

Environmental Management

The infamous Natterjack toad.....

Completing large construction projects in an environmentally sensitive manner is always difficult. Add to this the constraints put on the Vault 9 construction project due to protected species habitats, typical seasonal Cumbrian weather (rain...and more rain), and working in close proximity to potentially active leachate systems and you may understand the size of the challenge that the Vault 9 team has faced.

Significant environmental risks were identified in the preparation of the Environmental Statement. This information was incorporated into the project design resulting in mitigation measures including:

- Utilisation of the rail system to transport materials to site leading to significant reduction of environmental impact.
- Re-location of animals, sensitive soils and vegetation from the Vault 9 footprint carried out prior to the works, successfully preserving an acid grassland habitat.

During the construction process a number of further mitigation measures were put in place in order to reduce the environmental impact of construction activities. These included:



- A lagoon and settlement pond system augmented with Silt Busters for the removal of suspended solids from excavation and surface waters.
- A concrete washings settlement pond system to remove concrete fines from wash waters.
- Amphibian fencing to prevent frogs, toads, newts, etc. from entering settlement ponds and construction areas where they may be harmed.
- Identification and preservation of peripheral habitat areas.

All these have contributed to the significant environmental successes achieved in the construction of Vault 9 leading to valuable learning and experience for use in future LLWR projects.

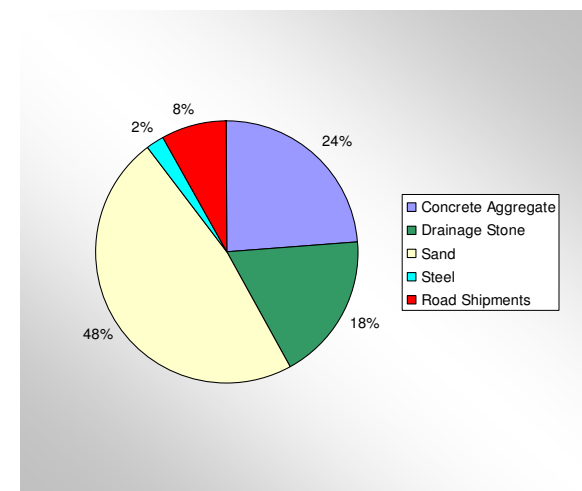


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Materials Management

LLWR's Traffic Management Plans Captured



The planning conditions imposed by Cumbria County Council stated that the movement of material by rail had to be maximised. A traffic management plan was developed which utilised existing off site rail facilities north of the LLWR site at the Port of Workington and the construction of a temporary off site rail loading facility south of the LLWR site near Millom, Cumbria. These facilities in conjunction with LLWR's on-site rail head proved to be a major Vault 9 success story with 144 trains transporting 154,800 tonnes, over 90% of the construction material to the LLWR site. The project has demonstrated that the existing sidings have sufficient capacity to manage LLW shipments and large volumes of construction material simultaneously. LLWR has developed the management arrangements to control the work safely. The successful transportation of material sets the template for future construction projects at LLWR, such as future vaults and the trench and vault capping.

NDA PAYS TRIBUTE

Vault 9 completion marks an important milestone for NDA, LLW Repository Ltd, our environmental, nuclear and safety regulators, the Planning Authorities, local communities and indeed the wider UK Nuclear Industry.

From the outset, back in 2005, Vault 9 was identified as one of NDA's most strategically important projects. It has subsequently attracted high levels of interest from many quarters.

The Opening Ceremony was pitched at a level that once again demonstrated the professional way in which UKNWM undertakes business.

Dave Weatherburn
Site Programme Manager
Nuclear Decommissioning Authority

ON THE LEVEL

ISSUE 5 July 2010

NEWS AND VIEWS FROM THE LLW REPOSITORY

LLWR Delivers Vault 9

On Thursday 29th July LLWR marked the opening of Vault 9 with a ribbon cutting ceremony when LLWR employees, civic leaders, local authorities, community representatives, regulators, customers and key stakeholders joined together for this auspicious event.



