Disposing of our Nuclear Legacy

Dr Juliet Long FIEMA CEnv
Head of Legacy & Waste Issues – Radioactive Substances Regulation
Environment Agency, UK

Presentation to RSC Distinguished Guest Lecture & Symposium, March 2019

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Environmental regulators in the UK

NIEA Northern Ireland Environment Agency
www.ni-environment.gov.uk

SEPA Scottish Environment Protection Agency

Environment Agency

Cyfoeth Naturiol Cymru Natural Resources Wales

Environment Agency

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Radioactive Waste Management

Defence

Nuclear

Oil & Gas

Manufacturing

Life Sciences

Radioactive Waste Management Policy & Infrastructure

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Radioactive Waste infrastructure

Enabled by:

- **Policy**
- **Leadership & Governance**
- **Inventory & Information management**
- **Regulation (including planning)**
- **Skilled workforce**
- **Incentivised supply chain**
- **Funding / Commercial contracts**
- **Communication & Engagement**

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What’s policy got to do with it?

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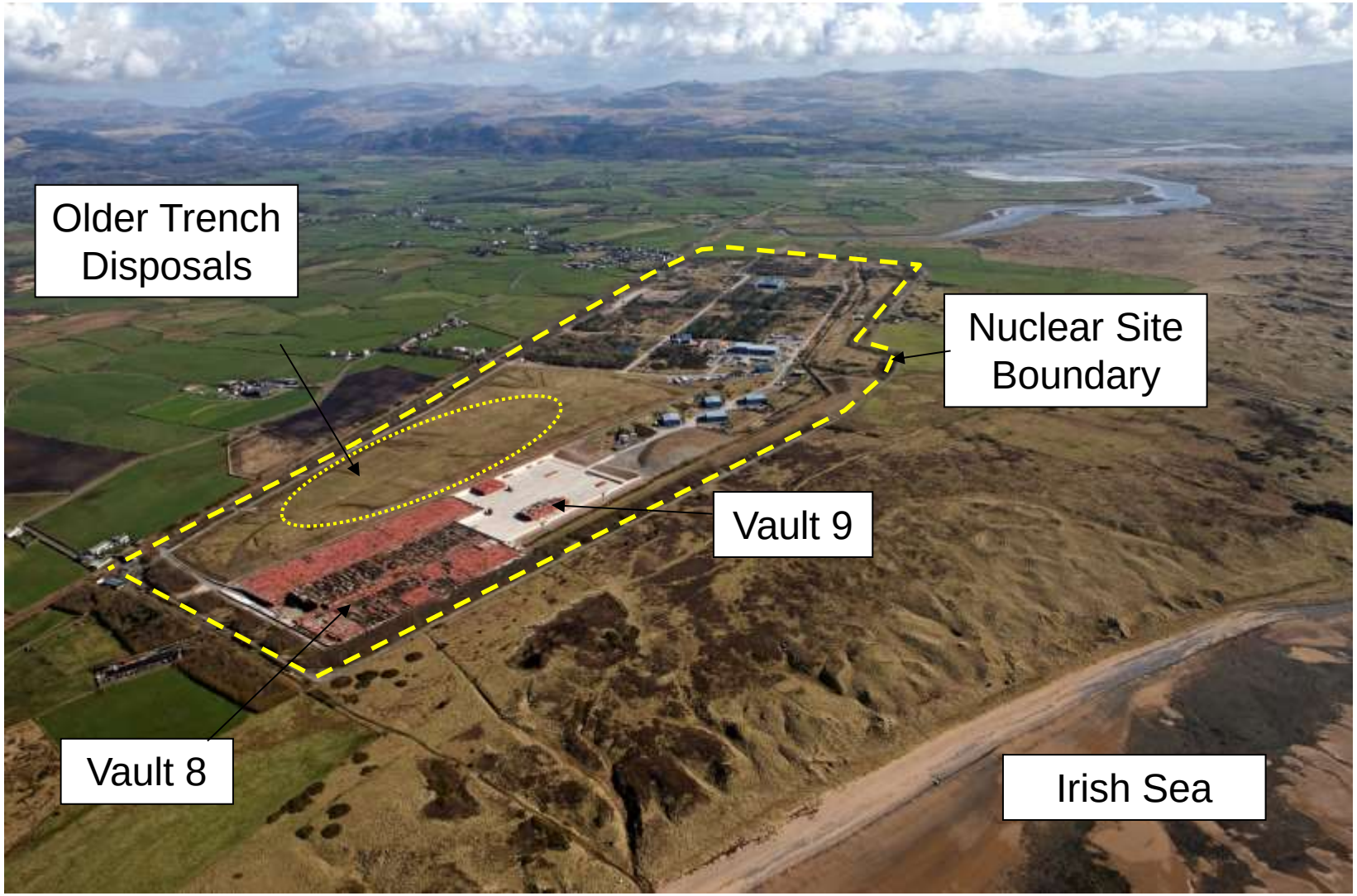
HM Government
dti
MEETING THE ENERGY CHALLENGE
A White Paper on Energy
And others?
NDA
strategy

Disposal at the Low Level Waste Repository?



