

Nevada Site Specific Advisory Board

June 9, 2011

Greater-Than-Class C Low-Level Radioactive Waste EIS
Office of Technical and Regulatory Support (EM-43)
U.S. Department of Energy
1000 Independence Avenue, SW.
Washington, DC 20585-0119

The Nevada Site Specific Advisory Board (NSSAB) appointed a subcommittee to review the Greater Than Class C Draft (GTCC) Environmental Impact Statement (EIS). The NSSAB is submitting the following formal comments to the Department of Energy (DOE) for consideration. Comments are focused on Nevada National Security Site related topics and broad regulatory issues. Expanded information on each comment can be found in the enclosed Appendix 1.

1. The Draft GTCC EIS does not include a preferred alternative. This severely limits the scope of the potential comments that might be received.
2. The GTCC EIS Scoping Hearings were based on an assumption that the Yucca Mountain license application would be submitted by June 2008. Dismissal of the Yucca Mountain repository option from consideration in the Draft GTCC EIS invalidates the scoping process, which should be redone.
3. GTCC waste is defined and regulated by the Nuclear Regulatory Commission (NRC). It is not clear the NRC will accept the near surface disposal alternatives (i.e., trenches or vaults). The DOE should formally engage the NRC in a rulemaking on this matter before recommending to Congress a path forward that the NRC ultimately may not support.
4. The Draft EIS assumes that: the effective life of the intruder barriers will be 500 years; GTCC waste is stable; and the maximum concentration of radionuclides at the end of the 500 year period will be at a level that does not pose an unacceptable hazard to an intruder or to public health and safety. The EIS contains no supporting documentation to support these assumptions and therefore the various disposal options cannot be reasonably compared.
5. The Draft GTCC EIS suffers from a lack of perspective of the difficulty of licensing a facility that had originally addressed 10 Code of Federal Regulations (CFR) Part 60 or 63 requirements. Licensing by the NRC would be done in an administrative hearing, which is a much more contentious and rigorous undertaking than an EPA permit process.
6. Insufficient information is presented that would allow local communities to understand how the projected transportation routes would impact those communities. (This is a particularly sensitive issue for the Nevada National Security Site [NNSS] due to the existing large amount of radioactive waste transported through the area).

Members

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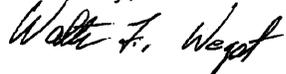
Administration

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7. The Draft GTCC EIS also does not include information about how shipping containers would be "certified." It would be appropriate to address such requirements in the EIS. (This is also a particularly sensitive issue for communities near the NNSS.)
8. The methodology for mitigation of human intrusion described in the Draft GTCC EIS is not consistent with existing requirements for geologic disposal. Both EPA and NRC regulations specify that an intrusion must be modeled as occurring and causing radioactive material to reach groundwater resources. (This point could work strongly in favor of the NNSS as the preferred disposal site).
9. The Draft GTCC EIS does not adequately address the potential impacts to historic artifacts or biological resources.
10. The Draft GTCC EIS does not adequately represent the difficulties that will arise in attempting to modify the WIPP Land Withdrawal Act to allow nearly thirty times as much total radioactivity as is currently allowed by the law. The EIS does not convey the difficulties inherent in requesting Congress to modify both the WIPP Land Withdrawal Act and the Nuclear Waste Policy Act.
11. The performance assessments described in the Draft GTCC Environmental Impact Statement are deficient because they assume that the facility characteristics to which performance is most sensitive will be met, rather than demonstrating that they can be met. For example, the Draft GTCC EIS does not recognize that removal of the sheet piling following trench disposal will create a pathway for water to contact wastes rapidly.
12. The Draft GTCC EIS does not present definitive arguments demonstrating that a near surface cover could meet the expected performance required for GTCC waste disposal.
13. On Page 5-65 the conclusion presented in the paragraph "As the distance would increase from 100 m (330 ft) to 500 m (1,600 ft), the maximum annual radiation dose would increase by more than 70%" is incorrect and is inconsistent with the argument presented.
14. The argument that a reduction in dose would occur with distance because of additional dilution of radionuclide concentrations in groundwater is not consistent with the EPA's concept of "Reasonably Maximally Exposed Individual" used as the receptor in current repository regulations. (This argument is also essentially irrelevant to near surface disposal at the NNSS since groundwater at that site is very deep and surface water does not reach the groundwater).
15. There are numerous deep boreholes existing on the NNSS as part of the Test Readiness Program (eventual use for nuclear weapons testing). These boreholes should be considered for disposal of GTCC wastes.

