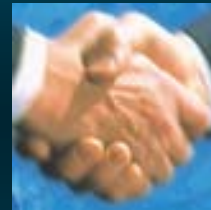


# NATO ARW Workshop – Environmental Security at Ports and Harbours



**17<sup>th</sup> March 2006**

**Preventing & Responding to Major Environmental Incidents in the UK: An Overview**

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# Introduction

- UK Ports & Harbours Overview
- UK Regulatory Regime
- Environmental Sensitivity of UK Ports
- Notable UK Incidents
- UK Approach to Risk Assessment
- Application of Good Practice



# UK Ports & Harbours

- Third longest coastline in Europe
- Over 500 Ports and Harbours
- Commercial (freight), Naval and Fisheries/Recreation
- Long history of handling many substances
- WWI & WWII usage (and earlier!)
- Increasing volume of freight & intermodal facilities
  - Over 90% of UK foreign trade is carried by sea
  - 26% of domestic trade carried by sea
  - Approx 600 million tonnes of freight per annum
  - > 70 million passenger movements
- Complex regulatory regime & stakeholder interest



# Stakeholders - Operational

- Port Operators
- Shipping Companies
- Employees
- Funders & Insurers
- Intermodal facilities
- Rail Operators





# Stakeholders - Regulatory

- Port Authorities & Police
- Local Authority
- Environment Agency
- Health & Safety Executive
- Department of Transport
- Department of Environment
- Her Majesty's Customs  
& Revenue Service
- The Crown Estates
- Nature Conservation Bodies
- The Strategic Rail Authority





# UK Regulatory Regime





# UK Regulatory Regime (Nationwide)

- **Department of Environment Food Regions & Agriculture (DEFRA)**
  - Policy & legislation
  - Guidance and interpretation
  - Dredging Licences
  
- **Environment Agency (10 Regions + SEPA)**
  - Industrial Permitting (IPPC)
  - Waste Management
  - Flood Risk
  - Protection of Controlled Waters (inc from contaminated land)
  - Invasive Species (Japanese Knotweed)
  
- **Local Authorities (>250 around UK)**
  - statutory nuisance (odour, noise, dust)
  - Industrial permitting (IPPC)
  - Contaminated land (human health risk)
  
- **Health and Safety Executive**
  - Health and Safety at Work
  - Seveso II (CoMAH)



# UK Regulatory Regime (Ports & Harbours)

- **Department of Transport (DoT)**
  - Policy & legislation
  - Guidance and interpretation
  - Port Marine Safety Code (PMSC)
  - PMSC – Guide to Good Practice
  
- **Port & Harbour Authorities**
  - Navigation, dredging and port management
  - Major incident response in port area
  
- **Maritime and Coastguard Agency**
  - Search and rescue
  - Pollution incident response
  
- **Crown Estates**
  - Naval Dockyards
  - “Seabed and HWM zone owner”



# Key Legislation (Ports & Harbours)

- **Integrated Pollution Prevention & Control Regulations**
- **Control of Major Accidents & Hazards Regulations**
- **Habitats Regulations 2000**
- *Dangerous Substances in Harbour Area Regulations*
- Oil pollution and dangerous vessels Code
- *Merchant Shipping (Prevention of Oil Pollution) Regulations*
- *Dangerous Vessels Act*
- Harbour Works (Environmental Impact Assessment) Regs
- Ship and Port Facility (Security) Regulations (ISPS)
- National Maritime Security Programme (ISPS)
- Marine Bill (suggests new regulatory body for marine protection)



# Who is in Charge when an Incident Occurs?





# Agencies Involved in an Incident

- **MCA** - Takes the lead in pollution from shipping at sea.
- **PORTS, HARBOURS, OIL FACILITIES & OFFSHORE INSTALLATIONS** - Have a statutory responsibility for clean-up in their jurisdictions.
- **ENVIRONMENT AGENCY** – Takes the lead in responding to pollution from land based sources.
- **LOCAL AUTHORITIES** / Environment and Heritage Service (in Northern Ireland) - Have accepted the non-statutory responsibility for shoreline clean-up.
- **Fire Brigade** take control in the event of a land based fire.

