

# TERRITORIAL AND ENVIRONMENTAL OPTIMISATION : HOW TO KEEP TRACK USING GIS

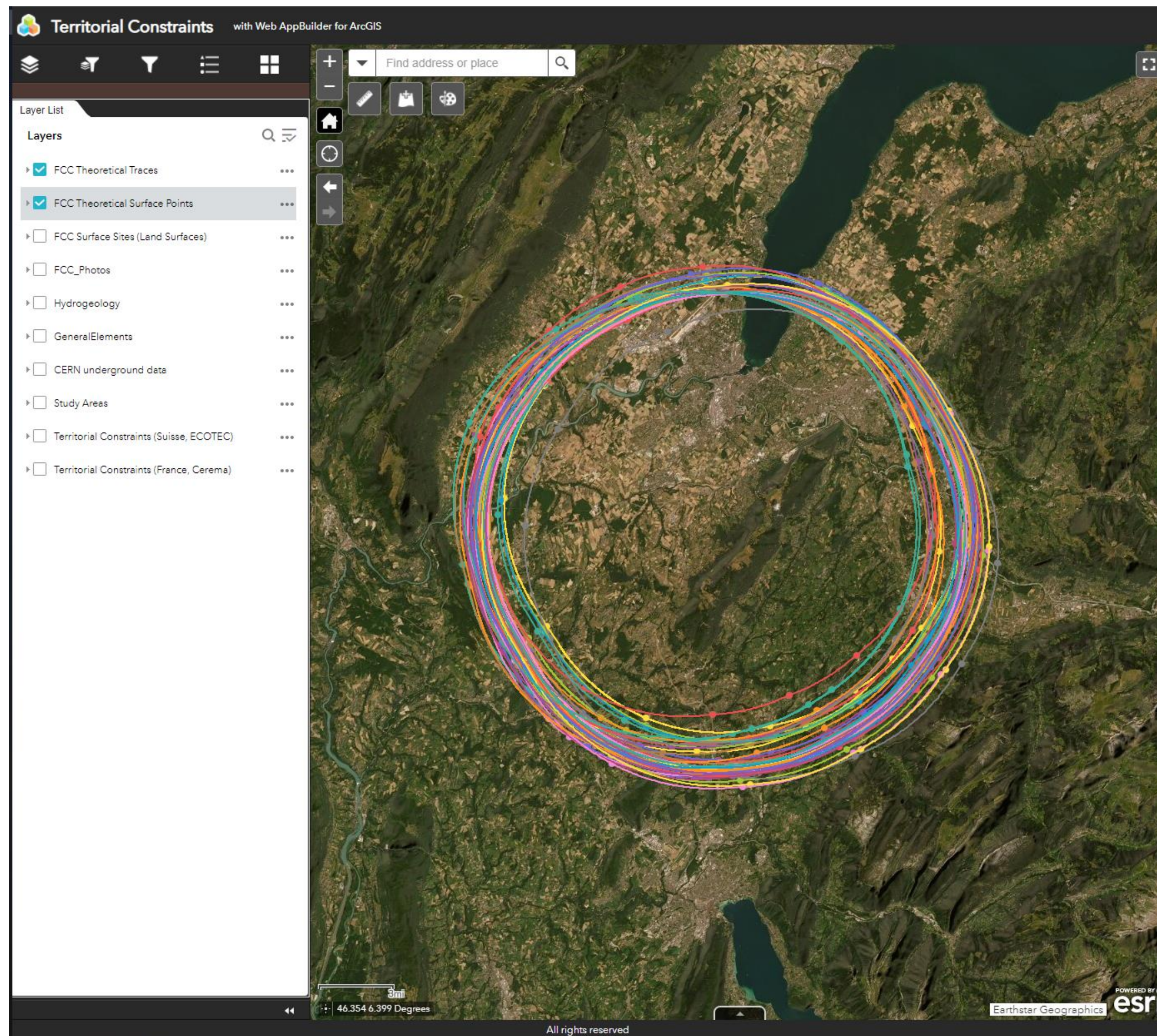
Anne-Laure. Verdier  
10 Nov. 2020  
11:10-11:30

# The web-based application: A window to the project data storage

1. Introduction
2. How to describe a scenario?
3. A tool to analyse scenarios
4. A tool to keep track of information
5. A tool to add associated information
6. A tool to compare results and open discussion
7. Access
8. Conclusion