The NSSAB thanks you for the opportunity to comment on this Draft GTCC EIS. We hope that our comments will be beneficial to DOE as you move forward in addressing the problem of what to do with GTCC wastes.

Sincerely,



Walter F. Wegst, Chair

Attachment (Appendix 1)

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Appendix 1

Nevada Site Specific Advisory Board Expanded Comments to the Greater Than Class C (GTCC) Draft Environmental Impact Statement (EIS) June 2011

1. The Draft GTCC EIS does not include a preferred alternative. This severely limits the scope of the potential comments that might be received.

Because the Draft GTCC EIS does not include a preferred alternative, it severely limits the scope of the potential comments that might be received. Typically, an Environmental Impact Statement would address multiple alternative approaches for an application at a specific site or perhaps multiple sites for a specific application. The GTCC EIS addresses twelve¹ potential sites with three potential disposal methods. Because the different categories of waste might not be suitable for each of the potential disposal methods, the number of alternatives may be even greater. This decision matrix is far too wide to analyze properly.

We understand that the Council on Environmental Quality (CEQ) regulations² can be read to mean that if the agency has a preferred alternative at the Draft EIS stage, that alternative must be labeled or identified as such in the Draft EIS, or if the responsible federal official in fact has no preferred alternative at the Draft EIS stage, a preferred alternative need not be identified there. Nonetheless, without an indication of how the DOE intends to proceed, or meaningful information to allow discrimination among the options, the public cannot be expected to generate meaningful comments.

It is thus imperative that the public be given a chance to comment on a preferred alternative, even if this means that the Department will have to delay the recommendation to Congress and any Record of Decision until after time has been allowed for the public to comment on the "Final" Environmental Impact Statement, and for those comments to be addressed by the Department.

¹ Hanford Site, Idaho National Laboratory, Los Alamos National Laboratory, the Nevada National Security Site, the Savannah River Site, the Waste Isolation Pilot Plant, and the Waste Isolation Pilot Plant Vicinity (where two locations are evaluated – one within and one outside the land withdrawal boundary, and four Generic (commercial) sites that coincide with the four NRC regions.

² According to the CEQ, the "agency's preferred alternative" is identified so that agencies and the public can understand the lead agency's orientation. 10 CFR 1502.14(e) requires the section of the EIS on alternatives to "identify the agency's preferred alternative if one or more exists, in the draft statement, and identify such alternative in the final statement . . ." If the public is expected to provide meaningful comments on the path forward to disposal of GTCC wastes, it has a right to expect information giving consideration to economic, environmental, technical and other factors about the alternatives. This Draft GTCC Environmental Impact Statement does not provide such information at a level appropriate to discriminate among the options, and is unclear about which alternative the agency believes would fulfill its statutory mission and responsibilities.

- 2. The GTCC EIS Scoping Hearings were based on an assumption that the Yucca Mountain license application would be submitted by June 2008. Dismissal of the Yucca Mountain repository option from consideration in the Draft GTCC EIS invalidates the scoping process, which should be redone.**

Scoping hearings were held in 2007, a point in time where the Department of Energy (DOE) had publically announced that submittal of the license application for the Yucca Mountain repository would take place less than one year later. With this Draft EIS, the DOE excluded the potential Yucca Mountain repository from consideration as a GTCC waste disposal option. There can be little doubt that the scoping commenters were aware of the Yucca Mountain repository program, and the fact that its EIS had considered the disposal of GTCC wastes. 10 CFR 61.55(a)(2)(iv) states: *[I]n the absence of specific requirements in this part, such waste must be disposed of in a geologic repository as defined in part 60 or 63 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.* Removal of the only repository to ever address 10 CFR Part 60 or 10 CFR Part 63 regulations from consideration, especially since there are lawsuits challenging the Secretary's abandonment of the Congressionally approved Yucca Mountain program, and the Secretary has testified that if directed by the Courts he will execute the program, has a significant negative impact on this Draft GTCC EIS. As the scoping hearings could not have anticipated or foreseen the current situation, the Draft GTCC EIS cannot be responsive to public perspectives on this important issue. Scoping should be redone if Yucca Mountain is not to be considered.

