# Mineral resources

**Norwegian Mapping Authority**
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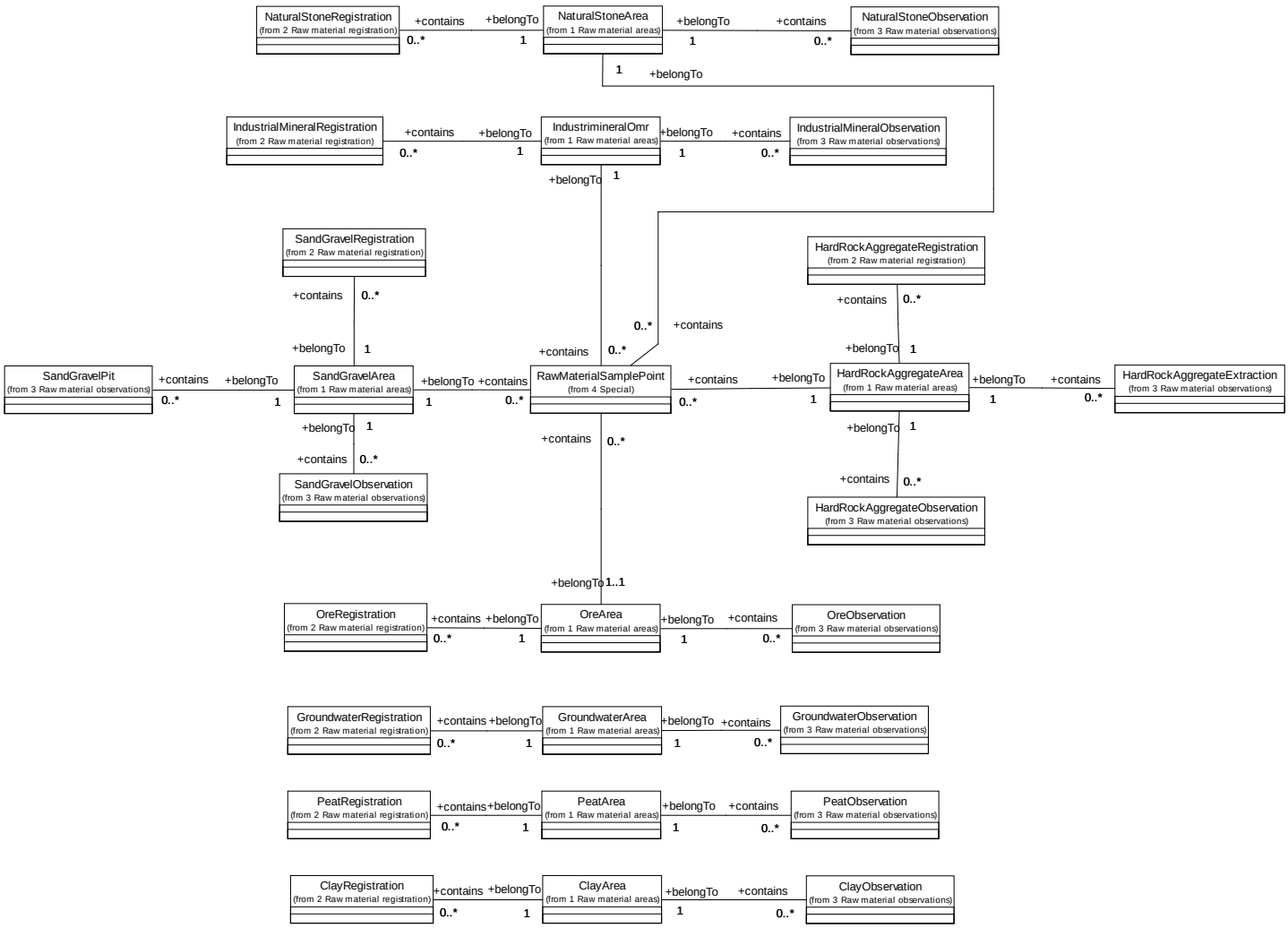
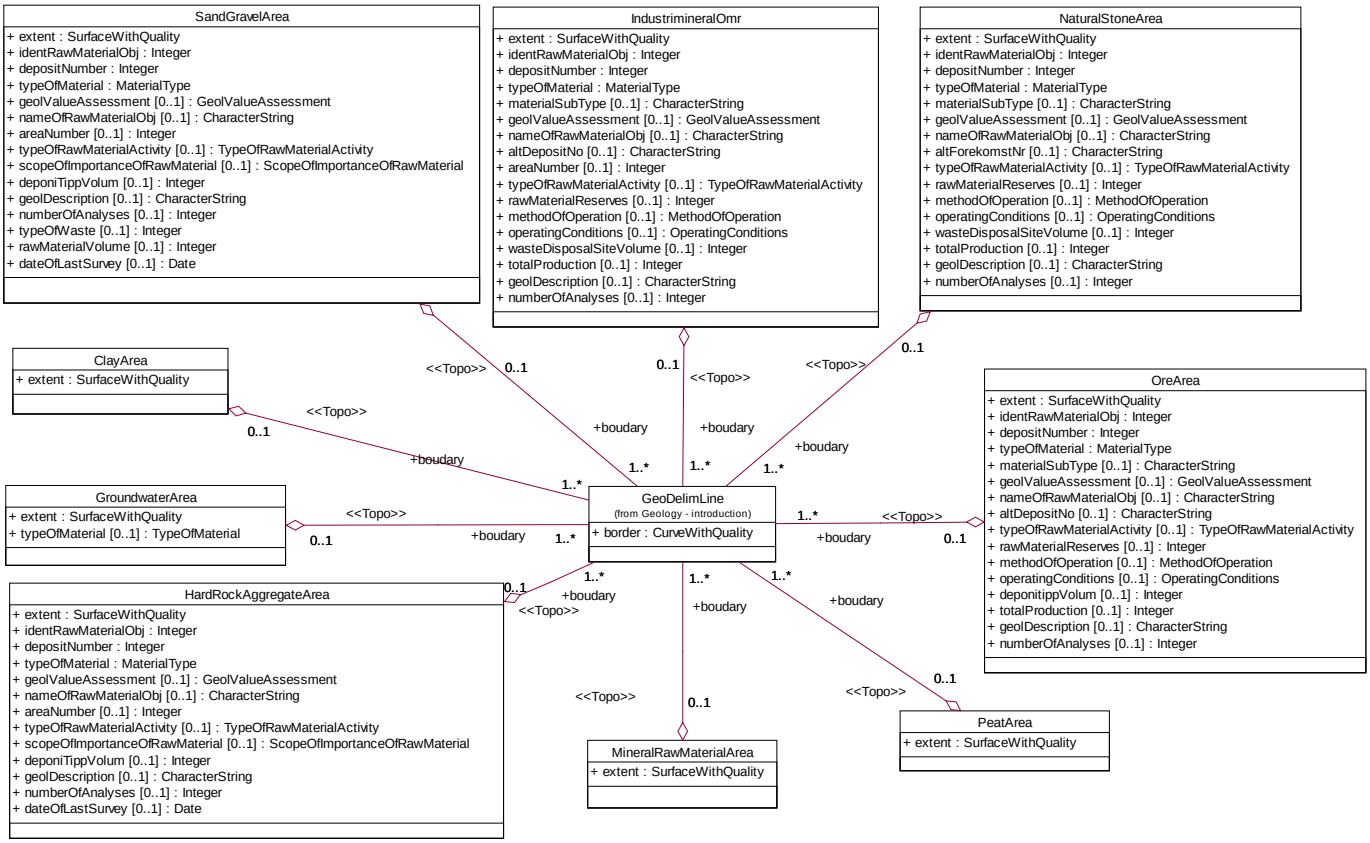
## 1.1 Application schema

