



Delivery Report Romania

EEA-FTSP-Sealing_CountryDeliveryReport-RO

Issue 1.0

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
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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document presents the country delivery report of EEA's Fast Track Service Precursor Sealing Product of Romania.

According to the Tender Specifications, this report corresponds to deliverable 5 (38 Country delivery reports).

1.2 APPLICABLE DOCUMENTS

ITD-0490-PRO-0006	Proposal responding to EEA's Invitation for Tender, Technical Offer including Management Part –Issue 1

1.3 REFERENCE DOCUMENTS

EEA/IDS/07/001	Tender Specifications "GMES Fast Track Service on Land Monitoring", EEA, 2006
ISO9001	ISO 9001: 2000 Standard
ITD-QMS-POL-0001_Infoterra_Quality_Policy	Quality Policy Statement
QMS-ITD-MA-0011_QMSManual_I3.1	Quality Management System (QMS) Manual
ITD-UMS-POL-0001_Infoterra_Environmental_Policy	Declaration of Enterprise Environmental Policy
ITD-QMS-STD-0001-ControlOfDocumentation	Control of Documentation and Data
QMS-ITD-ST-0001_CSM	Customer Satisfaction Measurement
QMS-ITD-PR-0003_PM_ProductDevelopment_I4	Project Management, Product (Prototype) Development and Production

2 DATA SPECIFICATIONS

2.1 TECHNICAL PRODUCT SPECIFICATION

Content
<i>Raster dataset of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in full spatial resolution (20 x 20 m) with the associated metadata.</i>
Geographic coverage
<i>Country of Romania (RO)</i>
<i>Coverage [km²]: 237.500 (plus additional buffer of 1000 meters outside of country border)</i>
Input data sources
<p><u>Input data provided by ESA:</u></p> <ul style="list-style-type: none"> ▪ <i>Orthorectified satellite data coverage for Europe (Image2006), acquired primarily in the reference year 2006 (+/- 1 year), covering two dates, used sensors SPOT 4 and 5 (HRVIR) and IRS-P6 LISS-III:</i> <ul style="list-style-type: none"> • <i>20 m resampled (with cubic convolution interpolation)</i> • <i>4 spectral bands</i> • <i>Max. 5% cloud coverage</i> • <i>Covering 2 dates, at least 6 weeks apart from the respect. scene selected for the first coverage</i> • <i>Orthorectified towards national projection systems (used DTM unknown)</i> • <i>Delivery on a country by country basis foreseen</i> • <i>Metadata to each scene</i> <p><u>Input data provided by EEA</u></p> <ul style="list-style-type: none"> ▪ <i>Dataset with national country borders (to be used for clipping the data at a national level) as defined and provided by the EEA</i> <p><u>Ancillary input data</u></p> <ul style="list-style-type: none"> ▪ <i>National Corine Land Cover 2000 data in vector format to be used for the stratification of the QA sample plots</i>
Methodology
<i>Supervised classification of built-up areas with following visual improvement of classification result and derivation of degree of soil sealing based on calibrated NDVI</i>
Geometric resolution
<i>Pixel resolution 20 x 20 m</i>

Coordinate Reference System
<i>Projection: Stereo_70 (Double Stereographic)</i>
<i>False Easting: 500000,00</i>
<i>False Northing: 500000,00</i>
<i>Longitude of Origin: 25°00'00,00"</i>
<i>Latitude of Origin: 46°00'00,00"</i>
<i>Scale_Factor: 0,99975</i>
<i>Datum: Krasovsky 1940</i>
Geometric accuracy (positioning scale)
<i>According to orthorectified satellite image base delivered by ESA</i>
Thematic accuracy (in %)
<i>Classification accuracy per hectare (based on 100 x 100 m grid) of built-up non built-up areas is > 85% (assessed according approach as described in chapter 4.1)</i>
Accuracy assessment approach
<i>Accuracy assessment based on random sample plots</i>
Delivery format
<i>IMAGINE Image (IMG)</i>
Data type
<i>Raster</i>
Raster coding
<i>Thematic pixel values</i>
<i>0 – Non-built up areas, water bodies inland</i>
<i>1-100 - sealing values for built-up areas</i>
<i>254 – Unclassifiable areas (clouds, shadows, etc.)</i>
<i>255 – No Data (No thematic information)</i>
Metadata
<i>According to EEA metadata standards (EEA MSGI specification)</i>
Ancillary Data – Mitigation shape file
<i>Metadata set per delivered country in vector format defining all areas which deviate from the ITT's EO data specifications (i.e. clouds, acquisition date). The vector layer is derived from image footprints and cloud cover information of Image2006 within the country border.</i>
<i>The attribute table contains information about WU identification and possible deviations from the standard specifications of Image2006:</i>

- *[Cntr]* Country Code;
- *[SCU]* Number of Sub-Country unit containing the Working Unit;
- *[WU_ID]* Full name of the Working Unit;
- *[No_acqu]* Number of acquisitions within the WU; 0 = gap / no image available;
- *[Out_Veg]* No of acquisition dates outside of country-specific vegetation period;
- *[Below_6w]* Acquisition dates less than 6 weeks apart;
- *[Cloud_cov]* Thematic value indicating the cloud coverage: No clouds = 1; Clouds present in coverage 1 = 2; Clouds present in Coverage 2 = 3; Clouds present in both coverages = 4

2.2 ALGORITHMS USED

The aim of the image processing is to derive in a robust, reliable and reproducible way based on satellite images (Spot 4/5, IRS LISS) a raster dataset of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in full spatial resolution (20 x 20 m).

As the main challenge, the derivation of a continuous degree of soil sealing has to be solved. The proposed image processing approach is based on the fact that a reliable derivation of soil sealing degrees is not possible directly from the vegetation index. Low vegetation index values, which are characteristic for densely built-up areas are e.g. also found in bare soil areas of agricultural fields. Even when using multi-temporal satellite images with different acquisition dates in combination with bi-temporal, multi-spectral classification techniques the result may be improved, but the vegetation indices of two acquisitions are still too ambiguous.