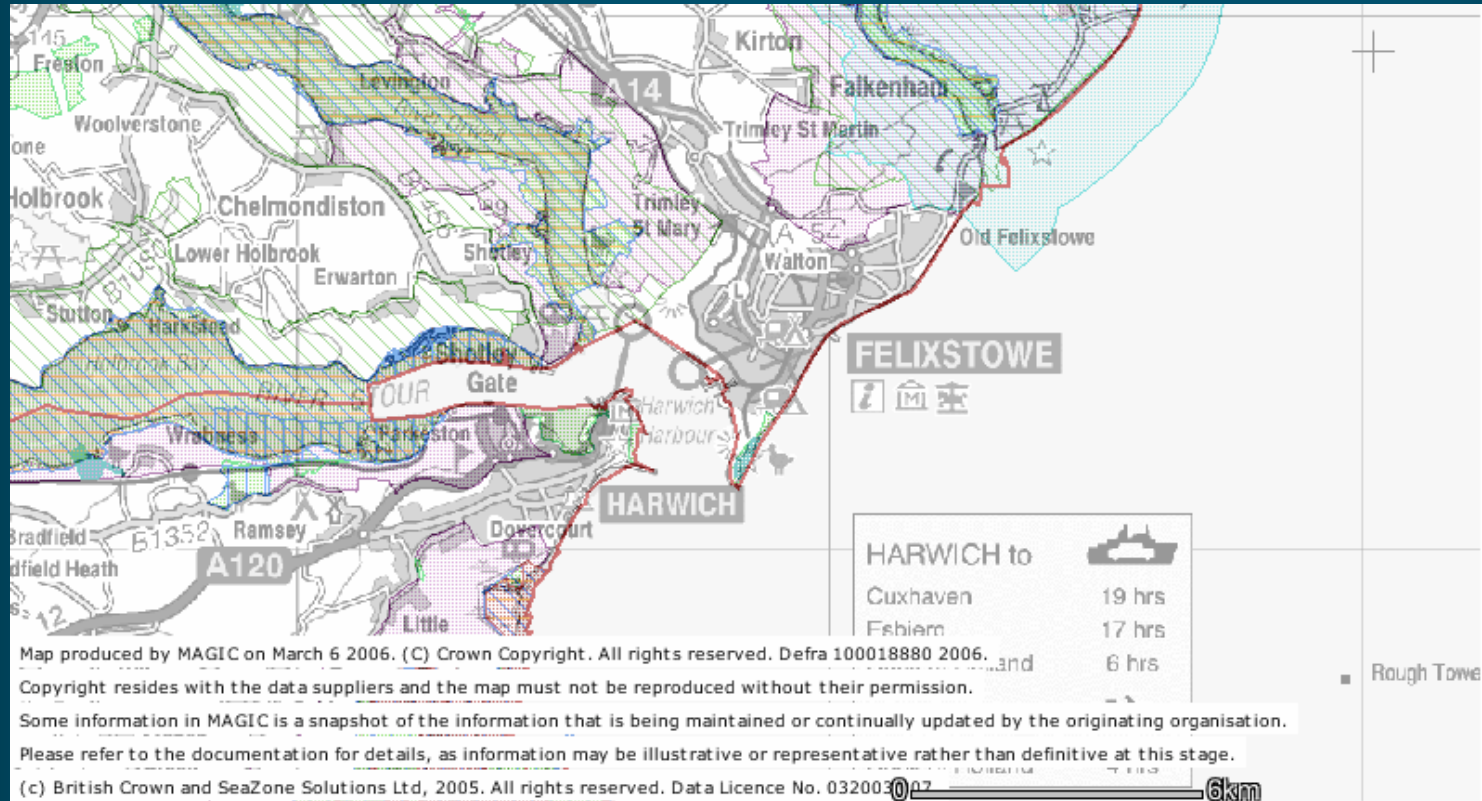


# Environmental Sensitivity of UK Ports





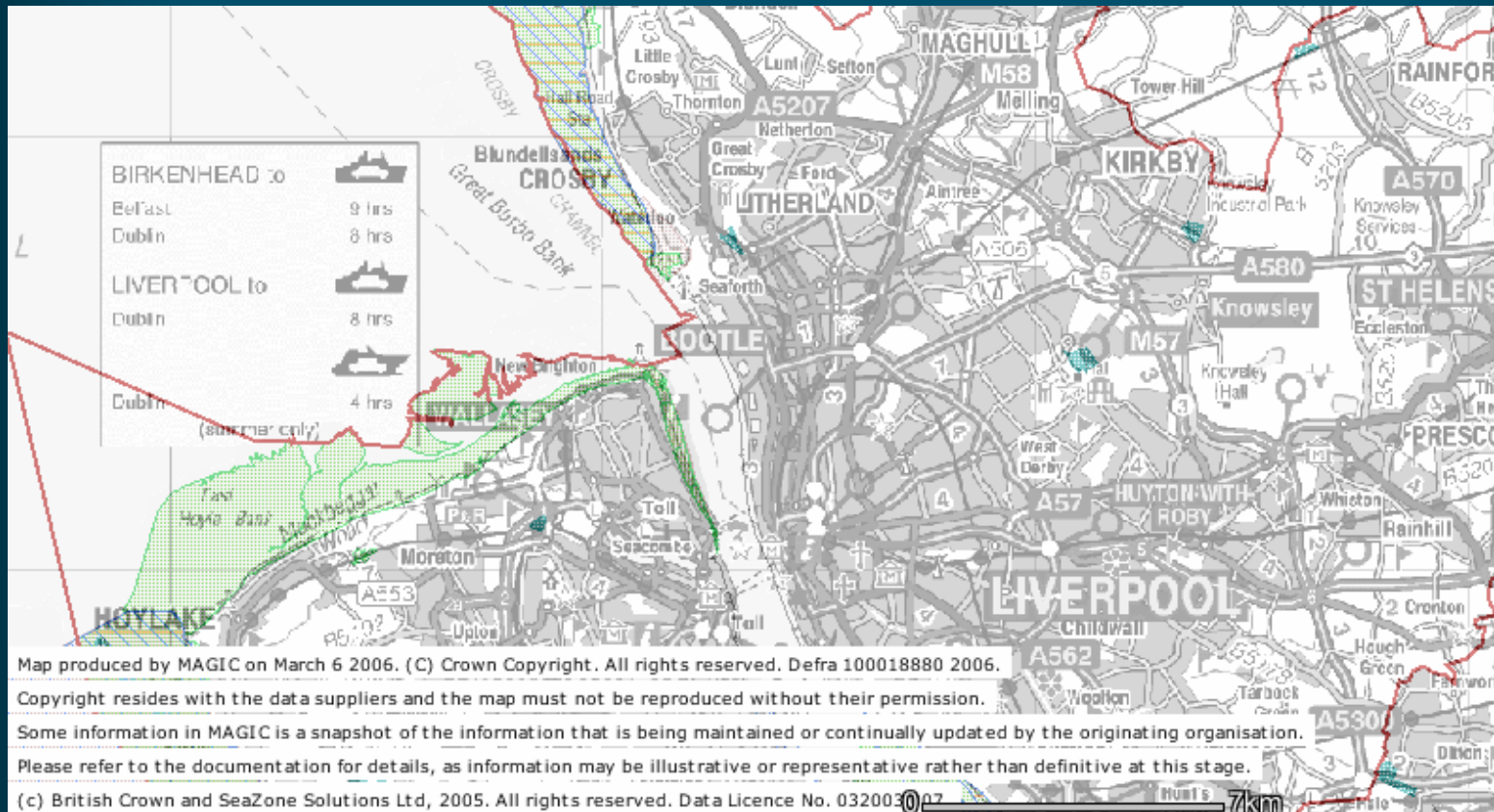
# Port of Felixstowe



- 4 nature reserves
- 2 SSSIs
- 2 Ramsar Sites (SPAs)
- 2 Environmentally Sensitive Areas



