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Determining the "true" three-dimensional environmental impact of Public Law Restrictions

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Outline

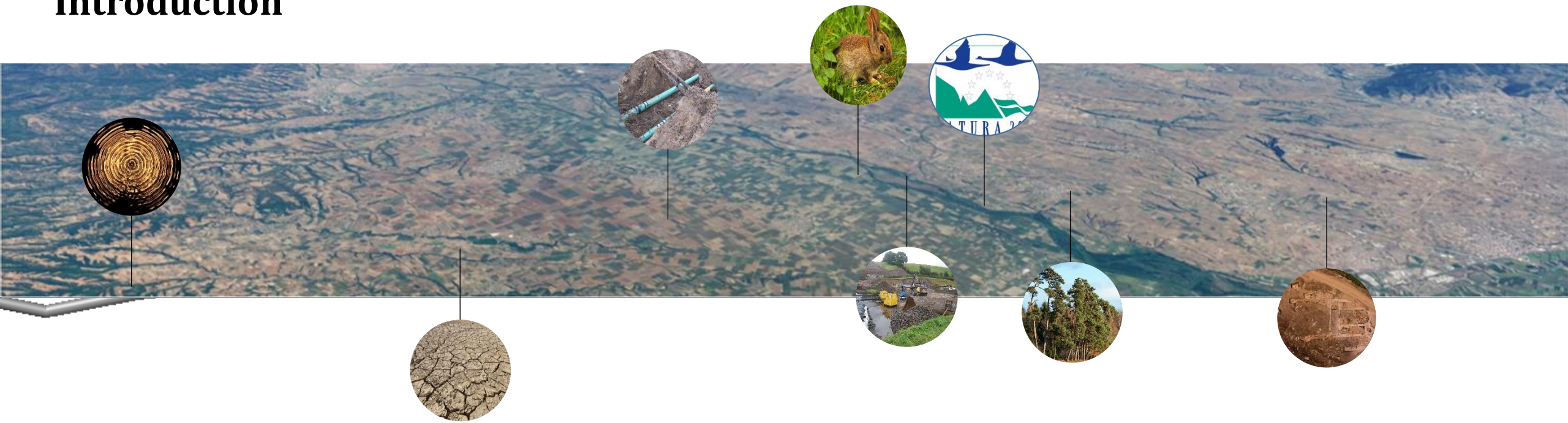
- ❑ Introduction
- ❑ Case study
- ❑ Baseline conditions and restrictions
  - Geology
  - Soil and groundwater
  - Biological environment
  - Cultural Heritage
  - Socio-economic environment
  - Landscape and visual amenity
- ❑ Conclusions

Introduction

3D Cadastre

- Related to modern structures
- Based on Private Law
- Secure real property rights
- Efficient land management

Introduction



- Multiple restrictions
- Different fields
- Quantitative and qualitative characteristics

Which PLRs apply to 3D space ?

How can they be defined ?

Case study

- Under construction (2020)
- Capacity:10 bcm/year
- Length: 860 in total
- Diameter: 48”
- Crosses 3 countries
- Depth: Minimum 1 m
- Highest point: 2100 m
- Lowest point: 820 m (underwater)

