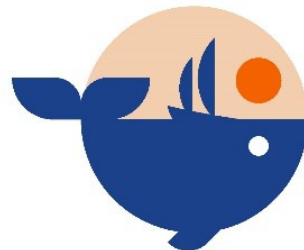


# Standardized Symbology for MSP, delivered Styled Layer Descriptor for MSP INSPIRE Data model

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## Workshop: Ready to use MSP products



**MSP-OR**  
Advancing Maritime  
Spatial Planning  
in Outermost Regions

## Using a common Styled Layer Descriptor



- ✓ In the process of harmonizing the vision and frameworks of Maritime Spatial Plans in the cross border context, it is highly recommended using a common and standard simbolization for portrayal of the objects types defined in the spatial plan.
- ✓ In this sense, the MarSP project was a perfect opportunity to develop the common styles for portrayal of the spatial objects in the spatial plan, applying the results on real world use case developed for Macaronesian Region.
- ✓ The proposal for the standardization of the symbology is the use a common Style layer Descriptor (SLD). This SLD developed in MARSP is based on a set of symbols also created by IEO. These symbols correspond to all spatial objects previously considered in the extended HILUCS developed by ECOAQUA.
- ✓ The SLD is a profile of the Web Map Service (WMS) Encoding Standard, and both are OpenGIS® standards. A SLD defines an encoding to allow the users to define a symbolisation and colouring of geographic feature and coverage data. <https://www.ogc.org/standards/symbol>



## *How standardize the symbology for the MSP INSPIRE data model?*

- ✓ Initially, the standards which already exist in symbology for marine cartography were investigated (example: the symbols of the International Hydrographic Organization - IHO).
  
- ✓ Later, numerous Web Map Service (WMS) of Marine Spatial Planning (MSP) were examined to analyze if there were some homogeneous representations for the same spatial use or, at least, having a certain analogy between them.
  
- ✓ Finally, this general portrayal structure is designed to fit the Planned Land Use data model, which in turn is mainly based on:
  - ZoningElement: that depicts the zoning defined by spatial planners (HILUCS values),
  - SupplementaryRegulation: that enables to inform on regulations that superimpose on the zoning.
  
- ✓ Most of the elements are areas (represented in polygons) and the higher the level of detail of the element in the HILUCS list, the greater the complexity of the symbol used, but within a clearly structured hierarchy.