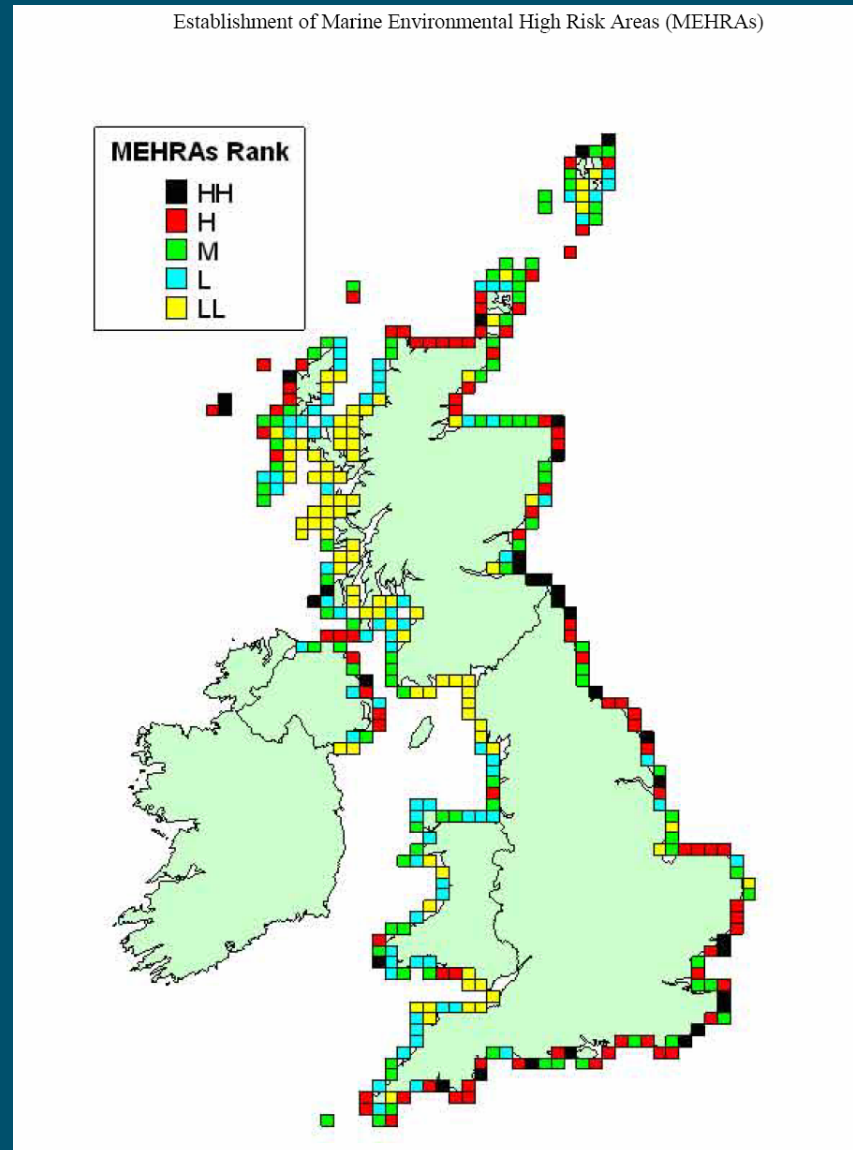
# Port of Liverpool



- 3 nature reserves
- 2 Ramsar Sites (SPAs)
- 3 SSSIs



# Marine Environmental High Risk Areas





## 2004 Pollution Statistics (from ACOPS)

- 81% Discharges are at sea 16% in ports and harbours and 3% in other marine environmental zones.
- 10 Prosecutions took place totalling €170,000 in fines.
- Incidents in ports have reduced by 8% per year since 2000.



