



Radioactive Waste Management

Legacy Ponds and Silos – key challenges for waste disposal

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Outline

- Role of RWM
- Legacy Ponds and Silos
- Key challenges for disposal

Radioactive Waste Management (RWM)

- **Our mission**

- Deliver a geological disposal facility and provide radioactive waste management solutions

- **Wholly-owned subsidiary of NDA** (since April 2014)

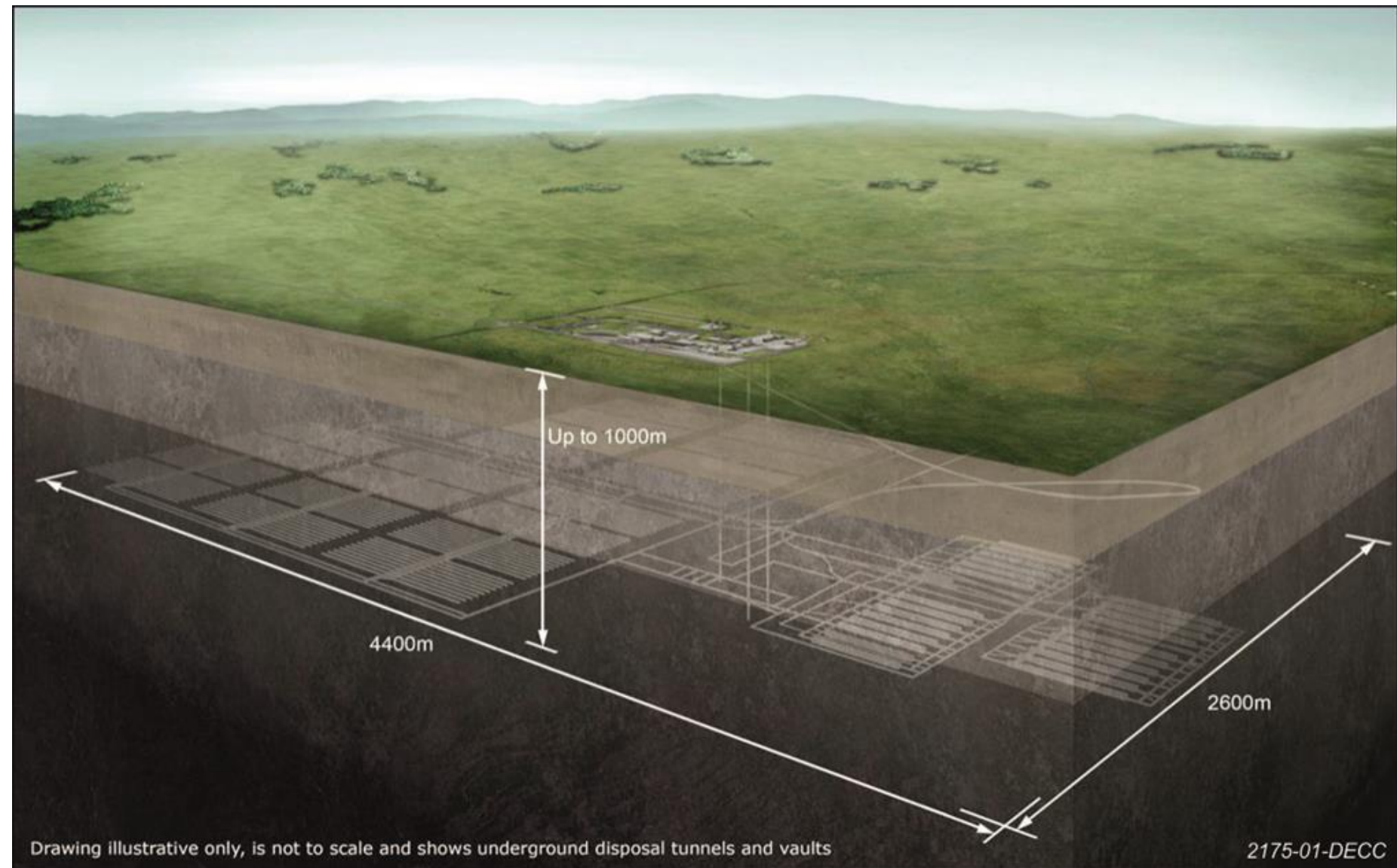
- Created to respond to regulatory need
- Employs around 100 staff
- Operates as a 'prospective' Site Licence Company

