

Nuclear Free Local Authorities **RADIOACTIVE WASTE POLICY**

Briefing No.53 – Welsh Government radwaste policy

Prepared for NFLA member authorities, January 2015
Response to the Review of Welsh Government Policy on the Management and Disposal of Higher Activity Radioactive Waste.

1. Background

In June 2014, the Nuclear Free Local Authorities (NFLA) responded to the Welsh Government Call for Evidence to seek the views on whether it should review the current Welsh Government policy on the disposal of Higher Activity Radioactive Waste (HAW), and if so the options it should consider. That submission can be found here:

http://www.nuclearpolicy.info/docs/radwaste/Rad_Waste_Brfg_51_Welsh_radwaste_policy.pdf

In this response NFLA recommended that the Welsh Government adopts the Scottish Government policy on HAW:

“...that the long-term management of higher activity radioactive waste should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved.”

NFLA argued that HAW arisings in Wales, once packaged, would be around half the volume of the HAW arisings in Scotland. A significant proportion of this waste will not arise until Final Site Clearance at the two Welsh reactor sites in 2073 and 2091. By the time the care and maintenance phase begins at Trawsfynydd in 2016 and Wylfa in 2025 all the early arisings of HAW will have been placed in interim storage, so there is no need to rush decisions and, for instance, start emplacing waste in a deep geological repository with inadequate geological barriers.

In the meantime NFLA recommended that the Welsh Assembly Government investigate why the MRWS process failed. The views NFLA made in the call for evidence and outlined in Radioactive Waste Briefing 51 remain its view on Welsh Government policy for higher activity waste. This NFLA briefing provides member authorities with additional information relevant to how the Welsh Government responded to the views made by NFLA.

The Welsh Government's preliminary view is that it should adopt a policy on HAW similar to that developed by the UK Government's – deep geological 'disposal' through a Geological Disposal Facility. It also rejects the Scottish Government policy. In the second consultation it is seeking final views on HAW policy before it determines whether to make a final view on its formal policy.

The Welsh Government consultation can be found at <http://wales.gov.uk/consultations/environmentandcountryside/disposal-higher-activity-radioactive-waste/?lang=en>

Responses need to be emailed to RPPmailbox@wales.gsi.gov.uk by the 22nd January 2014.

2. Welsh Government request to CoRWM over parts of the NFLA submission

In reviewing the responses it received to the call for evidence, prior to a second consultation to formalise its policy, Welsh Government made three comments on the NFLA response. Before

reiterating NFLA responses to the questions in the second consultation, it is important to directly respond to these comments with further detail.

In its request to CoRWM the Welsh Government made the following points about the NFLA submission to the Request for Evidence:

Welsh Government Point 1:

(1) Geological disposal is unsafe ("failure" at Yucca Mountain and the recent accidents at WIPP (Waste Isolation Pilot Plant in Carlsbad, New Mexico) are referred to as examples) and cannot protect future generations. NFLA refers to production of CO₂ and methane within the waste mass leading to the escape of radioactivity. Other comments include the vulnerability of geological disposal facilities to earth movements. If possible a comment on the nature of the WIPP accident would be useful please (e.g. was it a failure of geological disposal or an operational matter)?

The point NFLA emphasises about proposals to bury nuclear waste in a deep repository is around the uncertainties involved in making a safety case. Any safety case will rely on computer models of extremely complex, geological, chemical, biological and physical environments. The aim is to be able to show that radionuclides will only leak from a disposal site at a sufficiently slow rate to limit the doses to members of the public living nearby to an acceptably low level. But any slight miscalculation or misunderstanding about how thousands of difference factors are interacting could mean that the rate of leakage turns out to be much faster than expected. If the waste has been irretrievably buried, the problem of radionuclides leaking at a faster rate than expected could not be rectified.

CoRWM 1 itself pointed to *"the uncertainties surrounding the implementation of geological disposal"* and, therefore the need for *"a continued commitment to the safe and secure management of wastes that is robust against the risk of delay or failure in the repository programme."*

NFLA mentioned WIPP, Yucca Mountain, CO₂ and methane simply as examples of a large number of factors which need to be resolved. In September 2010, Greenpeace International published an extensive literature search on the science of deep geological disposal. The report – *Rock Solid* (1) – provided an overview of the status of research and scientific evidence regarding the long-term underground disposal of highly radioactive wastes. It identified a number of phenomena that could compromise the containment barriers potentially leading to significant releases of radioactivity.