# Introduction



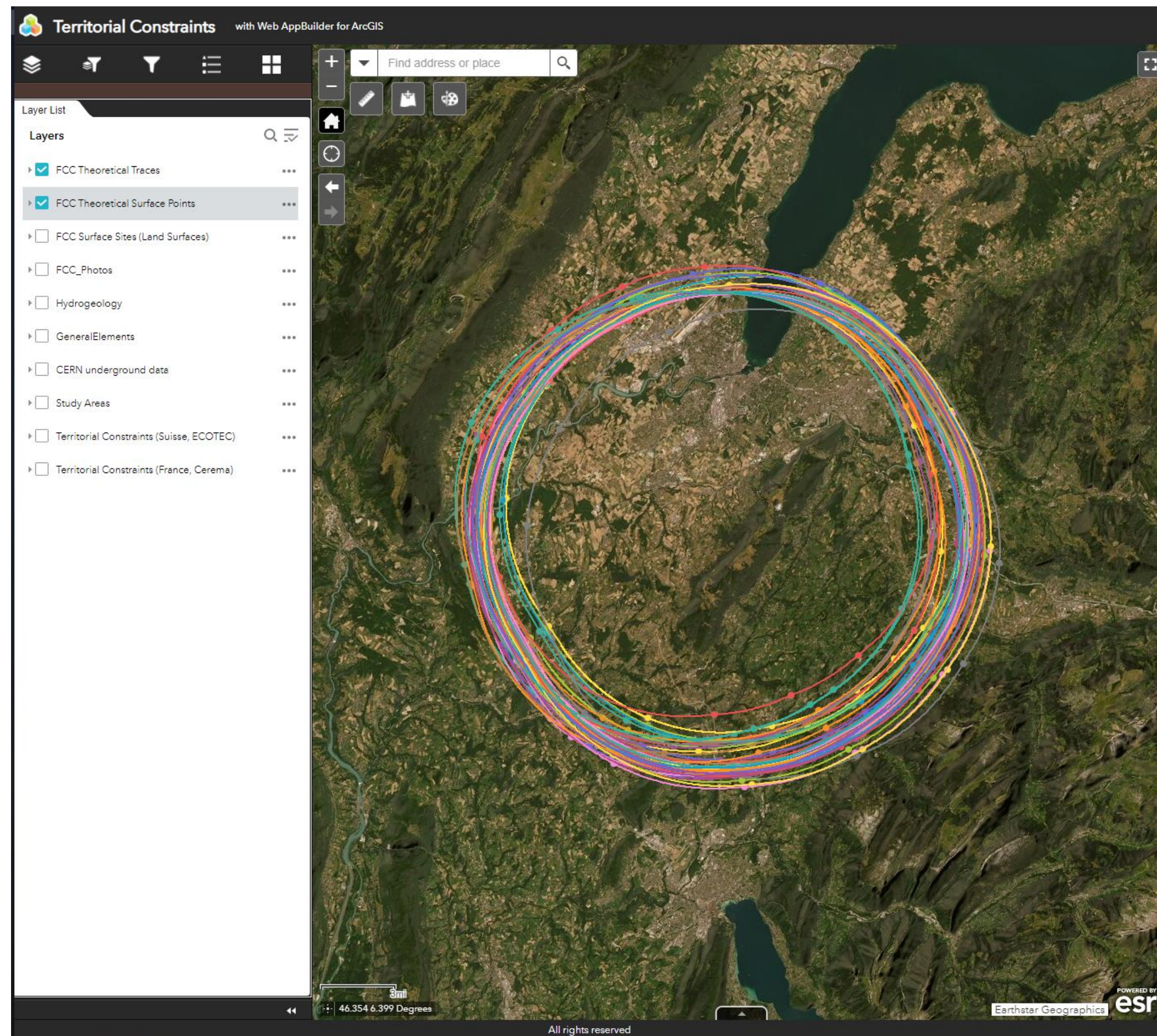
Work started in January 2020

## Steps

- Define the needs
- Implement a geographic database
- Define a nomenclature to be able to differentiate the configurations
- Define the functionalities needed

Ongoing work that will continue all along the study and project

# How to describe a scenario? (I)



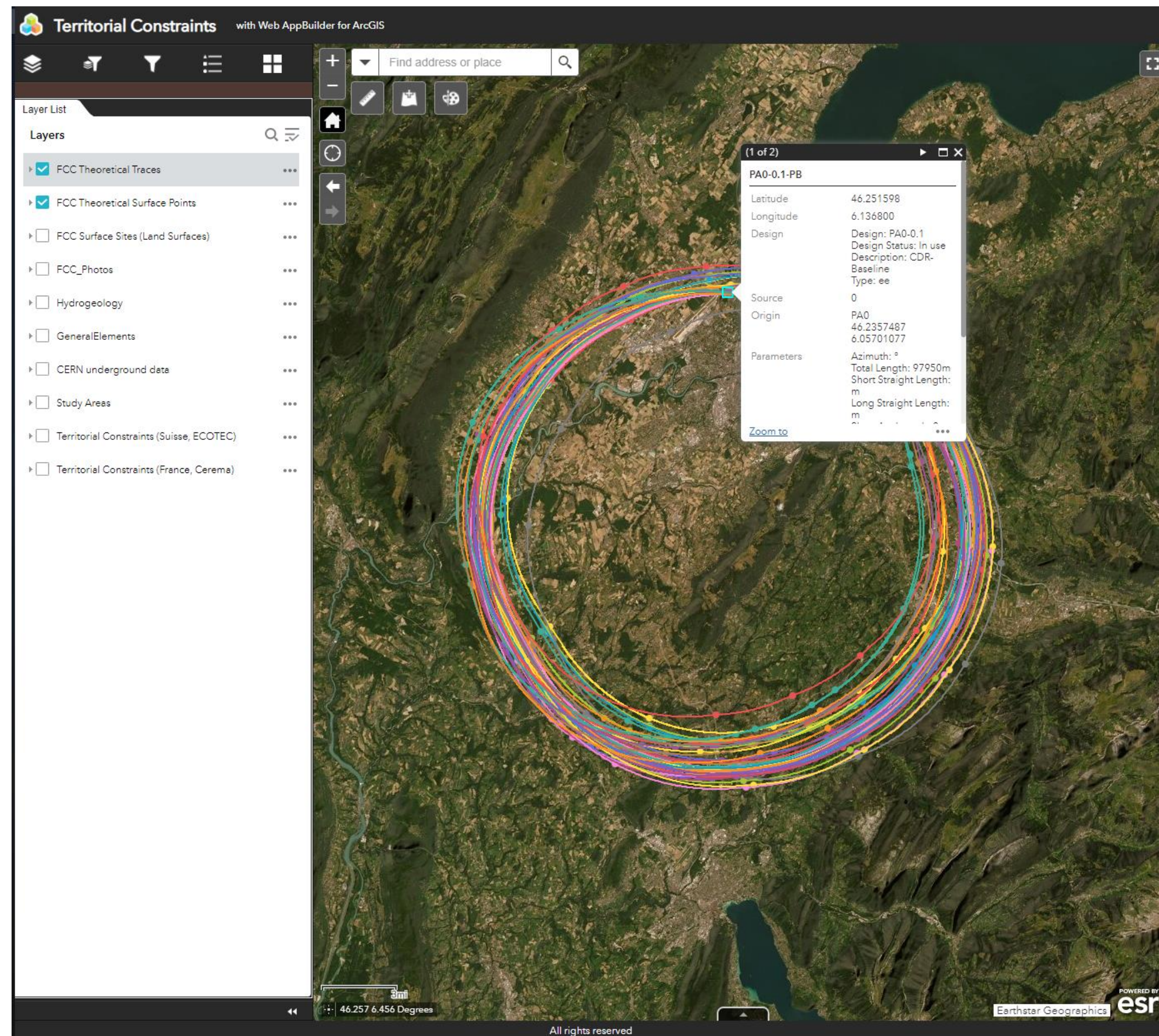
Elements needed:

