two or more sets of curves in which the members of each set intersect the members of the other sets in an algorithmic way,
- ‘grid cell’ means a cell delineated by grid curves,
- ‘grid point’ means a point located at the intersection of two or more curves in a grid.

2.2. Grids

↓ 1253/2013 Art. 1.10 and Annex II.5(a)

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.

↓ 1089/2010
→₁ 1253/2013 Art. 1.10 and Annex II.5(b)

2.2.1. →₁ Equal Area Grid ←

↓ 1253/2013 Art. 1.10 and Annex II.5(b)

↓ 1089/2010

The grid is based on the ETRS89 Lambert Azimuthal Equal Area (ETRS89-LAEA) coordinate reference system with the centre of the projection at the point 52° N, 10° E and false easting: $x_0 = 4321000$ m, false northing: $y_0 = 3210000$ m.

The origin of the grid coincides with the false origin of the ETRS89-LAEA coordinate reference system ($x=0, y=0$).

Grid points of grids based on ETRS89-LAEA shall coincide with grid points of the grid.

The grid is hierarchical, with resolutions of 1m, 10m, 100m, 1000m, 10000m and 100000m.

The grid orientation is south-north, west-east.

The grid is designated as Grid_ETRS89-LAEA. For identification of an individual resolution level the cell size in metres is appended.

↓ 1253/2013 Art. 1.10 and Annex II.5(b)

↓ 1089/2010

For the unambiguous referencing and identification of a grid cell, the cell code composed of the size of the cell and the coordinates of the lower left cell corner in ETRS89-LAEA shall be used. The cell size shall be denoted in metres ('m') for cell sizes up to 100m or kilometres ('km') for cell sizes of 1000m and above. Values for northing and easting shall be divided by 10^n , where n is the number of trailing zeros in the cell size value.

↓ 1253/2013 Art. 1.10 and Annex II.5(c)

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-GRS80zn_res, where *n* represents the number of the zone and *res* the cell size in angular units, as specified in Table 1.

<i>Table 1</i>							
<i>Common Grid_ETRS89-GRS80: Latitude spacing (resolution level) and longitude spacing for each zone</i>							
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°)	
<i>LEVEL 0</i>	3600	3600	7200	10800	14400	21600	1 D
<i>LEVEL 1</i>	3000	3000	6000	9000	12000	18000	50 M
<i>LEVEL 2</i>	1800	1800	3600	5400	7200	10800	30 M
<i>LEVEL 3</i>	1200	1200	2400	3600	4800	7200	20 M
<i>LEVEL 4</i>	600	600	1200	1800	2400	3600	10 M
<i>LEVEL 5</i>	300	300	600	900	1200	1800	5 M
<i>LEVEL 6</i>	120	120	240	360	480	720	2 M
<i>LEVEL 7</i>	60	60	120	180	240	360	1 M
<i>LEVEL 8</i>	30	30	60	90	120	180	30 S
<i>LEVEL 9</i>	15	15	30	45	60	90	15 S
<i>LEVEL 10</i>	5	5	10	15	20	30	5 S
<i>LEVEL 11</i>	3	3	6	9	12	18	3 S
<i>LEVEL 12</i>	1,5	1,5	3	4,5	6	9	1500 MS
<i>LEVEL 13</i>	1	1	2	3	4	6	1000 MS
<i>LEVEL 14</i>	0,75	0,75	1,5	2,25	3	4,5	750 MS
<i>LEVEL 15</i>	0,5	0,5	1	1,5	2	3	500

							MS
<i>LEVEL 16</i>	0,3	0,3	0,6	0,9	1,2	1,8	300 MS
<i>LEVEL 17</i>	0,15	0,15	0,3	0,45	0,6	0,9	150 MS
<i>LEVEL 18</i>	0,1	0,1	0,2	0,3	0,4	0,6	100 MS
<i>LEVEL 19</i>	0,075	0,075	0,15	0,225	0,3	0,45	75 MS
<i>LEVEL 20</i>	0,03	0,03	0,06	0,09	0,12	0,18	30 MS
<i>LEVEL 21</i>	0,015	0,015	0,03	0,045	0,06	0,09	15 MS
<i>LEVEL 22</i>	0,01	0,01	0,02	0,03	0,04	0,06	10 MS
<i>LEVEL 23</i>	0,0075	0,0075	0,015	0,0225	0,03	0,045	7500 MMS
<i>LEVEL 24</i>	0,003	0,003	0,006	0,009	0,012	0,018	3000 MMS
<i>FACTOR</i>	—	1	2	3	4	6	—

↓ 1089/2010

3. GEOGRAPHICAL NAMES

3.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Geographical Names:

- Named Place

3.1.1. Named Place (*NamedPlace*)

Any real world entity referred to by one or several proper nouns.

<i>Attributes of the spatial object type NamedPlace</i>			
Attribute	Definition	Type	Voidability
beginLifespanVersion	Date and time at which this version of the spatial	DateTime	voidable

	object was inserted or changed in the spatial data set.		
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
geometry	Geometry associated to the named place. This data specification does not restrict the geometry types.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
leastDetailedViewingResolution	Resolution, expressed as the inverse of an indicative scale or a ground distance, above which the named place and its associated name(s) should no longer be displayed in a basic viewing service.	MD_Resolution	voidable
localType	Characterisation of the kind of entity designated by geographical name(s), as defined by the data provider, given in at least in one official language of the European Union.	LocalisedCharacterString	voidable
mostDetailedViewingResolution	Resolution, expressed as the inverse of an indicative scale or a ground distance, below which the named place and its associated name(s) should no longer be displayed in a basic viewing service.	MD_Resolution	voidable
name	Name of the named place.	GeographicalName	
relatedSpatialObject	Identifier of a spatial	Identifier	voidable

	object representing the same entity but appearing in other themes of INSPIRE, if any.		
type	Characterisation of the kind of entity designated by geographical name(s).	NamedPlaceTypeValue	voidable

3.2. Data Types

3.2.1. Geographical Name (*GeographicalName*)

Proper noun applied to a real world entity.

<i>Attributes of the data type GeographicalName</i>			
Attribute	Definition	Type	Voidability
grammaticalGender	Classes of nouns reflected in the behaviour of associated words.	GrammaticalGenderValue	voidable
grammaticalNumber	Grammatical category of nouns that expresses count distinctions.	GrammaticalNumberValue	voidable
language	Language of the name, given as a three letters code, in accordance with either ISO 639-3 or ISO 639-5.	CharacterString	voidable
nameStatus	Qualitative information enabling to discern which credit should be given to the name with respect to its standardisation and/or its topicality.	NameStatusValue	voidable
nativeness	Information enabling to acknowledge if the name is the one that is/was used in the area where the spatial object is situated at the instant when the name	NativenessValue	voidable

	is/was in use.		
pronunciation	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of the geographical name.	PronunciationOfName	voidable
sourceOfName	Original data source from which the geographical name is taken from and integrated in the data set providing/publishing it. For some named spatial objects it might refer again to the publishing data set if no other information is available.	CharacterString	voidable
spelling	A proper way of writing the geographical name.	SpellingOfName	

3.2.2. *Pronunciation Of Name (PronunciationOfName)*

Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name.

Attributes of the data type PronunciationOfName

Attribute	Definition	Type	Voidability
pronunciationIPA	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name, expressed in International Phonetic Alphabet (IPA).	CharacterString	voidable
pronunciationSoundLink	Proper, correct or standard (standard within the linguistic community concerned) pronunciation of a name, expressed by a link to any sound file.	URI	voidable

Constraints of the data type PronunciationOfName

At least one of the two attributes pronunciationSoundLink and pronunciationIPA shall not be void.

3.2.3. *Spelling Of Name (SpellingOfName)*

Proper way of writing a name.

<i>Attributes of the data type SpellingOfName</i>			
Attribute	Definition	Type	Voidability
script	Set of graphic symbols (for example an alphabet) employed in writing the name, expressed using the four letters codes defined in ISO 15924, where applicable.	CharacterString	voidable
text	Way the name is written.	CharacterString	
transliterationScheme	Method used for the names conversion between different scripts.	CharacterString	voidable

3.3. *Code Lists*

3.3.1. *Grammatical Gender (GrammaticalGenderValue)*

The grammatical gender of a geographical name.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.2

<i>Values for the code list GrammaticalGenderValue</i>	
Value	Definition
common	‘Common’ grammatical gender (the merging of ‘masculine’ and ‘feminine’).
feminine	Feminine grammatical gender.
masculine	Masculine grammatical gender.

neuter	Neuter grammatical gender.
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↓ 1089/2010

3.3.2. Grammatical Number (*GrammaticalNumberValue*)

The grammatical number of a geographical name.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.3

<i>Values for the code list GrammaticalNumberValue</i>	
Value	Definition
dual	Dual grammatical number.
plural	Plural grammatical number.
singular	Singular grammatical number.

↓ 1089/2010

3.3.3. Name Status (*NameStatusValue*)

The status of a geographical name, that is the information enabling to discern which credit should be given to the name with respect to its standardisation and/or its topicality.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.4

<i>Values for the code list NameStatusValue</i>	
Value	Definition
historical	Historical name not in current use.

official	Name in current use and officially approved or established by legislation.
other	Current, but not official, nor approved name.
standardised	Name in current use and accepted or recommended by a body assigned advisory function and/or power of decision in matters of toponymy.

↓ 1089/2010

3.3.4. *Named Place Type (NamedPlaceTypeValue)*

The type of a named place.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.5

<i>Values for the code list NamedPlaceTypeValue</i>	
Value	Definition
administrativeUnit	Units of administration, dividing areas where Member States have and/or exercise jurisdictional rights, for local, regional and national governance, separated by administrative boundaries.
building	Geographical location of buildings.
hydrography	Hydrographic elements, including marine areas and all other water bodies and items related to them, including river basins and sub-basins.
landcover	Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-)natural areas, wetlands.
landform	Geomorphologic terrain feature.
other	A spatial object not included in the other types of the code list.
populatedPlace	A place inhabited by people.
protectedSite	Area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives.
transportNetwork	Road, rail, air, water and cable transport networks and related infrastructure. Includes links between different networks.

↓ 1089/2010

3.3.5. *Nativeness (NativenessValue)*

The nativeness of a geographical name.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.6

<i>Values for the code list NativenessValue</i>	
Value	Definition
endonym	Name for a geographical feature in an official or well-established language occurring in that area where the feature is situated.
exonym	Name used in a specific language for a geographical feature situated outside the area where that language is widely spoken, and differing in form from the respective endonym(s) in the area where the geographical feature is situated.

↓ 1089/2010

3.4. *Layers*

<i>Layer for the spatial data theme Geographical Names</i>		
Layer Name	Layer Title	Spatial object type
GN.GeographicalNames	Geographical Names	NamedPlace

↓ 1253/2013 Art. 1.10 and Annex II.6

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
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 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	CountryCode	

	published by the Publications Office of the European Union.		
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	
nationalLevelName	Name of the level in the national administrative hierarchy, at which the administrative	LocalisedCharacterString	voidable

	unit is established.		
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.	AdministrativeBoundary	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
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	
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 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	GM_Curve	

	of the maritime boundary.		
country	The country that the maritime zone of this boundary belongs to.	CountryCode	
legalStatus	Legal status of this maritime boundary.	LegalStatusValue	voidable
technicalStatus	The technical status of the maritime boundary.	TechnicalStatusValue	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

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.	MaritimeZoneTypeValue	
country	The country that this maritime zone belongs to.	CountryCode	
name	Name(s) of the maritime zone.	GeographicalName	voidable
beginLifeSpanVersion	Date and time at which this version of the	DateTime	voidable

	spatial object was inserted or changed in the spatial data set.		
endLife spanVersion	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.	BaselineSegmentTypeValue	

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 maritime 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.
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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> ¹⁴ Example: AU.ContiguousZone	<human readable name> Example: Contiguous Zone	MaritimeZone (zoneType: MaritimeZoneTypeValue)
AU.MaritimeBoundary	Maritime boundary	MaritimeBoundary

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

5. ADDRESSES

5.1. Definitions

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

- ‘addressable object’ means a spatial object to which it is meaningful to associate addresses.

5.2. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Addresses:

- Address
- Address Area Name
- Address Component
- Administrative Unit Name
- Postal Descriptor
- Thoroughfare Name

5.2.1. Address (Address)

An identification of the fixed location of property by means of a structured composition of geographic names and identifiers.

Attributes of the spatial object type Address

Attribute	Definition	Type	Voidability
alternativeIdentifier	External, thematic identifier of the address spatial object, which enables interoperability with existing legacy systems or applications.	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	DateTime	voidable

	the spatial data set.		
inspireId	External object identifier of the spatial object.	Identifier	
locator	Human readable designator or name.	AddressLocator	
position	Position of a characteristic point which represents the location of the address according to a certain specification, including information on the origin of the position.	GeographicPosition	
status	Validity of the address within the life-cycle (version) of the address spatial object.	StatusValue	voidable
validFrom	Date and time of which this version of the address was or will be valid in the real world.	DateTime	voidable
validTo	Date and time at which this version of the address ceased or will cease to exist in the real world.	DateTime	voidable

Association roles of the spatial object type Address

Association role	Definition	Type	Voidability
building	Building that the address is assigned to or associated with.	Building of the Buildings Base package	voidable
component	Represents that the address component is engaged as a part of the address.	AddressComponent	
parcel	Cadastral parcel that this address is assigned to or associated with.	CadastralParcel	voidable
parentAddress	Main (parent) address with which this (sub) address is tightly connected	Address	voidable

Deleted: Type to be specified in the spatial data theme Buildings

Constraints of the spatial object type Address

An address shall have an administrative unit address component spatial object whose level is 1 (Country).

An address shall have exactly one default geographic position (the 'default' attribute of the GeographicPosition spatial object must be 'true').

5.2.2. *Address Area Name (AddressAreaName)*

An address component which represents the name of a geographic area or locality that groups a number of addressable objects for addressing purposes, without being an administrative unit.

This type is a sub-type of AddressComponent.

<i>Attributes of the spatial object type AddressAreaName</i>			
Attribute	Definition	Type	Voidability
name	Proper noun applied to the address area.	GeographicalName	

<i>Association roles of the spatial object type AddressAreaName</i>			
Association role	Definition	Type	Voidability
namedPlace	The named place that this address area name represents.	NamedPlace	voidable

5.2.3. *Address Component (AddressComponent)*

Identifier or geographic name of a specific geographic area, location, or other spatial object which defines the scope of an address.

This type is abstract.

<i>Attributes of the spatial object type AddressComponent</i>			
Attribute	Definition	Type	Voidability
alternativeIdentifier	External, thematic identifier of the address component spatial object, which enables interoperability with existing legacy systems or applications.	CharacterString	voidable
beginLifespanVersion	Date and time at which this version of the spatial object was	DateTime	voidable

	inserted or changed in the spatial data set.		
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	
status	Validity of the address component within the life-cycle (version) of the address component spatial object.	StatusValue	voidable
validFrom	Date and time of which this version of the address component was or will be valid in the real world.	DateTime	voidable
validTo	Date and time at which the address component ceased/will cease to exist in the real world.	DateTime	voidable

<i>Association roles of the spatial object type AddressComponent</i>			
Association role	Definition	Type	Voidability
situatedWithin	Another address component within which the spatial object represented by this address component is situated.	AddressComponent	voidable

5.2.4. *Administrative Unit Name (AdminUnitName)*

An address component which represents the name of a unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.

This type is a sub-type of AddressComponent.

<i>Attributes of the spatial object type AdminUnitName</i>			
Attribute	Definition	Type	Voidability
level	The level of administration in the national administrative hierarchy.	AdministrativeHierarchyLevel	

name	Official, geographical name of the administrative unit, given in different languages where required.	GeographicalName	
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<i>Association roles of the spatial object type AdminUnitName</i>			
Association role	Definition	Type	Voidability
adminUnit	The administrative unit that is the source of the content of the administrative unit name.	AdministrativeUnit	voidable

5.2.5. *Postal Descriptor (PostalDescriptor)*

An address component which represents the identification of a subdivision of addresses and postal delivery points in a country, region or city for postal purposes.

This type is a sub-type of AddressComponent.

Attributes of the spatial object type PostalDescriptor

Attribute	Definition	Type	Voidability
postCode	A code created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	CharacterString	
postName	One or more names created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	GeographicalName	

Constraints of the spatial object type PostalDescriptor

If no post code exists, a post name is required.

If no post name exists, a post code is required.

5.2.6. *Thoroughfare Name (ThoroughfareName)*

An address component which represents the name of a passage or way through from one location to another.

This type is a sub-type of AddressComponent.

<i>Attributes of the spatial object type ThoroughfareName</i>			
Attribute	Definition	Type	Voidability
name	Name of the thoroughfare.	ThoroughfareNameValue	

<i>Association roles of the spatial object type ThoroughfareName</i>			
Association role	Definition	Type	Voidability
transportLink	One or several transport network links to which the spatial object of the thoroughfare name has been designated.	TransportLink	voidable

5.3. Data Types

5.3.1. Address Locator (*AddressLocator*)

Human readable designator or name that allows a user or application to reference and distinguish the address from neighbour addresses, within the scope of a thoroughfare name, address area name, administrative unit name or postal descriptor, in which the address is situated.

Attributes of the data type AddressLocator

Attribute	Definition	Type	Voidability
designator	A number or a sequence of characters that uniquely identifies the locator within the relevant scope(s).	LocatorDesignator	
level	The level to which the locator refers.	LocatorLevelValue	
name	A geographic name or descriptive text associated to a property identified by the locator.	LocatorName	

Association roles of the data type AddressLocator

Association role	Definition	Type	Voidability
withinScopeOf	The address component that defines the scope within which the address locator is assigned according to rules ensuring unambiguousness.	AddressComponent	voidable

Constraints of the data type AddressLocator

If no designator exists, a name is required.

If no name exists, a designator is required.

5.3.2. *Address Representation (AddressRepresentation)*

Representation of an address spatial object for use in external application schemas that need to include the basic, address information in a readable way.

<i>Attributes of the data type AddressRepresentation</i>			
Attribute	Definition	Type	Voidability
addressArea	The name or names of a geographic area or locality that groups a number of addressable objects for addressing purposes, without being an administrative unit.	GeographicalName	voidable
adminUnit	The name or names of a unit of administration where a Member State has and/or exercises jurisdictional rights, for local, regional and national governance.	GeographicalName	
locatorDesignator	A number or a sequence of characters which allows a user or an application to interpret, parse and format the locator within the relevant scope. A locator may include more locator designators.	CharacterString	
locatorName	Proper noun(s) applied to the real world entity identified by the locator.	GeographicalName	
postCode	A code created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	CharacterString	voidable
postName	One or more names created and maintained for postal purposes to identify a subdivision of addresses and postal delivery points.	GeographicalName	voidable
thoroughfare	The name or names of a passage or way through from one location to	GeographicalName	voidable

	another like a road or a waterway.		
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<i>Association roles of the data type AddressRepresentation</i>			
Association role	Definition	Type	Voidability
addressFeature	Reference to the address spatial object.	Address	voidable

5.3.3. *Geographic Position (GeographicPosition)*

The position of a characteristic point which represents the location of the address according to a certain specification, including information on the origin of the position.

<i>Attributes of the data type GeographicPosition</i>			
Attribute	Definition	Type	Voidability
default	Specifies whether or not this position should be considered as the default.	Boolean	
geometry	The position of the point expressed in coordinates in the chosen spatial reference system.	GM_Point	
method	Description of how and by whom the geographic position of the address was created or derived.	GeometryMethodValue	voidable
specification	Information defining the specification used to create or derive this geographic position of the address.	GeometrySpecificationValue	voidable

5.3.4. *Locator Designator (LocatorDesignator)*

A number or a sequence of characters that uniquely identifies the locator within the relevant scope(s). The full identification of the locator could include one or more locator designators.

<i>Attributes of the data type LocatorDesignator</i>			
Attribute	Definition	Type	Voidability
designator	The identifying part of the locator designator composed by one or more digits or other	CharacterString	

	characters.		
type	The type of locator value, which enables an application to interpret, parse or format it according to certain rules.	LocatorDesignatorTypeValue	

5.3.5. *Locator Name (LocatorName)*

Proper noun applied to the real world entity identified by the locator.

<i>Attributes of the data type LocatorName</i>			
Attribute	Definition	Type	Voidability
name	The identifying part of the locator name.	GeographicalName	
type	The type of locator value, which enables an application to interpret, parse or format it according to certain rules.	LocatorNameTypeValue	

5.3.6. *Part Of Name (PartOfName)*

A part of the full name resulting from the subdivision of the thoroughfare name into separate, semantic parts, using the same language and script as the full thoroughfare name.

<i>Attributes of the data type PartOfName</i>			
Attribute	Definition	Type	Voidability
part	The character string that expresses the separate part of the name using the same language and script as the full thoroughfare name.	CharacterString	
type	A classification of the part of name according to its semantics (meaning) in the complete thoroughfare name.	PartTypeValue	

5.3.7. *Thoroughfare Name Value (ThoroughfareNameValue)*

Proper noun applied to thoroughfare optionally including a subdivision of the name into parts.

<i>Attributes of the data type ThoroughfareNameValue</i>			
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Attribute	Definition	Type	Voidability
name	Proper noun applied to the thoroughfare.	GeographicalName	
nameParts	One or several parts into which the thoroughfare name can be subdivided.	PartOfName	voidable

5.4. Code Lists

5.4.1. Geometry Method (*GeometryMethodValue*)

Description of how and by whom this geographic position of the address was created or derived.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.8

<i>Values for the code list GeometryMethodValue</i>	
Value	Definition
byAdministrator	Decided and recorded manually by the official body responsible for address allocation or by the dataset custodian.
byOtherParty	Decided and recorded manually by another party.
fromFeature	Derived automatically from another INSPIRE spatial object which is related to the address or address component.

↓ 1089/2010

5.4.2. Geometry Specification (*GeometrySpecificationValue*)

Information defining the specification used to create or derive this geographic position of the address.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.9

Values for the code list GeometrySpecificationValue

Value	Definition
addressArea	Position derived from the related address area.
adminUnit1stOrder	Position derived from the related administrative unit of 1st order.
adminUnit2ndOrder	Position derived from the related administrative unit of 2nd order.
adminUnit3rdOrder	Position derived from the related administrative unit of 3rd order.
adminUnit4thOrder	Position derived from the related administrative unit of 4th order.
adminUnit5thOrder	Position derived from the related administrative unit of 5th order.
adminUnit6thOrder	Position derived from the related administrative unit of 6th order.
building	Position aims at identifying the related building.
entrance	Position aims at identifying the entrance door or gate.
parcel	Position aims at identifying the related land parcel.
postalDelivery	Position aims at identifying a postal delivery point.
postalDescriptor	Position derived from the related postcode area.
segment	Position derived from the related segment of a thoroughfare.
thoroughfareAccess	Position aims at identifying the access point from the thoroughfare.
utilityService	Position aims at identifying a point of utility service.