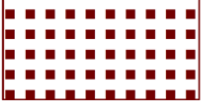

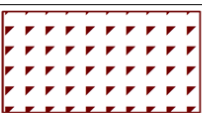

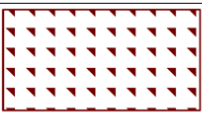

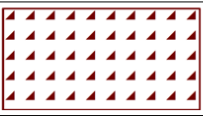







































# Styles for the layer LandUse.ZoningElement

Based on HILUCS (Hierarchical INSPIRE Land Use Classification System) values

<https://inspire.ec.europa.eu/codelist/HILUCSValue>

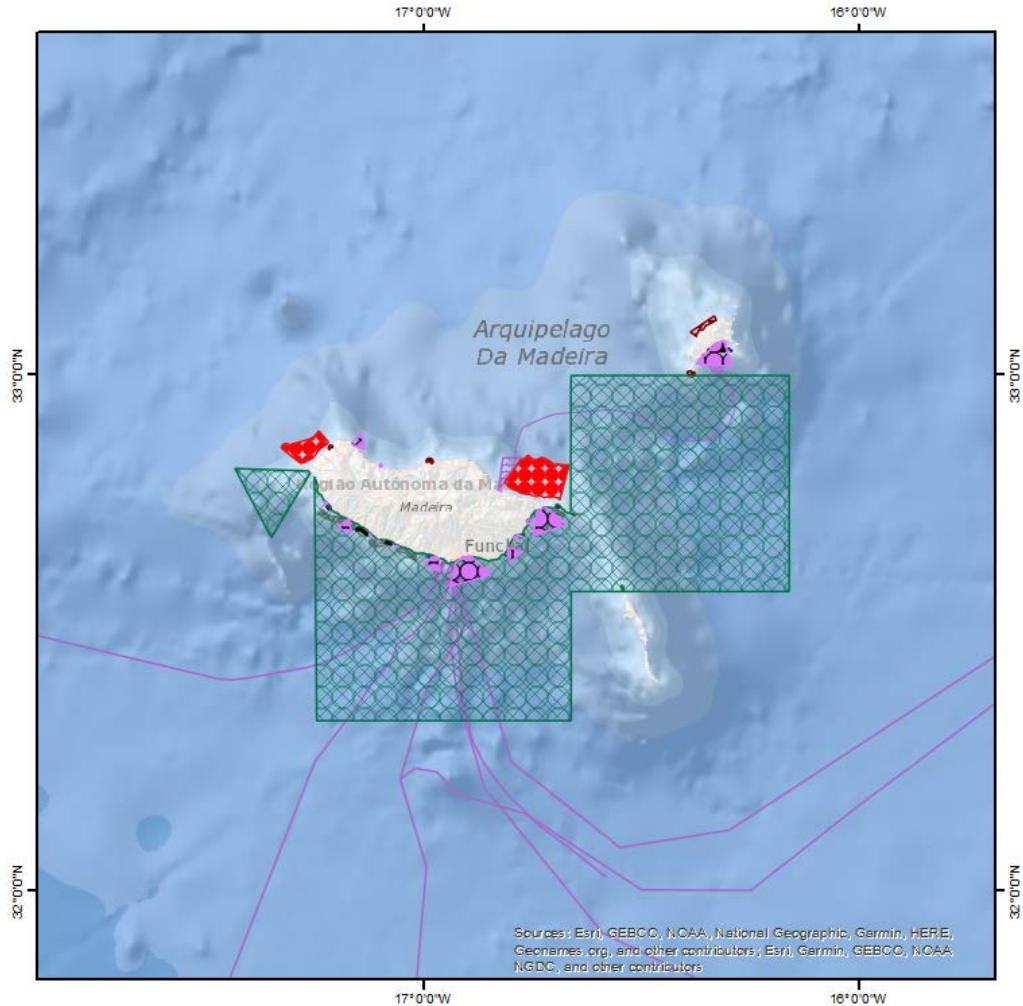
- 1) For each of the 6 main classes were assigned a general color or tone, and all the symbols within them have a similar hue.
- 2) A different pattern or geometrical frame styles were assigned to the next level within the hierarchical structure.
- 3) At each next level of detail in the hierarchy, a different geometrical frame was established but within the style of the upper level.
- 4) Between them there are different values of angle, offset, separation, etc.

Category HILUCS	Colour	Category	Sketch or Pattern
1_Primary Production		3_4_7_UnderwaterCulturalHeritage	
2_Secondary Production		3_4_7_1_Natural	
3_Tertiary Production		3_4_7_2_Wreck	
4_Transport, Networks, Logistics And Utilities		3_4_7_3_Archeological	
5_Residential Use			
6_Other Uses			

-  Aquaculture Fresh Water
-  Seaweed Cultivation
-  Recreational Fishing
-  Renewable Energy Production Wind
-  Renewable Energy Production Current
-  Renewable Energy Production Thermal
-  Renewable Energy Production Wave
-  Renewable Energy Production Tidal
-  Renewable Energy Production Osmotic
-  Renewable Energy Production
-  BlueBio Tech
-  Desalation
-  Nautical Sports
-  Beaches
-  Coastal Tourism
-  Maritime Services
-  Natural
-  Wreck
-  Archeological
-  Underwater Cultural Heritage
-  Others
-  Port
-  FishPort
-  Commercial Port
-  Cruises Ferries Port
-  Recreational Port
-  Harbours
-  Anchorage Area
-  Water Transport
-  Marine Traffic Lanes
-  OffShore Suply
-  Oil Line
-  Gas Line
-  SolidWaste Treatment
-  Water Waste Treatment
-  Marine Litter Location



# Example: Use case in Madeira. Styles for the layer LandUse.ZoningElement



- Other Mining And Quarrying
- Carbon Capture
- Mining And Quarrying
- Aquaculture Sea Water
- Aquaculture Brackish Water
- Aquaculture Fresh Water
- Seaweed Cultivation
- Recreational Fishing
- Renewable Energy Production Wind
- Renewable Energy Production Current
- Renewable Energy Production Thermal
- Renewable Energy Production Wave
- Renewable Energy Production Tidal
- Renewable Energy Production Osmotic
- Renewable Energy Production
- BlueBio Tech
- Desalation
- Nautical Sports
- Beaches
- Coastal Tourism
- Maritime Services
- Natural
- Wreck
- Archeological
- Underwater Cultural Heritage
- Others
- Port
- FishPort
- Commercial Port
- Cruises Ferries Port
- Recreational Port
- Harbours
- Anchorage Area
- Water Transport
- Marine Traffic Lanes
- OffShore Suply
- Oil Line
- Gas Line
- SolidWaste Treatment
- Water Waste Treatment
- Marine Litter Location
- Marine Oil Discharge
- Marine Offshore Discharge
- Submarine Cable Power
- Submarine Cable Telecom
- Submarine Cables
- Outfalls Gullyries
- Conservation Protection
- Marine Protected Area
- No Take Zone
- Protected Area
- Militar Area