Geological disposal facility (GDF)

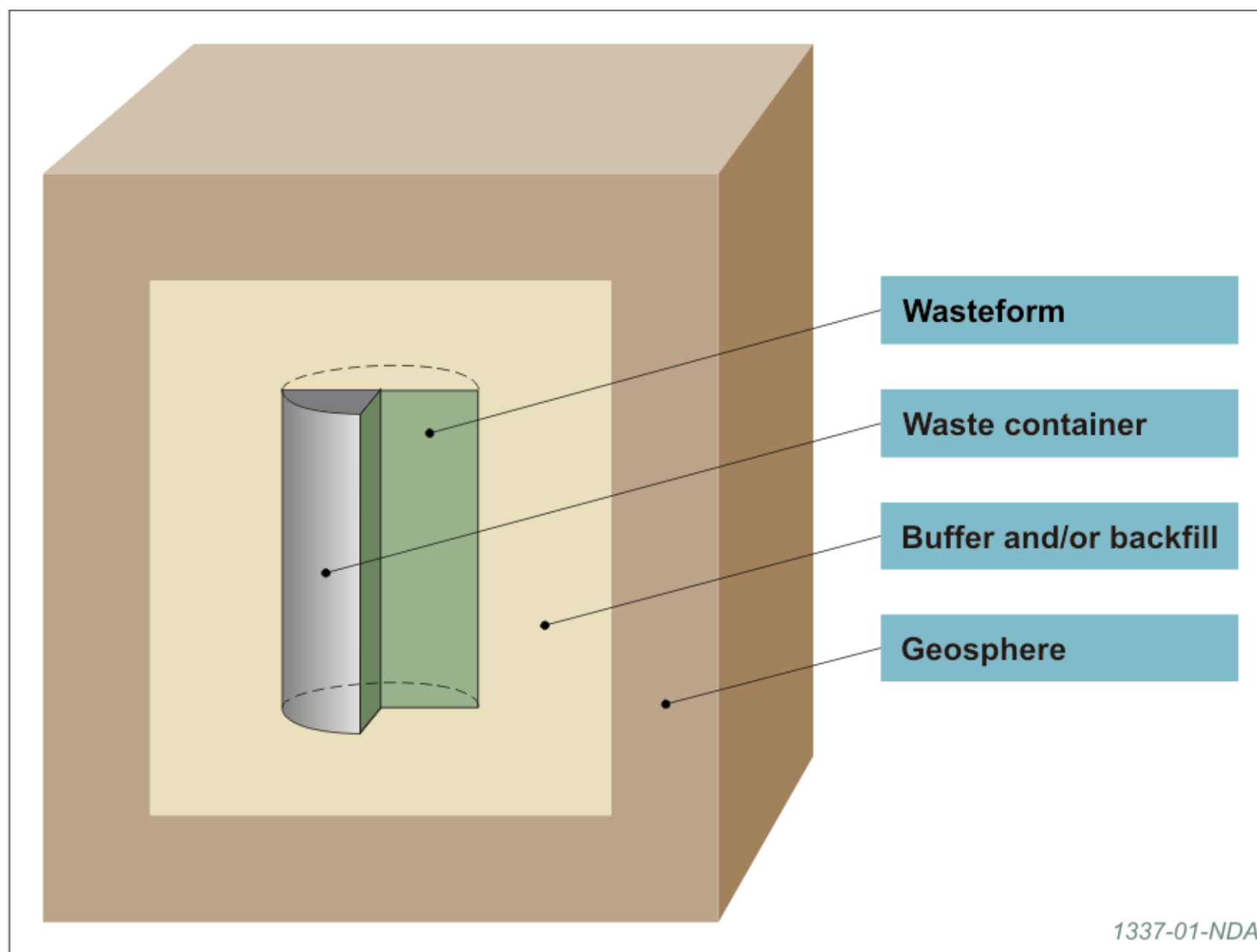
- ISOLATES radioactivity from surface
- CONTAINS until hazard has decayed
- Provides passively safe system

