

LPIS Quality Assurance Framework

Based on JRC IES/H04/P/PMI/pmi D(2011)(13518)

ANNEX I

Executable Test Suite (ETS)

LPIS data quality measures, version 6.4

July 2019

Developed in compliance with the guidelines and templates given in ISO 19114, 19113 and ISO/TS 19138

1. Release notes

a. changes/updates from version 6.3 2018

- TABLE 2: RP true eligible area, point 3.7: Clarification made to account the dimensions of the features part of traditional practices and technical areas inside and along the LUI,
- TABLE 8.3: Area Classification, point 4.5: Scope of the use of Waiver E is specified to those cases when PG is observed but not found recorded in LPIS,
- In TABLES 9 and 11.2: typos corrected,
- TABLE 16: LPIS cumulative land changes, point 4.5: Description of the cumulated rate calculation clarified.



2. Feasibility for inspection and measurement

The following two tables describe the measures related to the feasibility for inspection and feasibility for measurement of the sampled reference parcel.

TABLE 0: RP Feasibility for inspection (10100)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Completeness/Commission of all Reference Parcels in Scope
2	Data Quality Scope	All Reference Parcels, which are part of the sample pre-selection, sequentially handled, until a full QC sample is created from RP which pass this measure successfully (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10100
3.2	Name (Name)	RP feasibility for inspection
3.3	Alias (alias)	RP_FSI
3.4	Element name (elementName)	Completeness/Commission
3.5	Basic Measure (basicMeasure)	Error indicator
3.6	Definition (definition)	Correctness and completeness of the input vector and the reference image data to allow reliable inspection of the given Reference Parcel
3.7	Description (description)	<p>Table reporting the feasibility of the input vector and reference image data in respect to its use for correct and reliable Reference Parcel inspection. See the Actions "II3" from the "Activity Diagram" in Annex II. Individually:</p> <ol style="list-style-type: none"> 1. Analyse visually if the area represented by the parcel (LUI) can be inspected based on the available vector and image information. <ol style="list-style-type: none"> i. Check if the Reference parcel thematic ID is persistent in the LPIS (validityStatus) ii. Check if the geometry of the Reference Parcel is valid iii. Check if the Reference Parcel is fully or partly outside the active area of the image (the active area is the area of the image, which contains meaningful pixel information) iv. Check for presence of cloud cover or haze, which prevent the inspection of the parcel v. Check for occurrence of isolated image processing-related artefacts that cannot be attributed to neither a particular land cover nor land use phenomenon (ex. smoke from a chimney or passing airplane). vi. Check for presence of any force majeure circumstances occurring on the land that prevent the inspection of the RP (floods, fires). vii. Check if RP does not belong to the scope or was a part of an a priori RP aggregation

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		2. If the population submitted is complete but it contains extra parcels that are out of the scope as a result of an erroneous query, the query condition can be easily applied and verified (screened), then the skipping will be applied to all out of scope parcels (S1).																
3.8	Value Type (valueType)	1 – Boolean variable																
3.9	Value Structure (valueStructure)	4 - Table																
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “II3”)																
3.11	Example (example)	<table border="1"> <thead> <tr> <th>Feasibility code</th> <th>Occurrence</th> </tr> </thead> <tbody> <tr> <td>Reference parcel thematic ID found not persistent in the LPIS (A3)</td> <td>false</td> </tr> <tr> <td>Parcel geometry is not available (T5)</td> <td>false</td> </tr> <tr> <td>Parcel is partially or fully not covered by image (T2)</td> <td>false</td> </tr> <tr> <td>Parcel partially or fully covered by clouds or haze (T4)</td> <td>false</td> </tr> <tr> <td>LUI interpretation impossible due to observed isolated image processing artefacts or phenomena unrelated to land (C4)</td> <td>false</td> </tr> <tr> <td>Failure to inspect the reference parcel due to force majeure circumstances, observed on the LUI (floods, fires,) – F1</td> <td>false</td> </tr> <tr> <td>Extra parcel due to error in the scope or remaining parcel as a part of an a priori RP aggregation (S1)</td> <td>false</td> </tr> </tbody> </table>	Feasibility code	Occurrence	Reference parcel thematic ID found not persistent in the LPIS (A3)	false	Parcel geometry is not available (T5)	false	Parcel is partially or fully not covered by image (T2)	false	Parcel partially or fully covered by clouds or haze (T4)	false	LUI interpretation impossible due to observed isolated image processing artefacts or phenomena unrelated to land (C4)	false	Failure to inspect the reference parcel due to force majeure circumstances, observed on the LUI (floods, fires,) – F1	false	Extra parcel due to error in the scope or remaining parcel as a part of an a priori RP aggregation (S1)	false
Feasibility code	Occurrence																	
Reference parcel thematic ID found not persistent in the LPIS (A3)	false																	
Parcel geometry is not available (T5)	false																	
Parcel is partially or fully not covered by image (T2)	false																	
Parcel partially or fully covered by clouds or haze (T4)	false																	
LUI interpretation impossible due to observed isolated image processing artefacts or phenomena unrelated to land (C4)	false																	
Failure to inspect the reference parcel due to force majeure circumstances, observed on the LUI (floods, fires,) – F1	false																	
Extra parcel due to error in the scope or remaining parcel as a part of an a priori RP aggregation (S1)	false																	
4	Data quality evaluation																	
4.1	Date (DateTime)	yyyy-mm-dd																
4.2	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal																
4.3	Evaluation method type code (DQ_EvalMethodTypeCode)	002																
4.4	Evaluation method description (evaluationMethodDescription)	<p>Continue from 3.7</p> <ol style="list-style-type: none"> 2. Assign a code to the Reference Parcel as a result of the analysis, based on a pre-defined code list. 3. Report additional evidence when field "F1" is true in a separate "Comment" field. 4. If the area represented by the parcel (LUI) is not affected by the above technical issues (all occurrences are set as FALSE), <ol style="list-style-type: none"> a. flag the parcel as feasible for inspection b. add the parcel to the sample and, c. proceed with the ETS inspection for that Reference Parcel. <p>Else, flag the Reference Parcel as skipped</p>																
4.5	Evaluation procedure	Refer to Annex II																

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4.6	Conformance level (DQ_ConformanceLevel)	Not specified (All feasibility codes should be "false")					
5	Data quality result (DQ_ConformanceResult)						
5.1	Specification	LPIS specification					
5.2	Explanation	<table border="1"> <thead> <tr> <th>Feasibility code</th> <th>Occurrence</th> </tr> </thead> <tbody> <tr> <td>Reference Parcel is skipped (as input data is insufficient)</td> <td>false</td> </tr> </tbody> </table>		Feasibility code	Occurrence	Reference Parcel is skipped (as input data is insufficient)	false
		Feasibility code	Occurrence				
Reference Parcel is skipped (as input data is insufficient)	false						
Reference Parcel geometry is correct. Data quality and spatial extent of the reference image were found to be sufficient for inspection. Reference Parcel is processed for further inspection and NOT flagged as skipped.							
5.3	Pass	Boolean (1=yes, 0=no)					

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TABLE 1: RP Feasibility for measurement (10101)

	Data quality components	Value/Example/Description				
1	Data Quality Unit	Completeness/Commission of all Reference Parcels in Scope				
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample (005 – Dataset)				
3	Data quality measure					
3.1	Measure identifier (measureIdentifier)	10101				
3.2	Name (Name)	RP feasibility for measurement				
3.3	Alias (alias)	RP_FSM				
3.4	Element name (elementName)	Completeness/Commission				
3.5	Basic Measure (basicMeasure)	Error indicator				
3.6	Definition (definition)	Availability and completeness of the local ground conditions, as seen on the reference image data, that allow quantification of the agricultural area on the land under inspection (LUI) through CAPI				
3.7	Description (description)	Table reporting the feasibility of the LUI of Reference Parcel in respect to quantification of the agricultural area through CAPI. See the Actions "A1, A2 and A2a" from the "Activity Diagram" in Annex II: Individually <ol style="list-style-type: none"> 1. Perform a visual verification to ascertain all reference parcel boundaries match distinctive land features or follow well identifiable limits of land cover and/or land use. 				
3.8	Value Type (valueType)	1 - Boolean variable				
3.9	Value Structure (valueStructure)	4 - Table				
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions "A1, A2 and A2a")				
3.11	Example (example)	<table border="1"> <thead> <tr> <th>Feasibility code</th> <th>Occurrence</th> </tr> </thead> <tbody> <tr> <td>Reference Parcel is feasible for measurement</td> <td>true</td> </tr> </tbody> </table>	Feasibility code	Occurrence	Reference Parcel is feasible for measurement	true
		Feasibility code	Occurrence			
Reference Parcel is feasible for measurement	true					
4	Data quality evaluation					
4.1	Date (DateTime)	yyyy-mm-dd				
4.2	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal				

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4.3	Evaluation method type code(DQ_EvalMethodType Code)	002
4.4	Evaluation method description (evaluationMethodDescription)	<p>Continue from 3.7</p> <ol style="list-style-type: none"> 2. If affirmative, flag the Reference Parcel as suitable for measurement* 3. Else, check if previous year ETS results foresee application of the reference parcel aggregation: <ol style="list-style-type: none"> a. If negative, flag the Reference Parcel as not feasible for measurement and put the observed eligible area, area declared and the etsReferenceArea to value zero. Put also both values for RP_CNF (Area Percentage and Area Difference) to zero. b. If affirmative, expand the LUI to completely cover any and all visible crops, agricultural land cover type or land use units, whichever is smaller, occurring partially or completely inside the original LUI <ol style="list-style-type: none"> i. If any continuous aggregation of reference parcels (cluster) matches the smallest LUI expansion, substitute the original LUI with this resulted cluster and use it as the LUI in the data capture and area measurement process. ii. Else, flag the Reference Parcel as not feasible for measurement and put the observed eligible area, area declared and the etsReferenceArea to value zero. Put also both values for RP_CNF (Area Percentage and Area Difference) to zero. <p>*NOTE: that any "total absence of eligible land" is in principle measurable (there must be an agricultural land cover present) and as such should be deducted from eligible agricultural land if recorded as a positive value in LPIS (etsReferenceArea).</p>
4.5	Evaluation procedure	Refer to Annex II
4.6	Conformance level (DQ_ConformanceLevel)	Not specified (The Feasibility codes should be "true")
5	Data quality result (DQ_ConformanceResult)	
5.1	Specification	LPIS specification
5.2	Explanation	The LUI of the Reference Parcel match distinctive land features visible on the orthoimagery. Thus, the extent of the area represented by the Reference Parcel is well known. Reference Parcel is flagged for ETS measurement.
5.3	Pass	Boolean (1=yes, 0=no)

3. Inspection and analysis at RP level

The following 10 tables describe the measures related to the inspection and analysis performed at the level of the individual reference parcel or a reference parcel aggregate.