# Styles for the layer LandUse.Supplementary Regulation

Based on the categories of the Hierarchical Supplementary Regulation Code List (HSRCL)

<https://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue>

- 1) At each of the 9 main classes were assigned a general color or tone and all the symbols within them have a similar hue.
- 2) For this symbology, no interior pattern or symbology was chosen: only the outer line is the one that would represent the polygon.
- 3) At each next level of detail, line differences were established, but in consonance with the style of the higher level.
- 4) To distinguish the different categories of HSRCL we have used with thickness values, continuous or discontinuous lines, dashes, points, different patterns with points and dashes, double lines, etc.






















SupplementaryRegulation	Colour
Impact on environment	Green
Risk exposure	Red
Heritage protection	Orange
General interest	Purple
Land property right	Blue
Regulations on buildings	Grey
Local regional state development policies	Yellow
Social health choices	Olive Green
Regulated activities	Brown
Other supplementary regulation	Pink

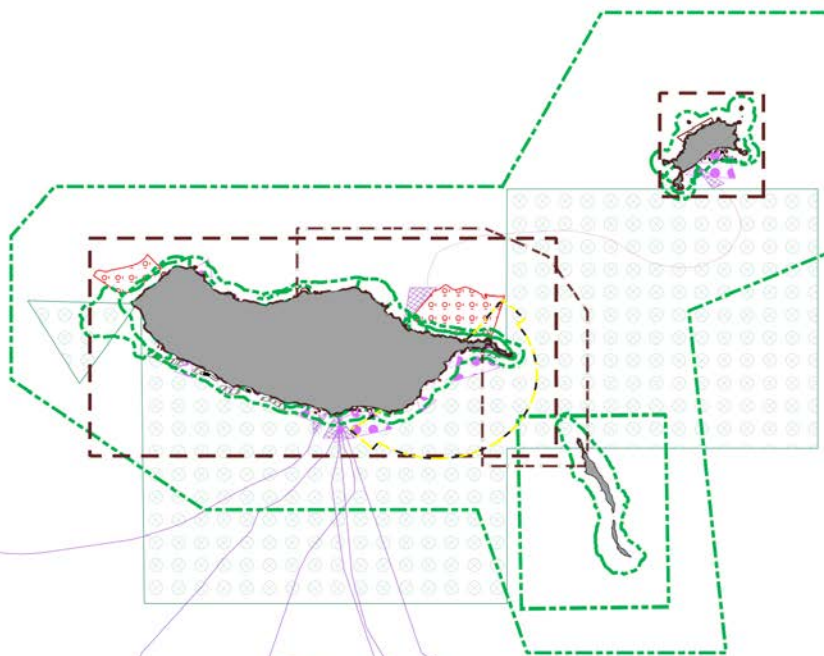
- MSP SupplementaryRegulation**
- [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/1\\_4\\_NatureProtection](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/1_4_NatureProtection)
- [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/7\\_1\\_3\\_10\\_AirportActivities](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/7_1_3_10_AirportActivities)
- [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/9\\_1\\_RestrictedActivities](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/9_1_RestrictedActivities)
- [http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9\\_3\\_1\\_WhaleWatchingExclusionArea.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9_3_1_WhaleWatchingExclusionArea.html)
- [http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9\\_3\\_2\\_AnchorageExclusionArea.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9_3_2_AnchorageExclusionArea.html)