- 3. GTCC waste is defined and regulated by the Nuclear Regulatory Commission (NRC). It is not clear the NRC will accept the near surface disposal alternatives (i.e., trenches or vaults). The DOE should formally engage the NRC in a rulemaking on this matter before recommending to Congress a path forward that the NRC ultimately may not support.**

The Draft GTCC EIS is written from a perspective that the two relatively near surface alternatives, namely, trench or vault burial, will be acceptable to the NRC. To the contrary, the NRC regulations at 10 CFR Part 61 suggest otherwise. In 10 CFR 61.7(a)(5) NRC notes that; *[T]his waste is disposed of at a greater depth than the other classes of waste so that subsequent surface activities by an intruder will not disturb the waste. Waste with concentrations above these limits is generally unacceptable for near-surface disposal.* Further, it notes that: *[T]here may be some instances where waste with concentrations greater than permitted for Class C would be acceptable for near-surface disposal with special processing or design. These will be evaluated on a case-by case basis.* It is inappropriate to assume that because the NRC is willing to consider that there *may be some instances* (emphasis added) where waste with concentrations greater than permitted for Class C would be acceptable for near-surface disposal with special processing or design that all GTCC wastes would meet this exemption, as is done in the Draft GTCC EIS. 10 CFR 61.55(a)(2)(iv) is clear that: *[I]n the absence of specific requirements in this part, such waste must be disposed of in a geologic repository as defined in part 60 or 63 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission.* A recommendation for a preferred disposal method that relies on an assumption that the NRC will find that near surface disposal for GTCC wastes is generally acceptable is a very precarious position for the DOE. It would seem

appropriate for the DOE to formally engage the NRC in a rulemaking on this matter before recommending to Congress a path forward that the NRC ultimately may not support.

- 4. The Draft GTCC EIS assumes that: the effective life of the intruder barriers will be 500 years; GTCC waste is stable; and the maximum concentration of radionuclides at the end of the 500 year period will be at a level that does not pose an unacceptable hazard to an intruder or to public health and safety. The EIS contains no supporting documentation to support these assumptions and therefore the various disposal options cannot be reasonably compared.**

The Draft GTCC EIS does not address how the DOE intends to assure the decision makers that the selected disposal option will in fact be allowable under the 10 CFR Part 61 requirements if other than repository disposal option is selected. It seems reasonable that borehole disposition could readily be allowed by the NRC, particularly if sealing requirements are addressed. However, it is not clear how the DOE will get NRC approval for other than repository disposal. This is particularly crucial as the Draft GTCC EIS does not demonstrate that the important 10 CFR Part 61, or Part 60 or Part 63 for that matter, requirements will be met. The Draft GTCC EIS assumes that the effective life of the intruder barriers will be 500 years, assumes the maximum concentration of radionuclides at the end of the 500 year period will be at a level that does not pose an unacceptable hazard to an intruder or public health and safety, and assumes GTCC waste will be stable. A reasonable comparison among the proposed options would require a meaningful demonstration that these requirements will be met by the options.

- 5. The Draft GTCC EIS suffers from a lack of perspective of the difficulty of licensing a facility that had originally addressed 10 Code of Federal Regulations (CFR) Part 60 or 63 requirements. Licensing by the NRC would be done in an administrative hearing, which is a much more contentious and rigorous undertaking than an EPA permit process.**

While it is true that the Waste Isolation Pilot Plant (WIPP) is a repository, it is permitted principally under State of New Mexico Resource Conservation Recovery Act (RCRA) requirements. While not intentionally demeaning the WIPP permitting process, experience gained with the Yucca Mountain program in pre-licensing interactions with the NRC suggests that licensing a GTCC facility to NRC repository or repository equivalent requirements could be a much more challenging exercise than the WIPP compliance certification process. The WIPP permitting process was based on a compliance certification process that was essentially a rulemaking. Licensing by NRC, particularly under requirements that could be equivalent to those for a repository, would be done in an administrative hearing. This is a much more rigorous undertaking, admitting interveners who are allowed to submit contentions to be litigated by the hearing. These contentions could challenge, in court, all of the technical arguments made by the applicant and supported by the staff.