TABLE 2: RP true eligible area (10102)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/classification correctness of all single land cover features in scope
2	Data Quality Scope	All single land cover features, which are on the land represented by the LUI (relevant only for those that are identified as feasible for measurement in measure 10101) (009 – Feature)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10102
3.2	Name (Name)	RP true eligible area
3.3	Alias (alias)	RP_MEA
3.4	Element name (elementName)	Thematic accuracy/classification correctness
3.5	Basic Measure (basicMeasure)	Correct eligible area value
3.6	Definition (definition)	Observed eligible area inside the LUI
3.7	Description (description)	<p>Table reporting the sum of the eligible area of all single land cover features found inside the LUI, which might represent eligible land. See Actions B1-B4 from the Annex "Activity Diagram" Individually:</p> <ol style="list-style-type: none"> 1. Delineate all individual agricultural land cover features larger than 0.03 ha on the land represented by the LUI. Use the LCCS description of the agricultural land cover classes in the eligible profile, to define the interpretation keys for the land cover mapping (if considered appropriate, translate the LCCS code into a national legend). Land cover features representing non-agricultural eligible area (Art. 32(2)(b) of 1307R2013 are also delineated in this step. Take into account the dimensions of the features making part of traditional practices and technical areas inside and along the LUI. <p>NOTE: in absence of coupled payment classes, the resulting delineation key should correspond to "aggregated classes" reflecting the land covers, documented as minimum mapping legend in Annex III.</p> <ol style="list-style-type: none"> 2. Exclude by delineation any individual or adjoining non-agricultural features larger than or equal to 0.03 ha (or 0.01 ha, if the combination of the spatial resolution of the reference orthoimage and the nature of the feature allow it), and all non-agricultural linear features wider than 2 meters, from the inner area of the mapped agricultural land cover features. Take into account the dimensions of

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		<p>the features making part of traditional practices and technical areas inside and along the LUI.</p> <p>NOTE: non-agricultural feature refers to any feature, which cannot be assigned to any LC type of the agricultural area, non-agricultural eligible area or eligible landscape features (extended code list by the MS in the eligibility profile) in the eligibility profile, because the definition, or the selection criteria, are not fulfilled.</p> <p>If a parcel contain total absence of eligible land, RP_MEA should be set to zero (0).</p> <p>3. Separately delineate the area of any landscape features given in the eligible profile from the inner area of the mapped land cover features representing eligible area. NOTE: The area of Landscape elements with up to 2 meters of width (below the minimum mappable unit for the ETS) can be incorporated in the eligible land cover feature adjacent to them.</p>	
3.8	Value Type (valueType)	2 - number	
3.9	Value Structure (valueStructure)	4 - Table	
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “B1 – B4”)	
3.11	Example (example)	Agricultural and eligible non-agricultural individual land cover features	True Eligible Area (m²)
		Arable Land	3700
		Permanent Crop	15600
		Permanent Grassland	2650
		Total Area	21950
4	Data quality evaluation		
4.1	Date (DateTime)	yyyy-mm-dd	
4.2	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal	
4.3	Evaluation method type code(DQ_EvalMethodType Code)	002	
4.4	Evaluation method description (evaluationMethodDescription)	<p>Continue from 3.7</p> <p>4. Calculate the eligible area for each of the land cover feature, using the information from the eligibility profile. Sum up first by land cover type and then in total, the eligible area of the digitized land cover polygons found on the LUI (Reference Parcel or aggregate of reference parcels)</p>	
4.5	Evaluation procedure	Refer to Annex II	
4.6	Conformance level (DQ_ConformanceLevel)	Not specified	
5	Data quality result DQ_QuantitativeResult		
5.1	Value	Record	
5.2	Value unit	Square meters	

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5.3	Explanation	21950 square meters of eligible land found on the LUI. Since conformance quality level is not specified, only the area is reported.
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TABLE 3: RP diversity (10103)

	Data quality components	Value/Example/Description	
1	Data Quality Unit	Thematic accuracy/classification correctness of all land cover features in scope	
2	Data Quality Scope	All land cover features, which are on the LUI (relevant only for those that can be measured). (009 – Feature)	
3	Data quality measure		
3.1	Measure identifier (measureIdentifier)	10103	
3.2	Name (Name)	RP diversity	
3.3	Alias (alias)	RP_ELC	
3.4	Element name (elementName)	Thematic accuracy/classification correctness	
3.5	Basic Measure (basicMeasure)	Land cover classes count (from 10102)	
3.6	Definition (definition)	Occurrence of the different land cover classes, which represents eligible land	
3.7	Description (description)	Binary (Pass/Fail) table of the occurrence of the land cover classes, representing eligible land.	
3.8	Value Type (valueType)	1 – Boolean variable	
3.9	Value Structure (valueStructure)	4 - Table	
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “B5”)	
3.11	Example (example)	Agricultural and eligible non-agricultural land cover Classes (Types)	
		Arable Land (A)	Yes
		Permanent Shrub Crop (S)	Yes
		Permanent Grassland (N)	Yes
		NOTE 1: This quality measure reports the occurrence of the land cover types found on the LUI, as defined in the country’s eligibility profile, and not aggregated at the level of the three agricultural land cover categories of AL, PG and PC. NOTE 2: Land cover features representing non-agricultural eligible area (Art. 32(2)(b) of 1307R2013 are also reported in this quality measure.	
4	Data quality evaluation		
4.1	DQ_AggregationDerivation	Derivation (10102)	
4.2	Date (DateTime)	yyyy-mm-dd	

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4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	Actions B5 from the Annex "Activity Diagram" Detect the observed presence of different land cover classes representing eligible land (from 10102), which are on the LUI. Use the correspondent class definitions from the eligibility profile (User-defined Legend Code).
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	Not specified
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Table
5.2	Value unit	Number
5.3	Explanation	Since conformance quality level is not specified, only the matrix is reported (Example 3.11, Example: Arable land and permanent grassland occurred on the LUI)

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TABLE 4: RP landscape features (10104)

	Data quality components	Value/Example/Description	
1	Data Quality Unit	Thematic accuracy/classification correctness of all land cover features in scope	
2	Data Quality Scope	All land cover features, which are on the LUI (relevant only for those that can be measured) (009 – Feature)	
3	Data quality measure		
3.1	Measure identifier (measureIdentifier)	10104	
3.2	Name (Name)	RP landscape features	
3.3	Alias (alias)	RP_ALF	
3.4	Element name (elementName)	Thematic accuracy/classification correctness	
3.5	Basic Measure (basicMeasure)	Landscape feature count	
3.6	Definition (definition)	Abundance of the landscape features (subject to retention – GAEC 7), which are on the LUI	
3.7	Description (description)	<p>Table of the abundance of the landscape features, subject to retention – GAEC 7.</p> <p>See Actions C1 - C5 from the Annex "Activity Diagram" Map (or identify, if already mapped) the individual landscape features observed, which are on the LUI and (if applicable) according to the temporal adjudication of these features made for the establishment of the etsReferenceArea. Use the list of features provided in the eligibility profile. Assign an area value to each identified landscape feature, according to the ruling eligibility conditions (see Annex III for more information).</p>	
3.8	Value Type (valueType)	2 - number	
3.9	Value Structure (valueStructure)	4 - Table	
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions "C1-C5")	
3.11	Example (example)	Type of Landscape features	Abundance
		hedges	3
		ponds	1
		trees in line	1
		trees in group	2
4	Data quality evaluation		
4.1	DQ_AggregationDerivation	Derivation (10102)	

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4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	Continue from 3.7 Count the number of observed landscape features by type. NOTE: store the features and assigned area for use in 10104_2
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	Not specified
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Table
5.2	Value unit	Number
5.3	Explanation	Since conformance quality level is not specified, only the matrix is reported (see 3.11). Example: There are 3 hedges, 1 pond, 1 line of trees and 2 groups of trees on the LUI.

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TABLE 5: RP landscape features area (10104_2)

	Data quality components	Value/Example/Description	
1	Data Quality Unit	Thematic accuracy/classification correctness of all land cover features in scope	
2	Data Quality Scope	All land cover features, which are on the LUI (relevant only for those that can be measured) (009 – Feature)	
3	Data quality measure/calculation		
3.1	Measure identifier (measureIdentifier)	10104_2	
3.2	Name (Name)	RP landscape features area	
3.3	Alias (alias)	RP_ELF	
3.4	Element name (elementName)	Thematic accuracy/classification correctness	
3.5	Basic Measure (basicMeasure)	Area of eligible landscape features	
3.6	Definition (definition)	Area of the landscape features (subject to retention – GAEC 7), which are inside OR are adjacent to eligible area, found on the LUI	
3.7	Description (description)	Table reporting the sum of the eligible square meters originating from landscape features found inside OR that are on the immediate border of the land cover features on the LUI representing eligible area. The area of Landscape elements with up to 2 meters of width (below the minimum mappable unit for the ETS) can be incorporated in the eligible land cover feature adjacent to them.	
3.8	Value Type (valueType)	2 - number	
3.9	Value Structure (valueStructure)	4 - Table	
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “C6”)	
3.11	Example (example)	Eligible landscape features found on the LUI	Area (m²)
		ponds	750
		patches of trees	200
		trees in line	300
		Total	1250
4	Data quality evaluation		
4.1	DQ_AggregationDerivation	Derivation (10102)	
4.2	Date (DateTime)	yyyy-mm-dd	

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4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	NOTE: this requires stored information from measure 10104 of Annex I See <u>Actions C6 from the Annex "Activity Diagram"</u> Recover the individual delineated eligible landscape features, which are inside OR are on the immediate border of the eligible area already determined in Action B. Retrieve their eligible area using the information from the eligibility profile. Sum up the assigned area by type of the eligible landscape feature.
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	Not specified
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Record
5.2	Value unit	Square meters
5.3	Explanation	1250 m ² of eligible landscape features found within OR that are adjacent to the eligible area on the LUI. Since conformance quality level is not specified, only the area is reported.

