

BRIEFING UPDATE

P & EP Committee 13 October 2009

ITEM NO	APPLICATION NO	SITE/DESCRIPTION
1.	09/00002	CONSULTATION FROM ADJACENT AUTHORITY – LANDFILL DISPOSAL OF LOW LEVEL RADIOACTIVE WASTE IN PHASES 4, 5A AND 5B OF THE PERMITTED HAZARDOUS WASTE LANDFILL SITE AT EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, STAMFORD ROAD, KINGS CLIFFE

Update Sheet for LLW Disposal at East Northants Resource Centre

The 10 parish councils in the East Northamptonshire/Peterborough area are intending to make a composite response to Northamptonshire County council after a meeting with the operator on 15th October. Therefore, no views to report.

No representations received from the PCT

No representations received from the EHO

A local resident expressed concerns, prior to the formal submission of the application, about the future impacts of the disposal of LLW by landfill. He has asked Cllr Fox to represent his views which can be summarised as follows:

- Why has a waste tip been chosen for nuclear waste in East Northamptonshire when the nuclear power stations to be demolished are in Cumbria, Anglesey, Somerset, Kent, Suffolk and Wearside? Why is the tipping not taking place locally to these?
- The tip is in the watershed between the River Nene and River Welland and Rutland Water is supplied by two pump stations nearby.
- Containment security cannot be guaranteed.
- How will materials be transported? Will they pass through Peterborough?
- The tip should be located closer to nuclear power stations demolition sites where it will not present a hazard to population and its water supply.

At a recent meeting of the Thornhaugh 1 Quarry Liaison Group the application for LLW waste disposal was discussed. There were a number of questions raised by residents of Home Farm including whether radon testing had taken place, how much waste would be imported and where it would be sourced from.

3 letters received on behalf of members of the **ProForma** group. These raise a number of issues:

- Lack of consultation in the Peterborough area
- Pre-existing danger – Kings Cliffe is a high radon area and residents should not be exposed to additional risks
- Radioactivity may leach into the surrounding soil and groundwater – Kings Cliffe stands on a major aquifer from which the local population gets its drinking water
- Flora and fauna at risk of radiation as well as humans
- Proximity to RAG Wittering – an attack on the airbase could have dangerous consequences for the landfill
- A private company cannot be entrusted to manage the waste safely and monitoring arrangements are not robust and lack independence
- Storage of nuclear waste is a long term project and nuclear waste is currently stored near to facilities. The use of this site breaks with this policy, increases the risk to people nearby and on haul routes
- The 60 year period of radioactivity is highly questionable
- Lack of experience and knowledge in local authorities to make a decision on this
- Inadequate regulatory capacity locally
- Waste should be disposed of as near as possible to its source – long distances increase risk
- Unimpressive site safety record

- Unacceptable risk to air quality and to health and safety of those working at the site and living in the vicinity
- Impacts on noise climate to an unacceptable degree

Letter received from '**Waste Watchers**' making the following points:

- a. The Nuclear Decommissioning Authority has not yet finished its consultation on the disposal of Low Level Waste.
- b. The proposal is not part of an overall, strategic plan, decided by Government, of the optimum locations for LLW disposal. Augean simply have available space.
- c. Augean have failed to supply evidence to show that low dose levels are not harmful to health. They have ignored the established belief that *all* radiation is potentially harmful.
- d. The risk assessment works from the assumption that dose levels are safe, and that therefore lack of risk can be proved simply by calculating dose levels.
- e. The methodology used to calculate risk is untested, and its application has been prejudiced by insufficient inputted data fields.
- f. Neither its location, nor the construction of the site, indicate its suitability.
- g. Augean's use the principle of optimisation to justify not taking extra measures to ensure the protection of public health.
- h. Augean reject established principles and procedures, such as Proximity, Article 37, and classifying the site as a nuclear installation.
- i. Augean have not drawn attention to any security measures at the site, nor indicated the need for such security.
- j. The monitoring, especially where it relates to the health of the local population, is inadequate, and fails to give confidence to the community.
- k. The extent of the consultation exercise has been woefully inadequate and has not met standards required by Government policy.
- l. Augean's safety record is poor, and becoming worse. Its financial instability is a threat to its ability to fulfil its obligations under the authorisation. Its expertise lies in the disposal of hazardous, not radioactive, waste.
- m. Around 250,000 people live within 12 miles of the dump. This has not been considered.
- n. The transport of radioactive materials in bulk bags for long distances along public roads, and through populated areas, cannot be considered safe.
- o. The length of the aftercare period has been significantly underestimated.
- p. Augean refer to a national need to get rid of the waste. Wastewatchers argue that there is a national need to get rid of it *safely*.
- q. Nuclear sites - Dounreay, Harwell, and Hinckley Point - are intending to build their own LLW facilities. This suggests that there is no immediate need for King's Cliffe.
- r. This region produces no nuclear waste of its own; it will simply be the dumping ground for other people's.
- s. There is doubt over the exact siting of the waste.

Conclusion

t. The decision to object, or not to object, to this proposal will have far-reaching consequences. Whatever Peterborough CC decides will send a signal to NCC when they come to deliberate the issue.

- u. A decision not to object will create an irreversible situation. Once the radioactive waste is buried, Peterborough will have to live with the consequences for at least hundreds, and possibly thousands of years.
- v. A decision not to object will lead inexorably to other landfill operators bidding for future nuclear waste disposal permissions.

(Additionally there is their consultee response to the Environment Agency concerning the request for authorisation by Auegan PLC to deposit LLW at Kings Cliffe and a copy of the Summary arguments attached)

Duddington Parish Council - opposed the application. The waste should be disposed of closer to the nuclear site which is already contaminated, as this also would save the risk of it being transported past schools etc causing risk to millions of people, such a distance is a problem on its own.

Peterborough Friends of the Earth – comments to NCC objecting to proposal:

1) The proposals are unsafe - The application is for the disposal and burial of 249,999 tonnes of radioactive waste LLW (low level radioactive waste) mainly from the nuclear industry up to 2013 in the hazardous waste landfill site at the East Northants Resource Management Facility. PFoE believe that "Low-Level Radioactive Waste" is one of the most misleading terms ever created and that it needs to be correctly understood. It can include entire nuclear power plants if and when they are dismantled. This includes, for example, from a typical 1,000 megawatt nuclear reactor building floor: over 13,000 tons of contaminated concrete and over 1,400 tons of contaminated reinforcing steel bar. The nuclear industry and government commonly describe "low-level" waste in terms of volume although there can be a tremendous concentration of radioactivity in a small package and a small concentration in a big package. All of this material is legally considered low-level.

Reactor waste remains hazardous for a very long time. Among the radioactive elements commonly found in nuclear reactor "low-level" waste are: Tritium, with a half-life of 12 years and a hazardous life of 120-240 years; Iodine-131, half-life of 8 days, hazardous life of 80-160 days; Strontium-90, half life of 28 years, hazardous life of 280-560 years; Nickel-59, half life of 76,000 years, hazardous life of 760,000-1,520,000 years, and Iodine-129, half-life of sixteen million years, hazardous life of 160-320 million years. Note: the Half-Life is the time it takes for HALF of the radioactive element to decay (give off half of its radioactivity).

PFoE draws attention to the fact that the radioactive wastes will include alpha, beta and gamma emitters. Whilst beta and gamma emitters naturally occur they can still be relatively dangerous. Each day we all experience long wavelength gamma rays, emitted by our sun, passing through our bodies and a very small proportion will result in cancers. However, the alpha emitters are mainly man-made and found in much of the nuclear power station waste. These are short wavelength materials which can be safely contained in a plastic bag. But if a particle of alpha radioactive materials comes into contact with skin tissue the results can be devastating. Thus they must on no account be inhaled or ingested.

The supposition that LLW is safe is highly questionable. Until recently it was deemed that all nuclear waste is harmful and that it must be shut away. The applicant has failed to supply evidence that LLW is safe. Also the methodology used to calculate risk is untested. Most experts agree that there is no safe level of radiation!

There are no proven safe and appropriate disposal routes for radioactive wastes. The best we can do is seek to manage and store them carefully (See item 3).

2) Radioactivity will leach into local aquifers - The planning application admits that radioactivity may leach into the surrounding soil and the groundwater. But it is generally acknowledged that all LLW should be 'contained' to prevent leaching. (Ref: Research Papers of the Parliamentary Library service, no 4/2006) Bearing in mind that the site overlies a major aquifer the repercussions for local water supplies could be quite serious when they become contaminated by radioactive materials. (See previous item re alpha emitter radiation). It is surprising that permission to bury radioactive waste at Harwell was recently refused because the site overlaid a major aquifer.