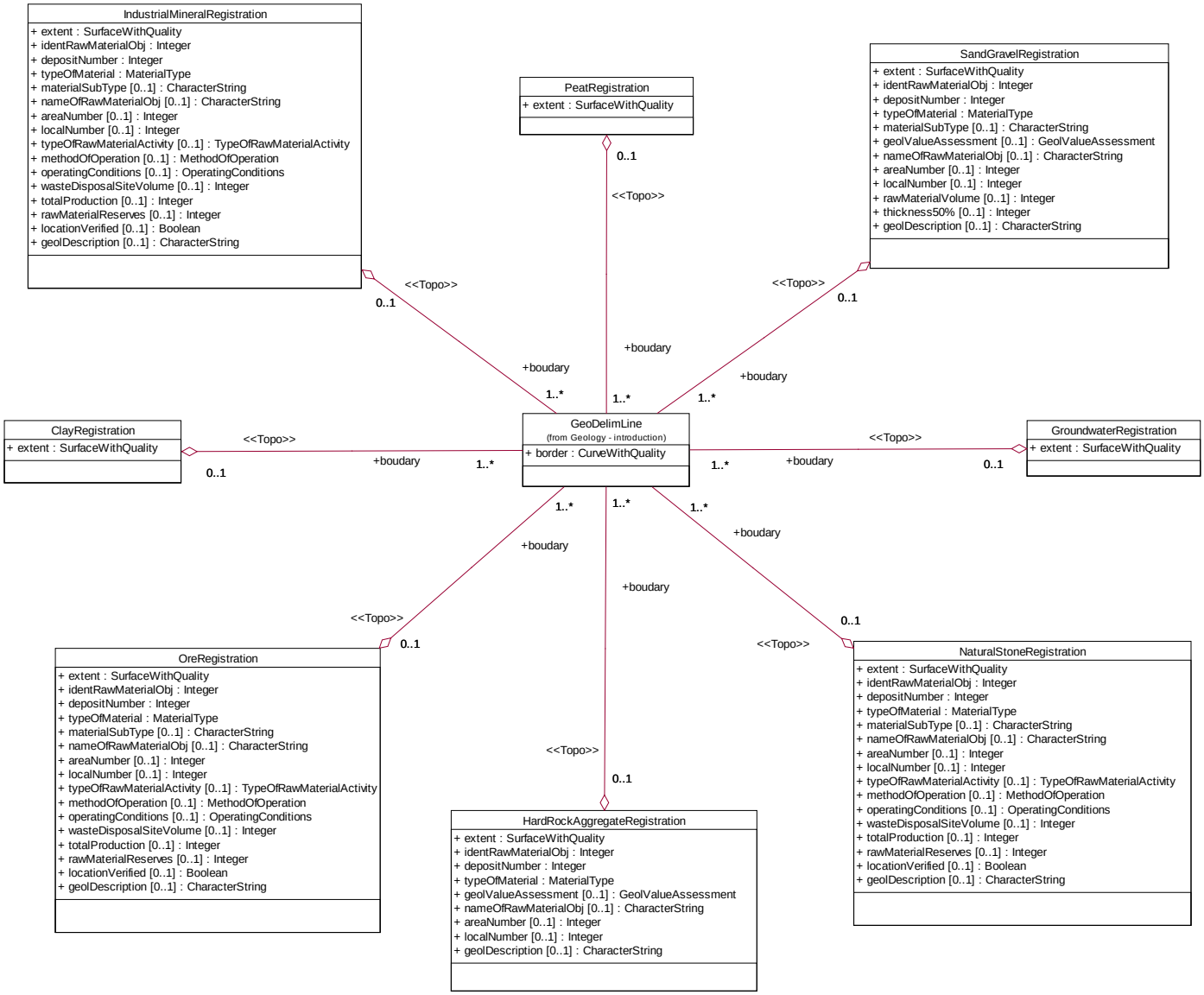
### Main



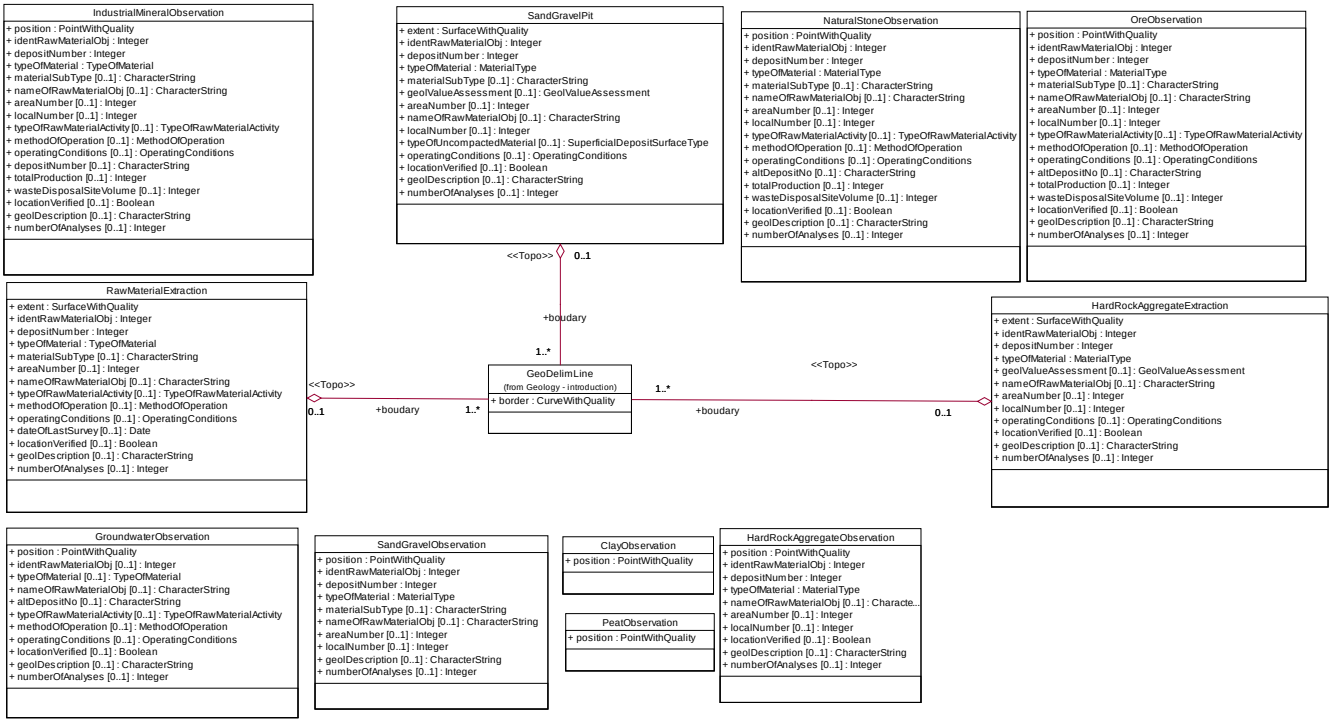
# Raw material areas



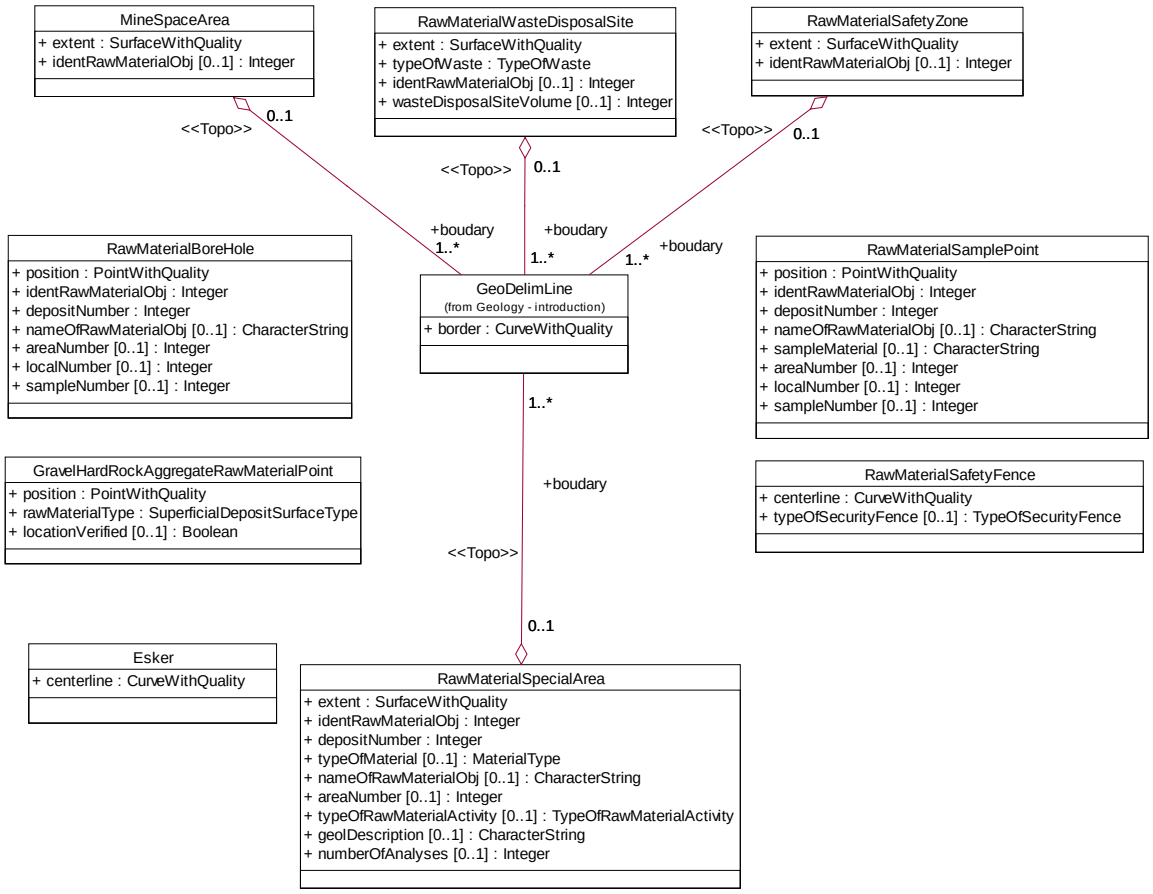
## Raw material registration



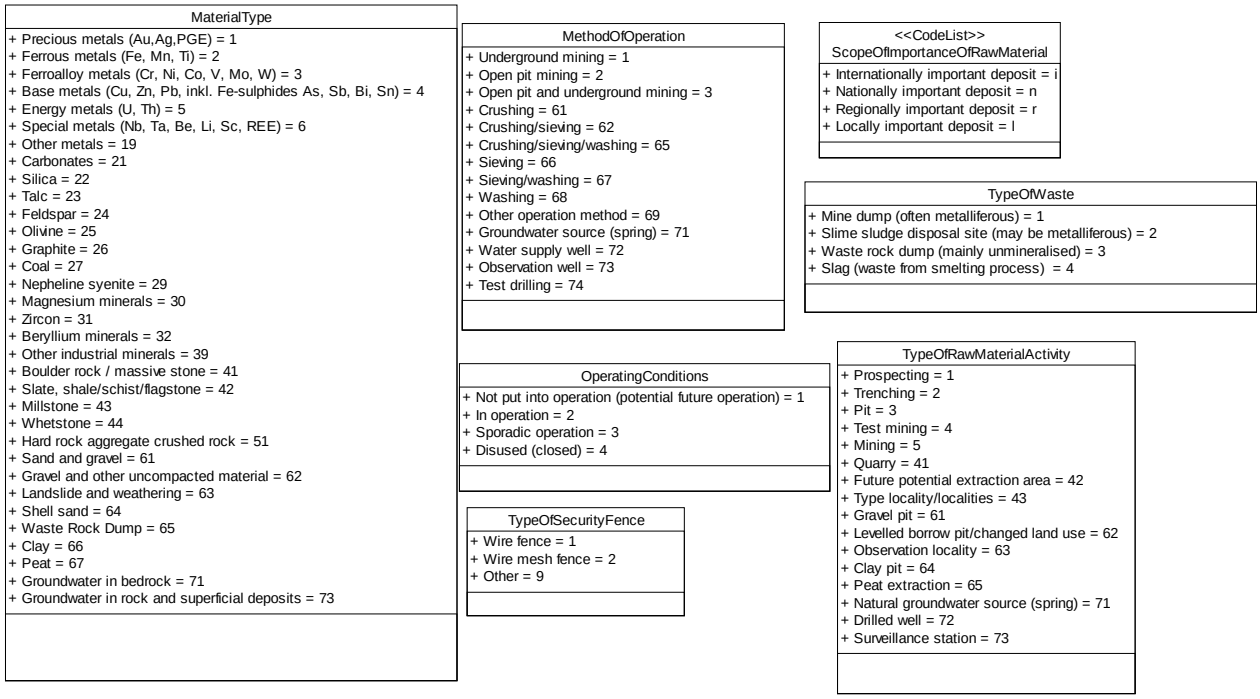
# Raw material observations



## Special


MineSpaceArea
+ extent : SurfaceWithQuality
+ identRawMaterialObj [0..1] : Integer
RawMaterialWasteDisposalSite
+ extent : SurfaceWithQuality
+ typeOfWaste : TypeOfWaste
+ identRawMaterialObj [0..1] : Integer
+ wasteDisposalSiteVolume [0..1] : Integer
RawMaterialSafetyZone
+ extent : SurfaceWithQuality
+ identRawMaterialObj [0..1] : Integer
<<Topo>>
0..1
<<Topo>>
0..1
<<Topo>>
0..1
+boudary
1..*
+boudary
1..*
+boudary
1..*
RawMaterialBoreHole
+ position : PointWithQuality
+ identRawMaterialObj : Integer
+ depositNumber : Integer
+ nameOfRawMaterialObj [0..1] : CharacterString
+ areaNumber [0..1] : Integer
+ localNumber [0..1] : Integer
+ sampleNumber [0..1] : Integer
GeoDelimLine
(from Geology - introduction)