↓ 1089/2010

5.4.3. *Locator Designator Type (LocatorDesignatorTypeValue)*

Description of the semantics of the locator designator.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.10

Values for the code list LocatorDesignatorTypeValue

Value	Definition
addressIdentifierGeneral	Address identifier composed by numbers and/or characters.
addressNumber	Address identifier composed only by numbers.
addressNumber2ndExtension	Second extension to the address number.
addressNumberExtension	Extension to the address number.
buildingIdentifier	Building identifier composed by numbers and/or characters.
buildingIdentifierPrefix	Prefix to the building number.
cornerAddress1stIdentifier	Address identifier related to the primary thoroughfare name in a corner address.
cornerAddress2ndIdentifier	Address identifier related to the secondary thoroughfare name in a corner address.
entranceDoorIdentifier	Identifier for an entrance door, entrance gate, or covered entranceway.
floorIdentifier	Identifier of a floor or level inside a building.
kilometrePoint	A mark on a road whose number identifies the existing distance between the origin point of the road and that mark, measured along the road.
postalDeliveryIdentifier	Identifier of a postal delivery point.
staircaseIdentifier	Identifier for a staircase, normally inside a building.
unitIdentifier	Identifier of a door, dwelling, suite or room inside a building.

↓ 1089/2010

5.4.4. *Locator Level (LocatorLevelValue)*

The level to which the locator refers.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.11

Values for the code list LocatorLevelValue

Value	Definition
accessLevel	The locator identifies a specific access to a plot of land, building or similar by use of an entrance number or similar identifier.
postalDeliveryPoint	The locator identifies a postal delivery point.
siteLevel	The locator identifies a specific plot of land, building or similar property by use of an address number, building number, building or property name.
unitLevel	The locator identifies a specific part of a building.

↓ 1089/2010

5.4.5. *Locator Name Type (LocatorNameTypeValue)*

Description of the semantics of the locator name.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.12

Values for the code list LocatorNameTypeValue

Value	Definition
buildingName	Name of building or part of building.
descriptiveLocator	Narrative, textual description of the location or addressable object.
roomName	Identifier of a dwelling, suite or room inside a building.
siteName	Name of real estate, building complex or site.

↓ 1089/2010

5.4.6. *Part Type (PartTypeValue)*

A classification of the part of name according to its semantics in the complete thoroughfare name.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.13

<i>Values for the code list PartTypeValue</i>	
Value	Definition
name	The part of name constitutes the core or root of the thoroughfare name.
namePrefix	The part of name is used to separate connecting words without sorting significance from the core of the thoroughfare name.
qualifier	The part of name qualifies the thoroughfare name.
type	The part of name indicates the category or type of thoroughfare.

↓ 1089/2010

5.4.7. *Status (StatusValue)*

Current validity of the real world address or address component.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.14

<i>Values for the code list StatusValue</i>	
Value	Definition
alternative	An address or address component in common use but different from the master address or address component as determined by the official body

	responsible for address allocation or by the dataset custodian.
current	Current and valid address or address component according to official body responsible for address allocation or deemed, by the dataset custodian, to be the most appropriate, commonly used address.
proposed	An address or address component awaiting approval by the dataset custodian or official body responsible for address allocation.
reserved	An address or address component approved by the official body responsible for address allocation or by the dataset custodian, but yet to be implemented.
retired	An address or address component no longer in every day use or abolished by the official body responsible for address allocation or by the dataset custodian.

↓ 1089/2010

5.5. Theme-specific Requirements

5.5.1. The Address Position

1. In the data set, the position of the address shall be represented by the coordinates of the actual location with the best available accuracy. This will be the most precise directly captured coordinates or, if none exist, then coordinates derived from one of the address components, with priority given to the component that allows the position to be most accurately determined.
2. If an address has more than one position, the specification attribute shall be populated with a different value for each of these.

5.5.2. Association roles

1. The withinScopeOf association role shall be populated for all locators which are assigned according to rules that seek to ensure unambiguousness within a specific address component (that is thoroughfare name, address area name, postal descriptor or administrative unit name).
2. The association role parentAddress shall be populated for all addresses which are connected to a parent (or main) address.
3. An address shall have an association to the name of the country in which it is located. Furthermore, an address must have associations to the additional address components necessary to the unambiguous identification and location of the address instance.

5.6. Layers

<i>Layer for the spatial data theme Addresses</i>		
Layer Name	Layer Title	Spatial object type

AD.Address	Addresses	Address
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6. CADASTRAL PARCELS

6.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Cadastral Parcels:

- Basic Property Unit
- Cadastral Boundary
- Cadastral Parcel
- Cadastral Zoning

Cadastral Parcels shall always be made available.

Basic property units shall be made available by Member States where unique cadastral references are given only for basic property units and not for parcels.

Cadastral boundaries shall be made available by Member States where absolute positional accuracy information is recorded for the cadastral boundary.

6.1.1. Basic Property Unit (*BasicPropertyUnit*)

The basic unit of ownership that is recorded in the land books, land registers or equivalent. It is defined by unique ownership and homogeneous real property rights, and may consist of one or more adjacent or geographically separate parcels.

Attributes of the spatial object type BasicPropertyUnit

Attribute	Definition	Type	Voidability
areaValue	Registered area value giving quantification of the area projected on the horizontal plane of the cadastral parcels composing the basic property unit.	Area	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	
nationalCadastralReference	Thematic identifier at national level, generally the full national code of the basic property unit. Must ensure the link to the national cadastral register or equivalent.	CharacterString	
validFrom	Official date and time the basic property unit was/will be legally established.	DateTime	voidable
validTo	Date and time at which the basic property unit legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type BasicPropertyUnit

Association role	Definition	Type	Voidability
administrativeUnit	The administrative unit of lowest administrative level containing this basic property unit.	AdministrativeUnit	voidable

Constraints of the spatial object type BasicPropertyUnit

Value of areaValue shall be given in square meters

6.1.2. Cadastral Boundary (CadastralBoundary)

Part of the outline of a cadastral parcel. One cadastral boundary may be shared by two neighbouring cadastral parcels.

Attributes of the spatial object type CadastralBoundary

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

estimatedAccuracy	Estimated absolute positional accuracy of the cadastral boundary in the used INSPIRE coordinate reference system. Absolute positional accuracy is the mean value of the positional uncertainties for a set of positions, where the positional uncertainties are the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
geometry	Geometry of the cadastral boundary.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
validFrom	Official date and time the cadastral boundary was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral boundary legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralBoundary

Association role	Definition	Type	Voidability
parcel	The cadastral parcel(s) outlined by this cadastral boundary. A cadastral boundary may outline one or two cadastral parcels.	CadastralParcel	voidable

Constraints of the spatial object type CadastralBoundary

Value of estimatedAccuracy shall be given in meters.

6.1.3. *Cadastral Parcel (CadastralParcel)*

Areas defined by cadastral registers or equivalent.

Attributes of the spatial object type CadastralParcel

Attribute	Definition	Type	Voidability
areaValue	Registered area value giving quantification of the area projected on the horizontal	Area	voidable

	plane of the cadastral parcel.		
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	Geometry of the cadastral parcel.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
label	Text commonly used to display the cadastral parcel identification.	CharacterString	
nationalCadastralReference	Thematic identifier at national level, generally the full national code of the cadastral parcel. Must ensure the link to the national cadastral register or equivalent.	CharacterString	
referencePoint	A point within the cadastral parcel.	GM_Point	voidable
validFrom	Official date and time the cadastral parcel was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral parcel legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralParcel

Association role	Definition	Type	Voidability
administrativeUnit	The administrative unit of lowest administrative level containing this cadastral parcel.	AdministrativeUnit	voidable
basicPropertyUnit	The basic property unit(s) containing this cadastral parcel.	BasicPropertyUnit	voidable

zoning	The cadastral zoning of lowest level containing this cadastral parcel.	CadastralZoning	voidable
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Constraints of the spatial object type CadastralParcel

Value of areaValue shall be given in square meters.

Type of geometry shall be GM_Surface or GM_MultiSurface

6.1.4. *Cadastral Zoning (CadastralZoning)*

Intermediary areas used in order to divide national territory into cadastral parcels.

Attributes of the spatial object type CadastralZoning

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
estimatedAccuracy	The estimated absolute positional accuracy of cadastral parcels within the cadastral zoning in the used INSPIRE coordinate reference system. Absolute positional accuracy is the mean value of the positional uncertainties for a set of positions, where the positional uncertainties are the distance between a measured position and what is considered as the corresponding true position.	Length	voidable
geometry	Geometry of the	GM_MultiSurface	

	cadastral zoning.		
inspireId	External object identifier of spatial object.	Identifier	
label	Text commonly used to display the cadastral zoning identification.	CharacterString	
level	Level of the cadastral zoning in the national cadastral hierarchy.	CadastralZoningLevelValue	voidable
levelName	Name of the level of the cadastral zoning in the national cadastral hierarchy, in at least one official language of the European Union.	LocalisedCharacterString	voidable
name	Name of the cadastral zoning.	GeographicalName	voidable
nationalCadastralZoningReference	Thematic identifier at national level, generally the full national code of the cadastral zoning.	CharacterString	
originalMapScaleDenominator	The denominator in the scale of the original paper map (if any) to whose extent the cadastral zoning corresponds.	Integer	voidable
referencePoint	A point within the cadastral zoning.	GM_Point	voidable
validFrom	Official date and time the cadastral zoning was/will be legally established.	DateTime	voidable
validTo	Date and time at which the cadastral zoning legally ceased/will cease to be used.	DateTime	voidable

Association roles of the spatial object type CadastralZoning

Association role	Definition	Type	Voidability
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upperLevelUnit	The next upper level cadastral zoning containing this cadastral zoning.	CadastralZoning	voidable
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Constraints of the spatial object type CadastralZoning

Value of estimatedAccuracy shall be given in meters.

A lower level cadastral zoning shall be part of an upper level zoning.

6.2. *Code Lists*

6.2.1. *Cadastral Zoning Level (CadastralZoningLevelValue)*

Levels of hierarchy of the cadastral zonings.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.15

<i>Values for the code list CadastralZoningLevelValue</i>	
Value	Definition
1stOrder	Uppermost level (largest areas) in the hierarchy of cadastral zonings, equal or equivalent to municipalities.
2ndOrder	Second level in the hierarchy of cadastral zonings.
3rdOrder	Third level in the hierarchy of cadastral zonings.

↓ 1089/2010

6.3 *Theme-specific Requirements*

6.3.1. *Geometry Representation*

1. The value domain of spatial properties defined in this Section is not restricted to the Simple Feature spatial schema as defined by EN ISO 19125-1.

2. If cadastral boundaries are provided, the cadastral boundaries corresponding to the outline of a cadastral parcel shall form closed ring(s).

6.3.2. *Modelling of object references*

All instances of the spatial object type CadastralParcel shall carry as a thematic identifier the attribute nationalCadastralReference. This attribute must enable users to make the link with rights, owners and other cadastral information in national cadastral registers or equivalent.

6.3.3. *Coordinate Reference Systems*

If data related to the spatial data theme Cadastral Parcels are made available in plane coordinates using the Lambert Conformal Conic projection, they shall also be made available in at least one other of the coordinate reference systems specified in sections 1.3.1, 1.3.2 and 1.3.3.

6.4. *Portrayal Rules*

6.4.1. *Layers*

<i>Layer for the spatial data theme Cadastral Parcels</i>		
Layer Name	Layer Title	Spatial object type
CP.CadastralParcel	Cadastral Parcel	CadastralParcel
CP.CadastralZoning	Cadastral Zoning	CadastralZoning
CP.CadastralBoundary	Cadastral Boundary	CadastralBoundary

7. **TRANSPORT NETWORKS**

7.1. *Definitions*

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

- ‘aerodrome reference point’ means the designated geographical location of an aerodrome, located near the initial or planned geometric centre of the aerodrome and normally remaining where originally established,
- ‘airport/heliport’ means a defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft/helicopters,
- ‘deep water route’ means a route in a designated area within defined limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles to a minimum indicated depth of water,
- ‘inter-modal connection’ means a connection between two elements in different transport networks that use a different transport mode, giving the possibility to change transported media (people, goods, etc) from one transport mode to another,
- ‘linear element’ means a 1-dimensional object that serves as the axis along which linear referencing is performed,

- ‘linear referencing’ means a specification of a location relative to a one-dimensional object as a measurement along (and optionally offset from) that element,
- ‘navaid equipment’ means a physical navaid equipment placed on the Earth surface, like Very High Frequency Omnidirectional Radio Range (VOR), Distance Measuring Equipment (DME), localizer, Tactical Air Navigation Beacon (TACAN) etc., which help in guiding aircraft traffic safely through existing air routes,
- ‘object referencing’ means providing the spatial extent of an object by referring to an existing spatial object or collection of spatial objects,
- ‘railway yard’ means an area crossed by a number of parallel railway tracks (usually more than two) interconnected between them, which are used to stop trains in order to load / unload freight without interrupting the traffic of a main railway line,
- ‘significant point’ means a specified geographical location used to define an Air Traffic Service (ATS) route, the flight path of an aircraft or for other navigation/ATS purposes,

↓ 102/2011 Art. 1.4 and Annex II.16

- ‘Area Navigation (RNAV)’ means a method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of both,
- ‘TACAN Navigation’ means a method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced Tactical Air Navigation Beacon (TACAN) navigation aids.

↓ 1089/2010

7.2. *Structure of the Spatial Data Theme Transport Networks*

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

- Common Transport Elements
- Air Transport Network
- Cable Transport Network
- Railway Transport Network
- Road Transport Network
- Water Transport Network

7.3. Common Transport Elements

7.3.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects related to Common Transport Elements:

- Access Restriction
- Condition Of Facility
- Maintenance Authority
- Marker Post
- Owner Authority
- Restriction for Vehicles
- Traffic Flow Direction
- Transport Area
- Transport Link
- Transport Link Sequence
- Transport Link Set
- Transport Network
- Transport Node
- Transport Object
- Transport Point
- Transport Property
- Vertical Position

7.3.1.1. Access Restriction (AccessRestriction)

A restriction on the access to a transport element.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type AccessRestriction</i>			
Attribute	Definition	Type	Voidability
restriction	Nature of the access restriction.	AccessRestrictionValue	

7.3.1.2. Condition Of Facility (ConditionOfFacility)

State of a transport network element with regards to its completion and use.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type ConditionOfFacility</i>			
Attribute	Definition	Type	Voidability
currentStatus	Current status value of a transport network element with regards to its completion and use.	ConditionOfFacilityValue	

7.3.1.3. Maintenance Authority (MaintenanceAuthority)

The authority responsible for maintenance of the transport element.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type MaintenanceAuthority</i>			
Attribute	Definition	Type	Voidability
authority	Identification of the maintenance authority.	CI_Citation	

7.3.1.4. Marker Post (MarkerPost)

Reference marker placed along a route in a transport network, mostly at regular intervals, indicating the distance from the beginning of the route, or some other reference point, to the point where the marker is located.

This type is a sub-type of TransportPoint.

<i>Attributes of the spatial object type MarkerPost</i>			
Attribute	Definition	Type	Voidability
location	Distance from the beginning of the route, or some other reference point, to the point where a marker post is located.	Distance	

<i>Association roles of the spatial object type MarkerPost</i>			
Association role	Definition	Type	Voidability

route	Route in a transport network along which the marker post is placed.	TransportLinkSet	voidable
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7.3.1.5. Owner Authority (OwnerAuthority)

The authority owning the transport element.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type OwnerAuthority</i>			
Attribute	Definition	Type	Voidability
authority	Identification of the owning authority.	CI_Citation	

7.3.1.6. Restriction For Vehicles (RestrictionForVehicles)

Restriction on vehicles on a transport element.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type RestrictionForVehicles</i>			
Attribute	Definition	Type	Voidability
measure	The measure for the restriction.	Measure	
restrictionType	The type of restriction.	RestrictionTypeValue	

7.3.1.7. Traffic Flow Direction (TrafficFlowDirection)

Indicates the direction of the flow of traffic in relation to the direction of the transport link vector.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type TrafficFlowDirection

Attribute	Definition	Type	Voidability
direction	Indicates the direction of the flow of traffic.	LinkDirectionValue	

Constraints of the spatial object type TrafficFlowDirection

This property can only be associated with a spatial object of the type Link or LinkSequence.

7.3.1.8. Transport Area (TransportArea)

Surface that represents the spatial extent of an element of a transport network.

This type is a sub-type of NetworkArea.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportArea

Attribute	Definition	Type	Voidability
validFrom	The time when the transport area started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport area no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportArea

All transport areas have an external object identifier.

7.3.1.9. Transport Link (TransportLink)

A linear spatial object that describes the geometry and connectivity of a transport network between two points in the network.

This type is a sub-type of Link.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLink

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportLink

All transport links have an external object identifier.

7.3.1.10. Transport Link Sequence (TransportLinkSequence)

A linear spatial object, composed of an ordered collection of transport links, which represents a continuous path in the transport network without any branches. The element has a defined beginning and end and every position on the transport link sequence is identifiable with one single parameter such as length. It describes an element of the transport network, characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of LinkSequence.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLinkSequence

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link sequence started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link sequence no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportLinkSequence

A transport link sequence must be composed of transport links that all belong to the same transport network.

All transport link sequences have an external object identifier.

7.3.1.11. Transport Link Set (TransportLinkSet)

A collection of transport link sequences and or individual transport links that has a specific function or significance in a transport network.

This type is a sub-type of LinkSet.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportLinkSet

Attribute	Definition	Type	Voidability
validFrom	The time when the transport link set started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport link set no longer exists in the real world.	DateTime	voidable

Association roles of the spatial object type TransportLinkSet

Association role	Definition	Type	Voidability
post	Marker post along a route in a transport network.	MarkerPost	voidable

Constraints of the spatial object type TransportLinkSet

A transport link set must be composed of transport links and or transport link sequences that all belong to the same transport network.

All transport link sets have an external object identifier.

7.3.1.12. Transport Network (TransportNetwork)

Collection of network elements that belong to a single mode of transport.

This type is a sub-type of Network.

Attributes of the spatial object type TransportNetwork

Attribute	Definition	Type	Voidability
inspireId	External object identifier of the spatial object.	Identifier	
typeOfTransport	Type of transport network, based on the type of infrastructure the network uses.	TransportTypeValue	

7.3.1.13. Transport Node (TransportNode)

A point spatial object which is used for connectivity.

This type is a sub-type of Node.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportNode

Attribute	Definition	Type	Voidability
validFrom	The time when the transport node started to exist in the real world.	DateTime	voidable

validTo	The time from which the transport node no longer exists in the real world.	DateTime	voidable
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Constraints of the spatial object type TransportNode

All transport nodes have an external object identifier.

7.3.1.14. Transport Object (TransportObject)

An identity base for transport network objects in the real world.

This type is abstract.

<i>Attributes of the spatial object type TransportObject</i>			
Attribute	Definition	Type	Voidability
geographicalName	A geographical name that is used to identify the transport network object in the real world. It provides a 'key' for implicitly associating different representations of the object.	GeographicalName	voidable

7.3.1.15. Transport Point (TransportPoint)

A point spatial object - which is not a node - that represents the position of an element of a transport network.

This type is a sub-type of NetworkElement.

This type is a sub-type of TransportObject.

This type is abstract.

Attributes of the spatial object type TransportPoint

Attribute	Definition	Type	Voidability
geometry	The location of the transport point.	GM_Point	
validFrom	The time when the transport point started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport point no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportPoint

All transport points have an external object identifier.

7.3.1.16. Transport Property (TransportProperty)

A reference to a property that falls upon the network. This property can apply to the whole of the network element it is associated with or - for linear spatial objects - be described using linear referencing.

This type is a sub-type of NetworkProperty.

This type is abstract.

Attributes of the spatial object type TransportProperty

Attribute	Definition	Type	Voidability
validFrom	The time when the transport property started to exist in the real world.	DateTime	voidable
validTo	The time from which the transport property no longer exists in the real world.	DateTime	voidable

Constraints of the spatial object type TransportProperty

All transport properties have an external object identifier.

7.3.1.17. Vertical Position (VerticalPosition)

Vertical level relative to other transport network elements.

This type is a sub-type of TransportProperty.

<i>Attributes of the spatial object type VerticalPosition</i>			
Attribute	Definition	Type	Voidability
verticalPosition	Relative vertical position of the transport element.	VerticalPositionValue	

7.3.2. Enumerations

7.3.2.1. Transport Type (TransportTypeValue)

Possible types of transport networks.

<i>Allowed values for the enumeration TransportTypeValue</i>	
Value	Definition

air	The transport network consists of transport by air.
cable	The transport network consists of transport by cable.
rail	The transport network consists of transport by rail.
road	The transport network consists of transport by road.
water	The transport network consists of transport by water.

7.3.3. Code Lists

7.3.3.1. Access Restriction (AccessRestrictionValue)

Types of access restrictions for a transport element.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.17

<i>Values for the code list AccessRestrictionValue</i>	
Value	Definition
forbiddenLegally	Access to the transport element is forbidden by law.
physicallyImpossible	Access to the transport element is physically impossible due to the presence of barriers or other physical obstacles.
private	Access to the transport element is restricted because it is privately owned.
publicAccess	The transport element is open to public access.
seasonal	Access to the transport element depends on the season.
toll	Access to the transport element is subject to toll.

↓ 1089/2010

7.3.3.2. Restriction Type (RestrictionTypeValue)

Possible restrictions on vehicles that can access a transport element.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.18

<i>Values for the code list RestrictionTypeValue</i>	
Value	Definition
maximumDoubleAxleWeight	The maximum weight per double axle of a vehicle allowed at a transport element.
maximumDraught	The maximum draught of a vehicle allowed on a transport element.
maximumFlightLevel	The maximum flight level allowed for a vehicle at a transport element.
maximumHeight	The maximum height of a vehicle which can pass under another object.
maximumLength	The maximum length of a vehicle allowed at a transport element.
maximumSingleAxleWeight	The maximum weight per single axle of a vehicle allowed at a transport element.
maximumTotalWeight	The maximum total weight of a vehicle allowed at a transport element.
maximumTripleAxleWeight	The maximum weight per triple axle of a vehicle allowed at a transport element.
maximumWidth	The maximum width of a vehicle allowed on a transport element.
minimumFlightLevel	The minimum flight level allowed for a vehicle at a transport element.

↓ 1089/2010

7.4. Air Transport Network

7.4.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects related to Air Transport Network:

- Aerodrome Area
- Aerodrome Category
- Aerodrome Node
- Aerodrome Type
- Air Link
- Air Link Sequence
- Air Node
- Air Route
- Air Route Link
- Airspace Area
- Apron Area
- Condition of Air Facility
- Designated Point
- Element Length
- Element Width
- Field Elevation
- Instrument Approach Procedure
- Lower Altitude Limit
- Navaid
- Procedure Link
- Runway Area
- Runway Centreline Point
- Standard Instrument Arrival
- Standard Instrument Departure
- Surface Composition
- Taxiway Area
- Touch Down Lift Off Area
- Upper Altitude Limit

– Use Restriction

7.4.1.1. Aerodrome Area (AerodromeArea)

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft and/or helicopters.

This type is a sub-type of TransportArea.

7.4.1.2. Aerodrome Category (AerodromeCategory)

Aerodrome category concerning the scope and importance of the air traffic services offered from and to it.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type AerodromeCategory

Attribute	Definition	Type	Voidability
aerodromeCategory	Value which indicates the category of an aerodrome.	AerodromeCategoryValue	

Constraints of the spatial object type AerodromeCategory

This property can only be associated with a spatial object that is an Aerodrome Node or an Aerodrome Area.