Therefore, the proposed image processing approach will start with deriving a binary map of built-up areas and then further subdivide this area into 100 degrees of soil sealing, ranging from totally sealed surfaces (100% degree of soil sealing) up to built-up areas with extensive vegetation cover (1% degree of soil sealing). This allows the final user to aggregate the continuous values as required.

To be viable for this objective the classification methodology has to fulfil the following general criteria:

- Allow for local calibration of parameters used per working sub-area (as defined by satellite images) to overcome diversity of different regions in Europe and image immanent characteristics (such compensating for different settlement structures, ecozones, phonological and weather conditions).
- Deliver the required accuracy
- Maximise consistency and objectivity of the results all over Europe
- Maximise cost-efficiency under given constraints

- Maximise standardisation of production and working motivation of the analysts
- Secure realisation in due time.

Based on these criteria, the proposed methodological approach consists of the following main steps:

- a) Data preparation & management: Provision of spatial database of bi-temporal satellite images and derived working sub-areas ("Working Units" = WU) to be processed in the following steps
- b) Core processing, containing the 3 main processing steps:
 - (1) Hybrid automated classification with supervised and unsupervised elements, leading to binary maps of built-up area
 - (2) Manual correction of the binary built-up map to obtain the required quantitative thematic accuracy (85%) as well as good qualitative results
 - (3) Derivation of degree of soil sealing based on the NDVI (Normalised Difference Vegetation Index)
- c) Generation of sub-country / country data sets
- d) Accuracy assessment
- e) Re-projection & mosaicing, generation of seamless European dataset.

2.3 FORMAT DESCRIPTION

Delivery format
<i>ERDAS IMAGINE Image (IMG)</i> <i>Data Type: unsigned 8-bit</i> <i>Compression: Run-length encoding (ESRI)</i> <i>Number of bands: 1</i> <i>Pixel size: 20 m</i>
Data type
<i>Thematic Raster</i>
Metadata
<i>According to EEA metadata standards (EEA MSGI specification)</i>

2.4 METADATA

See European Environment Agency – Metadata Standard for Geographic Information (EEA-MSGI), Version 1.1a (18 August 2004).

The metadata is provided as XML-file and as PDF-document according to EEA Metadata Standard for Geographic Information (EEA-MSGI).

3 SUMMARY OF PRODUCTION

3.1 TIMETABLE, PRODUCTION MILESTONES

Delivery by ESA	Data Reception	Data Preparation		Received by SP	Production	
		Start	End		Start	End
03.08.2007	7.08.2007	8.08.2007	10.10.2007	16.10.2007	31.10.2007	15.05.2008

3.2 TECHNICAL PROBLEMS ENCOUNTERED, MITIGATION MEASURES

Due to cloud and snow coverage in some WUs a monotemporal approach had to be applied. Satellite scenes with acquisition times outside the vegetation period caused more effort during manual editing.

To enlarge the number of sample plots for the statistical QA, the vegetation period valid for the analysis was extended to April 1st until October 31th (formerly May 1st to September 30th). Thus the sample plot count increased from 72 to 243 samples.

4 ACCURACY ASSESSMENT REPORT

4.1 DESCRIPTION OF APPROACH

The derivation of accuracy measures as agreed with EEA includes the following steps:

1. Definition of 100 x 100 m reference grid in national projection of the respective country assessed
2. Stratification of the area based on Corine Land Cover level I. To emphasize the accuracy assessment in the urban areas, 50 % of the sample plots are placed within CLC class Artificial Surfaces, the other 50 % are placed in the remaining classes.
3. Cluster based random sampling based on 100 x 100 m reference grid, defined per single nation, number of samples adapted to nation size in km²
4. Re-projection of reference samples to allow overlay with Google Earth
5. Estimation, if reference cell will be labelled as “built-up” according to EEA definition or not (80% threshold degree of soil sealing) taking into account the visibility of objects in the satellite images used for the production of the raster product (technically possible also when using Google Earth¹)
6. Estimation of overall accuracy to generate accuracy measure (overall accuracy, user accuracy, (commission error), producer accuracy (omission error), per single nation (for internal use & validation only) and for European dataset for publication by EEA.
7. Adaptation of statistics with regard to the mitigation shape file. All sample plots falling within areas of the raster product, where the underlying IMAGE2006 data has been identified to fail the ITT’s specifications, are not included in the final statistics. This includes areas where
 - Less than two coverages of EO data are available
 - One or more acquisition dates are outside the defined acquisition window
 - The acquisition dates of the two coverages used are less than six weeks apart
 - Cloud cover is present in one or more coverage