+ border : CurveWithQuality
RawMaterialSamplePoint
+ position : PointWithQuality
+ identRawMaterialObj : Integer
+ depositNumber : Integer
+ nameOfRawMaterialObj [0..1] : CharacterString
+ sampleMaterial [0..1] : CharacterString
+ areaNumber [0..1] : Integer
+ localNumber [0..1] : Integer
+ sampleNumber [0..1] : Integer
1..*
+boudary
GravelHardRockAggregateRawMaterialPoint
+ position : PointWithQuality
+ rawMaterialType : SuperficialDepositSurfaceType
+ locationVerified [0..1] : Boolean
RawMaterialSafetyFence
+ centerline : CurveWithQuality
+ typeOfSecurityFence [0..1] : TypeOfSecurityFence
<<Topo>>
0..1
Esker
+ centerline : CurveWithQuality
RawMaterialSpecialArea
+ extent : SurfaceWithQuality
+ identRawMaterialObj : Integer
+ depositNumber : Integer
+ typeOfMaterial [0..1] : MaterialType
+ nameOfRawMaterialObj [0..1] : CharacterString
+ areaNumber [0..1] : Integer
+ typeOfRawMaterialActivity [0..1] : TypeOfRawMaterialActivity
+ geolDescription [0..1] : CharacterString
+ numberOfAnalyses [0..1] : Integer