3) The plans do not accord with the proximity principle - The applicant rejects the need to bury waste as close as possible to its source. As there are no nuclear power stations in this area, it is self-evident that radioactive waste from decommissioned power stations will need to be transported considerable distances to reach King's Cliffe. This policy goes against the principle enshrined in various local planning policies that waste should be disposed of as close as possible to its source. This principle is even more important in the case of radioactive waste than it is for other forms of waste given the risks

involved in its transportation and disposal.

"Friends of the Earth believe that radioactive waste should be stored securely above ground, close to or at the site at which it was created, where it can be constantly monitored and easily retrieved.]"

4) Site will not be monitored by the nuclear industry - The waste will be outside the control of the nuclear industry, in the hands of private operators who may have no experience of managing such materials and not subject to the controls of the Nuclear Installations Inspectorate who monitor the safety of sites which handle nuclear material. The applicant appears to ignore Article 37 of the EU Council Directive which would classify the site as a nuclear installation.

5) Site is not suitable for purpose - The proposal fails to show that the site is the most suitable for purpose, either by BPEO (Best Practical Environmental Option) or BPM (Best Practical Means).

6) Poor safety record of applicant - Augean's safety record at the Kings Cliffe site has been very poor and becoming poorer. Last year the number of both minor and major accidents at the site rose significantly.

7) RAF Wittering is too close and could pose a danger - The site is far too close to this important air base. Any attack on the air base could impact on the landfill site with disastrous consequences. If a military aircraft were to crash into the site the results would be similarly disastrous.

Peterborough Friends of the Earth believe this application must be rejected

**Consultee response
to the Environment Agency
concerning the request for authorisation by Augean PLC to
deposit Low Level Radioactive waste in the King's Cliffe
landfill site**

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1. Preamble

1.1 After carefully reading the application, Wastewatchers have come to the conclusion that it would be inadvisable for the Environment Agency to grant an authorisation to Augean Plc for depositing Low Level Radioactive Waste in the King's Cliffe landfill site.

1.2 Wastewatchers are mindful of the national significance of this application: that this is the first occasion in which the Environment Agency has been called upon to grant a licence for such levels of radioactive waste (up to 200Bqs of Low Level waste), and the first occasion it has been asked to license nuclear waste in a landfill outside the direct control of the nuclear industry.

1.3 As such, this application will inevitably be seen as a test case, and the result will establish a precedent that will have an effect on the future disposal of such waste. Given the nature of such waste, and the assumed irreversibility of the process if a decision to grant a licence should be made, Wastewatchers believe it to be essential that the application be watertight both in terms of guaranteeing public safety, and, perhaps even more importantly, gaining public re-assurance and confidence.

1.4 Wastewatchers would like to make clear that it is a group of concerned locals, and not an anti-nuclear organisation, nor one with any defined political agenda. WW recognise that nuclear waste has to be disposed of; we are aware of the need to make a decision on the disposal of such waste sooner rather than later; we are aware of the policy and discussion documents on the topic that have been drawn up since 2007; and we are aware of the various options currently under discussion by the NDA.

1.5 More importantly, we accept that the waste has to go somewhere. However, we see it as our duty to our community to ensure that if the waste has to go to King's Cliffe, that it is done for the right reasons, after proper and transparent deliberation and a sustained period of public debate, after thorough consideration of all the available options, and after detailed analysis of the safety implications in a way that puts the health, well-being and human rights of those within the affected area foremost.

1.6 Wastewatchers believe that the application by Augean falls short of these desired aims.

1.7 Wastewatchers recognise that although the Environment Agency must focus on the details of this particular site, there is a broader issue, and a political dimension that means that its decision will have an affect on national policy. Augean seem to recognise this in their references to national needs, and therefore Wastewatchers will also look at the broader significance of the application.

2. Concerns over the process surrounding this application

2.1. Wastewatchers recognise that their primary function as consultees is to comment on the specific details of this application. However, given the significance of this particular application (as stated in the Preamble), WW feel they must draw attention to certain perceived flaws in the process which, if not addressed will lead to Government policy not being upheld, with a consequent risk to public safety and confidence. These flaws may also lay the process open to legal challenge which will disrupt the execution of the licence.

2.2. The disposal of nuclear waste is a matter of international, national, regional and local concern. It is a part of the energy debate and is of great public interest and concern. Decisions over this topic are the responsibility of national government, with due consideration of international obligations. In theory, the process is conceived and controlled from the top but, as this application reveals, in practice the impetus comes from the bottom.

2.3. Policies have been drawn up by Government departments and advisory bodies (DEFRA, HPA, EA, NDA), particularly since 2007. A consultation by the NDA is still in progress. Groundwork has been laid for the smooth implementation of policy, and suggestions have been made to try to ensure its safe, cost-effective, and publicly-acceptable implementation. The process so far can be seen as 'top down'.

2.4. However, this application reveals that in practice, the process is impelled by a 'bottom up' dynamic. The King's Cliffe site has not been chosen because Government has conducted a detailed examination

of best possible sites, and decided on this one, but because Augean, which owns the site, wants to increase its profits by bringing in this lucrative material. Thus national policy is, at a stroke, subject to the whims of private contractors, wherever they may be in the country.

2.5. This problem becomes more acute when local organisation is considered. Neither the East Midlands Regional Assembly, nor Northamptonshire County Council, have any provision for accepting nuclear waste in their strategic waste plans. If, as seems possible, the Secretary of State, rules in favour of this site, then it will effectively be Augean that has impelled the change to local and regional policy, and also influenced the decision of the Secretary of State over the best site for such waste.

2.6. This situation may well be normal in other planning matters, but the material being considered, in terms of its longevity and impact on public health and confidence, is such that greater Government control, with a view to the strategic, national picture of how and where this waste is to be disposed of, would be more appropriate. It might also be more publicly acceptable if the process were to go through the established democratic pathways i.e. regional assemblies, county councils, etc. rather than being seen to be imposed from above at the behest of a private company.

2.7. In terms of this application, practical consequences of this 'bottom up' dynamic can be seen in Augean not being obliged to produce any evidence of a BPEO to justify King's Cliffe as the optimum choice; not having to apply for an Article 37 licence from Euratom; and not needing to look at other options for site construction to assess BAT. In these aspects, which will be dealt with later, Augean seems able to evade its responsibilities, whereas if the direction came from Government, or Regional Assemblies, it is more likely that these assessments would be properly carried out.

2.8. There seems to be an element of haste about this process which is not conducive to a long-term, sustainable solution to the issue of nuclear waste. This can be seen in the by-passing of regional and local planning policies, and also in the apparent dismissal of the NDA's consultation phase which is not due to be reported upon until the start of 2010. A decision by the EA to grant a licence to Augean before this date not only invalidates the consultation process – and one of the key elements in policy documents is the need for full and effective stakeholder consultation – but it also pre-empts the NDA's conclusions by prematurely embarking on one of the options. This will then set a precedent which could invalidate any opposing conclusion by the NDA.

2.9. In the worst case, if the application were granted and dumping at King's Cliffe began, this could mean that the NDA might subsequently recommend a new national LLWR, or the retention of such waste on existing nuclear sites, which would mean that the area around King's Cliffe would have to endure sixty years plus of radioactive emissions needlessly.

2.10. It won't have escaped the notice of the EA, any more than it has done of WW, that an early decision to grant this licence could result in King's Cliffe becoming the new LLWR. Indeed, the tone of the application, and the fact that initially, due to the lack of other 'suitable' sites, waste will be accepted from all over England, suggests that it will effectively be a 'New Drigg'. Hopefully, the EA is aware of these implications of granting an early licence.

2.11. It has also been noticed that while there is some sort of policy (at least a range of options) on the disposal of Low Level Radioactive waste, there seems to be little consensus on Intermediate or High level waste. Some countries, e.g. Sweden, France, Spain bury Low Level and Intermediate Level waste together. It is not beyond the bounds of possibility that this may turn out to be the best option for the UK, too. One principle that is being mooted for the disposal of higher levels is that of 'volunteerism', i.e. communities opting into the process, rather than having it imposed upon them. A national debate on the issue, which there has so far not been, might well decide on this principle applying to Low Level waste as well. This is another reason to wait for some of the NDA's consultation results to be made public before granting a licence.

2.12. In short, although there appears to be a Government policy on the disposal of Low Level nuclear waste, there is no such 'roadmap' on the procedure for carrying it out. Policy has been made, and now it is up for grabs. This is not seen by Wastewatchers as an acceptable way of proceeding and, in the interests of respect for local democracy, public confidence, and a safe and sustainable solution to the problem of nuclear waste, which is legally and practically watertight, WW urge the EA to reject the application for a licence, at least until such time as these issues have been ironed out.