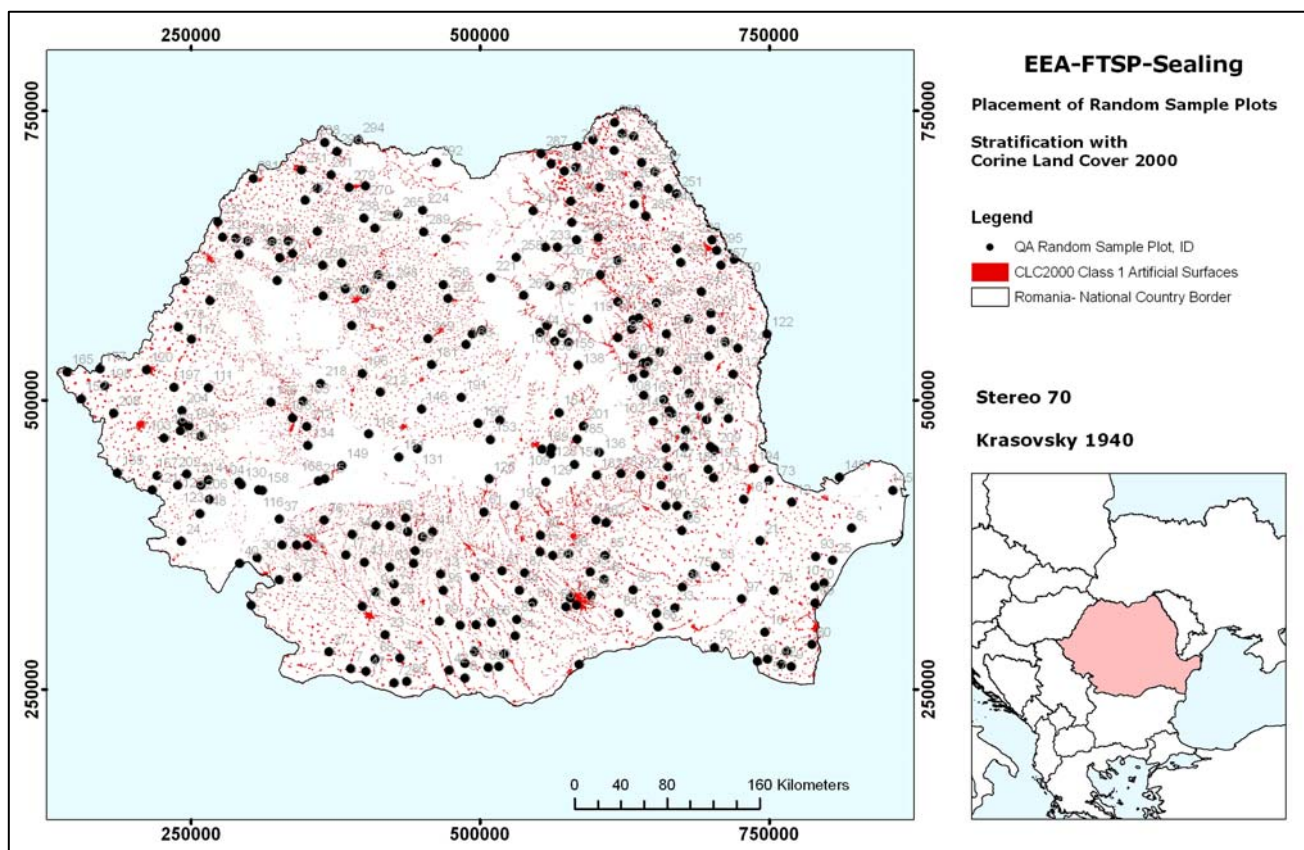
The built-up raster product which is subject to the accuracy assessment is accepted as according to the specifications if the final statistics indicate an overall accuracy of more than 85 %.

Accuracy assessment is performed per country product for internal quality control. For final acceptance by EEA, the overall accuracy of the European product is arbitative.

¹ using web-based information input to a local server

4.2 SAMPLE PLACEMENT (STRATIFICATION, NUMBER & LOCATIONS OF SAMPLE SITES)

Overall number of sample plots: 300 (150 within CLC2000 Artificial Surfaces). The figure below shows the placement of sample plots (black dots) within CLC urban areas (red areas) and outside.



4.3 FINAL RESULT

The final accuracy assessment for the country product surpassed the threshold of an overall accuracy of 85 %.

Classification				Producer's Accuracy	Omission Error
Validation		>80%	<80%	Σ	
	>80%	11	2	13	84,6%
	<80%	3	227	230	98,7%
	Σ	14	229	243	1,3%
	User's Accuracy	78,6%	99,1%		
	Commission Error	21,4%	0,9%		
	Overall Accuracy	97,9%			

5 DETAILED LIST OF PROVIDED DATA

- Raster dataset of built-up and non built-up areas including degree of soil sealing, 2006, in full spatial resolution (20 m x 20 m).
- ArcMap Legend File for raster data set for plotting a degree of soil sealing, aggregated to thematic classes
- ArcMap Legend File for raster data set for plotting a degree of soil sealing in a range from 1-100 %
- Mitigation shape file ; metadata set per delivered country defining all areas which deviate from the ITT's EO data specifications.
- XML-Metadata of raster and vector data after EEA specifications
- EEA Metadata Stylesheet
- Report per Country with description of raster and vector data, country specific production & mitigation issues (the document at hand)
- Product inspection sheet for outgoing deliveries, ensuring product conformity of raster data-set
- National country borders in national projection

ANNEX 1: INTERPRETATION GUIDELINE FOR VISUAL CORRECTION

Objective

To produce a pixel-based high-resolution layer of built-up areas including degree of soil sealing for the EEA member states of homogeneous look & feel with an overall thematic accuracy of 85%.

Definition of Built-up Areas

Built-up areas according to the consortium definition are represented by a degree of soil sealing between 1 and 100%.

Built-up area therefore comprises pixels that are fully or partly covered by houses, roads, mines and quarries and any other facilities, including their auxiliary spaces, deliberately installed for the pursuit of human activities. Built-up area does not include any fully vegetated pixels, even if they are closely related to these activities (such as city parks and gardens), or any other unvegetated non-built-up open spaces covered with bare soil, sand, glacier, bare rocks or water.

(modified according to http://glossary.eea.europa.eu/EEAGlossary/B/built_up_land)

The FTSP in Relation to Corine Land Cover

The FTSP high resolution core land cover data is a complementary element of the GMES Fast Track Services. The data set will be a land cover product, reflecting actual ground cover on a pixel by pixel level rather than functional properties.