7.4.1.3. Aerodrome Node (AerodromeNode)

Node located at the aerodrome reference point of an airport/heliport, which is used to represent it in a simplified way.

This type is a sub-type of AirNode.

Attributes of the spatial object type AerodromeNode

Attribute	Definition	Type	Voidability
designatorIATA	The three letter IATA designator of the aerodrome (airport/heliport).	CharacterString	voidable
locationIndicatorICAO	The four letter ICAO location indicator of the aerodrome (airport/heliport), as listed in ICAO DOC 7910.	CharacterString	voidable

<i>Association roles of the spatial object type AerodromeNode</i>			
Association role	Definition	Type	Voidability
controlTowers	The set of control towers belonging to an aerodrome (airport/heliport).	Building of the Buildings Base package	voidable

Deleted: Type to be specified in the spatial data theme Buildings

7.4.1.4. Aerodrome Type (AerodromeType)

A code specifying the type of aerodrome.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type AerodromeType

Attribute	Definition	Type	Voidability
aerodromeType	The type of aerodrome.	AerodromeTypeValue	

Constraints of the spatial object type AerodromeType

This property can only be associated with a spatial object that is an Aerodrome Node or Aerodrome Area.

7.4.1.5. Air Link (AirLink)

A linear spatial object that describes the geometry and connectivity of the air network between two points in the network.

This type is a sub-type of TransportLink.

This type is abstract.

7.4.1.6. Air Link Sequence (AirLinkSequence)

A linear spatial object, composed of an ordered collection of air links, which represents a continuous path in the air network without any branches.

This type is a sub-type of TransportLinkSequence.

7.4.1.7. Air Node (AirNode)

A node which occurs in an air network.

This type is a sub-type of TransportNode.

This type is abstract.

<i>Attributes of the spatial object type AirNode</i>			
Attribute	Definition	Type	Voidability
significantPoint	Attribute which indicates whether the air node is or is not a significant point.	Boolean	

7.4.1.8. Air Route (AirRoute)

A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services, from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

This type is a sub-type of TransportLinkSet.

<i>Attributes of the spatial object type AirRoute</i>			
Attribute	Definition	Type	Voidability
airRouteType	Route classification.	AirRouteTypeValue	voidable
designator	Code or designator that identifies an Air Route.	CharacterString	voidable

7.4.1.9. Air Route Link (AirRouteLink)

A portion of a route to be flown usually without an intermediate stop, as defined by two consecutive significant points.

This type is a sub-type of AirLink.

<i>Attributes of the spatial object type AirRouteLink</i>			
Attribute	Definition	Type	Voidability
airRouteLinkClass	The class or type of an air route link.	AirRouteLinkClassValue	voidable

7.4.1.10. Airspace Area (AirspaceArea)

A defined volume in the air, described as horizontal projection with vertical limits.

This type is a sub-type of TransportArea.

<i>Attributes of the spatial object type AirspaceArea</i>			
Attribute	Definition	Type	Voidability

AirspaceAreaType	A code indicating the general structure or characteristics of a particular airspace.	AirspaceAreaTypeValue	
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7.4.1.11. Apron Area (ApronArea)

A defined area, on a land aerodrome/heliport, intended to accommodate aircraft/helicopters for purposes of loading and unloading passengers, mail or cargo, and for fuelling, parking or maintenance.

This type is a sub-type of TransportArea.

7.4.1.12. Condition Of Air Facility (ConditionOfAirFacility)

State of an air transport network element with regards to its completion and use.

This type is a sub-type of ConditionOfFacility.

Constraints of the spatial object type ConditionOfAirFacility

This property can only be associated with a spatial object that is an Aerodrome Node, an Aerodrome Area or a Runway Area.

7.4.1.13. Designated Point (DesignatedPoint)

A geographical location not marked by the site of a radio navigation aid, used in defining an ATS route, the flight path of an aircraft or for other navigation or ATS purposes.

This type is a sub-type of AirNode.

<i>Attributes of the spatial object type DesignatedPoint</i>			
Attribute	Definition	Type	Voidability
designator	The coded designator of the point.	CharacterString	voidable

7.4.1.14. Element Length (ElementLength)

The physical length of the element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type ElementLength

Attribute	Definition	Type	Voidability
length	The physical length of the element.	Measure	

Constraints of the spatial object type ElementLength

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area or Touch Down Lift Off Area.

7.4.1.15.Element Width (ElementWidth)

The physical width of the element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type ElementWidth

Attribute	Definition	Type	Voidability
width	The physical width of the element.	Measure	

Constraints of the spatial object type ElementWidth

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area or Touch Down Lift Off Area.

7.4.1.16.Field Elevation (FieldElevation)

The aerodrome elevation as the vertical distance between the highest point of the landing area of an aerodrome and mean sea level.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FieldElevation

Attribute	Definition	Type	Voidability
altitude	Value of the field altitude.	Measure	

Constraints of the spatial object type FieldElevation

This property can only be associated with a spatial object that is an Aerodrome Node or Aerodrome Area.

7.4.1.17.Instrument Approach Procedure (InstrumentApproachProcedure)

A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

This type is a sub-type of ProcedureLink.

7.4.1.18.Lower Altitude Limit (LowerAltitudeLimit)

Altitude that defines the lower limit of an air transport network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type LowerAltitudeLimit

Attribute	Definition	Type	Voidability
altitude	Value of the altitude limit.	Measure	

Constraints of the spatial object type LowerAltitudeLimit

This property can only be associated with a spatial object that is an Air Route Link or Airspace Area.

7.4.1.19.Navaid (Navaid)

One or more Navaid Equipments providing navigation services.

This type is a sub-type of AirNode.

<i>Attributes of the spatial object type Navaid</i>			
Attribute	Definition	Type	Voidability
designator	The coded identifier given to the navaid system.	CharacterString	voidable
navaidType	Type of the navaid service.	NavaidTypeValue	voidable

7.4.1.20.Procedure Link (ProcedureLink)

A series of predetermined manoeuvres with specified protection from obstacles.

This type is a sub-type of AirLink.

7.4.1.21.Runway Area (RunwayArea)

A defined rectangular area on a land aerodrome/heliport prepared for the landing and take-off of aircraft.

This type is a sub-type of TransportArea.

<i>Attributes of the spatial object type RunwayArea</i>			
Attribute	Definition	Type	Voidability
designator	The full textual designator of the runway, used to uniquely identify it at	CharacterString	voidable

	an aerodrome/heliport which has more than one.		
runwayType	The type of runway, either runway for airplanes or final approach and take off area (FATO) for helicopters.	RunwayTypeValue	voidable

7.4.1.22. Runway Centreline Point (RunwayCentrelinePoint)

An operationally significant position on the centreline of a runway direction.

This type is a sub-type of AirNode.

<i>Attributes of the spatial object type RunwayCentrelinePoint</i>			
Attribute	Definition	Type	Voidability
pointRole	The role of the point along the runway direction centreline.	PointRoleValue	

7.4.1.23. Standard Instrument Arrival (StandardInstrumentArrival)

A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

This type is a sub-type of ProcedureLink.

<i>Attributes of the spatial object type StandardInstrumentArrival</i>			
Attribute	Definition	Type	Voidability
designator	The textual designator of the Standard Instrument Arrival.	CharacterString	voidable

7.4.1.24. Standard Instrument Departure (StandardInstrumentDeparture)

A designated instrument flight rule (IFR) departure route linking the aerodrome or a specific runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.

This type is a sub-type of ProcedureLink.

<i>Attributes of the spatial object type StandardInstrumentDeparture</i>			
Attribute	Definition	Type	Voidability
designator	The full textual designator of the Standard	CharacterString	voidable

	Instrument Departure.		
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7.4.1.25.Surface Composition (SurfaceComposition)

The composition of an aerodrome/heliport related surface.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type SurfaceComposition

Attribute	Definition	Type	Voidability
surfaceComposition	A code indicating the composition of an aerodrome/heliport related surface.	SurfaceCompositionValue	

Constraints of the spatial object type SurfaceComposition

This property can only be associated with a spatial object that is a Runway Area, Taxiway Area, Apron Area or Touch Down Lift Off Area.

7.4.1.26.Taxiway Area (TaxiwayArea)

A defined path at an aerodrome/heliport established for the taxiing of aircraft/helicopters and intended to provide a link between one part of the aerodrome and another.

This type is a sub-type of TransportArea.

<i>Attributes of the spatial object type TaxiwayArea</i>			
Attribute	Definition	Type	Voidability
designator	The textual designator of the taxiway.	CharacterString	voidable

7.4.1.27.Touch Down Lift Off Area (TouchDownLiftOff)

A load bearing area on which a helicopter may touch down or lift-off.

This type is a sub-type of AirNode.

<i>Attributes of the spatial object type TouchDownLiftOff</i>			
Attribute	Definition	Type	Voidability
designator	The textual designator of the touch down and lift-off area.	CharacterString	voidable

7.4.1.28.Upper Altitude Limit (UpperAltitudeLimit)

Altitude that defines the upper limit of an air transport network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type UpperAltitudeLimit

Attribute	Definition	Type	Voidability
altitude	Value of the altitude limit.	Measure	

Constraints of the spatial object type UpperAltitudeLimit

This property can only be associated with a spatial object that is an Air Route Link or Airspace Area.

7.4.1.29.Use Restriction (UseRestriction)

The restrictions to the use of an air network object.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type UseRestriction

Attribute	Definition	Type	Voidability
restriction	The type of use restriction for the air network object.	AirUseRestrictionValue	

Constraints of the spatial object type UseRestriction

This property can only be associated with a spatial object that is an Air Route, Air Link (or specialized Air Link), Air Node (or specialized Air Node) or Aerodrome Area.

7.4.2. Code Lists

7.4.2.1. Aerodrome Category (AerodromeCategoryValue)

Aerodrome possible categories concerning the scope and importance of the air traffic services offered from and to it.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.19

<i>Values for the code list AerodromeCategoryValue</i>	
Value	Definition
domesticNational	Aerodrome serving domestic national air traffic services.
domesticRegional	Aerodrome serving domestic regional air traffic services.
international	Aerodrome serving international air traffic services.

↓ 1089/2010

7.4.2.2. Aerodrome Type (AerodromeTypeValue)

A code specifying whether a particular entity occurrence is an Aerodrome or a Heliport.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.20

<i>Values for the code list AerodromeTypeValue</i>	
Value	Definition
aerodromeHeliport	Aerodrome with heliport landing area.
aerodromeOnly	Aerodrome only.
heliportOnly	Heliport only.
landingSite	Landing site.

↓ 1089/2010

7.4.2.3. Air Route Link Class (AirRouteLinkClassValue)

The type of the route from the navigation point of view.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.21

<i>Values for the code list AirRouteLinkClassValue</i>	
Value	Definition
conventional	Conventional navigation route: An air route which does neither use Area Navigation nor TACAN navigation for air traffic services.
RNAV	Area navigation route: An air route which uses Area Navigation (RNAV) for air traffic services.
TACAN	TACAN route: An air route which uses TACAN Navigation for air traffic services.

↓ 1089/2010

7.4.2.4. Air Route Type (AirRouteTypeValue)

The route classification as ATS route or North Atlantic Tracks.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.22

<i>Values for the code list AirRouteTypeValue</i>	
Value	Definition
ATS	ATS Route as described in ICAO Annex 11.
NAT	North Atlantic Track (part of Organized Track System).

↓ 1089/2010

7.4.2.5. Air Use Restriction (AirUseRestrictionValue)

The use restrictions for an air network object.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.23

<i>Values for the code list AirUseRestrictionValue</i>	
Value	Definition
reservedForMilitary	The air network object is exclusively for military use.
temporalRestrictions	The temporal restrictions apply to the use of the air network object.

↓ 1089/2010

7.4.2.6. Airspace Area Type (AirspaceAreaTypeValue)

Recognised types of Airspace.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.24

<i>Values for the code list AirspaceAreaTypeValue</i>	
Value	Definition
ATZ	Airport Traffic Zone. Airspace of defined dimensions established around an airport for the protection of airport traffic.
CTA	Control area. A controlled airspace extending upwards from a specified limit above the earth.
CTR	Control zone. A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

D	Danger area. Airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.
FIR	Flight information region. Airspace of defined dimensions within which flight information service and alerting service are provided. Might, for example, be used if service provided by more than one unit.
P	Prohibited area. Airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.
R	Restricted area. Airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.
TMA	Terminal control area. Control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes. Mainly used in Europe under the Flexible Use of Airspace concept.
UIR	Upper flight information region (UIR). An upper airspace of defined dimensions within which flight information service and alerting service are provided. Each state determines its definition for upper airspace.

↓ 1089/2010

7.4.2.7. Navaid Type (NavaidTypeValue)

Types of Navaid Services.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.25

<i>Values for the code list NavaidTypeValue</i>	
Value	Definition
DME	Distance Measuring Equipment.
ILS	Instrument Landing System.
ILS-DME	ILS with collocated DME.

LOC	Localizer.
LOC-DME	LOC and DME collocated.
MKR	Marker Beacon.
MLS	Microwave Landing System.
MLS-DME	MLS with collocated DME.
NDB	Non-Directional Radio Beacon.
NDB-DME	NDB and DME collocated.
NDB-MKR	Non-Directional Radio Beacon and Marker Beacon.
TACAN	Tactical Air Navigation Beacon.
TLS	Transponder Landing System.
VOR	VHF Omnidirectional Radio Range.
VOR-DME	VOR and DME collocated.
VORTAC	VOR and TACAN collocated.

↓ 1089/2010

7.4.2.8. Point Role (PointRoleValue)

Role of the Runway Centreline Point.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.26

<i>Values for the code list PointRoleValue</i>	
Value	Definition
end	Physical end of a runway direction.
mid	The mid point of the runway.
start	Physical start of a runway direction.

threshold	The beginning of that portion of the runway usable for landing.
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↓ 1089/2010

7.4.2.9. Runway Type (RunwayTypeValue)

A code that makes a distinction between runways for airplanes and FATO for helicopters.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.27

<i>Values for the code list RunwayTypeValue</i>	
Value	Definition
FATO	Final Approach and Take Off Area for helicopters.
runway	Runway for airplanes.

↓ 1089/2010

7.4.2.10. Surface Composition (SurfaceCompositionValue)

A code indicating the composition of a surface.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.28

<i>Values for the code list SurfaceCompositionValue</i>	
Value	Definition
asphalt	Surface made of an asphalt layer.
concrete	Surface made of a concrete layer.
grass	Surface consisting of a grass layer.

7.5. *Cable Transport Network*

7.5.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Cable Transport Network:

- Cableway Link
- Cableway Link Sequence
- Cableway Link Set
- Cableway Node

7.5.1.1. Cableway Link (CablewayLink)

Linear spatial object that describes the geometry and connectivity of a cable network between two points in a cableway transport network.

This type is a sub-type of TransportLink.

<i>Attributes of the spatial object type CablewayLink</i>			
Attribute	Definition	Type	Voidability
cablewayType	The type of a cableway transport.	CablewayTypeValue	voidable

7.5.1.2. Cableway Link Sequence (CablewayLinkSequence)

An ordered collection of cableway links that are characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.5.1.3. Cableway Link Set (CablewayLinkSet)

A collection of cableway link sequences and or individual cableway links that has a specific function or significance in a cable transport network.

This type is a sub-type of TransportLinkSet.

7.5.1.4. Cableway Node (CablewayNode)

A point spatial object that is used to represent connectivity between two consecutive cableway links.

This type is a sub-type of TransportNode.

7.5.2. Code Lists

7.5.2.1. Cableway Type (CablewayTypeValue)

The possible types of cableway transport.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.29

<i>Values for the code list CablewayTypeValue</i>	
Value	Definition
cabinCableCar	A cableway transport whose vehicles consist of a suspended cabin for carrying groups of people and/or goods inside it from one location to another.
chairLift	A cableway transport whose vehicles consist of suspended chairs for carrying individuals or groups of people from one location to another via a steel cable or rope which is looped around two points.
skiTow	A cableway transport for pulling skiers and snowboarders uphill.

↓ 1089/2010

7.6. Railway Transport Network

7.6.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects related to Railway Transport Network:

- Design Speed
- Nominal Track Gauge
- Number of Tracks
- Railway Area
- Railway Electrification
- Railway Line
- Railway Link

- Railway Link Sequence
- Railway Node
- Railway Station Area
- Railway Station Code
- Railway Station Node
- Railway Type
- Railway Use
- Railway Yard Area
- Railway Yard Node

7.6.1.1. Design Speed (DesignSpeed)

The specification of the maximum speed to which a railway line is designed for.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type DesignSpeed

Attribute	Definition	Type	Voidability
speed	The specification of the maximum speed to which a railway line is designed for.	Velocity	

Constraints of the spatial object type DesignSpeed

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.2. Nominal Track Gauge (NominalTrackGauge)

The nominal distance between the two outer rails (gauge) of a railway track.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NominalTrackGauge

Attribute	Definition	Type	Voidability
nominalGauge	A single value that identifies the track gauge.	Measure	voidable
nominalGaugeCategory	Provision of the gauge of a railway track as a fuzzy	TrackGaugeCategoryValue	voidable

	category with respect to the European standard nominal gauge.		
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Constraints of the spatial object type NominalTrackGauge

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.3. Number Of Tracks (NumberOfTracks)

The number of tracks for a railway stretch.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NumberOfTracks

Attribute	Definition	Type	Voidability
minMaxNumberOfTracks	Indicates whether the number of tracks are counted as minimum or maximum value.	MinMaxTrackValue	voidable
numberOfTracks	The number of tracks present.	Integer	

Constraints of the spatial object type NumberOfTracks

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.4. Railway Area (RailwayArea)

Surface occupied by a railway track, including ballast.

This type is a sub-type of TransportArea.

7.6.1.5. Railway Electrification (RailwayElectrification)

Indication whether the railway is provided with an electric system to power vehicles moving along it.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayElectrification

Attribute	Definition	Type	Voidability
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electrified	Indicates whether the railway is provided with an electric system to power vehicles moving along it.	Boolean	
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Constraints of the spatial object type RailwayElectrification

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.6. Railway Line (RailwayLine)

A collection of railway link sequences and or individual railway links that are characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of TransportLinkSet.

<i>Attributes of the spatial object type RailwayLine</i>			
Attribute	Definition	Type	Voidability
railwayLineCode	A code assigned to a railway line which is unique within a Member State.	CharacterString	voidable

7.6.1.7. Railway Link (RailwayLink)

A linear spatial object that describes the geometry and connectivity of a railway network between two points in the network.

This type is a sub-type of TransportLink.

<i>Attributes of the spatial object type RailwayLink</i>			
Attribute	Definition	Type	Voidability

- Deleted:** Attributes of the spatial object type RailwayLink
- Deleted:** Attribute
- Deleted:** Definition
- Deleted:** Type
- Deleted:** Voidability
- Deleted:** fictitious
- Deleted:** The railway link does not represent a real and existing railway track but a fictitious trajectory.
- Deleted:** Boolean
- Deleted:** voidable

7.6.1.8. Railway Link Sequence (RailwayLinkSequence)

A linear spatial object, composed of an ordered collection of railway links, which represents a continuous path in a railway network without any branches. The element has a defined beginning and end and every position on the railway link sequence is identifiable with one single parameter such as length. It describes an element of the railway network, characterized by one or more thematical identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.6.1.9. Railway Node (RailwayNode)

A point spatial object which represents a significant point along the railway network or defines an intersection of railway tracks used to describe its connectivity.

This type is a sub-type of TransportNode.

<i>Attributes of the spatial object type RailwayNode</i>			
Attribute	Definition	Type	Voidability
formOfNode	The function of a railway node within the railway network.	FormOfRailwayNodeValue	voidable

7.6.1.10. Railway Station Area (RailwayStationArea)

An area spatial object which is used to represent the topographical limits of the facilities of a railway station (buildings, railway yards, installations and equipment) devoted to carry out railway station operations.

This type is a sub-type of TransportArea.

7.6.1.11. Railway Station Code (RailwayStationCode)

The unique code assigned to a railway station.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayStationCode

Attribute	Definition	Type	Voidability
stationCode	A unique code assigned to a railway station.	CharacterString	

Constraints of the spatial object type RailwayStationCode

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.12. Railway Station Node (RailwayStationNode)

A railway node which represents the location of a railway station along the railway network.

This type is a sub-type of RailwayNode.

Attributes of the spatial object type RailwayStationNode

Attribute	Definition	Type	Voidability
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numberOfPlatforms	A value indicating the number of platforms available at a railway station.	Integer	voidable
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Constraints of the spatial object type RailwayStationNode

For a railway station node, the value for the ‘formOfNode’ attribute shall always be ‘RailwayStop’.

7.6.1.13. Railway Type (RailwayType)

The type of railway transport the line is designed for.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayType

Attribute	Definition	Type	Voidability
type	The type of railway transport to which the line is designed for.	RailwayTypeValue	

Constraints of the spatial object type RailwayType

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.14. Railway Use (RailwayUse)

The current use of the railway.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RailwayUse

Attribute	Definition	Type	Voidability
use	The current use of the railway.	RailwayUseValue	

Constraints of the spatial object type RailwayUse

This property can only be associated with a spatial object that is part of a railway transport network.

7.6.1.15. Railway Yard Area (RailwayYardArea)

An area spatial object which is used to represent the topographical limits of a railway yard.

This type is a sub-type of TransportArea.

7.6.1.16. Railway Yard Node (RailwayYardNode)

A railway node which occurs within a railway yard area.

This type is a sub-type of RailwayNode.

Constraints of the spatial object type RailwayYardNode

For a railway yard node, the value for the 'formOfNode' attribute shall always be 'RailwayStop'.

7.6.2. Enumerations

7.6.2.1. Minimum Or Maximum Track Number (MinMaxTrackValue)

Values to indicate whether number of tracks are counted as the maximum, minimum or average number.

<i>Allowed values for the enumeration MinMaxTrackValue</i>	
Value	Definition
average	The number of tracks is the average value for a given part of the railway network.
maximum	The number of tracks is the maximum value for a given part of the railway network.
minimum	The number of tracks is the minimum value for a given part of the railway network.

7.6.2.2. Track Gauge Category (TrackGaugeCategoryValue)

The possible categories of railways concerning its nominal track gauge.

<i>Allowed values for the enumeration TrackGaugeCategoryValue</i>	
Value	Definition
broad	The nominal track gauge property is broader than the standard one.
standard	The nominal track gauge property is equal to the European standard (1435 millimetres).
narrow	The nominal track gauge property is narrower than the standard one.
notApplicable	The definition of a nominal track gauge property is not applicable to the type of railway transport.

7.6.3. Code Lists

7.6.3.1. Form Of Railway Node (FormOfRailwayNodeValue)

The possible functions of a railway node within the railway network.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.30

<i>Values for the code list FormOfRailwayNodeValue</i>	
Value	Definition
junction	A railway node where the railway network has a mechanism consisting on a railroad track with two movable rails and the necessary connections, which let vehicles turn from one track to another.
levelCrossing	A railway node where the railway network is a crossed by a road at the same level.
pseudoNode	A railway node which represents a point where one or more attributes of the railway links connected to it change their value, or a point necessary to describe the geometry of the network.
railwayEnd	Only one railway link connects to the railway node. It signifies the end of a railway line.
railwayStop	A place in the railway network where trains stop to load/unload cargo or to let passengers get on and off the train.

