Horizon 2020
TO DE-POLLUTE THE MEDITERRANEAN BY THE YEAR 2020

GOBIERNO DE ESPAÑA
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

Horizon 2020, Initiative to de-pollute the Mediterranean by the year 2020

www.h2020.net

in collaboration with UNEP/MAP

Training on mercury management and remediation of contaminated sites. Almadén, SPAIN, 18-19 November 2015

"EU legislation relevant to the Sound Management of mercury and mercury wastes"

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UNEP MAP

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Legal Framework: EU Legislation

MERCURY:

- European Strategy Concerning Mercury (2005-2010)
- Mercury Regulation Nº 1102/2008
- Directive 2011/97/UE specific criteria for the temporary storage of metallic mercury considered as waste
- Recommendation 2009/39/CE on safe storage of mercury no longer used in Chlor-Alkali Industry

WASTES:

- Waste Framework Directive 2008/98/EC
- Landfill Directive 1999/31/EC
- Waste Acceptance Criteria Decision 2003/33/EC

European Strategy on Mercury 2005-2010

- **European Strategy Concerning Mercury is not a legally binding instrument but is usually followed by binding measures**
- **European Commission adopted the Strategy setting out 20 actions to reduce mercury levels in the environment and human exposure**
- **Development of the Strategy has promoted new legislation on mercury issues, as well as progress in scientific and technical knowledge and public awareness**

REDUCING SUPPLY AND ADDRESSING SURPLUSES AND RESERVOIRS OF METALLIC MERCURY

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Mercury Regulation (EC) 1102/2008

1) **Export ban** from UE (15-03-2011): metallic mercury, cinnabar ore, mercury chloride, mercury oxide and mixtures of metallic mercury with other substances (≥ 95% Hg by weight). (exemptions for medical, experimental and analytical)

2) As of 15-03-2011, considered as **waste** metallic mercury from:

- No longer used in Chlor-Alkali Industry
- Gained from cleaning natural gas
- Gained from non-ferrous mining and smelting operations
- Extracted from cinnabar ore

3) Amendment of **landfill** acceptance **rules**. Metallic mercury may be:

- Temporary stored (>1year) D15 or permanently stored in salt mines adapted, or deep underground hard rock formations D12
- Temporary stored (>1year) in aboveground storage D15

4) Assessment of ongoing research of **solidification/stabilization methods** and long-term behavior of Hg0 underground

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Mercury Regulation (EC)1102/2008
Points for revision or consideration

- Specific **criteria for the permanent storage** of metallic mercury considered as waste
- Ongoing research on safe **disposal options** including technologies of **stabilisation/solidification**
- **Time limits** concerning temporary storage (5 years…)
- Storage obligation to metallic mercury from other sources
- **Extending export ban** to other compounds
- **Import Ban**

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Directive 2011/97/EU
Temporary storage criteria

- Requirements for the purpose of temporary storage of metallic mercury for more than 1 year
- Storage site requirements
- Composition of the mercury
- Containment Standards
- Acceptance procedures
- Certificates
- Monitoring, inspection and emergency requirements
- Record keeping

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Recommendation 2009/39/CE safe storage of Hg from Cl-Al Industry

- First voluntary industry agreement to be formally recognised by a Commission Recommendation.
- Euro Chlor, business association representing the EU chlor-alkali producers and the European Free Trade Association regions, ensure safe management of mercury surpluses
- The Commission will develop the specific technical criteria, locations and safety requirements.
- Surplus mercury removed from decommissioned chlorine plants, transported to final destination in approved sealed steel containers

COMMISSION IMPLEMENTING DECISION of 9 December 2013 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU on industrial emissions, for the production of chlor-alkali :

December 2017: Mercury chlor-alkali plants within the EU will have to change to non mercury technology or to stop the activity.