6. Insufficient information is presented that would allow local communities to understand how the projected transportation routes would impact those communities. (This is a particularly sensitive issue for the Nevada National Security Site [NNSS].)

While it is likely that the transportation risk calculations used reasonable assumptions about shortest transit times and interstate highways, there is no recognition, for example, in Nevada that alternate routes likely would be specified, as is the case for low level waste shipments coming today to the Nevada National Security Site. These additional shipments, coming through small rural communities, will add a burden for emergency response capability that is not addressed in the Draft GTCC EIS. The following graphics provide a synopsis of the FY 2010 low-level waste transportation activities that already take place on the anticipated shipping routes.

List of Approved Generators Shipping To/On the NNSS in FY2010

	APPROVED GENERATOR, STATE	GENERATOR CODE
1	ADVANCED MIXED WASTE TREATMENT PROJECT, ID	AM
2	ARGONNE NATIONAL LABORATORY, IL	AE
3	BABCOX & WILCOX TECHNICAL SERVICES Y-12, TN	BW
4	BATELLE ENERGY ALLIANCE, ID	NE
5	BROOKHAVEN NATIONAL LABORATORY, NY	BR
6	DURATEK/ENERGYSOLUTIONS, TN	DR
7	ENERGX ARGONNE NATIONAL LABORATORY, IL	EN
8	IDAHO NATIONAL LABORATORY, ID	IN
9	LAWRENCE LIVERMORE NATIONAL LABORATORY, CA	LL
10	LOS ALAMOS NATIONAL LABORATORY, NM	LA
11	NATIONAL SECURITY TECHNOLOGIES, NV	DP
12	NAVARRO-INTERRA LLC, NV	IT
13	NUCLEAR FUEL SERVICES, TN	NF
14	OAK RIDGE RESERVATION, TN	OR
15	PADUCAH GASEOUS DIFFUSION PLANT, KY	PD
16	PANTEX PLANT, TX	PX
17	PERMAFIX (M&EC), TN, WA, CA	PF
18	PORTSMOUTH GASEOUS DIFFUSION PLANT, OH	PO
19	PRINCETON PLASMA PHYSICS LABORATORY, NJ	PL
20	SANDIA NATIONAL LABORATORIES, NM	SA
21	UT-BATELLE, TN	OL
22	WASTREN ADVANTAGE INC., TN	FW

**Figure 1 - FY 2010 National
Low-Level and Mixed Low-Level Waste General Transportation Routes
to/from the Nevada National Security Site**



Shipment Summary of Off-site, Inbound Regional Routes for FY 2010

DESCRIPTION	AE	AM	BR	BW	DR	EN	FW	IN	IT	LA	LL	NE	NF*	OL	OR	PD	PF	PL	PO	PX	SA	TOTAL
I-15 (MESQUITE), I-215, US-95 (NORTH BELTWAY NON APPROVED)	1																	1				2
I-15, CA-127, CA-178, NV-372, NV-160, US-95											3						817					820
I-15, CA-127, NV-373, US-95					1						17						41					59
I-15, NV-160, US-95					1												67					68
I-40, I-15, CA-127, NV-373, US-95				2																		2
I-40, I-15, NV-160, US-95																			1			1
I-40, US-93, AZ-68, NV-163, US-95, NV-164, I-15, NV-160, US-95	1		1	14			5				1				25							47
I-40, US-95, NV-164, I-15, CA-127, CA-178, NV-372, NV-160, US-95													1						1			2
I-40, US-95, NV-164, I-15, CA-127, NV-373, US-95				2	1	2				2												7
I-40, US-95, NV-164, I-15, NV-160, US-95	21		35	567	18	9	23	9			1	28	46	4	101	77	71		215	3	6	1234
I-80, I-80/ALT-95, US-95 (WINNEMUCCA)								2														2
I-80, US-93-ALT, US-6, US-95	28	46	21		1	195		18				29					18					356
I-80, US-95 (RENO)					1			2														3
US-90, US-6/90, US-6, US-95			7			162																169
US-6, US-95 (TTR)									13													13
US-93, US-6, US-95		26						45				9	47				2					82
	51	72	64	585	23	368	28	76	13	2	22	66	47	4	126	77	1016	1	217	3	6	2867

* 20 shipments were shipped via rail to Parker, AZ then transported via motor carrier to the NNSS.