- Trace
- Theoretical points
- Land surfaces

Adjusting the tables to reflect the upcoming needs

e.g. Environmental impact/assessment data to be added in the near future

# How to describe a scenario? (II)



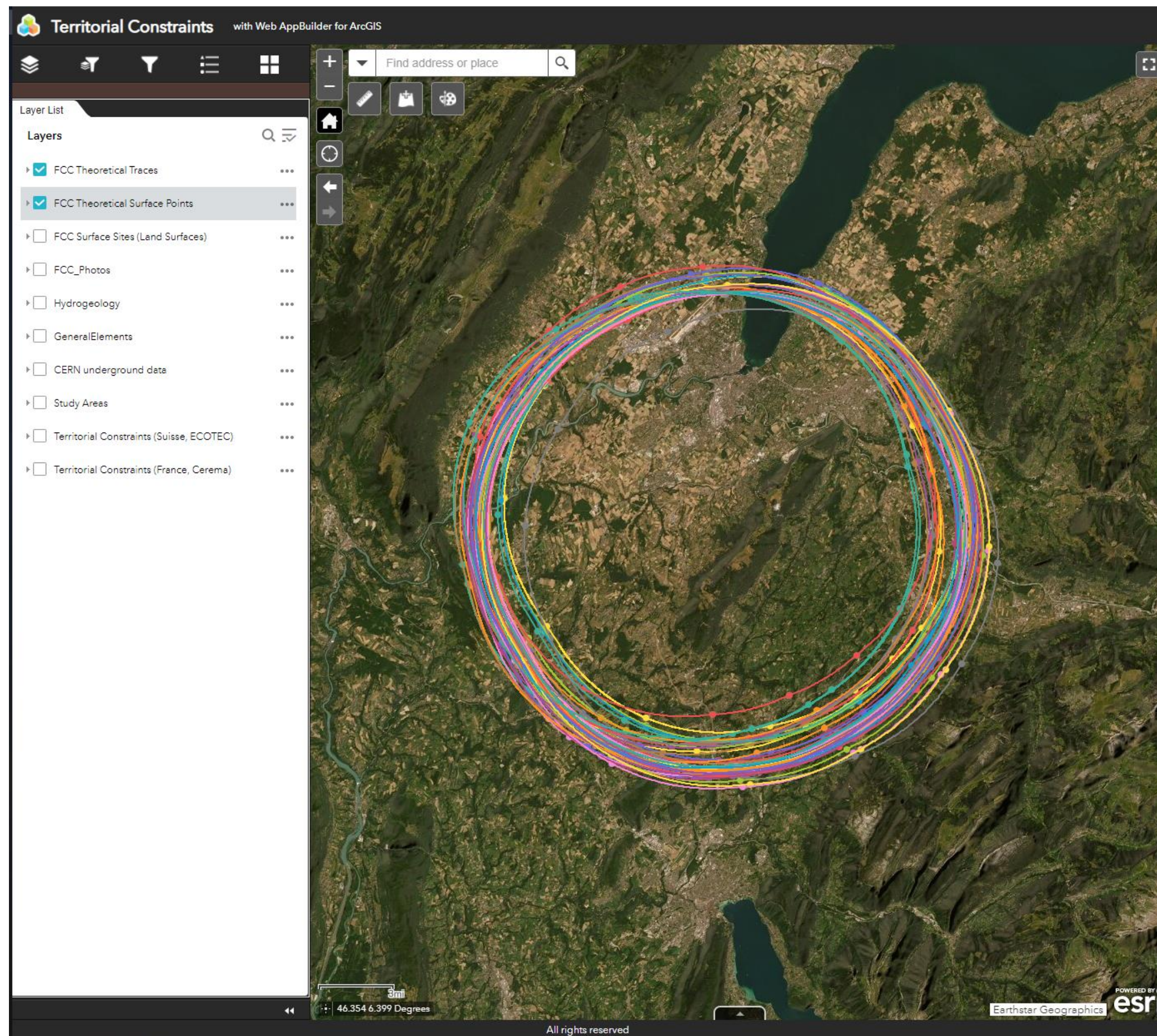
## Description parameters

- Saved in the Database
- Accessible directly in the app

### PA0-0.1-PB

Latitude	46.251598
Longitude	6.136800
Design	Design: PA0-0.1 Design Status: In use Description: CDR-Baseline Type: ee
Source	0
Origin	PA0 46.2357487 6.05701077
Parameters	Azimuth: ° Total Length: 97950m Short Straight Length: m Long Straight Length: m Short Arc Length: 0m Long Arc Length: 0m
Machine Parameters	No Related Records...
Underground Structures	<a href="#">More info</a>