Director's Corner

This edition focuses on a major milestone for LLWR - the addition of Vault 9 to our facilities. Many features of this project exemplify the changed nature of LLWR in the new national regime of managing Low Level Waste. First, of course, is the unaltered commitment to supporting the NDA's remit for decommissioning across the estate - no site must ever be held up for lack of LLW disposal routes. Vault 9 closes the "short term capacity gap" that existed at the time of our bid. Second, is the perfect example of cooperation and partnership with key stakeholders - especially Cumbria County Council. The agreement to proceed with construction in advance of a completed Environment Safety Case was a major expression of confidence in the future of this repository. Using this vault for storage, pending a new authorisation in 2013, is by far the most enlightened option available. It represents a major cost savings to the UK taxpayer and avoids unnecessary radiation dose impact to our employees. Third, Vault 9 represents the partnership with NDA needed to address the last-minute withdrawal of the original preferred bidder. Only such close coordination with our customer could have held the basic time line for success. Lastly, Vault 9 represents the very real benefits of real-time, fast reacting staff work to keep LLW Operations, NII, the Environment Agency and Birse Nuclear all focused on success. The ability to conduct joint construction and waste operations at the rail head and on the vault 9 pad made a real difference. Vault 9 has had its share of challenges - and our ability to pull this off should be a major source of pride to everyone.

Well done!

Dick Raaz
Managing Director, LLWR



From left to right: Mayor of Copeland, Chairman of Drigg & Carlton Parish Council, Chairman of Cumbria County Council, and Chairman of the PBO Board

The UK has developed a world-class Low Level Waste (LLW) Strategy and now has a world-class LLW Repository in West Cumbria

On Thursday 29th July 2010, visitors from around the globe converged on the LLW Repository in West Cumbria. The significance of the date was the official opening of the newly constructed Vault 9.

Almost 200 people gathered at the entrance to the Vault to witness the Chairman of Cumbria County Council, (Bert Richardson), the Mayor of Copeland, (Michael McVeigh) and the Chairman of Drigg & Carleton Parish Council, (John Jennings), cut the ribbon and declare the Vault "open for business".

Chairman of UK Nuclear Waste Management, Pres Rahe, was delighted to welcome so many guests to the facility and was justifiably proud of the significant achievement of all involved in delivering "a first class facility that will serve the UK low level nuclear waste management needs for many years to come". He attributed a major component of that success to the very close working relationship between LLWR and NDA staff.

Phil Davies, Head of Waste and Nuclear Materials at the Nuclear Decommissioning Authority (NDA) was pleased to be part of the celebrations saying "the world has changed significantly since the early days of planning the new vault. Since UK Nuclear Waste Management has taken over management and operations at LLWR, the emphasis has switched from single solution disposal to smarter strategies that make best use of this valuable asset".

TALK BACK with Paul Pointon & Carl Carruthers

Cath Giel asks.....

24 months and over 400,000 man hours to build!

Cath Giel asks Paul Pointon, Site Project Delivery Manager at LLWR and Vault 9 Project Manager, Carl Carruthers

“what makes Vault 9 different from an ordinary civil engineering project?”

Paul explains “Vault 9 is designed as a disposal facility that will have to perform to its’ design specification for thousands of years to come. The engineered liner system beneath the concrete vault is constructed with multi layers of clay, liners and aggregate with a drainage layer to collect any water that penetrates the vault in the future. The principal is to retain any water that penetrates through the cap in the future within the system in the short term”.

Both Paul and Carl come from construction and engineering backgrounds and I asked them

“what were the challenges associated with this particular project?”

For Paul it was the typical wet Cumbrian weather. For Carl it was mitigating the high probability, high impact risks throughout the construction phase. Things like the complex traffic management and water management arrangements and material compliance testing were significant challenges imperative to ensuring success.

When asked *“what have been the highlights associated with the project?”* Paul recalled the start of excavation works when the dump trucks started rolling and the successful movement of the different types of material to the site by rail. This principle has set the approach for future projects at LLWR. Carl cited the first and subsequent hand over of Vault sections to LLWR Operations for the storage of LLW. These were significant achievements in ensuring that the short term capacity gap risk was closed and that uninterrupted storage of LLW here in Cumbria to support the Nations’ needs was guaranteed.

“What have been the low points on the job?”

Paul said without doubt the lowest point was when a construction operative slipped and hurt his back which resulted in a 3 day lost time accident. Carl agreed then pointed out that the team had picked themselves back up and raised the bar resulting in over 380,000 man hours without a reportable accident.

