



July 31, 2014

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Dear Mses. Warren, D'Arrigo, and Hameister:

SUBJECT: Re: Erosion and Exhumation Working Group Reports

Thank you for your continued interest in the West Valley site and the Phase 1 Studies Process. We are writing in response to your January 15, 2014 memo (Reference 1) whereby you provided input on the work and progress of the Erosion and Exhumation Working Groups.

We have copied the issues and concerns from your January 15, 2014 memo below (in italics), and have inserted specific responses (in blue). DOE and NYSERDA value your continued interest in the Phase 1 Studies process.

Your January 15, 2014 memo states:

"Scientific truth and integrity are critical to all of the studies undertaken at West Valley and by the expert panels. It is not possible for this work to have a credible foundation when it is guided by the sole goal of the Agencies – to reach Agency consensus between DOE and NYSERDA. Agency consensus could mean that poorly considered agency administrative and budget concerns can trump environmental and public health protections, as well as scientific fact."

The Phase 1 Studies are being performed to evaluate and resolve the technical issues that have been the subject of disagreement between the agencies that are documented in the NYSERDA View in the 2010 FEIS. The agencies have enlisted nationally and internationally recognized experts in a number of subject-matter areas and solicited their independent recommendations for scientific studies that can help the agencies evaluate the technical issues. Resolution of these technical issues will assist the agencies in the Phase 2 decision-making process.

We agree that having scientifically defensible data and information is critical for the agencies in regard to making the Phase 2 decisions. The fact that the agencies were not in complete agreement (i.e., not in consensus) on the approach to and defensibility of some aspects of the EIS analysis is clearly identified in the NYSERDA View and in the DOE response to the NYSERDA View. So when the agencies speak of "reaching consensus," we wish to be very clear that we are referring to the resolution of the issues that were identified in the NYSERDA view. We also wish to be clear that the lack of consensus

on certain aspects of the 2010 is precisely the reason that the agencies developed the Phase 1 Studies process.

In regard to the degree of scientific rigor in the Phase 1 Studies, the agencies have engaged highly experienced scientists, many of whom are highly recognized academicians and researchers, to participate in the topical work groups to help us "reach consensus" on the issues. Some of the scientists and engineers were identified by each agency, some were identified by both agencies, and as you know, some were identified by your groups. In addition to the members identified by the agencies, the Erosion work group includes Dr. Richard Young, a geologist from SUNY Geneseo, requested by you, as well as Dr. Michael Wilson, from SUNY Fredonia, who was one of the authors of the Full Cost Study commissioned by your groups. In addition to the use of highly recognized scientists and engineers, the Phase 1 Study process was set up such that the scientific work groups are *not* directly managed by the agencies, in order to avoid undue influence by either agency on the direction or products of the work groups.

In addition to the convening of the Working Groups, we added *another* level of independent scientific involvement in the Phase 1 Studies process through the convening of the ISP, whose purpose is to give NYSERDA and DOE *additional* independent input on the broader issues of scientific defensibility of the studies. Dr. Kristin Shrader-Frechette, one of four members of the ISP, was also identified by your group.

We also wish to point out that, in terms of openness, the Phase 1 studies process includes: regular briefings at the QPMs; the posting of documents, meeting agendas, meeting materials, public comments, and agency responses to public comments on the Phase 1 Studies website; the presence of the researchers themselves at public meetings to present and discuss important work products; and the commitment from the agencies to accept and consider public comments on all aspects of the PIS process at any time. Considering all of this, we believe that the Phase 1 Studies Process is the most open and publicly accessible process that has ever been conducted in the history of the WVDP.

We know this has been a concern for your groups for some time, and we hope that this clarifies that scientific defensibility is at the forefront for both agencies in the Phase 1 Studies process. We also hope this clarifies that, when we speak of "reaching consensus," we are referring to the lack of consensus on issues of science and engineering that was documented in the NYSERDA View and DOE responses to the NYSERDA View as presented in the 2010 FEIS.

"It also seems that the Agencies have not endeavored to address the points that the scientific panel made concerning the Data Quality objectives. Instead of carefully articulating the objectives and scope of the studies planned, the Agencies and the subject matter teams are not responding appropriately to the input of the ISP or to that of the public."

In response to the input from the ISP, the Erosion Working Group (EWG) has developed a set of Data Quality Objectives for each of its three proposed studies. These DQO's include a problem statement, the study goals, required information/data, the study boundaries, the analytic approach, the performance or acceptance criteria, and a plan for obtaining the data.

"Several versions of these questions were asked by the public including ones that incorporated the problem and uncertainties associated with climate change impacts such as abrupt exclusionary events. Reference also was made to the extreme rainfall and flooding experienced recently in Boulder, Colorado and the region. One person said the assumptions used should be stated clearly as well as the outcomes and multiple persons spoke on worse case scenarios. Incredibly, the Erosion team representatives had not evaluated worst-case scenarios.