# Reported Incidents 2004

Reporting organisations	Total number of reports received
Sea Fisheries Committees in England & Wales	11
United Kingdom Ports	160
Scottish Local Authorities	31
Department of Trade & Industry	539
Environment Agency	29
English and Welsh Local Authorities	134
Maritime and Coastguard Agency	427
Northern Ireland Environment & Heritage Service	6
Scottish Environment Protection Agency	8
Scottish Society for the Prevention of Cruelty to Animals	9
<b>Grand Total</b>	<b>1,354</b>

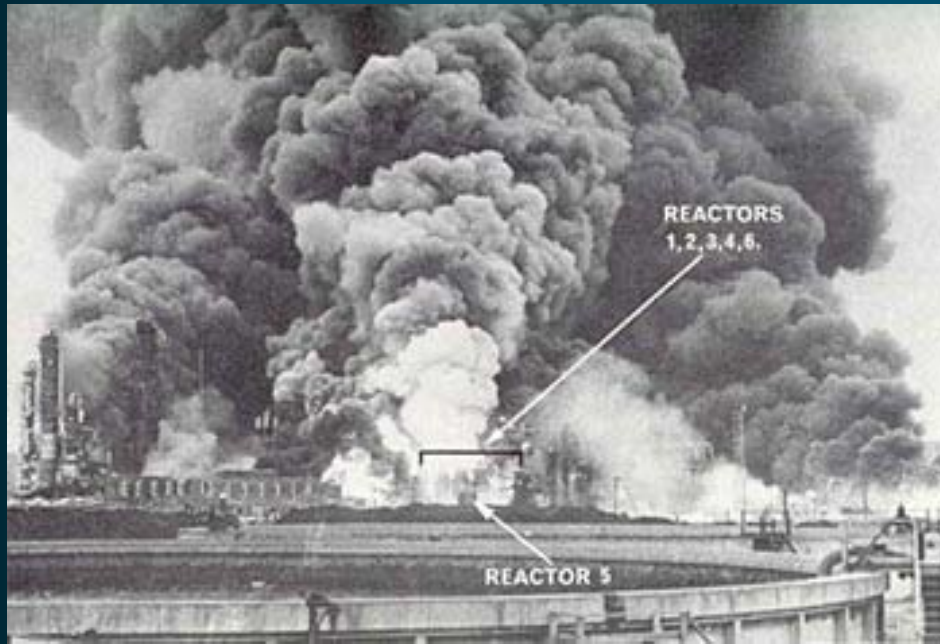


## Notable UK Incidents (that have modified policy)

- Flixborough
- Buncefield
- Sea Empress



# Flixborough Chemical Plant 1974



- 8" pipe fire ruptured an adjacent 20" pipe
- Cyclohexane escaped and formed vapour cloud
- Ignition caused massive vapour cloud explosion
- Set adjacent tanks on fire
- 28 killed, 36 injured



# Seveso II Directive

- Control of Major Accidents and Hazards (COMAH) Regulations
  - Based upon materials inventory (not site sensitivity)
  - Two tiers defined for affected installations
  - Sites have to identify Major Accident To The Environment (MATTE) scenarios and prepare a detailed Environmental Risk Assessment
  - On site and off site emergency responses must be defined
  - Plans and Procedures must be tested regularly
  - COMAH sites are regulated by HSE not the EA
  - COMAH safety reports are confidential (national security)
  - Rigorous regime covers “all” major incidents types (incl terrorism?).



## Major Accident To The Environment (MATTE)

- The definition of major accident within the COMAH Regulations is:
  - *‘an occurrence (including in particular, a major emission, fire or explosion) resulting from uncontrolled developments in the course of the operation of any establishment and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances’.*



# Buncefield Oil Depot December 2005



- December 2005
- Vapour explosion in bulk tank
- Engulfed surrounding tanks
- Took many days to extinguish
- Plume visible from space
- 40 injuries (none fatal)
- Unprecedented scale
- Physical damage to entire area
- Environmental impact unknown



# Sea Empress Oil Spill 1996



- Ran aground heading into Milford Haven
- Lost 72,000t crude oil cargo
- Also lost 250t HFO and 230t engine fuel oil
- Towed into Milford Haven still leaking oil
- 100km of coastline affected
- Milford Haven Port Authority was prosecuted