- Coastal erosion
- Non-radioactive contaminants
- Scope of assessment
- Heterogeneity
- Impact on Waste Acceptance Criteria

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Development of routes for management of VLLW disposal

- In 2005 the UK's National LLW Repository was nearly full
  - – review of the permit and Environmental Safety Case underway
- Potentially significant constraint to industry
  - In particular delays to decommissioning and clean-up of nuclear sites
- LLW Policy amended in 2007
  - recognised that the bulk of wastes disposed historically at the facility did not need the engineering protection it provided.
  - Revised definition of VLLW
  - Opened alternative disposal routes for nuclear industry

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VLLW definition in the UK (LLW Policy 2007)

- LLW
  - Waste not exceeding 4 GBq per tonne alpha activity, or 12 GBq/te beta / gamma
  - Approx 94% UK radioactive waste (by volume) is LLW
  - Most waste comes from the operation and decommissioning of nuclear facilities – including scrap metal, paper and plastics
- VLLW – a revised sub-category of LLW
  - High Volume suitable for disposal at permitted landfill facilities < 4MBq/te total activity (and a concentration limit for tritium of 40MBq/te)
  - Primarily building rubble, soil and steel items from the nuclear industry

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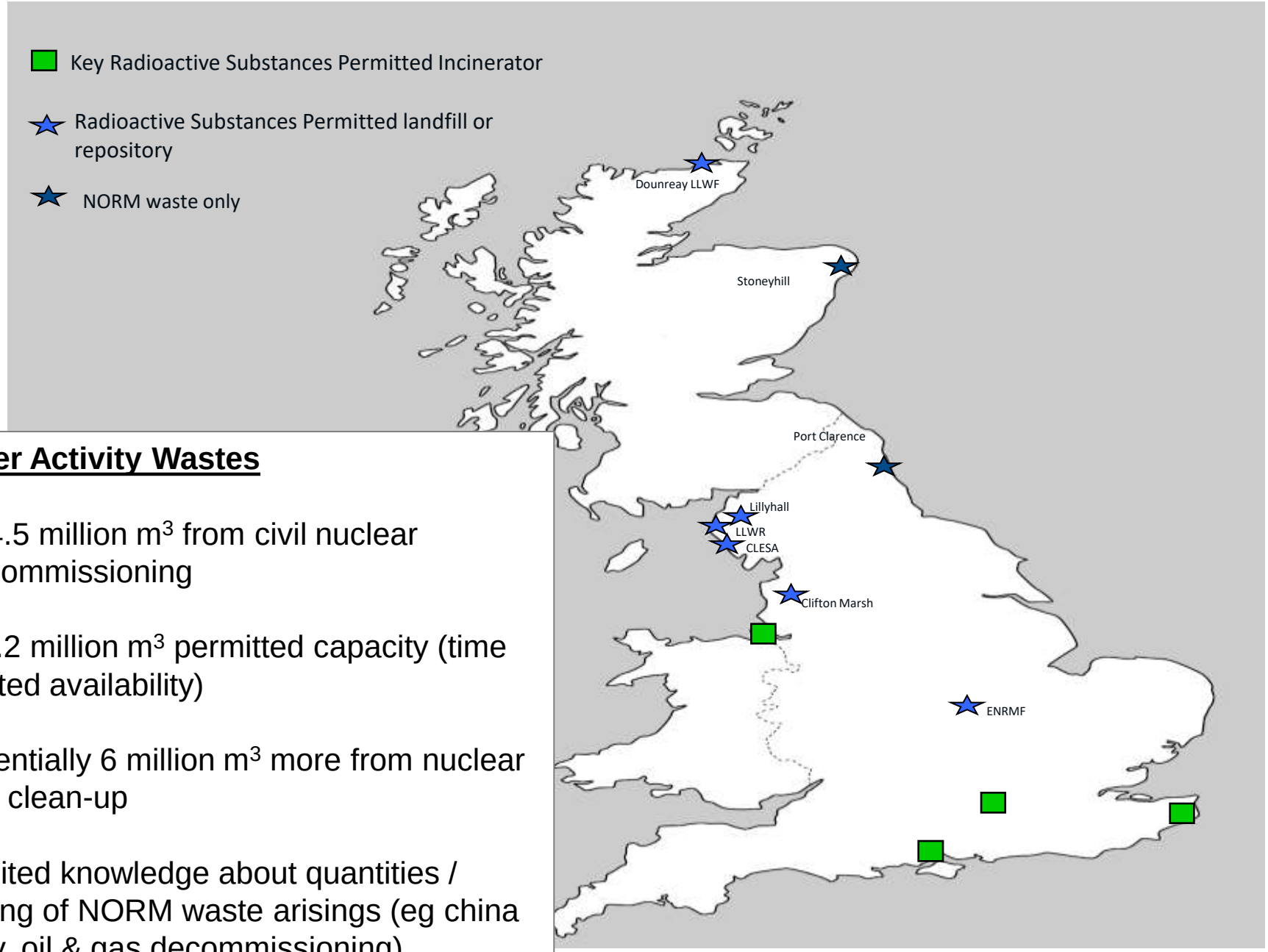
Current Disposal Capacity



