



**112 State Street
Montpelier, VT 05620
Telephone: (802) 828-2811 (main)**

December 13, 2014

Mr. Barrett Green
Entergy Nuclear Vermont Yankee (*VIA EMAIL*)

RE: Comments on the SAS and PSDAR

Dear Mr. Green:

Thank you for the opportunity to review the Site Assessment Study (SAS) and its attachments, including the draft Post Shutdown Decommissioning Activities Report (PSDAR) for the Vermont Yankee Nuclear Power Station.

As contemplated by the December 23, 2013 Settlement Agreement, attached are Comments from the Department of Public Service, the Agency of Natural Resources, and the Department of Health on the Site Assessment Study and its attachments. While these Comments include the Agencies' preliminary evaluation of the draft Post Shutdown Decommissioning Activities Report, the Agencies expect to submit more extensive comments once Entergy submits a formal filing to the Nuclear Regulatory Commission, and as some of the issues we are commenting on today get further fleshed out.

For convenience and completeness, we also attach other comments we have received to date through the NDCAP public process, but want to make clear those comments are the opinions of their respective authors and do not necessarily reflect the opinions of the State Agencies.

If you have any questions on the comments we have provided you today, we are happy to speak with you or meet at any time. We hope you find these constructive and in the spirit intended to improve the PSDAR uncertainties over time through the NRC review period. We look forward to receiving your responses to these comments and hope that these comments will be addressed in the filing you intend to make with the NRC later this month and at subsequent opportunities as the process moves forward.

Sincerely,

A handwritten signature in black ink, appearing to read "Christopher Recchia".

Christopher Recchia, Commissioner
Vermont Department of Public Service

Cc: William Glew, Jr., Esq.
Timothy Ngau, Esq.
T. Michael Twomey, Esq.

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 1	<u>General</u> : Entergy has until December 2016 to submit its PSDAR and should use this time to engage in a more thorough site characterization so that it can incorporate a more accurate Decommissioning Cost Estimate into its PSDAR.		
PSD – 2	<u>General</u> : The documents make clear that the characterization of the site (radiological and non-radiological) has not yet been done. Without the characterization work being done it is unclear what the basis is for the estimated scope of work and resulting costs. At a minimum, the documents need to discuss the basis for the current estimate, the uncertainty that remains pending complete site characterization and how this uncertainty is being dealt with in the estimate through inclusion of allowances or additional margin.		
PSD – 3	<u>General</u> : Entergy should provide an overall description of the assumed conditions at the Vermont Yankee (“VY”) site when decommissioning is to start. This would address questions about uncertainty of the conditions assumed for the technical descriptions of various decommissioning activities and their associated related cost estimates.		
PSD – 4	<u>General</u> : In instances where decommissioning activities or identified contaminations are items that will likely be updated once better data is available (such as after demolition of some VY structures has occurred) this should be stated.		
PSD – 5	<u>General</u> : There does not appear to be firm agreement on the site release criteria. It appears that the estimate is predicated on an NRC license termination limit of less than 25 mrem/year. The estimate does not appear to acknowledge that site		

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	restoration criteria originating with the State of Vermont for radiological and non-radiological contamination may require additional work. Consideration of the site restoration criteria for other sites such as Yankee Rowe would indicate more stringent criteria are likely.		
PSD – 6	<u>General</u> : The funding analysis indicates that even with the significantly delayed dismantlement there is not sufficient funding to cover the Entergy estimated scope of site restoration that may be understated. According to Entergy’s calculations, it currently falls \$82 million short of having enough money to pay for license termination and spent fuel management, and even if it made up for that shortfall, there would be no money left to cover the Entergy estimated site restoration cost of about \$57 million. If more stringent criteria were invoked or actual site characterization reveals added scope, the shortfall would be larger.		
PSD – 7	<u>General</u> : The decommissioning schedule assumes a delay of about 17 years after all spent fuel has been removed from the site in 2052 but before actual dismantlement begins. The rationale for this delay is unclear given that the financial benefit of the delay is very small and depending on actual investment performance and cost escalation could easily be zero or negative.		
PSD – 8	<u>General</u> : While the documentation provided is substantial, there is a lack of discussion of actual assumptions, work activities, and schedule information concerning the cost estimate. The detailed backup calculations and data that are part of decommissioning costs estimates have not been made available.		

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	As a result, the ability to review the actual estimated costs in any detail is extremely limited.		
PSD – 9	<p><u>Site Assessment Study (SAS), October 2014, Exec. Summary, pg. 1, next to last paragraph:</u> The increased costs being described should be listed. If one compares the current estimate with the Scenario 1 SAFSTOR costs from the February 2012 estimate there is a difference of about \$130 million after adjusting the Scenario 1 costs to be in 2014 dollars (assuming escalation of 3% per year). It is not clear how this difference can be explained as being due to the costs to transition to a SAFSTOR condition since such costs would also have been included in the 2012 Scenario 1 estimate. The explanation of the difference in the cost between the 2012 Scenario 1 costs and the 2014 estimate should be provided. It is understood that the scenarios are not identical but the differences would not explain the difference of about \$130 million.</p>		
PSD – 10	<p><u>SAS, Exec. Summary, pg. 1, last paragraph:</u> It is true that until all spent fuel is removed from the site, there will be some fraction of the site that cannot be released for unrestricted use. Entergy should provide any calculation or analysis that has been performed to establish what fraction or what parts of the VY site could be released for unrestricted use if license termination were completed except for the dry fuel storage facility. The result of this calculation should be included in the PSDAR.</p>		

