

Stakeholder Trust for the Disposal of Highly Radioactive Wastes in the USA, Japan, UK and Europe – Paper 11558

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ABSTRACT

Today, a global scientific and policy consensus exists in support of deep geological disposal [14]. Whether individual nations, especially the US, promote trust for this consensus is the subject of our review. In line with our past research (see [4] through [13]), we provide an overview of government and stakeholder contributions toward building trust in the decisions for the disposal of high-level radioactive wastes in the USA, Japan, UK and Europe. What is unique about a US repository is that the US has rejected its site for political, not scientific, reasons. What is unique about a repository in Japan is the nearness of its possible sites to earthquake zones. What is unique about a repository in Europe is the pursuit of multiple sites instead of one site as in the US or Japan.

UNITED STATES

In the USA, Yucca Mountain is the only Congressionally mandated site for high-level radioactive wastes (HLW consists of spent reactor fuel and wastes from reprocessing spent fuels). Yucca Mountain is not operational. Since 1999, however, deep geological disposal became operational for the Department of Energy's (DOE) transuranic wastes at its WIPP site in New Mexico.¹ At DOE's Savannah River Site (SRS) in Aiken, SC, the SRS Citizens Advisory Board made its first recommendation in support of Yucca Mountain in 1995 [16]. While it supported Yucca Mountain, the SRS-CAB was concerned that Yucca Mountain might not open; so the SRS-CAB recommended:

¹ <http://www.wipp.energy.gov/>

That the new Yucca Mountain EIS² address not only the environmental issues related to operating the Federal Repository but also those associated with not operating it (i.e., environmental impacts at SRS).

DOE accepted the recommendation and agreed to include in its EIS an evaluation of a “No-Action” alternative. In essence, DOE recognized that if Yucca Mountain did not open, it would have meant the “continued accumulation of spent nuclear fuel and high-level radioactive waste at ... Department facilities.” [17]

The SRS site is a unique storage site for DOE’s nuclear materials. As the SRS CAB has written [18]:

As a result of the Savannah River Site (SRS) production mission, the site has accumulated an extensive inventory of nuclear materials and waste extending back to the early 1950s when site operations began. While most of the nuclear materials and waste have been generated on-site, some additional materials and waste have been brought to the site in support of the larger Department of Energy (DOE) mission due to unique site capabilities. This inventory is probably the largest such inventory in the entire DOE. Considering the inventory and length of time these materials have been on-site there is some urgency to preparing and moving these materials to a final repository.

In its more recent recommendation on Yucca Mountain, the SRS-CAB spelled out its concerns in more detail [18]:

The total number of [vitrified HLW, or V-HLW] canisters is expected to exceed 7,000. Presently, the vitrified HLW in canisters is stored in two temporary Glass Waste Storage Buildings at SRS, with a third GWSB planned.³ The CAB’s concern is that in DOE’s new budget, the Yucca Mountain Repository program has been scaled back significantly with funding only sufficient to continue licensing by NRC.⁴ The SRS CAB is concerned that SNF, Surplus Pu,⁵ and V-HLW may remain indefinitely at SRS. We believe that having a path forward is critical.

In 2002, Congress and the White House accepted DOE’s determination that Yucca Mountain was an appropriate location for the repository. In June 2008, DOE applied to the Nuclear Regulatory Commission (NRC) to establish Yucca Mountain as the nation’s repository for SNF and V-HLW.⁶ To pay for the Yucca Mountain repository, the Nuclear Waste Policy Act of 1982 requires DOE to collect one tenth of a cent per kilowatt-hour for electricity generated in the US. By December 2008, the Nuclear waste Fund reached a total of \$29.6 billion; by then,

² Environmental Impact Statement; for Yucca Mountain, see <http://www.nrc.gov/waste/hlw-disposal/reg-initiatives/review-envir-impact.html>

³ http://www.srs.gov/sro/nr_2006/sr0602.htm

⁴ neinuclearnotes.blogspot.com/2009/03/washington-post-on-yucca-mountain.html

⁵ Excess plutonium, usually Pu-239.

⁶ ocrwm.doe.gov/ym_repository/index.shtml; also www.aps.org.

DOE had only spent about \$9.5 billion to examine Yucca Mountain out of a planned \$96 billion in estimated life-cycle costs spread over 150 years.⁷

The SRS CAB recognizes that SRS is otherwise safe since all of the SRS High Level waste (HLW) is being converted into glass. But the SRS CAB is concerned that the Glass Waste Storage Buildings (GWSB) are not designed for permanent storage.