# Use case in Madeira.

## Styles for the layer LandUse.Supplementary Regulation

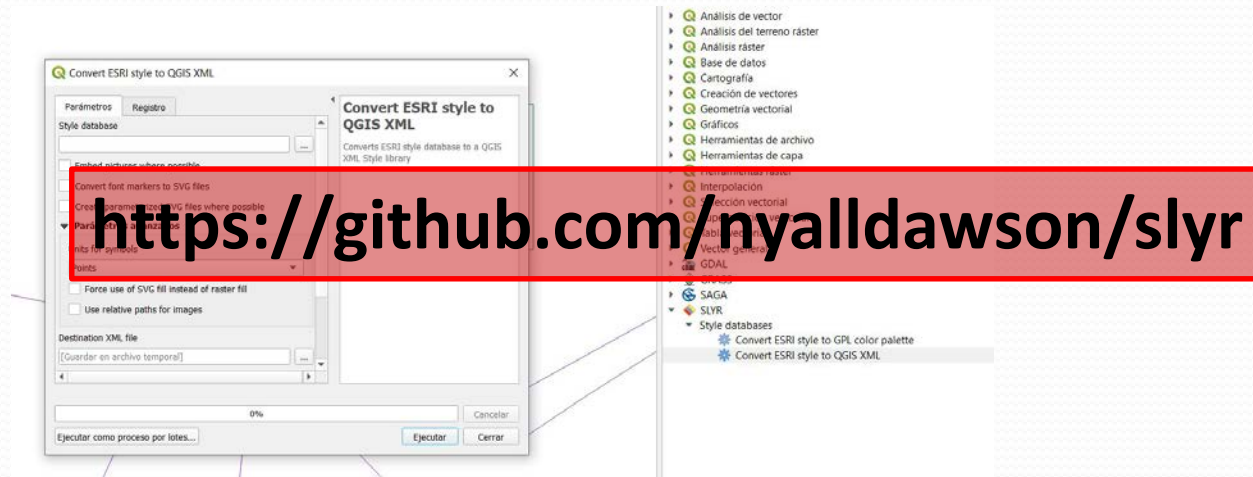
- msp\_inspire\_model\_NEW MSP\_SupplementaryRegulation**
  -  [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/1\\_4\\_NatureProtection](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/1_4_NatureProtection)
  -  [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/7\\_1\\_3\\_10\\_AirportActivities](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/7_1_3_10_AirportActivities)
  -  [http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/9\\_1\\_RestrictedActivities](http://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/9_1_RestrictedActivities)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9\\_3\\_1\\_WhaleWatchingExclusionArea.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9_3_1_WhaleWatchingExclusionArea.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9\\_3\\_2\\_AnchorageExclusionArea.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/SupplementaryRegulation/9_3_2_AnchorageExclusionArea.html)
- MSP\_ZoningElement**
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1\\_3\\_3\\_OtherMiningAndQuarrying.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1_3_3_OtherMiningAndQuarrying.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1\\_3\\_MiningAndQuarrying.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1_3_MiningAndQuarrying.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1\\_4\\_1\\_1\\_AquacultureSeaWater.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1_4_1_1_AquacultureSeaWater.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/2\\_4\\_4\\_RenewableEnergyProduction.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/2_4_4_RenewableEnergyProduction.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/3\\_4\\_7\\_2\\_Wreck.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/3_4_7_2_Wreck.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/4\\_1\\_4\\_6\\_AnchorageArea.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/4_1_4_6_AnchorageArea.html)
  -  [http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/4\\_1\\_4\\_WaterTransport.html](http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/4_1_4_WaterTransport.html)
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>
  -  <http://www.geoportal.ulpgc.es/registro/>



# Creating a SLD

## 1. Generate Symbology

- Import symbology from ESRI format (\*.style) to QGIS



- Generate directly in QGIS

Símbolo	Valor	Leyenda
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/1_3_3_OtherMiningAndQuarrying.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/1_3_MiningAndQuarrying.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/1_4_1_1_AquacultureSeaWater.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/2_4_4_RenewableEnergyProduction.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/3_4_7_2_Wreck.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_1_4_6_AnchorageArea.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_1_4_WaterTransport.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_1_1_OilLine.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_3_5_MarineOffshoreDischarge.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_5_1_SubmarineCablePower.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_5_2_SubmarineCableTelecom.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_5_SubmarineCables.html	http:
✓ [Symbol]	http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucExt/4_3_6_SubmarineOutfall.html	http:





# 1. Generate symbology

## Potential problems with fonts

```
<se:GraphicFill>
  <se:Graphic>
    <se:Mark>
      <se:WellKnownName>ttf://ESRI Default Marker#33</se:WellKnownName>
      <se:Fill>
        <se:SvgParameter name="fill">#f0f0f0</se:SvgParameter>
        <se:SvgParameter name="fill-opacity">0</se:SvgParameter>
      </se:Fill>
    </se:Mark>
  <se:Size>21</se:Size>
</se:Graphic>
</se:GraphicFill>
```