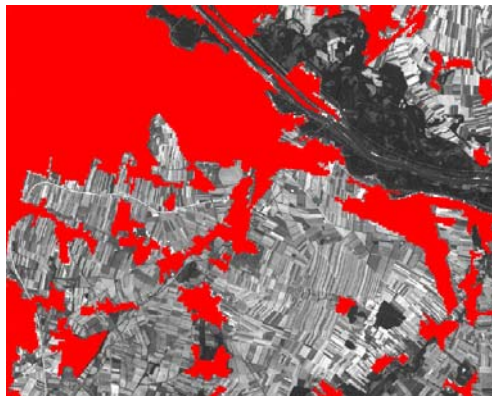
CLC level 1 class 'artificial surfaces' contains artificial surfaces and functionally related vegetated areas, reflecting the land use aspect. Therefore a significant part of this CLC level 1 class contains vegetated areas composed of fully vegetated pixels. However, in the FTSP product only pixels that contain some built-up/sealed area will be included.

In addition, built-up pixels within all other CLC level 1 classes (which are not mapped in CLC according to the 25ha MMU) will be included according to the above definition. Fully vegetated or unvegetated non-built-up pixels will be excluded.

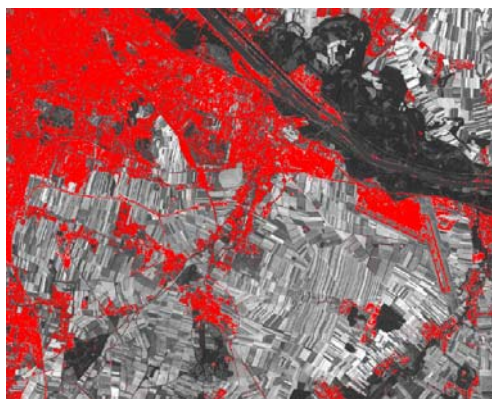
SPOT-4 satellite image over Vienna / Austria
(green band; 20m resolution)



CLC 2000 - level 1 class "artificial surfaces"



FTSP high-resolution layer of built-up areas
(20m resolution)



Special Considerations

- The same definition of built-up areas shall apply for production and quality control.
- To ensure homogeneity across the whole of Europe, partially captured linear features outside of urban agglomerations (e.g. fragments of roads or railway lines) will not be completed by the manual post editing.
- Mines and quarries will be considered built-up areas according to the above definition.
- It is proposed to include a no-data class for unclassifiable areas (e.g., clouds) which is to be marked and identified during the process of manual interpretation.

ANNEX 2: LIST OF WORKING UNITS AND EO DATA USED

The following list provides information about the two coverages of EO data which were used to create the working units. The file name is identical to the WU identification within the mitigation shapefile's attribute table and contains the specifications of sensors, paths/rows and capture dates.

The full file name is explained in the following:

[Sensor Coverage 1]_[TrackFrame Coverage 1]_[Capture Date YY/MM/DD Coverage 1]_[Instrument Coverage 1]_ [Sensor Coverage 2]_[TrackFrame Coverage 2]_[Capture Date YY/MM/DD Coverage 2]_[Instrument Coverage 2]

Table 1: List of Working Units used for the production of Romania

SCU	Working Unit
1	lrsp6_037036_060325_I30_lrsp6_038036_050404_I30
1	lrsp6_037036_060325_I30_lrsp6_038037_050404_I30
1	lrsp6_037036_060325_I30_spot4_079257_060627_2i0
1	lrsp6_037036_060325_I30_spot4_080257_060924_2i0
1	lrsp6_038035_050404_I30_lrsp6_038035_060914_I30
1	lrsp6_038035_060914_I30_lrsp6_039035_050503_I30
1	lrsp6_038036_050404_I30_lrsp6_038036_060914_I30
1	lrsp6_038036_060914_I30_lrsp6_039036_050503_I30
1	lrsp6_038037_050404_I30_lrsp6_038037_060914_I30
1	lrsp6_039035_050503_I30_spot4_084254_051101_1i0
1	lrsp6_039035_050503_I30_spot4_084254_060729_2i0
1	lrsp6_039035_050503_I30_spot5_083253_060718_1j0
1	Spot4_084255_051101_1i0_spot5_084255_060622_2j0
2	lrsp6_039035_050503_I30_lrsp6_040035_050905_I30
2	lrsp6_040035_050905_I30_lrsp6_040035_060409_I30
2	lrsp6_040035_050905_I30_spot5_085255_060616_1j0
2	lrsp6_040035_060409_I30_lrsp6_041035_050910_I30
2	lrsp6_041035_050910_I30_lrsp6_042035_060817_I30
2	lrsp6_041035_050910_I30_spot4_087253_061026_1i0
2	lrsp6_041035_050910_I30_spot4_089255_060703_1i1
2	lrsp6_041035_050910_I30_spot5_088253_060501_1j0
2	lrsp6_041035_050910_I30_spot5_088254_060501_1j0
2	lrsp6_042034_060513_I30_lrsp6_042034_060817_I30
2	lrsp6_042035_060817_I30_lrsp6_043035_050405_I30
2	lrsp6_042035_060817_I30_spot4_090253_061116_1i0
2	lrsp6_042035_060817_I30_spot4_090254_061031_1i4
2	lrsp6_042035_060817_I30_spot5_090254_051106_1j0
2	lrsp6_042035_060817_I30_spot5_090255_070526_1j0
2	lrsp6_042036_061004_I30_lrsp6_043036_050405_I30
2	lrsp6_043035_050405_I30_lrsp6_043035_060729_I30

