# “Capacity-building seminar Joint environmental inspections: Good practices and lessons learnt”

**23 June 2022, 12h – 15h CET - ZOOM**

EU4Environment
Green Economy in Eastern Partner Countries

## The “Landfill Inspection Guidance” issued within the IMPEL Project “Waste Management and Circular Economy”;

## A non-routine inspection campaign on landfills in Sardinia: from preparation to enforcement.

Ph.D. Romano Ruggeri
Sardinian Environmental Protection Agency (ARPAS)

# Myself: Romano Ruggeri

**Ph.D Environmental engineer**

**Environmental inspector/permit writer at the Sardinian Environmental Protection Agency of Sardinia (ITALY) (Referent of IED inspections at local level)**

**Project leader of the IMPEL "Waste management & Circular economy"**
**Member of the IMPEL "IED Implementation" project**

# Agenda

A. IMPEL project on landfill: Joint inspections

B. Non routinary inspection campaign in IED Industrial Landfills in Sardinia


# What does IMPEL do?

- Support the development of good practices with guidances and tools;
- Promote the exchange of information and experience;
- Support and facilitate capacity building and training of regulators;
- Carry out joint actions including inspections;
- Provide feedback and advice on new and existing EU environmental law.

# Network of practitioners in the field of permitting and enforcing environmental law

# The IMPEL Landfill project: general goals

- Use of the checklist and Guidance to drive joint inspection
- Identification of good inspection practices (preparation and execution of the inspection) and focus on the assessment of pre-treatment of the waste before landfilling
- Identification of good practices of pre-treatment of the waste before landfilling
- Cooperation (and helping each other) between IMPEL Member Countries to work towards a consistent regulatory and enforcement regime
- Feedback to policy makers on the (effectiveness of) various approaches and practices in the field of permitting and inspection of landfill sites in IMPEL Member countries

# Joint inspections: together on the field










**Landfill Project site of joint inspections**

# The Guidance book and checklist

**IMPEL LANDFILL PROJECT**
**Inspection guidance book for Landfill inspection**

A practical book with guidance on activities on landfills
(Revision 2016)

IMPEL

European Union Network for the Implementation and Enforcement of Environmental Law

**December 2016**

**Annex 2: Checklist ON SITE inspection**

**Landfill permitting and inspection**

**Reinforcement program in inspection skills according to landfill directive in IMPEL member countries**

**NON HAZARDOUS WASTE LANDFILL ENVIRONMENTAL INSPECTIONS: CHECKLIST**

1. WASTE ACCEPTANCE CRITERIA FOR LANDFILLS
2. GAS CONTROL
3. PROTECTION OF SOIL AND GROUNDWATER
4. SURFACE WATER CONTROL AND LEACH ATE MANAGEMENT
5. BUILDING AND CLOSING LANDFILL

# Implementation gaps

**IMPEL LANDFILL PROJECT**

**Landfill Directive Implementation**

*Analysis of the gaps found during the running of the Landfill Project*

(DECEMBER 2016)

IMPEL

European Union Network for the Implementation and Enforcement of Environmental Law

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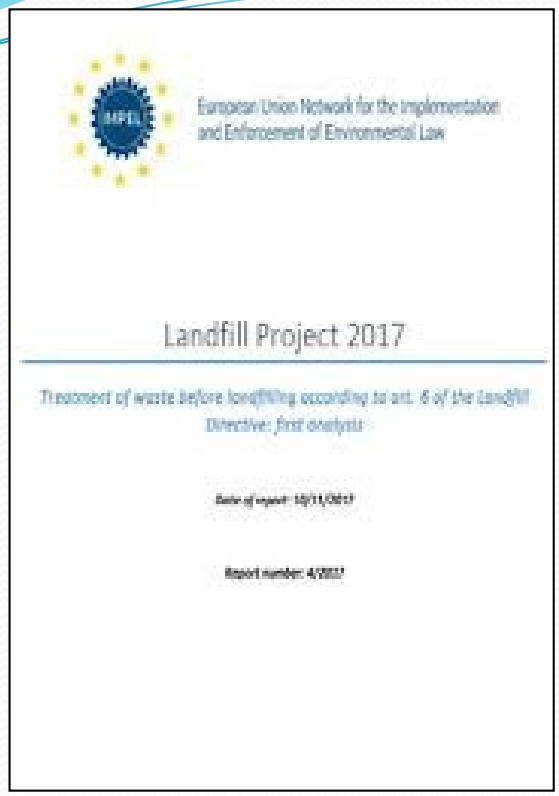
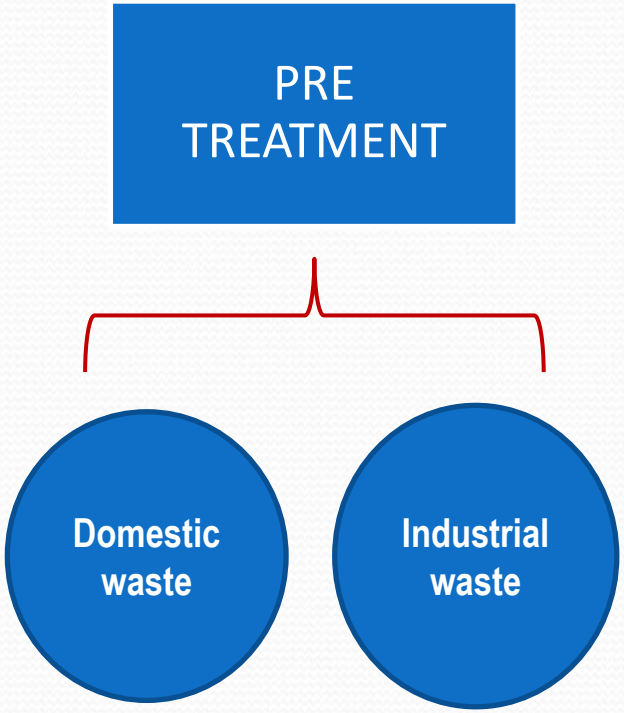