↓ 1089/2010

7.6.3.2. Railway Type (RailwayTypeValue)

The possible types of railway transport.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.31

Values for the code list RailwayTypeValue

Value	Definition
cogRailway	A railway transport which allows the vehicles to operate on steep gradients, consisting of a railway provided with a toothed rack rail (usually between the running rails) where vehicles are fitted with one or more cog wheels or pinions that mesh with this rack rail.
funicular	A railway transport consisting of a cable attached to a vehicle on rails which moves them up and down a very steep slope. Where possible the ascending and descending vehicles counterbalance each other.
magneticLevitation	A railway transport based on a single rail which acts as guideway of a vehicle and supports it by means of a magnetic levitation mechanism.
metro	An urban railway transport system used in large urban areas, which runs on a separate track from other transport systems, is usually electrically powered and in some cases runs under ground.
monorail	A railway transport based on a single rail which acts as both its only support and guideway.
suspendedRail	A railway transport based on a single rail, acting as both support and guideway, from which a vehicle is suspended to move along the railway.
train	A railway transport usually consisting of two parallel rails on which a powered-vehicle or train machine pulls a connected series of vehicles to move them along the railway in order to transport freight or passengers from one destination to another.
tramway	A railway transport system used in urban areas, which often runs at street level, sharing road space with motor traffic and pedestrians. Tramways are usually electrically powered.

↓ 1089/2010

7.6.3.3. Railway Use (RailwayUseValue)

The possible uses of railways.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.32

Values for the code list RailwayUseValue

Value	Definition
cargo	The use of railway is exclusively for cargo operations.
carShuttle	The use of railway is exclusively to perform car shuttle transport.
mixed	The use of railway is mixed. It is used to transport passengers and cargo.
passengers	The use of railway is exclusively to transport passengers.

↓ 1089/2010

7.7. *Road Transport Network*

7.7.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Road Transport Network:

- E-Road
- Form of Way
- Functional Road Class
- Number of Lanes
- Road
- Road Area
- Road Link
- Road Link Sequence
- Road Name
- Road Node
- Road Service Area
- Road Service Type
- Road Surface Category
- Road Width

- Speed Limit
- Vehicle Traffic Area

7.7.1.1. E-Road (ERoad)

A collection of road link sequences and or individual road links that represents a route that is part of the international E-road network, characterized by its European route number.

This type is a sub-type of TransportLinkSet.

<i>Attributes of the spatial object type ERoad</i>			
Attribute	Definition	Type	Voidability
euclideanRouteNumber	Code, identifying the route in the international E-road network. The code always starts with a letter 'E', followed by a one-, two- or three-digit number.	CharacterString	voidable

7.7.1.2. Form Of Way (FormOfWay)

A classification based on the physical properties of the Road Link.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FormOfWay

Attribute	Definition	Type	Voidability
formOfWay	Physical form of the way.	FormOfWayValue	

Constraints of the spatial object type FormOfWay

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.3. Functional Road Class (FunctionalRoadClass)

A classification based on the importance of the role that the road performs in the road network.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FunctionalRoadClass

Attribute	Definition	Type	Voidability
functionalClass	Functional rank of the road link in the road network.	FunctionalRoadClassValue	

Constraints of the spatial object type FunctionalRoadClass

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.4. Number Of Lanes (NumberOfLanes)

The number of lanes of a road element.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type NumberOfLanes

Attribute	Definition	Type	Voidability
direction	Indicates which direction the number of lanes is valid for.	LinkDirectionValue	voidable
minMaxNumberOfLanes	Indicates if the number of lanes is counted as minimum or maximum value.	MinMaxLaneValue	voidable
numberOfLanes	Number of lanes.	Integer	

Constraints of the spatial object type NumberOfLanes

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.5. Road (Road)

A collection of road link sequences and/or individual road links that are characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSet.

<i>Attributes of the spatial object type Road</i>			
Attribute	Definition	Type	Voidability
localRoadCode	Identification code assigned to the road by the local road authority.	CharacterString	voidable
nationalRoadCode	The national number of the road.	CharacterString	voidable

7.7.1.6. Road Area (RoadArea)

Surface which extends to the limits of a road, including vehicular areas and other parts of it.

This type is a sub-type of TransportArea.

7.7.1.7. Road Link (RoadLink)

A linear spatial object that describes the geometry and connectivity of a road network between two points in the network. Road links can represent paths, bicycle roads, single carriageways, multiple carriageway roads and even fictitious trajectories across traffic squares.

This type is a sub-type of TransportLink.

7.7.1.8. Road Link Sequence (RoadLinkSequence)

A linear spatial object, composed of an ordered collection of road links, which represents a continuous path in a road network without any branches. The element has a defined beginning and end and every position on the road link sequence is identifiable with one single parameter such as length. It describes an element of the road network, characterized by one or more thematic identifiers and/or properties.

This type is a sub-type of TransportLinkSequence.

7.7.1.9. Road Name (RoadName)

Name of a road, as assigned by the responsible authority.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadName

Attribute	Definition	Type	Voidability
name	Name of the road.	GeographicalName	

Constraints of the spatial object type RoadName

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.10. Road Node (RoadNode)

A point spatial object that is used to either represent connectivity between two road links or to represent a significant spatial object such as a services station or roundabout.

This type is a sub-type of TransportNode.

<i>Attributes of the spatial object type RoadNode</i>			
Attribute	Definition	Type	Voidability

formOfRoadNode	Description of the function of a road node in the road transport network.	FormOfRoadNodeValue	voidable
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7.7.1.11. Road Service Area (RoadServiceArea)

Surface annexed to a road and devoted to offer particular services for it.

This type is a sub-type of TransportArea.

7.7.1.12. Road Service Type (RoadServiceType)

Description of the type of road service area and the available facilities.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadServiceType

Attribute	Definition	Type	Voidability
availableFacility	Facility that is available for a given road service area.	ServiceFacilityValue	
type	Type of road service area.	RoadServiceTypeValue	

Constraints of the spatial object type RoadServiceType

This property can only be associated with a spatial object of the type RoadServiceArea or RoadNode (when formOfRoadNode=roadServiceArea).

7.7.1.13. Road Surface Category (RoadSurfaceCategory)

Specification of the state of the surface of the associated Road Element. Indicates whether a road is paved or unpaved.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadSurfaceCategory

Attribute	Definition	Type	Voidability
surfaceCategory	Type of road surface.	RoadSurfaceCategoryValue	

Constraints of the spatial object type RoadSurfaceCategory

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.14. Road Width (RoadWidth)

The width of the road, measured as an average value.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type RoadWidth

Attribute	Definition	Type	Voidability
measuredRoadPart	Indicates to which part of a road the value for the attribute 'width' applies.	RoadPartValue	voidable
width	Road width value.	Measure	

Constraints of the spatial object type RoadWidth

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.15. Speed Limit (SpeedLimit)

Limit for the speed of a vehicle on a road.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type SpeedLimit

Attribute	Definition	Type	Voidability
areaCondition	Speed limit is dependent on environmental circumstances.	AreaConditionValue	voidable
direction	Indicates which direction the speed limit is valid for.	LinkDirectionValue	voidable
laneExtension	Number of lanes (including the start lane) to which the speed limit applies.	Integer	voidable
speedLimitMinMaxType	Indicates if the speed limit is maximum or minimum and if it is recommended.	SpeedLimitMinMaxValue	

speedLimitSource	Source for speed limit.	SpeedLimitSourceValue	voidable
speedLimitValue	Value for speed limit.	Velocity	
startLane	Index of the first lane to which speed limit applies. For countries with right-hand traffic, the index 1 refers to the rightmost lane and the index is incremented to the left; for countries with left-hand traffic, the index 1 refers to the leftmost lane, and the index is incremented to the right.	Integer	voidable
validityPeriod	Period during which the speed limit is valid.	TM_Period	voidable
vehicleType	Vehicle type the speed limit is restricted to.	VehicleTypeValue	voidable
weatherCondition	Weather condition the speed limit is dependent on.	WeatherConditionValue	voidable

Constraints of the spatial object type SpeedLimit

This property can only be associated with a spatial object that is part of a road transport network.

7.7.1.16. Vehicle Traffic Area (VehicleTrafficArea)

Surface that represents the part of a road which is used for the normal traffic of vehicles.

This type is a sub-type of TransportArea.

7.7.2. Enumerations

7.7.2.1. Functional Road Class (FunctionalRoadClassValue)

Values for the functional road classification. This classification is based on the importance of the role that the road performs in the road network.

<i>Allowed values for the enumeration FunctionalRoadClassValue</i>	
Value	Definition
mainRoad	The most important roads in a given network.
firstClass	The second most important roads in a given network.
secondClass	The third most important roads in a given network.
thirdClass	The fourth most important roads in a given network.
fourthClass	The fifth most important roads in a given network.
fifthClass	The sixth most important roads in a given network.
sixthClass	The seventh most important roads in a given network.
seventhClass	The eighth most important roads in a given network.
eighthClass	The ninth most important roads in a given network.
ninthClass	The least important roads in a given network.

7.7.2.2. Minimum Or Maximum Lane Number (MinMaxLaneValue)

Values to indicate whether number of lanes are counted as the maximum, minimum or average number.

<i>Allowed values for the enumeration MinMaxLaneValue</i>	
Value	Definition
maximum	The number of lanes is the maximum value for a given part of the road network.
minimum	The number of lanes is the minimum value for a given part of the road network.
average	The number of lanes is the average value for a given part of the road network.

7.7.2.3. Nature Of Speed Limit (SpeedLimitMinMaxValue)

Possible values to indicate the nature of a speed limit.

<i>Allowed values for the enumeration SpeedLimitMinMaxValue</i>	
Value	Definition
maximum	Speed limit is a maximum value
minimum	Speed limit is a minimum value
recommendedMaximum	Speed limit is a recommended maximum value
recommendedMinimum	Speed limit is a recommended minimum value

7.7.3. Code Lists

7.7.3.1. Area Condition (AreaConditionValue)

Speed limit restriction depending on the area.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.33

<i>Values for the code list AreaConditionValue</i>	
Value	Definition
inNationalPark	Speed limit restriction inside national park.
insideCities	Speed limit restriction inside cities.
nearRailroadCrossing	Speed limit restriction near rail road crossing.
nearSchool	Speed limit restriction near school.
outsideCities	Speed limit restriction outside cities.
trafficCalmingArea	Speed limit restriction in traffic calming area.

↓ 1089/2010

7.7.3.2. Form Of Road Node (FormOfRoadNodeValue)

Functions of road nodes.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.34

<i>Values for the code list FormOfRoadNodeValue</i>	
Value	Definition
enclosedTrafficArea	The road node is situated inside and/or represents an enclosed traffic area. A traffic area is an area with no internal structure of legally defined driving directions. At least two roads are connected to the area.
junction	Road node where three or more road links connect.
levelCrossing	A road node where the road network is a crossed by a railway at the same level.
pseudoNode	Exactly two road links connect to the road node.
roadEnd	Only one road link connects to the road node. It signifies the end of a road.
roadServiceArea	Surface annexed to a road and devoted to offer particular services for it.
roundabout	The road node represents or is a part of a roundabout. A roundabout is a road which forms a ring on which traffic travelling in only one direction is allowed.
trafficSquare	The road node is situated inside and/or represents a traffic square. A traffic square is an area (partly) enclosed by roads which is used for non-traffic purposes and which is not a roundabout.

↓ 1089/2010

7.7.3.3. Form Of Way (FormOfWayValue)

Classification based on the physical properties of the road link.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.35

<i>Values for the code list FormOfWayValue</i>	
Value	Definition
bicycleRoad	Road where bicycles are the only vehicles allowed.
dualCarriageway	Road with physically separated carriageways regardless of the number of lanes, which is not a motorway or a freeway.
enclosedTrafficArea	Area with no internal structure of legally defined driving directions. At least two roads are connected to the area.
entranceOrExitCarPark	Road specially designed to enter or to leave a parking area.
entranceOrExitService	Road used only to enter or to leave a service.
freeway	Road having no single level crossings with other roads.
motorway	Road to which regulations will normally apply with regards to entry and use. It has two or more mostly physically separated carriageways and no single level-crossings.
pedestrianZone	Area with a road network which is especially designed for use by pedestrians.
roundabout	Road which forms a ring on which traffic travelling in only one direction is allowed.
serviceRoad	Road running parallel to, and designed to connect, a road with a relatively high connectivity function with roads with a lower connectivity function.
singleCarriageway	Road where the traffic is not separated by any physical object.
slipRoad	Road especially designed to enter or exit another road.
tractorRoad	Arranged road only usable for a tractor (farm vehicle or forest machine) or terrain vehicle (a vehicle with higher ground clearance, big wheels and 4 wheel drive).
trafficSquare	Area (partly) enclosed by roads which is used for non-traffic purposes and which is not a roundabout.
walkway	Road reserved for pedestrian use and closed for regular vehicular

	use by a physically barrier.
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↓ 1089/2010

7.7.3.4. Road Part (RoadPartValue)

Indication to which part of a road the value of a measurement applies.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.36

<i>Values for the code list RoadPartValue</i>	
Value	Definition
carriageway	The part of a road which is reserved for traffic.
pavedSurface	The part of the road which is paved.

↓ 1089/2010

7.7.3.5. Road Service Type (RoadServiceTypeValue)

Types of road service areas.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.37

<i>Values for the code list RoadServiceTypeValue</i>	
Value	Definition
busStation	The road service is a bus stop.
parking	The road service area is a parking facility.
restArea	The road service is a rest area.

toll	Area that provides toll services such as ticket dispensers or toll payment services.
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↓ 1089/2010

7.7.3.6. Road Surface Category (RoadSurfaceCategoryValue)

Values to indicate whether a road is paved or not paved.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.38

<i>Values for the code list RoadSurfaceCategoryValue</i>	
Value	Definition
paved	Road with a hard paved surface.
unpaved	Road not paved.

↓ 1089/2010

7.7.3.7. Service Facility (ServiceFacilityValue)

Possible service facilities available at a road service area.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.39

<i>Values for the code list ServiceFacilityValue</i>	
Value	Definition
drinks	Drinks are available.
food	Food is available.

fuel	Fuel is available.
picnicArea	A picnic area is present.
playground	A playground area is present.
shop	A shop is present.
toilets	Toilets are present.

↓ 1089/2010

7.7.3.8. Speed Limit Source (SpeedLimitSourceValue)

Possible sources for speed limits.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.40

<i>Values for the code list SpeedLimitSourceValue</i>	
Value	Definition
fixedTrafficSign	Source is a fixed traffic sign (site specific administrative order, explicit speed limit).
regulation	Source is a regulation (national regulation, rule or 'implicit speed limit').
variableTrafficSign	Source is a variable traffic sign.

↓ 1089/2010

7.7.3.9. Vehicle Type (VehicleTypeValue)

Possible types of vehicles.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.41

Values for the code list VehicleTypeValue

Value	Definition
allVehicle	Any vehicle, not including pedestrians.
bicycle	A pedal-driven two-wheeled vehicle.
carWithTrailer	A passenger car with an attached trailer.
deliveryTruck	A truck vehicle of relatively small size, whose principal use is for delivery of goods and materials.
emergencyVehicle	A vehicle engaged in emergency response, including but not limited to police, ambulance and fire.
employeeVehicle	A vehicle operated by an employee of an organization that is used according to that organization's procedures.
facilityVehicle	A vehicle dedicated to a localized area within a private or restricted estate.
farmVehicle	Vehicle commonly associated with farming activities.
highOccupancyVehicle	Vehicle populated with a number of occupants corresponding to (or exceeding) the specified minimum number of passengers.
lightRail	Train-like transport vehicle limited to a rail network within a limited area.
mailVehicle	A vehicle that collects, carries or delivers mail.
militaryVehicle	Vehicle authorized by a military authority.
moped	Two or three wheeled vehicle equipped with internal combustion engine, with size less than 50 cc and maximum speed that does not exceed 45 km/h (28mph).
motorcycle	Two or three wheeled vehicle equipped with internal combustion engine, with size more than 50 cc and maximum speed that does exceed 45 km/h (28mph).
passengerCar	A small vehicle designed for private transport of people.
pedestrian	A person on foot.
privateBus	A vehicle designed for transport of large groups of people, privately owned or chartered.

publicBus	A vehicle designed for transport of large groups of people that is generally characterised by published routes and schedules.
residentialVehicle	A vehicle whose owner is resident (or a guest) of particular street or town area.
schoolBus	Vehicle operated on behalf of a school to transport students.
snowChainEquippedVehicle	Any vehicle equipped with snow chains.
tanker	A truck with more than two axles used to transport liquid or gas loads in bulk.
taxi	A vehicle licensed for hire usually fitted with a meter.
transportTruck	A truck vehicle for long range transport of goods.
trolleyBus	A bus-like mass transport vehicle hooked up to an electrical network for power supply.
vehicleForDisabledPerson	A vehicle with supporting identification that designates a vehicle for disabled persons.
vehicleWithExplosiveLoad	Vehicle transporting explosive cargo.
vehicleWithOtherDangerous Load	Vehicle transporting dangerous cargo other than explosive or water-polluting loads.
vehicleWithWaterPollutingLoad	Vehicle transporting water-polluting cargo.

↓ 1089/2010

7.7.3.10. Weather Condition (WeatherConditionValue)

Values to indicate weather conditions that affect speed limits.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.42

<i>Values for the code list WeatherConditionValue</i>	
Value	Definition
fog	Speed applies when fog is present.

ice	Speed applies when ice is present.
rain	Speed applies when rain is present.
smog	Speed applies when a certain amount of smog is present.
snow	Speed applies when snow is present.

↓ 1089/2010

7.8. *Water Transport Network*

7.8.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Water Transport Network:

- Beacon
- Buoy
- CEMT Class
- Condition of Water Facility
- Fairway Area
- Ferry Crossing
- Ferry Use
- Inland Waterway
- Marine Waterway
- Port Area
- Port Node
- Restriction for Water Vehicles
- Traffic Separation Scheme
- Traffic Separation Scheme Area
- Traffic Separation Scheme Crossing
- Traffic Separation Scheme Lane
- Traffic Separation Scheme Roundabout
- Traffic Separation Scheme Separator

- Water Link Sequence
- Water Node
- Water Traffic Flow Direction
- Waterway
- Waterway Link
- Waterway Node

7.8.1.1. Beacon (Beacon)

A prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation, or for use in hydrographic survey.

This type is a sub-type of TransportPoint.

7.8.1.2. Buoy (Buoy)

A floating object moored to the bottom in a particular (charted) place, as an aid to navigation or for other specific purposes.

This type is a sub-type of TransportPoint.

7.8.1.3. CEMT Class (CEMTClass)

Classification of an inland waterway according to CEMT (European Conference of Ministers of Transport).

This type is a sub-type of TransportProperty.

Attributes of the spatial object type CEMTClass

Attribute	Definition	Type	Voidability
CEMTClass	Value indicating the classification of an Inland waterway according to CEMT (European Conference of Ministers of Transport).	CEMTClassValue	

Constraints of the spatial object type CEMTClass

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.4. Condition Of Water Facility (ConditionOfWaterFacility)

State of a water transport network element with regards to its completion and use.

This type is a sub-type of ConditionOfFacility.

Constraints of the spatial object type ConditionOfWaterFacility

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.5. Fairway Area (FairwayArea)

The main travelled part of a waterway.

This type is a sub-type of TransportArea.

7.8.1.6. Ferry Crossing (FerryCrossing)

A special waterway aimed at supporting the transport of passengers, vehicles or other cargo/freight across a water body, and which is normally used as a connection linking two or more nodes of a land based transport network.

This type is a sub-type of Waterway.

7.8.1.7. Ferry Use (FerryUse)

The type of transport carried out by a ferry crossing.

This type is a sub-type of TransportProperty.

Attributes of the spatial object type FerryUse

Attribute	Definition	Type	Voidability
ferryUse	Value indicating the type of transport carried out by a ferry crossing.	FerryUseValue	

Constraints of the spatial object type FerryUse

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.8. Inland Waterway (InlandWaterway)

Waterway which is defined at inland continental waters.

This type is a sub-type of Waterway.

7.8.1.9. Marine Waterway (MarineWaterway)

Waterway which is defined at sea waters.

This type is a sub-type of Waterway.

<i>Attributes of the spatial object type MarineWaterway</i>			
Attribute	Definition	Type	Voidability

deepWaterRoute	Attribute which indicates if the maritime waterway is a deep water route.	Boolean	voidable
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7.8.1.10.Port Area (PortArea)

An area spatial object which is used to represent the physical limits of all the facilities which constitute the terrestrial zone of a sea or inland port.

This type is a sub-type of TransportArea.

7.8.1.11.Port Node (PortNode)

A point spatial object which is used to represent a sea or inland port in a simplified way, approximately located at the bank of the waterbody where the port is placed.

This type is a sub-type of WaterNode.

7.8.1.12.Restriction For Water Vehicles (RestrictionForWaterVehicles)

Restriction on vehicles on a water transport element.

This type is a sub-type of RestrictionForVehicles.

Constraints of the spatial object type RestrictionForWaterVehicles

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.13.Traffic Separation Scheme (TrafficSeparationScheme)

A scheme which aims at reducing the risk of collision in congested and/or converging areas by separating traffic moving in opposite, or nearly opposite, directions.

Deleted: This type is abstract.

<i>Association roles of the spatial object type TrafficSeparationScheme</i>			
Association role	Definition	Type	Voidability
component	A component of a traffic separation scheme.	TrafficSeparationSchemeArea	
marineWaterRoute	The collection of marine waterways associated with a traffic separation scheme.	MarineWaterway	
markerBeacon	A marker forming part of a traffic	Beacon	

	separation scheme.		
markerBuoy	A marker forming part of a traffic separation scheme.	Buoy	

7.8.1.14. Traffic Separation Scheme Area (TrafficSeparationSchemeArea)

An area spatial object forming part of a traffic separation scheme.

This type is a sub-type of TransportArea.

This type is abstract.

7.8.1.15. Traffic Separation Scheme Crossing (TrafficSeparationSchemeCrossing)

A defined area where traffic lanes cross.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.16. Traffic Separation Scheme Lane (TrafficSeparationSchemeLane)

An area within defined limits in which one-way traffic flow is established.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.17. Traffic Separation Scheme Roundabout (TrafficSeparationSchemeRoundabout)

A traffic separation scheme in which traffic moves in a counter-clockwise direction around a specified point or zone.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.18. Traffic Separation Scheme Separator (TrafficSeparationSchemeSeparator)

A zone separating the lanes in which ships are proceeding in opposite or nearly opposite directions; or separating traffic lanes designated for particular classes of ships proceeding in the same direction.

This type is a sub-type of TrafficSeparationSchemeArea.

7.8.1.19. Water Link Sequence (WaterLinkSequence)

A linear spatial object, composed of an ordered collection of waterway and/or watercourse links (as necessary), which represents a continuous path in the water network without any branches.

This type is a sub-type of TransportLinkSequence.

7.8.1.20. Water Node (WaterNode)

A point spatial object which is used to represent the connectivity between two different waterway links, or between a waterway link and a watercourse link, in the water transport network.

This type is a sub-type of TransportNode.

This type is abstract.

7.8.1.21. Water Traffic Flow Direction (WaterTrafficFlowDirection)

Indicates the direction of the flow of water transport traffic in relation to the direction of the water transport link vector.