SCU	Working Unit
3	lrsp6_039035_050503_l30_lrsp6_040036_060409_l30
3	lrsp6_039035_050503_l30_spot5_084255_060622_2j0
3	lrsp6_039035_050503_l30_spot5_085255_060616_1j0
3	lrsp6_039036_050503_l30_lrsp6_040036_060409_l30
3	lrsp6_039036_050503_l30_spot4_084256_060925_1i0
3	lrsp6_039036_050503_l30_spot4_084257_051101_1i0
3	lrsp6_040036_060409_l30_lrsp6_041036_050910_l30
3	lrsp6_040036_060409_l30_spot4_086256_060729_1i0
3	lrsp6_040036_060409_l30_spot5_085255_060616_1j0
3	lrsp6_040036_060409_l30_spot5_086257_060907_1j0
3	lrsp6_040036_060409_l30_spot5_087257_060708_1j0
3	lrsp6_040037_060409_l30_lrsp6_041037_050910_l30
3	lrsp6_040037_060409_l30_spot4_085259_061020_2i0
3	lrsp6_040037_060409_l30_spot4_086260_050624_1i0
3	lrsp6_040037_060409_l30_spot5_085259_060907_1j0
3	lrsp6_040037_060409_l30_spot5_085260_060902_2j0
3	lrsp6_040038_060409_l30_lrsp6_040038_060620_l30
3	lrsp6_041036_050910_l30_lrsp6_041036_060719_l30
3	lrsp6_041037_050910_l30_lrsp6_041037_060719_l30
3	Spot4_084258_051101_1i0_spot5_084258_060627_1j0
3	Spot4_084259_051101_1i0_spot4_084259_060819_1i0
3	Spot4_084260_051101_1i0_spot5_084260_060627_1j0
3	Spot4_085258_061020_2i0_spot5_085258_060907_1j0
4	lrsp6_040038_060409_l30_lrsp6_041038_060719_l30
4	lrsp6_041038_060719_l30_lrsp6_041038_060905_l30
4	lrsp6_042036_060817_l30_lrsp6_042036_061004_l30
4	lrsp6_042037_060817_l30_lrsp6_042037_061004_l30
4	lrsp6_042038_060513_l30_lrsp6_042038_060817_l30
4	lrsp6_043036_050405_l30_lrsp6_043036_060729_l30
5	lrsp6_043036_060729_l30_lrsp6_044036_061014_l30
5	lrsp6_043037_050405_l30_lrsp6_043037_060729_l30
5	lrsp6_043037_060729_l30_lrsp6_044037_060523_l30
5	lrsp6_043038_050405_l30_lrsp6_043038_060729_l30
5	lrsp6_044036_061014_l30_spot5_094256_060719_1j0
5	lrsp6_044037_060523_l30_spot4_095259_060810_1i0
5	lrsp6_044038_060803_l30_lrsp6_045038_060528_l30
5	lrsp6_044038_060803_l30_spot4_095261_060427_1i0
5	lrsp6_045037_060504_l30_lrsp6_046037_051005_l30
5	lrsp6_045037_060504_l30_spot4_096258_060821_1i0
5	lrsp6_045037_060504_l30_spot4_097259_050716_1i0
5	lrsp6_045037_060504_l30_spot4_097260_060625_1i0
5	lrsp6_045037_060504_l30_spot4_098260_060215_1i0
5	lrsp6_045038_060528_l30_spot4_097261_060815_2i0
5	lrsp6_046037_051005_l30_spot4_099259_060705_1i0

SCU	Working Unit
5	Irsp6_046037_051005_I30_spot4_099260_060726_1i0
5	Spot4_097260_060625_1i0_spot4_098260_060215_1i0
5	Spot4_097260_060625_1i0_spot4_098260_060215_1i2
5	Spot5_094257_060719_1j0_irsp6_044036_061014_I30
5	Spot5_094258_060719_1j0_spot4_094258_061027_1i0
5	Spot5_094259_060719_1j0_irsp6_044037_060523_I30
5	Spot5_094260_060719_1j0_irsp6_044037_060523_I30
5	Spot5_096259_061026_1j0_irsp6_045037_060504_I30
5	Spot5_096260_060618_1j0_irsp6_045037_060504_I30
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5	Spot5_096260_061026_1j0_irsp6_045038_060528_I30
5	Spot5_097261_050720_2j6_irsp6_045038_060528_I30
5	spot4_095260_060629_2i0_irsp6_044037_060523_L30
5	spot4_095260_060629_2i0_irsp6_044038_060803_L30