Then the SRS CAB recommended that “DOE make a definitive statement on plans for the disposal of nuclear waste from the SRS to include ... the V-HLW ... in the Glass Waste Storage Buildings.”

DOE responded for SRS that it “will continue with a “good faith” effort to remove all SNF, EM⁸ surplus non-pit Pu and V-HLW from SRS as soon as reasonably practical.” [19]

But President Obama’s administration directed that the Department of Energy withdraw its licensing application to the Nuclear Regulatory Commission (NRC). To stop the President, multiple lawsuits have been filed to prevent DOE from withdrawing its license application for the repository at Yucca Mountain. In addition, President Obama created a Blue Ribbon Commission on America’s Nuclear Future (BRCANF) to begin anew the search for a geological disposal site [24].

Regarding public participation in setting policy for a high-level radioactive waste repository, BRCANF recently wrote a letter that agreed with Rosa et al. [14] to

stress “the importance of engaging impacted publics at the beginning of policy planning and projects.” We agree ...

This engagement with impacted publics has benefited us greatly and has highlighted both the diversity and depth of public concern about nuclear waste management ...

Although we agree with many of the comments Rosa and his colleagues offered the Commission, we take issue with their characterization of the Commission’s efforts at transparency and inclusiveness. The steps we have taken to ensure transparency far exceed the requirements of the Federal Advisory Committee Act (FACA). For example, we have opened subcommittee presentation sessions to the public, provided live webcasting of full Commission and subcommittee open meetings, extended public comment sessions far beyond what FACA requires, and funded the participation of community representatives in the Commission’s proceedings. Rosa et al.’s description of this process as a “pro forma approach—where the emphasis is on meeting formal requirements, not the needs of the public” strikes us as based on incomplete information. In fact, we have

⁷ *ibid.*

⁸ SNF: Spent nuclear fuel; EM: DOE’s Office of Environmental Management.

implemented most of the recommendations on transparency and inclusiveness provided by Rosa and his colleagues in a 25 March 2010 letter to the Commission

...

In response to BRCANF's criticism, Rosa et al. replied [27]

... past research and our own experience in conducting FACA processes show the law to be a minimal standard, suited to hearing prepared (and sometimes strategic) comments from professionals. Such testimonies cannot reveal the depth of distrust among culturally and historically disenfranchised individuals. Hearing public concerns is not the same as engaging with the public and making them part of deliberations. The response to the tritium leak at Brookhaven National Laboratory in 2002 provides a good example of using effective engagement, supported by social science knowledge, to resolve conflict with the public ... By focusing on procedural mechanics (e.g., going beyond FACA), the BRCANF does not address the deeper issues of how problems are framed and how options are deliberated. Listening to social scientist explanations is no substitute for carefully conducted research and active outreach to citizens for whom the act of communication may be as important as the communication content.

We argued for social science membership on the BRCANF or its subcommittees because we believe it is important to provide social science expertise on a continuing basis. This structure will ensure the implementation of effective deliberation techniques that engage the public early and continuously—not just to communicate their views but to give them a meaningful role in the decision-making process. As the BRCANF learned at its meetings, social science input has played a constructive role in the design of nuclear waste management planning in Europe ... and Canada ... To achieve similar success, the Commission must meaningfully involve the public and the social sciences. *The efforts cited in the BRCANF letter will create neither the social trust nor the trustworthiness needed to solve the waste problem.* (emphasis added)

Once again, DOE has become widely mistrusted in the US (e.g., [15]; also [14]), not only with Yucca Mountain. As an example of why DOE is mistrusted, consider SRS. Until recently, SRS had been more trusted by the public around SRS than any other site in the DOE complex, especially compared to DOE at its Hanford site [5],[9]. But DOE has begun to shut down the free exchange of information at all of its sites, making it difficult for the public to trust DOE on its decisions, including the HLW repository [31]. DOE has stopped the independent peer review of its annual monitoring report at SRS. DOE lost more public credibility after it attempted to shutter the independent Savannah River Ecology Laboratory at SRS. And since 2005, citizens around SRS who had become used to full access to unrestricted information at SRS, including access to DOE scientists and engineers at SRS, now find that their access has become limited or restricted. The SRS-CAB Technical Advisor has been instructed by DOE to not ask technical questions during public briefings. Some SRS-CAB members and SRS workers have complained that they learn more about SRS problems in the media than from DOE managers.