This type is a sub-type of TrafficFlowDirection.

Constraints of the spatial object type WaterTrafficFlowDirection

This property can only be associated with a spatial object that is part of a water transport network.

7.8.1.22. Waterway (Waterway)

A collection of water link sequences and or individual waterway and/or watercourse links (as necessary) that are characterized by one or more thematic identifiers and/or properties, which perform a navigable route within a water body (oceans, seas, rivers, lakes, channels or canals).

This type is a sub-type of TransportLinkSet.

This type is abstract.

7.8.1.23. Waterway Link (WaterwayLink)

A linear spatial object that describes the geometry or connectivity of the water transport network between two consecutive waterway or watercourse nodes. It represents a linear section across a body of water which is used for shipping.

This type is a sub-type of TransportLink.

7.8.1.24. Waterway Node (WaterwayNode)

A point spatial object which is used to represent the connectivity between two different waterway links, or between a waterway link and a watercourse link, in the water transport network.

This type is a sub-type of WaterNode.

<i>Attributes of the spatial object type WaterwayNode</i>			
Attribute	Definition	Type	Voidability
formOfWaterwayNode	Description of the function of a	FormOfWaterwayNodeValue	voidable

	waterway node in the water transport network.		
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7.8.2. Enumerations

7.8.2.1. CEMT Class (CEMTClassValue)

Inland waterway classification according to CEMT (European Conference of Ministers of Transport) Resolution No 92/2.

<i>Allowed values for the enumeration CEMTClassValue</i>	
Value	Definition
I	Inland waterway belonging to CEMT-class I, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
II	Inland waterway belonging to CEMT-class II, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
III	Inland waterway belonging to CEMT-class III, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
IV	Inland waterway belonging to CEMT-class IV, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
Va	Inland waterway belonging to CEMT-class Va, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
Vb	Inland waterway belonging to CEMT-class Vb, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIa	Inland waterway belonging to CEMT-class VIa, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIb	Inland waterway belonging to CEMT-class VIb, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
VIc	Inland waterway belonging to CEMT-class VIc, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.

VII	Inland waterway belonging to CEMT-class VII, defined by the European Conference of Ministers of Transport, Resolution No 92/2 - Table 1.
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7.8.3. Code Lists

7.8.3.1. Ferry Use (FerryUseValue)

Types of transport carried out by a ferry.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.43

<i>Values for the code list FerryUseValue</i>	
Value	Definition
cars	Ferry carries cars.
other	Ferry carries others forms of transport than passengers, cars, trucks or trains.
passengers	Ferry carries passengers.
train	Ferry carries trains.
trucks	Ferry carries trucks.

↓ 1089/2010

7.8.3.2. Form Of Waterway Node (FormOfWaterwayNodeValue)

Function of a Waterway Node in the water transport network.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.44

<i>Values for the code list FormOfWaterwayNodeValue</i>	
Value	Definition
junctionFork	Infrastructure elements where one vessel traffic flow crosses another vessel traffic flow or points where vessel traffic flows divide or come together.
lockComplex	Lock or group of locks, intended for raising and lowering boats between stretches of water of different levels on river and canal waterways.
movableBridge	Bridge that can be raised or turned to allow the passage of ships.
shipLift	A machine for transporting boats between water bodies at two different elevations, which is used as an alternative to the canal locks.
waterTerminal	The location where goods are transhipped.
turningBasin	A place where a canal or narrow waterway is widened to allow boats to turn around.

↓ 1089/2010

7.9. *Theme-specific Requirements*

7.9.1. *Consistency between spatial data sets*

1. Transport Networks centreline representations and nodes shall always be located within the extent of the area representation of the same object.
2. Connectivity between Transport Networks across state borders and – where applicable – also across regional borders (and data sets) within Member States shall be established and maintained by the respective authorities, using the cross-border connectivity mechanisms provided by the NetworkConnection type.

7.9.2. *Modelling of object references*

1. When linear referencing is used in Transport Networks data, the position of referenced properties on links and link sequences shall be expressed as distances measured along the supplied geometry of the underlying link object(s).
2. An inter-modal connection shall always reference two elements which belong to different networks.

7.9.3. *Geometry representation*

1. Transport link ends shall be connected wherever an intersection exists between the real world phenomena they represent. No connections shall be created at crossing network elements when it is not possible to pass from one element to another.
2. In a Transport Networks data set which contains nodes, these nodes shall only be present where Transport Links connect or end.

7.9.4. *Modelling of object references*

The Water transport networks shall re-use, where it exists and is practicable, the water network centreline geometry of the Hydrography theme. Therefore, object referencing shall be used to link the water transport course with the existing water network geometry in the Hydrography theme.

7.9.5. *Centrelines*

The centrelines of Road and Rail objects shall fall within the extent of the physical real world object that they represent if the Link is indicated as not being 'fictitious'.

7.9.6. *Ensuring Network Connectivity*

1. Wherever a connection exists in a transport network, all connected link ends and the optional node that take part in this connection have to be positioned at a distance of less than the connectivity tolerance from each other.
2. Link ends and nodes that are not connected shall always be separated by a distance that is greater than the connectivity tolerance.
3. In data sets where both transport links and nodes are present, the relative position of nodes and link ends in relation to the specified connectivity tolerance shall correspond to the associations that exist between them in the data set.

7.10. *Layers*

<i>Layers for the spatial data theme Transport networks</i>		
Layer Type	Layer Title	Spatial object type(s)
TN.CommonTransportElements.TransportNode	Generic Transport Node	TransportNode
TN.CommonTransportElements.TransportLink	Generic Transport Link	TransportLink
TN.CommonTransportElements.TransportArea	Generic Transport Area	TransportArea
TN.RoadTransportNetwork.RoadLink	Road Link	RoadLink
TN.RoadTransportNetwork.VehicleTrafficArea	Vehicle traffic Area	VehicleTrafficArea

TN.RoadTransportNetwork.RoadServiceArea	Road Service Area	RoadServiceArea
TN.RoadTransportNetwork.RoadArea	Road Area	RoadArea
TN.RailTransportNetwork.RailwayLink	Railway Link	RailwayLink
TN.RailTransportNetwork.RailwayStationArea	Railway Station Area	RailwayStationArea
TN.RailTransportNetwork.RailwayYardArea	Railway Yard Area	RailwayYardArea
TN.RailTransportNetwork.RailwayArea	Railway Area	RailwayArea
TN.WaterTransportNetwork.WaterwayLink	Waterway Link	WaterwayLink
TN.WaterTransportNetwork.FairwayArea	Fairway Area	FairwayArea
TN.WaterTransportNetwork.PortArea	Port Area	PortArea
TN.AirTransportNetwork.AirLink	Air Link	AirLink
TN.AirTransportNetwork.AerodromeArea	Aerodrome Area	AerodromeArea
TN.AirTransportNetwork.RunwayArea	Runway Area	RunwayArea
TN.AirTransportNetwork.AirspaceArea	Airspace Area	AirspaceArea
TN.AirTransportNetwork.ApronArea	Apron Area	ApronArea
TN.AirTransportNetwork.TaxiwayArea	Taxiway Area	TaxiwayArea
TN.CableTransportNetwork.CablewayLink	Cableway Link	CablewayLink

8. HYDROGRAPHY

8.1. Definitions

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

- ‘aquifer’ means a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater,
- ‘groundwater’ means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil,
- ‘sub-basin’ means an area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course,

8.2. Structure of the Spatial Data Theme Hydrography

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

- Hydro - base
- Hydro - Network
- Hydro - Physical Waters

↓ 1253/2013 Art. 1.10 and Annex II.7(a)

↓ 1089/2010

8.3. Hydro - base

8.3.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - base:

- Hydro Object

8.3.1.1. Hydro Object (HydroObject)

An identity base for hydrographic (including man-made) objects in the real world.

This type is abstract.

<i>Attributes of the spatial object type HydroObject</i>			
Attribute	Definition	Type	Voidability
geographicalName	A geographical name that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.	GeographicalName	voidable
hydroId	An identifier that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating different representations of the object.	HydroIdentifier	<u>voidable</u>

<i>Association roles of the spatial object type HydroObject</i>			
Association role	Definition	Type	Voidability
relatedHydroObject	A related hydrographic object representing the same real-world entity.	HydroObject	voidable

8.3.2. Data Types

8.3.2.1. Hydro Identifier (HydroIdentifier)

A hydrographic thematic identifier.

<i>Attributes of the data type HydroIdentifier</i>			
Attribute	Definition	Type	Voidability
classificationScheme	A description of the identification scheme (National, European, etc.) being used.	CharacterString	
localId	A local identifier, assigned by some authority.	CharacterString	
Namespace	An indicator of the scope for the local identifier.	CharacterString	

8.4. Hydro - Network

8.4.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - Network:

- Hydro Node
- Watercourse Link
- Watercourse Link Sequence
- Watercourse Separated Crossing

8.4.1.1. Hydro Node (HydroNode)

A node within the hydrographic network.

This type is a sub-type of Node.

This type is a sub-type of HydroObject.

<i>Attributes of the spatial object type HydroNode</i>			
Attribute	Definition	Type	Voidability
hydroNodeCategory	Nature of the hydro node.	HydroNodeCategoryValue	voidable

8.4.1.2. Watercourse Link (WatercourseLink)

A segment of a watercourse within a hydrographic network.

This type is a sub-type of Link.

This type is a sub-type of HydroObject.

<i>Attributes of the spatial object type WatercourseLink</i>			
Attribute	Definition	Type	Voidability
flowDirection	Direction of water flow in the segment relative to digitisation of segment geometry.	LinkDirectionValue	voidable
length	Length of network segment.	Length	voidable

8.4.1.3. Watercourse Link Sequence (WatercourseLinkSequence)

A sequence of watercourse links representing a non-branching path through a hydrographic network.

This type is a sub-type of LinkSequence.

This type is a sub-type of HydroObject.

8.4.1.4. Watercourse Separated Crossing (WatercourseSeparatedCrossing)

An element in the hydrographic network used to indicate non-interacting crossing of watercourse links separated by level.

This type is a sub-type of GradeSeparatedCrossing.

This type is a sub-type of HydroObject.

8.4.2. Code Lists

8.4.2.1. Hydro Node Category (HydroNodeCategoryValue)

Defines categories for different types of hydrographic network nodes.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.45

<i>Values for the code list HydroNodeCategoryValue</i>	
Value	Definition
boundary	Node used to connect different networks.
flowConstriction	A network node unrelated to the network topology per se, but associated with a hydrographic point of interest or facility, or a man-made object, that affects the network flow.
flowRegulation	A network node unrelated to the network topology per se, but associated with a hydrographic point of interest or facility, or a man-made object, that regulates the network flow.
junction	Node where three or more links connect.
outlet	Ending node of a series of interconnected links.
source	Starting node of a series of interconnected links.

↓ 1089/2010

8.5. *Hydro - Physical Waters*

8.5.1. *Spatial Object Types*

The following spatial object types shall be used for the exchange and classification of spatial objects related to Hydro - Physical Waters:

- Crossing
- Dam or Weir
- Drainage Basin
- Embankment
- Falls
- Fluvial Point
- Ford

– Hydro Point of Interest

↓ 1253/2013 Art. 1.10 and Annex II.7(b)

↓ 1089/2010

– Land-Water Boundary

– Lock

– Man-made Object

↓ 1253/2013 Art. 1.10 and Annex II.7(b)

↓ 1089/2010

– Rapids

– River Basin

– Shore

– Shoreline Construction

– Sluice

– Standing Water

– Surface Water

– Watercourse

– Wetland

8.5.1.1. Crossing (Crossing)

A man-made object allowing the passage of water above or below an obstacle.

This type is a sub-type of ManMadeObject.

<i>Attributes of the spatial object type Crossing</i>			
Attribute	Definition	Type	Voidability
type	The type of physical crossing.	CrossingTypeValue	voidable

8.5.1.2. Dam Or Weir (DamOrWeir)

A permanent barrier across a watercourse used to impound water or to control its flow.

This type is a sub-type of ManMadeObject.

8.5.1.3. Drainage Basin (DrainageBasin)

Area having a common outlet for its surface runoff.

This type is a sub-type of HydroObject.

Attributes of the spatial object type DrainageBasin

Attribute	Definition	Type	Voidability
area	Size of the drainage basin area.	Area	voidable
basinOrder	Number (or code) expressing the degree of branching/dividing in a drainage basin system.	HydroOrderCode	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
geometry	The geometry of the drainage basin, as a surface.	GM_Object	
inspireId	External object identifier of the spatial object.	Identifier	
origin	Origin of the drainage basin.	OriginValue	voidable

Deleted: Surface

Association roles of the spatial object type DrainageBasin

Association role	Definition	Type	Voidability
outlet	The surface water outlet(s) of a drainage basin.	SurfaceWater	voidable
containsBasin	A smaller sub-basin contained within a larger basin	DrainageBasin	voidable

Constraints of the spatial object type DrainageBasin

A river basin may not be contained in any other basin.

The geometry attribute has to be of type GM_Surface or GM_MultiSurface.

8.5.1.4. Embankment (Embankment)

A man-made raised long mound of earth or other material.

This type is a sub-type of ManMadeObject.

↓ 1253/2013 Art. 1.10 and Annex II.7(c)

↓ 1089/2010

8.5.1.5. Falls (Falls)

A vertically descending part of a watercourse where it falls from a height.

This type is a sub-type of FluvialPoint.

<i>Attributes of the spatial object type Falls</i>			
Attribute	Definition	Type	Voidability
height	Distance measured from the lowest point of the base at ground or water level (downhill side/downstream side) to the tallest point of the spatial object.	Length	voidable

8.5.1.6. Fluvial Point (FluvialPoint)

A hydro point of interest that affects the flow of a watercourse.

This type is a sub-type of HydroPointOfInterest.

This type is abstract.

8.5.1.7. Ford (Ford)

A shallow part of a watercourse used as a road crossing.

This type is a sub-type of ManMadeObject.

8.5.1.8. Hydro Point Of Interest (HydroPointOfInterest)

A natural place where water appears, disappears or changes its flow.

This type is a sub-type of HydroObject.

This type is abstract.

<i>Attributes of the spatial object type HydroPointOfInterest</i>			
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
geometry	The geometry of the hydro point of interest, as a point, curve or surface.	GM_Primitive	voidable
inspireId	External object identifier of the spatial object.	Identifier	
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	

↓ 1253/2013 Art. 1.10 and Annex II.7(d)

↓ 1089/2010

8.5.1.11.Land-Water Boundary (LandWaterBoundary)

The line where a land mass is in contact with a body of water.

<i>Attributes of the spatial object type LandWaterBoundary</i>			
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	DateTime	voidable

	spatial data set.		
geometry	The geometry of the land-water boundary, as a curve.	GM_Curve	
inspireId	External object identifier of the spatial object.	Identifier	
origin	Origin of the land-water boundary.	OriginValue	voidable
waterLevelCategory	Water-level defining the land-water boundary.	WaterLevelValue	voidable

8.5.1.12.Lock (Lock)

An enclosure with a pair or series of gates used for raising or lowering vessels as they pass from one water level to another.

This type is a sub-type of ManMadeObject.

8.5.1.13.Man-made Object (ManMadeObject)

An artificial object which lies inside a body of water and has one of the following types of function: - Retains the water; - Regulates the quantity of water; - Alters the course of the water; - Allows watercourses to cross each other.

This type is a sub-type of HydroObject.

This type is abstract.

<i>Attributes of the spatial object type ManMadeObject</i>			
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
condition	The state of planning, construction, repair, and/or maintenance of the structures and/or equipment comprising a facility and/or located at a site, as a whole.	ConditionOfFacilityValue	voidable
endLifespanVersion	Date and time at which this version of the	DateTime	voidable

	spatial object was superseded or retired in the spatial data set.		
geometry	The geometry of the man-made object, as a point, curve or surface.	GM_Primitive	voidable
inspireId	External object identifier of the spatial object.	Identifier	
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	

↓ 1253/2013 Art. 1.10 and Annex II.7(d)

↓ 1089/2010

8.5.1.17.Rapids (Rapids)

Portions of a stream with accelerated current where it descends rapidly but without a break in the slope of the bed sufficient to form a waterfall.

This type is a sub-type of FluvialPoint.

8.5.1.18.River Basin (RiverBasin)

The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.

This type is a sub-type of DrainageBasin.

8.5.1.19.Shore (Shore)

The narrow strip of land in immediate contact with any body of water including the area between high and low water lines.

This type is a sub-type of HydroObject.

↓ 1253/2013 Art. 1.10 and Annex II.7(e)

↓ 1089/2010
 →₁ 1253/2013 Art. 1.10 and
 Annex II.7(e)

Attributes of the spatial object type Shore

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
composition	The primary type(s) of material composing a spatial object, exclusive of the surface.	ShoreTypeValue	voidable
delineationKnown	An indication that the delineation (for example: limits and information) of a spatial object is known.	Boolean	voidable
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	DateTime	voidable
→ ₁ geometry ←	→ ₁ The geometry of the shore. ←	→ ₁ GM_MultiSurface ←	
inspireId	External object identifier of the spatial object.	Identifier	

8.5.1.20. Shoreline Construction (ShorelineConstruction)

An artificial structure attached to land bordering a body of water and fixed in position.

This type is a sub-type of ManMadeObject.

8.5.1.21. Sluice (Sluice)

An open, inclined conduit fitted with a gate for regulating water flow.

This type is a sub-type of ManMadeObject.

8.5.1.22. Standing Water (StandingWater)

A body of water that is entirely surrounded by land.

This type is a sub-type of SurfaceWater.

Attributes of the spatial object type StandingWater

Attribute	Definition	Type	Voidability
elevation	Elevation above mean sea level.	Length	voidable
meanDepth	Average depth of the body of water.	Length	voidable
surfaceArea	Surface area of the body of water.	Area	voidable

Constraints of the spatial object type StandingWater

Standing water geometry may be a surface or point

8.5.1.23. _Surface Water (SurfaceWater)

Any known inland waterway body.

This type is a sub-type of HydroObject.

This type is abstract.

Attributes of the spatial object type SurfaceWater

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
geometry	The geometry of the surface water: - either a curve or surface for a watercourse; - either a point or surface for a standing water.	GM_Primitive	
inspireId	External object identifier of the	Identifier	

	spatial object.		
levelOfDetail	Resolution, expressed as the inverse of an indicative scale or a ground distance.	MD_Resolution	
localType	Provides 'local' name for the type of surface water.	LocalisedCharacterString	voidable
origin	Origin of the surface water.	OriginValue	voidable
persistence	The degree of persistence of water.	HydrologicalPersistenceValue	voidable
tidal	Identifies whether the surface water is affected by tidal water.	Boolean	voidable

<i>Association roles of the spatial object type SurfaceWater</i>			
Association role	Definition	Type	Voidability
bank	The bank(s) associated to a surface water.	Shore	voidable
drainsBasin	The basin(s) drained by a surface water.	DrainageBasin	voidable
neighbour	An association to another instance of the same real-world surface water in another data set.	SurfaceWater	voidable

8.5.1.24. Watercourse (Watercourse)

A natural or man-made flowing watercourse or stream.

This type is a sub-type of SurfaceWater.

Attributes of the spatial object type Watercourse

Attribute	Definition	Type	Voidability
condition	The state of planning, construction, repair, and/or maintenance of a	ConditionOfFacilityValue	voidable

	watercourse.		
delineationKnown	An indication that the delineation (for example: limits and information) of a spatial object is known.	Boolean	voidable
length	Length of the watercourse.	Length	voidable
level	Vertical location of watercourse relative to ground.	VerticalPositionValue	voidable
streamOrder	Number (or code) expressing the degree of branching in a stream system.	HydroOrderCode	voidable
width	Width of watercourse (as a range) along its length.	WidthRange	voidable

Constraints of the spatial object type Watercourse

↓ 1253/2013 Art. 1.10 and Annex II.7(f)

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

↓ 1089/2010

Watercourse geometry may be a curve or surface

A condition attribute may be specified only for a man-made watercourse

8.5.1.25. Wetland (Wetland)

A poorly drained or periodically flooded area where the soil is saturated with water, and vegetation is supported.

This type is a sub-type of HydroObject.

↓ 1253/2013 Art. 1.10 and Annex II.7(g)

↓ 1089/2010

Attributes of the spatial object type Wetland

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
geometry	The geometry of the wetland, as a surface.	GM_Surface	
inspireId	External object identifier of the spatial object.	Identifier	
localType	Provides 'local' name for the type of wetland.	LocalisedCharacterString	voidable
Tidal	Identifies whether the wetland is affected by tidal water.	Boolean	voidable

8.5.2. Data Types

8.5.2.1. Hydro Order Code (HydroOrderCode)

A hydrologically meaningful 'order code' for ordering hierarchies of watercourses and drainage basins.

<i>Attributes of the data type HydroOrderCode</i>			
Attribute	Definition	Type	Voidability
order	Number (or code) expressing the degree of branching or dividing in a stream or drainage basin system.	CharacterString	
orderScheme	A description of the concept for ordering.	CharacterString	
scope	An indicator of the scope or origin for an order code (including whether it is national, supranational or European).	CharacterString	

8.5.2.2. Width Range (WidthRange)

The range of a watercourse's horizontal width along its length.

<i>Attributes of the data type WidthRange</i>			
Attribute	Definition	Type	Voidability
lower	Lower bound of width.	Length	
upper	Upper bound of width.	Length	

8.5.3. Enumerations

8.5.3.1. Origin (OriginValue)

An enumeration type specifying a set of hydrographic 'origin' categories (natural, man-made) for various hydrographic objects.

<i>Allowed values for the enumeration OriginValue</i>	
Value	Definition
natural	An indication that a spatial object is natural.
manMade	An indication that a spatial object is man-made.

8.5.4. Code Lists

8.5.4.1. Crossing Type (CrossingTypeValue)

Man-made physical watercourse crossing types.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.46

<i>Values for the code list CrossingTypeValue</i>	
Value	Definition
aqueduct	A pipe or artificial channel that is designed to transport water from a remote source, usually by gravity, for freshwater supply, agricultural, and/or industrial use.

bridge	A structure that connects two locations and provides for the passage of a transportation route over a terrain obstacle.
culvert	An enclosed channel for carrying a watercourse under a route.
siphon	A pipe used for conveying liquid from one level to a lower level, using the liquid pressure differential to force a column of the liquid up to a higher level before it falls to the outlet.

↓ 1089/2010

8.5.4.2. Hydrological Persistence (HydrologicalPersistenceValue)

Categories of hydrological persistence of a body of water.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.47

<i>Values for the code list HydrologicalPersistenceValue</i>	
Value	Definition
dry	Filled and/or flowing infrequently, generally only during and/or immediately after heavy precipitation.
ephemeral	Filled and/or flowing during and immediately after precipitation.
intermittent	Filled and/or flowing for part of the year.
perennial	Filled and/or flowing continuously throughout the year.

↓ 1253/2013 Art. 1.10 and Annex II.7(d)

↓ 1089/2010

8.5.4.4. Shore Type (ShoreTypeValue)

Categories of shore area composition.