ANNEX 3: SAMPLE PLOT VALIDATION SHEET

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
0	0,0	FALSE	FALSE	TRUE	FALSE
1	0,0	FALSE	FALSE	TRUE	FALSE
2	0,0	FALSE	FALSE	TRUE	FALSE
3	0,0	FALSE	FALSE	TRUE	FALSE
4	0,0	FALSE	FALSE	TRUE	FALSE
5	0,0	FALSE	FALSE	TRUE	FALSE
6	0,0	FALSE	FALSE	TRUE	FALSE
7	0,0	FALSE	FALSE	TRUE	FALSE
8	0,0	FALSE	FALSE	TRUE	FALSE
9	0,0	FALSE	FALSE	TRUE	FALSE
10	0,0	FALSE	FALSE	TRUE	TRUE
11	0,0	FALSE	FALSE	TRUE	FALSE
12	0,0	FALSE	FALSE	TRUE	FALSE
13	0,0	FALSE	FALSE	TRUE	FALSE
14	0,0	FALSE	FALSE	TRUE	FALSE
15	0,0	FALSE	FALSE	TRUE	FALSE
16	0,0	FALSE	FALSE	TRUE	FALSE
17	0,0	FALSE	FALSE	TRUE	FALSE
18	0,0	FALSE	FALSE	TRUE	FALSE
19	0,0	FALSE	FALSE	TRUE	FALSE
20	0,0	FALSE	FALSE	TRUE	FALSE
21	0,0	FALSE	FALSE	TRUE	FALSE
22	0,0	FALSE	FALSE	TRUE	FALSE
23	0,0	FALSE	FALSE	TRUE	FALSE
24	0,0	FALSE	FALSE	TRUE	FALSE
25	0,0	FALSE	FALSE	TRUE	FALSE
26	0,0	FALSE	FALSE	TRUE	FALSE
27	0,0	FALSE	FALSE	TRUE	FALSE
28	0,0	FALSE	FALSE	TRUE	FALSE
29	0,0	FALSE	FALSE	TRUE	TRUE
30	0,0	FALSE	FALSE	TRUE	TRUE
31	0,0	FALSE	FALSE	TRUE	FALSE
32	0,0	FALSE	FALSE	TRUE	FALSE
33	0,0	FALSE	FALSE	TRUE	FALSE
34	0,0	FALSE	FALSE	TRUE	FALSE
35	0,0	FALSE	FALSE	TRUE	FALSE
36	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
37	0,0	FALSE	FALSE	TRUE	TRUE
38	0,0	FALSE	FALSE	TRUE	FALSE
39	0,0	FALSE	FALSE	TRUE	FALSE
40	0,0	FALSE	FALSE	TRUE	TRUE
41	0,0	FALSE	FALSE	TRUE	TRUE
42	0,0	FALSE	FALSE	TRUE	FALSE
43	0,0	FALSE	FALSE	TRUE	FALSE
44	0,0	FALSE	FALSE	TRUE	FALSE
45	0,0	FALSE	FALSE	TRUE	FALSE
46	0,0	FALSE	FALSE	TRUE	TRUE
47	0,0	FALSE	FALSE	TRUE	FALSE
48	0,0	FALSE	FALSE	TRUE	FALSE
49	0,0	FALSE	FALSE	TRUE	FALSE
50	56,3	FALSE	FALSE	TRUE	FALSE
51	87,2	TRUE	TRUE	TRUE	FALSE
52	15,8	FALSE	FALSE	TRUE	FALSE
53	0,0	FALSE	FALSE	TRUE	FALSE
54	100,0	TRUE	TRUE	TRUE	FALSE
55	21,4	FALSE	FALSE	TRUE	FALSE
56	0,0	FALSE	FALSE	TRUE	FALSE
57	42,8	FALSE	FALSE	TRUE	FALSE
58	0,0	FALSE	FALSE	TRUE	FALSE
59	0,6	FALSE	FALSE	TRUE	FALSE
60	65,5	FALSE	FALSE	TRUE	FALSE
61	10,2	FALSE	FALSE	TRUE	FALSE
62	31,2	FALSE	FALSE	TRUE	FALSE
63	0,0	FALSE	FALSE	TRUE	FALSE
64	14,0	FALSE	FALSE	TRUE	FALSE
65	5,5	FALSE	FALSE	TRUE	FALSE
66	0,0	FALSE	FALSE	TRUE	FALSE
67	0,0	FALSE	FALSE	TRUE	FALSE
68	70,9	FALSE	FALSE	TRUE	FALSE
69	58,7	FALSE	TRUE	FALSE	FALSE
70	32,8	FALSE	FALSE	TRUE	TRUE
71	52,6	FALSE	FALSE	TRUE	FALSE
72	53,4	FALSE	FALSE	TRUE	FALSE
73	5,2	FALSE	FALSE	TRUE	FALSE
74	7,7	FALSE	FALSE	TRUE	FALSE
75	23,7	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
76	96,8	TRUE	TRUE	TRUE	FALSE
77	87,8	TRUE	TRUE	TRUE	FALSE
78	42,2	FALSE	FALSE	TRUE	FALSE
79	69,5	FALSE	FALSE	TRUE	FALSE
80	66,4	FALSE	FALSE	TRUE	FALSE
81	33,1	FALSE	FALSE	TRUE	FALSE
82	1,8	FALSE	FALSE	TRUE	FALSE
83	0,0	FALSE	FALSE	TRUE	FALSE
84	44,9	FALSE	FALSE	TRUE	FALSE
85	25,0	FALSE	FALSE	TRUE	FALSE
86	0,0	FALSE	FALSE	TRUE	FALSE
87	44,5	FALSE	FALSE	TRUE	FALSE
88	11,8	FALSE	FALSE	TRUE	FALSE
89	0,0	FALSE	FALSE	TRUE	FALSE
90	0,0	FALSE	FALSE	TRUE	FALSE
91	0,0	FALSE	FALSE	TRUE	TRUE
92	26,8	FALSE	FALSE	TRUE	FALSE
93	34,0	FALSE	FALSE	TRUE	TRUE
94	19,8	FALSE	FALSE	TRUE	FALSE
95	13,9	FALSE	FALSE	TRUE	FALSE
96	62,2	FALSE	FALSE	TRUE	FALSE
97	89,0	TRUE	FALSE	FALSE	FALSE
98	41,4	FALSE	FALSE	TRUE	FALSE
99	70,9	FALSE	TRUE	FALSE	FALSE