TABLE 6: RP Non-agricultural land cover features (10105)

	Data quality components	Value/Example/Description														
1	Data Quality Unit	Thematic accuracy/classification correctness of all land cover features identified in scope														
2	Data Quality Scope	All land cover features identified, which are on the LUI (relevant only for those that can be measured) (009 – Feature)														
3	Data quality measure															
3.1	Measure identifier (measureIdentifier)	10105														
3.2	Name (Name)	RP non-agricultural land cover features														
3.3	Alias (alias)	RP_ANF														
3.4	Element name (elementName)	Thematic accuracy/classification correctness														
3.5	Basic Measure (basicMeasure)	Error count														
3.6	Definition (definition)	Abundance of the non-agricultural land cover features, which are on the LUI														
3.7	Description (description)	Table showing the total number of the non-agricultural land cover features, which are on the LUI														
3.8	Value Type (valueType)	2 - number														
3.9	Value Structure (valueStructure)	4 - Table														
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “D1 – D3”)														
3.11	Example (example)	<table border="1"> <thead> <tr> <th>Non-agricultural land cover</th> <th>Abundance</th> </tr> </thead> <tbody> <tr> <td>Artificial sealed surface and associated areas</td> <td>3</td> </tr> <tr> <td>Forest and Woodland</td> <td>8</td> </tr> <tr> <td>Scrubland</td> <td>2</td> </tr> <tr> <td>Water Bodies</td> <td>0</td> </tr> <tr> <td>Natural Bare areas</td> <td>1</td> </tr> <tr> <td>Waterlogged Vegetation</td> <td>0</td> </tr> </tbody> </table>	Non-agricultural land cover	Abundance	Artificial sealed surface and associated areas	3	Forest and Woodland	8	Scrubland	2	Water Bodies	0	Natural Bare areas	1	Waterlogged Vegetation	0
		Non-agricultural land cover	Abundance													
		Artificial sealed surface and associated areas	3													
		Forest and Woodland	8													
		Scrubland	2													
		Water Bodies	0													
		Natural Bare areas	1													
Waterlogged Vegetation	0															
4	Data quality evaluation															
4.1	DQ_AggregationDerivation	Derivation (10102)														
4.2	Date (DateTime)	yyyy-mm-dd														
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal														
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002														

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4.5	Evaluation method description (evaluationMethodDescription)	See Actions D1 - D3 from the Annex IIb "Activity Diagram" 1. Count the number of individual distinct non-agricultural land cover features by class type, which has been already identified/detected in Actions B and C, by type of major land cover class, according the predefined class list. 2. Count and report the presence of any other not delineated individual non-agricultural feature found within the LUI 3. Provide point location for each of the individual non-agricultural features found on the LUI. NOTE: Only individual and distinct non-agricultural land cover features should be considered. Small intrusions of non-agricultural land cover at the border of the LUI, due to imprecise matching with the reference orthoimage and delineation artefacts are not counted.
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	Not specified
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Record (table)
5.2	Value unit	Number
5.3	Explanation	14 non-agricultural land cover features found on the LUI. Since conformance quality level is not specified, only the number is reported.

TABLE 7: RP Critical defects (10106)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Usability of all land cover features in scope
2	Data Quality Scope	All land cover features, which are on the land represented by the Reference Parcel (relevant for all RPs that are part of the QC sample) (009 – Feature)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10106
3.2	Name (Name)	RP Conformance Critical Defects
3.3	Alias (alias)	RP_CRA
3.4	Element name (elementName)	Usability
3.5	Basic Measure (basicMeasure)	Error indicator
3.6	Definition (definition)	Occurrence of local ground conditions, which evidenced for non-compliances (critical defects) that violate the implementation decisions and choices made for the LPIS under inspection (SUT) and/or obstruct the use of the reference parcel (in the IACS processes where the LPIS play core part).
3.7	Description (description)	<p>See Actions E1 from the Annex "Activity Diagram". Use the detailed instructions (No 1) for this inspection.</p> <ol style="list-style-type: none"> 1. Check for the occurrence of a critical defect, starting from the first defect listed at the top of the table (given below) and cascade down to the bottom. 2. For each of the pre-defined critical defects from the list: <ol style="list-style-type: none"> a) Verify the LPIS implementation decisions and choices as reported in the TG IXIT (Annex X) to define the general conditions b) Identify and detect the occurrence of ALL local ground conditions listed, that evidenced for non-compliances that violate the implementation decisions and choices of the LPIS under inspection and obstruct the use of the reference parcel. Use the information provided by IXIT, as part of the MTS-log and the predefined list of local ground conditions. <p>Table indicating the presence or absence of local ground conditions (expressed through the observed land cover and land use), which evidenced for non-compliances (critical defects) that violate the implementation decisions and choices made for the LPIS (SUT) under inspection and/or obstruct the use of the reference parcel. The parcel is flagged as non-conforming, if it contains at least one critical defect.</p>

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3.8	Value Type (valueType)	1 – Boolean variable														
3.9	Value Structure (valueStructure)	4 - Table														
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “E1”)														
3.11	Example (example)	<table border="1"> <thead> <tr> <th>Critical Defect</th> <th>Occurrence</th> </tr> </thead> <tbody> <tr> <td>Total absence of agricultural land (totalAbsenceOfAgriculturalLand)</td> <td>Yes</td> </tr> <tr> <td>Invalid RP perimeter (invalidRpPerimeter)</td> <td>No</td> </tr> <tr> <td>Invalid Common RP boundary (invalidCommonRpBoundary)</td> <td>No</td> </tr> <tr> <td>Incomplete block (incompleteBlock)</td> <td>No</td> </tr> <tr> <td>Multi-polygon (multiPolygon)</td> <td>No</td> </tr> <tr> <td>Multi-parcel (multiParcel)</td> <td>No</td> </tr> </tbody> </table>	Critical Defect	Occurrence	Total absence of agricultural land (totalAbsenceOfAgriculturalLand)	Yes	Invalid RP perimeter (invalidRpPerimeter)	No	Invalid Common RP boundary (invalidCommonRpBoundary)	No	Incomplete block (incompleteBlock)	No	Multi-polygon (multiPolygon)	No	Multi-parcel (multiParcel)	No
		Critical Defect	Occurrence													
		Total absence of agricultural land (totalAbsenceOfAgriculturalLand)	Yes													
		Invalid RP perimeter (invalidRpPerimeter)	No													
		Invalid Common RP boundary (invalidCommonRpBoundary)	No													
		Incomplete block (incompleteBlock)	No													
Multi-polygon (multiPolygon)	No															
Multi-parcel (multiParcel)	No															
4 Data quality evaluation																
4.1	Date (DateTime)	yyyy-mm-dd														
4.2	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal														
4.3	Evaluation method type code(DQ_EvalMethodType Code)	002														
4.4	Evaluation method description (evaluationMethodDescription)	Continue from 3.7 3. Flag the parcel as non-conforming, if at least one critical defect is detected. NOTE: Detailed instruction (No 1) on how to detect the presence of such non-compliances at the level of the reference parcel, is provided at the end of this document														
4.5	Evaluation procedure	Refer to Annex II														
4.6	Conformance level (DQ_ConformanceLevel)	Zero presence of Critical Defects														
5 Data quality result DQ_ConformanceResult																
5.1	Specification	LPIS specification														
5.2	Explanation	One critical defect found. Reference Parcel is not conforming.														
5.3	Pass	Boolean (1=yes, 0=no)														

TABLE 8: RP Area purity (10102_2)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Quantitative attributes accuracy of all eligible land in the scope
2	Data Quality Scope	All eligible land found on the LUI. NOTE: The measure is relevant only for those RPs that were feasible for measurement and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment. Those RPs from this subset having areas Aobs and Arc not directly comparable (see Annex II), are further excluded. (009 – Feature)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10102_2
3.2	Name (Name)	RP conformance (area purity)
3.3	Alias (alias)	RP_CNF
3.4	Element name (elementName)	Thematic accuracy/Quantitative attributes accuracy
3.5	Basic Measure (basicMeasure)	Correct items rate
3.6	Definition (definition)	Correctness of the eligible area recorded (MEA) for the LUI, in respect to the eligible area observed.
3.7	Description (description)	Percentage of the eligible area observed with respect to the area recorded in the attribute table of the individual reference parcel or aggregation of reference parcels part of the LUI
3.8	Value Type (valueType)	4 – percentage and 2 - number
3.9	Value Structure (valueStructure)	V1=Percent (%), V2=square meters (m ²)
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “E2”)
3.11	Example (example)	V1: 95.00% and V2: 675m ² 13 500 square meters recorded eligible in the attribute table of the individual reference parcel or aggregation of reference parcels. 12 825 square meters found to be eligible.
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation, aggregation and conforming (10102, 10104_2)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directInternal

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4.4	Evaluation method type code(DQ_EvalMethodType Code)	001
4.5	Evaluation method description (evaluationMethodDescription)	<p>Percentage of the eligible area observed with respect to the eligible area recorded in the attribute table of the individual reference parcel or aggregation of reference parcels</p> <p>NOTE: In order to calculate the eligible area found, sum up the values derived in 10102 and 10104_2. See Actions E2 from the Annex "Activity Diagram". Compare the sum of square meters found eligible with respect to those recorded as eligible in the attribute table of the individual reference parcel or aggregation of reference parcels. Sum up the area found to be eligible - Aobs. Then:</p> <ol style="list-style-type: none"> 1. Divide the result (Aobs) by the total area recorded as eligible in the attribute table (Arec). Multiply by 100. Report the value. (v1) 2. Subtract (Aobs) from the area recorded as eligible in the attribute table (Arec). Report the value in absolute terms (v2)
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	<p>a) For individual reference parcel or aggregation of reference parcels with area recorded greater than 5000m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 97.00 % and less than (or equal to) 103.00 % <p>AND</p> <ul style="list-style-type: none"> • (v2) Not greater than 10 000 m². <p>b) For individual reference parcel or aggregation of reference parcels with area recorded between (or equal to) 2000m² and 5000 m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 95.00 % and less than (or equal to) 105.00 % <p>c) For individual reference parcel or aggregation of reference parcels with area recorded less than 2000 m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 93.00 % and less than (or equal to) 107.00 %
5	Data quality result DQ_ConformanceResult	
5.1	Specification	LPIS specification
5.2	Explanation	Less than 97.00% of the square meters recorded as eligible in the attribute table of the individual reference parcel or aggregation of reference parcels, are found as eligible. Reference Parcel fails.
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 8.2: RP "contaminated" Reference Parcels (10102_3)