# Guidance treatment of waste before landfilling



# Joint inspections

Performing real inspections

Use of Guidance book and checklist

Reporting the inspection

- **INSPECTION: PREPARATION + EXECUTION + REPORTING**
- **REVISION OF THE GUIDANCE BOOK / CHECKLIST**

# Training activities for inspectors

## Training at the Environment Agency England (EA) - Birmingham


Environment Agency

# Sampling of waste and leachate

## Wien


# Sampling of groundwater

## Santiago

# Non routinary inspection campaign in IED Industrial Landfills in Sardinia

# Object of the inspection campaign


**The non-routinary inspection campaign involved the entire regional system of n.9 landfills for non-hazardous waste (other then municipal waste, so-called "special" waste landfills)**

**n.2 out of the 9 landfills are dedicated to specific IED industrial installations:**

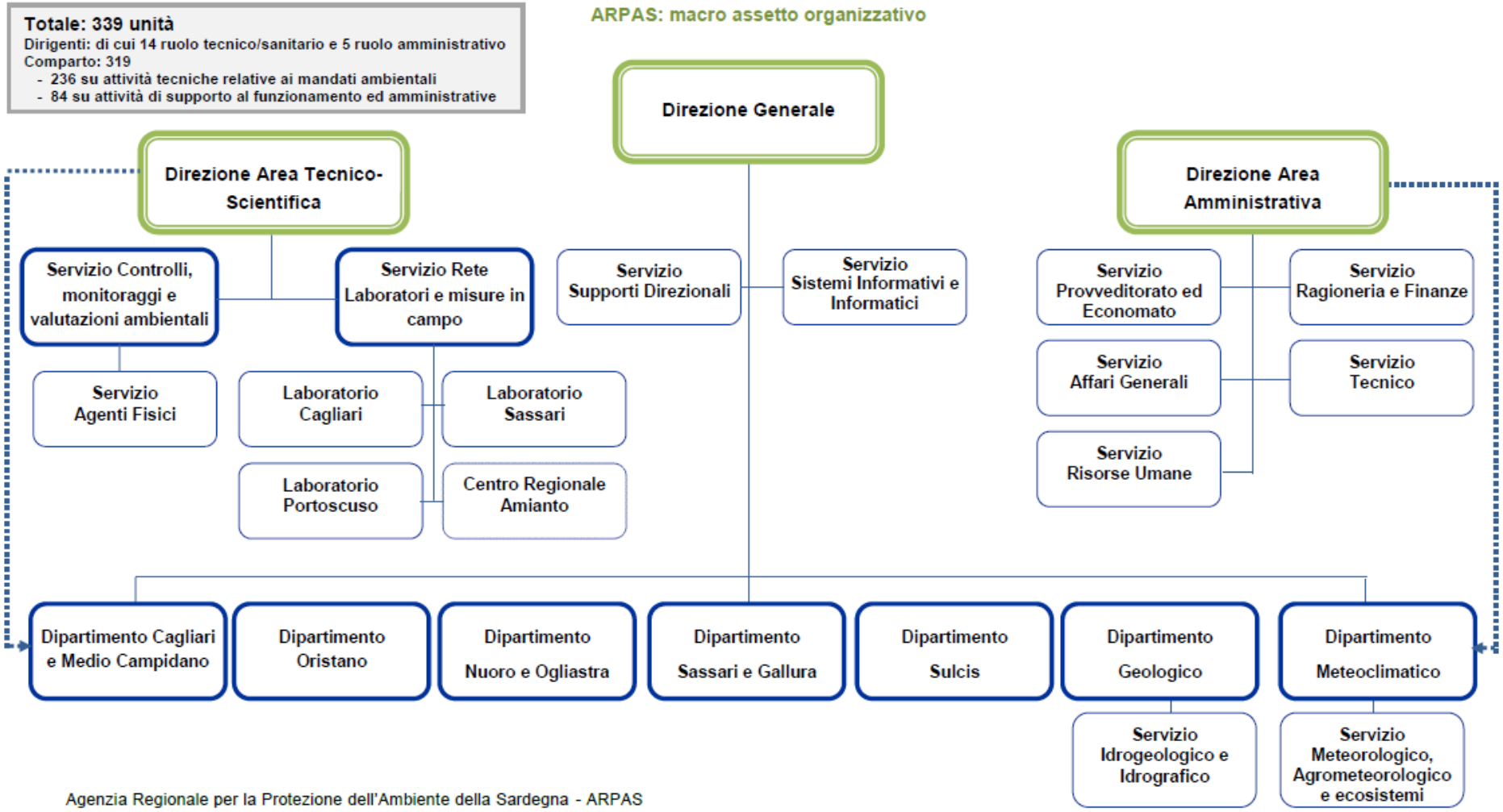
- **Coal power production plant (IED code 1.1)**
- **Non ferrous metal production plant (IED code 2.5)**

# Why a joint non-routinary inspection campaign?


1) Ensure the rotation of inspectors in compliance with the activities set out in the Plan containing the anti-corruption measures;
2) Ensure uniformity in the conduct of inspections and in the interpretation of regulatory requirements, including by reviewing system documents (checklist, templates ecc);
3) Respond to the request of the Regional Environmental Department to check the quality of the waste entering the landfills (hazardous waste, waste from abroad regions ecc).

