

Contaminated soil management in Greece

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Environmental baseline

Area: 130.000 km²

Population: 11 million

Hundreds of islands

One of the most mountainous countries in Europe

One of the lowest densities in Europe (84 inhabitants/km² vs. 508 inhabitants/km² in the Netherlands)

The longest coastline in Europe (approx. 14.000 km), 5% of which belongs to areas of unique ecological value

Significantly dependent on groundwater resources for water supply (for irrigation too)

Large number of protected areas

Environmental baseline

Significant agricultural production – diffuse contamination (nitrate pollution due to over-fertilization of soil)

Saltwater intrusion in coastal zones due to non-sustainable pumping practices

Significant natural (geogenic) concentration of heavy metals in soil and groundwater (e.g., CrVI concentration up to 100 µg/L in groundwater)

Mixed land uses across the areas where industry is also developed

Karstic and coarse-grained deposits aquifers across the country

No data for emerging contaminants, such as PFAS, so far

Lack of urban green space

Megasites will need to be remediated in the near future / Large infrastructure and regeneration projects already under construction

Administration

Member of the EU (since 1981) and the Eurozone (since 2001)

Organised on a decentralised basis:

- the central – State governance (Ministries, Decentralised Administrations); and
- the local self-government (Regions & Municipalities)

Environmental policy is planned by the Ministry of Environment and Energy (YPEN)

Legislation

National environmental policy is clearly driven by the EU Directives and Regulations

Very satisfactory implementation when a clear EU legislation exists (e.g., EIA Directive, Urban Wastewater Directive, Waste Framework Directive)

...but not a proactive advanced national environmental policy when EU legislation does not exist, e.g., for subjects like contaminated soil management!!!

The new EU Soil Strategy is already in place (2021) and the upcoming Soil Health Law will be soon (2023)...THEREFORE GREECE SHOULD GET READY

Legislation

JMDs 13588/725/2006 and 24944/1159/2006 transposed the EU hazardous waste policy in the Greek law, lacking an integrated definition of the “contaminated site” though. The need of Remediation Study is foreseen.

1.JMD 36060/201326 transposed the Industrial Emission Directive (IED 2010/75/EC) into the national legislation. However, a Baseline Report is prepared only when a new EIA is required and only for some industrial sectors.

1.Law 4042/2012, transposed the Waste Framework Directive (WFD 2008/98/EC) especially regarding issues such as the prohibition of unauthorized dumping of waste.

1.Presidential Decree (PD) 148/2009 transposed the Environmental Liability Directive (ELD 2004/35/EC)...“causal relationship” should be verified between the alleged polluter and the environmental damage

Law 4685/2020 on modernization of environmental legislation mandates landowners to clean up their properties from any hazardous wastes or asbestos containing materials

Multiple authorities involved in Contaminated Soil management

1. Directorate of Waste Management of YPEN – Responsible for coordinating waste management policy

Environmental Damage Coordination Office of YPEN – This is the authority that is responsible for the implementation of the Environmental Liability legislation

• Directorate of Environmental Permitting of YPEN – Responsible for the environmental permitting of large works and projects (A1). Typically deals with most IED baseline reports

Directorate of Water Management - Decentralized Administrations – Responsible for water management monitoring within each Region.

Directorate of Environmental Permitting of Decentralized Administrations – Responsible for environmental permitting works and projects (A2) and contaminated soil remediation projects within each Region.

Environmental Inspectors of YPEN

Contaminated site inventory (not completed)

2009: a study was completed for the investigation, evaluation and remediation of uncontrolled (illegal) contaminated sites with industrial and hazardous wastes

2013: a study was initiated for recording and evaluation of the contaminated sites by industrial hazardous wastes in several regions

2,029 potentially contaminated sites were identified and prioritized

300 most important contaminated sites were selected for further investigation through questionnaires and on-site assessment

135 were legal sites and 165 uncontrolled (illegal) sites, which were further investigated through field research, soil, sediment and water sampling, and chemical analyses

69 HP, 64 MP, 2 LP; and the illegal sites were classified as 82 HP, 82 MP and 1 LP

1. This project was the first approach...

However, an analytical database for illegal landfills exists...most of which have been already remediated

Screening values

There is no a national instituted soil Screening values in Greece

This is the typical practice in most EU countries and other countries as well with long experience in contaminated site management, such as the USA

France is an exemption since this list was withdrawn in 2007 and currently the contaminated soil framework is based solely on site-specific conditions

Authorities and consultants in Greece use Screening values from other EU countries, such as the new Dutch list of the Netherlands and the Federal Soil Protection and Contaminated Sites Ordinance of Germany... without any direct legal obligation, though