A similar exercise was carried out by the UK group Nuclear Waste Advisory Associates (NWAA) which published an Issues Register (March 2010) listing 100 issues which need resolution before any kind of safety case can be made for deep geological disposal. (2)

The issues raised by *Rock Solid* and the NWAA Issues Register have been included in the UK Nuclear Decommissioning Authority's Issues Register. (3) Each area has a response from RWM. This has now been developed by RWM into a detailed Issues Register website (<http://www.nda.gov.uk/rwm/issues/introduction/>). The issues can be searched according to, for instance, the issue raiser. (4)

What is worrying to the NFLA about this process is that the nuclear industry appears to believe that any uncertainties associated with the science of deep disposal can be reduced sufficiently by carrying out further research. This is poor scientific method. It cannot be assumed that further research will produce the desired outcome. As is pointed out by the Environment Agency of England and Wales:

"Further research has the potential to increase uncertainties, e.g. by revealing unforeseen complexities or additional processes influencing the system under study. While a well defined and executed research programme can answer fundamental questions, uncertainty is a normal characteristic of science, and as such, additional questions (and uncertainties) are often raised." (5)

NFLA recommends that the Welsh Government reserves its position on deep geological disposal until there is a recognition that the scientific research being carried out to demonstrate a safety case may, in fact, show that producing a robust safety case may not be possible.

Leakage incident at the WIPP underground facility in New Mexico

NFLA notes that CoRWM was unable to provide the Welsh Government with a fully informed diagnosis of the reasons for the leak at WIPP.

Deep Geological Repositories (DGRs) are proposed because of the long-term dangers posed by nuclear waste. It is assumed that a well-understood geological repository site can contain the radioactive wastes for the thousands of generations that they remain dangerous. In other words it is assumed that repositories are safer than leaving the wastes on or near the surface. However, it is worth noting that actual experience at the three deep geologic repositories that have operated for more than ten years – Asse and Morsleben in Germany and WIPP – have established that safe operations of any DGR are difficult, and apparently more difficult than surface storage. For example, while some transuranic waste containers have exploded or breached during surface storage, no such events have been documented while WIPP has been in operation since 1999.

We note CoRWM's view that "*[t]he proposed GDF at Yucca Mountain failed politically. No formal ruling on the safety case of Yucca Mountain has been made, therefore it cannot be said to have failed on safety grounds.*"

Don Hancock, who is Director of the Nuclear Waste Program at the Southwest Research and Information Centre (SRIC) in Albuquerque, near WIPP argues that WIPP (and Yucca Mountain) "*... were picked for political, not technical, reasons, so it is not surprising that they are inadequate.*" He believes that what is needed is a decades-long program to develop generic technical standards applicable to any site then a comprehensive national effort to identify the "best" sites that might meet the standards, then testing and establishing public "consent" for such sites (including a truck and train transportation system). (6)

US Government decision on nuclear waste storage facility at Yucca Mountain, Nevada

After 25 years in the planning and almost £90 billion wasted, the United States has abandoned its plans for a high level nuclear waste storage facility at Yucca Mountain. NFLA agrees with CoRWM that this was a political decision, but the project was doomed from the start because the site was chosen for political reasons, not sound radioactive waste management reasons. (7) The history of this proposal illustrates the problems caused by relying on engineered barriers rather than geological barriers,

The initial plan was to put the waste into rock in an unsaturated zone where water moves very slowly through the system so there was little danger of any of it contacting the waste, dissolving it and moving it back to the surface environment. But it became clear that water could move very rapidly through the system and waste could get back to the environment in less than a thousand years. Instead of saying 'new information has told us this is not workable' the Department of Energy (DoE) began looking for a metal container to hold the waste, which has high corrosion resistance. Instead of relying on the geology of the system to maintain isolation they were going to use a metal alloy to delay the release. Under different assumptions about the chemistry of the water that contacts the containers they may only last a few hundred to a thousand years rather than hundreds of thousands of years. DoE also came up with the idea of putting drip shields over the containers. So again rather than the geology doing the work an elaborate engineering logic was used to justify the scheme.