Rare events have the greatest potential to cause catastrophic loss of containment of radioactive materials at this site with steep slopes and highly erodible soil. It is essential that this group develop and consider its worst-case scenarios. This is not optional.

2. The Erosion report appears to focus on slow, uniform and long term erosive processes and fails to include adequate consideration of sudden, acute or severe events.

We are dealing with a very high hazard situation with hundreds of thousands of curies of radioactive materials that could be released to the Great Lakes, affecting the drinking water of millions of people and a critically important natural resource."

Your comment has been provided to the Erosion Working Group for their consideration.

"3. We are dealing with a situation in which there are NO defensible erosion models that can predict accurately the future, particularly over long time periods.

This definition is provided by Wikipedia on "Erosion Prediction": "Because there is a wide discrepancy between predicted and observed erosion rates, models are better as research tools than as public policy and regulatory instruments or for prescriptive design measures for constructed landforms. But some models may provide useful guidance for the design engineer if adequately calibrated and verified for local conditions and if the design accounts for the uncertainty."

*Note the last sentence – "some models may provide useful guidance IF:
Adequately calibrated and
Verified for local conditions and
Uncertainty is accounted for."*

Your comment has been provided to the Erosion Working Group for their consideration.

" Key points in the Scientific Panel's (ISP) Jan. 2, 2013 letter have also not been addressed. In their letter, the scientific panel noted that the study recommendations should discuss the ability of the CHILD model to address the erosion threat over long time periods, thousands to millions of years. The erosion workgroup must compare a performance objective that specifies long term containment of long-lived radionuclides with rigid consideration of the uncertainty associated with existing models."

The EWG has been provided the ISP's Jan 2, 2013 letter, and your comment for their consideration.

"The scientific panel indicated that the uncertainty over the time periods necessary may be irreducible and unacceptable, regardless of contributions from additional studies. The panel recommended a data quality objective approach of identifying the questions that need to be answered with the level of precision and accuracy necessary before any studies begin. The public has talked about this as improving the scope of work for the studies."

Your comment has been provided to the Erosion Working Group for their consideration.

"4. It is difficult, if not impossible, to separate the erosion analysis from other related work that is now assigned to other workgroups, but has not been launched-- slope stability and slope failure, seismic hazard and catastrophic release of contamination.

It is important to construct a whole picture of the problem that needs to be analyzed and identify all the relevant questions. We are very concerned about the piecemeal approach thus far. In the end, all of the individual pieces must be assembled into a coherent whole.

What has been needed from the outset is a comprehensive timeline that addresses the integration of the work of all the related Study workgroups including the expected start and completion dates."

The agencies agree that a comprehensive analysis is necessary to integrate all of the technical components (e.g., erosion, slope stability, seismic hazard, etc.). This integration will occur in the analysis performed as part of a Supplemental Environmental Impact Statement (SEIS), which will evaluate the potential impacts associated with Phase 2 Decisions. The Phase 1 Studies constitute data collection activities that will support the future decisionmaking process.

"At West Valley extreme weather events are likely to exacerbate erosion at the vulnerable West Valley facility. Under the President's Executive Order, federal agencies must prepare for and plan adaptation measures -- specifically as related to particular agency missions, infrastructure and responsibilities. Assessing vulnerabilities to climate change and preparing an adaptation plan for the vulnerable nuclear waste facility at West Valley is exactly the purpose of the President's EO. See highlighted portions of the Executive Order attached. Included in the federal mandate is the requirement of working with state and local partners, and other organizations on adaptation planning."

DOE and NYSEDA are committed to working together to evaluate climate change in the context of potential impacts to the West Valley Site. While climate change was not explicitly analyzed in the FEIS, the FEIS erosion analyses did include scenarios representing a potential shift to a wetter climate, including increase precipitation intensity (see the FEIS, Appendix F, Paragraph F.3.1.6.4, located on Pages F-47 and F-48). The Phase 1 Studies Erosion Working Group recommendations specifically call for an analysis of the sensitivity of erosion projections to climate change.

Furthermore, the Department of Energy released the 2014 Climate Change Adaptation Plan, which serves as the second iteration of a living climate adaptation plan. This plan is the second installment of an ongoing effort to build resilience across the Department and serves as a foundation from which future updates will build. Further plans will account for the advancement in scientific understanding and continued evaluation, made in accordance with Executive Order 13653.

"6. Real world data collection should be maximized.

Detailed evaluation of the August 2009 extreme rainfall event and the real world erosion outcomes on the West Valley site should be done as it will yield information grounded by reality. Other regional excursionary weather events should also be utilized to gain additional information on local site- specific impacts.

Your comment has been provided to the Erosion Working Group for their consideration.

" B. Exhumation Working Group

1. Complete waste removal is supposed to be considered. This working group is supposed to assess both partial and complete waste removal, however most of the questions listed on p. 1 of the November 2013 document relate to selective removal of contamination.