# A tool to analyse scenarios (I)

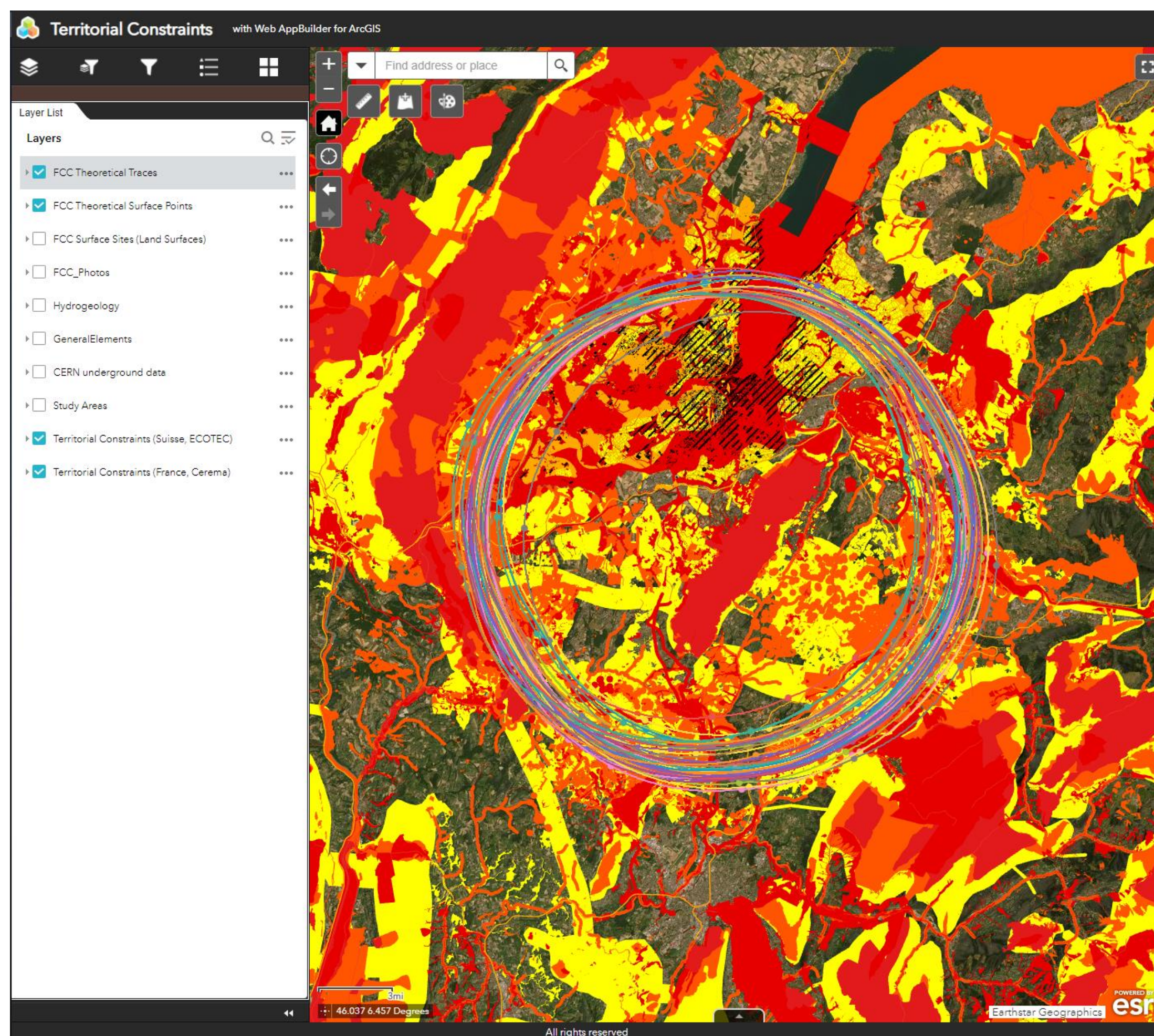


Over 45 scenarios analysed

Iterative process

Multiple partners

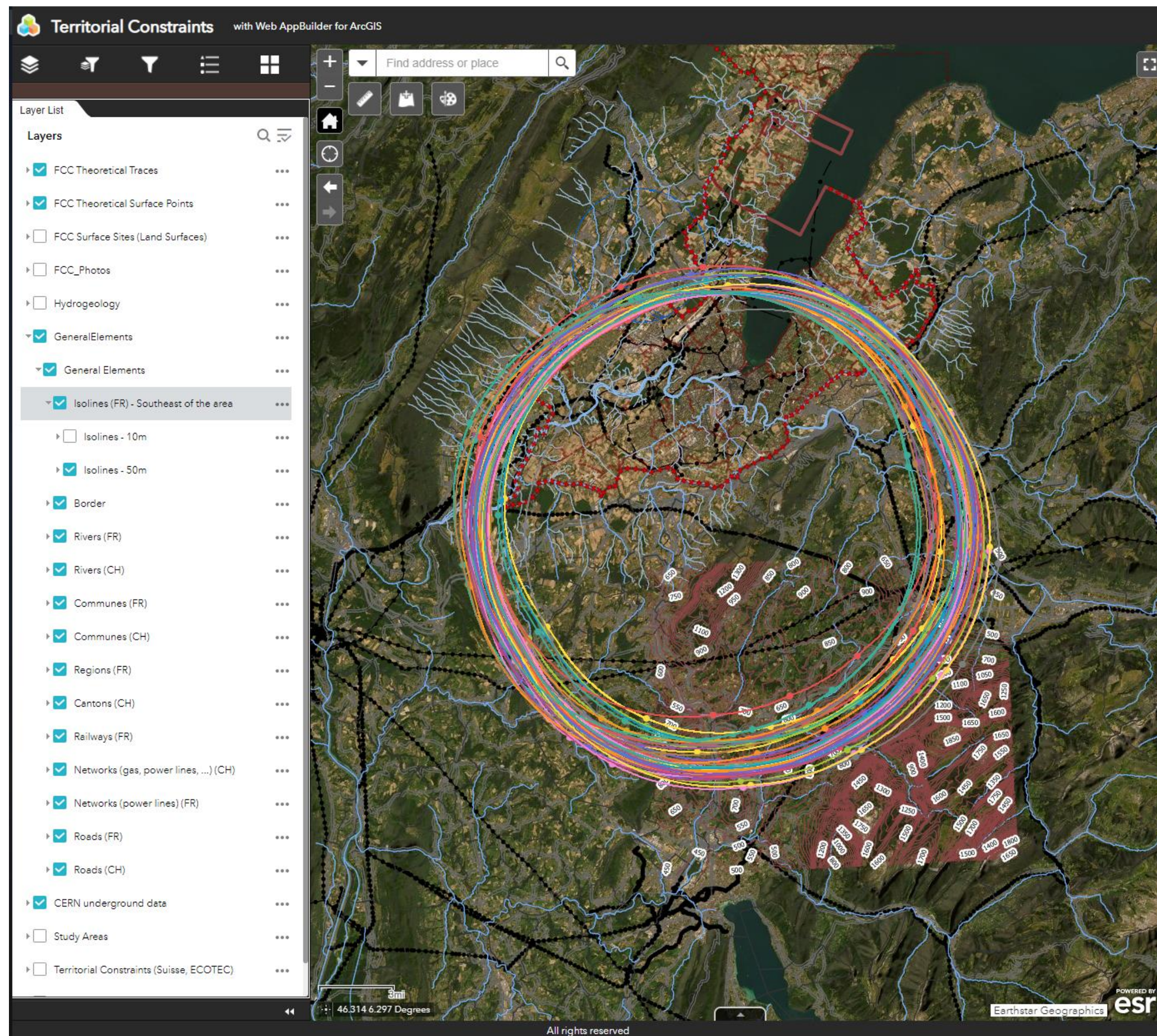
# A tool to analyse scenarios (II)



Analysis based on territorial constraints:

- Partnership with specialised organisations
- Data used: urbanism, nature, geological and hydrological situation, natural and technical risks, etc...

# A tool to analyse scenarios (III)



More constraints or opportunities already in the system:

- roads,
- railways,
- waterways,
- topography,
- power lines, gas lines
- and even more to come !

More functionalities



# A tool to keep track of information

## Territory information: links to documentation for land surfaces

The screenshot shows the 'Territorial Constraints' web application interface. On the left, a 'Layer List' contains various data layers such as 'FCC Theoretical Traces', 'FCC Theoretical Surface Points', and 'FCC Surface Sites (Land Surfaces)'. The main map area displays a satellite view with several overlapping, multi-colored circular plots. A popup window for plot '88-0.1 (PA6-0.1-PB-0.1)' provides the following details:

- Status: In progress
- Classification: Suitable with major reduction measures and compensation
- Observations: Document: [More info](#)
- Plot Area: 6.38ha