Welsh Government Point 2:

(2) *NFLA refers to the recommendations by CoRWM about the suitability of geological disposal as a permanent management option for higher activity radioactive waste and the later endorsement of these recommendations by CoRWM 2 (these are referred to in CoRWM's own*

response. The NFLA comments do not coincide with our interpretation of CoRWM's recommendations and we would be grateful for clarification on this matter please.

It is not clear here which part of the NFLA submission the Welsh Government is referring to. CoRWM says it will write to NFLA, but nothing has been received from them. What NFLA sought to do was to emphasise that CoRWM recognised “*the uncertainties surrounding the implementation of geological disposal*” and that “*its recommendations are directed to existing and committed waste arisings*” and that the “*creation of more waste*” raise quite different “political and ethical issues”.

In its submission to DECC in June 2013 in response to a call for evidence, Nuclear Waste Advisory Associates (NWAA), which includes two former CoRWM 1 members, reviewed lessons learned from the first attempt to implement the Managing Radioactive Waste Safely Programme. NWAA said that:

“The government ignored the requirement, implicit in the ‘current state of knowledge’ term, to recognise and convey publicly that disposal was and remains far from a proven technology.” (8)

Welsh Government Point 3:

(3) *Reference is made to the use of the “best” geology rather than “acceptable” geology and doubt is cast on the use of engineering to present a viable safety case. We would be grateful for CoRWM’s comments on this please.*

NFLA’s earlier submission referred to the lack of discussion and agreement about whether the key factor was to look for the best type of geology to contain radioactive waste, or whether the geology just needs to be adequate with more reliance placed on engineered barriers. This statement was in reference to examining why the last MRWS process (focussed on west Cumbria) failed. Whilst CoRWM may have repeatedly emphasised that geology is just one element contributing to the safety case, for the public it is also a matter of trust. CoRWM itself might want to examine why that former leader of Cumbria County Council remained “*unconvinced ... that engineered solutions can be tailored to fit the geology*” despite its reassurances. (9)

In this context NFLA welcomes the recognition by former CoRWM member Professor Andrew Blowers that the latest Government White Paper has moved some way towards the demands to give geology priority over voluntarism in the first instance. (10)

3. References to these additional points

- (1) Rock Solid? A scientific review of geological disposal of high-level radioactive waste <http://www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2010/9/rock-solid-a-scientific-review.pdf>
- (2) Nuclear Waste Advisory Associates Issues Register, March 2010. <http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2011/06/NWAA-ISSUES-REGISTER-COMMENTARY.pdf>
- (3) See Appendix B Geological Disposal: RWMD (now Radioactive Waste Management Ltd (RWM)) Approach to Issues Management, March 2012 <http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2013/02/Geological-Disposal-RWMD-approach-to-issues-management-March-2012.pdf>
- (4) See NDA 12th November 2014 <http://www.nda.gov.uk/2014/11/update-to-rwms-issues-register/>
- (5) Response to Nuclear Decommissioning Authority consultation radioactive waste management directorate proposed research and development strategy, Environment Agency, November 2008, page 6 http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/static/documents/Research/1976_RWMD_Proposed_RD_strategy.pdf
- (6) Truth Out 24th March 2014 <http://www.truth-out.org/news/item/22599-radiation-leak-at-new-mexico-nuclear-waste-storage-site-highlights-problems>
- (7) Engineering & Technology Magazine 19th April 2010 <http://eandt.theiet.org/magazine/2010/06/yucca-frishman-interview.cfm>
- (8) Nuclear Waste Advisory Associates, Managing Radioactive Waste Safely: a review of the lessons learned from the first attempt at implementation and recommendations for a more

successful second attempt, June 2013 http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2013/06/optimum_mrws_programme_FINAL_5_June_2013.doc

- (9) A letter to the members of CoRWM (Committee on Radioactive Waste Management) from CT chairman Eddie Martin. Cumbria Trust 10th May 2014.
<http://cumbriatrust.wordpress.com/2014/05/11/a-letter-to-the-members-of-corwmcommittee-on-radioactive-waste-management-ct-chairman-eddie-martin/>
- (10) Town & Country Planning 21st December 2014
http://www.tcpa.org.uk/data/files/Journal_Blurb_Sample_Articles/December_2014_Sample.pdf