3. Radiation Levels

3.1. WW would like to remind the regulators that current knowledge about the long-term impacts of burying nuclear waste, of whatever level, is imperfect. The application proceeds from the standpoint that radioactive material and its behaviour is sufficiently understood for terms like 'safe' to be used when referring to it. This is not a given. There is a lack of experience, and extraordinarily little research into even the short-term effects, especially those relating to human health. Whether this is more down to the fact that such matters are too new to have a full understanding of, or whether there is a reluctance within the nuclear industry to look too closely (which is what many of the public believe), or whether it is the difficulty of proving the link between illness and proximity to sources of radiation, is debatable. The fact remains, and this is supported by official documents¹, that we do not know enough about the behaviour of radioactive material.

3.2. Augean, in their proposal do not acknowledge this fact. Indeed, their entire assumption is that the effects of disposing of waste can be understood, and controlled. This blinkered thinking can be attributed partly to recent reports by DEFRA², NDA³ and the EA⁴ (though less by the HPA⁵) which encourage such a view. It will have two major, and significant effects: a failure to take the matter of safety seriously by not accepting the possibility of danger; and a belief that public apprehension can be allayed, rather than increased, by such bland, one-sided reassurances. WW will show, in this document, that Augean's attitude to public safety verges, at times, on the flippant.

3.3. The figure of 0.02 mSvs/yr as an expected dose from emissions raises its head frequently in the proposal, as it does in all the previously-mentioned Government documents, almost like a mantra. But its exact meaning is unclear, as is its origin. It appears to correlate to a 'one in a million' chance of contracting a fatal cancer from the site. WW question how this figure was arrived at? Was it scientific research? Was it empirical study of populations near radioactive sources? Or was it the result of mathematical modelling based on questionable theory, dubious hypotheses, and an even more debatable choice of inputted data? Was it simply a round number plucked from a hat? WW do not consider that the EA can be sufficiently confident of the accuracy, and meaningfulness, of this figure to grant a licence on the strength of it.

3.4. Augean helpfully give examples of other 'one in a million' eventualities (S15). These, however, are misleading, not to mention irrelevant and patronising, and they display a lack of confidence in the company's own assurances. How can smoking be compared to this situation? Not only are these examples meretricious, but they are hardly reassuring. Some people give up smoking entirely because they fear the consequences. They do not have ten cigarettes a year; they have none. For them the 'one in a million' statistic is no more reassuring than it is for an air traveller who fears crashing. The fear is absolute. WW can assure EA, from empirical research, that most of those who would have to put up with the consequences of this application, do not consider themselves safe because they, or their children, have only a 'one in a million' chance of contracting a fatal cancer (not to mention the non-fatal variety, for which there is not even a statistic!).

3.5. The figure of 0.02 is only of significance if it bears a relation to human health, and Augean fail to provide this link. Expert opinion suggests that 4-5 Sv is an immediately fatal dose, but below that there seems no consensus on the damage incurred by lesser doses. The fact that there is a legal limit of 1 mSv/yr from man-made radiation, suggests that a potentially harmful dose is considered to be quite low. The reason for this vagueness is perfectly obvious: it is not possible to give an absolute figure for a harmful dose because the effects of that dose will vary according to the recipient. The corollary of this is that it is equally impossible to give an absolute figure for a safe dose, be it 0.02 or otherwise.

3.6. For someone who has already been exposed to significant amounts of man-made radiation – not difficult nowadays with modern appliances – the 0.02 from the King's Cliffe site could easily tip them over the 1.0 limit. Which makes a mockery of the limit, since how will such exposure to an individual be measured? For someone who is susceptible to cancer (and understanding of that condition is as limited as it is of radiation) 0.02 could easily provide the tipping point that leads to malignancy.

¹ HPA, Radiological Protection Objectives for the Land Based Disposal of Solid Radioactive Wastes, Feb. 2009, p.4

² DEFRA, Policy for the Long-term Management of Solid Low Level Radioactive Waste in the United Kingdom, Mar. 2007

³ NDA, UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry, June 2009

⁴ EA, Near Surface Disposal Facilities on Land for Solid Radioactive Wastes, Feb. 2009

⁵ HPA, *op. cit.*

3.7. Augean, along with Government organisations, refers to 0.02 as low. This is a subjective statement. It may be low in relation to the background radiation that those in the area already incur, but it is high in relation to the 0.00 that precedes disposal of this source. It is high enough to cause fatal cancers, as the 'one in a million' statistic shows. It is high enough to render the term 'safe' an inaccuracy, and it is high enough to cause significant public alarm. The bottom line is that the figure of 0.02 mSvs/yr will have some effect on human health, and this effect will not be positive.

3.8 It might also be asked why the figure of 0.02 is viewed as acceptable. It may not be possible to prevent radioactive emissions entirely, but the proposal shows that it is certainly possible to reduce them. Augean have shown that bags leak more radiation than drums (Annex C, p14); yet they are going to allow in bags. They have indicated a cap of slightly more than one metre in thickness over the cells; Dounreay is planning a cap of four metres. Simply making these improvements would reduce the level of radiation further. To those living near the site, this would make an important difference.

3.9. As importantly, the 0.02 figure is a guide, not a limit. The EA suggest a dose constraint of 0.3, above which emissions from a single site should not rise. This is not a legal limit, either. The Government has set a limit of 1.0 from man-made radiation. This is a legal limit, but proving that a person's dosage came from a single site would be virtually impossible. Only when doses reach 3.0, does remedial action have to be taken. All these stages might appear low, but it is worth noting that Augean could allow emissions to rise *50 times* the promised dose ceiling of 0.02 before they face the threat of prosecution. This does not give cause for confidence, especially in view of the previous record of the site, and the proposed arrangements for monitoring (see below).

3.10. There is also concern about a lack of consensus between Government agencies. The EA suggest a dose constraint of 0.3 mSvs/yr from a single source of man-made radiation. The HPA, on the other hand, put the figure at 0.15. When challenged, the EA have waved aside this discrepancy as insignificant, yet their tolerance level is as much as double that of the HPA. In most mathematical calculations this would seem to be a fairly significant differential; when the topic under consideration relates to human health it could be critical. Such a blasé attitude reveals not just a lack of responsibility, but also hints at a lack of real understanding.

3.11. On top of this, local people are already subject to above-average levels of radiation. Radon levels, which nationally are 2.6, are measured in the local area at 3.6. This means that locals are already nearer their personal tipping point. There is also believed to be significant radioactivity emanating from the disused weapons dump for RAF Wittering a hundred metres north of the site. This has not been referred to in the application. The presence of these factors makes the dosage received by those in the vicinity of the dump potentially dangerous even before more radioactive material is deposited. The argument that there is so much radiation anyway that a little extra would hardly be noticed is not one that endears itself to local people.

3.12. The HPA concludes that all radiation is dangerous and that it can lead to leukaemia⁶. The Linear No Threshold theory, which underlines the thinking behind Government calculations, supports this. Augean guarantee that there **will** be radioactive emissions from the site. The link between cancer and radiation is established by the Government's own 'one in a million' statistic. And yet Augean still state that there is no risk to human health. Given this muddled thinking, and the lack of understanding and credible research behind it, the time is clearly not right to grant a licence for this application.

4. ALARA and the Optimisation Principle.

4.1. This principle has become accepted in Government circles, to the extent that it now appears in Government documents as beyond question or further justification. It is summarised in the HPA report as: 'The process of determining what level of protection and safety makes exposures, and the probability and magnitude of potential exposures, as low as reasonably achievable, economic and social factors being taken into account'⁷. It is quite clear that the Augean proposal is guided by this principle.

4.2. This can be seen most clearly in Section 11 of the application. In paragraph 11.1.4, for example, it states that as a result of feedback from the workplace and environmental monitoring 'further optimisation

⁶ Documents of the NRPB: Volume 14, No. 1 Risk of Leukaemia and Related Malignancies following Radiation Exposure: Estimates for the UK Population: Report of an Advisory Group on Ionising Radiation, para.1

⁷ HPA, *op. cit.*, p.49

measures' would be implemented if required. Not further 'safety' measures, note. In 11.2.1 it refers to a 'reasonable cost' governing the implementation of further measures of safety. What is reasonable, then, is not allaying public anxiety, but bringing down emissions only as far as the target set, even though it would be perfectly possible, and not too expensive, to reduce them further.

4.3. To give an example, it would be possible to reduce emissions further by increasing the depth of soil covering the completed cell – at the moment it is less than half that deemed suitable at the new LLW facility at Dounreay. This would reduce – not by much - the amount of waste that could be stored in each cell. This would affect the profits, but it would cause relatively small extra cost. Given that the expected charge per tonne of radioactive waste (based on current Drigg charges) will be £300, as opposed to the current charge of £45 for toxic waste (Augean figs), that is not going to make a huge impact on their profit margin. It would, however, have a big impact on public confidence.