- Design: Associated Surface Point: PB Design: PA6-0.1 Design Status: In progress Description: PC in Presinge Type: ee
- Source: FFE2, ArcGIS
- Origin: PA6 46.24750003 6.08588
- Parameters: Total Length: 92497.057m

On the right side of the interface, a file explorer shows a directory structure: `_myprojects > fcc-gis > data > placement > PB > PA6-0.1-PB-0.1_#88_Bellevue-Highway > PA6_0.1-PB-0.1_#88_README.txt`. Below the file explorer is a table of 'Site Description Information Sheet' data.

Site Description Information Sheet		Site Name:	PB	Version:	PB13-0.1-PB-0.1
		Land Surface Name:	91-0.1		
Document identifier	FCC_2007071000_AVE_SiteDescriptionInformationSheet_PB13-0.1-PB-0.1		Doc. Version:	0.4	
Date:	2020-10-14		Approval status:	IN WORK	
Approved by:	Last name, first name, organisation		Approval date:	YYYY-MM-DD	
Created by:	Verdier, Anne-Laure, CERN				
E-mail:	<a href="mailto:anne-laure.verdier@cern.ch">anne-laure.verdier@cern.ch</a>		Phone:	+41 75 411 5106	
Geographic location:	Lambert 93	WGS84	LV95		
	Easting: 940403.6m Northing: 6578233.4	Lat: 46.26120003 Long: 6.12190054	Easting: 2498478.3719m Northing: 1124161.776m		
	Town: Bellevue	Canton or Departement: Genève	Country:	Switzerland	
	Parcels, owners, classification (PLU, PD): 371, 376, private owners Additional parcels for evaluation: 372, private owners			Approximate Size: 4.4 ha for the sum of all plots	
Map:					

