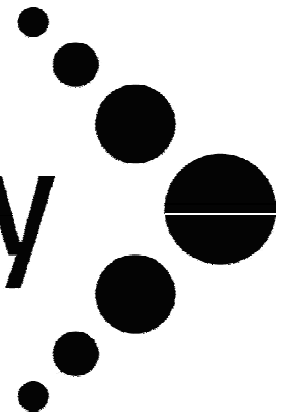


National Nuclear Laboratory



UK National Nuclear Laboratory – Environmental Remediation

WM 2010

Presented by : Mr Peter M Booth, National Nuclear
Laboratory



Presentation Scope

- Challenges and Gaps in Environmental Remediation
- UK Perspective
- Brief Overview of NNL Ltd
 - Who we are
 - Capability in support of Environmental Remediation
 - Role in ENVIRONET
- ENVIRONET and its benefits

Challenges in Environmental Remediation

- Primarily legacy issues.
- Pollution and contamination does not just effect the vicinity of the plant, mine, waste tailings etc.
- Nowadays there is a greater focus on environmental legislation and permits, doing it correctly.
- Disposal Routes.
- Sustainable Technologies.
- Greater requirement for stakeholder engagement.
- **COST.**

Gaps - General

- Need to understand the problem first and often better, but why?
 - To understand the risk
 - To aid the decision making process
 - To understand the funding implications
 - To work within the regulatory framework
 - To know which solutions may work
 - To choose the most appropriate options and solutions
 - Sustainability

UK Nuclear Industry Challenges

- We use the term remediation but is the term management more appropriate?
- Very few examples of provable solutions apart from moving material from one location to another.
- Not enough sharing of experiences and output from R&D.
- Do the commercial challenges and restrictions our organisations face prevent us from communicating and helping those who need it most?

UK Nuclear Industry Challenges

- Contamination within the ground or groundwater on nuclear licensed sites may be radiological, non-radiological or a combination of the two.
- Causes
 - Historical leaks from buildings/silos.
 - Accidents/Incidents.
 - Continued leaks from buildings/silos.
 - Cross contamination from one aquifer or water body to another through poorly installed boreholes.
 - Failing disposal facilities.
 - Non engineered burials.
 - Aerial discharges.

UK Perspective – Nuclear Industry

- Only two nuclear installations with significant soil and groundwater issues.
 - UK's National LLWR needs to prove there is no environmental risk from migration.
 - Ageing single skinned plants still exist.
- Funding drivers are leading to a prioritisation of the decommissioning work.
- However, remediation might be required to support decommissioning, site end state declaration, de-licensing, stewardship and liability estimates.
- Networks like SAFEGROUNDS and CL:AIRE provide guidance and technology demonstrators respectively.

UK Perspective – Nuclear Industry

- Hazards
 - Contaminated soil and groundwater.
- Drivers to act
 - Risk to the environment through the migration of contaminants.
 - Exposure risks to site workers.
 - Financial and legal liabilities.
 - Delicensing and potential land re-use.
 - Good management.
 - Increase stakeholder trust.
 - Meeting regulatory and site licence issues.
 - Site Licence Conditions 32 & 34

National Nuclear Laboratory (NNL Ltd)

- Former Research Capability component of BNFL.
- Became Nexia Solutions and is now the UK's National Nuclear Laboratory (NNL).
- About 800 personnel – looking to increase this by 40% over the next 3 years.
- Environment team has c30 personnel.
- Government owned, contractor operated.
- Consortium of Serco, Battelle and Manchester University run NNL.
- Purely customer funded, i.e. no government funding.

Roles and Aspirations

- International nuclear R&D centre of excellence
- Support new build and clean up
- Safeguard nuclear expertise, facilities and skills
- Deliver value for customers
- Trusted advisor
- Collaborations/Partnerships/Links
- Socio-economic focus

National Nuclear Laboratory

Unique Combination

People



Facilities



National Nuclear Laboratory

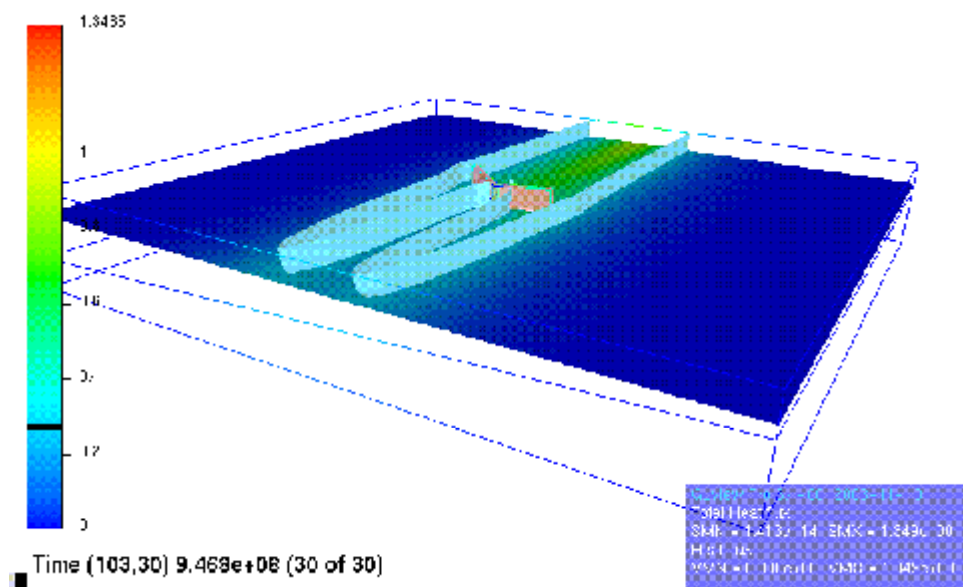
Products and Services:

- Fuel Manufacture and Reactors
- Operating Reprocessing/Waste Plants
- Decommissioning and Treatment of Legacy Waste
- **Environmental Management**
- Modelling and Simulation
- Disposal
- Defence
- CBRN/Homeland Security
- New Nuclear Build/Future Nuclear Systems
- Research Training and Academia

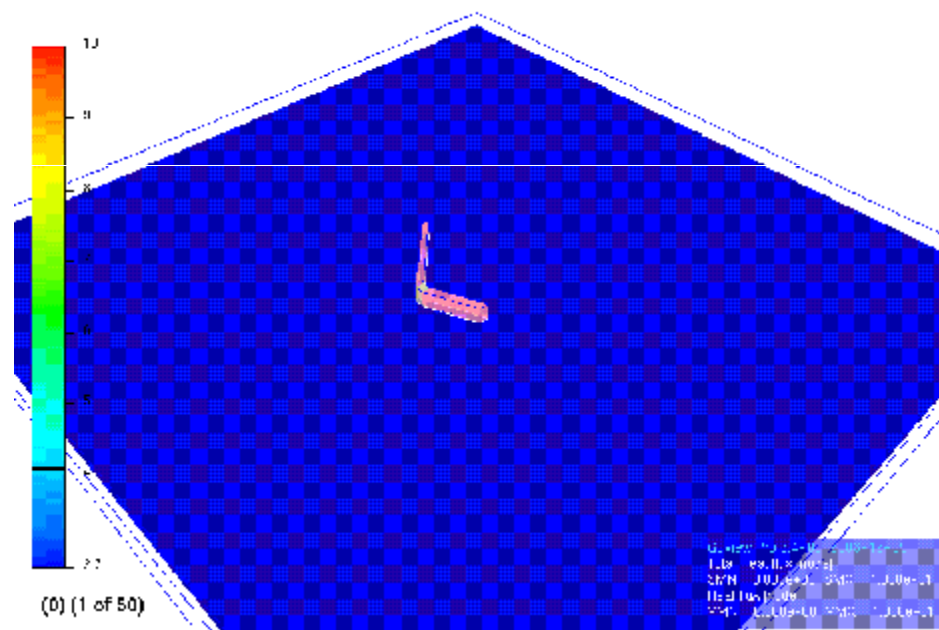
Capability in support of Environmental Remediation

- Undertake a wide range of environmental work.
- Site characterisation, data assessment and GIS , record keeping.
- Stakeholder Engagement.
- Remediation modelling.
- Remediation studies, optioneering, optimisation and lab and pilot plant trials, R&D, costing studies.
- Decision making.

Remediation Modelling



Simulating permeable reactive barriers



Capability in support of Environmental Remediation

- Experience of working in networks
 - UK based
 - SAFEGROUNDS
 - SAFESPUR
 - SAGTA
 - CL:AIRE
 - International
 - NICOLE
 - ENDSEP
 - IAEA ENVIRONET
 - IAEA IDN (Considering)

Capability in support of Environmental Remediation

- International Experience

- Worked for the IAEA extensively in the areas of waste management and environmental remediation.
 - Writing Safety Series and TecDocs
 - IAEA Technical Missions
 - Ukraine, Estonia, Romania
 - IAEA Training Courses
 - IAEA projects on safety case development
 - ENVIRONET
- Undertaken work in Kazakhstan, Kyrgyz Republic, Russia on groundwater remediation projects.

Benefits of involvement with ENVIRONET

- **Two way process**

- For the IAEA Member States we offer;
 - Experience of the benefits of networking.
 - Extensive experience of working internationally and therefore understand different problems and solutions.
 - Work closely within a regulatory framework.
 - Extensive stakeholder engagement experience .
 - Developed best practice with a wide range of stakeholders.
 - Decision making processes and optioneering studies.
 - Offer pragmatic and sustainable solutions.
 - An understanding of the complete life cycle of operations.

Benefits of involvement with ENVIRONET

- Role
 - Assisted the IAEA in developing the ENVIRONET aspirations and forward programme.
 - Chaired meetings/workshops.
- Benefits of involvement
 - Allows us to help others.
 - Can have our viewpoints and approaches challenged and peer reviewed.
 - We can gain knowledge and learning and apply this both internationally and in a UK context .
 - Maintains our profile in this field.

Priorities for ENVIRONET

- Understanding the complete life cycle of site/plant operation.
- Improved planning.
- Application of the Waste Management Hierarchy.
- Provision of training.
- Sustainability.
- Awareness of approaches and solutions.
- Working closer with stakeholders.
- **Prevention is better than the cure!**

What can ENVIRONET offer its members

- General networking and sharing of experiences.
- Assistance in understanding the reasons behind success and failure.
- Understanding how to apply sustainable solutions.
- Stakeholder engagement.
- Training.
- Hopefully provide a focus which will assist Member States gain funding support.
- Learning how to minimise the problem at the outset.