





## **Training course**

# "Identification and assessment of remediation measures for significant environmental damage and preparation of a remediation plan"

## 4-8 July 2022

Location: Environmental Information and Education Center, Conference Centre Ministry of Environmental Protection and Agriculture of Georgia

6 Marshal Archil Gelovani Avenue, Tbilisi 0159, Georgia

Please contact Olga Olson (<u>Olga.OLSON@oecd.org</u>) or Mari Laikre (<u>Mari.LAIKRE@oecd.org</u>) for more information.

Action implemented by:











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## Training course "Identification and assessment of remediation measures for significant environmental damage and preparation of a remediation plan" 4-8 July 2022

#### **Background information**

#### Background

Georgia adopted a Law on Environmental Liability in 2021, in accordance with the provisions of its Association Agreement with the European Union. This law aims to establish monetary liability of polluters for environmental damage they cause, as well as a requirement for them to remediate such damage. The law includes provisions on assessing significant environmental damage. Polluting entities will be required to produce remediation plans, the implementation of which will be overseen by the Department of Environmental Supervision (DES) of the Ministry of Environmental Protection and Agriculture (MEPA). In addition, the law has provisions for the creation of a dedicated fund that will spend collected payments on environmental remediation measures. Finally, the sets out the obligation of operators with dangerous activities to acquire financial security.

The government of Georgia is now in the process of developing bylaws and a damage assessment methodology.

Many concepts of the new law are new to policy makers and practitioners in the country, and awareness of the Law on Environmental Liability could be increased.

#### **Objectives, expected outputs and outcomes**

The main objectives of the practical training on "Identification and assessment of remediation measures for significant environmental damage and preparation of a remediation plan" are:

- To raise awareness about the Environmental Liability Directive (ELD) and its application in European Union countries, including success factors and possible challenges;
- To improve the ability to identify, characterise and assess pollution of soil and groundwater;
- To introduce different remediation technologies for soil and groundwater.

#### **Participants**

The course will be delivered by two professionals of the Italian National Institute for Environmental Protection and Research (ISPRA).

It is primarily intended for technical experts of relevant departments of the MEPA as well as policy makers of the MEPA and other environmental regulatory authorities.

It could also be of interest for stakeholders from academia, other governmental authorities, environmental NGOs, site owners, private consulting agencies and various other environmental professionals.

#### About EU4Environment

The "European Union for Environment" (**EU4Environment**) aims to help the six partner countries: Armenia, Azerbaijan, Belarus<sup>1</sup>, Georgia, Republic of Moldova, Ukraine preserve their natural capital and increase people's environmental well-being, by supporting

<sup>&</sup>lt;sup>1</sup> There is currently no co-operation with Belarus.

environment-related action, demonstrating and unlocking opportunities for greener growth, and setting mechanisms to better manage environmental risks and impacts.

The Action is funded by the European Union and implemented by five Partner organisations: OECD, UNECE, UNEP, UNIDO and the World Bank based on a budget of some EUR 20 million. The Action implementation period is 2019-2022.

For further information contact: <u>EU4Environment@oecd.org</u>.

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#### **Training Programme**

#### **Course description**

Environmental damage and contamination of soil and groundwater may come from a range of activities, for example, urban, industrial, mining and agriculture. Even some "environmental" activities like wastewater treatment plants or waste recycling facilities may cause contamination of different environmental media, if not managed correctly. The remediation activities are in some cases well implemented and documented.

This training course will introduce the subject of environmental liability and its application in EU countries; how to characterize soil and water pollution from a wide range of sources; and how to evaluate the risks of contamination using a standard risk assessment methodology that takes into account the so-called Conceptual Site Model (Source of Contamination – Pathway of Transport – Receptors). Different remediation technologies for remediation of soil and groundwater will be discussed. Strategies for overcoming the environmental problems will be examined in relation to degraded urban, agricultural and industrial landscapes, as well as the calculation of background values when contaminants are naturally present in the environmental matrixes.

The theoretical learning will be complemented by a practical exercise and a field trip to a contaminated site.