Methodology

1. European Union legislation
2. National Greek legislation
3. International Conventions
4. International requirements

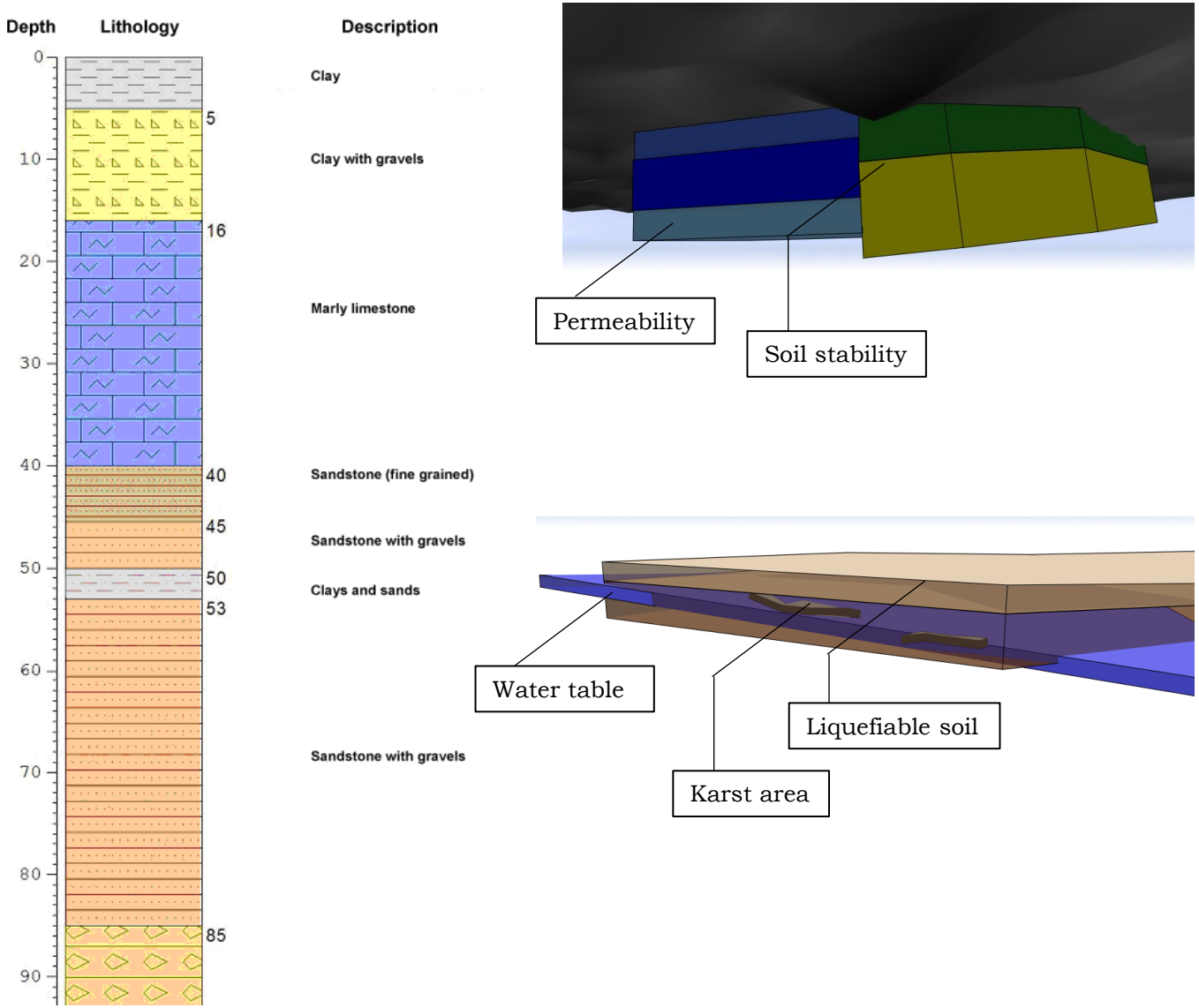
TAP Environmental and Social Impact Assessment

3D requirements

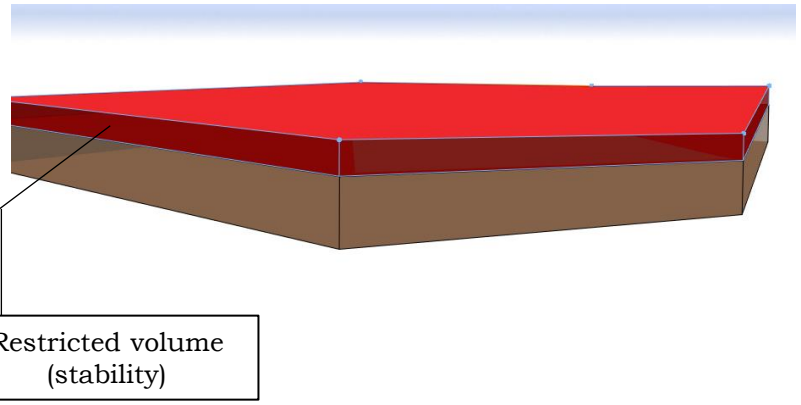
3D modelling
(ESRI CityEngine software)