	Data quality components	Value/Example/Description																								
1	Data Quality Unit	Completeness/Commission of all land cover features in scope																								
2	Data Quality Scope	All land cover features, which are on the land represented by the Reference Parcel. NOTE: The measure is applicable only for those RPs found to be conformant in respect to quality measure 10102_2 (009 – Feature)																								
3	Data quality measure																									
3.1	Measure identifier (measureIdentifier)	10102_3																								
3.2	Name (Name)	RP Conformance ("Contaminated" reference parcel)																								
3.3	Alias (alias)	RP_CNT																								
3.4	Element name (elementName)	Completeness/Commission																								
3.5	Basic Measure (basicMeasure)	Error indicator																								
3.6	Definition (definition)	Occurrence of non-agricultural land cover features on the land represented by the Reference Parcel (if the parcel is found to be conformant in respect to 10102_2) that are considered triggers for contamination, which violate the relevant general and local ETS conditions for the pre-defined waiver.																								
3.7	Description (description)	Table indicating the presence (occurrence) of non-agricultural land cover features, considered as triggers for contamination, by land cover type (as is defined by measure 10105), on the LUI Reference Parcel (Item for Inspection) and the conformance status of the Reference Parcel in respect to that "contamination". The parcel is flagged as non-conforming, if at least one occurrence of these triggers for contamination remains "unwaivered". (see Detailed Instruction 2).																								
3.8	Value Type (valueType)	1 – Boolean variable																								
3.9	Value Structure (valueStructure)	4 - Table																								
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions "E3")																								
3.11	Example (example)	<table border="1"> <thead> <tr> <th>Contamination per land cover</th> <th>Present within the item for inspection?</th> <th>Waivered</th> <th>Waiver</th> </tr> </thead> <tbody> <tr> <td>Artificial sealed surface and associated areas</td> <td>Yes</td> <td>Yes</td> <td>C</td> </tr> <tr> <td>Forest and Woodland</td> <td>Yes</td> <td>Yes</td> <td>C</td> </tr> <tr> <td>Scrubland</td> <td>Yes</td> <td>Yes</td> <td>C</td> </tr> <tr> <td>Water Bodies</td> <td>No</td> <td></td> <td></td> </tr> <tr> <td>Natural Bare areas</td> <td>Yes</td> <td>Yes</td> <td>C</td> </tr> </tbody> </table>	Contamination per land cover	Present within the item for inspection?	Waivered	Waiver	Artificial sealed surface and associated areas	Yes	Yes	C	Forest and Woodland	Yes	Yes	C	Scrubland	Yes	Yes	C	Water Bodies	No			Natural Bare areas	Yes	Yes	C
Contamination per land cover	Present within the item for inspection?	Waivered	Waiver																							
Artificial sealed surface and associated areas	Yes	Yes	C																							
Forest and Woodland	Yes	Yes	C																							
Scrubland	Yes	Yes	C																							
Water Bodies	No																									
Natural Bare areas	Yes	Yes	C																							

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		Waterlogged Vegetation	No		
4	Data quality evaluation				
4.1	DQ_AggregationDerivation	Derivation and conforming (10102_2, 10105)			
4.2	Date (DateTime)	yyyy-mm-dd			
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directInternal			
4.4	Evaluation method type code(DQ_EvalMethodType Code)	001			
4.5	Evaluation method description (evaluationMethodDescription)	<p>See Actions E3 from the Annex "Activity Diagram"</p> <ol style="list-style-type: none"> 1. If the Reference Parcel is found to be conformant with respect to 10102_2, take the information for the abundance and location of non-agricultural land cover features collected in 10105 2. Select those non-agricultural land cover features found on the area represented by the Reference Parcel (Item for Inspection) that can be considered triggers for contamination. These features can be: <ol style="list-style-type: none"> A. any feature artificial in origin that seal the soil surface (buildings, roads), (regardless its size) B. any non-agricultural feature, natural or man-made features that do not seal the soil, that can neither be taken up by any agricultural activity nor be considered part of the local established practices of the region (designated EFA categories, Agroforestry, PG-ELP etc.), but that either <ol style="list-style-type: none"> a. splits the reference parcel (functional objects), (regardless the size) <p>or</p> <ol style="list-style-type: none"> b. violates the local LPIS RP specifications esp. regarding non-agricultural features and their minimum dimensions and size 3. Recover the point location for those triggers for contamination and report their occurrence per land cover type using the predefined list of 10105. 4. Flag the "Reference parcel as "contaminated" if for any of the given land cover types, a trigger was observed. Use the information provided from the IXIT and the MTS-log and the predefined list of acceptable waivers, (given in Detailed instruction 2) to vindicate the presence of such observed anomalies for that reference parcel. 5. Report the presence of an applicable waiver (if any). 6. Flag the parcel as non-conforming, if at least one contaminations remains "unwaivered". <p>NOTE: each LPIS custodian should duly document the criteria on "local LPIS RP specifications esp. regarding non-agricultural features and their minimum dimensions and size"</p>			
4.6	Evaluation procedure	Refer to Annex II			

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4.7	Conformance level (DQ_ConformanceLevel)	Absence of "unwaivered" occurrence of contamination.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	LPIS specification
5.2	Explanation	Example: Reference parcel is "contaminated" by artificial sealed surface Reference parcel is "contaminated", but there is no presence of "unwaivered" occurrence of ineligible features. Reference Parcel is conforming.
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 8.3: Area Classification (10102_4)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Classification correctness of all single land cover features in scope
2	Data Quality Scope	All single land cover features, which are on the LUI NOTE: The measure is relevant only for those RPs that were measured. Those RPs from this subset having areas Aobs and Arc not directly comparable (see Annex II), are further excluded. (009 – Feature)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10102_4
3.2	Name (Name)	RP Area_Classification
3.3	Alias (alias)	RP_CLS
3.4	Element name (elementName)	Thematic accuracy/Classification correctness
3.5	Basic Measure (basicMeasure)	Correct land cover classification
3.6	Definition (definition)	Correctness of the observed land cover with respect to the agricultural land cover types as recorded in the LPIS (if CAPI in doubt -> field observations)
3.7	Description (description)	Correctness of the observed area attributed to the 3 main agricultural land cover categories, defined for BPS/SAPS, with respect to the correspondent values recorded in the LPIS (BPS/SAPS layer). NOTE 1: The land cover categories defined for the Basic Payment Layer (BPS/SAPS) are: arable land (AL); permanent grassland (PG) and permanent crop (PC) NOTE 2: If the code HV for generic herbaceous vegetation is used to delineate one or more <u>distinctly visible</u> grasslands during ETS inspection of the reference parcel, then the whole HV area of each delineation is added to the area sums to be compared to either the recorded AL area, or recorded PG area, depending on the individual choice made by the ETS operator per HV polygon . NOTE 3: Code HV shall be used only where proper classification and attribution to either AL or PG is impossible.
3.8	Value Type (valueType)	4 – percentage and 2 - number
3.9	Value Structure (valueStructure)	V1=Percent (%), V2=square meters (m ²) 4 - Table
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “E3a”)

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		For each item of inspection						
		LC category	Observed on the LUI? (Y/N)	Recorded in LPIS? (Y/N)	V1 (%)	V2 (m2)	Waived	Waiver
3.11	Example (example)	AL	Y	Y	93 %	100	Yes	E
		PG	Y	Y	17 %	160	No	
		PC	N	Y	N/A	N/A	N/A	N/A
4	Data quality evaluation							
4.1	DQ_AggregationDerivation	Derivation, aggregation and conforming (10102, 10104_2)						
4.2	Date (DateTime)	yyyy-mm-dd						
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directInternal						
4.4	Evaluation method type code(DQ_EvalMethodType Code)	001						
4.5	Evaluation method description (evaluationMethodDescription)	<p>See Actions E3a from the Annex "Activity Diagram".</p> <ol style="list-style-type: none"> For each agricultural land cover category observed: <ul style="list-style-type: none"> ➤ Check if present as recorded in the LPIS. ➤ If affirmative, sum all areas of the agricultural land cover features mapped within the LUI as derived in 10102 belonging to that category, together with area of the corresponding landscape features found within or adjacent to this agricultural land as derived in 10104 (when appropriate, use the rules for attribution of eligible landscape features given in DSCG/2014/33). ➤ Divide the result (Aobs LCcat) by the area attributed to this category as recorded in the LPIS for the individual reference parcel or aggregation of reference parcels (Arec LCcat). Multiply by 100. Report the value in percentage ➤ Calculate the difference by subtracting (Aobs LCcat) from the area attributed to this category as recorded in the LPIS for the individual reference parcel or aggregation of reference parcels (Arec LCcat). Report the value (in absolute terms) Check for agricultural land cover categories not recorded in LPIS but found on ETS Verify if the land cover inventory of the LUI returns HV polygons AND the item is non-conforming due to any of the following: <ul style="list-style-type: none"> ➤ PG area values are observed, but AL is recorded in the LPIS instead ➤ The area difference for PG values observed and recorded is above the conformance threshold If so, retrieve the available historical records that evidence the recorded presence of any AL over the 						

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		<p>last 5 years preceding the ETS assessment for each HV polygon in the LUI. These records shall be either :</p> <ul style="list-style-type: none"> ➤ historical orthoimagery, less than 6 years old, ➤ farmer’s declarations, less than 6 years old ➤ conclusive third party evidence <p>5. If such evidence is present for each HV polygon</p> <ul style="list-style-type: none"> ➤ Vindicate the non-conformity found by using waiver E (see Detailed Instruction 4) ➤ Else, keep the non-conformity found <p>6. Record your findings and provide the evidence for the use of waiver E as PDF document, including the relevant ID of the reference parcel.</p> <p>7. Flag the parcel as non-conforming, if at least one classification error remains “unwaivered”.</p> <p>NOTE 1: Once a non-conformity is vindicated, no adjustment in the measurements (copy/pasting from historical data or delineation from older image) is needed. Also, there is no need to adjust the values for AL and PG at the level of the item of inspection.</p>
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	<p>1. Observed agricultural land cover category on the LUI should be present as recorded in the LPIS AND</p> <p>2. The difference between the area observed and recorded per category should be as follows:</p> <p>a) For individual reference parcel or aggregation of reference parcels with agricultural area for a given category recorded to be greater than 5000m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 97.00 % and less than (or equal to) 103.00 % <p>AND</p> <ul style="list-style-type: none"> • (v2) Not greater than 10 000 m². <p>b) For individual reference parcel or aggregation of reference parcels with agricultural area for a given category recorded between (or equal to) 2000m² and 5000 m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 95.00 % and less than (or equal to) 105.00 % <p>c) For individual reference parcel or aggregation of reference parcels with agricultural area for a given category recorded less than 2000 m².</p> <ul style="list-style-type: none"> • (v1) more than (or equal to) 93.00 % and less than (or equal to) 107.00 % <p>3. Each agricultural land cover category recorded in the LPIS for individual reference parcel or aggregation of reference parcels should be present on the LUI</p>
5	Data quality result DQ_QuantitativeResult	
5.1	Specification	LPIS specification
5.2	Explanation	Two of the three agricultural land cover categories are found on the LUI.