In our case the layer to symbolize must have the field "hilucsMSP.1.href" because this data will be symbolized through it, via a rule of filter defined by the standard SLD.

```
<ogc:Filter>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName> hilucsMSP.1.href</ogc:PropertyName>
    <ogc:Literal>"code value"</ogc:Literal>
  </ogc:PropertyIsEqualTo>
</ogc:Filter>
```



# 1. Generate symbology

```
</se:Description>
<ogc:Filter>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>hilucsMSP.1.href</ogc:PropertyName>
    <ogc:Literal>http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1\_3\_4\_CarbonCapture.html</ogc:Literal>
  </ogc:PropertyIsEqualTo>
</ogc:Filter>
<se:PolygonSymbolizer>
  <se:Fill>
    <se:GraphicFill>
      <se:Graphic>
        <se:Mark>
          <se:WellKnownName>circle</se:WellKnownName>
          <se:Fill>
            <se:SvgParameter name="fill">#686868</se:SvgParameter>
          </se:Fill>
          <se:Stroke>
            <se:SvgParameter name="stroke">#686868</se:SvgParameter>
            <se:SvgParameter name="stroke-opacity">0</se:SvgParameter>
            <se:SvgParameter name="stroke-width">1</se:SvgParameter>
          </se:Stroke>
        </se:Mark>
        <se:Size>7</se:Size>
      </se:Graphic>
    </se:GraphicFill>
  </se:Fill>
  <se:VendorOption name="distance">11,11</se:VendorOption>
</se:PolygonSymbolizer>
<se:LineSymbolizer>
  <se:Stroke>
    <se:SvgParameter name="stroke">#686868</se:SvgParameter>
    <se:SvgParameter name="stroke-width">1</se:SvgParameter>
```



## 2. Load Symbology

Apply symbology in the corresponding WMS service

Identificado como admin. [Cerrar sesión](#)

### Editor de estilos

Editar el estilo SLD actual. El editor puede proporcionar realce de sintaxis y ser expandido a pantalla completa. Presione el botón "Validar" para verificar la validez del documento SLD.

**Data** | **Publishing** | **Layer Preview** | **Layer Attributes**

#### Style Data

Nombre:

Espacio de trabajo:

Formato:  El formato es editable solamente para nuevos estilos

#### Legend

Legend

Previsualización de leyenda

#### Style Content

Generate a default style

Copiar de un estilo existente

Archivo de estilo  
 Ningún archivo seleccionado

Font: 12pt | Height: 300px

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <StyledLayerDescriptor xmlns="http://www.opengis.net/sld" version="1.1.0" xmlns:se="http://www.opengis.net/se" xsi:schemaLocation="http://www.opengis.net/sld
3 http://schemas.opengis.net/sld/1.1.0/StyledLayerDescriptor.xsd" xmlns:ogc="http://www.opengis.net/ogc" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
4   <name>layer</name>
5   <userStyle>
6     <se:Name>MarsSP_SLD_Feb2020</se:Name>
7     <se:FeatureType>MarsSP_SLD_Feb2020</se:FeatureType>
8     <se:Rules>
9       <se:Name>1_3_3_OtherMiningAndQuarrying</se:Name>
10      <se:Description>
11        <se:Title>Other Mining And Quarrying</se:Title>
12      </se:Description>
13      <ogc:Filter>
14        <ogc:PropertyIsEqualTo>
15          <ogc:PropertyName>hilucsMSP.1.href</ogc:PropertyName>
16          <ogc:Literal>http://www.geoportal.ulpgc.es/registro/plannedLandUse/HilucsExt/1_3_3_OtherMiningAndQuarrying.html</ogc:Literal>
17        </ogc:PropertyIsEqualTo>
18      </ogc:Filter>
19      <se:PolygonSymbolizer>
20        <se:Fill>
21          <se:GraphicFill>
22            <se:Graphic>
23              <se:Mark>
24                <se:WellKnownName>circle</se:WellKnownName>
25              </se:Mark>
26            </se:Graphic>
27          </se:GraphicFill>
28        </se:Fill>
29      </se:PolygonSymbolizer>
30      <se:SvgParameter name="fill" value="#ff0000" />
31    </se:Rules>
32  </userStyle>
33 </name>
34 </StyledLayerDescriptor>
```

# MANY THANKS FOR YOUR ATTENTION!

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E INNOVACIÓN



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