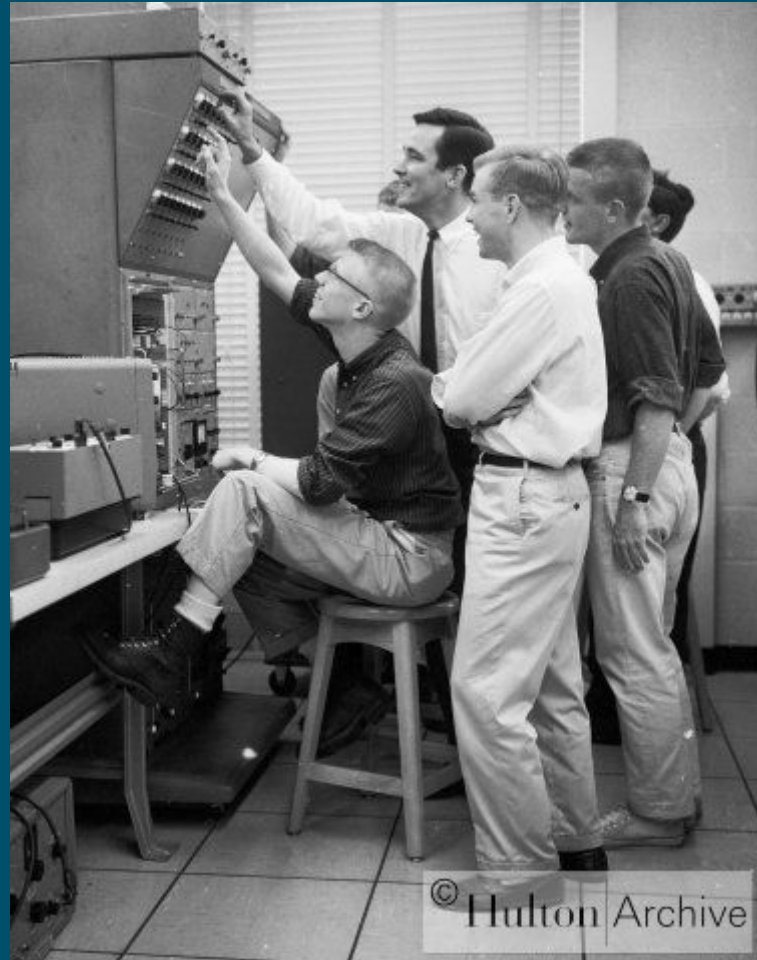


# Risk Assessment in the UK

- The Port Marine Safety Code and COMAH apply the ALARP principle - As Low as Reasonably Practical (not based upon financial resources).
- A documented and audited safety management system must be in place and must allow for contingency measures and response to incidents.
- The preferred hierarchy of risk control principles -
  - eliminate risks - by avoiding a hazardous procedure, or substituting a less dangerous one;
  - combat risks - by taking physically protective design measures to prevent risk;
  - minimise risk - by suitable systems of working.
- If a range of procedures is available, the relative costs need to be weighed against the degree of
- control provided, both in the short and long term.