# Codelists


MaterialType
+ Precious metals (Au,Ag,PGE) = 1
+ Ferrous metals (Fe, Mn, Ti) = 2
+ Ferroalloy metals (Cr, Ni, Co, V, Mo, W) = 3
+ Base metals (Cu, Zn, Pb, inkl. Fe-sulphides As, Sb, Bi, Sn) = 4
+ Energy metals (U, Th) = 5
+ Special metals (Nb, Ta, Be, Li, Sc, REE) = 6
+ Other metals = 19
+ Carbonates = 21
+ Silica = 22
+ Talc = 23
+ Feldspar = 24
+ Olivine = 25
+ Graphite = 26
+ Coal = 27
+ Nepheline syenite = 29
+ Magnesium minerals = 30
+ Zircon = 31
+ Beryllium minerals = 32
+ Other industrial minerals = 39
+ Boulder rock / massive stone = 41
+ Slate, shale/schist/flagstone = 42
+ Millstone = 43
+ Whetstone = 44
+ Hard rock aggregate crushed rock = 51
+ Sand and gravel = 61
+ Gravel and other uncompacted material = 62
+ Landslide and weathering = 63
+ Shell sand = 64
+ Waste Rock Dump = 65
+ Clay = 66
+ Peat = 67
+ Groundwater in bedrock = 71
+ Groundwater in rock and superficial deposits = 73
MethodOfOperation
+ Underground mining = 1
+ Open pit mining = 2
+ Open pit and underground mining = 3
+ Crushing = 61
+ Crushing/sieving = 62
+ Crushing/sieving/washing = 65
+ Sieving = 66
+ Sieving/washing = 67
+ Washing = 68
+ Other operation method = 69
+ Groundwater source (spring) = 71
+ Water supply well = 72
+ Observation well = 73
+ Test drilling = 74
<<CodeList>>
ScopeOfImportanceOfRawMaterial
+ Internationally important deposit = i
+ Nationally important deposit = n
+ Regionally important deposit = r
+ Locally important deposit = l
TypeOfWaste
+ Mine dump (often metalliferous) = 1
+ Slime sludge disposal site (may be metalliferous) = 2
+ Waste rock dump (mainly unmineralised) = 3
+ Slag (waste from smelting process) = 4
OperatingConditions
+ Not put into operation (potential future operation) = 1
+ In operation = 2
+ Sporadic operation = 3
+ Disused (closed) = 4
TypeOfSecurityFence
+ Wire fence = 1
+ Wire mesh fence = 2
+ Other = 9
TypeOfRawMaterialActivity
+ Prospecting = 1
+ Trenching = 2
+ Pit = 3
+ Test mining = 4
+ Mining = 5
+ Quarry = 41
+ Future potential extraction area = 42
+ Type locality/localities = 43
+ Gravel pit = 61
+ Levelled borrow pit/changed land use = 62
+ Observation locality = 63
+ Clay pit = 64
+ Peat extraction = 65
+ Natural groundwater source (spring) = 71
+ Drilled well = 72
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## 1.2 Description

### 1.2.1 Raw material areas

#### 1.2.1.1 GroundwaterArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 1 | Class GroundwaterArea | area assumed to contain potential groundwater resources | | | | |
| 1.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 1.2 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 0 | 1 | TypeOfMaterial | |
| 1.3 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 1.4 | Role contains | | 0 | N | GroundwaterRegistration | |
| 1.5 | Role contains | | 0 | N | GroundwaterObservation | |

#### 1.2.1.2 IndustrimineralOmr

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 2 | Class IndustrimineralOmr | area presumed to contain potential industrial mineral resources | | | | |
| 2.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 2.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 1 | 1 | Integer | |
| 2.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | deposit. For example. 1729001 | | | | |
| 2.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 2.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 2.6 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 2.7 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 2.8 | altDepositNo | alternative numbering of the deposit Note: May have a specific form in the individual deposit database and does not need to be unique. Often used to refer back to numbering systems in older registers | 0 | 1 | CharacterString | |
| 2.9 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 2.10 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 2.11 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or other operative data. | 0 | 1 | Integer | |
| 2.12 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 2.13 | operatingConditions | | 0 | 1 | OperatingConditions | |
| 2.14 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | deposit has several different waste rock dumps, the total waste volume is stated | | | | |
| 2.15 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 2.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 2.17 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 2.18 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 2.19 | Role contains | | 0 | N | RawMaterialSamplePoint | |
| 2.20 | Role contains | | 0 | N | IndustrialMineralRegistration | |
| 2.21 | Role contains | | 0 | N | IndustrialMineralObservation | |

### 1.2.1.3 ClayArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 3 | Class ClayArea | area where the clay material may have a certain industrial potential | | | | |
| 3.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 3.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 3.3 | Role contains | | 0 | N | ClayRegistration | |
| 3.4 | Role contains | | 0 | N | ClayObservation | |

### 1.2.1.4 OreArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 4 | Class OreArea | area presumed to contain ore resources | | | | |
| 4.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 4.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | | | | |
| 4.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit. For example. 172 | 1 | 1 | Integer | |
| 4.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 4.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 4.6 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 4.7 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 4.8 | altDepositNo | alternative numbering of the deposit Note: May have a specific form in the individual deposit database and does not need to be unique. Often used to refer back to numbering systems in older registers | 0 | 1 | CharacterString | |
| 4.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 4.10 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | other operative data. | | | | |
| 4.11 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 4.12 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 4.13 | deponitippVolum | | 0 | 1 | Integer | |
| 4.14 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 4.15 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 4.16 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 4.17 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 4.18 | Role contains | | 0 | N | RawMaterialSamplePoint | |
| 4.19 | Role contains | | 0 | N | OreRegistration | |
| 4.20 | Role contains | | 0 | N | OreObservation | |

### 1.2.1.5 MineralRawMaterialArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 5 | Class MineralRawMaterialArea | unspecified area with potential for registration of one or more mineral deposits | | | | |
| 5.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 5.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

NaturalStoneArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 6 | Class NaturalStoneArea | area presumed to have potential as natural stone resource | | | | |
| 6.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 1 | 1 | Integer | |
| 6.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit. For example. 1729001 | 1 | 1 | Integer | |
| 6.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 6.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 6.6 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 6.7 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 6.8 | altForekomstNr | | 0 | 1 | CharacterString | |
| 6.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 6.10 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or other operative data. | 0 | 1 | Integer | |
| 6.11 | methodOfOperation | indicates method of operation Note: | 0 | 1 | MethodOfOperation | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Predominant method of operation for the site | | | | |
| 6.12 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 6.13 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 6.14 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 6.15 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 6.16 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 6.17 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 6.18 | Role contains | | 0 | N | NaturalStoneRegistration | |
| 6.19 | Role contains | | 0 | N | NaturalStoneObservation | |
| 6.20 | Role (unnamed) RawMaterialSamplePoint | | 1 | 1 | RawMaterialSamplePoint | |
| 6.21 | Role contains | | 0 | N | RawMaterialSamplePoint | |

### 1.2.1.6 HardRockAggregateArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 7 | Class HardRockAggregateArea | area where there is a potential for rock to be used as raw material for hard rock aggregate | | | | |
| 7.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 7.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For e | | | | |
| 7.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 7.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 7.5 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 7.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 7.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 7.8 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 7.9 | scopeOfImportanceOfRawMaterial | indicates the degree of importance for the community | 0 | 1 | ScopeOfImportanceOfRawMaterial | |
| 7.10 | deponiTippVolum | | 0 | 1 | Integer | |
| 7.11 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 7.12 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 7.13 | dateOfLastSurvey | dato for siste feltbefaring av forekomsten | 0 | 1 | Date | |
| 7.14 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 7.15 | Role contains | | 0 | N | RawMaterialSamplePoint | |
| 7.16 | Role contains | | 0 | N | HardRockAggregateObservation | |
| 7.1 | Role | | 0 | N | HardRockAggr | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | contains | | | | egateRegistration | |
| 7.18 | Role contains | | 0 | N | HardRockAggregateExtraction | |

### 1.2.1.7 SandGravelArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 8 | Class SandGravelArea | demarcation of area presumed to contain potential sand and gravel resources | | | | |
| 8.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 8.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). | 1 | 1 | Integer | |
| 8.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 8.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 8.5 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 8.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 8.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 8.8 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 8.9 | scopeOfImportan | indicates the degree of | 0 | 1 | ScopeOfImport | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | ceOfRawMaterial | importance for the community | | | anceOfRawMaterial | |
| 8.10 | deponiTippVolum | | 0 | 1 | Integer | |
| 8.11 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 8.12 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 8.13 | typeOfWaste | describes the type of waste type in a landfill (waste disposal area) | 0 | 1 | Integer | |
| 8.14 | rawMaterialVolume | average volume of the registration of raw materials or all registrations in the raw material area in total The volume is measured in m3 and estimated with a 50% probability. Indicates area multiplied by the average thickness | 0 | 1 | Integer | |
| 8.15 | dateOfLastSurvey | dato for siste feltbefaring av forekomsten | 0 | 1 | Date | |
| 8.16 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 8.17 | Role contains | | 0 | N | SandGravelRegistration | |
| 8.18 | Role contains | | 0 | N | RawMaterialSamplePoint | |
| 8.19 | Role contains | | 0 | N | SandGravelObservation | |
| 8.20 | Role contains | | 0 | N | SandGravelPit | |