Lower Activity Wastes

- ~ 4.5 million m^3 from civil nuclear decommissioning
- ~ 1.2 million m^3 permitted capacity (time limited availability)
- potentially 6 million m^3 more from nuclear site clean-up
- Limited knowledge about quantities / timing of NORM waste arisings (eg china clay, oil & gas decommissioning)

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Current / future challenges for management of VLLW in the UK

- Potential for very significant volumes of VLLW to arise from final stage decommissioning and clean-up of nuclear sites
  - Estimated 6 million m^3 from one site alone

- Regulatory guidance (the GRR) developed to help ensure optimisation of both:
  - Waste management, and
  - Site end-states

Ref: https://www.gov.uk/government/publications/decommissioning-of-nuclear-sites-and-release-from-regulation

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Lots of large concrete and metal structures – now activated – leave in-situ or dispose off-site?

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Significant below ground structures

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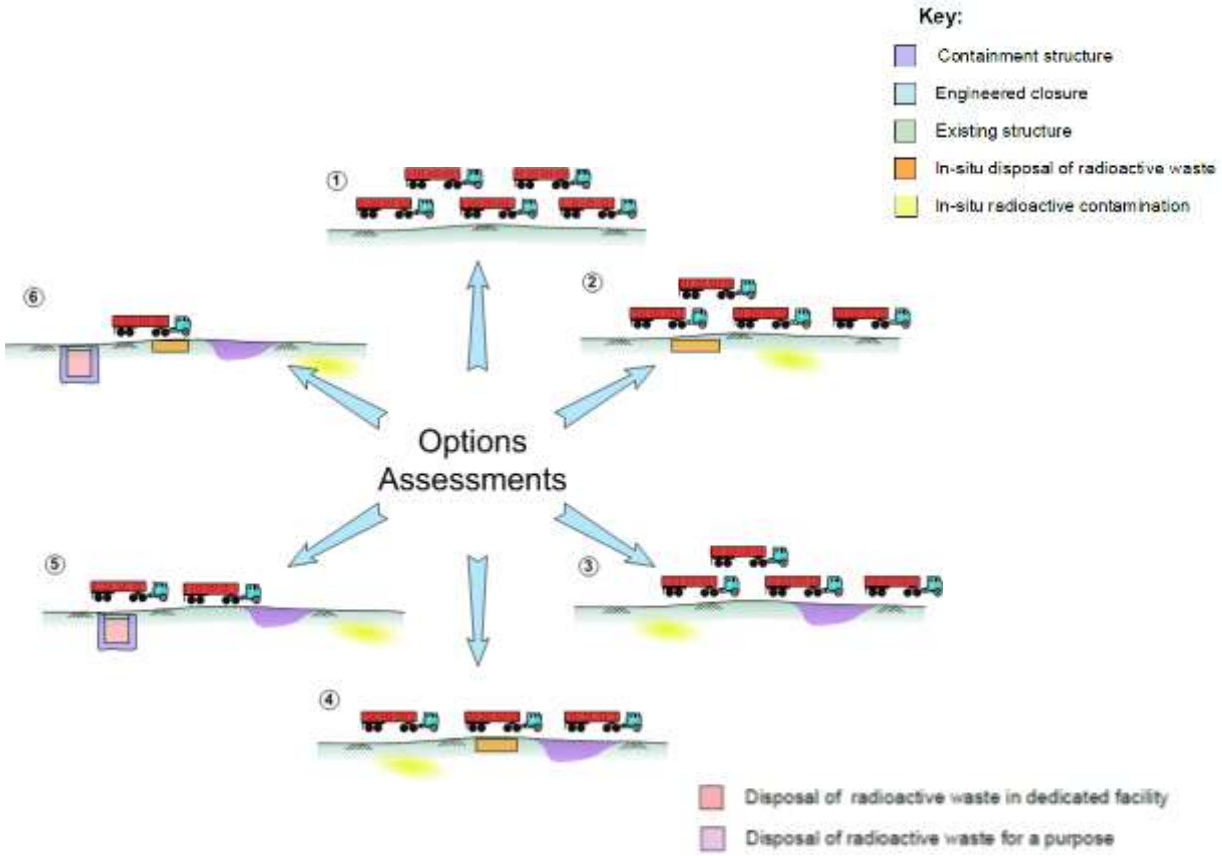
Optimisation of waste management from final nuclear site clearance in the UK