- 7. The Draft GTCC EIS also does not include information about how shipping containers would be “certified”. It would be appropriate to address such requirements in the EIS. (This also a particularly sensitive issue for communities around the NNSS).**

As the GTCC wastes are deemed by the NRC to be sufficiently hazardous to require that *such waste must be disposed of in a geologic repository as defined in part 60 or 63 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission*, it is not unreasonable to question whether or not the transportation containers need to be as robust as those required for shipping high-level radioactive waste or spent nuclear fuel. No information is provided about the shipping containers, the certification testing, or any ancillary transportation requirements pertaining to escorts, notifications, or emergency response requirements. Such information would be invaluable to differentiate impacts among the different potential locations under consideration.

- 8. The methodology for mitigation of human intrusion described in the Draft GTCC EIS is not consistent with existing requirements for geologic disposal. Both EPA and NRC regulations specify that an intrusion must be modeled as occurring and causing radioactive material to reach groundwater resources. (This point could work strongly in favor of the NNSS as the preferred disposal site.)**

The Draft GTCC EIS states that human intrusion impacts might be mitigated by the waste form and packaging, institutional controls, and engineered and natural barriers (e.g., grouting and depth of disposal). All four disposal methods analyzed in the EIS include a combination of some or all these mitigation features. Mitigation of human intrusion is not consistent with requirements for geologic disposal; both EPA and NRC regulations specify that an intrusion must be modeled as occurring and causing radioactive material to be placed in groundwater resources.

- 9. The Draft GTCC EIS does not adequately address the potential impacts to historic artifacts or biological resources.**

The Draft GTCC EIS states that once (a) specific site(s) is (are) selected for further consideration, DOE plans to consult with other agencies including the Advisory Council on Historic Preservation, the appropriate State Historic Preservation Officer(s), and pertinent Regional Fish and Wildlife Service Office(s). It is not clear how the Draft EIS can be said to have considered and addressed the associated impacts.

- 10. The Draft GTCC EIS does not adequately treat the difficulties that will arise in attempting to modify the WIPP Land Withdrawal Act to allow nearly thirty times as much total radioactivity as is currently allowed by the law. The EIS does not treat the difficulties inherent in requesting Congress to modify both the WIPP Land Withdrawal Act and the Nuclear Waste Policy Act.**

The Draft GTCC EIS correctly points out that: the total capacity for disposal of transuranic (TRU) waste established under the WIPP Land Withdrawal Act is 175,675 m³ (6.2 million ft³). The Consultation and Cooperative Agreement with the State of New

Mexico (1981) established a total Remote Handles capacity of 7,080 m³ (250,000 ft³), with the remaining capacity for Contact Handled TRU at 168,500 m³ (5.95 million ft³) and the Land Withdrawal Act limits the total radioactivity of RH waste to 5.1 million curies. For comparison, the GTCC Low-Level Radioactive Waste (LLRW) and GTCC-like CH volume, RH volume, and RH total radioactivity are approximately 6,650 m³ (235,000 ft³), 5,050 m³ (178,000 ft³), and 157 million curies, respectively. On the basis of emplaced and anticipated waste volumes, the disposal of all GTCC LLRW and GTCC-like waste at WIPP would exceed the limits for RH volume by nearly a factor of two, and RH total activity by nearly a factor of 30. The WIPP LWA (P.L. 102-579) limits disposal in WIPP to defense-generated TRU waste, so modification of the WIPP LWA to authorize acceptance of non-defense and non-TRU waste, increase the disposal capacity limit for RH total curies, and change the Consultation and Cooperative Agreement to authorize an increase in the total volume of all RH TRU wastes would be required. The Final EIS and Supplemental EIS (SEIS) for Yucca Mountain consider the emplacement of all GTCC wastes; the WIPP EIS does not. Not only would the WIPP LWA need to be amended, the WIPP EIS would need to be amended as well.