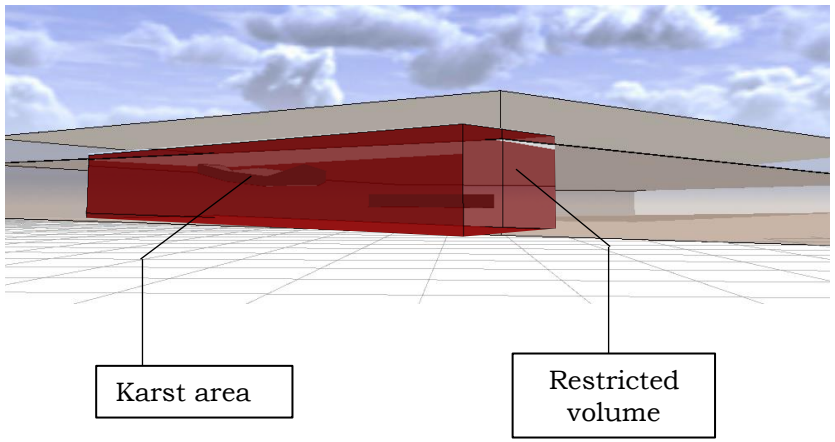
Baseline Conditions and Restrictions

Geology



Source: Veranis (2010)





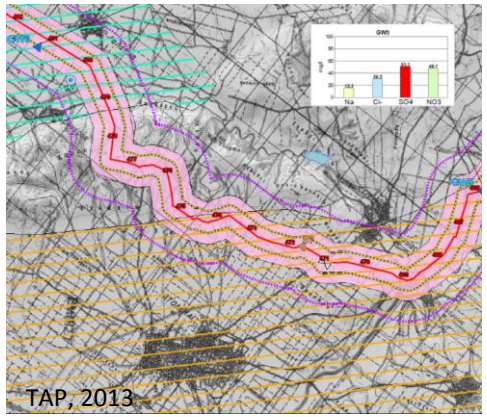
Baseline Conditions and Restrictions

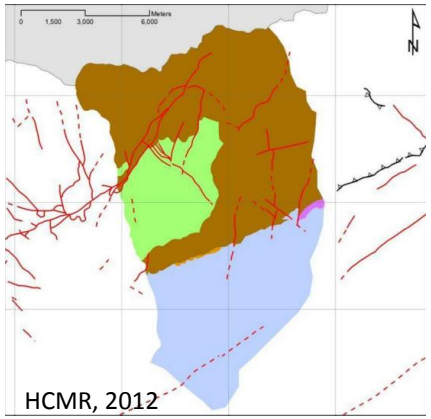
Soil and groundwater

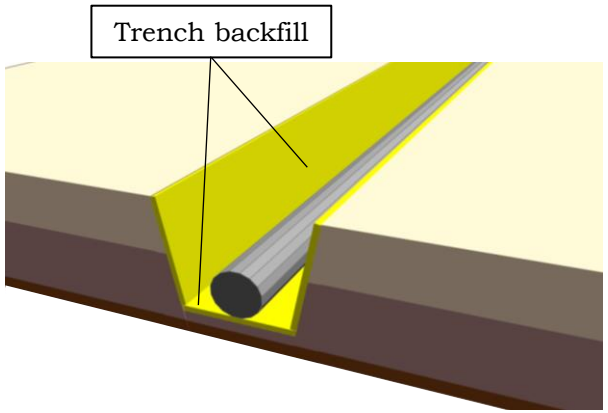
- Soil survey results
- Soil analysis
- Soil mapping and classification study
- Identification and description of land use and cover characteristics