- Opportunities for Nuclear Site operators to consider options including:
  - In-situ disposal
  - Disposal on-site
  - Leaving contamination in situ
  - Removal of all wastes off-site



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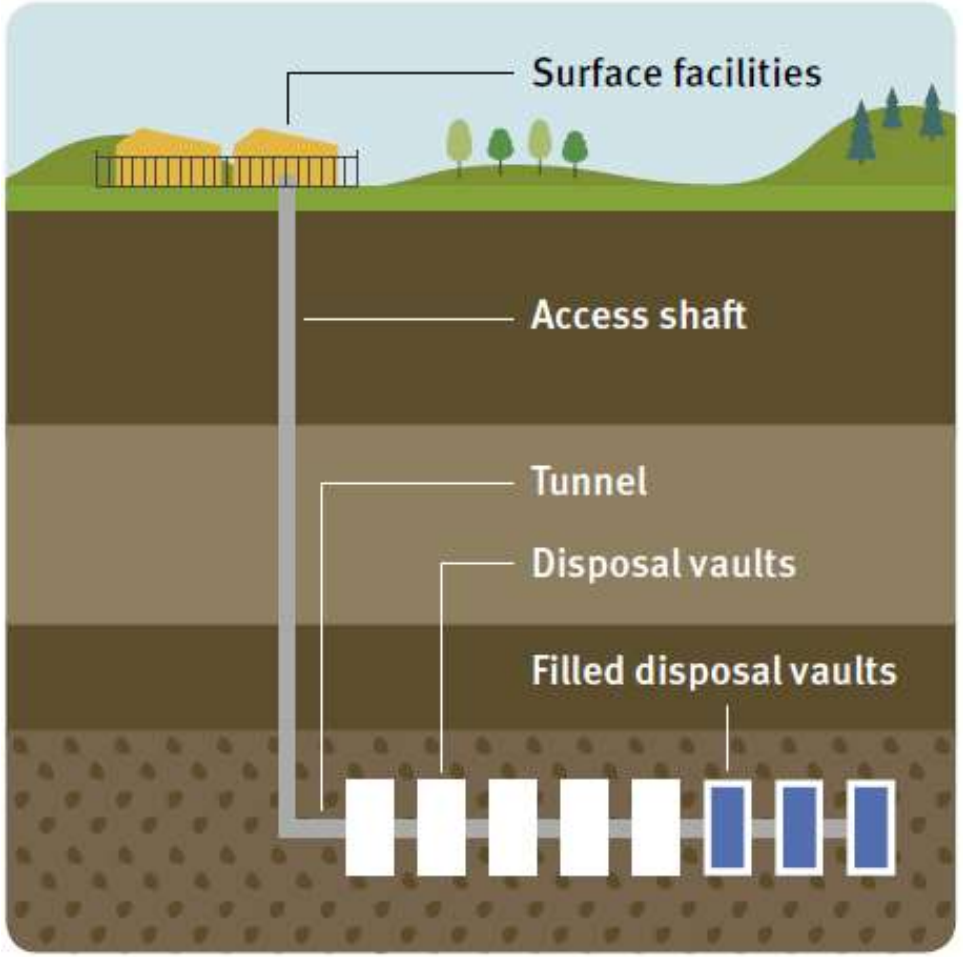
A sustainable solution for higher activity radioactive waste?

- Government published a revised policy on geological disposal in 2018
- A siting programme of community engagement is expected to commence later this year



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