# ARPAS organization

**Totale: 339 unità**
Dirigenti: di cui 14 ruolo tecnico/sanitario e 5 ruolo amministrativo
Comparto: 319
- 236 su attività tecniche relative ai mandati ambientali
- 84 su attività di supporto al funzionamento ed amministrative

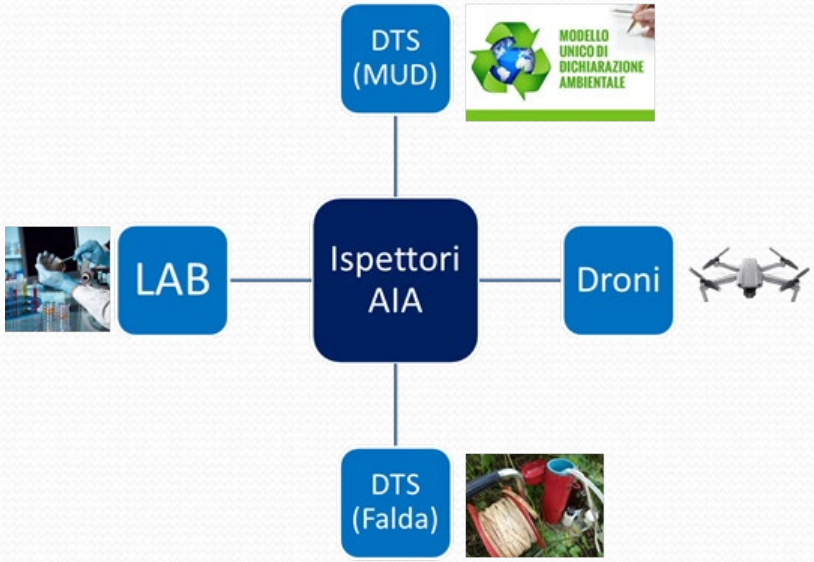



1) Stimulate technical discussion and transfer of skills;
2) Stimulate the self-training of technical staff;
3) Experimenting new inspection techniques through the use of drones;
4) Create a personal support network;
5) Verify the quality of inspection procedures on waste management plants subject to IED.

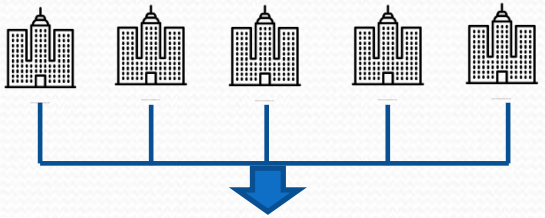
# Legislative references

- Council Directive 99/31/EC
  - **LANDFILL DIRECTIVE** (as amended by Directive (EU) 2018/850)
- Council Decision 2003/33/EC
  - **CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE**
- Council Directive 2010/75/EU
  - **INDUSTRIAL EMISSION DIRECTIVE (IED - Cat. 5.4)**
- Council Directive 2008/98/EC
  - **WASTE FRAMEWORK DIRECTIVE (WFD)**

# Supporting the inspection team




SARDINIAN ENVIRONMENTAL PROTECTION AGENCY DEPARTMENTS



**n.15 IED inspectors: inspection teams made up of 3 people belonging to 5 different departments**


- **Groundwater specialist group (n.5 people)**
- **Drone core specialist group (n.6 people)**
- **Technical Direction supporting Group (regional waste register analysis - n.4 people)**
- **Laboratory Network Support**

# Organization of the work

| | |
|---|---|
| Phase 1 | • **PREPARATORY ACTIVITIES** |
| Phase 2 | • **EXECUTION OF THE INSPECTION CAMPAIGN** |
| Phase 3 | • **DRAFTING OF INSPECTION REPORTS AND FINAL OVERALL REPORT** |
| Phase 4 | • **HOMOGENIZATION OF SELF-MONITORING PLANS** |