Needs:

- Suitable geological environment and
- a willing community



Geological Disposal – multi-barrier approach



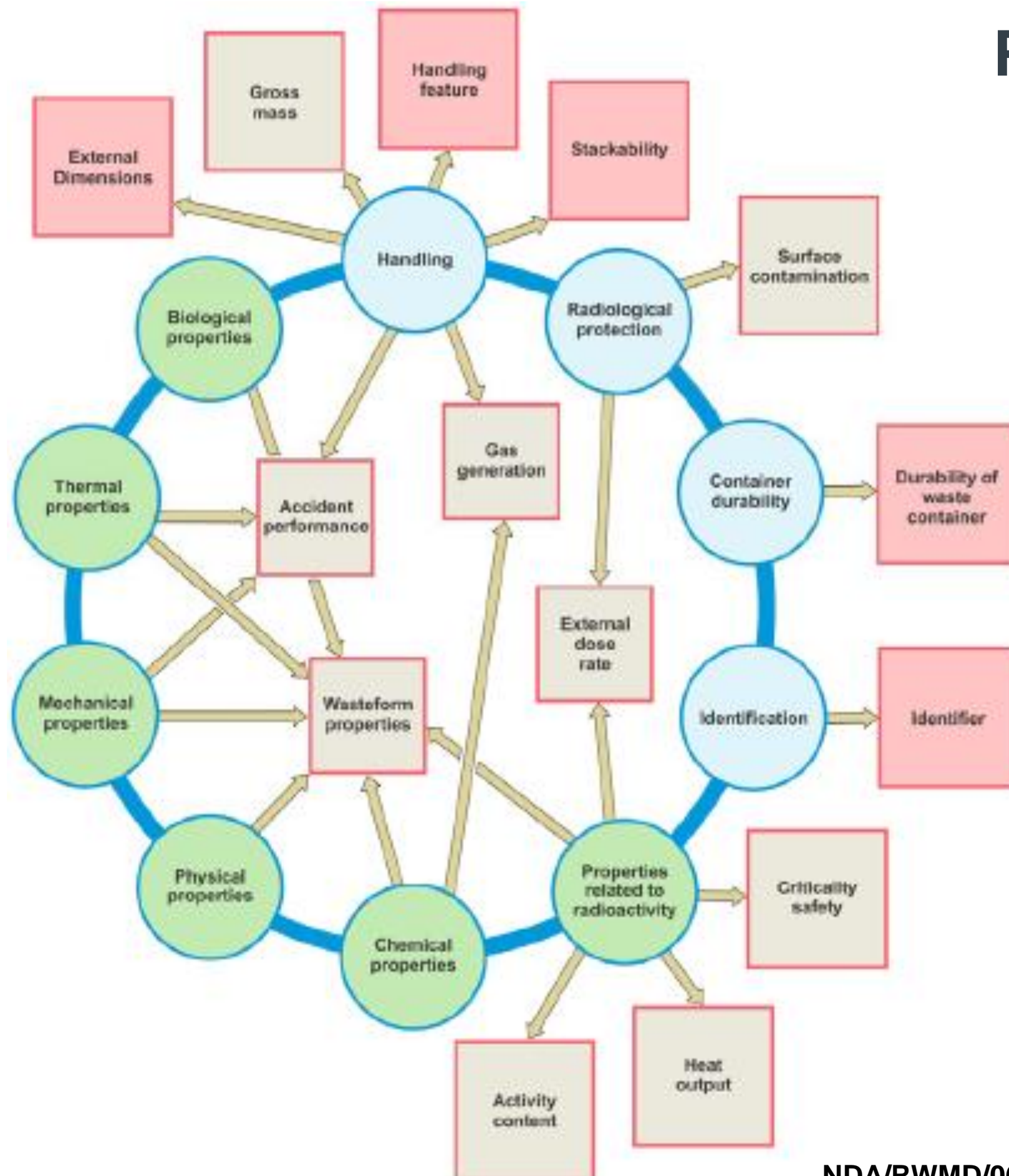
Safety is delivered through a multi-barrier system

