M-32 M 4/10/97 done

135 East Main Street
Hamburg, N.Y. 14075
April 6, 1997

Melinda Holland
Clean Sites
700 N. Trade Avenue
Landrum, S.C. 29356

Tom Attridge
NYSERDA
P.O. Box 191
West Valley, N.Y. 14171

Dear Melinda and Tom:

This is my fourth letter on information and data. This letter deals primarily with information that will be or should be presented to the CTF (rather than information already presented).

Since the CTF has assigned a relatively low priority to data issues, I will not send this letter directly to CTF members but ask that you make copies available to any members and observers who may be interested.

1) GTCC waste in WMA 8 (SDA)

It is well known that the SDA contains some waste that, under current regulations, is classified as "Greater Than Class C" or GTCC. At the time of burial this material was apparently considered low-level waste, but it now falls outside the usual low-level waste criteria and is not generally considered acceptable for near-surface disposal. (See 10 CFR 61.55 and 6 NYCRR 382.80.)

What quantity of GTCC waste is buried in the SDA? Unfortunately, different sources show substantially different numbers. I am concerned that the quantity listed in the DEIS (133,000 ft^3 of GTCC) is much lower than the 415,000 ft^3 of GTCC given in the SDA Waste Characterization Report on which the DEIS was supposedly based. The discrepancy is more than a factor of three.

I can see no good reason for such a large disagreement between the DEIS and one of its major sources. In any case, I want to be sure that any presentation to the CTF uses the most conservative credible estimate of GTCC in the SDA. Since this is likely to be something that Jim Hammelman will present on April 15, please ask him to use the more conservative value from the SDA Waste Characterization Report rather than the less conservative value from the DEIS.

(See page 3-136 of the DEIS for the value of 133,000 ft^3 of

NF08 1/1

recip: NMSS/LLDP

GTCC waste in the SDA. My other source is the SDA Waste Characterization Report, WVDP-022, Rev. 0, partial copies of which I gave both of you a few weeks ago [delivered to Tom at home and mailed to Melinda at Clean Sites' Alexandria address]. See pages iii and 12 therein for the value of 11,753 m^3 [equivalent to 415,000 ft^3]. See also Attachment E of the report for breakdown: 727 m^3 of GTCC in Trench 2, 728 m^3 in Trench 5, 3011 m^3 in Trench 8, 2613 m^3 in Trench 9, 3118 m^3 in Trench 10, and 1556 m^3 in Trench 11 -- which adds up to 11,753 m^3 or 415,000 ft^3. As I've mentioned to both of you, Rev. 0 is the version of the SDA Waste Characterization Report that I happen to have; I don't have the current Rev. 2. Presumably Rev. 2 doesn't show a threefold reduction in GTCC compared to Rev. 0. If it does, I need to see what the justification is. But my main point remains the same: The CTF should be given the most conservative credible value.)

2) How and to whom onsite doses are modeled

If and when institutional controls cease, people will have access to the West Valley Project Premises and/or SDA. For example, a so-called "intruder" might explore the site briefly, or a family might build a house and reside on the site.

The DEIS considers a few of these "intruder" or onsite resident scenarios and calculates the doses that such people would receive. However, the DEIS is not consistent or sufficiently conservative in the scenarios it considers and the doses it models.

See, for example, page D-36 for a table of impacts (radiological doses) to an intruder from an assumed loss of institutional control under Alternative III. Very high doses are shown for some of the WMAs under the agriculture/residential scenario, but doses from the NDA and SDA are said to be "not applicable" under this scenario.

In my opinion, it is deceptive for the DEIS to claim that the agriculture/residential scenario is "not applicable" to the NDA and SDA under Alternative III, especially given gradual cap failure, water percolation, and degradation of cement barriers.

See either page D-47 or page 3-150 of the DEIS (copies enclosed) for the same general scenario under Alternative V. The agriculture/residential scenario produces a dose of 570,000,000 mrem from the NDA or a dose of 44,000,000 mrem from the SDA under Alternative V.

Such a scenario is clearly applicable to Alternative III as well, assuming that institutional control is lost sometime during the next 1000 years. Doses would be somewhat lower than 570 million millirems and 44 million millirems due to radioactive decay, but they would still be far above the proposed NRC limits. Jim Hammelman needs to address this on April 15.