100	0,0	FALSE	FALSE	TRUE	FALSE
101	0,0	FALSE	FALSE	TRUE	FALSE
102	0,0	FALSE	FALSE	TRUE	FALSE
103	0,0	FALSE	FALSE	TRUE	FALSE
104	0,0	FALSE	FALSE	TRUE	TRUE
105	0,0	FALSE	FALSE	TRUE	TRUE
106	0,0	FALSE	FALSE	TRUE	TRUE
107	0,0	FALSE	FALSE	TRUE	TRUE
108	0,0	FALSE	FALSE	TRUE	FALSE
109	0,0	FALSE	FALSE	TRUE	FALSE
110	0,0	FALSE	FALSE	TRUE	FALSE
111	0,0	FALSE	FALSE	TRUE	FALSE
112	0,0	FALSE	FALSE	TRUE	TRUE
113	0,0	FALSE	FALSE	TRUE	TRUE
114	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
115	0,0	FALSE	FALSE	TRUE	FALSE
116	0,0	FALSE	FALSE	TRUE	TRUE
117	0,0	FALSE	FALSE	TRUE	FALSE
118	0,0	FALSE	FALSE	TRUE	FALSE
119	0,0	FALSE	FALSE	TRUE	FALSE
120	0,0	FALSE	FALSE	TRUE	FALSE
121	0,0	FALSE	FALSE	TRUE	FALSE
122	0,0	FALSE	FALSE	TRUE	FALSE
123	0,0	FALSE	FALSE	TRUE	TRUE
124	0,0	FALSE	FALSE	TRUE	TRUE
125	0,0	FALSE	FALSE	TRUE	TRUE
126	0,0	FALSE	FALSE	TRUE	FALSE
127	0,0	FALSE	FALSE	TRUE	TRUE
128	0,0	FALSE	FALSE	TRUE	FALSE
129	0,0	FALSE	FALSE	TRUE	FALSE
130	0,0	FALSE	FALSE	TRUE	TRUE
131	0,0	FALSE	FALSE	TRUE	FALSE
132	0,0	FALSE	FALSE	TRUE	FALSE
133	0,0	FALSE	FALSE	TRUE	FALSE
134	0,0	FALSE	FALSE	TRUE	TRUE
135	0,0	FALSE	FALSE	TRUE	FALSE
136	0,0	FALSE	FALSE	TRUE	FALSE
137	0,0	FALSE	FALSE	TRUE	FALSE
138	0,0	FALSE	FALSE	TRUE	FALSE
139	0,0	FALSE	FALSE	TRUE	FALSE
140	0,0	FALSE	FALSE	TRUE	FALSE
141	0,0	FALSE	FALSE	TRUE	FALSE
142	0,0	FALSE	FALSE	TRUE	FALSE
143	0,0	FALSE	FALSE	TRUE	FALSE
144	0,0	FALSE	FALSE	TRUE	FALSE
145	0,0	FALSE	FALSE	TRUE	FALSE
146	0,0	FALSE	FALSE	TRUE	FALSE
147	0,0	FALSE	FALSE	TRUE	FALSE
148	0,0	FALSE	FALSE	TRUE	FALSE
149	0,0	FALSE	FALSE	TRUE	TRUE
150	0,0	FALSE	FALSE	TRUE	FALSE
151	0,0	FALSE	FALSE	TRUE	FALSE
152	0,0	FALSE	FALSE	TRUE	TRUE
153	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
154	0,0	FALSE	FALSE	TRUE	FALSE
155	0,0	FALSE	FALSE	TRUE	FALSE
156	0,0	FALSE	FALSE	TRUE	FALSE
157	0,0	FALSE	FALSE	TRUE	FALSE
158	0,0	FALSE	FALSE	TRUE	TRUE
159	0,0	FALSE	FALSE	TRUE	FALSE
160	0,0	FALSE	FALSE	TRUE	FALSE
161	18,2	FALSE	FALSE	TRUE	FALSE
162	5,2	FALSE	FALSE	TRUE	FALSE
163	0,0	FALSE	FALSE	TRUE	FALSE
164	7,3	FALSE	FALSE	TRUE	FALSE
165	50,1	FALSE	FALSE	TRUE	TRUE
166	66,7	FALSE	FALSE	TRUE	FALSE
167	99,1	TRUE	TRUE	TRUE	FALSE
168	89,8	TRUE	TRUE	TRUE	FALSE
169	56,6	FALSE	FALSE	TRUE	FALSE
170	0,0	FALSE	FALSE	TRUE	FALSE
171	0,0	FALSE	FALSE	TRUE	TRUE
172	0,0	FALSE	FALSE	TRUE	FALSE
173	74,9	FALSE	FALSE	TRUE	FALSE
174	0,0	FALSE	FALSE	TRUE	FALSE
175	50,0	FALSE	FALSE	TRUE	FALSE
176	4,1	FALSE	FALSE	TRUE	TRUE
177	58,7	FALSE	FALSE	TRUE	TRUE
178	6,3	FALSE	FALSE	TRUE	FALSE
179	90,8	TRUE	TRUE	TRUE	FALSE
180	20,7	FALSE	FALSE	TRUE	FALSE
181	0,0	FALSE	FALSE	TRUE	FALSE
182	0,0	FALSE	FALSE	TRUE	FALSE
183	0,0	FALSE	FALSE	TRUE	FALSE
184	12,9	FALSE	FALSE	TRUE	FALSE
185	0,0	FALSE	FALSE	TRUE	FALSE
186	58,8	FALSE	FALSE	TRUE	FALSE
187	0,0	FALSE	FALSE	TRUE	FALSE
188	64,0	FALSE	FALSE	TRUE	FALSE
189	96,4	TRUE	TRUE	TRUE	FALSE
190	46,8	FALSE	FALSE	TRUE	FALSE
191	0,8	FALSE	FALSE	TRUE	FALSE
192	40,2	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
193	40,8	FALSE	FALSE	TRUE	FALSE
194	40,8	FALSE	FALSE	TRUE	FALSE
195	0,0	FALSE	FALSE	TRUE	FALSE
196	72,2	FALSE	FALSE	TRUE	TRUE
197	19,3	FALSE	FALSE	TRUE	FALSE
198	0,0	FALSE	FALSE	TRUE	FALSE
199	0,9	FALSE	FALSE	TRUE	FALSE