Site description sheets for all potential plots

# A tool to add associated information (I)

## Civil engineering information: links to underground structure drawings

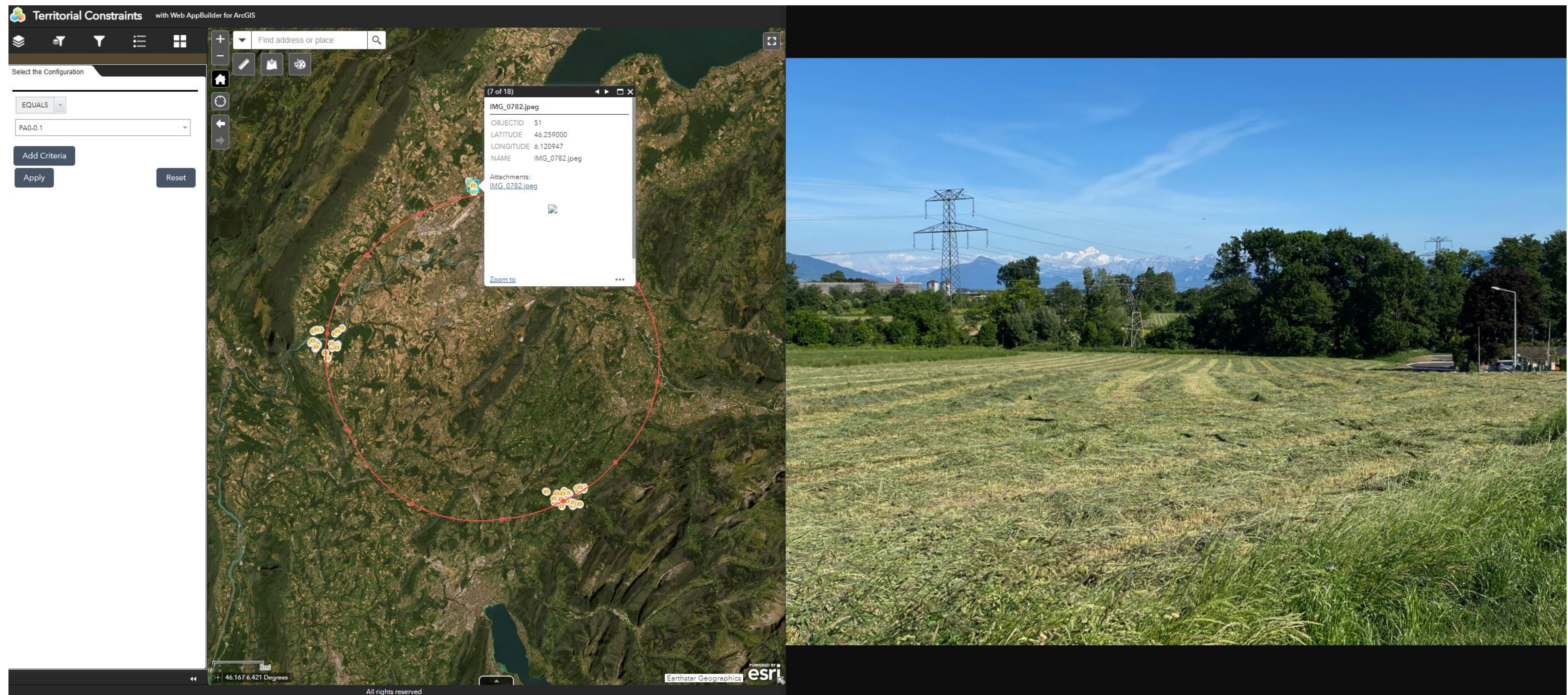
The image shows two side-by-side screenshots. The left screenshot is a GIS application titled "Territorial Constraints" with a search bar and a layer list on the left. The main map area shows a circular structure overlaid on a satellite image. A pop-up window displays technical data for a selected point, including source, origin coordinates, azimuth, total length, and straight length. The right screenshot is a CAD drawing viewer from CERN, showing a 3D model of a structure. The interface includes a search bar, document information (CDD Number, Type, Responsible, Team, Status), and a "NAVIGATE TO PART" button. A note at the bottom states: "If experiencing errors when viewing drawings, please ensure you are logged into EDMS".

Category	Value
Source	0
Origin	PA0 46.2357487 6.05701077
Parameters	Azimuth: ° Total Length: 97950m Short Straight Length: m Long Straight Length: m Short Arc Length: 0m Long Arc Length: 0m
Machine Parameters	No Related Records...
Underground Structures	<a href="#">More info</a>
Related tables:	FCC_SURFACE_POINTS - FCC.DESIGN