For groundwater “good chemical status” values are typically used (for limited heavy metals and organics parameters) regardless land uses (MD 1811/2011). The water for human consumption legislation is also used for some parameters as indication

•The existing situation is further perplexed by the lack of land uses regulations in many parts of the country and the common mixed land use regime

Assessment

Remediation Study is foreseen in the Greek Law on hazardous waste management, but the approach is inadequate (e.g., no good practices such as the CSM and the phased approach are clearly described)

IED Baseline report is foreseen in the Greek law however, is only required for a limited number of projects and activities (usually large industrial sites, as provided by the IED) and does not cover the entire spectrum of contaminated soil needs

Therefore, in cases of private development's, especially when large multinational companies are involved, site assessment tools such as the ASTM ESA (Phase I & II), are typically used to cover this need by the consultants

Regarding soil and groundwater sampling, there are no specific guidelines for significant parameters such as sampling depth, equipment required, appropriate containers, QA/QC practices etc.

Regarding chemical analyses, chemical laboratories in Greece generally follow well-known international standards for water and soil analysis (e.g., EN, ISO, BS, ASTM) and are accredited by an international organization (ESYD)

Assessment

No standard pre-treatment procedures used across the laboratories. No standard containers used based on the parameter's characteristics, QA/QC methods during sampling are generally of limited use

Leaching tests according to the Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills, is also a typical practice in Greece for contaminated soil assessment...however only as indicative measure

Remediation targets are typically identical to the natural background values or to the Screening values of other EU countries

Circular economy and sustainability

Maximization of excavated soil and construction demolition wastes (CDW) reuse is foreseen nowadays in the environmental permits of large infrastructure works and rehabilitation projects carried out in Greece in the context of sustainability and circular economy.

However, there is no an adequate excavated soil management framework, including tools such as “slightly contaminated soil policy” (e.g., the Netherlands) or “Soil Passport” (e.g., Belgium) tool. Therefore excavated soil reuse is still not an adequately regulated practice in Greece.

Similarly, there is no such a framework for CDW reuse, even for industrial and contaminated sites, e.g., no Screening values (e.g., Austria), no exclusions reuse practices (e.g., Belgium). Therefore CDW reuse is not an adequately regulated practice in Greece.

Since both excavated soil and CDW inappropriate reuse may create continuous diffuse contamination sources, these subjects are VERY CRITICAL and attention should be paid on these ASAP...taking into account emerging contaminants as well!

That is why a new workshop on CDW reuse in Greece is planned with ISWA at the beginning of 2023...and you are welcome to participate as speakers!!!

Liability transfer

Governed by the general provisions of the Greek Civil Code, in combination with the harmonized provisions of the Environmental Liability Directive (ELD) 2004/35/EC, as it was as transposed into Greek Legislation

Potential contamination of a land property usually follows the actual owner, whether a natural or a legal person

In case that a property has been bought by a new owner, the competent authorities shall turn against him for the restoration of the land, in case of historical contamination

...the new owner can subsequently turn against the previous owner, in case that the new owner was not aware of the relevant fact or fault

Limited number of cases of environmental damage have been addressed in the framework of the environmental liability legislation and even fewer have reached a full restoration on the cost of the polluter.

No tools like the "Soil certificate" exist.

Positive outcomes

The authorities have identified the need for a robust national contaminated soil management framework

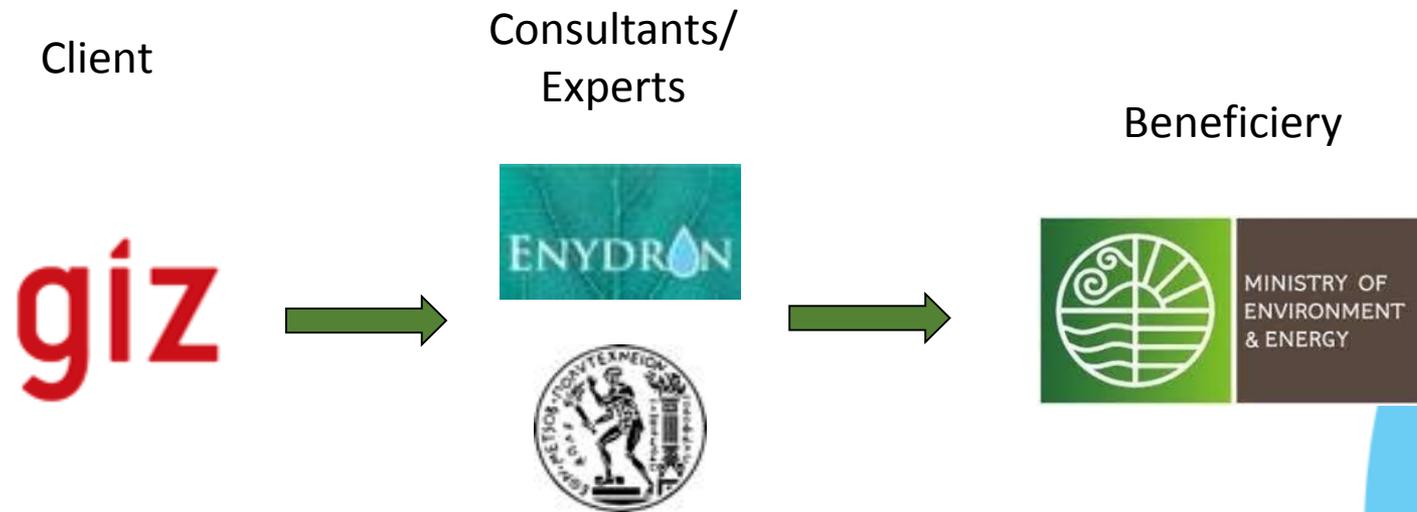
There are competent personnel (but few in numbers) that could support this effort