200	26,8	FALSE	FALSE	TRUE	FALSE
201	0,0	FALSE	FALSE	TRUE	FALSE
202	55,8	FALSE	FALSE	TRUE	FALSE
203	26,1	FALSE	FALSE	TRUE	FALSE
204	27,6	FALSE	FALSE	TRUE	FALSE
205	0,0	FALSE	FALSE	TRUE	FALSE
206	28,3	FALSE	FALSE	TRUE	FALSE
207	40,5	FALSE	FALSE	TRUE	FALSE
208	76,1	FALSE	FALSE	TRUE	FALSE
209	0,0	FALSE	FALSE	TRUE	FALSE
210	51,1	FALSE	FALSE	TRUE	FALSE
211	54,0	FALSE	FALSE	TRUE	FALSE
212	89,9	TRUE	FALSE	FALSE	FALSE
213	0,0	FALSE	FALSE	TRUE	TRUE
214	47,6	FALSE	FALSE	TRUE	FALSE
215	99,1	TRUE	TRUE	TRUE	FALSE
216	87,4	TRUE	FALSE	FALSE	FALSE
217	0,0	FALSE	FALSE	TRUE	TRUE
218	0,0	FALSE	FALSE	TRUE	TRUE
219	19,3	FALSE	FALSE	TRUE	FALSE
220	0,0	FALSE	FALSE	TRUE	TRUE
221	0,0	FALSE	FALSE	TRUE	FALSE
222	0,0	FALSE	FALSE	TRUE	FALSE
223	0,0	FALSE	FALSE	TRUE	FALSE
224	0,0	FALSE	FALSE	TRUE	FALSE
225	0,0	FALSE	FALSE	TRUE	FALSE
226	0,0	FALSE	FALSE	TRUE	TRUE
227	0,0	FALSE	FALSE	TRUE	FALSE
228	0,0	FALSE	FALSE	TRUE	FALSE
229	0,0	FALSE	FALSE	TRUE	FALSE
230	0,0	FALSE	FALSE	TRUE	FALSE
231	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
232	0,0	FALSE	FALSE	TRUE	FALSE
233	0,0	FALSE	FALSE	TRUE	TRUE
234	0,0	FALSE	FALSE	TRUE	TRUE
235	0,0	FALSE	FALSE	TRUE	FALSE
236	0,0	FALSE	FALSE	TRUE	TRUE
237	0,0	FALSE	FALSE	TRUE	FALSE
238	0,0	FALSE	FALSE	TRUE	FALSE
239	0,0	FALSE	FALSE	TRUE	FALSE
240	0,0	FALSE	FALSE	TRUE	FALSE
241	0,0	FALSE	FALSE	TRUE	TRUE
242	0,0	FALSE	FALSE	TRUE	TRUE
243	0,0	FALSE	FALSE	TRUE	TRUE
244	0,0	FALSE	FALSE	TRUE	TRUE
245	0,0	FALSE	FALSE	TRUE	FALSE
246	0,0	FALSE	FALSE	TRUE	FALSE
247	0,0	FALSE	FALSE	TRUE	TRUE
248	0,0	FALSE	FALSE	TRUE	FALSE
249	0,0	FALSE	FALSE	TRUE	FALSE
250	0,0	FALSE	FALSE	TRUE	FALSE
251	0,0	FALSE	FALSE	TRUE	FALSE
252	0,0	FALSE	FALSE	TRUE	FALSE
253	0,0	FALSE	FALSE	TRUE	TRUE
254	0,0	FALSE	FALSE	TRUE	FALSE
255	0,0	FALSE	FALSE	TRUE	TRUE
256	0,0	FALSE	FALSE	TRUE	FALSE
257	0,0	FALSE	FALSE	TRUE	FALSE
258	0,0	FALSE	FALSE	TRUE	TRUE
259	0,0	FALSE	FALSE	TRUE	FALSE
260	4,4	FALSE	FALSE	TRUE	FALSE
261	38,4	FALSE	FALSE	TRUE	FALSE
262	0,0	FALSE	FALSE	TRUE	FALSE
263	61,6	FALSE	FALSE	TRUE	FALSE
264	0,0	FALSE	FALSE	TRUE	FALSE
265	0,0	FALSE	FALSE	TRUE	FALSE
266	3,9	FALSE	FALSE	TRUE	FALSE
267	0,0	FALSE	FALSE	TRUE	TRUE
268	39,5	FALSE	FALSE	TRUE	TRUE
269	0,0	FALSE	FALSE	TRUE	FALSE
270	0,9	FALSE	FALSE	TRUE	TRUE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
271	0,0	FALSE	FALSE	TRUE	FALSE
272	11,6	FALSE	FALSE	TRUE	FALSE
273	25,4	FALSE	FALSE	TRUE	FALSE
274	0,6	FALSE	FALSE	TRUE	FALSE
275	14,2	FALSE	FALSE	TRUE	FALSE
276	0,0	FALSE	FALSE	TRUE	FALSE
277	0,0	FALSE	FALSE	TRUE	FALSE
278	0,0	FALSE	FALSE	TRUE	TRUE
279	55,0	FALSE	FALSE	TRUE	FALSE
280	0,0	FALSE	FALSE	TRUE	FALSE
281	28,1	FALSE	FALSE	TRUE	FALSE
282	8,6	FALSE	FALSE	TRUE	FALSE
283	0,0	FALSE	FALSE	TRUE	FALSE
284	0,0	FALSE	FALSE	TRUE	TRUE
285	0,0	FALSE	FALSE	TRUE	FALSE
286	60,9	FALSE	FALSE	TRUE	TRUE
287	0,0	FALSE	FALSE	TRUE	TRUE
288	41,3	FALSE	FALSE	TRUE	FALSE
289	0,0	FALSE	FALSE	TRUE	TRUE
290	0,0	FALSE	FALSE	TRUE	TRUE
291	33,2	FALSE	FALSE	TRUE	FALSE
292	0,0	FALSE	FALSE	TRUE	TRUE
293	37,3	FALSE	FALSE	TRUE	FALSE
294	97,7	TRUE	TRUE	TRUE	FALSE
295	98,7	TRUE	TRUE	TRUE	FALSE
296	35,1	FALSE	FALSE	TRUE	FALSE
297	42,4	FALSE	FALSE	TRUE	FALSE
298	0,0	FALSE	FALSE	TRUE	FALSE
299	3,8	FALSE	FALSE	TRUE	FALSE