Because organizations depend on information to solve the problems they face, the loss of information suggests that it may parallel an increase in operational problems at SRS (e.g., the recent spill of liquids containing Pu-238; cf. [20]).

In addition [31], the SRS-CAB is not allowed to choose or to fire its Technical Advisor, nor supporting staff, with all of them reporting to DOE, not the CAB. Starting in January 2011, the CAB will not be permitted to choose its own members, a process begun with its founding in 1993. Finally, the SRS-CAB does not have the authority to reject decisions imposed on it by DOE. Instead of information transparency, the result of suppressing the general flow of information to the SRS-CAB is ineffective public participation.

JAPAN

In Japan, reprocessing of spent fuel and deep geological disposal of vitrified high-level waste have been Japan's priorities. The search of a site for a deep geological disposal facility has been ongoing since 2002. Stakeholders attempt to exert influence on decision making processes by means of social movements, local elections, and litigation.

In Japan, many organizations share responsibility for nuclear energy and radioactive waste management. Its Atomic Energy Commission (AEC) “plans, deliberates, and makes decisions on national policies relating to the utilization of nuclear energy” [28]. Radioactive Waste Management funding and research Center (RWMC) researches radioactive waste management, assisted by the Nuclear Waste Management Organization (NUMO).

In addition to other authorities, various stakeholders and decision makers are involved in developing nuclear energy policies in general and the management of radioactive waste materials. But the division of labor is not straightforward. NSC attempts to incorporate a broad spectrum of interests through a diversity of report reviews and public comments. However, outside of government and industry, few perspectives are acknowledged.

Japan increased its number of reactors from 32 in 1987 to 55 in 2006, dropping to 53 in 2009, to generate about one-third of its electricity. Japan is committed to nuclear reprocessing. Rather than simply dispose of nuclear waste, it attempts to extract uranium and plutonium from spent nuclear fuel. A reprocessing plant, located in Rokkasho, Aomori Prefecture [79], is expected to commence operations in October 2010.

Public acceptance of nuclear energy and radioactive waste management policies in Japan are controversial. About 80% of respondents surveyed disapproved of the construction of high-level waste repository in their community. [29].

However, the authorities do not intend working with voluntary groups on decision making of waste management [30]. Instead, they want public acceptance of geologic disposal policies through public relations.

And yet, according to the Japanese AEC [25],

Hence, the NUMO has adopted and started an open solicitation approach to find candidate areas for the feasibility study of final repository from countrywide municipalities in 2004. Areas to be investigated will be selected carefully by stepwise process consisting of literature survey, preliminary investigation and detailed investigation, respecting opinions of the concerned local communities at each step. Although no mayor of municipalities has succeeded to apply the study yet, the NUMO is enthusiastically committing to communication activities to achieve mutual understanding on necessity and safety of geological disposal, working closely with the government and the electric power companies who are major waste generators.

At ICEM-10 in Tsukuba, Japan, we discussed this situation with the public and representatives from NUMO. Until now, the process has been surreptitious and not open to public participation, producing surprise, even shock and anger when it belatedly becomes public information. For example, regarding the only application for a repository from a Japanese municipality, by the mayor of Toyo-cho, got this response [32]:

... mayor Yasuoki Tashima of Toyo-cho had handed in the application for the Literature Survey to build a high-level nuclear radioactive waste disposal site, however, was rejected since it had been confirmed at talk with NUMO, Mayor Tashima and the director of the Planning, Commerce and Industry Division of Toyo-cho and that he had not gained an understanding from the council and the residents ... (p. 3) NUMO, an organization which runs HLW projects, didn't effectively coordinate Toyo-cho and stakeholders ... (p. 1)

JAPAN: CONCLUSION

Citizen participation is new to Japan. Legislation regarding waste management calls for information disclosure to facilitate public acceptance of reprocessing policies. But to date, stakeholders have not participated in setting or making policy. Relationships between agencies and citizens mirror public relations more than deliberation.

EUROPE

In Europe, broad consensus exists for deep geological disposal as the best technical solution for high-level waste repositories. Countries that have found the political will and taken the political decision to assess the deep geological disposal option and are close to authorizing the construction of sites include Finland, Sweden, Switzerland and France. Countries that have not yet decided include Belgium, Germany and UK. Switzerland and France are still in the process of selecting a site for the facility. Other countries are actively considering this option. The rock formations most studied for deep disposal are clay (in Belgium, France, Germany and Switzerland), crystalline rocks (Sweden, Finland and Switzerland) and salt (Germany).