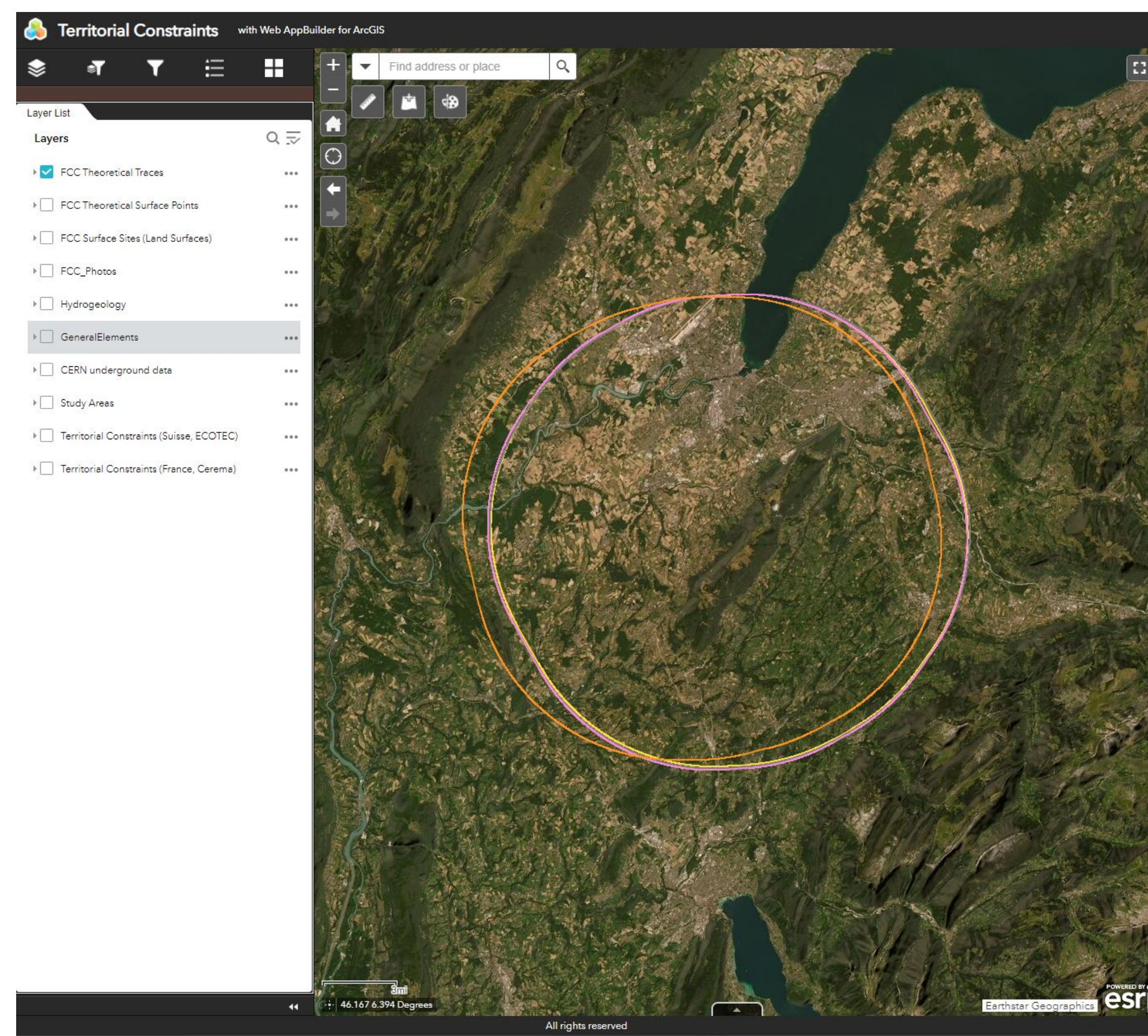
Field	Value
CDD Number:	Not found
Type:	CATIA Product
Responsible:	Fani Valchkova-Georgieva (fani)
Team:	CAD-All-Users
Status:	Preliminary ✓

# A tool to add associated information (II)

## Field visit: links to photos



# A tool to compare results and open discussion

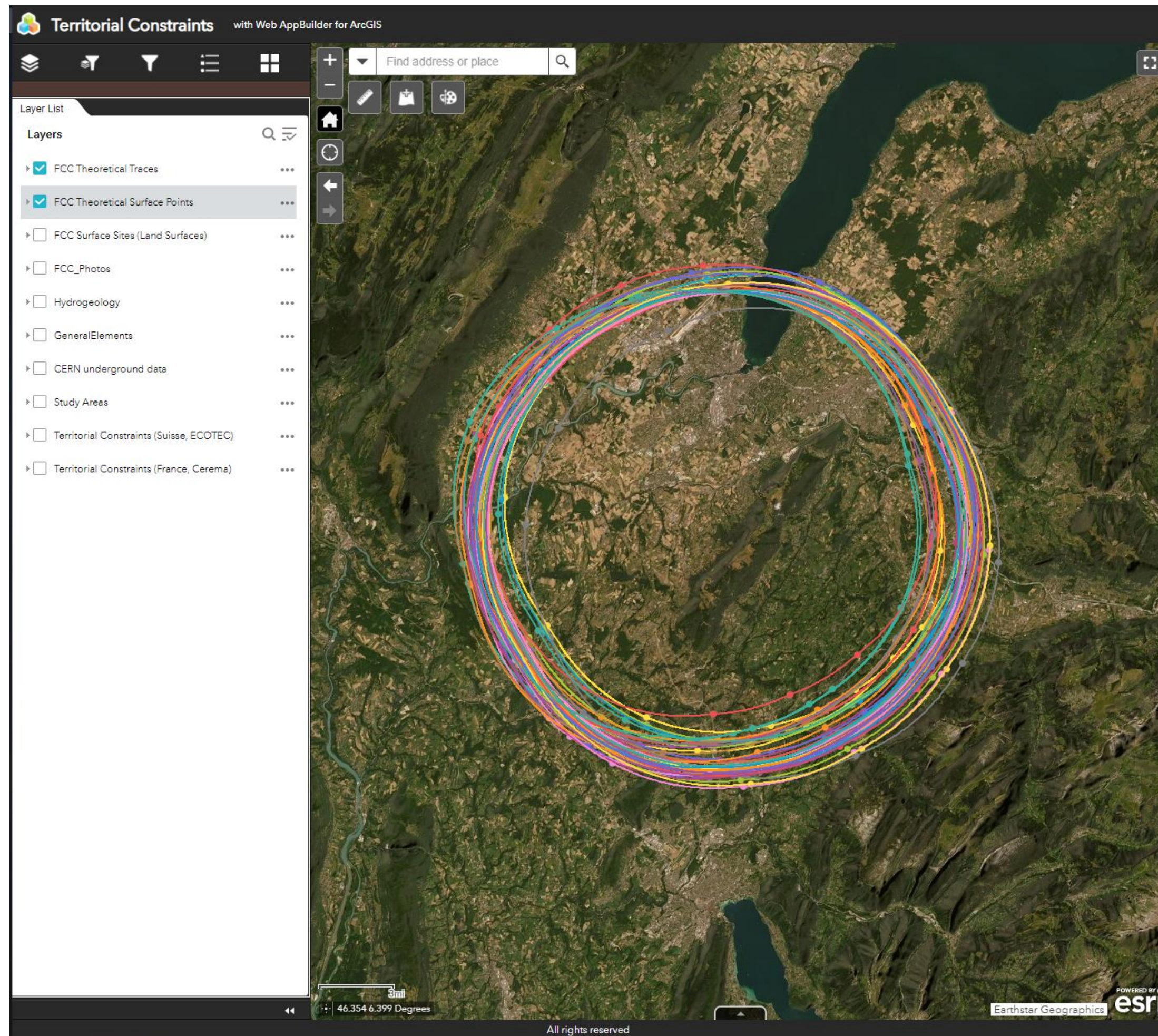


- Multiple variants of the same scenario  
Which one is best?
- Multiple scenarios