Geological disposal – multi-barrier approach

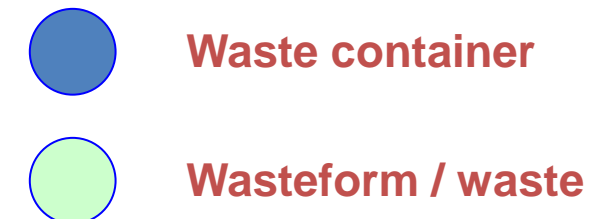


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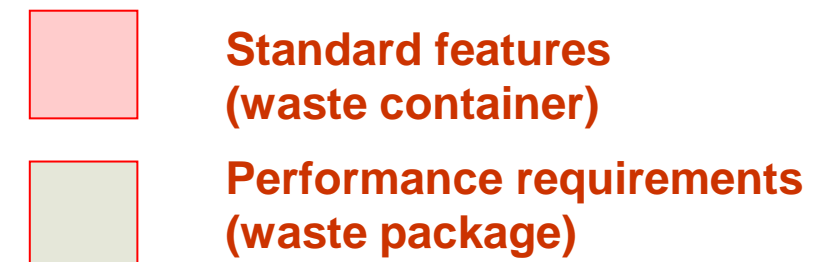
Packaging criteria



IAEA requirements



Packaging criteria



Waste Immobilisation and Packaging