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		<ol style="list-style-type: none">1. The presence of AL is accounted in the LPIS the correspondent area is correct, as the area difference is vindicated (waivered).2. The presence of PG is accounted in the LPIS, however the correspondent area is incorrect.3. There is presence of PC recorded in the LPIS, which is not found during the ETS (omission) <p>Two misclassification errors were found. The reference parcel is non-conforming.</p>
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 9: RP cause of non-conformity (10107)

	Data quality components	Value/Example/Description			
1	Data Quality Unit	Completeness/Commission of possible weaknesses found on the non-conforming Reference Parcels in scope			
2	Data Quality Scope	Each non-conforming Reference Parcels, which take part of the QC sample, as identified in measures 10106, 10102_2, 10102_3 and 10102_4 (009 – Feature)			
3	Data quality measure				
3.1	Measure identifier (measureIdentifier)	10107			
3.2	Name (Name)	Categorization of the possible weaknesses found on the non-conforming reference parcels (derived from 10106, 10102_2, 10102_3 and 10102_4), in the LPIS			
3.3	Alias (alias)	RP_CEA, ReasonForNonConformityValue			
3.4	Element name (elementName)	Completeness/Commission			
3.5	Basic Measure (basicMeasure)				
3.6	Definition (definition)	Categorization of the possible weaknesses found on the non-conforming Reference Parcel, based on a pre-defined list of causes for the non-conformity			
3.7	Description (description)	<p>Table, which verifies the occurrence of the initially pre-defined causes for the presence of the detected problem for each possible weaknesses found on the non-conforming Reference Parcel. There can be more than one non-conformity (possible weakness) found for the item for inspection.</p> <p>NOTE 1: Each individual contamination reported in quality measure 10102_3 for the item of inspection is counted as one non-conformity (weakness).</p> <p>Note 2: The total absence of eligible land for a given Reference Parcel is reported as critical defect, but also as area-based and classification correctness non-conformities. However, within the context of 10107, such observation (no agricultural area found) is reported as one single weakness only.</p>			
3.8	Value Type (valueType)	1 – Boolean variable			
3.9	Value Structure (valueStructure)	4 - Table			
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram, Actions “E4”)			
3.11	Example (example)	Non-conformity - weakness	Type of non-conformity (weakness)	Causes/reason for occurrence of the non-conformity found	Occurrence

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		P01	Critical Defect	Changes of the underlying land where not applied (missedUpdate)	Yes
				Revisions of the Regulations were not applied (missedUpgrade)	No
				Incomplete processing (incompleteProcessing)	No
				Erroneous processing (processingError)	No
				Incomplete LPIS design (incompatibleDesign)	No
		P02	Area non-conformity	Changes of the underlying land where not applied (missedUpdate)	No
				Revisions of the Regulations were not applied (missedUpgrade)	No
				Incomplete processing (incompleteProcessing)	Yes
				Erroneous processing (processingError)	No
				Incomplete LPIS design (incompatibleDesign)	No
		P03	Contamination	Changes of the underlying land where not applied (missedUpdate)	Yes
				Revisions of the Regulations were not applied (missedUpgrade)	No
				Incomplete processing	No

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				(incompleteProcessing)	
				Erroneous processing (processingError)	No
				Incomplete LPIS design (incompatibleDesign)	No
		P04	Classification incorrectness	Changes of the underlying land where not applied (missedUpdate)	No
				Revisions of the Regulations were not applied (missedUpgrade)	No
				Incomplete processing (incompleteProcessing)	No
				Erroneous processing (processingError)	Yes
				Incomplete LPIS design (incompatibleDesign)	No
4	Data quality evaluation				
4.1	DQ_AggregationDerivation	Derivation and aggregation (10106, 10102_2, 10102_3, and 10102_4)			
4.2	Date (DateTime)	yyyy-mm-dd			
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal			
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002			
4.5	Evaluation method description (evaluationMethodDescription)	<p>See Actions E4 from the Annex IIb "Activity Diagram". Assign to each non-conformity (possible weakness), one and only one given pre-defined causes. Consult the local LPIS data model and the results from the MTS, wherever is needed</p> <p>Follow the Detailed Instruction 3 on the categorization of the non-conformant parcels, given at the end of this document.</p>			
4.6	Evaluation procedure	Refer to Annex II			

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4.7	Conformance level (DQ_ConformanceLevel)	Not specified
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Record
5.2	Value unit	Number
5.3	Explanation	The Reference Parcel in this particular example has 4 causes for the presence of the non-conformity – “missedUpdate” twice, one “erroneousProcessing” and one “incompleteProcessing”. Since conformance quality level is not specified, only the values are reported.

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1. Data consolidation and analysis at LPIS sample level

The following nine tables describe the measures related to the data consolidation and analysis at LPIS sample level.

TABLE 10: LPIS eligible area (10201)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Quantitative attribute accuracy of all Reference parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that were not measured (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10201
3.2	Name (Name)	LPIS maximum eligible area
3.3	Alias (alias)	LPIS_RP_MEA
3.4	Element name (elementName)	Thematic accuracy/Quantitative attribute accuracy
3.5	Basic Measure (basicMeasure)	Correct items rate
3.6	Definition (definition)	Rate of correct eligible hectares found with respect to the total number of eligible hectares currently recorded in the LPIS.
3.7	Description (description)	No measures. For further analysis use values derived in 10102 and 10104_2. Percentage of the eligible hectares as observed, with respect to all eligible hectares recorded.
3.8	Value Type (valueType)	4 – Percentage
3.9	Value Structure (valueStructure)	Number (%)
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram)
3.11	Example (example)	96.60%
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation, aggregation and conformity (10102, 10104_2)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal

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4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	<p>Percentage of the eligible hectares as observed, with respect to all eligible hectares recorded.</p> <p>For all parcels in DQ_scope,</p> <ol style="list-style-type: none"> i. Calculate the eligible hectares found by sum up the values derived in 10102 and 10104_2. ii. Calculate the ratio between the sum of hectares found during the ETS and the sum of area recorded in the LPIS <ol style="list-style-type: none"> a. Sum up all eligible hectares found. b. Divide the result by the hectares recorded for the Reference Parcels, which are part of the QC sample. c. Multiply by 100.
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	The differences between eligible land and recorded land in the LPIS cumulated over the sample should be less or equal to 2.00% ($\geq 98.00\%$ and $\leq 102.00\%$).
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	<p>3 500 000 ha recorded eligible for all Reference Parcels, which are part of the QC sample. 3.380 000 ha found to be eligible. This results in 96.60% of the eligible hectares recorded in LPIS that are truly eligible.</p> <p>Less than 98 % of the eligible hectares recorded in LPIS are actually found to be eligible. LPIS fails to be compliant with this particular quality element.</p>
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 10.2: LPIS lower and upper interval boundaries (10201_2)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Quantitative attribute accuracy of all Reference parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that were not measured (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10201_2
3.2	Name (Name)	LPIS maximum eligible area – overestimates and underestimates
3.3	Alias (alias)	LPIS_RP_MEA_B
3.4	Element name (elementName)	Thematic accuracy/Quantitative attribute accuracy
3.5	Basic Measure (basicMeasure)	Area of incorrect items rate
3.6	Definition (definition)	One-sided probability boundary of the rates of the eligible hectares that indicate overestimations and underestimations found with respect to the total number of eligible hectares currently recorded in the LPIS.
3.7	Description (description)	For further analysis use values derived in 10102 and 10104_2. Percentage of the overestimate eligible hectares as observed, with respect to all eligible hectares recorded.
3.8	Value Type (valueType)	4 – Percentage
3.9	Value Structure (valueStructure)	LIB: Percent (%), UIB: Percent (%)
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram)
3.11	Example (example)	LIB=7.26% , UIB=0.56%
	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation, aggregation and conformity (10102, 10104_2)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002