Industry and service providers are willing to help since the lack of such a framework is seen as a constraint for future investments

There are experienced academics that could support this effort

Greece has research institutions (HSGME, NAGREF, NCSR Demokritos etc..) with vast soil & groundwater experience that can support this effort

“Improved hazardous waste and contaminated soil management in Greece” 2021



Objective: to investigate the best available EU practices and make recommendations for a new contaminated soil management framework

A roadmap – Next-day steps using EU experience

Create a Committee, under the Ministry of Environment and Energy, where all authorities involved will be represented.

Build a pyramid network between the Committee and authorities, with competent staff.

Create a new robust, independent, practical and informative legislation for contaminated soil management as part of a wider Soil Strategy. (...the new Soil Health Law will accelerate this process)

Complete and update the digital contaminated site register and decide what will be the ultimate use and the access to it from stakeholders (many countries in EU have).

Use an existing soil Screening values list of a country with wide known experience (e.g., Germany), until such a list will be prepared based on the specific conditions of Greece.

Adopt a simple land use categorization similar to other EU countries (e.g., Germany, Italy).

Create a strong technical toolbox to support the legislative framework and also a non-technical toolbox for public consultation (e.g., France).

Add soil & groundwater investigation (like the Baseline Report) as part of the EIA of all A1 projects and works.

Increase participation of pertinent personnel to EU networks such as the Common Forum on contaminated land and the NICOLE.

A roadmap – Further steps using EU experience

Design an integrated Soil Strategy considering the climate crisis, the EU Green Deal, the EU Soil Strategy and other available EU and international best practices

Build a contaminated soil framework, as part of the Soil Strategy, governed by a) the polluter pays principle, b) the risk-based approach, and c) the BATNEEC principle (Best available techniques not entailing excessive cost)

Organize a new administrative body to be responsible for the Soil Strategy and the contaminated soil management framework (e.g., OVAM of Flanders Belgium).

Create a Diffuse Contamination Strategy, Emerging contaminants should be also included.

Create a separate Historical Brownfield Management Strategy

Create a new Screening value list based on the Greek specific conditions

Determine soil natural background (geogenic) values across the country (GeoAtlas)

Design a risk assessment methodology based on the Greek specific conditions

Create an accreditation procedure of contaminated site experts

Enhance the capacity building of pertinent authorities, wherever it is necessary

Introduce the Soil Certificate before any land transfer of potentially contaminated site

Key challenges

Diffuse contamination management (e.g., NO₃, PFAS)

Timely & efficient management of orphan and historical contaminated sites

Significant natural background concentrations of heavy metals

Interfaces with other policies - land planning policy, waste & ww policies etc.

Excavated soil and CDW reuse

Dissemination



Workshop: Contaminated soil management in Greece: learning from EU and international experience

17th International Conference on Environmental Science and Technology

A new stakeholder organization in Greece...under construction



LinkedIn
Sustainable
management
Of Industrial
Land in
GRreece

To start the discussion on contaminated soil and groundwater management in Greece

To prepare on time an integrated approach helping the Administration

To include all possible stakeholders that makes the framework transparent & fair

To provide the appropriate scientific state-of-the-art knowledge to the Administration

To do research on the subject of contaminated soil and groundwater management

To train professionals and organize workshops on the subject

Thank you for your attention!

Contaminated soil management in Greece

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A blue banner with white text and logos. On the left is the "COM FORUM N" logo. The text reads "Common Forum Autumn meeting 2022", "23 November, 2022", and "Athens, GREECE". On the right is the flag of Greece.

COM FORUM N

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