# Phase 1: Preparatory activities

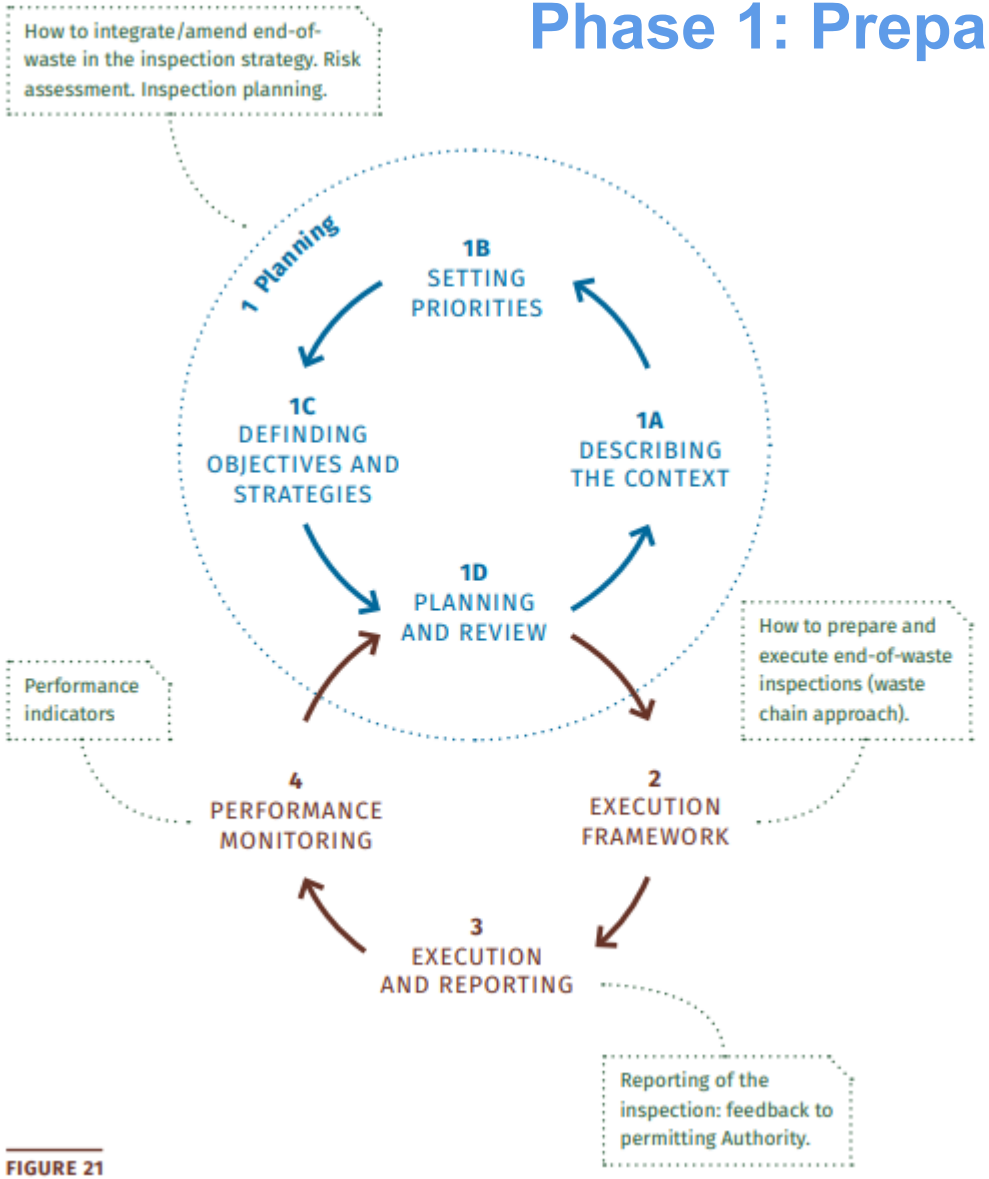



FIGURE 21
Inspection Cycle

- Homogenization of "system documents": inspection and sampling reports, final inspection report format, notification of administrative offense, communication of criminal offence to prosecutors;
- Draft the general inspection checklist on landfill inspections;
- Common definition of technical issues in the application of landfill legislation; identification of critical points;
- Definition of common operating procedures in preparing, performing and reporting the inspection activity.

# Results of preliminary activities

| | |
|---|---|
| **HOMOGENIZATION OF SYSTEM DOCUMENTS (TEMPLATES AND CONTENT)** | **DRAFTING OF THE FOLLOWING SYSTEM DOCUMENTS:**<br>- Inspection Operational Plan template<br>- Inspection Final Report template<br>- Groundwater sampling report template<br>- Waste sampling report template<br>- Inspection Report template<br>- Checklist of documents and equipment needed for the IED inspection<br>- Operating procedure for radiometric investigations<br>- Administrative offense report template<br>- Crime information template for the Public Prosecutor's Office<br>**ADDITIONAL SUPPORTING ACTIVITIES:**<br>- Activation of contracts for liquid waste disposal installations<br>- Management of procedures for the authorization to drones flights in no-fly zones<br>- Training on the use of the radioactivity meter<br>- Sampling activities: determining parameters, containers ecc. |