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Waste Framework Directive 2008/98/EC

- Waste management without risk
- Definitions of waste, reuse, recycling, recovery, disposal, end-of-waste status, by-products
- Waste management hierarchy:
  - Prevention
  - Preparing for reuse
  - Recycling
  - Other recovery, notably energy recovery
  - Disposal (last option)
- Waste Reduction, Recycling and Recovery targets
- Polluter pays principle
- Extended producer responsibility

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Waste Framework Directive 2008/98/EC

- Waste management plans and waste prevention programmes
- Principles of self-sufficiency and proximity
- Permits and registrations
- List of wastes according to origin and composition
- Allowed Recovery and Disposal Operations
- Provisions on hazardous wastes:
  - Ban of mixing
  - Hazardous wastes properties list
  - Casuistry
  - Record keeping 3 years
  - Packaged or labelled (international or EU regulations)

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Hazardous wastes

Characteristics:

- H 5 "Harmful"
- H 6 "Toxic"
- H 7 "Carcinogenic":
- H 10 "Toxic for reproduction":
- H 11 "Mutagenic":
- H 12 releases of toxic or very toxic gases
- H 14 "Ecotoxic“

Hg wastes:

- 05 07 01* Hg wastes from natural gas purification,
- 06 04 04* Hg wastes from inorganic chemical processes,
- 06 07 03* barium sulphate sludge containing mercury,
- 10 14 01* waste from gas cleaning containing mercury,
- 16 01 08* components containing mercury,
- 16 06 03* mercury-containing batteries,
- 17 09 01* construction and demolition mercury wastes
- 20 01 21* fluorescent tubes, other mercury-containing waste

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Mercury Wastes

RECOVERY OPERATIONS:

R 4 Recycling/reclamation of metals and metal compounds
R 5 Recycling/reclamation of other inorganic materials
R 8 Recovery of components from catalysts
R 11 Use of waste obtained from R 1 to R 10
R 13 Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where the waste is produced)

DISPOSAL OPERATIONS:

D 1 Deposit into or on to land (e.g. landfill, etc.)
D 5 Specially engineered landfill
D 9 Physico-chemical treatment results in final compounds or mixtures discarded by means of any of the operations D1 to D14
D 12 Permanent storage
D 13 Blending or mixing prior to submission to D 1 to D 12
D 15 Storage pending any of the operations D 1 to D 14

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Landfill Directive 1999/31 EC

- Landfill definition scope
- Landfill classes
- Requirements of location, stability, leachate management, protection of solid and water, etc.
- Requirements for a permit, closure and after-care procedures
- Monitoring and control during operation and after-care
- Allowed storage up to 3 years if pending to recovery, 1 year if disposal
- Treatment operations accepted for landfills
- First guideline for the acceptance of waste at landfills. **Liquid waste are not allowed.**

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Waste Acceptance Criteria Decision 2003/33/EC

- Develops Landfill Directive on basic characterization, compliance testing and on site verification
- The acceptance of Hg waste at each landfill type primarily depends on the leaching properties of the waste.
- Sets out leaching limit values, sampling and test methods to determine the leachability
- Mercury waste above the leaching limit value for a specific type of landfill has to be treated again to reduce the content of mercury or to be stablised and reduce the leachability
- Criteria for monolithic waste will have to provide at least the same level of environmental protection as for granular waste
- For underground storage specific safety assessment is prescribed due to the fact that leaching limit values do not apply

Waste Acceptance Criteria Decision 2003/33/EC

Mercury leaching limit values for landfill types: Dec. 2003/33/EC

Landfill type	L/S =2 l/kg mg/kg dry substance	L/S =10 l/kg mg/kg dry substance	C0 (percolating test) mg/l
Criteria for waste acceptable for landfills for HAZARDOUS WASTE	0.5	2	0.3
Criteria for HAZARDOUS WASTE acceptable AT LANDFILLS FOR NON HAZARDOUS waste	0.05	0.2	0.03
Criteria for granular NON HAZARDOUS WASTE accepted in the same cell as STABLE Non Reactive hazardous waste	0.05	0.2	0.03
Criteria for landfills for INERT WASTE	0.003	0.01	0.002