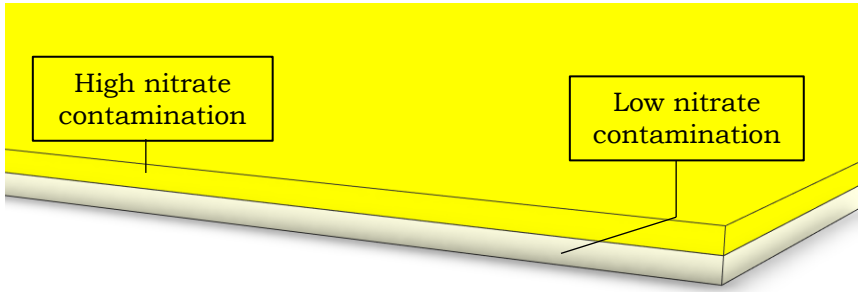
- Geological maps

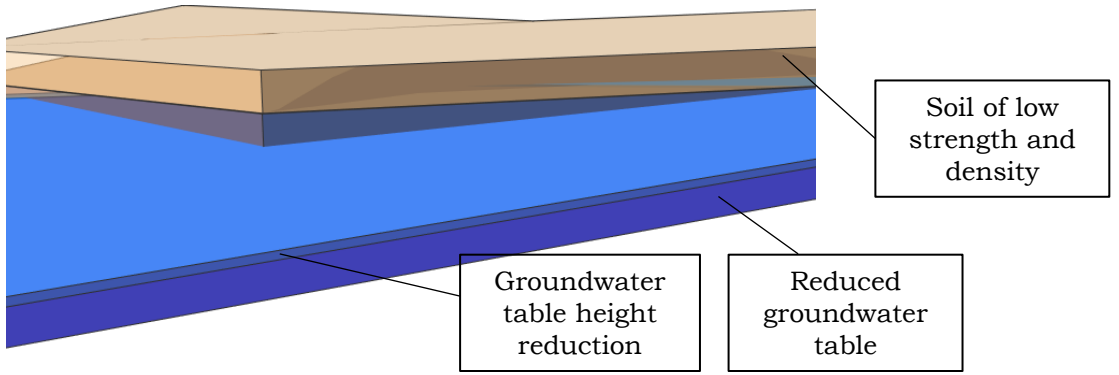
- Groundwater bodies
- Groundwater heads and flows
- Groundwater quality


TAP, 2013


HCMR, 2012



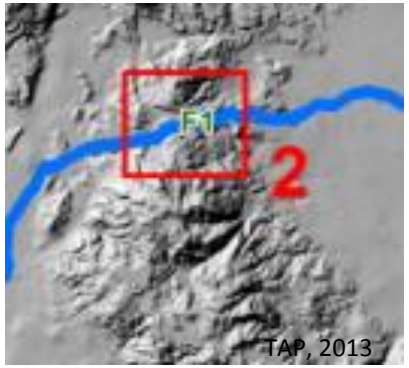




Baseline Conditions and Restrictions

Biological environment

- Fauna
- Flora
- Protected areas, sites of conservation interest



TAP, 2013

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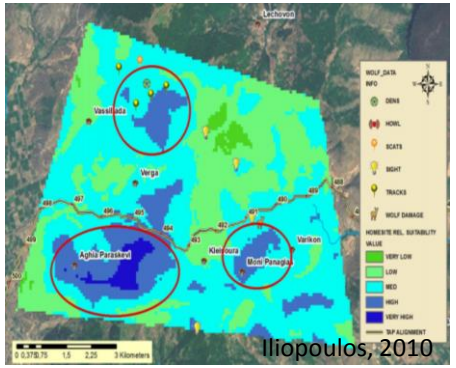
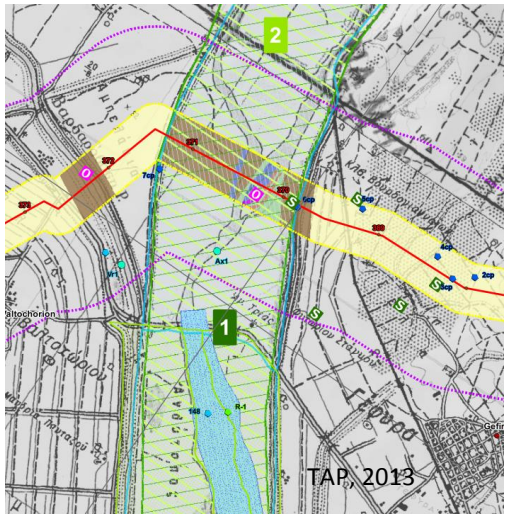
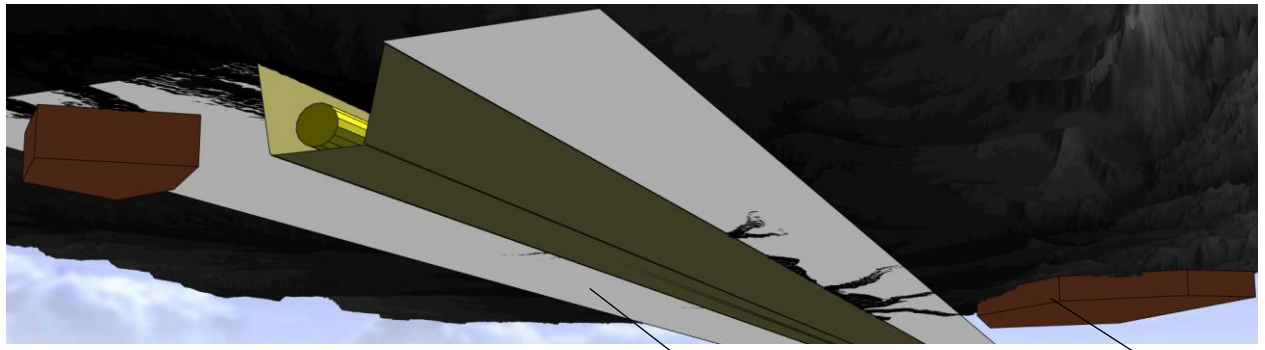