↓ 1253/2013 Art. 1.10 and Annex II.7(h)

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.49

<i>Values for the code list ShoreTypeValue</i>	
Value	Definition
boulders	Large water- or weather-worn stones.
clay	A stiff tenacious fine-grained earth consisting mainly of hydrated aluminosilicates, which become more plastic when water is added and can be moulded and dried.
gravel	Small water-worn or pounded stones.
mud	Soft wet soil, sand, dust, and/or other earthy matter.
rock	Stones of any size.
sand	Granular material consisting of small eroded fragments of (mainly siliceous) rocks, finer than gravel and larger than a coarse silt grain.
shingle	Small, loose, rounded water-worn pebbles, especially as accumulated on a seashore.
stone	Pieces of rock or mineral substance (other than metal) of definite form and size, usually artificially shaped, and used for some special purpose.

↓ 1089/2010

8.5.4.5. Water Level (WaterLevelValue)

The tidal datum / waterlevel to which depths and heights are referenced.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.50

Values for the code list WaterLevelValue

Value	Definition
equinoctialSpringLowWater	The level of low water springs near the time of an equinox.
higherHighWater	The highest of the high waters (or single high water) of any specified tidal day due to the declination A1 effects of the moon and sun.
higherHighWaterLargeTide	The average of the highest high waters, one from each of 19 years of observations.
highestAstronomicalTide	The highest tidal level, which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.
highestHighWater	The highest water level observed at a location.
highWater	The highest level reached at a location by the water surface in one tidal cycle.
highWaterSprings	An arbitrary level, approximating that of mean high water springs.
indianSpringHighWater	A tidal surface datum approximating the level of the mean of the higher high water at spring tides.
indianSpringLowWater	A tidal surface datum approximating the level of the mean of the lower low water at spring tides.
localDatum	An arbitrary datum defined by an authority of a local harbour, from which levels and tidal heights are measured by that authority.
lowerLowWater	The lowest of the low waters (or single low water) of any specified tidal day due to the declination A1 effects of the moon and sun.
lowerLowWaterLargeTide	The average of the lowest low waters, one from each of 19 years of observations.
lowestAstronomicalTide	The lowest tide level that can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.
lowestLowWater	An arbitrary level conforming to the lowest tide observed at a location, or somewhat lower.

lowestLowWaterSprings	An arbitrary level conforming to the lowest water level observed at a location at spring tides during a period shorter than 19 years.
lowWater	An approximation of mean low water adopted as the reference level for a limited region, irrespective of better determinations later.
lowWaterDatum	An approximation of mean low water that has been adopted as a standard reference for a limited area.
lowWaterSprings	A level approximating that of mean low water springs.
meanHigherHighWater	The average height of higher high waters at a location over a 19-year period.
meanHigherHighWaterSprings	The average height of higher high water at spring tides at a location.
meanHigherLowWater	The average of the higher low water height of each tidal day observed over a National Tidal Datum Epoch.
meanHighWater	The average height of all high waters at a location over a 19-year period.
meanHighWaterNeaps	The average height of the high waters of the neap tide.
meanHighWaterSprings	The average height of the high waters of spring tides.
meanLowerHighWater	The average of the lower high water height of each tidal day observed over a National Tidal Datum Epoch.
meanLowerLowWater	The average height of the lower low waters at a location over a 19-year period.
meanLowerLowWaterSprings	The average height of lower low water at spring tides at a location.
meanLowWater	The average height of all low waters at a location over a 19-year period.
meanLowWaterNeaps	The average height of the low waters of the neap tide.
meanLowWaterSprings	The average height of the low waters of spring tides.
meanSeaLevel	The average height of the sea at a tide station measured from a fixed predetermined reference level.
meanTideLevel	The arithmetic mean of mean high water and mean low water.
meanWaterLevel	The average of all hourly water levels over the available period of record.

nearlyHighestHighWater	An arbitrary level approximating the highest water level observed at a location, usually equivalent to the high water springs.
nearlyLowestLowWater	A level approximating the lowest water level observed at a location, usually equivalent to Indian spring low water.
tropicHigherHighWater	The highest of the high waters (or single high water) of the tides occurring semimonthly when the effect of the Moon's maximum declination is greatest.
tropicLowerLowWater	The lowest of the low waters (or single low water) of the tides occurring semimonthly when the effect of the Moon's maximum declination is greatest.

↓ 1253/2013 Art. 1.10 and Annex II.7(d)

↓ 1089/2010
 →₁ 1253/2013 Art. 1.10 and Annex II.7(i)

8.7. Theme-specific Requirements

8.7.1. Consistency between spatial data sets

1. Hydrography links, centrelines and nodes shall always be located within the extent of the area representation of the same object.
2. Connectivity between hydrographic networks across state borders and – where applicable – also across regional borders (and data sets) within Member States shall be established and maintained by the respective authorities, using the cross-border connectivity mechanisms provided by the NetworkConnection type.
3. All attribution of objects in this schema shall be the same as the equivalent property of that object used for reporting obligations under Directive 2000/60/EC.

8.7.2. Identifier management

1. If a geographical name is used as a unique hydrologic ID for an object in this specification then it shall be derived, where possible, from a pan-European Gazetteer or another authoritative, pan-European source.
2. The localId attribute of the external object identifier of a spatial object shall be the same as the ID used for reporting obligations under Directive 2000/60/EC.

8.7.3. *Modelling of object references*

1. If the same real world object in a data set is exchanged using spatial objects from more than one of the Hydrography application schemas then these spatial objects shall carry either the same, unique, geographical name or the same hydrographic thematic identifier.
2. When linear referencing is used in hydrographic Network data, the position of referenced properties on links and link sequences shall be expressed as distances measured along the supplied geometry of the underlying link object(s).

8.7.4. *Geometry representation*

1. If spatial objects are provided at different spatial resolutions, the spatial resolution must be specified for each spatial object using the levelOfDetail attribute where applicable.
2. Watercourse links shall intersect wherever a connection exists between the real world phenomena they represent. No intersections shall be created at crossing network elements when it is not possible for water to pass from one element to another.
3. In a hydrographic network data set which contains nodes, these nodes shall only be present where Watercourse Links connect or end.
4. The geometry shall be the same as the geometry used for reporting obligations under Directive 2000/60/EC.

8.7.5. *Use of the DelineationKnown Attribute*

1. The attribute delineationKnown shall not be used to indicate that the accuracy / precision of a certain geometry is low; this indication should be given using the appropriate data quality element(s).
2. The attribute delineationKnown shall not be used to indicate a change of geometry over time where this change of geometry is known.

8.7.6. *Centrelines*

The centrelines of watercourse objects shall fall within the extent of the physical real world object that they represent if the Watercourse Link is indicated as not being 'fictitious'.

8.7.7. *Ensuring Network Connectivity*

1. Wherever a connection exists in a hydrographic network, all connected link ends and the optional node that take part in this connection have to be positioned at a distance of less than the connectivity tolerance from each other.
2. Link ends and nodes that are not connected shall always be separated by a distance that is greater than the connectivity tolerance.
3. In data sets where both transport links and nodes are present, the relative position of nodes and link ends in relation to the specified connectivity tolerance shall correspond to the associations that exist between them in the data set.

8.8. Layers

<i>Layers for the spatial data theme Hydrography</i>		
Layer Type	Layer Title	Spatial object type(s)
→ ₁ HY.Network ←	→ ₁ Hydrographic Network ←	→ ₁ HydroNode, WatercourseLink ←
→ ₁ HY.PhysicalWaters.Waterbodies ←	→ ₁ Waterbodies ←	→ ₁ Watercourse, StandingWater ←
→ ₁ HY.PhysicalWaters.LandWaterBoundary ←	→ ₁ Land-Water Boundaries ←	→ ₁ LandWaterBoundary ←
→ ₁ HY.PhysicalWaters.Catchments ←	→ ₁ Catchments ←	→ ₁ DrainageBasin, RiverBasin ←
→ ₁ HY.PhysicalWaters.HydroPointOfInterest ←	→ ₁ Hydro Points of Interest ←	→ ₁ Rapids, Falls ←
→ ₁ HY.PhysicalWaters.ManMadeObject ←	→ ₁ Man-made Objects ←	→ ₁ Crossing, DamOrWeir, Embankment, Lock, Ford, ShorelineConstruction, Sluice ←
→ ₁ HY. PhysicalWaters.Wetland ←	→ ₁ Wetlands ←	→ ₁ Wetland ←
→ ₁ HY. PhysicalWaters.Shore ←	→ ₁ Shores ←	→ ₁ Shore ←

9. PROTECTED SITES

9.1. Spatial Object Types

The following spatial object types shall be used for the exchange and classification of spatial objects from data sets that relate to the spatial data theme Protected Sites:

– Protected Site

9.1.1 Protected Site (*ProtectedSite*)

An area designated or managed within a framework of international, Union and Member States' legislation to achieve specific conservation objectives.

<i>Attributes of the spatial object type ProtectedSite</i>			
Attribute	Definition	Type	Voidability
geometry	The geometry defining the	GM_Object	

	boundary of the Protected Site.		
<u>inspireId</u>	External object identifier of the spatial object.	Identifier	
siteDesignation	The designation (type) of Protected Site.	DesignationType	voidable
siteName	The name of the Protected Site.	GeographicalName	voidable
siteProtectionClassification	The classification of the protected site based on the purpose for protection.	ProtectionClassificationValue	voidable
<u>thematicId</u>	<u>Thematic object identifier.</u>	<u>ThematicIdentifier</u>	<u>voidable</u>

- Deleted:** D
- Deleted:** legalFoundationDate
- Deleted:** The date that the protected site was legally created. This is the date that the real world object was created, not the date that its representation in an information system was created.
- Deleted:** DateTime
- Deleted:** voidable
- Deleted:** legalFoundationDocument
- Deleted:** A URL or text citation referencing the legal act that created the Protected Site.
- Deleted:** CI_Citation
- Deleted:** voidable

9.2. Data Types

9.2.1 Designation Type (*DesignationType*)

A data type designed to contain a designation for the Protected Site, including the designation scheme used and the value within that scheme.

Attributes of the data type DesignationType

Attribute	Definition	Type	Voidability
designation	The actual Site designation.	DesignationValue	
designationScheme	The scheme from which the designation code comes.	DesignationSchemeValue	
percentageUnderDesignation	The percentage of the site that falls under the designation.	<u>Decimal</u>	

- Deleted:** Percentage

	This is used in particular for the IUCN categorisation.		
<u>legalFoundationDate</u>	<u>The date that the protected site was legally created. This is the date that the real world object was created, not the date that its representation in an information system was created.</u>	<u>Date</u>	<u>voidable</u>
<u>legalFoundationDocument</u>	<u>A URL or text citation referencing the legal act that created the Protected Site.</u>	<u>CI_Citation</u>	<u>voidable</u>

Deleted: If a value is not provided for this attribute, it is assumed to be 100 %

Constraints of the data type *DesignationType*

Sites must use designations from an appropriate designation scheme, and the designation code value must agree with the designation scheme.

9.3. Enumerations

9.3.1 Protection Classification (*ProtectionClassificationValue*)

The protected site classification based on the purpose of protection.

<i>Allowed values for the enumeration ProtectionClassificationValue</i>	
Value	Definition
natureConservation	The Protected Site is protected for the maintenance of biological diversity.
archaeological	The Protected Site is protected for the maintenance of archaeological heritage.
cultural	The Protected Site is protected for the maintenance of cultural heritage.
ecological	The Protected Site is protected for the maintenance of ecological stability.

landscape	The Protected Site is protected for the maintenance of landscape characteristics.
environment	The Protected Site is protected for the maintenance of environmental stability.
Geological	The Protected Site is protected for the maintenance of geological characteristics.

9.4. Code Lists

9.4.1. Designation Scheme (*DesignationSchemeValue*)

The scheme used to assign a designation to the Protected Sites.

The allowed values for this code list comprise the values specified in the Sections 9.4.3-9.4.8 below and additional values at any level defined by data providers.”

	↓ 102/2011 Art. 1.4 and Annex II.51
<i>Values for the code list DesignationSchemeValue</i>	
Value	Definition
emeraldNetwork	The Protected Site has a designation under the Emerald Network.
IUCN	The Protected Site has a classification using the International Union for Conservation of Nature classification scheme.
nationalMonumentsRecord	The Protected Site has a classification using the National Monuments Record classification scheme.
natura2000	The Protected Site has a designation under either the Habitat Directive (92/43/EEC) or the Birds Directive (79/409/EEC).
ramsar	The Protected Site has a designation under the Ramsar Convention.
UNESCOManAndBiosphereProgramme	The Protected Site has a designation under UNESCO Man and Biosphere programme.
UNESCOWorldHeritage	The Protected Site has a designation under UNESCO World Heritage Convention.

Deleted: This code list may be extended by the Member States.¶

↓ 1089/2010

9.4.2. Designation (*DesignationValue*)

Classification and designation types under different schemes.

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

- IUCN Designation (*IUCNDesignationValue*): A code list for the International Union for the Conservation of Nature classification scheme, as specified in Section 9.4.3

- National Monuments Record Designation (*NationalMonumentsRecordDesignationValue*): ...

- ...

9.4.3. IUCN Designation (*IUCNDesignationValue*)

A code list for the International Union for the Conservation of Nature classification scheme.

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.52

Values for the code list IUCNDesignationValue

Value	Definition
habitatSpeciesManagementArea	The Protected Site is classified as a habitat species management area under the IUCN classification scheme.
managedResourceProtectedArea	The Protected Site is classified as a managed resource protected area under the IUCN classification scheme.
nationalPark	The Protected Site is classified as a national park under the IUCN classification scheme.
naturalMonument	The Protected Site is classified as a natural monument under the IUCN classification scheme.
ProtectedLandscapeOrSeascape	The Protected Site is classified as a protected landscape or seascape under the IUCN classification scheme.
strictNatureReserve	The Protected Site is classified as a strict nature reserve under the IUCN classification scheme.
wildernessArea	The Protected Site is classified as a wilderness area under the IUCN classification scheme.

Deleted: Abstract base type for code lists containing the classification and designation types under different schemes.¶
This type is abstract.¶

Deleted: This type is a sub-type of *DesignationValue*.¶

9.4.4. *National Monuments Record Designation*
(*NationalMonumentsRecordDesignationValue*)

↓ 1089/2010

A code list for the National Monuments Record classification scheme.

↓ 1253/2013 Art. 1.10 and Annex II.1

Deleted: This type is a sub-type of DesignationValue.

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

↓ 102/2011 Art. 1.4 and Annex II.53

Values for the code list NationalMonumentsRecordDesignationValue

Value	Definition
agricultureAndSubsistence	The Protected Site is classified as an agricultural or subsistence monument under the National Monuments Record classification scheme.
civil	The Protected Site is classified as a civil monument under the National Monuments Record classification scheme.
commemorative	The Protected Site is classified as a commemorative monument under the National Monuments Record classification scheme.
commercial	The Protected Site is classified as a commercial monument under the National Monuments Record classification scheme.
communications	The Protected Site is classified as a communications monument under the National Monuments Record classification scheme.
defence	The Protected Site is classified as a defence monument under the National Monuments Record classification scheme.
domestic	The Protected Site is classified as a domestic monument under the National Monuments Record classification scheme.
education	The Protected Site is classified as an education monument under the National Monuments Record classification scheme.

gardensParksAndUrbanSpaces	The Protected Site is classified as a garden, park or urban space monument under the National Monuments Record classification scheme.
healthAndWelfare	The Protected Site is classified as a health and welfare monument under the National Monuments Record classification scheme.
industrial	The Protected Site is classified as an industrial monument under the National Monuments Record classification scheme.
maritime	The Protected Site is classified as a maritime monument under the National Monuments Record classification scheme.
monument	The Protected Site is classified as a monument with some unclassified form under the National Monuments Record classification scheme.
recreational	The Protected Site is classified as a recreational monument under the National Monuments Record classification scheme.
religiousRitualAndFunerary	The Protected Site is classified as a religious, ritual or funerary monument under the National Monuments Record classification scheme.
settlement	The Protected Site is classified as a settlement under the National Monuments Record classification scheme.
transport	The Protected Site is classified as a transport monument under the National Monuments Record classification scheme.
waterSupplyAndDrainage	The Protected Site is classified as a water supply and drainage monument under the National Monuments Record classification scheme.

↓ 1089/2010

9.4.5. *Natura2000 Designation (Natura2000DesignationValue)*

A code list for the Natura2000 designation scheme, in accordance with Council Directive 92/43/EEC¹⁵ (Habitats Directive).

¹⁵ OJ L 206, 22.7.1992, p. 7.

Deleted: This type is a sub-type of DesignationValue.¶

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.54

<i>Values for the code list Natura2000DesignationValue</i>	
Value	Definition
proposedSiteOfCommunityImportance	The Protected Site is proposed as a Site of Community Importance (SCI) under Natura2000.
proposedSpecialProtectionArea	The Protected Site is proposed as a Special Protection Area (SPA) under Natura2000.
siteOfCommunityImportance	The Protected Site is designated as a Site of Community Importance (SCI) under Natura2000.
specialAreaOfConservation	The Protected Site is designated as a Special Area of Conservation (SAC) under Natura2000.
specialProtectionArea	The Protected Site is designated as a Special Protection Area (SPA) under Natura2000.

↓ 1089/2010

9.4.6. Ramsar Designation (*RamsarDesignationValue*)

A code list for the Convention on Wetlands of International Importance (Ramsar Convention) designation scheme.

Deleted: This type is a sub-type of DesignationValue.¶

↓ 1253/2013 Art. 1.10 and Annex II.1

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

↓ 102/2011 Art. 1.4 and Annex II.55

<i>Values for the code list RamsarDesignationValue</i>	
Value	Definition
ramsar	The Protected Site is designated under the Ramsar Convention.

↓ 1089/2010

9.4.7. *UNESCO Man And Biosphere Programme Designation (UNESCOManAndBiosphereProgrammeDesignationValue)*

A code list for the Man and Biosphere Programme classification scheme.

↓ 1253/2013 Art. 1.10 and Annex II.1

Deleted: This type is a sub-type of DesignationValue.¶

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

↓ 102/2011 Art. 1.4 and Annex II.56

Values for the code list UNESCOManAndBiosphereProgrammeDesignationValue

Value	Definition
biosphereReserve	The Protected Site is designated as a Biosphere Reserve under the Man and Biosphere Programme.

↓ 1089/2010

9.4.8. *UNESCO World Heritage Designation (UNESCOWorldHeritageDesignationValue)*

A code list for the World Heritage designation scheme.

↓ 1253/2013 Art. 1.10 and Annex II.1

Deleted: This type is a sub-type of DesignationValue.¶

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

↓ 102/2011 Art. 1.4 and Annex II.57

Values for the code list UNESCOWorldHeritageDesignationValue

Value	Definition
cultural	The Protected Site is designated as a cultural World Heritage site.
mixed	The Protected Site is designated as a mixed World Heritage site.
natural	The Protected Site is designated as a natural World Heritage site.

↓ 1089/2010

9.5. *Layers*

<i>Layers for the spatial data theme Protected Sites</i>		
Layer Type	Layer Title	Spatial object type(s)
PS.ProtectedSite	Protected Sites	ProtectedSite

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.	ElevationPropertyTypeValue	
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	ElevationGridCoverage	

	<p>an aggregated elevation grid coverage.</p> <p>The association has additional properties as defined in the association class ElevationGridCoverageAggregation.</p>		
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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	GM_MultiSurface	

	coverage.		
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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	ChartDatum	

	used to refer depth measurements.		
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.	ElevationPropertyTypeValue	

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
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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
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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	DateTime	voidable

	which this version of the spatial object was inserted or changed in the spatial data set.		
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.	ElevationPropertyTypeValue	
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	LC_LandCoverClassificationSystem	voidable

	ISO 19144-2.		
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 description 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 (PureLandCoverComponentValue) 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	Identifier	

	spatial object.		
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	

Association roles of the spatial object type LandCoverUnit

<u>Association role</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>dataSet</u>	<u>Land Cover data set to which this Land Cover object belongs.</u>	<u>LandCoverDataset</u>	

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
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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	
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 **external** *Description* 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.

Deleted: online

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.

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.	InterpolationMethodValue	
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	TM_Position	voidable

	from the spatial data set.		
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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 OrthoimageCoverage 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 OrthoimageCoverage 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 OrthoimageCoverage 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
anthropogenicGeomorphologicFeatureType	Terms describing the type of a geomorphologic feature.	AnthropogenicGeomorphologicFeatureTypeValue	

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
naturalGeomorphologicFeatureType	The type of the natural geomorphologic feature.	NaturalGeomorphologicFeatureTypeValue	
activity	The level of activity of the natural geomorphologic feature.	GeomorphologicActivityValue	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	ThematicClassificationValue	

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.
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
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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
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	explorationExploitationRawMaterial

		mineral resources from the subsurface, usually through the injection and/or extraction of mineral bearing fluids.	
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
hydrogeologicalSurvey	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.	environmentalMonitoring
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.	environmentalMonitoring
groundwaterLevelMonitoring	groundwater level monitoring	Construction of a gauge for recording groundwater level changes.	environmentalMonitoring
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	
thermalCleaning	sparging, thermal cleaning	A kind of remediation. In situ cleaning of soil using heat, steam.	remediation
recharge	recharge	<p>(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.</p> <p>(b) Saline Water Intrusion Barrier Wells: Used to inject</p>	

		<p>water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers.</p> <p>(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.</p>	
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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.	
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 in appearance 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	geologicUnit

		stratified.	
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
geophysicalUnit	geophysical unit	Geologic unit defined by its geophysical characteristics.	geologicUnit
magnetostratigraphicUnit	magnetostratigraphic unit	Geologic unit defined by magnetic characteristics.	geophysicalUnit
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.	lithogeneticUnit
excavationUnit	excavation unit	Geologic unit defined by human-made genesis involving excavation.	lithogeneticUnit
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	lithogeneticUnit

		present in the deposit are related in time and space.	
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	lithostratigraphicUnit
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.	lithotectonicUnit
pedostratigraphicUnit	pedostratigraphic unit	Geologic unit that represents a single pedologic horizon in a sequence of strata (consolidated or non-consolidated).	geologicUnit
polarityChronostratigraphicUnit	polarity chronostratigraphic	Geologic unit defined by primary	geologicUnit

	unit	magnetic-polarity record imposed when the rock was deposited or crystallized during a specific interval of geologic time.	
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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
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 formed by	compositeGenesisMaterial

ck	rock	geological modification of pre-existing rocks outside the realm of igneous and sedimentary processes.	terial
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	compoundMaterial

		solid organic material.	
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
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
carbonateSedimentaryMaterial	carbonate sedimentary material	Sedimentary material in which at least 50 percent of the primary and/or recrystallized constituents are	sedimentaryMaterial

		composed of one (or more) of the carbonate minerals calcite, aragonite and dolomite, in particles of intrabasinal origin.	
chemicalSedimentaryMaterial	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
clasticSedimentaryMaterial	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
nonClasticSiliceousSedimentaryMaterial	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

organicRichSedimentaryMaterial	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
fragmentalIgneousMaterial	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
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	compoundMaterial

		considered a solid in its own right.	
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 predominately 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
naturalGeomorphologicFeature	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.
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.
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 undulating 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, glaciofluvial), 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
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.
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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
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swathType	Type of geophysical swath.	SwathTypeValue	
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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 acquisition 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 chargeability (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.
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
environmentalMonitoringFacility	The related EnvironmentalMonitoringFacility.	EnvironmentalMonitoringFacility	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
hydroGeochemicalRockType	The rock type with respect to the soluble rock components and their hydrogeochemical influence on groundwater.	HydroGeochemicalRockTypeValue	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 AquiferSystem.	Aquiclude	voidable
aquifer	The Aquifer(s) contained in the AquiferSystem.	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
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inspireId	External object identifier of the spatial object.	Identifier	
approximateHorizontalExtent	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 HydrogeologicalObject Natural interacting with the GroundwaterBody.	HydrogeologicalObject Natural	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 HydrogeologicalObject.	PT_FreeText	voidable
description	The description of the HydrogeologicalObject.	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	Aquifer	voidable

	HydrogeologicalObject occurs.		
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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 hydrogeological object was/will be legally established.	DateTime	voidable
validTo	Date and time at which the hydrogeological 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.	NaturalObjectTypeValue	
waterPersistence	The degree of persistence of water flow.	WaterPersistenceValue	voidable
approximateQuantityOfFlow	An approximate value defining the water yield in a natural hydrogeological	QuantityValue	voidable

	object.		
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Association roles of the spatial object type HydrogeologicalObjectNatural

Association role	Definition	Type	Voidability
groundWaterBody	The GroundWaterBody 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 HydrogeologicalUnit.	PT_FreeText	voidable
approximateDepth	The approximate depth of the HydrogeologicalUnit occurrence.	QuantityValue	voidable
approximateThickness	The approximate thickness of the HydrogeologicalUnit.	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 HydrogeologicalUnit(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	
surfaceReferenceableGrid	Surface whose domain consists of a referenceable grid.	ReferenceableGridCoverage	
surfacePointCollection	Hydrogeological surface represented by collection of observations in points.	PointObservationCollection	

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	<p>(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.</p> <p>(b) Saline Water Intrusion Barrier Wells: Used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers.</p> <p>(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.</p>
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.
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 35000 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> ¹⁶	<human readable name>	MappedFeature (spatial objects whose specification property is of type GeologicFeature and which are classified (using the themeClass property) according to the same thematic classification)
Example: GE.ShrinkingAndSwelling Clays	Example: Shrinking and swelling clays	(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)
GE.Groundwaterbody	Groundwater	Groundwaterbody

¹⁶ One layer shall be made available for each code list value, in accordance with Art. 14(3).