From a local community/stakeholder perspective, the number of people employed and local supply chain involvement is a key indicator of a successful project. I asked the guys *“how many people were involved in the construction project and what types of disciplines were deployed throughout the design and construction phases?”*

At its peak there were over 150 personnel covering all facets of civil, mechanical and electrical works and approximately 45 supply chain companies. The emphasis throughout the project has been utilisation of local labour.

“With the benefit of hindsight, is there anything you would have changed?”

“The project started rapidly with huge pressures to ensure we solved the LLW capacity gap. At contract award in June 2008 there was real concern that the lack of LLW storage space would significantly impact decommissioning activities across the NDA estate. A more gradual build-up would have been advantageous and some of the construction details could have been simplified”.

“Are you proud of your/the company’s achievement?”

They both replied with a resounding “YES” stating that they were proud of the way that the staff, supply chain and the local community came together to assist in the delivery of this fantastic long-term asset. They are particularly proud of the LLWR team that managed the construction

“WE WERE A GREAT TEAM!”



Peaks and Troughs from Birse

How the Main Contractor reflects on the construction of Vault 9

A big concrete box containing 12,000 cubic meters of structural concrete! That’s the end product of 24 months work and over 400,000 man hours. However, there was slightly more to the construction of this facility which literally took blood, sweat and tears to complete. The vault was built to very high standards set by Birse Nuclear and LLWR project teams.

On award of the contract back in July 2008, Birse Nuclear were honoured to join LLWR in the construction of Vault 9. Birse Nuclear’s main project objectives were to build the vault with an exemplary Safety, Quality and Environmental record, whilst working closely with the customer’s team and the local authorities to minimize the impact on the local communities. This was achieved through the development of a traffic management plan to minimize traffic movements throughout the county and specifically the village of Drigg and reduce the environmental impacts on the local area. A logistical plan was hatched and put in place which took over 7,500 road deliveries and moved them onto the rail infrastructure which clearly relieved some of the strains on the local roads and communities. All of the aggregates for the project were sourced within the county and batching plants for both the concrete and the Bentonite enriched soil (BES) were set up on site to further reduce deliveries.

Vault 9 footprint is in excess of 22,000 square meters and the concrete floor slab is 350mm thick, however under the concrete is 2 layers of BES both 500mm deep with a drainage stone layer running between the BES also 500mm thick. To put this into perspective, the base slab consists of just over 6 feet of engineered materials. The testing regime for the BES was both intensive and thorough which required constant monitoring for compaction and moisture content.

Constructing the vault, which in effect is a very large swimming pool, would have been a challenge anywhere in the country, however in Cumbria renowned for its rainfall, was certainly a challenge and on occasions has been an operational headache and sometimes a heart ache!!

A seacant pile wall was constructed driving in 20 meter piles along the full length of the East wall. The earthworks commenced and the large excavation was ready for the construction team to start laying the Basel liner and concrete. Unfortunately the weather in Cumbria was unkind flooding towns, washing out bridges and forming our very own lake at LLWR. Extensive water management systems were set up which helped the team to move forward. Whilst the world was watching the flooding across Cumbria, Birse Nuclear were literally trying to pump the county dry!!!

The vault has been completed and looking back at the original objectives, the project has been a great success with:

- over 380,000 man hours without a reportable incident
- delivery of a world class product.
- satisfied stakeholders.

All of the Birse team have enjoyed the challenges of the project and this working environment and wish to thank LLWR for their support. We would welcome the opportunity of working with them again.

Spotlight on Excellence



This Edition – Carl Carruthers Project Manager Vault 9.



Carl is a Civil Engineer by profession and has over 10 years of experience in the nuclear industry. During that time he has been involved in the safe delivery of over 10 nuclear facilities either on the LLWR or Sellafield sites. This work has involved high profile multi-disciplined projects ranging from PCM retrieval buildings at the LLWR, a metal recycling facility at Sellafield, ILW remote handling facility within Sellafield’s separation area and most recently Vault 9 for LLW storage at the LLWR.

Carl and his Vault 9 team have been responsible for ensuring the safe delivery of Vault 9 within cost and schedule constraints whilst ensuring that the exacting regulatory quality requirements are met in addition to managing LLW site operations and local stakeholders requirements.

Carl has a passion for cars, in particular vintage Volkswagens and spends much of his limited personal time attending national and international VW events with his family. Carl is also enjoying his time with a recent addition to his family.

TIMELINE OF VAULT 9