4. NFLA response to the questions in the consultation

Question 1: The Welsh Government is reviewing its current position on the disposal of higher activity waste and spent fuel declared as waste. In carrying out this review the Welsh Government has three options:

- **Should it seek to adopt a policy for disposal for HAW and spent fuel?**
- **Should it retain its existing neutral position of neither supporting nor rejecting a disposal option?**
- **Should it adopt a policy opposing a disposal option for potentially spent fuel?**

NFLA believes that nuclear waste management policy should always be governed by a clear set of environmental principles. The box below shows the principles agreed at the NFLA AGM in 2004.

Environmental Principles

The NFLA Steering Committee agreed a set of clear environmental principles which should be used for the management of nuclear waste in October 2004 at its Annual General Meeting in Hull. These are:

- **The idea that radioactive waste can be "disposed" or be rejected in favour of radioactive waste management;**
- **Any process or activity that involves new or additional radioactive discharges into the environment be opposed, as this is potentially harmful to the human and natural environment;**
- **The policy of 'dilute and disperse' as a form of radioactive waste management (i.e. discharges into the sea or atmosphere) be rejected in favour of a policy of 'concentrate and contain' (i.e. store safely on-site);**
- **The principle of waste minimisation be supported;**
- **The unnecessary transport of radioactive and other hazardous wastes be opposed;**
- **Wastes should ideally be managed on-site where produced (or as near as possible to the site) in a facility that allows monitoring and retrieval of the wastes.**

'Disposal' implies getting rid of something, but placing waste in a Deep Geological Facility is simply moving the waste from the surface environment to an underground environment. It does not 'get rid of' the waste. Key to the philosophy of deep geological disposal is that it removes a burden from future generations. But this would only be the case if radionuclides do not leak at a faster rate than expected. It may, in fact, create a significant burden for future generations if radionuclides leak faster than expected.

There are two main reasons NFLA opposes deep disposal. Firstly, making a safety case for deep disposal relies on computer models which purport to show that radionuclides will only leak from a disposal site at a sufficiently slow rate to limit the doses to members of the public living nearby to an acceptably low level. These predictions are far too uncertain. The rate of leakage may turn out to be much faster than expected. If the waste has been irretrievably buried, the problem of radionuclides leaking at a faster rate than expected could not be rectified. This means a Geological Disposal Facility (GDF) could create a leaking nuclear waste dump, representing a significant but unquantifiable burden for future generations rather than removing a burden from them through 'disposal', as was argued by CoRWM in arriving at its disposal recommendation. It would be far better to leave them the option of managing the waste in the way they see fit.

Secondly, even if the predictions turn out to be correct, there is no 'safe' dose of radiation, and there are huge uncertainties involved in deciding what dose members of the public actually receive and what the health impact of those doses might be. The methodology used in deciding the dose of an individual is quite complicated, and is derived using computer models. The cumulative uncertainty in dose estimates could be large as recognised by the Committee Examining Radiation Risks of Internal Emitters (CERRIE) in 2004. (1) In other words, even if the deep disposal models are correct, future generations would be committed to a radioactive burden which they might decide is unacceptable, but there would be very little they could do about it if deep disposal goes ahead.

NFLA agrees that the Welsh Government should review its policy. Although the Welsh Government has reserved its position on geological disposal, it has been playing a full part in the MRWS process. This process has clearly failed.

The Welsh Government should examine thoroughly why the MRWS process failed.

The UK Government's recent consultation following this failure focussed solely on finding a site for a geological repository rather than looking at why the process had failed. (2)

In the NFLA view one of the main reasons why the process has failed is because the Government has ignored most of the first CoRWM's original recommendations.

Geological disposal purports to involve immobilising radioactive waste within multiple, engineered barriers, and then isolating it deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity ever reach the surface environment. But radioactive chemicals can migrate from a repository by dissolving in underground water or by being carried to the surface through rock fractures as a gas. This involves complex chemical and geological processes.