United Kingdom: In the UK, we have carried out research that focuses on the influence

that nuclear industry stakeholders have on decision making for nuclear decommissioning [6],[9]. The work used the Nuclear Decommissioning Authority National Stakeholder Dialogue process as a research group to assess participants' perceptions regarding the nature of the dialogue used to engage them and their influence on the decision making process. The findings of the work highlighted the various types of dialogue used in meetings (deliberation, consultation), the role of social interaction outside the meetings and the importance to participants of demonstrating their influence on the decisions made. We discuss the emergent themes of the role of deliberation, fairness and stakeholder influence with reference to the dialogue process implemented for the decommissioning of nuclear power station sites in the UK.

Nuclear Decommissioning Authority (NDA) and the National Stakeholder Group (NSG) have manifold aims. For the long-term disposal of higher activity radioactive wastes, NDA is “working with government and communities on the programme for the implementation of geological disposal for higher active wastes” with public workshops [57]). The transparency of participants to express views, engage with NDA and understand other stakeholder positions were priority issues for respondents. But stakeholders were confused regarding their influence and role at NSG.

In terms of time, cost and availability of staff members at both the nuclear site and national level, NDA has committed to stakeholder engagement. But NDA was not clear how participants influenced its thinking. Although informal discussion by stakeholders occurred at these meetings, NDA did not translate these deliberations into a formal demonstration of stakeholder influence. No evidence was offered by NDA based on participant comments that matched its commitment. This became a missed opportunity in the minds of stakeholders and decision-making resilience for future NDA Strategy.

Sweden: SKB, Sweden’s nuclear fuel and waste management company, decided in 2009 to build its final repository for spent nuclear fuel at Forsmark. The waste disposal facility, which could be completed by 2023, should be one of the first permanent disposals for high level waste (HLW) to be built in the world. It has taken around 20 years to make a decision on where to build the facility. Swedish high-level waste will be disposed of in the final repository in crystalline bedrock at a depth of nearly 500 m.

Finland: In 2001, a governmental decision in principle was ratified by the Finnish Parliament. It states that the location of the future final repository will be in Olkiluoto, Eurajoki. The facility is expected to start by 2020.

Switzerland: The Federal Council adopted on 2 April 2008 a plan to construct deep geological repositories. The selection of the site is currently being carried out. NAGRA, the Swiss waste management company, has already proposed potential sites.

France: The 2006 French law on radioactive waste management provides that a deep geological repository for high-level waste should be built by 2025. The law also indicates that waste has to be retrievable.

Final HLW disposal in USA, Japan, Europe and UK: DGR: Deep Geological Repository; RWM: Radioactive Waste Management; GD: Geological Disposal

Sources:

<http://www.euridice.be/eng/010301infrastructuur.shtm>

	Organization	Decision Date	Site	Research	Start	Type
Belgium	ONDRAF	2011	Not known	Mol, Hades DGR (clay)	Not known	Not known
Finland	POSIVA	2001	Olkiluoto (2001)	None	2020	DGR (crystalline bedrock)
France	ANDRA	2006: law on RWM	Selection in process	Bure (Meuse) DGR (clay)	2025	DGR (retrievability)
Germany	BFS	None	Not known	Gorleben DGR (salt)	Not known	Not known
Japan	AEC	Not set	Not selected	Open	Not known	DG
Sweden	SKB	1977 Stipulation Act; 2001-2002 DGD approval	Forsmark (2009)	Äspö Hard Rock Laboratory (DGR)	2023	DGR (crystalline bedrock)
Switzerland	NAGRA	2008: Plan to build DGR	Selection in process	Grimsel pass (Canton Bern): DGR (clay)	Not known	DGR
UK	NDA	2008: White Paper on RWM (framework for GD)	Not known	In preparation	Not known	DG
USA (HLW)	DOE OCRWM	In litigation	Possibly Yucca Mountain	Extensive	Post-poned	GD (tuft)
USA (TRU)	DOE Carlsbad	Operational	WIPP	Extensive, licensed	1999	GD (salt)

http://www.skb.se/Templates/Standard_26400.aspx

<http://www.foratom.org/e-bulletin-tout-1378/other-articles-tout-1385/610-forsmark-in-sweden-to-be-first-hlw-final-repository-in-europe-.html>