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4.5	Evaluation method description (evaluationMethodDescription)	<p>Boundary of the confidence interval of the percentage of the overestimate eligible hectares as observed, with respect to all eligible hectares recorded.</p> <p>For all parcels in DQ_scope,</p> <ol style="list-style-type: none"> d. Sum up all eligible hectares found. e. Divide the result by the hectares recorded for the Reference Parcels, which are part of the QC sample, multiply by 100. f. Compute the relative discrepancy g. Select <ul style="list-style-type: none"> • Overestimate parcels with discrepancy <-3% • Underestimate parcels with discrepancy >3% h. Separately sum up area discrepancies for overestimates and underestimate parcels i. Divide the two sums by the sum of recorded area to compute the overestimate error rate (OER) and underestimate error rate (UER) j. Compute the differences between observed overestimation / underestimation and the parcel's estimated overestimation, / underestimation (note: both sums of these differences have to be zero) k. Evaluate the OER's and UER's variability by calculating the standard deviation of the previously calculated differences between observations and estimations. l. Compute boundaries <ul style="list-style-type: none"> • LIB (lower interval boundary as [LIB = OER - z*stdev(OER)] (z=1.6449, i.e. 95% quantile of the normal distribution • UIB (upper interval boundary as [UIB = UER + z*stdev(UER)] (z=1.6449, i.e. 95% quantile of the normal distribution m. Compare LIB with -2% and UIB with 2%
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	<p>The LIB of the overestimation should be higher or equal to -2.00%.</p> <p>The UIB of the underestimation should be lower or equal to 2.00%</p>
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	<p>The lower interval boundary of the overestimate error rate represents the worst (lowest), but possible, value for the system under inspection based on independent measurements of the sample. Its value must remain well above the material error of -2%.</p> <p>The upper interval boundary of the underestimate error rate represents the worst (highest), but possible, value for the system under inspection based on independent measurements of the sample. Its value must remain well below the material error of 2%.</p> <p>A conforming system must pass both conditions.</p>
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 11: LPIS area based non-conforming RP (10202)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Non-quantitative attribute correctness of all Reference Parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that were not feasible for measurement, minus RPs having referenceArea that is not directly comparable (see Annex II). (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10202
3.2	Name (Name)	Number of area non-conforming reference parcels in LPIS
3.3	Alias (alias)	LPIS_RP_NEA
3.4	Element name (elementName)	Thematic accuracy/Non-quantitative attribute correctness
3.5	Basic Measure (basicMeasure)	Error count
3.6	Definition (definition)	Number of area-based non-conforming Reference Parcels (as identified in measures 10102_2 and 10102_3) in respect to all Reference Parcel from the DQ_Scope.
3.7	Description (description)	No measures. Use the values from 10102_2 and 10102_3 Total number of area non-conforming Reference Parcels derived from measures 10102_2 and 10102_3 compared to the total number of Reference Parcel from the DQ_Scope.
3.8	Value Type (valueType)	2 – Number
3.9	Value Structure (valueStructure)	“Number” out of “number”
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram)
3.11	Example (example)	178 out of 1250
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation, aggregation and conformity (10102_2 and 10102_3)
4.2	Date (DateTime)	yyyy-mm-dd

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4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	<p>For all parcels in DQ_scope,</p> <ol style="list-style-type: none"> 1. Count and report (nominator) the number of non-conforming Reference Parcels (as identified in measures 10102_2 and 10102_3) 2. Count and report the total number of Reference Parcels as denominator <p>NOTE: Area based non-conforming reference parcels are those parcels, allowing undue payment on ineligible land or excluding agricultural land, above the given threshold, as well as those "contaminated" with ineligible features.</p>
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	The proportion parcels with an incorrect recorded eligible area should not exceed 5 %, expressed as Limiting Quality (LQ) of 12.5.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	<p>A LPIS has 1,550,645 reference parcels: a sample of 200 with acceptance number of 18 is prescribed. More than 18 Reference Parcels out of 200 (or 112/1250) are area non-conforming. The LPIS fails to be conforming.</p> <p>As 1250 were actually inspected and measured, the equivalent acceptance number becomes 112 (=1250*18/200, truncated). 178 non-conforming parcels were identified.</p>
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 11.2: LPIS area based non-conforming RP larger than 0.1 ha (10202_2)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Non-quantitative attribute correctness of all Reference Parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that were not feasible for measurement, minus RPs having referenceArea that is not directly comparable (see Annex II). (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10202_2
3.2	Name (Name)	Number of area non-conforming reference parcels in LPIS with etsReferenceArea larger or equal to 0.10 ha.
3.3	Alias (alias)	LPIS_RP_NEA_B
3.4	Element name (elementName)	Thematic accuracy/Non-quantitative attribute correctness
3.5	Basic Measure (basicMeasure)	Error count
3.6	Definition (definition)	Number of area-based non-conforming Reference Parcels (as identified in measures 10102_2 and 10102_3), with area recorded bigger than or equal to 0.1 ha in respect to all Reference Parcel from the DQ_Scope.
3.7	Description (description)	No measures. Use the values from 10102_2 and 10102_3. Total number of area non-conforming Reference Parcels derived from measures 10102_2, 10102_3, with etsReferenceArea bigger than or equal to 0.1 ha, compared to the total number of Reference Parcels from the DQ_Scope. NOTE 1: Area based non-conforming reference parcels are those parcels, allowing undue payment on ineligible land or excluding agricultural land, above the given threshold, as well as those “contaminated” with ineligible features.
3.8	Value Type (valueType)	2 – Number
3.9	Value Structure (valueStructure)	“Number” out of “number”
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).
3.11	Example (example)	108 out 1250
4	Data quality evaluation	

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4.1	DQ_AggregationDerivation	Derivation, aggregation and conformity (10102_2 and 10102_3)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	For the parcels in DQ_scope: <ol style="list-style-type: none"> 1. Count and report the number of non-conforming Reference Parcels (as identified in measures 10102_2 and 10102_3) with etsReferenceArea larger than or equal to 0.1 ha (nominator) 2. Count and report the total number of Reference Parcels, as denominator
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	The proportion parcels with an incorrect recorded eligible area or contaminated should not exceed 5 %, expressed as Limiting Quality (LQ) of 12.5.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	Less than 18 Reference Parcels out of 200 (or 112/1250) are non-conforming. The LPIS is conforming. A LPIS has 1,550,645 reference parcels: a sample of 200 with acceptance number of 18 is prescribed. As 1250 were actually inspected and measured, of which 70 were smaller than 0.1 ha. The applied denominator however is still the total number of measured parcels – 1250. The equivalent acceptance number becomes 112 (=1250*18/200, truncated). 108 non-conforming parcels were identified.
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 11.3: LPIS land classification error RP (10202_3)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Non-quantitative attribute correctness of all Reference Parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample, minus RPs that were not feasible for measurement. (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10202_2
3.2	Name (Name)	Number of non-conforming reference parcels in LPIS with classification error
3.3	Alias (alias)	LPIS_RP_CLS
3.4	Element name (elementName)	Thematic accuracy/Non-quantitative attribute correctness
3.5	Basic Measure (basicMeasure)	Error count
3.6	Definition (definition)	Number of non-conforming Reference Parcels with classification error (as identified in measure 10102_4), with respect to all Reference Parcel from the DQ_Scope.
3.7	Description (description)	No measures. Use the values from 10102_4. Total number of non-conforming Reference Parcels derived from measures 10102_4, compared to the total number of Reference Parcels from the DQ_Scope. NOTE 1: Reference parcel found to be area non-conforming for 10102_2 will not be counted as non-conforming for 10102_4 if: <ul style="list-style-type: none"> • They have only one type of agricultural land cover category recorded in the LPIS AND • This category corresponds to the one found on the LUI during the ETS
3.8	Value Type (valueType)	2 – Number
3.9	Value Structure (valueStructure)	“Number” out of “number”
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).
3.11	Example (example)	108 out 1250
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation, aggregation and conformity (10102_2 and 10102_4)
4.2	Date (DateTime)	yyyy-mm-dd

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4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	For the parcels in DQ_scope: 3. Count and report the number of non-conforming Reference Parcels (as identified in measure 10102_4) (nominator) 4. Count and report the total number of Reference Parcels, as denominator
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	The proportion parcels with an incorrect recorded eligible area should not exceed 5 %, expressed as Limiting Quality (LQ) of 12.5.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	More than 18 Reference Parcels out of 200 (or 112/1250) are non-conforming with classification error. The LPIS fails to be conforming. A LPIS has 1,550,645 reference parcels: a sample of 200 with acceptance number of 18 is prescribed. As 1250 were actually inspected and measured, the equivalent acceptance number becomes 112 (=1250*18/200, truncated). 178 non-conforming parcels were identified.
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 12: LPIS eligibility rates (10203)

	Data quality components	Value/Example/Description		
1	Data Quality Unit	Thematic accuracy/Quantitative attribute correctness of all Reference Parcels in scope		
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample and have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that were not measured, minus RPs having referenceArea that is not directly comparable (see Annex II). (005 – Dataset)		
3	Data quality measure			
3.1	Measure identifier (measureIdentifier)	10203		
3.2	Name (Name)	Distribution of the reference parcels in LPIS, according to the correctness of the eligible area recorded.		
3.3	Alias (alias)	LPIS_RP_SEA		
3.4	Element name (elementName)	Thematic accuracy/Quantitative attribute correctness		
3.5	Basic Measure (basicMeasure)	Error rate		
3.6	Definition (definition)	Distribution of the Reference Parcels, according to the correctness of the eligible area recorded.		
3.7	Description (description)	Distribution of the Reference Parcels, according to the correctness of the eligible area recorded (in respect to the eligible area observed).		
3.8	Value Type (valueType)	2 – Number		
3.9	Value Structure (valueStructure)	4 - Table		
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram)		
3.11	Example (example)		Difference between eligible area observed and eligible area recorded in the RPs [%]	% of RP
			<= -50	1
			(-50; -20]	2.5
			(-20; -12]	1.2
			(-12; -8]	1
			(-8; -4]	3.1
			(-4; -2]	15
			(-2; 0]	34
			(0; 2]	44
			(2; 4]	14.6
			(4; 8]	15.1
			(8; 12]	7.21
			(12; 20]	2.09
			(20; 50]	5
	>50	1.3		
4	Data quality evaluation			

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4.1	DQ_AggregationDerivation	Derivation and aggregation (10102, 10102_2)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	<p>For the parcels in DQ_scope, classify the Reference Parcels according to the degree of deviation of the area recorded from its observed value.</p> <ol style="list-style-type: none"> 1. Calculate the relative area correctness for each item: <ul style="list-style-type: none"> • First, calculate the area difference between area measured and etsReferenceArea for each item, then calculate the ratio between that area difference and the etsReferenceArea for each item. • Sum up for the total number of selected items (n). <p>NOTE: For all calculation of area difference, use units of the same kind, i.e. m2 or hectares with 4 decimals.</p> <ol style="list-style-type: none"> 2. Select the items belonging to each ratio range and count the number of item selected. 3. Divide the result by the total number of selected items (n). 4. Express in parts per hundred: multiply by 100 to find the value as a percent with two decimal place. <p>NOTE: Reference parcels with zero area differences (actual or due to rounding) are reported in the range (-2; 0].</p>
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	There is no specified conformance threshold for the distribution; the distribution primarily serves as a source of information.
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Record (table)
5.2	Value unit	Percent
5.3	Explanation	Since conformance quality level is not specified, only the values are reported