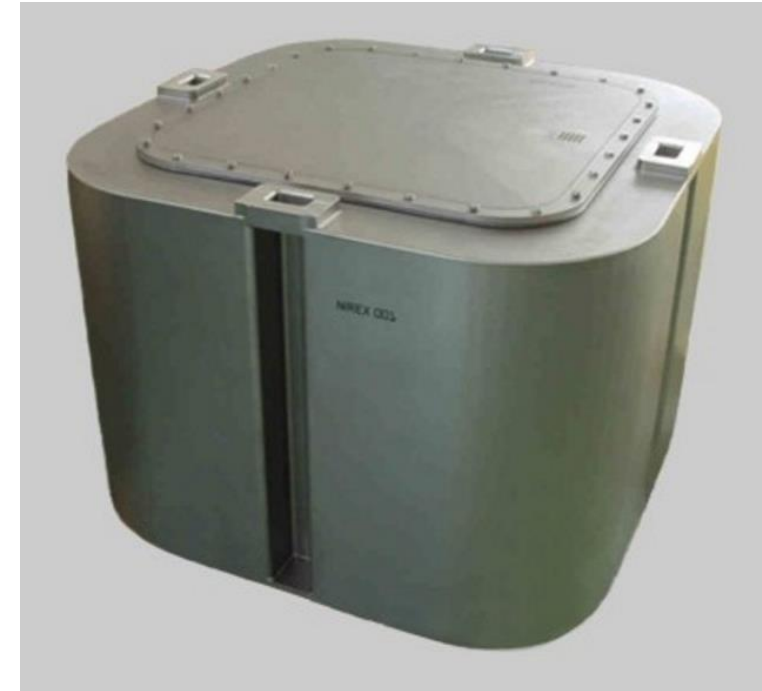
cement encapsulation



polymer encapsulation



*thin-walled container
(stainless steel)*



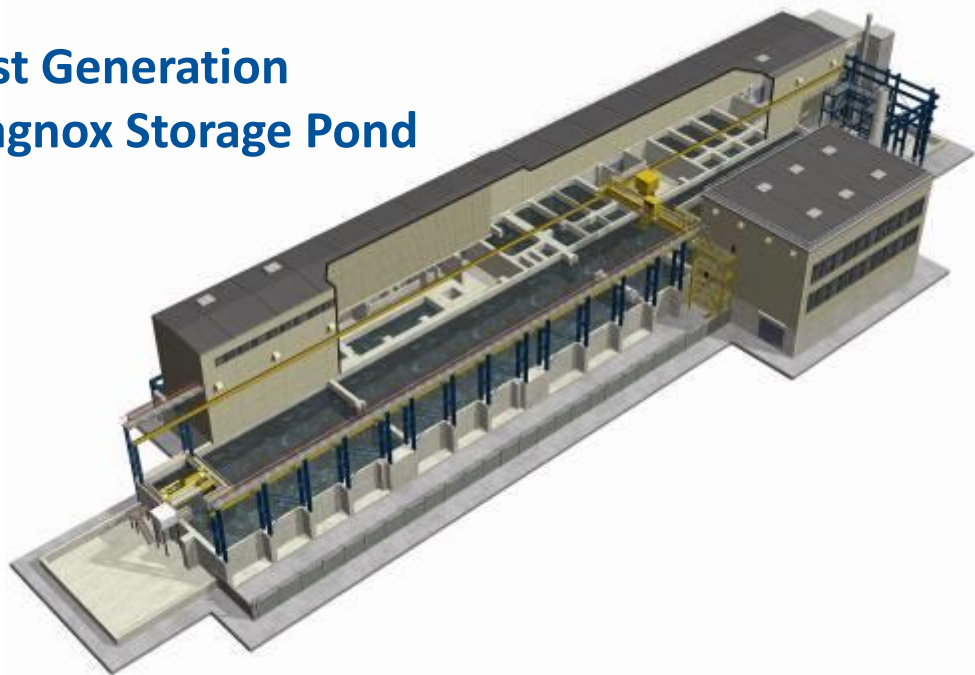
*thick-walled container
(cast iron)*



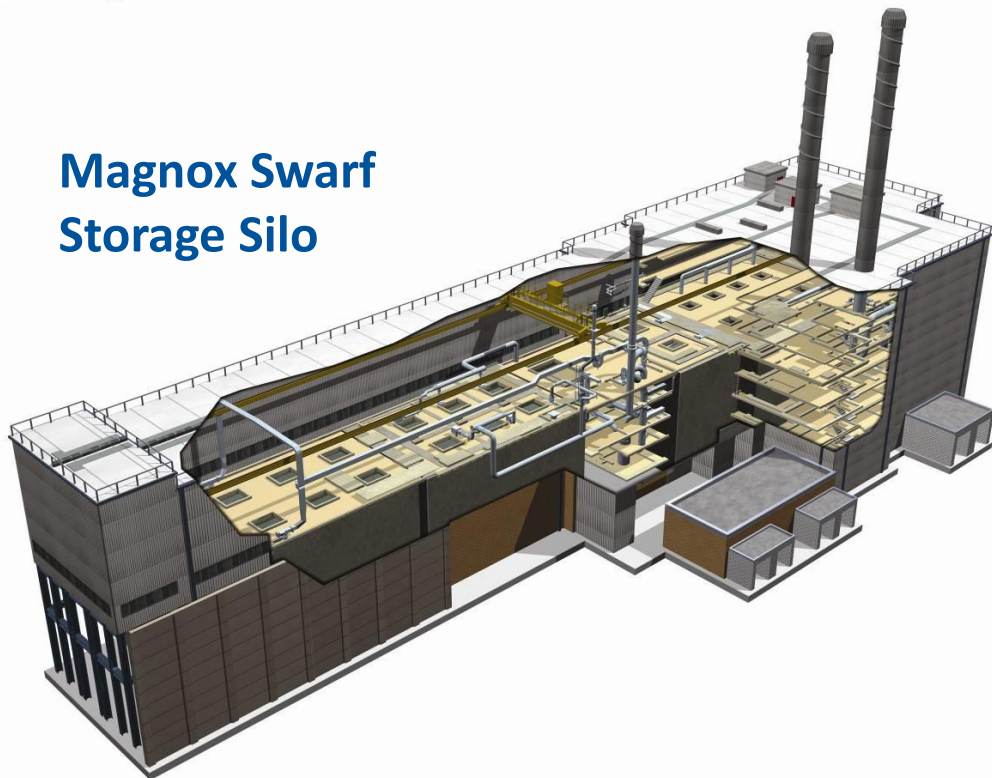
Legacy Ponds and Silos and key challenges for waste disposal