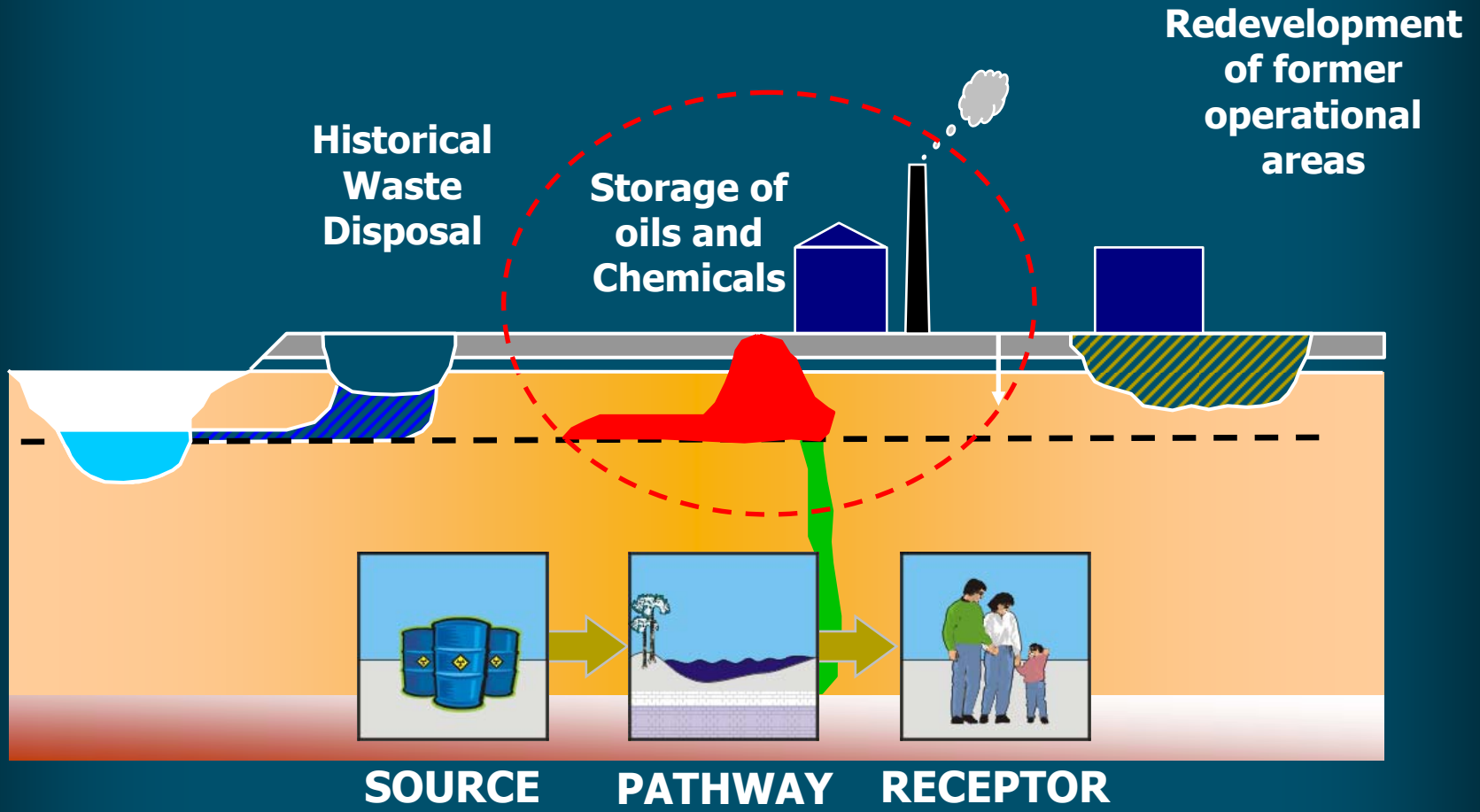


# Risk Assessment Models





# Conceptual site model





# Approaches to Environmental Risk Assessment

- QRA mainly applied to groundwater and contaminated sediment scenarios or CoMAH sites
- Otherwise generally qualitative or at best semi-quantitative assessments are used
- Most sophisticated modelling relates to air emissions (ADMS3 model)
- Usually only applied via IPPC or CoMAH regulatory regimes.
- QRA is not used systematically in decision making.
- Rely on Management Controls & Safeguards.



***Good practice guidelines for ports and  
harbours operating within or near UK  
European marine sites***

*UK Marine SACs Project (English Nature)*



# Port Marine Safety Code (PMSC)

- The PMSC applies to Harbour authorities and places duties upon them to conserve, and facilitate the safe use of, the harbour; and
- a duty of care against loss caused by the authority's negligence.



# Key Components of Port Plans

- • SAR
- • Counter pollution
- • Salvage
- • Media
- • Disturbance
- • Collision
- • Grounding
- • Sinking
- • Fire
- • Pollution
- • Air pollution (Toxic cloud)
- • Chemical spillage
- • Bomb threat / terrorism
- • Medical emergency
- • Hazardous substances washed ashore



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# The Edict of Egnazio

By divine providence the city of Venice is founded on water, surrounded by water and protected by water instead of a wall. Hence, whoever dares in any way damage the public waterways, let him be condemned as an enemy of the fatherland and punished no less gravely than someone who has undermined a city's walls. Let this edict remain in force immutable and perpetual.

*Giovanni Battista Cipelli (1476 – 1556)*