Criteria	Sum values	Sum scores	Scores %
<b>LAND STATUS</b>	9	19	14.39
Plot availability	2	4	3.03
Clean and clear title	2	4	3.03
Plot price	2	4	3.03
Time for acquisition and expected challenges during acquisition	2	4	3.03
Cost of development	1	3	2.27
<b>CONNECTIVITY</b>	4	8	6.06
Distance from transport, industrial and other relevant infrastructures	2	4	3.03
Distance from populated areas	2	4	3.03
<b>RAW MATERIALS AND SERVICES</b>	4	8	6.06
Availability of raw materials	2	4	3.03
Proximity to service providers	2	4	3.03
<b>PHYSICAL FEATURES</b>	15	33	25.00
Plot size and shape	1	3	2.27
Topography	1	3	2.27
Shaft depth	1	3	2.27
Drainage conditions	2	4	3.03
Surface (soil) conditions (from sensibility sheet)	2	4	3.03
Water resources	2	4	3.03
Accessibility	2	4	3.03
Subsurface conditions (physical)	2	4	3.03
Subsurface conditions (regulatory)	2	4	3.03

Multi-criteria analysis for all sites and the entire scenario

# Access

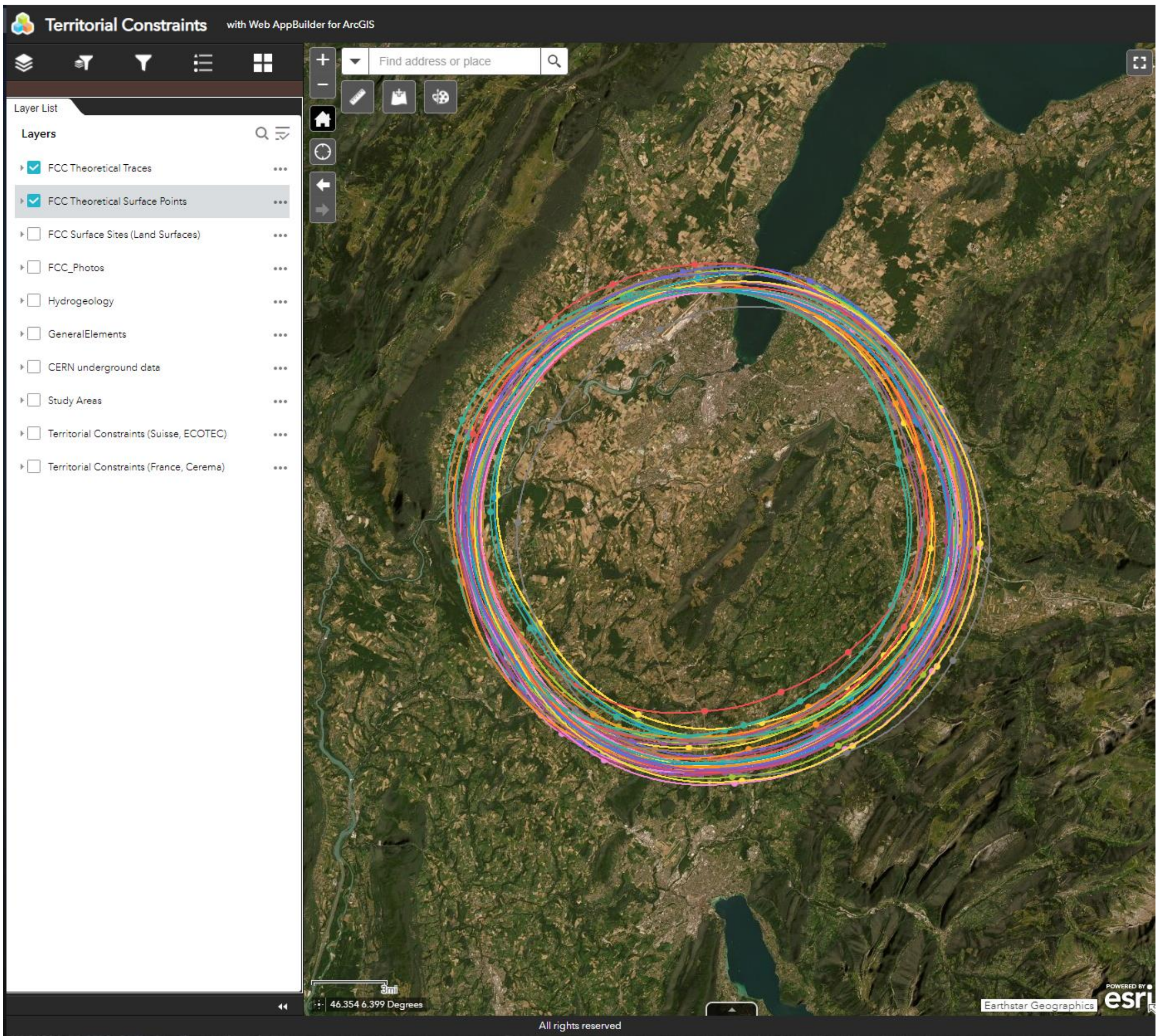


Currently: access is reserved to the study team

In the near future: access will be gradually granted to people outside of the team

Eventually: some data will be made publicly available

# Conclusion



Visualisation tool

Analysis tool



Thank you for your attention  
Any questions?