### 1.2.1.8 PeatArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 9 | Class PeatArea | area where the peat material may have a certain industrial potential | | | | |
| 9.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 9.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 9.3 | Role contains | | 0 | N | PeatRegistration | |
| 9.4 | Role contains | | 0 | N | PeatObservation | |

### 1.2.1.9 Association <<Topo>> GroundwaterArea-GeoDelimLine

| No | Name/ | Description | Obligation/ | Maximum | Type | Constraint |
|---|---|---|---|---|---|---|

| | Role name | | Condition | Occurrence | | |
|---|---|---|---|---|---|---|
| 10 | Association GroundwaterArea-GeoDelimLine | | | | | |
| 10.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 10.2 | Role (unnamed) GroundwaterArea | | 0 | 1 | GroundwaterArea | |

### 1.2.1.10 Association <<Topo>> IndustrimineralOmr-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 11 | Association IndustrimineralOmr-GeoDelimLine | | | | | |
| 11.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 11.2 | Role (unnamed) IndustrimineralOmr | | 0 | 1 | IndustrimineralOmr | |

### 1.2.1.11 Association <<Topo>> NaturalStoneArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 12 | Association NaturalStoneArea-GeoDelimLine | | | | | |
| 12.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 12.2 | Role (unnamed) NaturalStoneArea | | 0 | 1 | NaturalStoneArea | |

### 1.2.1.12 Association <<Topo>> OreArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 13 | Association OreArea-GeoDelimLine | | | | | |
| 13.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 13.2 | Role (unnamed) OreArea | | 0 | 1 | OreArea | |

### 1.2.1.13 Association <<Topo>> ClayArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 14 | Association ClayArea-GeoDelimLine | | | | | |
| 14.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 14.2 | Role (unnamed) ClayArea | | 0 | 1 | ClayArea | |

### 1.2.1.14 Association <<Topo>> PeatArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 15 | Association PeatArea-GeoDelimLine | | | | | |
| 15.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 15.2 | Role (unnamed) PeatArea | | 0 | 1 | PeatArea | |

### 1.2.1.15 Association <<Topo>> MineralRawMaterialArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 16 | Association MineralRawMaterialArea-GeoDelimLine | | | | | |
| 16.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 16.2 | Role (unnamed) MineralRawMaterialArea | | 0 | 1 | MineralRawMaterialArea | |

### 1.2.1.16 Association <<Topo>> HardRockAggregateArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 17 | Association HardRockAggregateArea-GeoDelimLine | | | | | |
| 17.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 17.2 | Role (unnamed) | | 0 | 1 | HardRockAggregateArea | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | HardRockAggregateArea | | | | | |

### 1.2.1.17 Association <<Topo>> SandGravelArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 18 | Association SandGravelArea-GeoDelimLine | | | | | |
| 18.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 18.2 | Role (unnamed) SandGravelArea | | 0 | 1 | SandGravelArea | |

## 1.2.2 Raw material registration

### 1.2.2.1 GroundwaterRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 1 | Class GroundwaterRegistration | demarcation of area registered as a groundwater resource/groundwater reservoir in rock or unconsolidated deposits | | | | |
| 1.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 1.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 1.3 | Role belongTo | | 1 | 1 | GroundwaterArea | |

### 1.2.2.2 IndustrialMineralRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 2 | Class IndustrialMineral Registration | area registered as an industrial mineral resource, industrial mineral deposit or part of such a deposit | | | | |
| 2.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 2.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | | | | |
| 2.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit. For example. 1729001 | 1 | 1 | Integer | |
| 2.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 2.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 2.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 2.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 2.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 2.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 2.10 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 2.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 2.12 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | dumps, the total waste volume is stated | | | | |
| 2.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object | 0 | 1 | Integer | |
| 2.14 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or other operative data. | 0 | 1 | Integer | |
| 2.15 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 2.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 2.17 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 2.18 | Role belongTo | | 1 | 1 | IndustrimineralOmr | |

### 1.2.2.3 ClayRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 3 | Class ClayRegistration | demarcation of area registered as clay mineral resource | | | | |
| 3.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 3.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 3.3 | Role belongTo | | 1 | 1 | ClayArea | |

### 1.2.2.4 OreRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 4 | Class OreRegistration | area registered as an ore resource, ore deposit or part of such a deposit | | | | |
| 4.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 4.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | | | | |
| 4.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used as an identifier (relational key) between the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit. For example. 1729001 | 1 | 1 | Integer | |
| 4.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 4.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 4.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 4.7 | areaNumber | | 0 | 1 | Integer | |
| 4.8 | localNumber | | 0 | 1 | Integer | |
| 4.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 4.10 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 4.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 4.12 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 4.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | | | | |
| 4.14 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or other operative data. | 0 | 1 | Integer | |
| 4.15 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 4.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 4.17 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 4.18 | Role belongTo | | 1 | 1 | OreArea | |

### 1.2.2.5 NaturalStoneRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 5 | Class NaturalStoneRegistration | demarcation of area registered as natural stone resource | | | | |
| 5.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 5.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 1 | 1 | Integer | |
| 5.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used as an identifier (relational key) between the different objects in the deposit. Many important attributes are found only on the area object, which | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | is the main object of the deposit. | | | | |
| 5.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 5.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 5.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 5.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 5.8 | localNumber | numbering of site in the deposit | 0 | 1 | Integer | |
| 5.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 5.10 | methodOfOperation | indicates method of operation | 0 | 1 | MethodOfOperation | |
| 5.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 5.12 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 5.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 5.14 | rawMaterialReserves | the number of tonnes of proven raw material reserves Note: Given in 1000 tonnes. Only stated if the reserves have been proven through drilling or other operative data. | 0 | 1 | Integer | |
| 5.1 | locationVerified | statement of whether the | 0 | 1 | Boolean | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 | | location (coordinates) has (have) been checked and found to be in order (verified) | | | | |
| 5.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 5.17 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 5.18 | Role belongTo | | 1 | 1 | NaturalStoneArea | |

### 1.2.2.6 HardRockAggregateRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 6 | Class HardRockAggregateRegistration | demarcation of area containing a hard rock aggregate resource | | | | |
| 6.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 6.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). | 1 | 1 | Integer | |
| 6.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used as an identifier (relational key) between the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of | 1 | 1 | Integer | |
| 6.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 6.5 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 6.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 6.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | DEPOSIT_ID For example: 1729(001)0101 | | | | |
| 6.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 6.9 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 6.10 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 6.11 | Role belongTo | | 1 | 1 | HardRockAggregateArea | |

### 1.2.2.7 SandGravelRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 7 | Class SandGravelRegistration | demarcation of area containing sand and gravel resources | | | | |
| 7.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 7.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 1 | 1 | Integer | |
| 7.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 7.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 7.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) | 0 | 1 | CharacterString | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | and names of minerals) | | | | |
| 7.6 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 7.7 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 7.8 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 7.9 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 7.10 | rawMaterialVolume | average volume of the registration of raw materials or all registrations in the raw material area in total The volume is measured in m3 and estimated with a 50% probability. Indicates area multiplied by the average thickness | 0 | 1 | Integer | |
| 7.11 | thickness50% | | 0 | 1 | Integer | |
| 7.12 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 7.13 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 7.14 | Role belongTo | | 1 | 1 | SandGravelArea | |

### 1.2.2.8 PeatRegistration

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 8 | Class PeatRegistration | demarcation of area registered as peat resource | | | | |
| 8.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 8.2 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 8.3 | Role belongTo | | 1 | 1 | PeatArea | |