4.4. Under this heading, the proposal continues by stating that the BAT is synonymous with the BPM. In 11.2.8, it states that 'if a new specialist landfill were designed for the LLW of the type proposed for ENRMF it is unlikely to use engineering features and standards beyond those currently used to define BAT for modern hazardous waste landfills.' This is a curious statement, which seems to fly in the face of evidence. In France, the facility for storage of LLW at L'Aube looks nothing like the King's Cliffe site. The design for the new Dounreay LLW store is significantly different, and none of the options considered in its BPEO consultation involved shallow burial⁸. Even the Clifton Marsh site has the waste in metal containers, as does Drigg. The only apparent reason that BAT will show hazardous waste landfills to be the BPM is because they are cheap.

4.5. Augean state that the 'current state of the wastes on the various nuclear sites...is unarguably less satisfactory and less sustainable than final disposal' (11.2.7). While glossing over the 'unarguable', which seems to be a motto for Augean, it would be good to have some evidence for the rest of this statement. Harwell's perfectly adequate plans for in-house disposal of its own HVLA waste⁹ may suggest that there *is* an argument. Augean concludes by stating that its option represents a 'net reduction in risk'; this is highly debatable. If Harwell can, and are prepared, to dispose of their own waste, using the UKAEA's long experience of dealing with it, does it really entail less risk to transport it a significant distance along public roads, to hand it to an untried company which is purely interested in profit and which happens to have a landfill site which, while not purpose-built for this type of waste, has been taking in something more or less equally unpleasant?

4.6. Another argument in the proposal for not reducing emissions, and increasing safety, further, and one that WW rejects, is that the site might then not be able to meet the demand of the decommissioning process (11.2.12). This statement seems to imply that public safety is subject to the demands of the process. This is not reassuring on several levels. Firstly, it implies a disrespect for public safety – strange in this age where 'health and safety' seems otherwise to be a crucial factor. Secondly, it implies that there is pressure being put on sites to accept quotas of waste that they may not safely be able to accommodate. Given the number of Government agencies involved in this process this seems perfectly possible. If this is the case, it would be useful for stakeholders to be aware of the situation; at least it might stop them thinking that this was just an argument by Augean to protect their profits.

4.7. WW reject the use of ALARA as being either relevant or justifiable in this case. The principle may make sense when, as in the case of publicly-funded organisations like the NHS, there is a genuine dilemma between the needs of the public and the costs to the public. This, however, does not apply in this instance, since public monies are not part of the equation. The only economic factor under consideration is the profits of the company and the dividend for its shareholders. Public health and public safety should not be compromised by these factors, but this is, in effect, what Augean are proposing.

4.8. Augean are using this principle to justify reducing emissions, and ensuring public safety only to the limits suggested by Government organisations and not beyond. They show, quite plainly, in Annex C, p.14, that radioactive emissions from bulk bags are, in almost every case, greater than from steel drums. Bags were discontinued at Drigg in 1994, and are not used at Clifton Marsh (which has a lower Bq limit), yet Augean state, quite plainly, that some of the waste is going to be admitted in bulk bags. Obviously, these will be cheaper (though, interestingly, for the consignors rather than Augean), which may explain why Augean are not insisting on drums.

⁸ UKAEA, Developing the Long Term Strategy for Managing Dounreay's Solid Low Level Radioactive Waste, 9 Sept 2003, pp.18-23

⁹ Research Sites Restoration Ltd, 2008/9 Lifetime Plan Rev D (v2), Harwell Site Summary, p.10

4.9. The design of the site is further evidence of cost-cutting. Augean propose a one metre cap on top of the cells. Dounreay, in its new facility, offers a four metre cap. It is obvious which is the safer, and equally obvious which is the cheaper. Augean are presumably content that one metre will keep emissions to under 0.02; WW and those living near the dump do not see why Augean should not spend a bit more to bring the emissions down further.

4.10. WW recognise that the policy of sending waste to landfill satisfies the optimisation principle on a national level, but do not accept that the same principle can be used by private contractors to prejudice the health of local people. If the Linear No Threshold is the basis of Government thinking, and the fewer emissions the fewer the health risks right down to the lowest possible emission level, then it would be logical for a licence to be refused until safety was ensured irrespective of economic factors.

4.11. Perhaps it would be impertinent to suggest that if the emissions were reduced there would be fewer illnesses and therefore less cost to the NHS in treating the potential consequences of this proposal. That might serve optimisation rather better.

5. The Risk Assessment

5.1. The risk assessment for the site appears to be in two stages, though this is not entirely clear. One stage involves trying to show that there is a very low risk from radiation if things go wrong, or even if they go right; the other uses HPA advice for what should be done to minimise the risks. Neither of these two approaches is dealt with satisfactorily, and neither gives much cause for public confidence.

5.2. The first approach relies heavily on SNIFFER methodology, as well as drawing on a few models drawn up by the HPA. From the outset, this creates a nagging worry. The SNIFFER report of 2006 was, according to its website, partly commissioned by the Environment Agency, who also happen to be the licensing body, the external monitors, the regulators, the Government Agency responsible for the disposal of LLW, and who shared a platform with Augean at the 'consultation' at King's Cliffe. The HPA, as well as being a Government agency, are paid consultants of Augean in this process. Galson Sciences, who drew up the Radiological Assessment, were commissioned by UKAEA Harwell who are hoping to use King's Cliffe to take their waste. The risk assessment has therefore been compiled by organisations which can only be described as stakeholders in this process, rather than truly independent, and Augean, on whose shoulders the burden of ensuring the safety of the site rests, seems to have been largely absent from the process.

5.3. The SNIFFER methodology is problematic in other ways. For a start, it claims that its report (UKRSR03) is 'aimed at small users rather than at the nuclear industry...', and that 'The framework, therefore, may not be applicable to inert and hazardous landfill sites' (p.i). Given that King's Cliffe is designated a hazardous waste site, and is being used as a disposal route for the nuclear industry, and that the amounts – up to 250,000 tonnes p.a. - could hardly be described as 'small', one wonders whether this is the most appropriate methodology to use. Furthermore, Galson Sciences refer to 'errors in the dose coefficients' (Suitability Report, p.21) in the SNIFFER methodology which casts doubt on the accuracy of other aspects of the model. Admittedly, Galson say that they have taken the fact that it is a hazardous site into consideration when amending the SNIFFER model, but their tweaking only seems to take into account the depth of clay at the base, and not the presence of nearby and potentially volatile hazardous waste, which might well have some level of radioactivity.

5.4. However, the main objection to the use of such methodology as part of a risk assessment/safety case, is the fact that it is based on mathematical probability and not real life experience. It uses mathematical formulae to make a prediction on which the safety of the local community is based. It takes scenarios, applies a range of factors which can never be complete, and then through an equation emerges magically with a result that is meant to guarantee safety. It should be noted, also, that the recent coroner's verdict (Sept. 10 2009) in the inquest into the death of Stuart Dyson throws significant doubt on the dependability of the ICRP modelling which is the basis of all radiological protection. If the bedrock of radiation safety calculations has been shown to be legally unsustainable, then it would be quixotic to permit the dumping of radioactive waste on the evidence of the same, flawed models.

5.5. To take just one example: the air crash scenario. It is assumed by the model that the incident lasts for 30 minutes and then is miraculously finished. But what about the radioactive dust from the explosion (which may well be gamma-emitting) which can settle on crops, or enter the water, or be blown by the wind the very short distance to a populated area? What about the water produced by fire hoses which

will wash away radioactive dust as slurry? What about it getting into the boots of firemen and rescuers and rescue vehicles? Why has none of this been taken into account? This is the problem with such modelling; it deals with the predictable, and the predictable rarely happens.

5.6. The main part of the risk assessment, produced by the HPA, is similarly complacent. In fact it barely merits the title of risk assessment and would certainly not pass muster in most organisations. It is generally understood that the purpose of a risk assessment is to identify a risk, identify ways of minimising or preventing it, and then identify ways of dealing with any incident brought about by that risk. This straightforward, and fairly obvious, schema is hard to discern in the documentation.

5.7. For a start, nearly all the risk events are dealt with in the Suitability Assessment and the attitude that governs that document is that there is little or no risk, and that everything can be explained in terms of doses. In none of the scenarios is there a suggestion on how to reduce or avoid the risk, nor any suggestion on what to do if the risk becomes an event, apart from not to worry. With the air crash scenario, for example, risk minimisation could be achieved by recommending a no-fly zone over the site, and a disaster plan could be drawn up for the eventuality of a crash occurring. Neither of these is even suggested.