Examples of Legacy Ponds and Silos

First Generation
Magnox Storage Pond



Magnox Swarf
Storage Silo



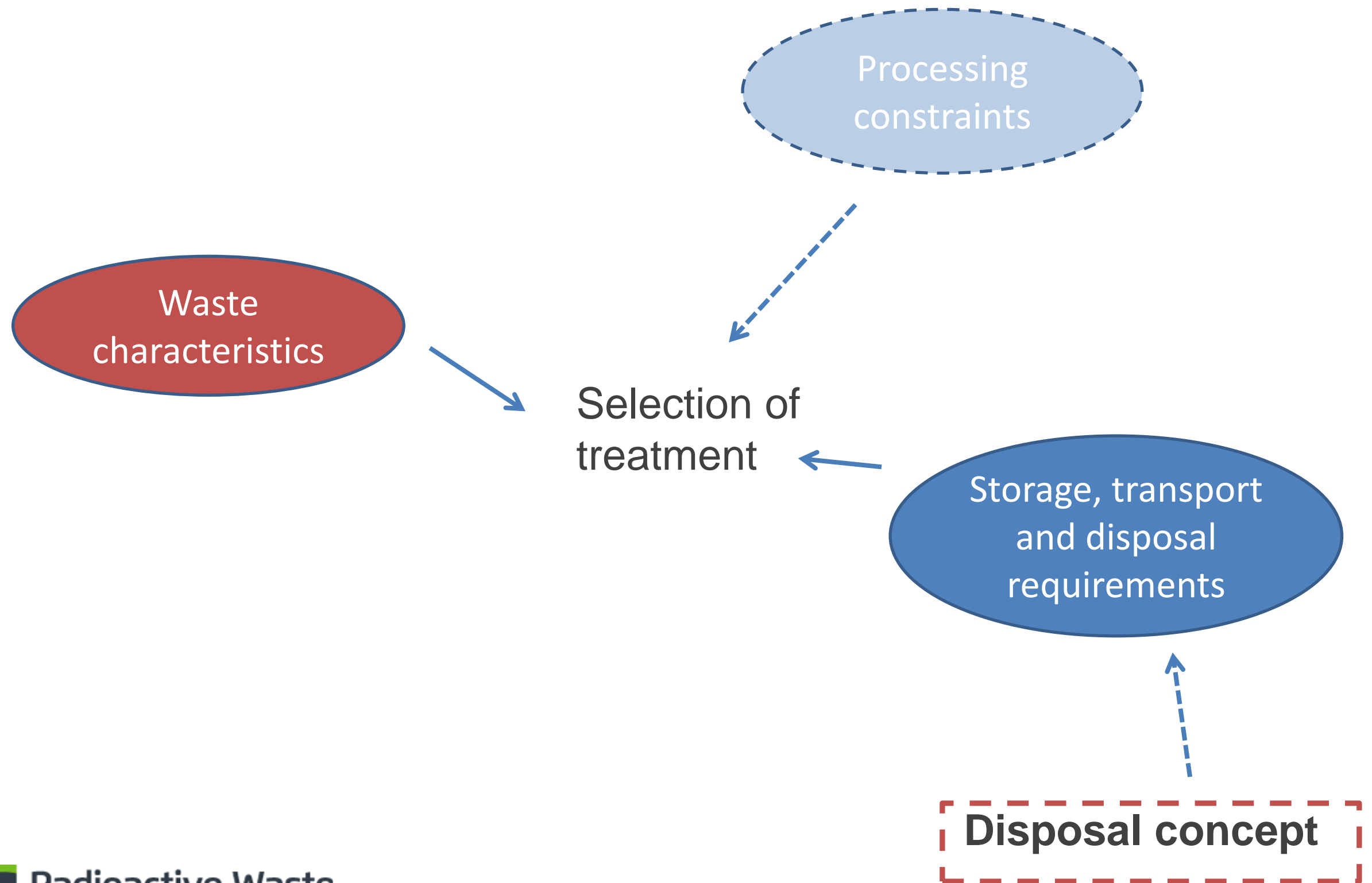
Types of wastes:

- Spent nuclear fuel
- Sludges (ILW)
- A variety of solids (ILW/LLW)