# Landfill inspection checklist

AGENZIA REGIONALE PER LA PROTEZIONE DELL'AMBIENTE DELLA SARDEGNA
ARPAS

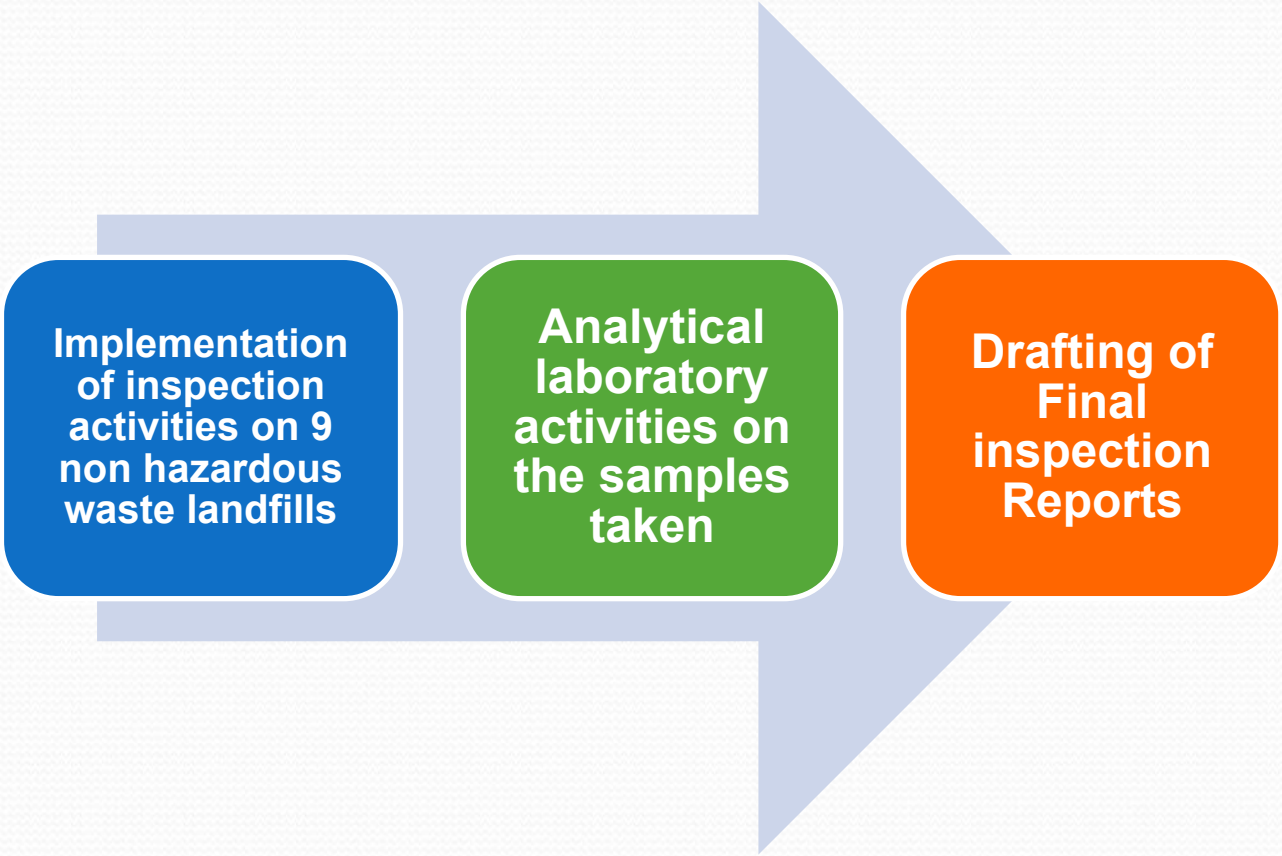
Direzione Generale – GdL Discariche

## COAT – CONTROLLI SU ATTIVITA' AUTORIZZATE

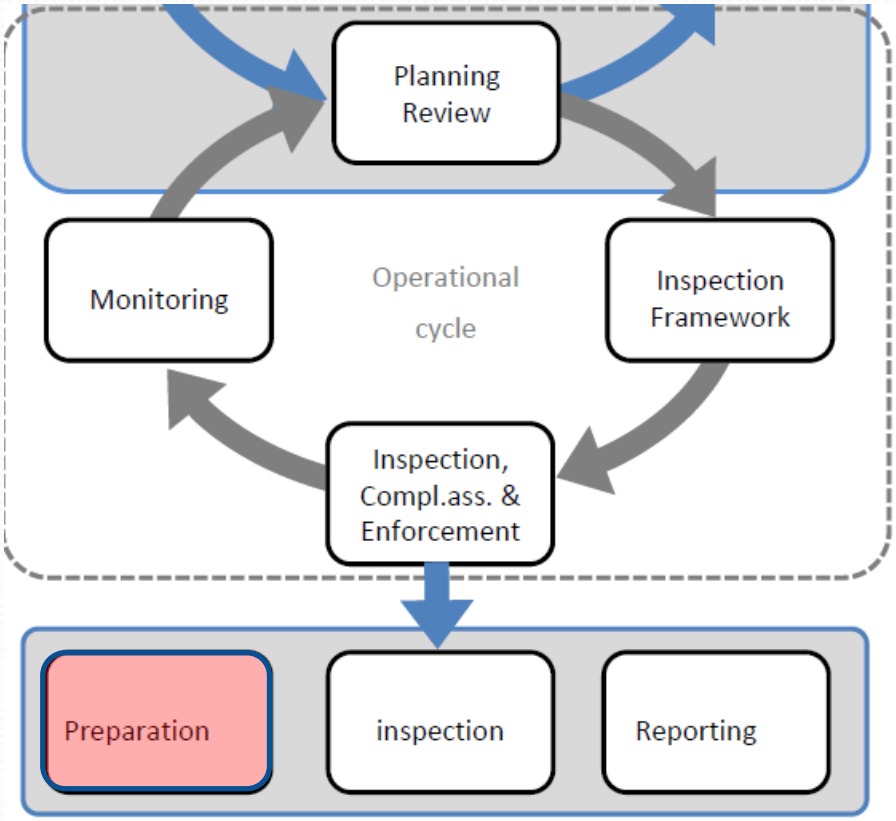
## LNG01: Checklist per la conduzione di visite ispettive in impianti di discarica per rifiuti non pericolosi

| Revisione | Data | Redattore | Approvazione |
|---|---|---|---|
| Rev.00 | 17/05/2012 | Romano Ruggeri | |
| Rev.01 | 31/03/2021 | Romano Ruggeri | |

# Phase 2: Execution of the inspection campaign



# Preparation of the inspection




- **Gathering relevant documents:**
  - ✓ *IED permit and Self-Monitoring plan*
  - ✓ *Self-Monitoring Reports*
  - ✓ *Previous inspection reports*
  - ✓ *Previous sampling analysis results*
  - ✓ *Competent Authority's measures*
  - ✓ *Relevant mail (accidents, etc.).*
- **Analysis of Received waste national register (MUD)**
- **Preparatory meeting with the inspection staff of the competent Department for acquiring documentation;**
- **Tailoring the inspection checklist: including the agreed minimum inspection contents**