### 1.2.2.9 Association <<Topo>> IndustrialMineralRegistration-GeoDelimLine

| No | Name/ | Description | Obligation/ | Maximum | Type | Constraint |
|---|---|---|---|---|---|---|

| | Role name | | Condition | Occurrence | | |
|---|---|---|---|---|---|---|
| 9 | Association IndustrialMineralRegistration-GeoDelimLine | | | | | |
| 9.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 9.2 | Role (unnamed) IndustrialMineralRegistration | | 0 | 1 | IndustrialMineralRegistration | |

### 1.2.2.10 Association <<Topo>> SandGravelRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 10 | Association SandGravelRegistration-GeoDelimLine | | | | | |
| 10.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 10.2 | Role (unnamed) SandGravelRegistration | | 0 | 1 | SandGravelRegistration | |

### 1.2.2.11 Association <<Topo>> PeatRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 11 | Association PeatRegistration-GeoDelimLine | | | | | |
| 11.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 11.2 | Role (unnamed) PeatRegistration | | 0 | 1 | PeatRegistration | |

### 1.2.2.12 Association <<Topo>> ClayRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 12 | Association ClayRegistration-GeoDelimLine | | | | | |
| 12.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 12.2 | Role (unnamed) ClayRegistration | | 0 | 1 | ClayRegistration | |

### 1.2.2.13 Association <<Topo>> GroundwaterRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 13 | Association GroundwaterRegistration-GeoDelimLine | | | | | |
| 13.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 13.2 | Role (unnamed) GroundwaterRegistration | | 0 | 1 | GroundwaterRegistration | |

### 1.2.2.14 Association <<Topo>> NaturalStoneRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 14 | Association NaturalStoneRegistration-GeoDelimLine | | | | | |
| 14.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 14.2 | Role (unnamed) NaturalStoneRegistration | | 0 | 1 | NaturalStoneRegistration | |

### 1.2.2.15 Association <<Topo>> HardRockAggregateRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 15 | Association HardRockAggregateRegistration-GeoDelimLine | | | | | |
| 15.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 15.2 | Role (unnamed) HardRockAggregateRegistration | | 0 | 1 | HardRockAggregateRegistration | |

### 1.2.2.16 Association <<Topo>> OreRegistration-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 16 | Association OreRegistration-GeoDelimLine | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 16.2 | Role (unnamed) OreRegistration | | 0 | 1 | OreRegistration | |

### 1.2.3 Raw material observations

#### 1.2.3.1 GroundwaterObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 1 | Class GroundwaterObservation | site providing information about a groundwater resource | | | | |
| 1.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 1.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 0 | 1 | Integer | |
| 1.3 | typeOfMaterial | | 0 | 1 | TypeOfMaterial | |
| 1.4 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 1.5 | altDepositNo | alternative numbering of the deposit Note: May have a specific form in the individual deposit database and does not need to be unique. Often used to refer back to numbering systems in older registers | 0 | 1 | CharacterString | |
| 1.6 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 1.7 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 1.8 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 1.9 | locationVerified | statement of whether the | 0 | 1 | Boolean | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | location (coordinates) has (have) been checked and found to be in order (verified) | | | | |
| 1.10 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 1.11 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 1.12 | Role belongTo | | 1 | 1 | GroundwaterArea | |

### 1.2.3.2 SandGravelObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 2 | Class SandGravelObservation | site providing information about a sand/gravel resource | | | | |
| 2.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 2.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 1 | 1 | Integer | |
| 2.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 1729 | 1 | 1 | Integer | |
| 2.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 2.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.6 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 2.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 2.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 2.9 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 2.10 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 2.11 | Role belongTo | | 1 | 1 | SandGravelArea | |

### 1.2.3.3 SandGravelPit

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 3 | Class SandGravelPit | site where sand and gravel are extracted | | | | |
| 3.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 3.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 1 | 1 | Integer | |
| 3.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 3.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 3.5 | materialSubType | sub-classification of material types that may be/are subject to | 0 | 1 | CharacterString | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | | | | |
| 3.6 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 3.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 3.8 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 3.9 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 3.10 | typeOfUncompactedMaterial | | 0 | 1 | SuperficialDepositSurfaceType | |
| 3.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 3.12 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 3.13 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 3.14 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 3.15 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 3.16 | Role belongTo | | 1 | 1 | SandGravelArea | |

### 1.2.3.4 IndustrialMineralObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 4 | Class IndustrialMineralObservation | site providing information about an industrial mineral resource | | | | |
| 4.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 4.2 | identRawMaterialObj | deposit object identification code Note: | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | | | | |
| 4.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used as an identifier (relational key) between the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example: 1729001 | 1 | 1 | Integer | |
| 4.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | TypeOfMaterial | |
| 4.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 4.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 4.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 4.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 4.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 4.10 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 4.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 4.1 | depositNumber | unique numbering of the | 0 | 1 | CharacterStrin | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | | deposit to which the raw material object belongs Note: used as an identifier (relational key) between the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example: 1729001 | | | g | |
| 4.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 4.14 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 4.15 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 4.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 4.17 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 4.18 | Role belongTo | | 1 | 1 | IndustrimineralOmr | |

### 1.2.3.5 ClayObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 5 | Class ClayObservation | site providing information about a clay resource | | | | |
| 5.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 5.2 | Role belongTo | | 1 | 1 | ClayArea | |

### 1.2.3.6 OreObservation

| No | Name/ | Description | Obligation/ | Maximum | Type | Constraint |
|---|---|---|---|---|---|---|

| | Role name | | Condition | Occurrence | | |
|---|---|---|---|---|---|---|
| 6 | Class OreObservation | site providing information about an ore resource | | | | |
| 6.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 6.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 1 | 1 | Integer | |
| 6.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit. For example. 1729001 | 1 | 1 | Integer | |
| 6.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 6.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 6.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 6.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 6.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 6.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 6.1 | methodOfOperati | indicates method of | 0 | 1 | MethodOfOper | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | on | operation Note: Predominant method of operation for the site | | | ation | |
| 6.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 6.12 | altDepositNo | alternative numbering of the deposit Note: May have a specific form in the individual deposit database and does not need to be unique. Often used to refer back to numbering systems in older registers | 0 | 1 | CharacterString | |
| 6.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 6.14 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 6.15 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 6.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 6.17 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 6.18 | Role belongTo | | 1 | 1 | OreArea | |

### 1.2.3.7 RawMaterialExtraction

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 7 | Class RawMaterialExtraction | demarcation of the actual extraction area for industrial minerals, natural stone, ore, etc. (opencast quarry) | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 7.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 1 | 1 | Integer | |
| 7.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 7.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | TypeOfMaterial | |
| 7.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) and names of minerals) | 0 | 1 | CharacterString | |
| 7.6 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 7.7 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 7.8 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 7.9 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 7.10 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 7.11 | dateOfLastSurvey | dato for siste feltbefaring av forekomsten | 0 | 1 | Date | |
| 7.12 | locationVerified | statement of whether the location (coordinates) has | 0 | 1 | Boolean | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (have) been checked and found to be in order (verified) | | | | |
| 7.13 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 7.14 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 7.15 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

### 1.2.3.8 NaturalStoneObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 8 | Class NaturalStoneObservation | site providing information about a natural stone resource | | | | |
| 8.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 8.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 1 | 1 | Integer | |
| 8.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 1729001 | 1 | 1 | Integer | |
| 8.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 8.5 | materialSubType | sub-classification of material types that may be/are subject to extraction Note: a more detailed classification of the raw material that is extracted (mainly chemical elements (Cu,Pb, Zn, etc.) | 0 | 1 | CharacterString | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | and names of minerals) | | | | |
| 8.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 8.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 8.8 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 8.9 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 8.10 | methodOfOperation | indicates method of operation Note: Predominant method of operation for the site | 0 | 1 | MethodOfOperation | |
| 8.11 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 8.12 | altDepositNo | alternative numbering of the deposit Note: May have a specific form in the individual deposit database and does not need to be unique. Often used to refer back to numbering systems in older registers | 0 | 1 | CharacterString | |
| 8.13 | totalProduction | estimated tonnage of total extracted raw material from the deposit object Note: Given in 1000 tonnes and estimated on the basis of trial operations/commissioning ?? or regular operations | 0 | 1 | Integer | |
| 8.14 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 8.15 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 8.16 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8.17 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 8.18 | Role belongTo | | 1 | 1 | NaturalStoneArea | |