	Bodies	
GE.ActiveWell	Active Wells	ActiveWell
GE. <CodeListValue> ¹⁷	<human readable name>	GeophStation (stationType: StationTypeValue)
Example: GE.gravityStation	Example: Gravity Stations	
GE. <CodeListValue> ¹⁸	<human readable name>	GeophStation (profilType: ProfileTypeValue)
Example: GE.seismicLine	Example: Seismic Lines	
GE. <CodeListValue> ¹⁹	<human readable name>	GeophStation (surveyType: SurveyTypeValue)
Example: GE.groundGravitySurvey	Example: Ground Gravity Surveys	
GE. <CodeListValue> ²⁰	<human readable name>	Campaign (surveyType: SurveyTypeValue)
Example: GE.groundMagneticSurvey	Example: Ground Magnetic Surveys	
GE.Geophysics.3DSeismics	3D Seismics	GeophSwath

¹⁷ One layer shall be made available for each code list value, in accordance with Art. 14(3).

¹⁸ One layer shall be made available for each code list value, in accordance with Art. 14(3).

¹⁹ One layer shall be made available for each code list value, in accordance with Art. 14(3).

²⁰ One layer shall be made available for each code list value, in accordance with Art. 14(3).

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 [Statistical Units](#) Vector contains the following spatial object types:

- Vector Statistical Unit
- Area Statistical Unit
- Statistical Tessellation
- 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	
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.	VectorStatisticalUnitGeometry	
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
tessellation	The tessellation 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 Tessellation (*StatisticalTessellation*)

A tessellation 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 tessellation.	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 occurred.	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	Integer	

	supposed to be suitable for (expressed as the inverse of an indicative scale).		
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
<code>inspireId</code>	External object identifier of the spatial object.	Identifier	
<code>EPSGCode</code>	The EPSG code to identify the grid Coordinate Referencing System.	Integer	
<code>resolution</code>	The grid resolution.	StatisticalGridResolution	
<code>origin</code>	The position of the origin point of the grid in the specified coordinate reference system (if defined).	DirectPosition	
<code>width</code>	The grid width, in cell number (if defined).	Integer	
<code>height</code>	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. For pan-European usage additional allowed grid cell sizes are the lower grid cell sizes in Section 2.2.1 of Annex II multiplied by the following integers: 2 and 5.
- (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 (geoid, 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
conditionOfConstruction	Status of construction.	ConditionOfConstructionValue	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 characteristic 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
numberOfFloorsAboveGround	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_ of the Buildings Base package	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
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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 Geometry2D (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 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
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	Length	voidable

	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.		
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.

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.
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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).	
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.
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
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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.
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.
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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.	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	BuildingGeometry3DLoD	—

	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).		
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	BuildingGeometry3DLoD1	—

	outer boundary by vertical lateral surfaces and horizontal base polygons.		
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
verticalGeometryEstimate	The estimated absolute positional accuracy of	Length	voidable

tedAccuracy	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.		
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	
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
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 (as defined in section 3.2.6)	
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 ([as defined in section 3.2.6](#)); 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	DateTime	voidable

	the spatial data set.		
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Association roles of the spatial object type SoilBody

Association role	Definition	Type	Voidability
isDescribedBy	<p>Link to a derived soil profile that characterizes the soil body, possibly in combination with other derived soil profiles.</p> <p>The association has additional properties as defined in the association class <code>DerivedProfilePresenceInSoilBody</code>.</p>	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
isBasedOnSoilDerivedObject	Link to a soil derived object on whose properties the derived value is based.	SoilDerivedObject	voidable
isBasedOnObservedSoilProfile	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	SoilBody	voidable

	based.		
soilDerivedObjectObservation	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 (as defined in section 3.2.6); 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.	FAOHorizonNotationType	voidable
otherHorizonNotation	Designation of the soil horizon according to a specific classification system.	OtherHorizonNotationType	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	Assignment 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
layerGenesisEnvironment	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.	LayerGenesisProcessStateValue	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	
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
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Constraints of the spatial object type SoilProfile

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

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

The result of the soil profile observation shall be of one of the following types: Number; RangeType (as defined in section 3.2.6); 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	DateTime	voidable

	spatial data set.		
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 ([as defined in section 3.2.6](#)); 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	DateTime	

	inserted or changed in the spatial data set.		
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
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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
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Constraints of the spatial object type SoilThemeCoverage

The rangeSet values shall be of one of the following types: Number; RangeType [\(as defined in section 3.2.6\)](#); 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	
soilThemeDescriptiveParameter	A descriptive property for the soil-related property (soil theme) that is represented by its associated SoilThemeCoverage.	SoilThemeDescriptiveParameterType	

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 ([as defined in section 3.2.6](#)); 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
derivedProfilePercentageRange	Interval that defines the minimum and maximum percentage of the area of the soil body represented by a specific derived soil profile.	RangeType_ (as defined in section 3.2.6)	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
FAOHorizonDiscontinuity	Number used to indicate a discontinuity in the horizon	Integer	

	notation.		
FAOHorizonMaster	Symbol of the master part of the horizon notation.	FAOHorizonMasterValue	
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	
FAOHorizonSubordinate	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.	FAOHorizonSubordinateValue	
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	
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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.	OtherHorizonNotationTypeValue	
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.	OtherSoilNameTypeValue	
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_ (as defined in section 3.2.6)	

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	
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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
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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 connote 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.
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.	chemicalParameter
nitrogenContent	nitrogen content	total nitrogen content in the soil, including both the organic and inorganic forms.	chemicalParameter
pHValue	pH value	pH value of the profile element.	chemicalParameter
cadmiumContent	cadmium content	Cadmium content of the profile element.	chemicalParameter
chromiumContent	chromium content	Chromium content of the profile element.	chemicalParameter
copperContent	copper content	Copper content of the profile element.	chemicalParameter
leadContent	lead content	Lead content of the profile element.	chemicalParameter
mercuryContent	mercury content	Mercury content of the profile element.	chemicalParameter
nickelContent	nickel content	Nickel content of the profile element.	chemicalParameter

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).	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.	chemicalParameter
waterDrainage	water drainage	Natural water drainage class of the soil profile.	physicalParameter
organicCarbonContent	organic carbon content	Portion of the soil measured as carbon in organic form, excluding living macro and mesofauna and living plant tissue.	chemicalParameter
nitrogenContent	nitrogen content	Total nitrogen content in the soil, including both the organic and inorganic forms.	chemicalParameter
pHValue	pH value	pH value of the soil derived object.	chemicalParameter
cadmiumContent	cadmium content	Cadmium content of the soil derived object.	chemicalParameter
chromiumContent	chromium content	Chromium content of the soil derived object.	chemicalParameter
copperContent	copper content	Copper content of the soil derived object.	chemicalParameter
leadContent	lead content	Lead content of the soil derived object.	chemicalParameter
mercuryContent	mercury content	Mercury content of the soil derived object.	chemicalParameter
nickelContent	nickel content	Nickel content of the soil derived object.	chemicalParameter

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zincContent	zinc content	Zinc content of the soil derived object.	chemicalParameter
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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	Excavation 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.	chemicalParameter
waterDrainage	water drainage	Natural internal water drainage class of the soil profile.	physicalParameter

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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, SoilDerivedObjectParameterNameValue, SoilProfileParameterNameValue, SoilSiteParameterNameValue (chemicalParameter, biologicalParameter, physicalParameter) serve only the purpose of structuring; only the 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> ²¹	<human readable name>	SoilDerivedObject (basePhenomenon: SoilDerivedObjectParameterNameValue)
Example: SO.OrganicCarbonContent	Example: Organic Carbon Content	
SO.<CodeListValue>Coverage ²²	<human readable name>	SoilThemeCoverage (soilThemeParameter / soilThemeParameterName: SoilDerivedObjectParameterNameValue)
Example: SO.OrganicCarbonContentCoverage	Example: Organic Carbon Content Coverage	

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.

²¹ One layer shall be made available for each code list value, in accordance with Art. 14(3).

²² One layer shall be made available for each code list value, in accordance with Art. 14(3).

(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.	LandUseClassificationValue	
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	LandUseClassificationValue	
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	1_1_Agriculture

		for human or animal feed or bio-energy production.	
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
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	1_2_Forestry

		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_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_MiningOfMetals	mining of metal ores	Mining of iron and	1_3_MiningAndQuarrying

alOres		other non-ferrous metal ores (except uranium and thorium).	rying
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
1_5_1_Hunting	hunting	Professional hunting. The areas can be fenced or open.	1_5_OtherPrimaryProduction
1_5_2_ManagementOfMigratoryAnimals	management of migratory animals	Keeping and feeding migratory animals such as reindeer and deer.	1_5_OtherPrimaryProduction
1_5_3_PickingOfNaturalProducts	picking of natural products	Picking up natural non wood based products such as non-cultivated	1_5_OtherPrimaryProduction

		berries, mosses, lichen etc.) for commercial purposes	
2_SecondaryProduction	secondary production	<p>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.</p> <p>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.</p>	
2_1_RawIndustry	raw industry	Industrial activities transforming the output primary sector into manufactured raw products.	2_SecondaryProduction
2_1_1_ManufacturingOfTextileProducts	manufacturing of textile products	Preparation and spinning of textile	2_1_RawIndustry

		fibres, sewing threads, textile weaving, tanning and dressing of leather.	
2_1_2_ManufacturingOfWoodAndWoodBasedProducts	manufacturing of wood and wood based products	Sawmilling and planing 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_ManufacturingOfPulpPaperAndPaperProducts	manufacturing of pulp paper and paper products	Manufacturing of pulp, paper, paperboard, paper based sanitary goods, wallpapers.	2_1_RawIndustry
2_1_4_ManufacturingOfCokeRefinedPetroleumProductsAndNuclearFuel	manufacturing of coke refined petroleum products and nuclear fuel	Manufacturing coke, refined petroleum and processing of nuclear fuel.	2_1_RawIndustry
2_1_5_ManufacturingOfChemicalsChemicalProductsManMadeFibers	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
2_1_6_ManufacturingOfBasicMetalsAndFabricatedMetals	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_ManufacturingOfNonMetallicMineralProducts	manufacturing of non-metallic mineral products	Manufacturing glass, bricks, ceramics, concrete, cement, lime, plaster, cutting and shaping of stone and other	2_1_RawIndustry

		non-metallic mineral products.	
2_1_8_ManufacturingOfRubberPlasticProducts	manufacturing of rubber plastic products	Manufacturing of tyres, tubes, plastic packing good and other rubber and plastic products.	2_1_RawIndustry
2_1_9_ManufacturingOfOtherRawMaterials	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_HeavyEndProductIndustry	heavy end product industry	Activities transforming raw manufactured products into heavy manufactured products.	2_SecondaryProduction
2_2_1_ManufacturingOfMachinery	manufacturing of machinery	Manufacturing of production, agricultural, forestry and other machinery (excluding aircrafts and vehicles), weapons, ammunition and domestic appliances.	2_2_HeavyEndProductIndustry
2_2_2_ManufacturingOfVehiclesAndTransportEquipment	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_HeavyEndProductIndustry
2_2_3_ManufacturingOfOtherHeavyEndProducts	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_HeavyEndProductIndustry
2_3_LightEndProduct	light end product	Activities	2_SecondaryProduction

Industry	industry	transforming raw manufactured products into light manufactured products.	on
2_3_1_ManufacturingOfFoodBeveragesAndTobaccoProducts	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_ManufacturingOfClothesAndLeather	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
2_3_3_PublishingAndPrinting	publishing and printing	Publishing and printing of books, newspapers, journals and the publishing and reproduction of sound recordings.	2_3_LightEndProductIndustry
2_3_4_ManufacturingOfElectricalAndOpticalEquipment	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_ManufacturingOfOtherLightEndProducts	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_SecondaryProduction
2_4_1_NuclearBasedEnergyProduction	nuclear based energy production	Nuclear power plants.	2_4_EnergyProduction
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_EnergyProduction
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_EnergyProduction
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_EnergyProduction
2_5_OtherIndustry	other industry	Production of other industrial products not included in any other of the narrower values of 2_SecondaryProduction.	2_SecondaryProduction
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.	
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	3_1_CommercialServices

		in any other of the narrower values of 3_1_CommercialServices, such as beauty and wellbeing services.	
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_FinancialProfessional	3_2_FinancialProfessionalAndInformationServices

		ionalAndInformation Services.	
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	3_4_CulturalEntertainmentAndRecreationalServices

		resorts, golf courses and other sports infrastructure.	
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
4_TransportNetworksLogisticsAndUtilities	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_TransportNetworksLogisticsAndUtilities
4_1_1_RoadTransport	road transport	Areas used for road transport, e.g. roads, parking areas, service stations.	4_1_TransportNetworks

4_1_2_RailwayTransport	railway transport	Areas used for rail transport, e.g. rails, railway stations and yards etc.	4_1_TransportNetworks
4_1_3_AirTransport	air transport	Areas used for air transport, e.g. airports and related services.	4_1_TransportNetworks
4_1_4_WaterTransport	water transport	Areas used for water transport, e.g. ports, rivers, docks and related services.	4_1_TransportNetworks
4_1_5_OtherTransportNetwork	other transport network	Areas used for other transport not included in any of the other narrower values of 4_1_TransportNetworks.	4_1_TransportNetworks
4_2_LogisticalAndStorageServices	logistical and storage services	Areas used for separate (not linked directly to industries) storage services and logistical services.	4_TransportNetworksLogisticsAndUtilities
4_3_Utilities	utilities	Infrastructure related to utilities.	4_TransportNetworksLogisticsAndUtilities
4_3_1_ElectricityGasAndThermalPowerDistributionServices	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_WaterAndSewageInfrastructure	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	4_3_Utilities

		waste.	
4_3_4_OtherUtilities	other utilities	Areas used for other utilities not included in any of the other narrower values of 4_3_Uilities.	4_3_Uilities
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_ResidentialUse WithOtherCompatibleUses	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	Areas which are in natural state, e.g.	6_3_NaturalAreasNotInOtherEconomicUse

e	economic use	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'.	e
6_3_2_WaterAreasNotInOtherEconomicUse	water areas not in other economic use	Water areas which are not in any other socio-economic use.	6_3_NaturalAreasNotInOtherEconomicUse
6_4_AreasWhereAnyUseAllowed	areas where any use allowed	Areas where any use is allowed in the Planned land use (PLU).	6_OtherUses
6_5_AreasWithoutAnySpecifiedPlannedUse	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 type ExistingLandUseObject.	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.	LandUseClassificationValue	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	DateTime	voidable

	the spatial object was superseded or retired in the spatial data set.		
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	DateTime	voidable

	which this version of the spatial object was inserted or changed in the spatial data set.		
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.	LandUseClassificationValue	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.	SampledExistingLandUseDataSet	

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 ExistingLandUseSample.	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
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member	Reference to the members of the sampled existing land use data set.	ExistingLandUseSample	
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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	
extent	Geometrical union of all the instances of the spatial object types <code>ZoningElement</code> and <code>SupplementaryRegulation</code> . When a <code>SpatialPlan</code> is only composed of a document, the attribute <code>extent</code> is the border of the cartographic image that contains the land use information (i.e. the land use map extent).	<code>GM_MultiSurface</code>	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	<code>DateTime</code>	voidable
officialTitle	Official title of the spatial plan.	<code>CharacterString</code>	
levelOfSpatialPlan	Level of the administrative units covered by the plan.	<code>LevelOfSpatialPlanValue</code>	
endLifespanVersion	Date and time at which this version of the spatial object was superseded or retired in the spatial data set.	<code>DateTime</code>	voidable
validFrom	First date at which this spatial plan is valid in	<code>DateTime</code>	voidable

	reality.		
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.	ProcessStepGeneralValue	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.	SupplementaryRegulation	

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	
specificSupplementaryRegulation	Reference to a category of supplementary regulation provided in a specific nomenclature of supplementary regulations provided by the data provider.	SpecificSupplementaryRegulationValue	voidable
supplementaryRegulation	Code of the supplementary regulation from the hierarchical supplementary regulation code list agreed at the European level.	SupplementaryRegulationValue	
beginLifespanVersion	Date and time at which this version of the spatial object was inserted or changed in the spatial	DateTime	voidable

	data set.		
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.	ProcessStepGeneralValue	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.	DimensioningIndicationValue	voidable
inheritedFromOtherPlans	Indication whether the supplementary regulation is inherited from another spatial plan.	Boolean	voidable
specificRegulationNature	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	OfficialDocumentation	voidable

	supplementary regulation.		
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	SpatialPlan	

	ZoningElement belongs to.		
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	
backgroundMapURI	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	
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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 ²³ .
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.

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
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²³ OJ L 154, 21.6.2003, p. 1.

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 SupplementaryRegulation. 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	ExistingLandUseObject

	INSPIRE Land Use Classification System at the most appropriate level	
LU.SpatialPlan	Extent of a spatial plan	SpatialPlan
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	
biomarkerStatisticalParameter	The statistical summary of a human biomonitoring study, representing the most important statistical features of a biomarker measured in that particular study.	BiomarkerStatisticalParameterType	
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	BiomarkerThematicMetadata	

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.	GeneralHealthTypeValue	
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.	HealthServicesTypeValue	
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.	EnvHealthDeterminantTypeValue	
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	DateTime	voidable

	used.		
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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.	StatisticalAggregationMethodValue	
type	The type of environmental health determinant.	EnvHealthDeterminantTypeValue	

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	

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.	DiseaseMeasureTypeValue	
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.HealthDeterminantMeasure	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.	UtilityNetworkTypeValue	
authorityRole	Parties authorized to manage a utility network, such as	RelatedParty	

	maintainers, operators or owners.		
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.	ConditionOfFacilityValue	voidable
validFrom	The time when the utility network	DateTime	voidable

	element started to exist in the real world.		
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
governmentalServiceReference	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.	UtilityDeliveryTypeValue	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.	AppurtenanceTypeValue	voidable
specificAppurtenanceType	Type of appurtenance according to a domain-specific classification.	SpecificAppurtenanceTypeValue	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
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towerHeight	The height of the tower.	Length	voidable
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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)
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	A set or paving of pavers or tiles in concrete material

	paving	covering cables or pipes.
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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.
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
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
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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.
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 type Thermal 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.	ThermalProductTypeValue	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.
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	AreaOfResponsibilityType	voidable

	responsibility of a service instance.		
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
areaOfResponsibilityByAdministrativeUnit	Administrative unit describing the geographic extent of the responsibility of a service.	AdministrativeUnit	

areaOfResponsibilityByNamedPlace	Geographical object describing the geographic extent of the responsibility of a service.	NamedPlace	
areaOfResponsibilityByNetwork	Part of a network describing the geographic extent of the competence of a service.	NetworkReference	
areaOfResponsibilityByPolygon	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 of the Buildings 2D package	
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,	UtilityNode	

	electricity, etc.), e.g. hydrant or emergency call point.		
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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
publicAdministrationOffice	public administration office	Public administration offices (not further differentiated).	
generalAdministrationOffice	general administration office	General administration offices, e.g. town halls.	publicAdministrationOffice
specializedAdministrationOffice	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).	publicAdministrationOffice
publicOrderAndSafety	public order and safety	Services concerned with public order and safety.	
administrationForPublicOrderAndSafety	administration for public order and safety	Administration offices concerned with public order and safety.	publicOrderAndSafety
policeService	police service	Services concerned with police affairs.	publicOrderAndSafety

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.	publicOrderAndSafety
fireStation	fire station	Services concerned with a station housing fire fighters, their equipment and vehicles.	fireProtectionService
siren	siren	Stationary device, often electrically operated, for producing a penetrating sound for warning the public.	fireProtectionService
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.	fireProtectionService
antiFireWaterProvision	anti-fire water provision	Location, installation or designated area from where water for fire-fighting is provided.	fireProtectionService
fireDetectionAndObservationSite	fire detection and observation site	Location, facility, construction or device for the detection and observation of fires.	fireProtectionService
rescueService	rescue service	Services dedicated to the search-and-rescue	publicOrderAndSafety

		of people, animals and goods in emergency situations.	y
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	defence

		buildings used especially for lodging soldiers in garrison.	
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.	
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	<p>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.</p> <p>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.</p>	health
generalMedicalService	general medical	General medical	outpatientService

e	service	services delivered by general medical clinics and general medical practitioners.	
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

hospitalService	hospital service	<p>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.</p> <p>Hospitals are defined as institutions which offer in-patient care under direct supervision of qualified medical doctors.</p>	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	health

		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.	
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

		education at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 2.	
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	education

		at ISCED-2011 (International Standard Classification of Education, 2011 revision) level 7.	
doctoralOrEquivalent Education	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
subsidiaryServicesTo Education	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
specializedServiceOf SocialProtection	specialized service of social protection	Various specialized services concerned with transport,	socialService

		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.	
housing	housing	Services concerned with any home, residence, facility, or premises which provide temporary, interim or permanent housing to various groups of persons.	socialService
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 unemployed, the socially deprived, disaster 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, Cabinet, Duct, Pipe
US.ElectricityNetwork	Electricity Network	Electricity Cable, Appurtenance (if included in an electricity network)
US.	Oil, Gas or Chemicals	OilGasChemicalsPipe,

OilGasChemicalsNetwork	Network	Appurtenance (if included 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> ²⁴	<human readable name>	GovernmentalService
<i>Example: US.PoliceService</i>	<i>Example: Police Service</i>	<i>(serviceType: ServiceTypeValue)</i>
US.EnvironmentalManagementFacility	Environmental Management Facility	EnvironmentalManagementFacility

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 (*EnvironmentalMonitoringNetwork*, *EnvironmentalMonitoringFacility*).