5.8. While the HPA document merely consists of recommendations for what Augean *should* do, its own procedures in 15.7 only tell us what it *will* do. This amounts to drawing up plans and procedures, the exact details of which are to be left to our imagination. WW hope that the EA will check the existence, and efficacy, of these procedures before granting a licence.

5.9. While the risks to human health are seemingly brushed aside, the effects on the local ecology are dismissed even more perfunctorily. The risk to wildlife and vegetation is deemed to be 'insignificant' (14.0.3), and only a Tier 1 ERICA assessment was needed. Strangely, Augean went to some lengths, and expense, to move the Great Crested Newt population away from the site, so perhaps the risks are not as insignificant as assumed. There is also the problem of the Red Kites, recently introduced with great success into the area, who fly regularly around the site. They presumably feed on animals which may have been on the site, and which are thus contaminated.

5.10. WW trust that the Environment Agency, which has the responsibility for protecting and improving the environment, will safeguard the future of these creatures by checking carefully the accuracy of the Augean claims.

5.11. In the so-called risk assessment, there are some suggestions and recommendations on what to do in certain situations, but these apply only to on-site incidents, not those involving risk to the general public. These, it must be repeated, are only suggestions from the HPA; there is little or no indication of what Augean are actually going to do to implement these suggestions. It is hard to believe that these documents could pass muster as a risk assessment for any organisation, let alone one that deals with such an unpredictable and potentially hazardous process as radioactivity.

5.12. The assumption underlying this attitude appears to be the fixed belief that there is minimal, if not nil, danger to the public outside the site. Conversations with Augean, HPA and EA, which WW representatives have had, always run up against this stonewalling attitude of certainty. Yet reality suggests otherwise. The widespread public fear of radiation is not based purely on superstition; radiation is dangerous and the management of it is historically imperfect. The public know about the effects of Hiroshima and Chernobyl and depleted uranium. They know about unusual cancer clusters around Sellafield, Harwell/Aldermaston, and German nuclear sites. They know about leaking containers at Harwell, Sellafield, and the LLWR at L'Aube in France; they know about illegal dumping of ILW at Drigg, and the prosecution of UKAEA at Harwell, not to mention Augean at Thornhaugh. They know that there is something worrying otherwise nuclear LLW would not have been treated with such care, and by the nuclear industry alone, until now when the Government is desperate to get rid of it by the cheapest means possible. Simply producing a risk assessment that tries to show there is no risk is not the way to gain public confidence.

5.13. In mitigation, Augean imply that the risk assessment is imperfect because it is assumed that the engineering of the site is sufficiently good to take care of any eventuality. If this is the case, it would still be useful to link more directly the benefits of the engineering to the mitigation of each problem, and some sort of disaster plan would be welcome.

5.14. There is a more worrying possibility; that a proper risk assessment has not been made because it

already exists for handling toxic waste. This is alarming because Augean have often given the impression that radioactive waste is just another form of hazardous waste. It may be similarly dangerous, but technically, and legally, it should not be classed, or treated, as hazardous, and assessment of the special risks it poses needs to be made.

6. BPEO

6.1. WW are aware that Government policy for England and Wales is to replace BPEO and BPM with BAT. Nevertheless, the existing system, which forms a basis of this application, demands a BPEO to justify sending waste from the consignor site, and Augean use it to justify their application to receive it.

6.2. Augean refer to the standards required for assessing the BPEO in Section 10, and then state that it is the duty of each consigning site to carry out this exercise. That each consigning site should decide that sending waste material away is the better environmental option for them is no great surprise. Judging by the BPEO performed by Harwell in 2006, there is no need for consigning sites to consider the environmental implications for the consignee site, so in effect, a BPEO that establishes King's Cliffe as better than any other destination need not be carried out.

6.3. In 10.1.2, Augean note that the EA require only nuclear industry sites to carry out a BPEO; perhaps this explains why they do not wish to be considered a nuclear site.

6.4. The BPEO involves 'extensive consultation' (10.1.3), and this is deemed to be 'important'. One assumes that Harwell have consulted with Augean, since they wrote the risk assessment for them, but there is no evidence that they have consulted with any other stakeholders, for example local democratic bodies or the public in the King's Cliffe area.

6.5. With particular reference to Harwell, their 2007 BPEO¹⁰ rejected an on-site facility on the grounds of expense (an interesting environmental concern, and especially cynical given the amount the local economy has benefited from the research facility, and will continue to benefit from the Science and Innovation Park that will be constructed on decommissioned land), and the fact that the site is geologically unsuitable as it overlies a major aquifer. The King's Cliffe site also overlies a major aquifer.

6.6. Augean don't go into any details about the benefits of keeping waste on sites like Harwell – simply referring to them as geologically unsuitable (a slightly worrying revelation), so perhaps WW can help. In its 2008/9 plan, Harwell has allowed for, consulted upon, and set aside money for a HVLA facility on the site, taking waste up of up to 40Bqs, unless another destination can be found¹¹. This does not sound as if they really need King's Cliffe, apart from the money they would save (though they have budgeted for this expense), since this facility would accommodate virtually all the waste they need to get rid of. The Augean proposal does not, therefore, fulfil a national need as far as Harwell waste is concerned, but is simply a mutually-beneficial financial arrangement between two organisations.

6.7. If the BPEO were to be done in the spirit of the exercise, Harwell would be required, at the very least, to show why moving waste from one radioactive site (which can never be completely cleaned) to another, and thus ending up with two radioactive sites instead of one, is the best environmental option. This would involve a good deal more openness about their motives, and consultation with the local community around the King's Cliffe site, than they have managed so far. That Augean are using the BPEO to their advantage shows the fallibility of the process. As BPEO will very shortly (if not already) become outdated practice, the EA should discount it as a factor in its consideration of the licence

7. Best Available Techniques (BAT)

7.1. BAT is becoming the most important guide for limiting the environmental impact of LLW disposal. Despite Augean's claims, they do not score highly on this aspect.

7.2. Augean put more emphasis on the 'available', rather than on the 'best'. They have available a hazardous landfill site, engineered, we are assured, to the highest standards. But it is engineered for *hazardous* waste, not radioactive waste. Hazardous waste emissions are allowed to rise to the surface to be burnt off, or to sink down and be collected as leachate. Emissions from radioactive waste need to be

¹⁰ Harwell Site Waste Best Practicable Environmental Options (BPEO) Study Second Stakeholder Consultation Document, p.71

¹¹ Research Sites Restoration Ltd, *op.cit*, p.10

contained as far as possible. The steel drums, and reinforced concrete chambers that are used at Dounreay and L'Aube are different precisely because they are purpose-built for radioactive waste.

7.3. Dounreay, in its recent decision on the BAT to be used for its LLW storage facility, considered a range of options of purpose-built structures, not one of which bears any resemblance to the cells at the King's Cliffe site¹². Dounreay is using a cap of 4 metres to cover the cell; Augean is proposing slightly more than 1 metre. This may be partly due to cost, but it is mainly because (according to oral conversation with Augean) the clay base could not take the weight of such a cap. So the much-lauded clay base clearly does not represent BAT for the demands of this type of waste.

7.4. Questions could also be asked as to the reaction of the clay base to climate change. The site is prone to flooding, and 'bathtubbing', and this will have some effect on the porosity of the clay. Another possible change might involve a drying out of the clay, in which case it is likely to crack and leak. The long-term integrity of the HDPE liner is another issue. Augean admit that it may well tear and release radioactivity into the ground, even from the start. A Geological Society report into the risks from landfill affected by high water table talks of the danger of organic material diffusing through HDPE liners, and suggests that this process might be even greater if the liner is intact¹³. Does this really represent BAT for a nuclear waste disposal site?

7.5. It is also noted that a considerable amount of leachate – 5000 tonnes per year - is collected from existing cells, and that it is expected that a similar amount will be generated from the new cells. This leachate will, naturally, contain radioactivity and will have to be carefully dealt with. This entails a collection process, which is potentially hazardous, together with another long journey, this time to Avonmouth where it is 'cleaned' and then discharged into the Bristol Channel. This method doesn't exactly tie in with the aims of the OSPAR convention to reduce emissions to the marine environment. The sort of facility offered at Dounreay, and even at Drigg, produces very little leachate, and so would create less pollution. This is further evidence that the King's Cliffe landfill does not represent BAT for this type of waste.

7.6. The fact that the site is built on top of a major aquifer is another alarming revelation, which makes one wonder whether it is the ideal location. The Lincolnshire Limestone Aquifer supplies about 60% (40 million litres a day) of the drinking water for Peterborough¹⁴, a city less than 10 miles away which is expanding at a rapid rate towards the dump. Augean assure us that water from this aquifer is not drunk locally, which is not an entirely comprehensive re-assurance that it is not drunk further afield. BAT, which encompasses BPEO, might rule out this site (as Harwell has tried to rule itself out) on just these grounds.