DISCUSSION

We assumed that there is value in the public's participation from the perspective of the increasing trust in the process coupled with more sustainable decisions (e.g., Ostrom [22]; also, see [1],[2],[3]). However, according to the OECD [23],⁹ there are at least two reasons why Yucca Mountain failed to be accepted by the State of Nevada's publics: DOE's public participation groups were not able to hire their own technical advisors; and the public participation groups did not have the power to reject the decisions imposed on them by DOE. In reviewing this state of affairs with the public and DOE and the SRS-CAB [31], the first author recommended to DOE that the CAB at SRS and across the DOE complex provide an excellent opportunity to use the CABs as a laboratory to relearn how to reinvigorate public participation processes at its CABs and to avoid a repeat of what happened at Yucca Mountain.

Today, nuclear waste decision in the US and to a lesser extent in the UK and Japan are often made by experts in a manner that indicates a high degree of trust in the democratic process. The end result may well be chaotic due to the long time scales required to design, build and operate a high-level radioactive waste repository.

SUMMARY

Instead of faceless bureaucracies making decisions for the public, properly run public participation processes will return democracy back to the public for nuclear waste decisions. But it may also increase the likelihood of a more sustainable decision as indicated by European [23] and American [22] scientists.

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REFERENCES

1. J.A. BRADBURY, K.M. BRANCH, & E.L. MALONE, E.L. An evaluation of DOE-EM Public Participation Programs (PNNL-14200), (2003).
2. T. DIETZ, E. OSTROM, & P.C. STERN, "The struggle to govern the commons." *Science* 302 1907, (2003).
3. Holmes, O. W. (1919). U.S. Supreme Court, *Abrams et al. v. United States*, No. 316. The dissent was written by Justice Holmes, concurred by Justice Brandeis.

⁹ Organization for Economic Co-operation and development; see http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html

4. Lawless, W. F. (1985). "Problems with military nuclear wastes." Bulletin of the Atomic Scientists 41(10): 38-42.
5. Lawless, W. F., Bergman, M., & Feltovich, (2005). Consensus-seeking versus truth-seeking, ASCE Hazardous, Toxic, and RadWaste Mgt, 9(1): 59.
6. Lawless, W. F. & Whitton, J. (2006), Consensus versus truth-seeking, WM'06, 2/26-3/2, 2006, Tucson.
7. Lawless, W. F., & Whitton, J. (2007a). "Consensus driven risk perceptions versus majority driven risk determinations " Nuclear Futures, 3(1): 33-38.
8. Lawless, W. F. & Whitton, J. (2007b), Case studies of stakeholder decision making on radioactive waste mgt in US and UK, WM'07, 2/28/2007, Tucson.
9. Lawless, W. F., Whitton, J., & Poppeliers, C. (2008a). "Case studies from the UK and US of stakeholder decision-making on radioactive waste management." ASCE Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management 12(2): 70-78.
10. Lawless, W.F., Whitton, J., Poppeliers, C., & Abubucker, C.P. (2008b), Stakeholder decision making on radioactive waste management in the US and UK, Proceedings of WM08, Phoenix, AZ.
11. Lawless, W.F., Whitton, J., Poppeliers, C., & Akiyoshi, M. (2009), Stakeholder participation in environmental cleanup of radioactive wastes in United Kingdom, Japan and United States-9024, Proceedings Waste Management 2009, Phoenix.
12. Lawless, W.F., Whitton, J., Akiyoshi, M., Angjellari-Dajci, F., & Poppeliers, C. (2010, March 11), *An Update on Stakeholder participation in the environmental cleanup of radioactive wastes in the UK, Japan and US – 10390*, WM'09 Conference, March 7 - 11, 2010, Phoenix, AZ
13. Lawless, W.F., Akiyoshi, M., Whitton, J., Angjellari-Dajci, F., & Poppeliers, C. (2010, October), A comparative study of stakeholder participation in the cleanup of radioactive wastes in US, Japan and UK, Proceedings of 13th ICM2010, □October 3-7, 2010, Tsukuba, Japan.
14. Rosa, E.A., Tuler, S.P., Fischhoff, B., Webler, T., Friedman, S.M., Sclove, R.E., Shrader-Frechette, K., English, M.R., Kasperson, R.E., Goble, R.L., Leschine, T.M., Freudenberg, W., Chess, C., Perrow, C., Erickson, K. & Short, J.F. (2010), Nuclear waste: Knowledge waste? Science, 329: 762-3.
15. Metlay, D. (1999), Institutional **trust** and confidence: A journey into a conceptual quagmire, in G. Cvetkovich & R. Lofstedt (Eds.), Social Trust and the Management of Risk, London: Earthscan, pp. 100-116.
16. SRS-CAB (1995, Nov. 28), High-level waste disposal. Recommendation No. 14.
17. Bames, W.E., Department of Energy, Office of Civilian Radioactive Waste Management, Yucca Mountain Site Characterization Office (1996, February 11), Letter to Robert Slay, Chair, SRS-CAB.
18. SRS-CAB (2009), Final disposition for Spent Nuclear Fuel, Surplus Plutonium, and Vitrified High level Waste. Recommendation No. 263.
19. Allison, J. (2009, July 1), Letter from DOE at SRS to Manuel Bettencourt, Chairperson, SRS CAB.
20. DNFSB (2010, July 30), DEFENSE NUCLEAR FACILITIES SAFETY BOARD Technical Report, to T. J. Dwyer, Technical Director, from M. T. Sautman and D. L. Burnfield, Site Representatives, subject: Savannah River Site Weekly Report