11. The performance assessments described in the Draft GTCC Environmental Impact Statement are deficient because they assume that the facility characteristics to which performance is most sensitive will be met, rather than demonstrating that they can be met. For example, the Draft GTCC EIS does not recognize that removal of the sheet piling following trench disposal will create a pathway for water to contact wastes rapidly.

The performance assessments described in the Draft GTCC Environmental Impact Statement are based on a number of assumptions. The performance assessments method assumed that: a) the engineering measures (e.g., a cover system) would remain intact for 500 years after the disposal facility closed, b) after 500 years, the barriers would gradually fail, c) the water infiltration rate to the top of the waste disposal area would be zero for the first 500 years and then 20% of the natural rate for the area of the remainder of the period of calculation (10,000 years), and d) the natural background infiltration rate was appropriate to use at the perimeter of the waste disposal units. The performance assessments thus are not true indicators of the differences in performance among the sites. More importantly, the sensitivity study performed indicated that the results were sensitive to the assumptions. In other words, if the assumptions proved to be incorrect, the performance likely would be worse. Absent better information about the likely performance of these key parameters, the performance assessments are reduced to nothing more than assumptions about how the different sites perform.

12. The Draft GTCC EIS does not present definitive arguments demonstrating that a near surface cover could meet the expected performance required for GTCC waste disposal.

The performance assessment results indicated that the peak annual dose would increase as the water infiltration rate increased. This result is not unexpected because when more water enters the waste disposal horizon, more radionuclides would be leached and released from the disposal facility. The increase in the peak dose is approximately proportional to the increase in the water infiltration rate, and indicates the need for a very effective cover to minimize the amount of infiltrating water that could

contact the GTCC wastes. This is an important reason for the NRC position that GTCC wastes require greater disposal depths than low-level wastes. Rather than basing the potential selection of a disposal option on an assumed performance of a near surface design, the decision maker ought to be presented with a definitive argument demonstrating that a near surface cover could meet the expected performance required for this class of wastes.

13. On Page 5-65 the conclusion presented in that paragraph [As the distance would increase from 100 m (330 ft) to 500 m (1,600 ft), the maximum annual radiation dose would increase by more than 70%] is incorrect and is inconsistent with the argument presented.

14. The argument that a reduction in dose would occur with distance because of additional dilution of radionuclide concentrations in groundwater is not consistent with the EPA's concept of "Reasonably Maximally Exposed Individual" used as the receptor in current repository regulations. (This argument is also essentially irrelevant to near surface disposal at the NNSS since groundwater at that site is very deep and surface water does not reach the groundwater.)

Page 5-65 states that the radiation dose incurred by the hypothetical resident farmer would decrease with increasing exposure distance, as would be expected. The Draft GTCC EIS argues that reduction would occur because additional dilution of radionuclide concentrations in groundwater would result from the additional transport distance toward the location of the off-site well. The dilution with additional distance may not be as effective as assumed for two reasons. First, the Reasonably Maximally Exposed Individual concept of the EPA and NRC repository regulations requires consideration of all of the radionuclides in a representative volume. This construct does not lend itself to an argument that dilution with distance decreases dose [see, for example, the Yucca Mountain SEIS]. Also, the dilution with distance argument is predicated on an assumption of homogeneous porous media flow. There are enough technical papers on contaminant flow arguing against the practicality of this ideal construct to warrant a more sophisticated analysis in the Draft GTCC EIS. The performance assessments which are based on assumed k_d s, also overlook another very important consideration. Under the oxidizing conditions likely for relatively near surface disposal, colloids could form and enhance the transport of certain nuclides of plutonium.

15. There are numerous deep boreholes existing on the NNSS as part of the Test Readiness Program (eventual use for nuclear weapons testing). These boreholes should be considered for disposal of GTCC wastes.