7.7. There is no example of a purpose-built facility for LLW, constructed in the last few years, which involves shallow burial in clay, with only rubble as a covering. This is no longer BAT. Nor is the use of bulk bags, ably shown by Augean to be significantly less of a barrier to radioactive emissions than steel drums. Augean are putting cost factors, and the availability of their site, forward as representing BAT, but they do not fulfil the criteria. They represent an outdated method that was discontinued at Drigg in 1996.

8. The Proximity Principle and Transport

8.1. Augean state that proximity is not a 'strong differentiator between options' on a national level, and go on to argue that additional carbon emissions will be low. This may be partly true, on a technical level, though given the fact that currently Augean are taking in less than half their potential capacity from their existing waste streams, and the likelihood that if the application is granted they will enjoy full capacity, carbon emissions are actually set to double.

8.2. The main problem with their attitude, however, is that the Proximity Principle is not just about carbon emissions, nor even about the dangers of transporting the waste (though this is significant); it is about responsibility. It is a feature of European policy that individual countries should deal with their own waste, because they were responsible for creating it. In UK national policy documents, including those concerned with LLW, the PP is a strong feature, as it is in Regional, County and Local waste policies, for

¹² UKAEA, *op.cit.* pp.18-23

¹³ Potter, Dr. Hugh, Assessing the risks from hydraulically contained landfill sites, Geological Society Landfill Hydrogeology, No.28, p.4

¹⁴ British Geological Survey, UK Groundwater Forum, Groundwater Development, p.4

these same reasons. Recently, there have begun to be agreements between regions, and within regions, for the transfer of waste, but good waste practice dictates that where possible, the waste should be buried close to source.

8.3. Augean have been used to ignoring this principle, because the PP has been bent to accommodate toxic waste streams for which there haven't been enough local disposal facilities available. This is not the case with LLW. Nuclear sites already have arrangements for disposal of LLW, either on their own turf, or at Drigg. As the case of Harwell shows, some are prepared to continue with this practice unless a cheaper option arises. There are no nuclear facilities in Northamptonshire, and none within at least a 40-mile radius. If the Proximity Principle, which is written large in the waste policies of Northamptonshire County Council, and the East Midlands Regional Assembly, is not to be ignored completely, then King's Cliffe cannot morally (and perhaps legally) be chosen.

8.4. If, however, Augean's disdain for this policy is upheld, then why choose King's Cliffe at all? Why not choose somewhere well away from centres of population (within a 12-mile radius of the site there is a population of 250,000, and it is one of the fastest growing areas of the country), which can be reached far more safely (and green-ly) by rail, and where there will be no local concern over health?

8.5. Arising from this issue is the question of transport of LLW. This will have to be done by road. The only legal route for lorries bringing waste is along the road leading to King's Cliffe, off the A47. Local experience reminds us that this is, literally, a death trap. Coming through the woods, there is a deceptively sharp left-hand bend (where there have been fatalities) and then the road rises through trees so that the entrance to the site is not revealed until less than 50 yards before. Directly opposite the site is the entrance to one of the largest haulage firms in the region, with HGVs constantly coming and going. Beyond that the road carries on towards King's Cliffe and is used by the locals as an unofficial race track. The road near the site in most seasons is continuously covered in mud from lorries exiting the site, and therefore slippery. An alternative, though illegal, route for lorries to the site (which, nevertheless, is so often used by them that Augean have helpfully put up a sign on it to direct them), is from the Wansford road involving a very steep hill which is obviously dangerous. In other words, access to the site is highly unsuitable.

8.6. Augean were coy in their proposal about their role in closing the A1 for 18 hours last November (2008) while emergency services cleared up a toxic spill from a bag destined for their dump¹⁵. They still claim that all aspects of transport are not their responsibility, though one wonders whether, as one does with this application, had they demanded a safer type of container for waste to be carried in then the inconvenience could have been avoided. However, they claim that this will not happen again, since with radioactive waste it is a simple matter of 'sweeping the road' (S40). Really? They also state that there will be an 'established response arrangement'. Does the EA know the details of this, and the locations of the 'suitably qualified and experienced advisors'?

8.7. If the waste is coming from Harwell, the obvious route is along the A43. This will involve passing close to the town centres of Towcester, Northampton, Wellingborough, Thrapston and Oundle, not to mention several villages. A spill of radioactive, nuclear material, whatever practical effects it might have on the local populations, is unlikely to do much for their nerves. This is one of the reasons why adherence to the Proximity Principle, and rejecting the licence for this site, is so desirable.

9. Issues of Responsibility

9.1. Apart from evading the responsibility to conduct a BPEO, which they may be entitled to do, and to follow the sentiments of the Proximity Principle, and to produce a proper risk assessment and disaster plan, and to conduct adequate consultation, and to put in place a proper monitoring procedure, and to have a proper security plan, Augean also seem cavalier in ignoring two other essential requirements of taking in nuclear waste, which may infringe European Law: denial that King's Cliffe would constitute a nuclear installation, and failure to notify Euratom under Article 37.

9.2. Augean state that they wish to be called a 'non-nuclear premises'(3.2.9). This would seem to go against Council Directive (Euratom) COM(2004) 526 final, which says: 1) "Nuclear installation" means any civilian facility and its associated land, buildings and equipment where radioactive materials are produced, processed, used, handled, stored or disposed of temporarily or permanently;' The use of the word 'or', rather than 'and' in the last line suggests that a nuclear installation does not have to do all

¹⁵ Peterborough Evening Telegraph, 21 November 2008

these things; just one. This clearly indicates that according to the Euratom Treaty, King's Cliffe should be considered a nuclear installation.

9.3. As such, King's Cliffe would have to come under the aegis of the NDA, or another body with responsibility for nuclear sites, and it would be subject to the far more stringent regime of the Nuclear Installations Inspectorate. There would be the possibility of a no-fly zone being imposed around the site, which could render RAF Wittering inoperable. Security would have to be stepped up, and inevitably costs would mount. The EA would also lose its position as licensees and regulators. Augean would also have to submit a BPEO. The result might be to the benefit of local residents, whose safety would improve (not least because the nuclear industry would be more than likely not to choose King's Cliffe at all), but it would cause a real problem to the Government's intention to quietly offload nuclear waste around the country.

9.4. Oral statements from Augean, and their consultants, the HPA, dismiss this as unnecessary because of the low level of radioactivity. WW would like to know what is the level of radioactivity needed for the site to be called a nuclear installation, as LLWR Drigg is. Clifton Marsh, even though not formally a nuclear site, is right next door to Springfields, which it serves and which is a nuclear site, and it has been inspected by the NII. This would make King's Cliffe the only independent, non-nuclear site containing nuclear materials in the UK.

9.5. Augean also challenge European Law by declaring that there is no need for them to submit an Article 37 request to Euratom for permission to take in nuclear waste (3.10.1). They write that 'It is assumed by this application that Article 37 submissions, where required, are implemented by the consigning nuclear industry sites'. Yet Article 37 states: 'Each Member State shall provide the Commission with such general data relating to any plan for the disposal of radioactive waste in whatever form as will make it possible to determine whether the implementation of such plans is liable to result in the radioactive contamination of the water, soil or airspace of another Member State.' The Augean application certainly looks like a 'plan'.

9.6. WW are mystified by the reluctance of Augean to submit such a request. If the claims about the low level of emissions are correct, then this step is a purely legal formality. Since Augean are instituting the 'plan' to set up a new waste stream, it is clearly their responsibility, rather than that of each individual consigning site to notify the European Commission. Curiously, this was also the decision taken in the Drigg Review of March 2006, where the legalistic argument for not providing an Article 37 submission was that Drigg was originally created before the UK joined the EU. It seems almost as if UK Government are trying to avoid their commitments to transparency in their dealings with the EU.

9.7. WW suggest that this permission is achieved before a licence is granted, both to allay public suspicion and to prevent tiresome legal challenges that might arise. If Augean were seen to abide by the spirit of the law at the outset, much public suspicion might be overcome.

10. Security

10.1. Augean state that 'Inadvertent intrusion into the site in the future is not certain to occur and therefore this event has a low probability of occurrence' (5.1.1). This rather contradictory statement (does something really have a 'low probability' because it is 'not certain'?) doesn't leave WW any the clearer about whether Augean take the problem of intrusion, either inadvertent or deliberate, seriously, nor what they might propose to do about it. At present, both types of intrusion are extremely simple to achieve, with a low risk of detection. Approaching on waymarked footpaths from Duddington there is no barrier, or sign, to prevent anyone from wandering onto the site.