# Focus of the inspection

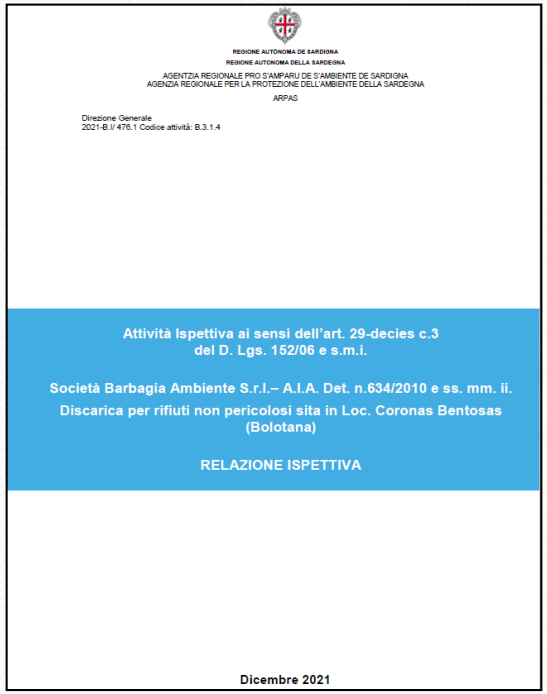
- **Definition of the 2020-2021 framework of the following incoming waste:**
  - *Hazardous stable non reactive waste;*
  - *Waste arriving from outside the region;*
  - *Asbestos waste.*
- **Acceptability criteria for asbestos waste and management of cells;**
- **Acceptability of stable non-reactive hazardous waste with particular reference to the treatment carried out;**
- **Compliance with the principle of waste treatment pursuant to art. 6 of Landfill Directive;**

# Focus of the inspection

- Leachate management (head minimization, treatment, recirculation);
- Water management distinguishing between surface, rain and drainage waters;
- Sampling of the most critical waste;
- Accreditation of laboratories;
- Acceptability of biodegradable waste: measurement and collection of biogas.
- Daily coverage

Preparation | Inspection | Reporting

# Reporting of the inspection



REGIONE AUTONOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA
AGENTZIA REGIONALE PRO S'AMPARU DE S'AMBIENTE DE SARDIGNA
AGENZIA REGIONALE PER LA PROTEZIONE DELL'AMBIENTE DELLA SARDEGNA
ARPAS

Direzione Generale
2021-B.I/ 476.1 Codice attività: B.3.1.4

Attività Ispettiva ai sensi dell'art. 29-decies c.3
del D. Lgs. 152/06 e s.m.i.

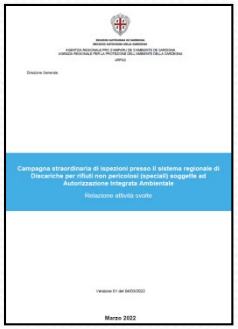
Società Barbagia Ambiente S.r.l.– A.I.A. Det. n.634/2010 e ss. mm. ii.
Discarica per rifiuti non pericolosi sita in Loc. Coronas Bentosas
(Bolotana)

RELAZIONE ISPETTIVA

Dicembre 2021

- Definition of non-compliances (administrative and criminal).
- Definition of critical points.
- Indications of measures to fix non-compliances and critical points.
- Suggestions of improvement to the operator.
- Suggestions of improvement of the IED permit (to Competent Authority).
- Actions for the next inspection.
- Drafting of the inspection Report, administrative offense communication and crime information (if the case).

# Phase 3: Drafting of the final report

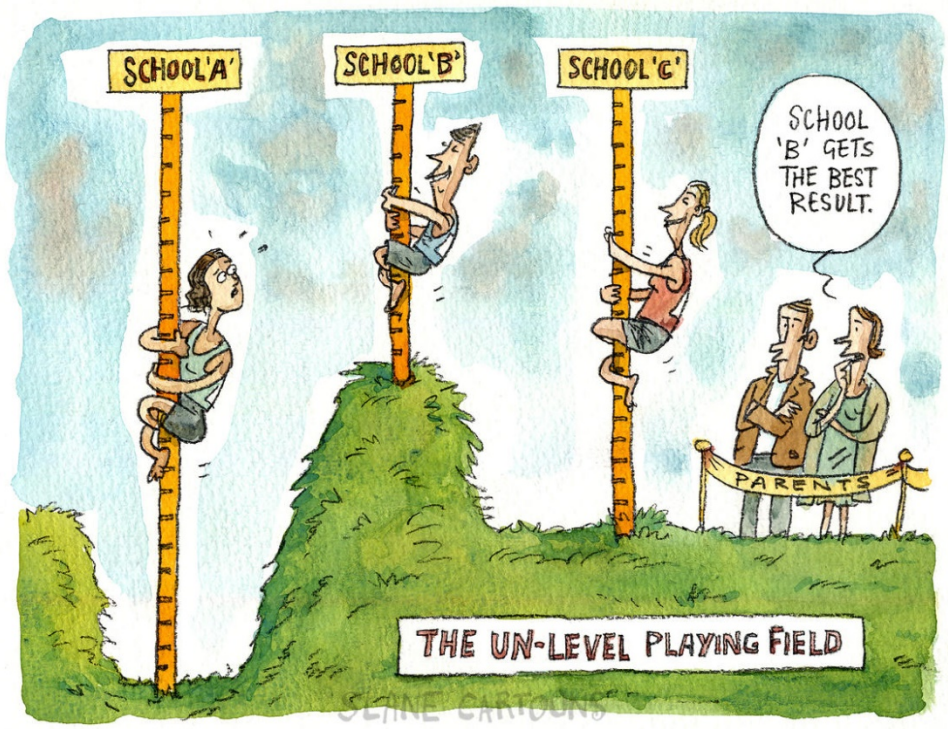



- Drafting of the overall Final report and suggestions for the competent authorities

- Drafting of a non-technical synthesis for external communication (publication on the ARPAS and ARPA network website).