TABLE 13: LPIS number of causes for non-conformity (10204)

	Data quality components	Value/Example/Description	
1	Data Quality Unit	Thematic accuracy/Non quantitative attribute correctness of all identified non-conforming Reference Parcels in scope	
2	Data Quality Scope	All identified possible weaknesses in the non-conforming Reference Parcels found, which take part of the QC sample. (005 – Dataset)	
3	Data quality measure		
3.1	Measure identifier (measureIdentifier)	10204	
3.2	Name (Name)	Abundance of the causes for occurrence of non-conformities in the reference parcels (derived from 10107).	
3.3	Alias (alias)	LPIS_RP_CEA	
3.4	Element name (elementName)	Thematic accuracy/Non quantitative attribute correctness	
3.5	Basic Measure (basicMeasure)		
3.6	Definition (definition)	Abundance of the causes for occurrence of non-conformities among the reference parcels (derived from 10107).	
3.7	Description (description)	Table showing the number of non-conformities affected by a given causes, as derived from 10107.	
3.8	Value Type (valueType)	2 – Number	
3.9	Value Structure (valueStructure)	4 - Table	
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).	
3.11	Example (example)	Causes for occurrence of non-conformities	non-conformities, affected by a given cause
		Changes of the underlying land were not applied	28
		Revisions of the Regulation were not applied	0
		Incomplete processing	10
		Erroneous processing	4
		Incompatible LPIS design	0
4	Data quality evaluation		
4.1	DQ_AggregationDerivation	Derivation and conformity (10107)	
4.2	Date (DateTime)	yyyy-mm-dd	
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal	

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4.4	Evaluation method type code(DQ_EvalMethodType Code)	002
4.5	Evaluation method description (evaluationMethodDescription)	For all parcels in DQ_Scope and for each predefined cause: <ol style="list-style-type: none"> 1. Take the number of non-conformities (nominator) affected by the given causes, as derived from 10107, from all non-conforming reference parcels found. 2. Compare that number to the proportional acceptance number for index LQ12.5.
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	None of the above categories should affect more than 5 percent of the parcels, expressed as Limiting Quality (LQ) of 12.5.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	A LPIS has 404.257 reference parcels: a sample of 800 parcels is required. 42 non-conformities were observed in the sample; respectively 28 caused by updates, 10 by omission and 4 by errors. All are below the proportional acceptance number of 72 (= 18 * (800 / 200)). Note: the rate of change (calculated in table 16 will be 28 / 800 or 3.5 per 100 items
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 14: LPIS critical defects (10205)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Completeness/Commission of all Reference parcels in scope
2	Data Quality Scope	All Reference Parcels, which are part of the QC sample (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10205
3.2	Name (Name)	LPIS critical defects
3.3	Alias (alias)	LPIS_RP_CRA
3.4	Element name (elementName)	Completeness/Commission
3.5	Basic Measure (basicMeasure)	Number of commissions
3.6	Definition (definition)	Total number of Reference Parcels that have critical defects.
3.7	Description (description)	Abundance of Reference Parcels with critical defects (number of commissions).
3.8	Value Type (valueType)	2 – Number
3.9	Value Structure (valueStructure)	“Number” out of “number”
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).
3.11	Example (example)	1 out of 800
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation and conformity (10106)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code DQ_EvalMethodTypeCode	002
4.5	Evaluation method description evaluationMethodDescription	For the parcels in DQ_scope, <ol style="list-style-type: none"> Count and report the number of Reference Parcels having critical defects (nominator), as derived from measure 10106. Report the total number of reference Parcels as denominator

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4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	Critical defects should not affect more than 1 percent of the parcels, expressed as Limiting Quality (LQ) of 2.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	An LPIS has 469,421 reference parcels: a sample of 800 parcels with acceptance number of 10 is prescribed. During inspection, 1 non-conforming parcel is found. Less than 10 reference parcels out of 800 have critical defects. The LPIS is conforming.
5.3	Pass	Boolean (1=yes, 0=no)

TABLE 15: LPIS declared area (10206)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Thematic accuracy/Quantitative attribute accuracy of all parcels in scope
2	Data Quality Scope	All parcels with areas [ha] declared in year N, Any inspected RP that have etsReferenceArea that equals the maximum eligible area (MEA) available for direct payment, minus RPs that cannot be measured, minus RPs who fail RP_CNF/RP_CNT Note: in 2011, also minus RP with incomparable area. (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10206
3.2	Name (Name)	LPIS total declared area
3.3	Alias (alias)	LPIS_RP_DCA
3.4	Element name (elementName)	Thematic accuracy/Quantitative attribute accuracy
3.5	Basic Measure (basicMeasure)	Correct items rate
3.6	Definition (definition)	Rate of the declared hectares in year N with respect to the total number of eligible hectares recorded in LPIS for the RPs in the DQ_Scope: <i>NOTE: the DQ_scope identifies only parcels that are area-based conformant, so this is not "an IACS-only" but a true ETS measure</i>
3.7	Description (description)	Percentage of the eligible hectares declared in year N, with respect to all eligible hectares recorded in the LPIS.
3.8	Value Type (valueType)	4 - percentage
3.9	Value Structure (valueStructure)	V1: Percent (%), V2: Percent (%)
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).
3.11	Example (example)	V1: 84% AND V2: 91%
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation and aggregation (10202 and 10202_2)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directInternal

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4.4	Evaluation method type code(DQ_EvalMethodType Code)	001
4.5	Evaluation method description (evaluationMethodDescription)	<ol style="list-style-type: none"> 1. For the parcels in DQ_scope, calculate and report the ratio between the sum of hectares declared in year N and the sum of area recorded in LPIS.(v1) 2. Report the same rate for the whole IACS (as defined in Article 9.1. (a) of Reg. 2014/809. NB, the "maximum eligible area" should be used).(v2)
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	There is no specified conformance threshold.
5	Data quality result DQ_QuantitativeResult	
5.1	Value	Record (number)
5.2	Value unit	Percent
5.3	Explanation	<p>Since conformance quality level is not specified, only the values are reported.</p> <p>The ETS has assessed that 1152 area conforming reference parcels correctly record 155.257 ha of eligible area between them. These very parcels supported a declaration total of 130.416 ha. This means that 84% of the eligible hectares are effectively declared. The same rate for the whole IACS is reported to be 91%</p>

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TABLE 16: LPIS cumulative land changes (10207)

	Data quality components	Value/Example/Description
1	Data Quality Unit	Completeness/Commission of all identified non-conformities in the Reference Parcels found in scope
2	Data Quality Scope	All identified non-conformities found in the Reference Parcels that are part of the QC sample. (005 – Dataset)
3	Data quality measure	
3.1	Measure identifier (measureIdentifier)	10207
3.2	Name (Name)	LPIS cumulative land changes
3.3	Alias (alias)	LPIS_RP_CMC
3.4	Element name (elementName)	Completeness/Commission
3.5	Basic Measure (basicMeasure)	Error rate
3.6	Definition (definition)	Cumulative rate of undetected non-conformities (possible weaknesses) due to permanent physical changes of the land cover that has an impact on the eligibility.
3.7	Description (description)	Cumulated rate of non-conformities due to undetected or unaccounted land cover changes, as observed in ETS, counting from the year the LPIS was last systematically verified. It is calculated by adding up, year after year, the non-conformities due to undetected or unaccounted land cover changes as found during the annual ETS inspection.
3.8	Value Type (valueType)	4 - percentage
3.9	Value Structure (valueStructure)	Percent (%)
3.10	Source Reference (sourceReference)	Citation (the citation of the documentation of the measure – Annex II, explanation of the Activity Diagram).
3.11	Example (example)	35%
4	Data quality evaluation	
4.1	DQ_AggregationDerivation	Derivation and conformity (10204)
4.2	Date (DateTime)	yyyy-mm-dd
4.3	Evaluation method type (DQ_EvaluationMethod)	(001 directInternal, 002 directExternal, 003 indirect) - directExternal
4.4	Evaluation method type code(DQ_EvalMethodType Code)	002

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4.5	Evaluation method description (evaluationMethodDescription)	<ol style="list-style-type: none"> 1. Report the number of non-conformities assigned with the cause "Changes of the underlying land were not applied", as defined in 10204 per LPIS control zone. 2. Determine the effective rate (in percentage) of these non-conformities per zone by dividing by: (1) the total number of inspected reference parcels, which are part of the LPIS QA sample of any given zone and (2) by the number of years since the last systematic update of that zone (exceptionally, use value 1 as "number of years" if the update of the zone/subzone was in the current year). 3. Average the overall annual change rate over all LPIS control zones 4. Sum up the annual change rates reported for previous years, starting from the year of the last systematic update of the current LPIS (consider the entire system, not only those parts encompassed by the LPIS control zones in the current assessment year) and add to the overall annual change rate calculated for current assessment year. 5. Report the cumulative rate. <p>NOTE: If parts (subzones) of a given LPIS control zone were systematically updated in different years, then step 2 is changed in the following way:</p> <ol style="list-style-type: none"> a. Determine the annual rate (in percentage) of the non-conformities per subzone by: (1) dividing by the total number of inspected reference parcels, which are part of the LPIS QA sample of any given subzone and (2) by the number of years since the last systematic update of that subzone (exceptionally, use value 1 as "number of years" if the update of the zone/subzone was in the current year). b. Average the overall annual change rate over all subzones, belonging to the LPIS control zone
4.6	Evaluation procedure	Refer to Annex II
4.7	Conformance level (DQ_ConformanceLevel)	The cumulative rate of non-conformities due to undetected or unaccounted land cover changes shall not exceed 25 percent, counting from the year the parcels were last systematically verified.
5	Data quality result DQ_ConformanceResult	
5.1	Specification	Discussion document
5.2	Explanation	<p>The cumulative rate of non-conformities due to undetected or unaccounted land cover changes is more than 25% as from 2012. LPIS fails to be conforming.</p> <p>2010: 12% - cumulated: 12% 2011: 12% - cumulated: 24% 2012 : 11% - cumulated: 35%</p>

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		The cumulative rate of parcels affected by land change is 35 %.
5.3	Pass	Boolean (1=yes, 0=no)

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2. DETAILED INSTRUCTION 1: Definitions and conditions for occurrence of critical defect.

The ETS reports the types of potential critical defect given in Table A1, if the inspection observes the specified local ground conditions. The occurrence of one or more critical defects renders a reference parcel non-conforming.