The government and its agencies have so far failed to demonstrate an ability to gather enough accurate information to enable a sufficiently rigorous calculation of the extent to which radioactive chemicals will escape from a GDF – and hence they are unable to provide a robust safety evaluation and give adequate assurances on health impacts and environmental contamination that a GDF may pose to affected communities.

It is impossible to demonstrate with any scientific credibility that radiation doses to people from a nuclear waste repository would be at an acceptably low level into the far distant future, if there is such uncertainty on how nuclear waste will behave underground. For instance, methane and carbon dioxide will be produced in bulk in a GDF and the extent to which these gases are radioactive will depend on how much radioactive carbon is in the waste. Originally it was thought that these gases would combine with cement placed around waste drums, but now it is thought that this won't happen with methane. This serves to illustrate the huge uncertainties involved in estimating the behaviour of radioactive chemicals underground.

The Radioactive Waste Management Directorate (RWMD) has listed 900 outstanding scientific and technical issues which need to be resolved. However, because 400 of these were internally raised and work on resolving them is already in-hand they were removed, leaving 500 issues listed in a March 2012 RWMD report. (3) The process of resolving the 900 issues needs to be much more open and transparent.

CoRWM was aware of the uncertainties surrounding the implementation of geological disposal. It expressed the view that there needs to be a focus on the safe and secure management of wastes in robust interim stores, not just for the period awaiting the opening of a Geological Disposal Facility (GDF), but also because of a risk of delay or failure in the repository programme. The possibility that storage might be required for the long term or even indefinitely needs to be considered.

CoRWM was clear that deep 'disposal' of radioactive waste is far from a proven technology. It recommended an intensified programme of research and development into the long-term safety of geological disposal, but also a robust programme of interim storage.

CoRWM also said it **did not** want its recommendations to be seen as a green light for new nuclear reactors.

“New build wastes would extend the timescales for implementation possibly for very long but essentially unknowable, future periods. Further, the political and ethical issues raised by the creation of more wastes are quite different from those relating to committed – and therefore unavoidable – wastes. Should a new build programme be introduced, in CoRWM’s view it would require a quite separate process to test and validate proposals for the management of wastes arising” (4)

It is also worth remembering that spent fuel from new reactors may require storage for up to 100 years after the end of generation, to enable an adequate cooling period before it can be emplaced in a GDF. This means, for example, that interim storage may be required on Anglesey for up to 160 years if new reactors are built at Wylfa. (5)

The NFLA believes the UK and Welsh Governments should instead be consulting on strategies for interim storage and the implications new nuclear reactors will have for long term storage, including the need to find appropriate and secure locations for spent fuel stores into the far future. The first step in any new process must be to develop a comprehensive programme of research and development into examining the uncertainties of disposal, research into the concept of retrievability and improving robust interim storage. Technical and scientific uncertainties as well as ethical issues should be examined in a process which is accessible and open to scrutiny.

Optimum or adequate geology?

Another reason why the process failed was because of a lack of discussion and agreement about whether the key factor was to look for the best type of geology to contain radioactive waste, or whether the geology just needs to be adequate with more reliance placed on engineered barriers.

The leader of Cumbria County Council at the time of the decision to withdraw from the process was Councillor Eddie Martin. He said:

“The key question for us ... is whether or not Cumbria is the optimum location.” (6)

Clearly the County Council’s view was that Cumbria is not the optimum location.

The Government’s view is that *“there is no ‘best’ or ‘most suitable’ generic type of geology”* and that *“engineered elements can be tailored”* to meet the requirements of different geologies. It was clear in the West Cumbria Managing Radioactive Waste Safely Partnership Report that the Nuclear Decommission Authority’s (NDA) Radioactive Waste Management Directorate (RWMD) (now Radioactive Waste Management Ltd) is only looking for a site which is *“sufficiently good”*. RWMD’s view was that *“although characterising and demonstrating safety is more challenging for a comparatively complex site [as sites in West Cumbria would be geologically speaking] than for a simpler site this does not prevent complex sites from being considered”*. (7)

A recent letter from the former leader of Cumbria County Council, Eddie Martin, in his role as Chair of the newly formed local group Cumbria Trust, to CoRWM members discusses the importance of the geological barrier and the current emphasis there appears to be from RWM Ltd on engineered barriers. Eddie Martin concludes that:

“With so much scientific uncertainty and, indeed, scientific conflict of opinion there are clearly multiple assurances yet to be made and many caveats yet to be heeded before the public can be entirely confident that a GDF, anywhere in the UK, is the optimum solution to the permanent disposal of HLW ... We remain unconvinced, therefore, that engineered solutions can be tailored to fit the geology.” (8)

The Cumbria Trust, like the NFLA, has consistently argued for a national geological survey to identify the most geologically suitable potential sites for radioactive waste disposal in England (and Wales) as, indeed, did the vast majority of responders to DECC’s recent consultation exercise.

In the NFLA's view the Welsh Government should withdraw its support from the current MRWS process until it is made clear that the objective is to look for the best available geology for the job rather than making use of mediocre geology and relying more heavily on engineered barriers.

Question 2: Should the Welsh Government adopt a policy for geological disposal for the long term management of higher activity radioactive waste and spent fuel declared as waste?

It is clear from CoRWM's 2006 report that geological disposal is viewed by CoRWM as the "least worst" option. Its **second recommendation which is often overlooked** is that:

"...uncertainties surrounding the implementation of geological disposal, including social and ethical concerns, lead CoRWM to recommend a continued commitment to the safe and secure management of wastes that is robust against the risk of delay or failure in the repository programme".

The idea that geological disposal is the best available policy, but is still a far from ideal solution to the problem, is the reason why CoRWM said the creation of more wastes raises new ethical issues.

Whilst it may not be necessary to look again at most of CoRWM's long list of options, it is for this reason that NFLA would urge the Welsh Government to look in detail at the development of the well considered policy to managed Higher Activity Waste in Scotland. It emphasises that other solutions are available.

Scottish Government Higher Activity Waste Implementation strategy

In January 2011 the Scottish Government published its Higher Activity Radioactive Waste Policy. (9) This states that the long-term management of higher activity radioactive waste should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved. All long-term waste management options will be subject to robust regulatory requirements.

The Scottish Government has been developing a Strategy to implement the policy. To achieve this it convened a Project Management Board which included members from a wide range of stakeholders including the Scottish Councils Committee on Radioactive Substances (SCCORS) and NFLA.

It is expected that the Scottish Government will publish a consultation document on its proposed implementation strategy during the summer.

How Wales compares with Scotland

Scotland has two Magnox nuclear power stations at Hunterston and Chapelcross and two AGR stations, at Hunterston and Torness, as well as a nuclear research site at Dounreay. Scottish policy also covers some waste at the Rosyth Royal Dockyard, but not the HAW which is expected to arise from dismantling submarines at the base, which is being dealt with in a different policy process led by the Ministry of Defence.

Similarly, Wales is the site of two Magnox stations, but there are no AGR stations or nuclear research sites located in the country.

In Scotland the total reported volume of radioactive waste at 1 April 2013 and in estimated future arisings is 264,000m³. Most waste is from Dounreay and the Magnox power station sites at Chapelcross and Hunterston. In summary:

Scotland	Volume at 1 st April 2013 plus estimated future arisings.	Packaged Volume
HLW	Nil	Nil
ILW	25,600m ³	41,200m ³

LLW & VLLW	237,000m ³	LLW 271,000m ³
		VLLW 1040m ³

In Wales the total reported volume of radioactive waste at 1 April 2013 and in estimated future arisings is 131,000m³. In Wales nearly all waste is from the Magnox power station sites at Trawsfynydd and Wylfa. There is a small amount of ILW generated at the Cardiff GE Healthcare plant. In summary:

Wales	Volume at 1 st April 2013 plus estimated future arisings.	Packaged Volume
HLW	Nil	Nil
ILW	14,200m ³	22,300m ³
LLW & VLLW	117,000m ³	LLW 133,000m ³
		VLLW 40m ³

So the HAW arisings in Wales (22,300m³), once packaged, will be around half the volume of the HAW arisings in Scotland (41,200m³). (10)

A significant portion of HAW waste in Scotland will not arise for many years because under current planning assumptions Magnox reactors will be left in place for several decades to allow radioactivity to decay before they are dismantled. The most significant HAW produced at Scottish sites will be irradiated graphite and this will not arise until after 2080. Graphite accounts for 45% of Scotland's HAW.