### 1.2.3.9 HardRockAggregateObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 9 | Class HardRockAggregateObservation | site providing information about a stonehard rock aggregate resource | | | | |
| 9.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 9.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For ex | 1 | 1 | Integer | |
| 9.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 9.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 9.5 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 9.6 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 9.7 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 9.8 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9.9 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 9.10 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 9.11 | Role belongTo | | 1 | 1 | HardRockAggregateArea | |

### 1.2.3.10 HardRockAggregateExtraction

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 10 | Class HardRockAggregateExtraction | site where hard rock aggregate is extracted (quarry) | | | | |
| 10.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 10.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For e | 1 | 1 | Integer | |
| 10.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 17 | 1 | 1 | Integer | |
| 10.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 1 | 1 | MaterialType | |
| 10.5 | geolValueAssessment | how important a geological resource or registration is as regards potential commercial exploitation now or in the future | 0 | 1 | GeolValueAssessment | |
| 10.6 | nameOfRawMaterialObj | name of the deposit | 0 | 1 | CharacterString | |
| 10.7 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 10. | localNumber | numbering of site in the | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8 | | deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | | | | |
| 10.9 | operatingConditions | indicates operating conditions Note: Up-to-date as of the last update | 0 | 1 | OperatingConditions | |
| 10.10 | locationVerified | statement of whether the location (coordinates) has (have) been checked and found to be in order (verified) | 0 | 1 | Boolean | |
| 10.11 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 10.12 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 10.13 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |
| 10.14 | Role belongTo | | 1 | 1 | HardRockAggregateArea | |

### 1.2.3.11 PeatObservation

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 11 | Class PeatObservation | site providing information about a peat resource | | | | |
| 11.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 11.2 | Role belongTo | | 1 | 1 | PeatArea | |

### 1.2.3.12 Association <<Topo>> SandGravelPit-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 12 | Association SandGravelPit-GeoDelimLine | | | | | |
| 12.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 12.2 | Role (unnamed) SandGravelPit | | 0 | 1 | SandGravelPit | |

### 1.2.3.13 Association <<Topo>> HardRockAggregateExtraction-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 13 | Association HardRockAggregateExtraction- | | | | | |

| | GeoDelimLine | | | | | |
|---|---|---|---|---|---|---|
| 13.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 13.2 | Role (unnamed) HardRockAggregateExtraction | | 0 | 1 | HardRockAggregateExtraction | |

### 1.2.3.14 Association <<Topo>> RawMaterialExtraction-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 14 | Association RawMaterialExtraction-GeoDelimLine | | | | | |
| 14.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 14.2 | Role (unnamed) RawMaterialExtraction | | 0 | 1 | RawMaterialExtraction | |

## 1.2.4 Special

### 1.2.4.1 RawMaterialSpecialArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 1 | Class RawMaterialSpecialArea | collective term for special areas in connection with raw material surveys, detail surveys, prospecting work, etc. | | | | |
| 1.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 1.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 1 | 1 | Integer | |
| 1.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. | | | | |
| 1.4 | typeOfMaterial | what type of raw material that may be/is subject to extraction | 0 | 1 | MaterialType | |
| 1.5 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 1.6 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 1.7 | typeOfRawMaterialActivity | indicates type/status of any activities | 0 | 1 | TypeOfRawMaterialActivity | |
| 1.8 | geolDescription | descriptive text field or link (URL) to textual description | 0 | 1 | CharacterString | |
| 1.9 | numberOfAnalyses | the number of chemical and/or mechanical analyses performed | 0 | 1 | Integer | |
| 1.10 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

### 1.2.4.2 MineSpaceArea

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 2 | Class MineSpaceArea | area where there are mine spaces (cavities) in the subsurface | | | | |
| 2.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 2.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For example: 17290010 | 0 | 1 | Integer | |
| 2.3 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

### 1.2.4.3 RawMaterialWasteDisposalSite

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | Class RawMaterialWasteDisposalSite | area with waste rock dumps from raw material extraction or mine tailings, etc. | | | | |
| 3.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 3.2 | typeOfWaste | describes the type of waste type in a landfill (waste disposal area) | 1 | 1 | TypeOfWaste | |
| 3.3 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). For | 0 | 1 | Integer | |
| 3.4 | wasteDisposalSiteVolume | estimated volume of landfill Note: Given in cubic metres. Often applies to waste tips from production. When the deposit has several different waste rock dumps, the total waste volume is stated | 0 | 1 | Integer | |
| 3.5 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

### 1.2.4.4 RawMaterialSafetyZone

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 4 | Class RawMaterialSafetyZone | stipulated zone around groundwater well, etc. | | | | |
| 4.1 | extent | area over which an object extends | 1 | 1 | SurfaceWithQuality | |
| 4.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). Fo | 0 | 1 | Integer | |
| 4.3 | Role boudary | | 1 | N | GeoDelimLine | Aggregration |

### 1.2.4.5 RawMaterialSafetyFence

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 5 | Class RawMaterialSafetyFence | safety fence around pit mouths, etc. | | | | |
| 5.1 | centerline | course followed by the central part of the object | 1 | 1 | CurveWithQuality | |
| 5.2 | typeOfSecurityFence | type of security around a mining pit, etc. | 0 | 1 | TypeOfSecurityFence | |

### 1.2.4.6 RawMaterialSamplePoint

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 6 | Class RawMaterialSamplePoint | site where a sample/samples has/have been taken (collected) for further processing/analysis | | | | |
| 6.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 6.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a location number (2 digits) and a test number (2 digits). Fo | 1 | 1 | Integer | |
| 6.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 6.4 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 6.5 | sampleMaterial | describes what has been sampled. For crushed stone, for example, it is the type of rock | 0 | 1 | CharacterString | |
| 6.6 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.7 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 6.8 | sampleNumber | numbering of sample point in the deposit or at the site | 0 | 1 | Integer | |
| 6.9 | Role belongTo | | 1 | 1 | SandGravelArea | |
| 6.10 | Role belongTo | | 1 | 1 | HardRockAggregateArea | |
| 6.11 | Role belongTo | | 1 | 1 | OreArea | |
| 6.12 | Role belongTo | | 1 | 1 | IndustrimineralOmr | |
| 6.13 | Role (unnamed) NaturalStoneArea | | 1 | 1 | NaturalStoneArea | |
| 6.14 | Role belongTo | | 1 | 1 | NaturalStoneArea | |

### 1.2.4.7 Esker

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 7 | Class Esker | long, narrow and often winding ridge or hill consisting of stratified and sorted sand, gravel or rounded stones, formed by deposition from melt water rivers in a tunnel under or inside a glacier | | | | |
| 7.1 | centerline | course followed by the central part of the object | 1 | 1 | CurveWithQuality | |

### 1.2.4.8 RawMaterialBoreHole

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 8 | Class RawMaterialBoreHole | point location where exploration drilling for mineral raw materials has been carried out | | | | |
| 8.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 8.2 | identRawMaterialObj | deposit object identification code Note: Consists of a municipality number (4 digits) and a serial number (7 digits). Ideally the serial number should consist of an area number (3 digits), a | 1 | 1 | Integer | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | location number (2 digits) and a test number (2 digits). For | | | | |
| 8.3 | depositNumber | unique numbering of the deposit to which the raw material object belongs Note: used to identify the different objects in the deposit. Many important attributes are found only on the area object, which is the main object of the deposit For example. 172 | 1 | 1 | Integer | |
| 8.4 | nameOfRawMaterialObj | name of raw material object | 0 | 1 | CharacterString | |
| 8.5 | areaNumber | deposit numbering (deposit area) in the municipality Note: part of DEPOSIT_ID For example: 1729(001)0101 | 0 | 1 | Integer | |
| 8.6 | localNumber | numbering of site in the deposit Note: part of DEPOSIT_ID: For example: 1729001(01)01 | 0 | 1 | Integer | |
| 8.7 | sampleNumber | numbering of sample point in the deposit or at the site Note: part of DEPOSIT_ID: For example: 172900101(01) | 0 | 1 | Integer | |