3) How and to whom airborne doses are modeled

The risks associated with airborne releases of radionuclides are presented primarily in Appendix G of the DEIS. Relatively large doses are predicted from relatively small accidental releases, showing the magnitude of risk associated with airborne as opposed to waterborne releases of a given source term.

However, in Appendix G and elsewhere, the DEIS tends to underestimate the risks of airborne releases. This underestimation comes from insufficient attention to credible exposure scenarios, from excluding various exposed populations from consideration, and possibly from calculational errors and/or incorrect dose conversion factors.

In general, the CTF needs reliable information on doses from credible airborne releases.

I will review one example of an airborne release from Appendix G of the DEIS and will compare it to my own calculations based on WVDP-065.

The example from Appendix G involves an airborne release of 6.48 curies from the RTS Drum Cell (WMA 9) as a result of a beyond-design-basis earthquake that destroys the Drum Cell. As shown on page G-18, the released activity consists of 1 curie of strontium-90, 1 curie of cesium-137, 0.4 curie of plutonium-238, 0.08 curie of plutonium 239/240, and 4 curies of plutonium-241. The released activity is allegedly 0.2% of the total source term in the Drum Cell, but comparison to page C-59 shows that this is not quite true, resulting in some initial underestimation.

Accepting the airborne release as given on page G-18, I calculate the following dose from the hypothetical beyond-design-basis earthquake that destroys the Drum Cell:

Radionuclide*	Released activity (Ci)*	Airborne dose (CEDE) to the maximally exposed offsite individual (rem)**
Sr-90	1	0.308
Cs-137	1	0.008
Pu-238	0.4	43.2
Pu-239/240	0.08	9.6
Pu-241	4	9.4
TOTAL	6.48	62.5

*From DEIS, page G-18.

**Calculated by RV from WVDP-065, Rev. 2, Table 2.

Thus, I calculate a dose of 62.5 rem to the maximally exposed individual from this hypothetical accident presented in the DEIS. The DEIS (page G-31, Table G-20, WMA 9) shows that the maximally exposed individual receives a dose of only 20 rem from this accident. If my calculation is correct, then the DEIS underestimates the dose by a factor of three. I invite comment on whether my calculation is wrong, or the DEIS calculation is wrong, or the DEIS employs incorrect dose conversion factors.

Returning to page G-31 of the DEIS, and assuming for the sake of discussion that the doses presented there are correct, note the high <u>population</u> doses shown not only for the Drum Cell earthquake accident but also for postulated accidents in other WMAs, including the NDA and SDA. These estimated population doses are hundreds of thousands of person-rems. Doses of this magnitude are <u>underestimations</u> of the impact because the population to which doses are modeled is arbitrarily cut off at 50 miles or 80 km (see page G-2). Elsewhere in the DEIS, transportation impacts are modeled far beyond a 50-mile radius. For similar reasons, an arbitrary 50-mile radius cannot be allowed to hide airborne impacts beyond this radius. Airborne releases that produce population doses of 200,000 to 400,000 person-rems within a 50-mile radius will almost certainly have impacts in population centers further out (e.g., Toronto, Rochester).

Finally, it is important for the DEIS (and presentations to the CTF) to consider credible non-accident scenarios for airborne releases. One such possibility is airborne dust from waterborne sediments resulting from the Erosional Collapse scenario.

It is clear from the DEIS that Erosional Collapse may carry large quantities of radionuclides downstream into Buttermilk Creek, Cattaraugus Creek, Lake Erie, etc. A substantial portion of the source term carried downstream will, at any given time, be deposited on beaches, banks, terraces, sediment bars, etc., where the radiologically contaminated sediment fines may dry and be picked up by wind. Airborne resuspension seems less likely in deep gorges (e.g., Zoar Valley) than in areas where Cattaraugus Creek runs between low banks (e.g., through much of the Cattaraugus Reservation of the Seneca Nation), but its impact needs to be modeled for a variety of terrains.

Unwitting commercial use of contaminated sediments (by mining or dredging) also has a significant potential for causing airborne resuspension if the sediments are transported, stored, or used in a dry, dusty form.