#### Trainers

#### Marco Falconi, Remediation Manager, ISPRA



Marco Falconi holds two Master's Degrees, in Environmental Science (2001) and in Geology (2010), both received from the University of Urbino, Italy. He has been working with ISPRA since 2003. His main activity in ISPRA is to support the Italian Ministry for Ecological Transition (IMET) in the technical control of the Characterisation Plans, Risk Analysis, Reclamation Projects, Monitoring Plans, and Emergency Safety measures in the 42 Contaminated Sites of the Italian National Priority List. He is the author of several reports and guidelines on the topic of land and contaminated sites management with Italian and international institutions. He is the Leader of the European Union Network for the Implementation and Enforcement of Environmental Law

(IMPEL) Expert Team "Water and Land", a member of the European Environment Information and Observation Network (EIONET) as National Reference Center (NRC) for soil. He collaborates or has collaborated with various international institutions such as the European Environment Agency (EEA), the European Commission, the Joint Research Centre, the UN Environment Programme and the Food and Agriculture Organisation (FAO), on different aspects concerning soil and groundwater, and with several universities in Italy and abroad.

#### Francesco Andreotti, Environmental Technologist, ISPRA (Day 1)



Francesco Andreotti is an Environmental Engineer and holds a Master's Degree in Energy and Environmental Management. He has been working at ISPRA since 2004. He is a senior expert for the implementation and enforcement of the ELD in Italy. He also has relevant experience in project management and co-ordination (Deputy Leader of the Cross-cutting Expert Team of IMPEL, Manager of the IMPEL project "Criteria for the Assessment of the Environmental Damage", Co-ordinator of the Working Group "Italian National System for Environmental Protection" (SNPA)), as well as

training and tutoring on the implementation and enforcement of environmental laws (industrial pollution, environmental inspections, environmental liability) in Italy (ISPRA and SNPA, Carabinieri, Master's courses) and in international projects. He has been awarded international assignments and collaborations within EU and international institutions such as being the ISPRA representative in the EU ELD Government Expert Group. He has managed Twinning and EuropeAid projects in Serbia, Montenegro, Romania.

## Day 1: Introduction to EU legislation on environmental liability Monday, 4<sup>th</sup> July 2022

## Description

Day 1 focuses on introducing the EU legislative framework for environmental liability and the activities of EU Member States for addressing environmental damage, especially identification and assessment.

Time	Item
09h00-09h15	Participant registration
09h15-09h30	Introductory remarks
	• Mr Krzysztof Michalak, Senior Programme Manager, Green Growth and Global Relations Division, OECD Environment Directorate: Introductory remarks
	• Mr. Alexandre Darras, Attaché, Team Leader Connectivity, Energy, Environment and Climate Change, Delegation of the European Union to Georgia: Introductory remarks
	• Ms. Nino Tandilashvili, Deputy Minister of Environmental Protection and Agriculture of Georgia: Introduction to Georgia's Law on Environmental Liability and other legislative developments
09h30-10h00	Introduction of the speakers and brief tour de table of the participants (Marco Falconi)
10h00-11h00	<b>Overview of the main legislation on environmental liability in the EU (Francesco Andreotti, remotely)</b>
11h00-11h15	Coffee break
11h15-13h15	Overview of the challenges during the introduction and implementation of an environmental liability system (Francesco Andreotti, remotely)
13h15-14h15	Lunch
14h15-16h00	A review of successful and unsuccessful cases related to environmental liability from the experience of European countries (Francesco Andreotti, remotely)
16h00-16h15	Coffee break
16h15-17h45	Identification/assessment of environmental damage (Francesco Andreotti, remotely)
17h45-18h00	Test (multiple choice) and correction (Marco Falconi) Questions & Answers
18h00	End of Day 1

## Day 2: Characterisation Tuesday, 5<sup>th</sup> July 2022

#### Description

The objective of Day 2 is to present the most common technologies for understanding the environmental quality of solid and water matrixes. The training will also cover measurement of aeriforms (contaminants that are volatile e.g. benzene, mercury, chlorinated solvents) and the most advanced high-resolution characterization techniques that are useful for a better comprehension of the contamination distribution.