10.2. Such intrusion should be of importance to Augean for two reasons. Firstly, the dose rate which might occur from such an intrusion is calculated at 3-20 mSvs/yr. This is significantly greater than the legal limit, and could lay Augean open to prosecution, especially if access to the site is so easy and unhindered. It could also expose the intruder to potentially dangerous levels. Current practice being what it is, responsibility would lie with Augean, even though the intent of the intruder might be criminal.

10.3. Secondly, there is the possibility of terrorism. The site is a ready-made 'dirty bomb'. The radioactive capabilities of material that might be exposed, and exploded, and of course the risks from gamma radiation of that exploded material, would make such a venture an attractive and, with the present security measures, virtually risk-free one for a terrorist. Arguments that the radioactivity would still be so low that no harm would come to anyone miss the point. The aim of a 'dirty bomb' is not to kill

or injure; it is to spread fear, and that would be easily achieved. There is a population of 250,000 within 12 miles of the site, so plenty of disruption could be caused.

10.4. There is nothing in the risk assessment, or plans, about the security of the site. How many night watchmen, for example? The cells are particularly vulnerable during that - quite lengthy - period before they are capped. Drigg can still call on armed response units from the Civil Nuclear Constabulary, as well as employing a firm of private security guards. What can Augean provide? Furthermore, will this security remain in place for the 60 years of the post-operational phase, when materials will retain much of their radioactivity? Augean are required to post a bond of £3.5m, which amounts over 60 years to little more than £58,000 per year. Is this enough to provide maintenance and security? And what about after the 60 years when the site will still be emitting radioactivity? WW suggest that authorisation be withheld until this matter is dealt with.

11. Monitoring

11.1. WW consider that effective monitoring during the operational and post-operational phases is one of the most important safeguards of this process. They regret that Augean, in this application, do not appear to share this sentiment.

11.2. Augean will monitor the cells on a daily basis to ensure that there is enough covering to limit the emissions to proposed levels. So far, so good. Thereafter, proposed radiochemical monitoring is either quarterly, or annually, which WW consider to be too infrequent, especially in the early days when the exact behaviour of the deposited material in this environment cannot be predicted with complete certainty.

11.3. WW are unaware of the MAPs already in place, but doubt that they include adequate radiological monitoring procedures since there has hitherto been no need to check for radioactive materials. WW have, therefore, to assume that section 5.8.2 represents the sum total of the radiological monitoring proposed. This is not enough for public confidence, especially since there is apparently no monitoring off-site. Again, WW come up against Augean's belief that there is absolutely no danger to the health of the public, while at the same time admitting that there will be emissions from the site, and that there might be some escape into the air and groundwater which might not necessarily be picked up on-site.

11.4. WW are particularly bemused by the monitoring for dust that involves just one sampler being placed in a 'predominantly downwind location'. WW would like to point out that local weather conditions vary and the wind direction does change, and hope that if there is an escape of dust that the wind happens to be blowing towards the sampler at that moment.

11.5. Augean's monitoring may be checked by the regulators. The Environment Agency state only that they 'may' monitor sites such as this. This will probably comprise of examining Augean's records, but may involve some independent testing. The HPA refuse to monitor the health of the local population. None of this is good for public confidence. It doesn't reassure local people that the site is safe, simply that Government agencies apparently don't care very much about the health of local people.

11.6. WW are somewhat surprised by the fact that nuclear material, which has hitherto been subject to the close control of the nuclear industry - even the low-level variety - and which has been off-limits to the general public with dire warnings of risks to health, is now deemed so safe that it can be handed over to private contractors with no previous experience of handling it, and that it doesn't even have to be closely monitored. They are also surprised that the opportunity is not taken to monitor more comprehensively so that fears about radioactivity can be laid to rest. If this type of enterprise is to be the first of many, then the subsequent process would be a lot easier if it could be proved to be safe.

12. Consultation

12.1. Government documents confirm the importance of the consultation process with stakeholders. There should be 'effective and proactive engagement with local communities' (NDA)¹⁶; 'high quality' consultation (DEFRA)¹⁷, which should be 'open and transparent', with 'good quality, accurate and easily understandable briefing material', and it should be 'iterative'. Augean, themselves, promised 'extensive

¹⁶ NDA, *op.cit*, p.32

¹⁷ DEFRA, *op.cit*, p.42

public consultation'¹⁸. The emphasis on such consultation, WW presume, is because of the sensitive nature of the material being disposed of and the controversial and little-understood nature of radioactivity. Yet Augean have failed to play their part in this consultation phase.

12.2. Consultation, in its literal sense, implies a process whereby the consultor informs the consultee of his intention, asks the consultee for his opinion, and then reacts to that opinion. There is no indication in these documents that Augean have shown any reaction to the opinions of local people. Even in conversation they show no sign of interest in suggestions or contrary points of view. They don't even bother to pay lip service to the process with a 'we will consider that'; they simply argue back with the same line, which can be paraphrased as 'its perfectly safe, don't worry'. In their questionnaire, there was only a tiny space for opinions to be recorded, showing that they were not really interested, but just going through the motions.

12.3. Augean state that they sent information about their one public meeting, in King's Cliffe village hall, to over 560 households in King's Cliffe and Duddington. Two members of Wastewatchers who live in houses in the centre of King's Cliffe never received this. No other villages apart from these two were informed, although Augean, curiously, talked to the councils of various Peterborough wards, so evidently they assumed these were within the affected area. Peterborough City Councillors were consulted, though not, apparently, anyone from the far closer town of Stamford. The Parish Councils of Wansford, Easton and Collyweston were informed, but not the people who live there. Notification was, therefore, strictly rationed. The placing of small adverts in the local papers, in practical terms, was next to useless. Rather cutely, Augean refer to the posters that Wastewatchers produced, and their Facebook site, as part of *their* consultation. We are glad to have been of service, but must deny that we were acting on behalf of Augean.

12.4. The open meeting presumably ticked some boxes for Augean but, from the point of view of local people, it was not very enlightening. For a start, it happened early in the process, and for most visitors was the first they had heard of either the proposal or any of the details surrounding the topic of LLW disposal. Augean representatives were not well briefed – one announced that waste would be 'tipped' into pits – and some of the information was misleading (for example the use of the phrase 'very low levels of radioactivity' which was confusing if one understood the technical difference between VLLW and LLW).

12.5. There was also a lack of transparency. For example, it was not made clear that the visitors book, which one was virtually obliged to sign, would be used as evidence of thorough consultation. It was not explained (though it did become clear) that the EA and HPA representatives were consultants of Augean rather than independent Government agencies (some people didn't realise that the HPA isn't actually responsible for the protection of health).

12.6. The analysis of the results is hardly revelatory, apart from the interesting, though not entirely relevant, information about which part of King's Cliffe the visitors to the exhibition came from. Out of 223 visitors they appear to have found 9 people who supported the project, with 9 against; not exactly an earth-shattering endorsement, and a figure that might have told them something, considering that there was only their side of the story on offer. The others, presumably, left rather uninspired, or bemused.

12.7. Since then, there has been a follow-up newsletter and an open day at the site. The latter was poorly advertised. Although it was referred to in the newsletter no confirmation of date was given, and no timings. In the end, there was only one small poster in the newsagent's window in King's Cliffe confirming these details. As a result they seem to have had less than a dozen attendees. The newsletter followed up some points raised at the village meeting to which Augean were not invited (WW requested that they were, but this was declined by the PC). The answers are glib and typically unsatisfactory. For example, Q6 asked about the correlation between dose and risk to health, but the answer simply reiterated the dose figures. The answer to Q12 is similarly unsatisfactory and contradictory – they are monitoring their employees, even though there is no possibility of harm coming to them, so it is not necessary to monitor the health of those off-site!?

12.8. In short, the consultation has failed to meet the level of 'extensive' declared by Augean, and certainly not that demanded in Government policy documents. WW can assure the EA that it has consulted rather more comprehensively, and has given presentations to the PC's of Elton, Duddington, Laxton, Barrowden, Apethorpe and King's Cliffe, where there was almost complete suspicion and lack of

¹⁸ Augean, Press release, 7 May 2009

support for the proposal. Representatives of the EA were present at the King's Cliffe meeting, and can verify this assertion for this event at least. WW have also canvassed opinion on the streets of Stamford, Peterborough, Oundle and Corby, and the growing size of the petition is evidence of the unpopularity of the proposal and, more significantly, the anxiety it engenders.

13. Suitability of Augean

13.1. As a private company, working outside the direct control of the nuclear industry, the reputation of Augean must come under scrutiny before they, or even the site, is granted authorisation to accept radioactive waste on this scale. They will be the first private operators in the UK to be completely independent of the nuclear authorities, and if the process of sending waste to similarly-run landfills is to become acceptable, then this test case must be seen to work.