### 1.2.4.9 GravelHardRockAggregateRawMaterialPoint

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 9 | Class GravelHardRockAggregateRawMaterialPoint | minor registration of hard rock aggregate or superficial deposit where the extensiveness of the area has not been recorded | | | | |
| 9.1 | position | location where the object exists | 1 | 1 | PointWithQuality | |
| 9.2 | rawMaterialType | kvartærgeologiske løsmassetyper (jordartstyper) | 1 | 1 | SuperficialDepositSurfaceType | |
| 9.3 | locationVerified | | 0 | 1 | Boolean | |

### 1.2.4.10 Association <<Topo>> MineSpaceArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 10 | Association MineSpaceArea-GeoDelimLine | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 10.2 | Role (unnamed) MineSpaceArea | | 0 | 1 | MineSpaceArea | |

### 1.2.4.11 Association <<Topo>> RawMaterialWasteDisposalSite-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 11 | Association RawMaterialWasteDisposalSite-GeoDelimLine | | | | | |
| 11.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 11.2 | Role (unnamed) RawMaterialWasteDisposalSite | | 0 | 1 | RawMaterialWasteDisposalSite | |

### 1.2.4.12 Association <<Topo>> RawMaterialSafetyZone-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 12 | Association RawMaterialSafetyZone-GeoDelimLine | | | | | |
| 12.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 12.2 | Role (unnamed) RawMaterialSafetyZone | | 0 | 1 | RawMaterialSafetyZone | |

### 1.2.4.13 Association <<Topo>> RawMaterialSpecialArea-GeoDelimLine

| No | Name/ Role name | Description | Obligation/ Condition | Maximum Occurrence | Type | Constraint |
|---|---|---|---|---|---|---|
| 13 | Association RawMaterialSpecialArea-GeoDelimLine | | | | | |
| 13.1 | Role boudary | | 1 | N | GeoDelimLine | Aggregation |
| 13.2 | Role (unnamed) RawMaterialSpecialArea | | 0 | 1 | RawMaterialSpecialArea | |

### 1.2.5 CodeLists

#### 1.2.5.1 <<CodeList>> TypeOfWaste

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 1 | CodeList TypeOfWaste | describes the type of waste in a landfill (waste disposal area) | |
| 1.1 | Mine dump (often metalliferous) | | 1 |
| 1.2 | Slime sludge disposal site (may be metalliferous) | | 2 |
| 1.3 | Waste rock dump (mainly unmineralised) | | 3 |
| 1.4 | Slag (waste from smelting process) | | 4 |

#### 1.2.5.2 <<CodeList>> OperatingConditions

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 2 | CodeList OperatingConditions | indicates operating conditions Note: Up-to-date as of last update | |
| 2.1 | Not put into operation (potential future operation) | | 1 |
| 2.2 | In operation | | 2 |
| 2.3 | Sporadic operation | | 3 |
| 2.4 | Disused (closed) | | 4 |

#### 1.2.5.3 <<CodeList>> MethodOfOperation

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 3 | CodeList MethodOfOperation | indicates method of operation Note: Predominant method of operation for the site | |
| 3.1 | Underground mining | | 1 |
| 3.2 | Open pit mining | | 2 |
| 3.3 | Open pit and underground mining | | 3 |
| 3.4 | Crushing | | 61 |

| | | | |
|---|---|---|---|
| 3.5 | Crushing/sieving | | 62 |
| 3.6 | Crushing/sieving/washing | | 65 |
| 3.7 | Sieving | | 66 |
| 3.8 | Sieving/washing | | 67 |
| 3.9 | Washing | | 68 |
| 3.10 | Other operation method | | 69 |
| 3.11 | Groundwater source (spring) | | 71 |
| 3.12 | Water supply well | | 72 |
| 3.13 | Observation well | | 73 |
| 3.14 | Test drilling | | 74 |

### 1.2.5.4 <<CodeList>> MaterialType

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 4 | CodeList MaterialType | | |
| 4.1 | Precious metals (Au,Ag,PGE) | | 1 |
| 4.2 | Ferrous metals (Fe, Mn, Ti) | | 2 |
| 4.3 | Ferroalloy metals (Cr, Ni, Co, V, Mo, W) | | 3 |
| 4.4 | Base metals (Cu, Zn, Pb, inkl. Fe-sulphides As, Sb, Bi, Sn) | | 4 |
| 4.5 | Energy metals (U, Th) | | 5 |
| 4.6 | Special metals (Nb, Ta, Be, Li, Sc, REE) | | 6 |
| 4.7 | Other metals | | 19 |
| 4.8 | Carbonates | | 21 |
| 4.9 | Silica | | 22 |
| 4.10 | Talc | | 23 |
| 4.11 | Feldspar | | 24 |
| 4.12 | Olivine | | 25 |
| 4.13 | Graphite | | 26 |
| 4.14 | Coal | | 27 |
| 4.15 | Nepheline syenite | | 29 |
| 4.16 | Magnesium minerals | | 30 |
| 4.17 | Zircon | | 31 |

| | | | |
|---|---|---|---|
| 4.18 | Beryllium minerals | | 32 |
| 4.19 | Other industrial minerals | | 39 |
| 4.20 | Boulder rock / massive stone | | 41 |
| 4.21 | Slate, shale/schist/flagstone | | 42 |
| 4.22 | Millstone | | 43 |
| 4.23 | Whetstone | | 44 |
| 4.24 | Hard rock aggregate crushed rock | | 51 |
| 4.25 | Sand and gravel | | 61 |
| 4.26 | Gravel and other uncompacted material | | 62 |
| 4.27 | Landslide and weathering | | 63 |
| 4.28 | Shell sand | | 64 |
| 4.29 | Waste Rock Dump | | 65 |
| 4.30 | Clay | | 66 |
| 4.31 | Peat | | 67 |
| 4.32 | Groundwater in bedrock | | 71 |
| 4.33 | Groundwater in rock and superficial deposits | | 73 |

### 1.2.5.5 <<CodeList>> TypeOfSecurityFence

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 5 | CodeList TypeOfSecurityFence | type of security round a mining pit, etc. | |
| 5.1 | Wire fence | | 1 |
| 5.2 | Wire mesh fence | | 2 |
| 5.3 | Other | | 9 |

### 1.2.5.6 <<CodeList>> TypeOfRawMaterialActivity

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 6 | CodeList TypeOfRawMaterialActivity | indicates type/status of any activities | |
| 6.1 | Prospecting | | 1 |
| 6.2 | Trenching | | 2 |
| 6.3 | Pit | | 3 |
| 6.4 | Test mining | | 4 |

| | | | |
|---|---|---|---|
| 6.5 | Mining | | 5 |
| 6.6 | Quarry | | 41 |
| 6.7 | Future potential extraction area | | 42 |
| 6.8 | Type locality/localities | | 43 |
| 6.9 | Gravel pit | | 61 |
| 6.10 | Levelled borrow pit/changed land use | | 62 |
| 6.11 | Observation locality | | 63 |
| 6.12 | Clay pit | | 64 |
| 6.13 | Peat extraction | | 65 |
| 6.14 | Natural groundwater source (spring) | | 71 |
| 6.15 | Drilled well | | 72 |
| 6.16 | Surveillance station | | 73 |

### 1.2.5.7 <<CodeList>> ScopeOfImportanceOfRawMaterial

| Nr | Code name | Definition/Description | Code |
|---|---|---|---|
| 7 | CodeList ScopeOfImportanceOfRawMaterial | whether the deposit is of international, national, regional, or only local importance | |
| 7.1 | Internationally important deposit | | i |
| 7.2 | Nationally important deposit | | n |
| 7.3 | Regionally important deposit | | r |
| 7.4 | Locally important deposit | | l |