Time	Item
09h00-11h00	Optimization and design of a characterization programme in a contaminated site
11h00-11h15	Coffee break
11h15-12h15	Sampling techniques for solid matrixes (soil, sediment and sludge)
12h15-13h15	Sampling techniques for water matrixes (groundwater, surface water, effluents)
13h15-14h15	Lunch
14h15-16h00	Sampling techniques for aeriform matrixes (soil gas survey, flux chamber)
16h00-16h15	Coffee break
16h15-17h45	Advanced techniques and instruments for analysing samples from a contaminated site (High Resolution Site Characterization)
17h45-18h00	Test (multiple choice) and correction
	Questions & Answers
18h00	End of Day 2

## Day 3: Risk Assessment Wednesday, 6<sup>th</sup> July 2022

#### Description

Day 3 is dedicated to risk assessment, which could help to understand when the presence of contaminants causes a significant risk (ELD, article 2, letter 1c) as well as the target concentrations for remediation activities called Site Specific Target Levels (SSTL). The discussed risk assessment is based on the Conceptual Site Model (sources of contamination, transport pathways, active receptors). A risk assessment helps to avoid unnecessary remediation measures and to concentrate the efforts and resources that are really needed. In the afternoon, participants will undertake a practical exercise where they will carry out their own risk assessment.

Time	Item
09h00-10h00	Conceptual Site Model for risk assessment
10h00-11h30	Site specific parameters for risk assessment
11h30-11h45	Coffee break
11h45-13h00	Risk calculation and determination of Site Specific Target Levels
13h00-13h15	Test (multiple choice) and correction
	Questions & Answers
13h15-14h15	Lunch
14h15-15h50	PRACTICAL EXERCISE
	Exercise on a PC with a real case of risk assessment to carry out (difficulty: simple, petrol station contaminated by the release of gasoline)
	Note: A PC is required to download for free the software necessary to carry out the exercise. The software is available in English only.
15h50-16h00	Coffee break
16h00-18h00	PRACTICAL EXERCISE
	Exercise on a PC with a real case of risk assessment to carry out (difficulty: complex, mining area contaminated by heavy metals)
	Note: A PC is required to download for free the software necessary to carry out the exercise. The software is available in English only.
18h00	End of Day 3
Conceptual Site M	



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## Day 4: Remediation Techniques Thursday, 7<sup>th</sup> July 2022

#### Description

The site remediation phase comprises all activities that are necessary for achieving the target concentration of pollutants in a contaminated site. These techniques could be differentiated into biological, chemical-physical and thermal according to the environmental media affected. Choosing the right remediation technique is important for resolving the environmental problem on an accelerated time frame as requested by Article 1.2.1 of Annex II of the ELD Directive.

The morning of Day 4 will focus on soil remediation techniques, while the afternoon will focus on groundwater remediation techniques. There will be time to examine some remediation techniques in-depth and consider their sustainability aspects.

Time	Item
09h00-10h30	Soil remediation techniques
10h30-11h30	Soil Vapour Extraction (SVE), theory, pilot study and full scale implementation
11h30-11h45	Coffee break
11h45-13h00	Soil Washing, theory, pilot study and full scale implementation
13h00-14h00	Lunch
14h00-15h30	Groundwater remediation techniques
15h30-16h15	In Situ Chemical Oxidation (ISCO), theory, pilot study and full scale implementation
16h15-16h30	Coffee break
16h30-17h00	Multi Phase Extraction, theory, pilot study and full scale implementation
17h00-18h00	Test (multiple choice) and correction
	Questions & Answers
18h00	End of Day 4

## Day 5: Site visit and the final assessment

Friday, 8<sup>th</sup> July 2022

## Description

Day 5 is dedicated to a field trip to the mining company "RMG Copper" in order to see its remediation activities. Participants will receive their course completion certificates at the end of the day.

Time	Item
08h45-16h30	SITE VISIT to RMG Copper, Kazreti, Bolnisi municipality
	08h45 - Meeting at the Environmental Information and Education Centre (EIEC)
	09h00 - Departure
	09h00 - 11h00 Travel to the site (by bus)
	11h00 - 12h00 Presentation by the site manager
	12h00 - 13h00 Visit of the site
	13h00 - 13h15 Group photo
	13h15 - 14h30 Lunch
	14h30 - 16h30 Travel back to the EIEC
16h30-17h00	Feedback and concluding remarks
17h00-17h30	Issuance of course completion certificates
17h30	End of Day 5

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