In Wales Trawsfynydd will be only the second UK site to enter the care and maintenance phase, in 2016. Final Site Clearance is expected at Trawsfynydd in 2073. (11) Final Site Clearance at Wylfa isn't expected until 2091. (12) Unlike Scotland, Wales has no raffinate or plutonium contaminated waste, so an even higher proportion of HAW arising will be accounted for by irradiated graphite which will not arise until 2070-2090.

By the time the care and maintenance phase begins at Trawsfynydd (2016) and Wylfa (2025) all the early arisings of HAW will have been placed in interim storage.

A recent NDA options paper pointed out that dissolution of Fuel Element Debris (FED) is not considered to be an appropriate treatment for FED at Trawsfynydd, due to progress already made in the construction of interim waste storage facilities. (13)

FED is not generated at Wylfa because desplitting of spent fuel elements is not undertaken at the site.

Question 3: If the Welsh Government does not adopt a geological disposal policy should it adopt an alternative disposal for higher activity waste and spent fuel declared as waste? If so what policy should it adopt?

NFLA recommends that the Welsh Government looks in detail at Scottish Government policy on HAW. (14)

The Scottish Government Policy is that the long-term management of higher activity radioactive waste should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved.

Although the term "near-surface disposal facilities" is used, the word 'disposal' is used simply to indicate that waste is being placed in a facility without the intention to retrieve it. But this does not mean the waste cannot be retrieved if that proves necessary – it just means there is no present intention to retrieve it. (paragraph 2.04.26) The Chair of CoRWM pointed out at a recent meeting in Workington, Cumbria, that the term "disposal" is used in Scotland as a legal term to mean the transfer of waste.

“...*Scottish Government Policy at the present time is that long-term **storage is still the primary long-term management option***” (paragraph 2.04.03) (emphasis added by NFLA). (15)

5. Summary of NFLA arguments on the review of Welsh Government HAW policy

In this model response, NFLA has made five specific arguments on the review of Welsh Government HAW policy:

- HAW arisings in Wales, once packaged, will be around half the volume of the HAW arisings in Scotland. A significant proportion of this waste will not arise until Final Site Clearance at the two Welsh reactor sites in 2073 and 2091 in any case. By the time the care and maintenance phase begins at Trawsfynydd in 2016 and Wylfa in 2025 all the early arisings of HAW will have been placed in interim storage, so there is no need to rush decisions and, for instance, start emplacing waste in a deep geological repository with inadequate geological barriers.
- The Welsh Assembly Government should investigate why the MRWS process has failed. NFLA believes the process has failed partly because it has ignored most of the recommendations of CoRWM in particular that there should be an intensified programme of research and development into the long-term safety of geological disposal, as well as research on a robust programme of interim storage. There are currently too many uncertainties about how packaged nuclear waste will behave underground.
- The MRWS process also failed because it did not start with a debate about whether we should be looking for the most suitable geology for radioactive waste disposal. Experience from Cumbria suggests that the public wants to see the best geological barriers AND engineered barriers, not simply adequate or poor geology with a greater reliance on engineered barriers. At the very least the Welsh Assembly Government should withdraw from the MRWS process until it is made clear that the objective is to look for the best available geology for the job rather than making use of mediocre geology and relying more heavily on engineered barriers.
- The Welsh Assembly Government should implement CoRWM's recommendation that a quite separate discussion should be held on the political and ethical issues raised by creating new wastes by building new reactors. In any case spent fuel from the new reactors proposed for Wylfa will need to be stored for up to 100 years before it can be emplaced in a geological disposal facility.
- **NFLA recommends that the Welsh Government adopts the Scottish Government policy on HAW:**

“...that the long-term management of higher activity radioactive waste should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved.”

6. References to points made in responding to the Welsh Government's questions

- (1) CERRIE (2004) Report of the Committee Examining the Radiation Risks of Internal Emitters. <http://www.cerrie.org/>
- (2) Consultation: Review of the Siting Process for a Geological Disposal Facility, DECC September 2013
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239237/Consultation_Review_of_the_siting_process_for_a_GDF_FINAL.pdf
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