Iliopoulos, 2010

Sample No.	GPS point*	KP	Area	Habitat type	Distance to pipeline centreline	Other remarks
228	MP193	393.1	SW of Paralimni (Giannitsa valley)	Large maize cultivations.	11 m	Absence of suitable habitat for sampling. No sampling was conducted

TAP, 2013



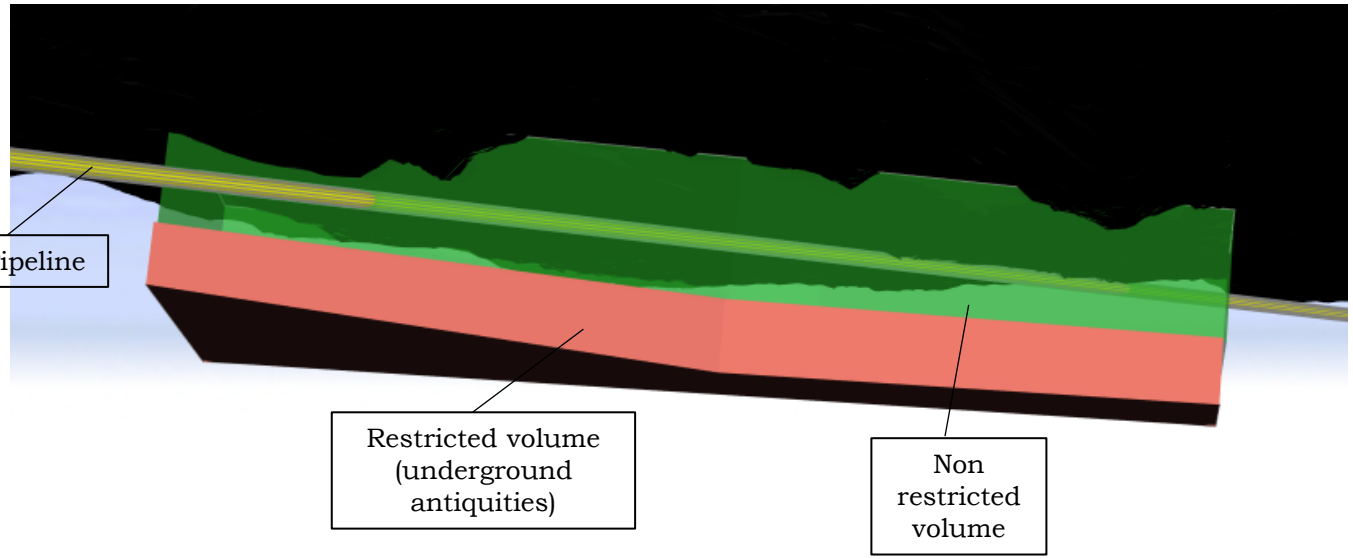
TAP, 2013

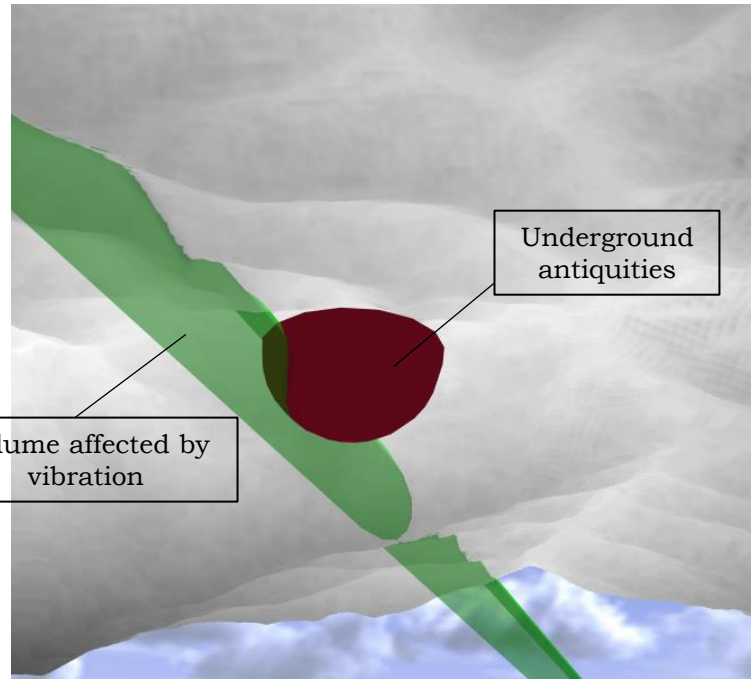


Baseline Conditions and Restrictions

Cultural Heritage

- 2D location based
- 2D potential areas of underground antiquities
- Restrictions on surface parcel level