We recommend returning to the original scope for the workgroup:

- *Alternate approaches for, costs of, and risks associated with complete waste and tank exhumation.*
- *Viability, cost and benefit of partial exhumation of waste and removal of contamination.*
- *Exhumation uncertainties and benefit of pilot exhumation activities.*

We submitted earlier comments on the scope of work for this workgroup, which were not accepted. Now we see that both agencies and the study team are ignoring the outline of the Agency scope of work. Given the questions on p. 1, how can the workgroup ever address complete waste and tank exhumation?

Based on the Agency's own outline for the areas of study, the subject matter expert team must examine complete waste and tank exhumation, not just partial or selective removal."

Alternate approaches to complete waste and tank removal will be considered by the EXWG as stated in the first bullet in their mission statement in the Recommendations for Phase 1 Exhumation Studies (November 2013). The seven questions on Page 1 of the November 2013 document do not limit the EXWG's analysis to selective exhumation. The EXWG recommendations are intended to be *initial* study activities to investigate the waste inventory, including inventory uncertainty, and to review precedent projects. These initial study activities will be useful in evaluating all exhumation alternatives -- selective, partial, and full.

"2. The basis of the order or sequence of the planned studies is not logical and should be reconsidered. We recommend that Study #3 be conducted first with important additions.

A Literature review is frequently done at the beginning of a study. Here it is proposed to be done as Study #3 after extensive work in Study 1 & 2."

The EXWG recommended studies are intended to proceed concurrently, not sequentially, so Study 3 (review of precedent projects), will not take place after extensive work in Studies 1 and 2 (inventory analysis and inventory uncertainty).

"3. The report should also plan next steps by preparing a qualitative (descriptive) assessment of the existing information pertaining to the radionuclide inventories and identification of the expected sources of uncertainty and their likely magnitude based on professional judgment.

Careful evaluation of the existing inventories and a descriptive assessment of the uncertainties is more useful than performing another complicated calculation on the inventory by updating the inventory -- which can introduce additional uncertainties. Failure to evaluate the uncertainties and fully describe them could lead to significant errors in subsequent quantitative analyses. Next steps should also include goals and objectives for the work and a clear decision tree. Further statistical analysis or quantitative assessments should only be done if they are deemed to provide useful information. The ISP recommended a data quality objective approach of identifying the questions that need to be answered with the level of precision and accuracy necessary before any studies begin. This point needs to be addressed before proceeding with extensive statistical analysis. The consensus goal is continually cited with little description and no technical support for its use. On p. 7 some sort of bizarre decision-tree is advanced with consensus inserted in addition to cost-reasonableness. No description of these two goals and how they would be used here is provided.

A qualitative assessment should also endeavor to identify all hidden or unstated Agency assumptions that may underlie the notion that successful containment of radionuclides can be achieved over thousands of years in degrading containers in an unlined dump on an erosion

prone plateau. The studies should be designed to separate unsupported beliefs from scientific facts."

Your comment has been provided to the Erosion Working Group for their consideration.

"4. The benefits of pilot exhumations are supposed to be explored according to the scope.

Pilot exhumations can be used to:

- *test the accuracy of radionuclide inventory estimates*
- *evaluate several different methods of safely accomplishing exhumation*
- *assess the spread of contamination from the unlined disposal facility*

Given the high value of such real world information, too little emphasis is placed on evaluating and planning for pilot exhumations. Instead, the Agencies' seven questions bias the direction of the inquiry away from pilot exhumations."

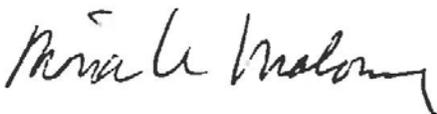
As indicated in Question 7, P.1 of the EXWG recommendations, pilot exhumation activities could have implications with regard to health and safety, worker exposure, waste generation, and cost. The EXWG will consider these factors as well as data needs and evaluate cost/benefits of pilot exhumation if there are exhumation uncertainties or data needs that can only be addressed in this manner.

"5. The Exhumation workgroup should be commended for identifying the significance of landslides to the integrity of the SDA and NDA disposal areas and as an underlying purpose for the exhumation analysis.

We agree that landslides should be a study item, but unfortunately the Agencies have not included this topic as part of the Erosion workgroup and have also not assigned this topic to another workgroup. The Agencies need to address this unassigned subject area in the near future."

The agencies agree that landslides and other means of slope failure could impact the site and this topic was identified as a Potential Area of Study for the Phase 1 Studies. While it has not yet been determined whether a separate Phase 1 Studies working group will be formed to evaluate these processes, slope stability (including landslides) will be addressed as part of the SEIS analysis, prior to the Phase 2 decisions.

Sincerely,



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U.S. Department of Energy



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Project Manager/Geologist
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LMG/MNM/amd

References:

1. Memo, Barbara Warren, Citizens' Environmental Coalition; Diane D'Arrigo, Nuclear Information and Resource Service; and Joanne Hameister, Coalition on West Valley Nuclear Waste to Moira Maloney, DOE & Lee Gordon, NYSERDA, dated January 15, 2014.

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cc: B. C. Bower, DOE-WVDP
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File #61806