- Presentation of the results of the campaign to the IED regional coordination table

# Phase 4: Homogenization of self-monitoring plans




- **Verification and homogenization of the Self-Monitoring Plans of the 9 installations in order to make them consistent in relation to the self-monitoring needs defined therein (frequencies, parameters, analytical methods ecc).**

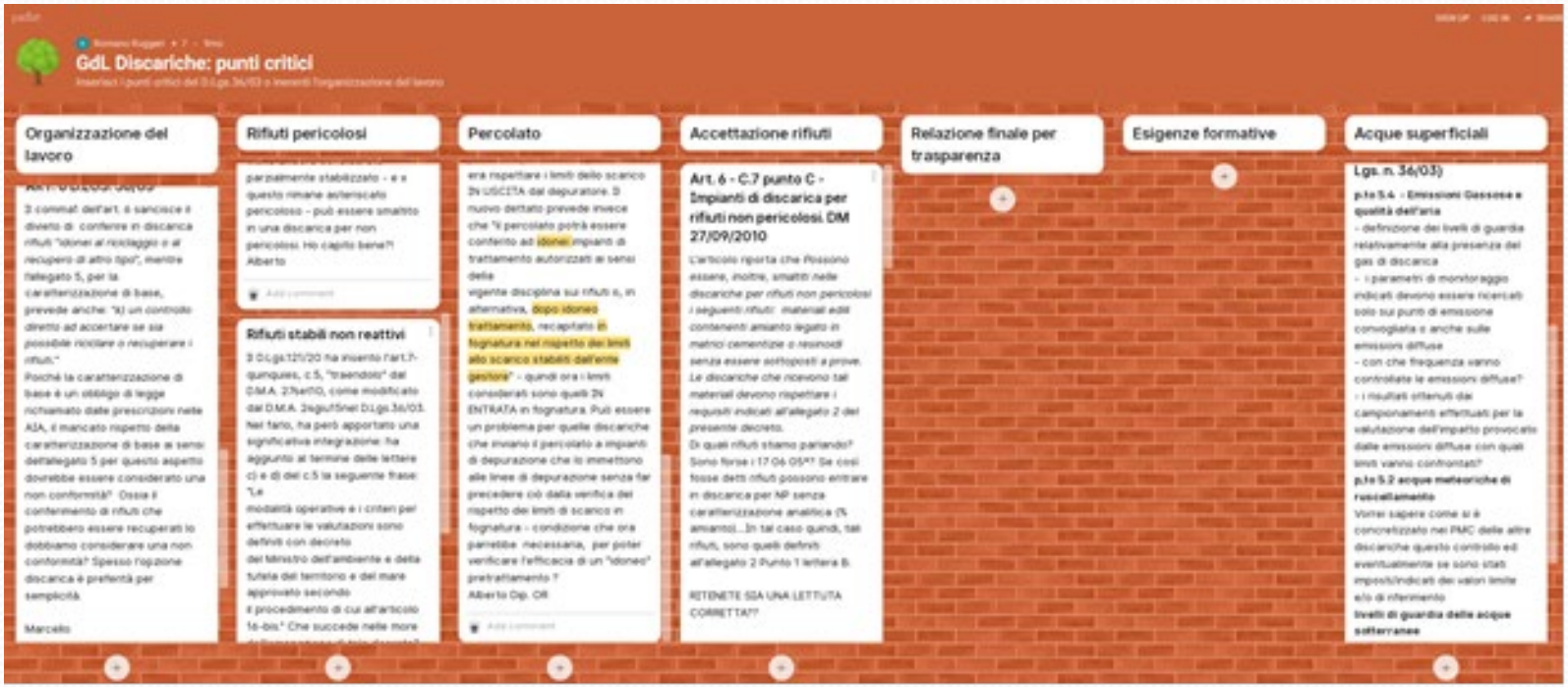
# How we worked together

- The Working Group operated according to common methods that were discussed in 10 plenary meetings
- The results of each inspection visit were also discussed collectively in order to homogenize any sanctioning implications.
- In addition to the 10 plenary meetings, through the use of the mailing list there was a continuous exchange of information between the members of the working group.

- Prior to the launch of the campaign, the system documentation was reviewed and shared and the most relevant technical aspects were defined and appropriately addressed in each inspection visit.
- A common checklist was used to be implemented for each specific case with the additional requirements present in each IED permit.

# Virtual wall

**A "virtual wall" was also created in which each member of the working group was able to post his/her observations on the critical points of the inspections or landfill legislation application , in order to stimulate internal debate (https://padlet.com/)**



# Supporting activities: GW sampling

**Preparatory activities :**

- **Analysis of piezometers data: location, depth, diameter, approximate level of the piezometric surface, productivity, downstream/upstream**
- **Defining the list of parameters for the lab: previous results of self monitoring data, Self-Monitoring Plan indications**
- **Feasibility of sampling. Constraints: storage capacity of liquid waste and reduced head of the 12V pumps supplied, of about 30 meters**
- **Operational procedure**

# Supporting activities: drones

The surveys led to the model reconstruction of landfills, allowing:

- on the one hand to refine the inspections, providing a complete point of view on the entire area (including inaccessible landfill areas),
- on the other hand to create a database that, systematically enriched over the years, will allow the monitoring of landfill and the verification of the effective management of the areas (e.g. state of cultivation, height of the landfill compared to authorized ones, revegetation, ecc).