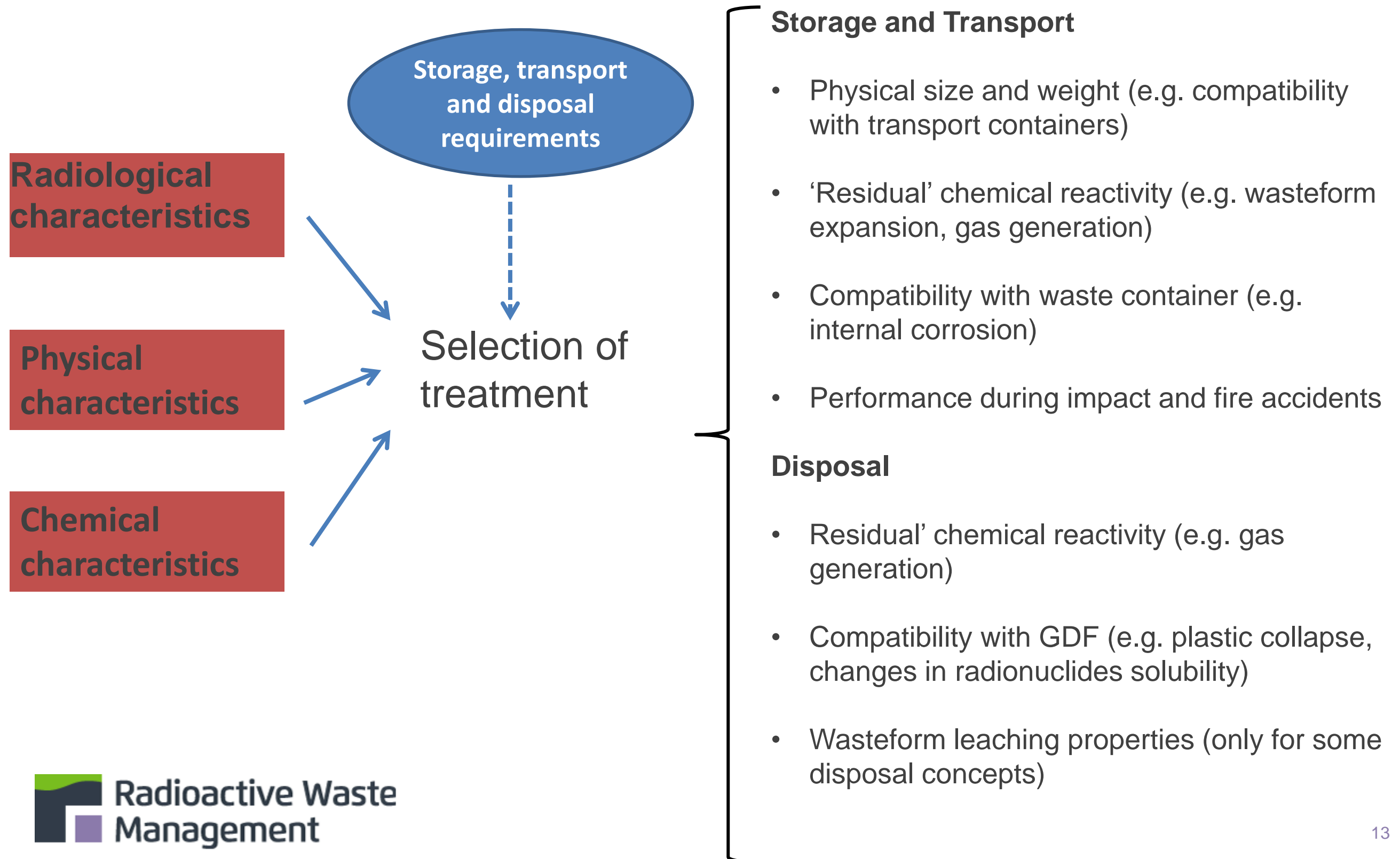
Key issues:

- Old and poorly characterised
- A variety of physical, chemical and radiological characteristics

Drivers for selection of waste treatment



Wasteform characteristics – some considerations for disposal



Summary

- RWM works with nuclear sites to develop suitable solutions for the treatment, storage and disposal of radioactive wastes
- The Legacy Ponds and Silos represent a critical and unique challenge, which requires both upstream and downstream considerations
- Specific constraints may result in interim solutions which may (or may not) require further processing before disposal
- Key issues for waste disposal includes:
 - the treatment of bulk fuel (particularly metallic fuel)
 - the immobilisation and residual reactivity of some ILW streams, particularly sludges

Acknowledgements

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- *Sellafield Ltd. for some of the images used in the presentation*