Table A1

Critical Defect	General conditions (from IXIT)	Local Ground Conditions
Total absence of agricultural area	N/A	<ul style="list-style-type: none"> etsReferenceArea is more than zero There is a total lack of agricultural land cover, which might represent eligible hectare on the area represented by the Reference Parcel. <p><i>The total absence of agricultural area indicates an evident problem.</i></p>
Invalid RP perimeter	N/A	<ul style="list-style-type: none"> Reference parcel cannot be measured AND there are non-agricultural elements within 5m of the Reference Parcel boundary AND none of the RP perimeter "prime" vertices, which outline the shape of the Reference Parcel, correspond to the observed ground truth (as visible through the existing land cover, land use features). AND at least one non-agricultural land cover feature is "crossing" the 5m buffer into the LUI core of the individual Reference Parcel. <p><i>These parcels are virtual and so irrelevant for land administration.</i></p>
Invalid common RP boundaries	Applicable only for physical and topographic block systems. IXIT qualifier A reports "TB" or "PB"	<ul style="list-style-type: none"> The Land use / land cover counter-indicates the presence of common stable physical boundary between the inspected reference parcel and at least two of its neighbouring reference parcels. AND the common boundary location cannot be derived from surrounding land cover / land use elements. <p><i>These parcels represent sub-parcels of larger units.</i></p>
Incomplete block	Applicable only for production) block systems. IXIT qualifier A reports "TB", "PB", "FB" or "AP".	<ul style="list-style-type: none"> The Land use / land cover counter-indicates the presence of a true stable physical boundary of the block AND the LPIS does not hold a neighbouring non-zero MEA parcel (adjacent to that "missing" boundary) where the farmer can declare that land clearly in his use.

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		<ul style="list-style-type: none"> • AND this unaccounted land use indicates that more than 10 percent or 2000m2 (whichever is LARGER) of the agricultural land found is missing from the LPIS. • AND the LPIS QA inspection cannot produce external evidence that the land tenure of this unaccounted part of the agricultural land found is held by a farmer who is not receiving any aid for the assessment year. <p><i>These parcels prevent the neighbouring, potentially eligible land, land from being declared.</i></p> <p>NOTE: The presence of a neighbouring reference parcel is not restricted to parcels within the scope of the current assessment year.</p>
Multi-polygon	Applicable only for production) block systems. IXIT qualifier A reports "TB", "PB", "FB" or "AP".	<ul style="list-style-type: none"> • The Reference Parcel identifier is actually composed of or associated to two or more disjoint polygons. <p><i>The issue with multi-polygon is that it does not allow unambiguous location of the agricultural activity, even if managed by the same farmer.</i></p> <p>NOTE: Internal or adjacent polygons representing sub-divisions in a single production block are not multi-polygon defects.</p>
Multi-parcel	Applicable only for production) block systems. IXIT qualifier A reports "TB", "PB", "FB" or "AP".	<ul style="list-style-type: none"> • The inspected Reference Parcel is an amalgamate of 10 (ten) or more clearly distinct units of agricultural land which according to the internal LPIS implementation rules and decisions rules should have been processed separately. <p><i>The issue with multi-parcel is that it spreads or "blurs" the information over several land units, adversely effecting land identification and land use accuracy.</i></p>

3. DETAILED INSTRUCTION 2: Application of waivers, which can vindicate a reference parcel contaminated by ineligible features.

The Commission issues the following waivers and Member States may choose to activate it to vindicate an observed contamination of the Reference Parcel by one or more ineligible features.

- The waiver is Rptype independent; all Rptypes can apply the waiver, if all waiver conditions are met.
- General conditions are assessed at LPIS level during the time of MTS and indicated in the IXIT.
- Local conditions are assessed during ETS of the parcel with an observed contamination. The fulfilment of the conditions can be screened.
- As a result, for these instructions one must interpret:
 - “Verify that”: verification of conditions to be done once at the LPIS level (MTS)
 - “Check that”: checking of conditions to be done at the parcel level (during ETS inspection)
- Waiver C essentially requires documentation indicating that the contamination inside the Reference Parcel was known and dealt with appropriately.

Table A2

Waiver	General condition	Local conditions to be verified during ETS inspection
C	Verify that a separate GIS layer represents (in)eligible land cover. A presence of such separate GIS layer can be expected in the following cases: 1. The IXIT qualifier D reports any of values of q13. 2. Module M11 reports the presence of checkAgriculturalLandGeometry (test case 1421)	Verify, if the contamination is fully located within the separate GIS layer for non-eligible areas, or if it is fully located outside the separate GIS layer for eligible areas.

4. Detailed Instruction 3: Categorization of the non-conforming reference parcels

In order to decide, if a particular cause can explain the observed non-conformity, the operator should perform a minimum set of actions, specific for each cause. An indicative and non-exhaustive list of MTS-related actions is given below (for each cause separately). Start with the first listed cause. If the cause is not applicable, proceed with the next one from the cascade list. Stop when the correct cause is determined:

1. Changes of the underlying land were not applied
 - Check the date of validity of the reference parcel (by consulting the Module M11, test cases "checkReferenceParcelValidFrom" and checkReferenceParcelValidTo" of the MTS)
 - Check the results from qualifier B of the IXIT
 - Check any archive reference data (orthoimagery, topomaps, cadastral plans,..)
 - Consult the vector and orthoimagery system metadata as part of the MTS-log

Typical examples are a newly constructed road or building that is still being considered agricultural land or a recent conversion into agricultural land that has not been taken into account.
2. Revisions of the Regulations were not applied
 - Check the rules on eligibility applied for the given LPIS lot (by consulting the eligibility profile) and the results from Module M11 "Group of tests related to the BPS/SAPS layer feature types" of the MTS

Typical examples are an underestimate of the maximum eligible area because the abolishment of separate schemes (olives, vineyards, decouplement,...) or a creation of new schemes (greening, VCS, permanent grassland subject to ELP) have not been introduced in LPIS.
3. Incomplete processing
 - Check the availability of separate datasets or layers, which store agricultural land cover types, or small exclusions or landscape features (by consulting Modules M11/M12 of MTS)
 - Check the results from qualifiers B, C and D of the IXIT
 - Check archive reference data (orthoimagery, topomaps, cadastral plans,..)

Typical examples are that a separate sub-parcel or eligibility layer, although foreseen in the LPIS design, has not been produced for the full LUI or that a validation procedure, although required by the LPIS creation specifications, has not been performed (a particular example is where a military mask prevented photo interpretation in the past and the parcel was "cut off" at the mask).
4. Erroneous processing
 - Check the validity date of the reference parcel (by consulting the Module M11, test cases "checkReferenceParcelValidFrom" and checkReferenceParcelValidTo" of the MTS)
 - Check archive reference data (orthoimagery, topomaps, cadastral plans,..)

Typical examples are that the operator has used inappropriate (e.g. outdated) source material or there has been a manifest deviation from the documented instructions.
5. Incompatible LPIS design
 - Check the definition of the Reference Parcel (by consulting results from qualifier A of IXIT)
 - Consult historical data

This is when the situation that has not been foreseen in the specifications and cannot be explained by any of the above causes.

Typical example could be a reference parcel of AP type, detected during the ETS as being a multi-polygon.

5. DETAILED INSTRUCTION 4: Application of waiver “E”, which can vindicate a classification error found on the reference parcel

The Commission issues the following waiver and Member States may choose to activate it to vindicate an observed non-conformity on the Reference Parcel (Item of inspection) related to the classification of the agricultural land cover categories (AL, PG, PC).

- The waiver is RPTYPE independent; all RPTYPES can apply the waiver, if all waiver local conditions are met.
- Local conditions are assessed and checked for each individual polygon classified as HV during the ETS of the item with an observed classification error. The fulfilment of the conditions can be screened.
- Waiver E essentially requires documented evidence for the occurrence of arable land (AL) within that HV polygon over the last 5 years preceding the ETS assessment. Historic imagery, farmer’s declarations and third party evidence are the acceptable sources of evidence.
- Provide the evidence for the use of waiver E as PDF document, as part of the ETS reporting package. Point out to the relevant ID of the reference parcel.

Table A3

Waiver	Local conditions to be verified during ETS inspection
E	There is sufficient evidence that: <ul style="list-style-type: none">• in the last 5 years preceding the ETS assessment part of the HV polygon was arable land (either physically or as part of AECM commitment)• the area occupied by this arable land would be delineated separately in the ETS if it was visible on the current orthoimage used in the ETS

6. DETAILED INSTRUCTION 5: Clarifications on how to manage land defined under Art. 32(2)(b) of R1307/2013 in the ETS

The following paragraphs explain how reference parcels with non-agricultural eligible area as referred to in Art. 32(2)(b) of 1307R2013 are processed in the current ETS setup.

1. Reference parcels containing only non-agricultural land cover, related to Art.32(b)(2)

These reference parcels will be checked for critical defects (all applicable, except of "total absence of agricultural area). They will not be subject to area-based quality measures (etsReferenceArea is NOT equal the MEA available for payment); however, they can be measured and associated area can be mapped. Theoretically, they will fall within the scope of the classification correctness. Nevertheless, no meaningful test can be conducted as: (1) none of these non-agricultural and at the same time eligible LC types can be attributed to any of the three agricultural land categories; (2) the correspondent value in the LPIS for the presence of these agricultural categories will be always zero. Thus, the RP will be in principle always conformant with respect to the classification correctness.

NOTE: If a given natural vegetation as defined in Art.32(2)(b)(i) of 13007R2013 can be qualified as permanent grassland in line with Article 45(1) of the same regulation, then it must be recorded as such in the LPIS and treated in the LPISQA as part of the agricultural area envelope. It will be processed in the ETS the same way as any agricultural land cover.

2) Reference parcels containing both agricultural land cover (Art. 4 of 1307R2013) and non-agricultural land cover, related to Art.32(b)(2)

In the ETS, these reference parcels will be processed the same way as the "normal" reference parcels having etsReferenceArea above zero. Since the etsReferenceArea will NOT equal the MEA available for payment, they will not be subject to area-based measures related to eligibility. They will fall within the scope of the classification correctness test: only the observed and the correspondent recorded agricultural land cover will be taken into account - the eligible non-agricultural land cover will be disregarded.