²⁴ One layer shall be made available for each code list value, in accordance with Art. 14(3).

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.	EnvironmentalMonitoringActivity	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	Identifier	

	object.		
name	Plain text denotation of the AbstractMonitoringObject.	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
responsibleParty	Responsible party for the AbstractMonitoringObject.	RelatedParty	voidable
geometry	Geometry associated to the AbstractMonitoringObject. 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.	PurposeOfCollectionValue	voidable

Association roles of the spatial object type AbstractMonitoringObject

Association role	Definition	Type	Voidability
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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 AbstractMonitoringObject (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 AbstractMonitoringObject(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 <i>EnvironmentalMonitoringActivity</i> .	TM_Object	voidable
activityConditions	Textual description of the <i>EnvironmentalMonitoringActivity</i> .	CharacterString	voidable
boundingBox	Bounding box in which the <i>EnvironmentalMonitoringActivity</i> takes place.	GM_Boundary	voidable
responsibleParty	Responsible party for the <i>EnvironmentalMonitoringActivity</i> .	RelatedParty	voidable
inspireId	External object identifier of the spatial object.	Identifier	
onlineResource	A link to an external document providing further information on the <i>EnvironmentalMonitoringActivity</i> .	URL	voidable

Association roles of the spatial object type EnvironmentalMonitoringActivity

Association role	Definition	Type	Voidability
setUpFor	<i>EnvironmentalMonitoringProgramme</i> (s) for which the <i>EnvironmentalMonitoringActivity</i> is set up.	<i>EnvironmentalMonitoringProgramme</i>	voidable
uses	Specific set of <i>AbstractMonitoringFeature</i> (s) involved in an <i>EnvironmentalMonitoringActivity</i> .	<i>AbstractMonitoringFeature</i>	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	EnvironmentalMonitoringFacility	voidable

	association class AnyDomainLink.		
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.	EnvironmentalMonitoringFacility	voidable

	The association has additional properties as defined in the association class NetworkFacility.		
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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	EnvironmentalMonitoring Activity(s) triggered by the EnvironmentalMonitoringProgramme.	EnvironmentalMonitoring Activity	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 AbstractMonitoringFeature.	Boolean	voidable
observingCapabilityRequired	Indicates whether the observingCapability is required for the AbstractMonitoringFeature.	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.EnvironmentalMonitoringFacilities	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility
EF.EnvironmentalMonitoringNetworks	Environmental Monitoring Networks	EnvironmentalMonitoringNetwork
EF.EnvironmentalMonitoringProgrammes	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 stationary technical unit, such as machinery, apparatus, devices or equipment placed in position or connected for use, within which one or more activities listed in Annex I of

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PRTR-Regulation 166/2006/EC²⁵ and in Annex I or in Part 1 of Annex VII of the Industrial Emission Directive 2010/75/EU²⁶ are carried out, and any other directly associated activities which have a technical connection with the activities listed and which could have an effect on emissions and pollution;

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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.	InstallationTypeVal ue	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

²⁵ [Commission Regulation \(EC\) No 166/2006 of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC \(OJ L 33, 04.02.2006\)](#)

²⁶ [Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions \(integrated pollution prevention and control\) \(OJ L 334, 17.12.2010\)](#)

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
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	StatusType	voidable

	period.		
type	Special kind of an installation part, denoting the operative function which has to be performed.	InstallationPartTypeValue	voidable
technique	Method to reduce pollutant concentration due to the emissions of a technical component, typically a chimney.	PollutionAbatementTechniqueValue	voidable

8.2.4. Production Site (*ProductionSite*)

All land at a distinct geographical 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	
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
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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> ²⁷	<human readable name>	ProductionFacility
<i>Example: PF.Manufacturing</i>	<i>Example: Manufacturing</i>	<i>(activity: EconomicActivityValue)</i>
PF.ProductionPlot	Production And Industrial Parcel	ProductionPlot
PF.ProductionInstallation	Production And Industrial	ProductionInstallation

²⁷ One layer shall be made available for each code list value, in accordance with Art. 14(3).

	Installation	
PF.ProductionInstallationPart	Production And Industrial Installation Part	ProductionInstallationPart
PF.ProductionBuilding	Production and Industrial Building	ProductionBuilding

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	
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 1165/2008²⁸ 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. Agricultural Holding	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. Aquaculture Holding	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

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	Identifier	

²⁸ OJ L 321, 1.12.2008, p. 1.

	the spatial object.		
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	Number	

	proportion of population of the area of interest that is not counted in any of its spatial components .		
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	DateTime	voidable

	superseded or retired in the spatial data set.		
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.	ClassificationItemTypeValue	

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	
conventionallyLocatedProportion	The proportion of population counted in the piece of datum but that cannot actually be physically located anywhere within the area of interest.	Number	
approximatelyLocatedPopulationProportion	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 StatisticalData distribution 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.	StatisticalDataStatusValue	

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.	SpecialisedZoneTypeCode	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 ²⁹ .
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

²⁹ OJ L 312, 22.11.2008, p. 3.

		to nitrate pollution.
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 ³⁰ 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 ³¹ 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.

³⁰ OJ L 327, 22.12.2000, p. 1.

³¹ OJ L 288, 6.11.2007, p. 27.

		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 ³² .
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.

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.

³² OJ L 135, 30.5.1991, p. 40.

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 ₂ O) 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 SupplementaryRegulation. 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
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AM.<CodeListValue> ³³	<human readable name>	ManagementRestrictionOrRegulationZone (zoneType: ZoneTypeCode)
Example: AM.AirQualityManagementZone	Example: Air Quality Management Zone	

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

³³ One layer shall be made available for each code list value, in accordance with Art. 14(3).

- 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

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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

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Association roles of the spatial object type AbstractHazardArea

Association role	Definition	Type	Voidability
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source	The observed event that triggered the modelling of a hazard area.	AbstractObservedEvent	voidable
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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
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

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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.	ExposedElementClassification	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 exposed element.	GM_Object	
assessmentOfVulnerability	Assessment of the	VulnerabilityAssessment	voidable

	vulnerability of the exposed element.		
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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 extent covered by the hazard area.	GM_Surface	
likelihoodOfOccurrence	A general concept relating to the chance of an event occurring.	LikelihoodOfOccurrence	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 occurrence.

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 occurrence.

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	

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
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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.	SpecificExposedElementfTypeValue	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 occurrence 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.	NaturalHazardCategoryValue	
specificHazardType	Additional classification of the natural hazard that further specifies the hazard type according to a nomenclature that is specific to this data set.	SpecificHazardTypeValue	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.
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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
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	geologicalHydrological

		in a large water body reaching emerged land.	al
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	geologicalHydrological

		that slides rapidly downhill.	
flood	flood	Processes of inundation of usually dry (emerged) land, or temporary covering by water of land not normally covered by water.	geologicalHydrological
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	meteorologicalClimatological

		hurricane or a rapid change in atmospheric pressure.	
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
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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> ³⁴	<human readable name>	HazardArea, HazardAreaCoverage (typeOfHazard: NaturalHazardCategoryValue)
Example: NZ.Landslide	Example: Landslides	
NZ. <CodeListValue> ³⁵	<human readable name>	ObservedEvent, ObservedEventCoverage (typeOfHazard: NaturalHazardCategoryValue)
Example: NZ.Flood	Example: Floods	

³⁴ One layer shall be made available for each code list value, in accordance with Art. 14(3).

³⁵ One layer shall be made available for each code list value, in accordance with Art. 14(3).

NZ.ExposedElement	Exposed Elements	ExposedElement
NZ.ExposedElementCoverage	Exposed Element Coverage	ExposedElementCoverage

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)
- Observation References (specified in Section 7.1 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, PointTimeSeriesObservation, 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 Timeseries 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	DateTime	voidable

	which this version of the spatial object was superseded or retired in the spatial data set.		
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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.

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.

Spatial object types of type Sea shall have only one value for the extent attribute.

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Attribute

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	

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Constraints of the spatial object type MarineCirculationZone

Spatial object types of type MarineCirculationZone shall have only one value for the extent attribute.

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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

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 15.1.6. *Shore Segment (ShoreSegment)¶*
 A Shore Segment is a section of shoreline.¶
Attributes of the spatial object type ShoreSegment¶
 Attribute

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15.1.6. *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.

15.1.7. Marine Contour (MarineContour)

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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 isolines (e.g. wave height).	AbstractObservableProperty	
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 underlying observations which were used to define a marine contour.	ObservationSet	

15.1.8. Marine Layer (MarineLayer)

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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 [9](#). *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	

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15.1 [10](#). *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.	SeaSurfaceClassificationValue	

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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
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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

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15.2.4. Shore Segment (*ShoreSegment*)

A Shore Segment is a section of shoreline.

Attributes of the data type ShoreSegment

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<u>Attribute</u>	<u>Definition</u>	<u>Type</u>	<u>Voidability</u>
<u>geometry</u>	<u>The geometry of the</u>	<u>GM Curve</u>	

	<u>ShoreSegment</u>		
<u>shoreClassification</u>	<u>The primary type of the shore segment, taken from the ShoreTypeClassificationValue code list.</u>	<u>ShoreTypeClassificationValue</u>	<u>voidable</u>
<u>shoreStability</u>	<u>The primary stability type of the shore segment, taken from the ShoreStabilityValue code list.</u>	<u>ShoreStabilityValue</u>	<u>voidable</u>

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.	RegionClassificationValue	
regionClassificationScheme	Classification scheme used for classifying regions.	RegionClassificationSchemeValue	
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 Strategy Framework Directive classification, as listed in Article 4 of Directive 2008/56/EC³⁶.
- 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

³⁶ OJ L 164, 25.6.2008, p. 19.

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
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.	ReferenceHabitatTypeCodeValue	
referenceHabitatTypeScheme	One of the Pan-European classification schemes that are widely used in Europe.	ReferenceHabitatTypeSchemeValue	
localHabitatName	Habitat type according to a local habitat classification scheme.	LocalNameType	voidable
referenceHabitatTypeName	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.	QualifierLocalNameValue	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.
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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.	OccurrenceCategoryValue	
residencyStatus	Information on the status	ResidencyStatusValue	voidable

	of residency of a species regarding nativeness versus introduction and permanency.		
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	CountingUnitValue	

	abundance of a species within the species distribution unit.		
populationSize	A range value indicating the counted, estimated or calculated occurrences or population sizes using upper and lower bounds.	RangeType (as defined in section 18.3.3)	

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	ReferenceSpeciesSchemeValue	

	taxonomical standard to which all local names and taxonomic concepts shall be mapped.		
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.
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 occurrenceCategory 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> ³⁷	Species Distribution (of <human readable name>)	SpeciesDistributionUnit (speciesName / referenceSpeciesId: ReferenceSpeciesCodeValue)
Example: SD.SulaBassana	Example: Species Distribution (of Sula bassana)	

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

³⁷ One layer shall be made available for each code list value, in accordance with Art. 14(3).

accordance with Article 2 of Directive 2009/28/EC of the European Parliament and of the Council³⁸.

(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

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.).

³⁸ OJ L 140, 5.6.2009, p. 16.

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.	VerticalExtentRangeType	
scalar	Number representing the height or depth of an Energy Resource.	Length	

Deleted: Reference

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.
solarThermal	solar thermal	Heat from solar radiation that 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.
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 petroleum 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 hydrocarbons).
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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 Resources.

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 extent covered by this energy resource.	GM_Object	
classificationAndQuantificationFramework	A reference classification scheme to classify and quantify energy resources.	ClassificationAndQuantificationFrameworkValue	
verticalExtent	Vertical dimensional property consisting of an absolute measure or	VerticalExtentType	voidable

	range of measures referenced to a well-defined vertical reference level which is commonly taken as origin (ground level, mean sea level, etc.).		
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 which the 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.	FossilFuelMeasure	voidable
typeOfResource	Type of fossil fuel.	FossilFuelValue	

Deleted: HydrocarbonMeasure

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
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
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	MiningActivity	voidable

	resource.		
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.	ExplorationActivityTypeValue	
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	MiningFeature	

	MiningFeatureOccurrence specifies.		
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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.	MiningActivityTypeValue	
oreProcessed	The amount of ore processed by the activity.	Quantity	voidable
processingType	The type of processing carried out during the mining activity.	ProcessingActivityTypeValue	

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
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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.	MineralDepositGroupValue	
mineralDepositType	Style of mineral occurrence or deposit.	MineralDepositTypeValue	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	EarthResourceDimension	voidable

	in the calculation.		
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.
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.
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	nonMetallicMinerals

		including Aggregate; Dimension & ornamental stones (granite, gabbro, travertine, etc.); Gypsum, anhydrite; Cement limestone; Limestone for lime; Marble.	
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).	nonMetallicMinerals
chemicalMinerals	chemical minerals	Mineral occurrences including Borates; Barite; Fluorite; Magnesium (magnesite); Sodium sulphate; Sodium carbonate (trona);	nonMetallicMinerals

		Pyrite; Sulphur; Rock salt; Strontium; Zeolites.	
energyCoverMinerals	energy cover minerals	Mineral occurrences including Bituminous sandstone/limestone, oil shale; Coal; Lignite; Peat; Thorium; Uranium.	nonMetallicMinerals
fertilizer	fertilizer	Mineral occurrences including Phosphate; Potash (sylvite, carnalite).	nonMetallicMinerals
preciousAndSemiPreciousStones	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).	nonMetallicMinerals
specialityAndOtherIndustrialMinerals	speciality and other industrial rocks and minerals	Mineral occurrences including Abrasives: garnet,	nonMetallicMinerals

		stauroilite, corundum; Asbestos (antophyllite , chrysotile, crocidolite); Attapulgit, sepiolite (clay); Bentonite (clay); Limestone, calcite (filler); Diatomite (kieselguhr); Graphite; Mica; Perlite; Quartz (massive / block for ferrosilicon); Quartz, optical & piezoelectric al use; Silica sand; Talc, pyrophyllite; Vermiculite; Wollastonite .	
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
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	regionalReconnaissance

		collected.	
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
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
assessmentOfResource	assessment of 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.	assessmentOfResource
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	assessmentOfResource

		to collect undisturbed rock cylinders and allows to confirm/to precise results from percussion drilling.	
geological Interpretation	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.	assessmentOfResource
ore Beneficiation Test	ore beneficiation tests	Technique designed to treat run of mine material.	assessmentOfResource
approximate Resource Calculation	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.	assessmentOfResource
evaluationOfOreDeposit	evaluation of the ore deposit	This the final phase of evaluation leading to the final yes/no mining decision.	
systematic Reconnaissance Core Drilling	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
mining Workings	mining workings	Reconnaissance workings aimed at getting a better understanding of the deposit, and allowing to get large ore samples for detailed	evaluationOfOreDeposit

		beneficiation tests.	
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	Identification of particular minerals which may indicate a

	key minerals	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
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.	
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.
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.
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 ultramafic plutonism and resulting from magmatic processes such as fractional crystallisation. The main types of deposits are chromite and platinoids in ophiolitic peridotites, titanium within anorthosites, nickel, copper and platinoids 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.
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.
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)

ANNEX V

IMPLEMENTING RULES FOR INVOCABLE SPATIAL DATA SERVICES

PART A

Writing Conventions

Similar to the Regulation (EC) No 1205/2008, the following writing conventions are used for the spatial data service metadata.

Where specified in the description of the metadata elements, the value domains shall be used with the multiplicity expressed in the relevant tables. In relation to a particular domain, each value is defined by:

- a numerical identifier,
- a textual name for humans which may be translated in the different Community languages,
- a language neutral name for computers (the value expressed between parenthesis),
- an optional description or definition.

The table present the following information:

- the first column contains the reference to the paragraph in the Annex defining the metadata element or group of metadata elements,
- the second column contains the name of the metadata element or group of metadata elements,
- the third column specifies the multiplicity of a metadata element. The expression of the multiplicity follows the unified modelling language (UML) notation for multiplicity, in which:
 - N means that there shall be only N instances of this metadata element in a result set,
 - 1..* means that there shall be at least one instance of this element in a result set,
 - 0..1 indicates that the presence of the metadata element in a result set is conditional but can occur only once,
 - 0..* indicates that the presence of the metadata element in a result set is conditional but the metadata element may occur once or more,
 - when the multiplicity is 0..1 or 0..*, the condition defines when the metadata elements is mandated.

- the fourth column contains a conditional statement if the multiplicity of the element does not apply to all types of resources. All elements are mandatory in other circumstances.

PART B

Category Metadata Element

1. Category

This is a citation of the status of the spatial data service versus invocability.

The value domain of this metadata element is as follows:

1.1. Invocable (invocable)

The spatial data service is an invocable spatial data service.

1.2. Interoperable (interoperable)

The invocable spatial data service is an interoperable spatial data service.

1.3. Harmonised (harmonised)

The interoperable spatial data service is a harmonised spatial data service.

PART C

Instructions on Multiplicity and Conditions of the Metadata Elements

The new metadata describing the spatial data service shall comprise the metadata elements or groups of metadata elements listed in Table 1.

Those metadata elements or groups of metadata elements shall be in accordance with the expected multiplicity and the related conditions set out in Table 1.

When no condition is expressed in relation to a particular metadata element, that element shall be mandatory.

<i>Table 1</i>			
<i>Metadata for invocable spatial data services</i>			
Reference	New metadata elements	Multiplicity	Condition
1	Category	0..1	mandatory for an invocable spatial data service

PART D

Additional Requirements on Metadata Set Out in Regulation (EC) No 1205/2008

1. Resource Locator

The Resource Locator metadata element set out in Regulation (EC) No 1205/2008 shall also contain all access points from the spatial data service provider and these access points shall be unambiguously identified as such.

2. Specification

The Specification metadata element set out in Regulation (EC) No 1205/2008 shall also refer to or contain technical specifications (such as INSPIRE technical guidance but not only), to which the invocable spatial data service fully conforms, providing all the necessary technical elements (human, and wherever relevant, machine readable) to allow its invocation.

ANNEX VI

**IMPLEMENTING RULES FOR THE INTEROPERABILITY OF INVOCABLE
SPATIAL DATA SERVICES**

PART A

Additional Requirements on Metadata Set Out in Regulation (EC) No 1205/2008

1. Conditions applying to access and use

The technical restrictions applying to the access and use of the spatial data service shall be documented in the metadata element 'CONSTRAINT RELATED TO ACCESS AND USE' set out in Regulation (EC) No 1205/2008.

2. Responsible party

The responsible party set out in Regulation (EC) No 1205/2008 shall at least describe the custodian responsible organisation, corresponding to the Custodian responsible party role set out in Regulation (EC) No 1205/2008.

PART B

Metadata Elements

3. Coordinate Reference System Identifier

Where appropriate, this is the list of coordinate reference systems supported by the spatial data service.

Each supported coordinate reference system shall be expressed using an identifier.

4. Quality of Service

This is the minimum quality of service estimated by the spatial data service responsible party and expected to be valid over a period of time.

4.1. Criteria

These are the criteria to which the measurements refer.

The value domain of this metadata element is as follows:

4.1.1. Availability (availability)

It describes the percentage of time the service is available.

4.1.2. Performance (performance)

It describes how fast a request to the spatial data service can be completed.

4.1.3. Capacity (capacity)

It describes the maximum number of simultaneous requests that can be completed with the declared performance.

4.2. *Measurement*

4.2.1. Description

It describes the measurement for each criterion.

The value domain of this metadata element is free text.

4.2.2. Value (value)

It describes the value of the measurement for each criterion.

The value domain of this metadata element is free text.

4.2.3. Unit (unit)

It describes the Unit of the measurement for each criterion.

The value domain of this metadata element is free text.

PART C

Instructions on Multiplicity and Conditions of the Metadata Elements

The metadata describing an interoperable spatial data service shall comprise the metadata elements or groups of metadata elements listed in Table 1.

Those metadata elements or groups of metadata elements shall be in accordance with the expected multiplicity and the related conditions set out in Table 1.

When no condition is expressed in relation to a particular metadata element, that element shall be mandatory.

<i>Table 1</i>			
<i>Metadata for interoperable spatial data services</i>			
Reference	New metadata elements	Multiplicity	Condition
1	Coordinate reference system identifier	1..*	Mandatory if relevant
2	Quality of service	3..*	

ANNEX VII

**IMPLEMENTING RULES FOR THE HARMONISATION OF INTEROPERABLE
SPATIAL DATA SERVICES**

PART A

Characteristics

1. Quality of Service

The probability of a harmonised spatial data service to be available shall be 98 % of the time.

2. Output encoding

A harmonised spatial data service returning spatial objects in the scope of the Directive 2007/2/EC shall encode those spatial objects according to this regulation.

PART B

Metadata Elements

3. invocation metadata

The invocation metadata element documents the interfaces of the harmonised spatial data service and lists the end points to enable machine-to machine communication.

PART C

Instructions on Multiplicity and Conditions of the Metadata Elements

The harmonised spatial data service metadata shall comprise the metadata element or group of metadata elements listed in Table 1.

This metadata element or group of metadata elements shall be in accordance with the expected multiplicity and the related conditions set out in Table 1.

When no condition is expressed in relation to a particular metadata element, that element shall be mandatory.

<i>Table 1</i>			
<i>Metadata for harmonised spatial data services</i>			
Reference	New metadata elements	Multiplicity	Condition
1	invocation metadata	1..*	

PART D

Operations

1. List of operations

A harmonised spatial data service shall provide the operation listed in table 2.

<i>Table 2</i>	
<i>Operations for Harmonised Spatial Data Services</i>	
Operation	Role
Get Harmonised Spatial Data Service Metadata	Provides all necessary information about the service and describes service capabilities

2. Get Harmonised Spatial Data Service Metadata Operation

2.1. Get Harmonised Spatial Data Service Metadata Request

2.1.1. Get Harmonised Spatial Data Service Metadata Request parameters

The Get Harmonised Spatial Data Service Metadata Request parameter indicates the natural language for the content of the Get Harmonised Spatial Data Service Metadata Response

2.2. Get Harmonised Spatial Data Service Metadata Response

The Get Harmonised Spatial Data Service Metadata Response shall contain the following sets of parameters:

- Harmonised Spatial Data Service Metadata,
- Operations Metadata,
- Languages.

2.2.1. Harmonised Spatial Data Service Metadata parameters

The Harmonised Spatial Data Service Metadata parameters shall at least contain the INSPIRE metadata elements of the Harmonised Spatial Data Service set out in this Regulation, and in Regulation (EC) No 1205/2008.

2.2.2. Operations Metadata parameters

The Operations Metadata parameter provides metadata about the operations of the Harmonised Spatial Data Service. It shall at least describe each operation, including as a minimum a description of the data exchanged and the network address.

2.2.3. Languages parameter

Two language parameters shall be provided:

- the Response Language parameter indicating the natural language used in the Get Harmonised Spatial Data Service Metadata Response parameters,
- the Supported Languages parameter containing the list of the natural languages supported by the Harmonised Spatial Data Service.



ANNEX