In general, the DEIS (and presentations to the CTF) should provide a better assessment of impacts from airborne releases than the DEIS currently does.

I hope that these various points I am raising are helpful in the long run. To the extent possible I will try to anticipate

discrepancies so that they can be dealt with <u>before</u> they arise at CTF meetings.

Sincerely,

Raymond C. Vaughan

cc: Tom Rowland, DOE
Paul Piciulo, NYSERDA
Doug Miller, NYSERDA
Michael Weber, NRC
John Greeves, NRC
Jack Krajewski, DEC

Table D-18. Impacts to an Intruder from the Assumed Loss of Institutional Control for Alternative V (Discontinue Operations)[a]

	Dose (mrem)			
WMA/Facility	Agriculture/ Residential	Construction	Discovery	Drilling
1—Process Building	5.8×10^7 [2017]	NA[b]	4.0×10^4 [2000]	NA
2—LLWTF and Lagoons 1-5	5.0×10^5 [2017]	5.2×10^5 [2001]	NA	1.8 [2001]
3—HLW/Vitrification Facility	9.2×10^9 [2017]	NA	8.0×10^4 [2000]	NA
5—Lag Storage Building/Additions	1.6×10^7 [2017]	0.6 [2000]	1.0×10^4 [2000]	NA
6,10—Balance of Site	24.0 [2000]	9.4 [2000]	NA	NA
7—NDA	5.7×10^8 [2000]	4.1×10^6 [2000]	7.0×10^4 [2000]	21.0 [2000]
8—SDA	4.4×10^7 [2016]	2,600 [2000]	2.6×10^5 [2000]	27.0 [2000]
9—RTS Drum Cell	4,400 [2000]	NA	0.001 [2000]	NA
Cesium Prong On Site	88.0 [2000]	NA	NA	NA
North Plateau Plume	1.1×10^4 [2000]	NA	NA	NA

a. Doses are for year of maximum exposure, year of occurrence is provided in brackets.
b. NA = Due to nature of the scenario and the WMA, the scenario is not applicable for this case.

Table 3-33. Summary of Long-Term Radiological Performance Assessment for Alternative V (Discontinue Operations)

WMA/Facility	Was WMA Important for Evaluating and Selecting an Alternative?	On-Premises or SDA Intruder: Dose Commitment to Receptor with Largest Dose (mrem)	Buttermilk Creek Receptor: Sand and Gravel Aquifer Pathway (mrem)	Buttermilk Creek Receptor: Weathered Till Pathway (mrem)	Buttermilk Creek Receptor: Erosion Pathway (mrem)
1—Process Building	Yes	58,000,000 (A)[a] [2017][b]	670 [2061]	no dose	no dose
1—01/14 Building	No			no dose	no dose
2—LLWTF and Lagoons 1-5	Yes	500,000 (A) [2017] 520,000 (C)[c] [2001]	11 [2050]	no dose	520 [2680]
3—HLW Tanks/Vitrification Facility	Yes	9,200,000,000 (A) [2017]	45,000 [2072]	no dose	no dose
4—CDDL	No		no dose	no dose	no dose
5—CPC Waste Storage Area and Lag Storage Building/Additions	Yes	16,000,000 (A) [2017]	490 [2061]	no dose	no dose
6—Central Project Premises	No	24 (A) [2000]	no dose	no dose	no dose
7—NDA	Yes	570,000,000 (A) [2000]	no dose	0.04 [2068]	47,000 [2290]
8—SDA	Yes	44,000,000 (A) [2016]	no dose	1.0 [2248]	330,000 [2220]
9—RTS Drum Cell	Yes	4,400 (A) [2000]	no dose	6.3 [2125]	4,500 [2100]
10—Support Services Area	No		no dose	no dose	no dose
11—Bulk Storage Warehouse and Hydrofracture Test Well Area	No		no dose	no dose	no dose
12—Balance of Site	No		no dose	no dose	no dose
Cesium Prong	No	88 (A) [2000]			
North Plateau Groundwater Plume	Yes	11,000 (A) [2000]	3.4 [2000]		

a. (A) = agriculture scenario
b. [ ] = peak year of occurrence
c. (C) = construction scenario