# Overall results: non compliances

| Non compliance topic | Subject | n. | Criminal/administrative offence |
|---|---|---|---|
| Waste acceptance | Stable non reactive waste acceptance, Basic characterization, Waste not accepted in landfills | 4 | Criminal (n.4) |
| Asbestos waste | Asbestos waste treatment, Asbestos cell, trucks moving in the cell | 6 | Criminal (n.6) |
| Landfill management issues | HW cells management, daily coverage, sludge disposal, lab accreditation | 9 | Criminal (n.6)<br>Administrative (n.3) |
| Water management | Trigger levels, runoff waters | 6 | Criminal (n.1)<br>Administrative (n.5) |
| Administrative management | Waste register, Inspection fee | 2 | Administrative (n.2) |
| Self monitoring activities | Water discharge analysis, groundwater analysis | 2 | Administrative (n.2) |
| Leachate management | Head minimization, overcoming of treated leachate limits, accessibility of wells, reuse of brine | 6 | Criminal (n.5)<br>Administrative (n.1) |

# Overall results: critical points

| Topic of critical points | Subject | n. |
|---|---|---|
| Water management | Water drainage cleaning, GW contamination, runoff water management, discharging point, truck cleaning water, piezometers, rainwater management, trigger levels, water reuse. | 13 |
| Leachate management | Head minimization, piezometers characteristics, leachate head measures, pumping system | 9 |
| Landfill management issues | Accidents, Emergency plan, cultivation criteria, slopes, waste coverage, EMS, dust production, Maintenance Plan, signage of waste cells, track paving | 18 |
| Waste input | Waste samples, HW and waste from abroad entering the landfills | 5 |
| Waste acceptance | Stable non reactive waste, mirror code waste lab bullettin, Basic characterization, compliance assessment, lab accreditation | 16 |
| Organic waste | Treatment before landfilling | 4 |
| Self monitoring activities | Missing information (disposed volumes, air-quality measures, lab methods, frequencies ecc) | 11 |
| Administrative management | Financial guarantees, waste registers, temporary storage, communications to ISPRA | 6 |
| Asbestos waste | Release index | 1 |

| Topic | Subject |
|---|---|
| **Asbestos** | Dedicated cell |
| | Release Index |
| | Treatment |
| **HW, Asbestos dedicated cells** | Sign with waste codes, precautions ecc |
| **Daily coverage** | Avoiding dust production |
| **Leachate** | Minimizing head, volume counters, recycling |
| **Groundwater** | Trigger levels |
| **Water management** | Trucks cleaning water reuse |
| | Water definitions: surface, runoff, rainwater |
| | GW breaches of the contaminant levels |
| **Stable non reactive waste** | Acceptance criteria (treatment) |
| **Waste input** | Recyclables waste |
| | Treatment according to art. 6 |
| | Organic waste |
| | Compliance assessment |
| **Laboratory** | Accreditation ISO 17025 |
| **Samples** | Rapresentative sampling |
| **Closing landfill** | Official closure and post operational phase |


**Suggestions for Competent Authorities**


Asbestos


LANA di ROCCIA ↔ AMIANTO

# Daily coverage

*Waste that can give rise to dust dispersion or odours emission must be covered as soon as possible with layers of suitable materials*

**Suggestion for revising the IED permit:**

- Different categories of waste consist of powdery material. In other cases the material may also be odorous (pulp&paper discards ecc). It is necessary to clarify that in such circumstances the waste must be covered on a daily basis. The application for authorization must contain an indication of the volume of materials used for daily coverages.

# Leachate



Landfill Directive: *ensure that leachate accumulation at the base of the landfill is kept to a minimum*

# Water monitoring

The Landfill Directive requires that surface water, if present, be monitored at representative points. The surface water environment on and off a landfill site may comprise of: streams, rivers, canals and ditches, lakes, reservoirs and lagoons, wetlands, estuaries, and coastal waters.

| | | |
|---|---|---|
| 2.3. Volume and composition of surface water (7) | quarterly (3) | every six months |

For flowing water bodies (e.g. rivers and streams), monitoring should be undertaken at not less than two locations, one upstream and one downstream of the landfill.

CHEMICAL analyses of surface waters are essential both in identifying possible contaminants and in quantifying their concentrations

Periodic BIOLOGICAL assessments of the quality of the surface waters surrounding the landfill.

# Stable non reactive waste

Council Decision

*If the waste is hazardous , the **treatment** may have enabled the waste to meet the criteria for placement of SNRHW in non-hazardous waste landfills within cells for inorganic waste with low organic/biodegradable content. The waste maybe granular (rendered chemically stable) or solidified/monolithic.*

Italian law

*In the landfills for non-hazardous waste, SNRHW is also disposed of, i.e. waste which, **subjected to preliminary treatment**, for example solidification / stabilization, vitrification, exhibits a leaching behavior that does not undergo negative alterations in the long term.*

\+ **ANC test and geotechnical properties assessment (UK WAC)**

# Treatment of waste

*WFD Article 6: Waste to be accepted in the different classes of landfill Member States shall take measures in order that only waste that has been subject to treatment is landfilled*

From the inspections it emerges that usually the Basic Characterizations do not report the reasons for the **absence of the treatment** with respect to the purposes indicated in the definition. The need for treatment can be assessed using the ISPRA guidelines, although not legally binding.

# Laboratory

Accredited testing laboratory

DIN EN ISO 17025

Laboratories shall have proven experience in waste testing and analysis and an efficient quality assurance system.

*Landfill facilities must be equipped, directly or by contract, with **accredited** laboratories for the specific determinations required for the management of the plant.*

**Suggestion for revising the IED permit:**

The use of accredited laboratories in compliance with the EN ISO 17025: 2018 standard for the tests of interest should be made explicit in the authorization and / or in the Self Monitoring Plan, in order to guarantee the proven experience of the Laboratories responsible for carrying out the waste analysis. The analysis of asbestos and / or asbestos-containing waste must be conducted in qualified laboratories at the Ministry of Health.


Thank you for your attention

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