- for Week Ending July 30, 2010. It describes the spill of liquids from a drum taken from Pad 16 but containing pu-238 inside of the Solid Waste Management Facility. See news report of the incident in Augusta Chronicle (2010, 9/1) "Procedure review follows slow response to July spill".
21. Lawless, W. F. (1985). "Problems with military nuclear wastes." Bulletin of the Atomic Scientists **41(10)**: 38-42.
 22. Ostrom, E. (2009). "A general framework for analyzing sustainability of social-ecological systems." Science **325**: 419-422.
 23. Pescatore, C. (2010): Activities of the OECD/NEA in the Field of Stakeholder Confidence for Radwaste Management and Decommissioning, Paper 40288, ICEM2010, Tsukuba, Japan.
 24. Blue Ribbon Commission on America's Nuclear Future (BRCANF) webpage: <http://brc.gov/>.
 25. Kondo, S., Chairman Japan Atomic Energy Commission (JAEC), (2010, November 15-16) A Note on Japanese Backend Policy: Past and Present, Presentation to BRCANF.
 26. Hamilton, L. & Scowcroft, B., Co-Chairmen, Blue Ribbon Commission on America's Nuclear Future, U.S. Department of Energy, (2010, October 22), Nuclear Waste: Progress with Public Engagement, *Science, Letters*, 330, 448.
 27. Rosa et al. (2010, October 22), Response. *Science, Letters*, 330, 448-9.
 28. Ministry of Economy, Trade and Industry. (2005). "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management" Retrieved 9/8/08 from www.meti.go.jp/report/data/g51114aj.html.
 29. TCO-GOJ (2009), The Cabinet Office, the Government of Japan, "A Survey on Nuclear Power" ("Genshiryokuni Kansuru Tokubetsu Yoron Chousa") www8.cao.go.jp/survey/tokubetu/tindex-h21.html (for a news account in English, see www.breitbart.com/article.php?id=D9C771400&show_article=1; and whatjapanthinks.com/2009/12/01/nuclear-power-generation-worries-in-japan/)
 30. NISA February 25, 2010 "Re: Inquiries about Nuclear Waste Management" email reply to the Whitton.
 31. Lawless, W.F. (2010, November 15], Public review comments presented to the Department of Energy's Citizens Advisory Board, Savannah River Site.
 32. Komatsuzaki, S., Saigo, T. & Horii, H. (2009). An analysis of the dispute process regarding high-level nuclear waste repository siting in Toyo-cho, Japan: Decisive factors in the dispute and roles of the governments and experts, presented at *Managing Radioactive Waste Problems and Challenges in a Globalizing World*, University of Gothenburg, Sweden (December 15-17, 2009).
 33. NDA Annual Report 2007/08 (2008, July 17). Retrieved 9/21/08 from www.nda.gov-UK/news/arac-0708.cfm. Also, NDA Annual Report 2008/2009. Retrieved 12/14/09 from: <http://www.nda.gov.uk/loader.cfm?csModule=security/getfile&pageid=31829>