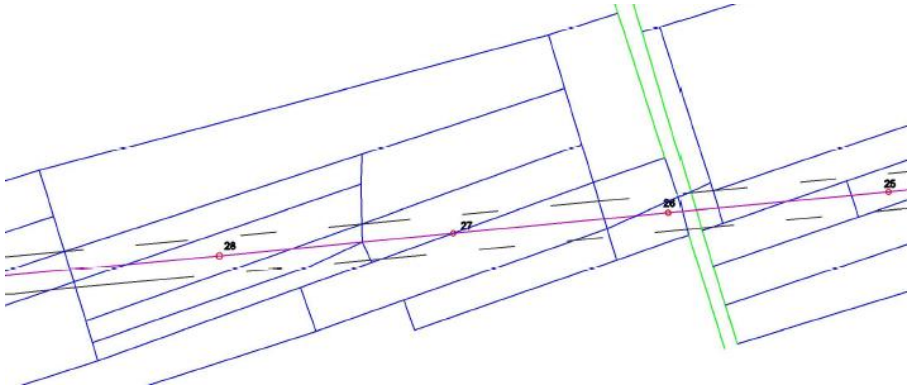


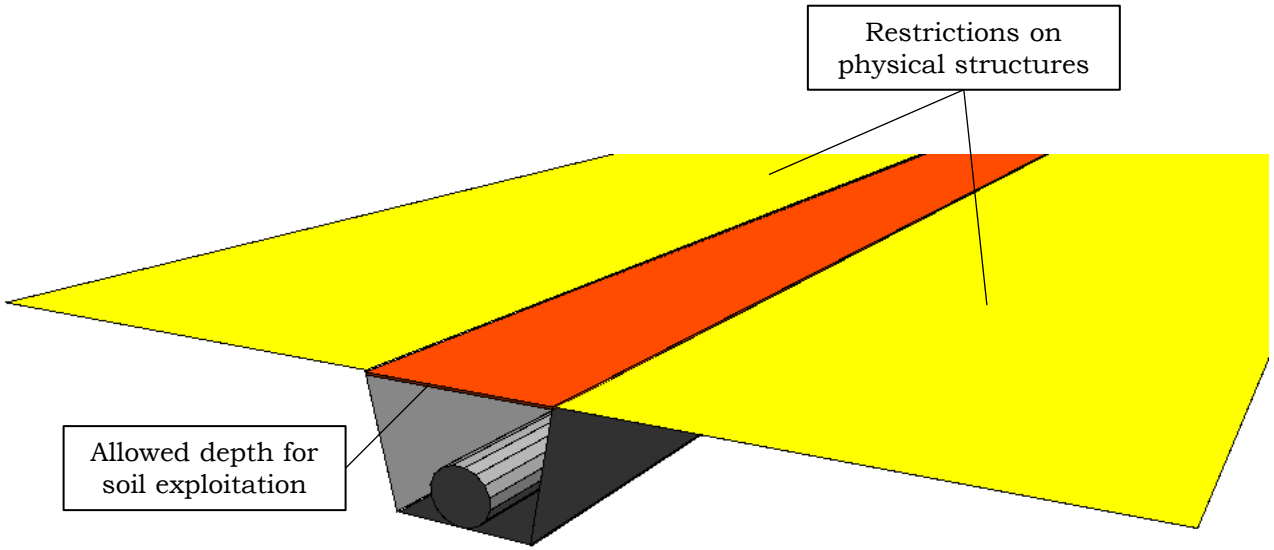


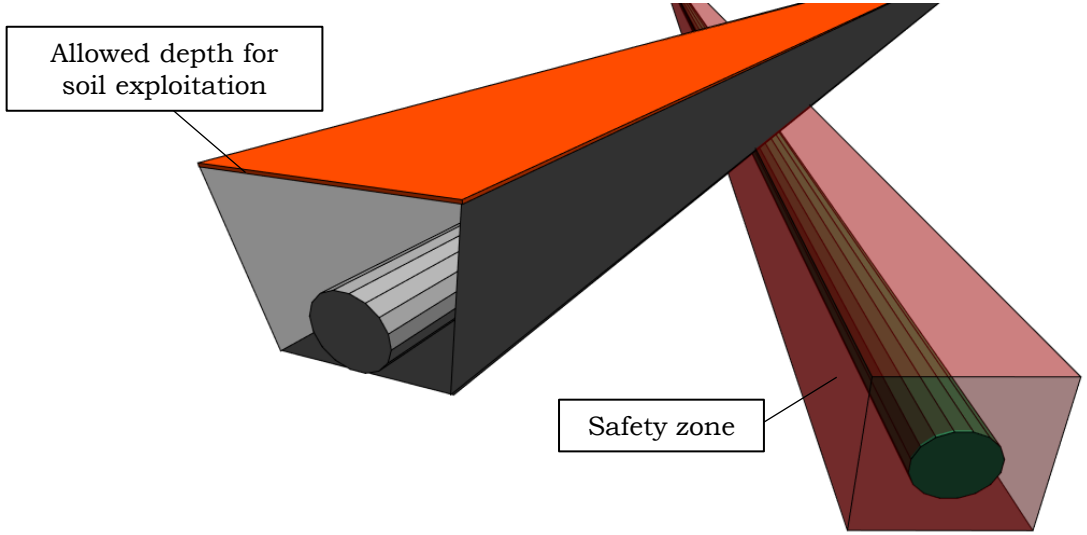
Baseline Conditions and Restrictions

Socio-economic environment

- Land tenure
- Infrastructures
- Health and safety





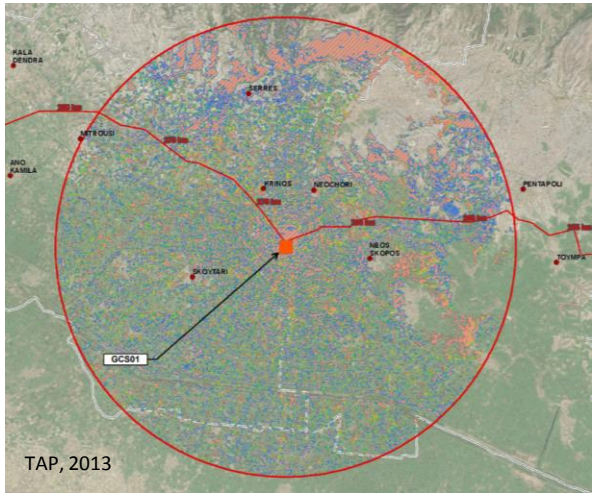


Baseline Conditions and Restrictions

Landscape and visual amenity

Landscape components (Goodey, 1995)

- Physical
- Human
- Aesthetics (visual, other)
- Associations



- View shed analysis
- 3D models of structures
- Photomontages

Conclusions

- Complex 3D relations among environmental components
- Explicit, non-geometrical, implied 3D restrictions
- 3D baseline conditions in 2D/3D
- 3D already in E(S)IA assessment (e.g. landscape)

Challenges

- Which PLRs should be defined and registered in 3D?
- 3D environment models or 3D PLR models?
- Can qualitative data be quantified?
- How could E(S)IA legislation be modified to incorporate explicit 3D PLRs and require 3D documentation?

Thank you!