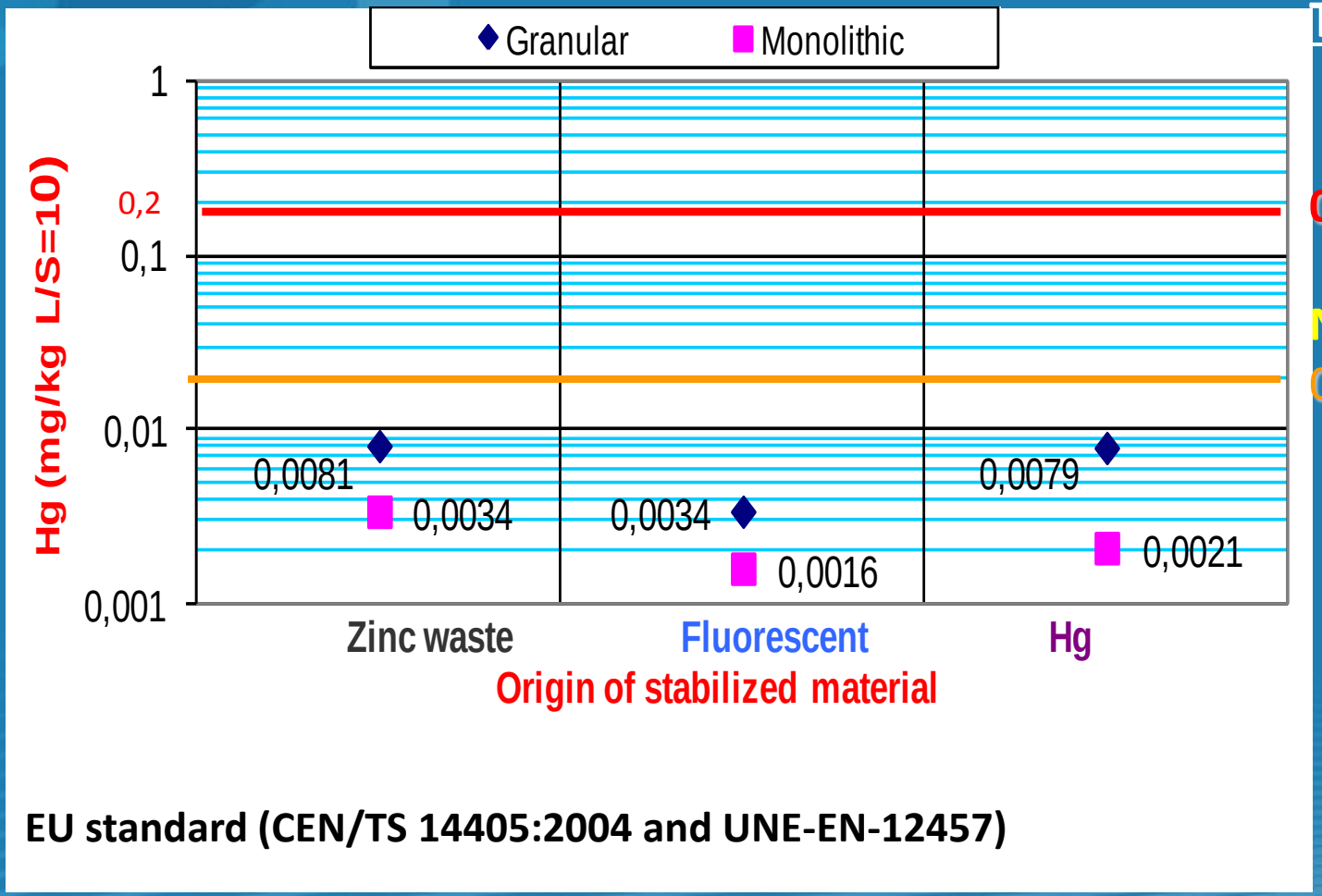
CTNDM Technology (SPSS) is directly applicable to elemental mercury and to diverse mercury wastes

- **Elemental mercury (purity> 98%)**

- **Waste from Zinc production (45% wt of Hg)**

- **Fluorescent dust (0,03% wt of Hg)**

Leaching values of final stabilized/solidified products fulfill the EU acceptance criteria for landfills for inert wastes (<0,01 mg/kg, Decision 2003/33/EC)



Type of landfill

Hazardous
0,2

Non hazardous
0,01

Inerts

EU standard (CEN/TS 14405:2004 and UNE-EN-12457)

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Leaching values of final stabilized/solidified products Acceptance criteria Decision 2003/33/EC)

- **Sulphur Polymer Stabilization and Solidification (SPSS):** results are well bellow 0,01 mg/kg. (Decision 2003/33/EC)
- Stabilization and Solidification (S/S) with sulphur microcements: results are well bellow 0,01 mg/kg (Decision 2003/33/EC).

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MANY THANKS
FOR YOUR ATTENTION !!

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