13.2. Alarming, Augean seem to have little practical experience of handling this type of material. As they claim there will be no extra employees on the site, it has to be assumed, that existing staff will receive training. Indeed, the monitoring expert who WW met at the open day said cheerily that he knew nothing yet about checking for radioactivity but he was going to get a day's training. This is only partly reassuring. The scientific expertise in checking the radionuclides that come into the site, and then calculating their combined effect so as to keep the levels of radioactivity down, sounds complicated. Is EA convinced that Augean employees are competent in this? Has the EA seen details of Augean's training plans?

13.3. Historically, Augean's operating procedures appear to have been less than commendable. The EA will be aware of prosecutions brought against the company for illegal activities at the King's Cliffe and Thornhaugh sites in 2006. In 2008, seven major accidents were reported on Augean's sites, and the company's own report¹⁹ refers to 'poor safety management'. External performance indicators for Augean sites from 2008 reveal that none of them are higher than average, and some are below average and poor²⁰. King's Cliffe, admittedly was 'average', but local people might be hoping for slightly better than this, given the nature of what Augean might soon be in charge of.

13.4. Company reports indicate that accidents are increasing at the King's Cliffe site. In 2007 the number of near misses was 1, in 2008 it was 8. In 2007 the number of minor accidents was 3, in 2008 it was 7. In 2007 the number of major accidents was 0, in 2008 it was 2²¹. This shows an endemic carelessness in operational matters, and hints at the lack of a safety culture. This is very much mirrored in the company's attitude to the possible risks to the public from radiation, and it is a very good reason why authorisation should be refused.

13.5. A glance at Augean's economic situation reveals not just concerns over its viability, but also worries over its ability to fulfill the obligations laid down in the proposal. Stability is a highly desirable commodity in this matter, since the EA don't want to be relicensing the site and investigating the suitability of new owners on a regular basis. Augean have a relatively small operating profit, and depend on the fortunes of the economy to provide the waste on which they depend. In the last two years they have been unable to fill even half their quota, and their share price has dipped to historic lows. In July, the Irish investment company, One51, made a takeover bid and, although this was rejected the group have not yet lost interest. The possibility of a takeover by a company with even less experience of waste management is a worrying one, yet this appears to be an on-going issue.

14. The Fear Factor

14.1. Public anxiety may seem a nebulous idea, and one which is difficult to measure, but for people living near the site it is very real, and it is one that deserves careful consideration. The fact that this area has no experience of the threat of radiation means that if this site is granted authorisation and eventually Council permission, local people are going to be suddenly faced with what they see as a significant threat to their health and that of their children.

14.2. This is different to the situation of those who have grown up near nuclear sites who will have become accustomed to the presence of this threat, and will have learnt to live with it. Crucially, they are

¹⁹ Augean, Corporate Social Responsibility Report 2008

²⁰ Ibid, p.25

²¹ Ibid, pp.26-7

likely to have benefited from the boost to the local economy, and so will see the site as a more benign presence.

14.3. In this area, there will be no economic benefit, merely the sudden threat and the fear of the looming danger on the hill. The site will be seen as malign, intrusive, unwanted, and forced upon us. An area which is relatively free from man-made radiation will be perceived to have become a hotspot. King's Cliffe will have the same aura attached to its name as any other site which is infamous because of its nuclear connections. Who will want to come and live here? Who will even want to come as a tourist? Who will want to buy food produced near the site? In short the impact on the local economy (no locals are employed on-site) will be purely negative.

14.4. There are alternatives. Nuclear sites where the waste already is. Areas of the country where there is not a population of 250,000 people (and rising fast) within 12 miles. The EA representatives who were at the King's Cliffe meeting will be able to confirm that local opinion is very worried by this proposal. Many see this as a step along the way to bringing in higher levels of radioactive waste, extending the site, and asking for a renewal in 2013. The argument goes that the toxic dump was the thin end of the wedge, and now we are moving further along it. Augean have failed completely in their uninspired efforts to provide public reassurance that this might not be the case.

15. Other

15.1.1. Augean claim (S18) that over time radioactivity decays and that after a few decades the waste becomes non-radioactive. They also aver, in the same paragraph, that some radionuclides take so long to decay that they can be ignored. This is a strange and contradictory statement. Such radionuclides are still radioactive, even if Augean feel they can ignore them. The site will still be monitored for 60 years after closure, which suggests not everyone is so confident.

15.1.2. A report by the EA in 2005 on Drigg estimated that emissions might reach 90 mSvs/yr in 500-5000 years time²². That is a curious example of radioactive decay, especially since emissions are currently only 0.016. The HPA state that the future behaviour of the radionuclides cannot be predicted²³. The point is, nobody knows for sure what will happen to radioactive material in the long-term; there has simply not been enough experience of it.

15.1.3. This is all the more reason not to permit a company like Augean, who clearly understand little about the problem, to take on board such a potentially hazardous undertaking. Their mixture of ignorance and sublime over-confidence – they haven't, after all, had to do any of the thinking for this application themselves; they have simply employed experts to do it for them – is a recipe for disaster. If the licence is granted they will be left to their own devices with no nearby specialist help in case of emergency and no apparent plan or procedures to deal with such a disaster.

15.2. WW note with dismay the position of the EA within this application. Not only are they responsible for authorising landfills to take LLW, but they are also responsible for regulating those landfills, and acting as monitors both of the consigning and receiving sites. On top of this they are acting as consultants for Augean in this process, and are responsible to the Government for effecting the policy of using landfills to take LLW as part of the decommissioning process. There appears to be a conflict of interests here, and WW deplore the lack of an independent, or at least a different, body involved in the process.

15.3. Throughout this response, WW have used the accepted terminology surrounding radioactivity, most notably 'emissions'. Emissions are, however, pollution, and pollution that is potentially damaging to human health. If these emissions were CO₂, and there was a simple way to reduce them, Augean would face pressure to do so. Yet for radioactive pollution there seems to be different standards. WW hope that the EA are mindful of their remit to protect the environment (which does include humans), and that they will think hard before granting an authorisation to pollute.

16. Conclusion

WW urge the Environment Agency **not** to grant Augean an authorisation for the disposal of LLW at the

²² Environment Agency, Assessment of BNFL's 2002 Environmental Safety Cases for the Low-Level Radioactive Waste Repository at Drigg (NWAT/Drigg/05/001)

²³ HPA, *op.cit*, p.16

King's Cliffe site. The main reasons are:

- a. The grant of an authorisation before the NDA has finished its consultation on the disposal of LLW would prejudice any conclusions it might make.
- b. The proposal is evidence of a practical 'bottom up dynamic' by which decisions on the disposal of this nationally-significant material are impelled from below, when what is needed is an overall, strategic plan, decided by Government, which suggests the optimum locations for LLW disposal.
- c. Augean have failed to supply evidence to show that low dose levels are not harmful to health.
- d. The risk assessment works from the assumption that dose levels are safe, and that therefore lack of risk can be proved by calculating dose levels, rather than by measures to reduce emissions.
- e. The methodology used to calculate risk is untested, and its application has been prejudiced by insufficient inputted data fields.
- f. The proposal fails to show that the site is the most suitable, either by BPEO, BPM, or BAT. WW have shown that neither its location, nor its construction, indicate its suitability.
- g. Augean's use of the principle of optimisation, in its attempts to justify not taking extra measures to ensure protection of public health, is inapplicable to a private company.
- h. Augean reject established principles and procedures, such as proximity, Article 37, and classifying the site as a nuclear installation.
- i. Augean have not drawn attention to any security measures at the site, nor indicated the need for such security.
- j. The monitoring, especially where it relates to the health of the local population, is inadequate, and fails to give confidence to the community.
- k. The extent of the consultation exercise has been woefully inadequate and has not met standards required by Government policy.
- l. Augean's safety record is poor, and becoming worse. Its financial instability is a threat to its ability to fulfil its obligations under the authorisation.
- m. The size of the local community has been underestimated, and its fears over the dump have been neither considered, nor allayed, by Augean.

Endnote

It may have escaped the attention of some, as it clearly has of Augean, that their application contains another mistake. The handwritten application form states that the cells which will take radioactive material will be 4a, 5a and 5b. In the supporting information, these cells are described as 4b, 5a and 5b.

This is doubtless just a slip of the pen, a piece of momentary carelessness.

Unfortunately, it creates confusion, and possibly invalidates the application.

More unfortunately, it may be seen as part of the endemic carelessness revealed by the worsening accident record at the King's Cliffe site. If so little trouble is taken over such an important document as this, what level of care and attention can we expect when the consignments of LLW arrive, and the properties of all the different quantities and types of radionuclides have to be speedily calculated?