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PSD – 11	<p><u>SAS, Exec. Summary, pg. 2, first paragraph</u>: The acknowledgement that the NRC will not at present allow ENVY to take credit for potential recovery from claims against DOE is consistent with NRC statements to Entergy. Entergy should confirm that this cost estimate includes all of the costs for all expected post-shutdown work at VY including site maintenance, spent fuel management, NRC license termination and site restoration without any credits or deductions based on possible recovery from the DOE.</p>		
PSD – 12	<p><u>SAS, Exec. Summary, pg. 2, first paragraph</u>: This paragraph states that although the fuel will be completely removed from the VY site by 2052, the dismantling will not begin until 2069. Thus, the delay can only be for the purpose of allowing the trust fund to grow. However, based on the Entergy funding analysis (“Vermont Yankee Nuclear Power Station Funding Scenario Calculations”), the fund balance only increases by about \$4 million during this 17-year delay period. Given the uncertainties in decommissioning and waste disposal cost increases over time, it is unclear that a delay from 2052 to 2069 is warranted for such a small increase in the trust fund. The rationale for this delay after all fuel is removed should be provided.</p>		
PSD – 13	<p><u>SAS, Exec. Summary, pg. 2, first paragraph</u>: With regard to the start of dismantling in 2069, the funding calculations show a draw of over \$43 million from the fund in 2068 when the previous years had been about \$3.5 million. Thus, it appears the funding analysis assumes start of significant decommissioning work in 2068 even though the description says that work would not begin until 2069. The reason for the significant increase in</p>		

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	expenditures in 2068 should be identified.		
PSD –14	<u>SAS, § 1.4</u> : While this section discusses radiological impacts on the VY site soil in detail, it makes no mention of the groundwater sampling that is routinely performed onsite. While the latter is discussed in Section 1.6 and Appendix E, groundwater sampling should also be noted here.		
PSD – 15	<u>SAS, § 1.4, pg. 10, first paragraph</u> : This paragraph notes that there has been a buildup of radioactive contamination in the site storm drains. However, there is no discussion here or in the PSDAR as to what extent such buildup is expected to occur during the decades of SAFSTOR prior to plant dismantlement. Further, there is no discussion or explanation of how such buildup over time has been factored into the estimated cost for decommissioning. Discussion of the anticipated buildup during the decades of SAFSTOR should be provided along with explanation of how this anticipated buildup has been factored into the estimated costs for decommissioning.		
PSD – 16	<u>SAS, § 1.4, pg. 10, first paragraph</u> : Given the noted buildup of radioactive contamination, an explanation should be provided as to why historical sampling is sufficient to conclude that contamination levels will not require mitigation after the lengthy SAFSTOR period.		
PSD – 17	<u>SAS, § 1.4, pg. 10, second paragraph</u> : This paragraph lists radioactive isotopes of interest. However, Carbon-14 is not included in this list. Carbon-14 has been an issue in decommissioning of other sites such as Yankee Rowe. Carbon-14 is expected to be a concern in the decommissioning of future		

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	sites such as San Onofre. Entergy should provide any evaluations, analyses or other basis for assuming that Carbon-14 will not be of concern in decommissioning VY. Alternatively, Entergy should identify any costs and include them in the VY cost estimate to account for dealing with Carbon-14.		
PSD – 18	<u>SAS, § 1.4, pg. 10, Class 1 Areas</u> : The methodology for establishing the scope of remediation should be provided. The method for estimating the cost for this remediation should be provided. The work breakdown structure (“WBS”) that includes this estimated cost should be identified.		
PSD –19	<u>SAS, § 1.4 pg. 10, Class 1, Item #1</u> : Indications of tritium in the Condensate Storage Tank (CST) telltale drains were reported to the State in June 2014. Entergy should indicate whether the expectation is that this is evidence of a new CST leakage incident or that the noted curtailment of the leak has degraded. Make sure any changes in the discussion here are reflected in the corresponding Appendix E, Section 7.1.1 discussion.		
PSD – 20	<u>SAS, § 1.4, pg. 11, Class 2 Areas</u> : The discussion should be expanded to make clear whether any remediation has been assumed for these areas. If not, any analysis, evidence or other bases for assuming zero remediation will be needed for these areas should be provided and a description of the basis discussed. If some remediation has been assumed, the extent of remediation should be identified and the basis for arriving at the assumed scope of remediation should be described. The methodology for estimating the cost for such remediation should be explained. The WBS that includes this cost should be		

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	identified.		
PSD – 21	<u>SAS, § 1.4, pg. 11, Class 2, Item #3</u> : The North Warehouse is slated to be dismantled in early 2015 in preparation for constructing a Second ISFSI pad adjacent to the first pad. Will any remediation of radiological contamination be done as part of this tear-down? Additionally, does this tear-down effort include additional radiological or non-radiological sampling to assure that there is not additional contamination beneath the warehouse footprint?		
PSD – 22	<u>SAS, § 1.4, pg. 11, Class 2, Item #4</u> : It is noted elsewhere within the SAS that VELCO now owns the switchyards located on the VY site. Is the last sentence of this item intended to mean that any remediation for this item cannot be completed until the switchyard(s) is (are) dismantled by VELCO?		
PSD – 23	<u>General Comment related to PSD-6</u> : Because the switchyards are owned by VELCO, are there any on-site radiological or non-radiological clean-up activities that are VELCO's responsibilities rather than Entergy's? If yes, briefly enumerate those responsibilities in the reply to this comment.		
PSD – 24	<u>SAS, § 1.4, pg. 12, Class 3 Areas</u> : The discussion should be expanded to make clear whether any remediation has been assumed for these areas. If not, any analysis, evidence or other bases for assuming zero remediation will be needed for these areas should be provided and a description of the basis discussed. If some remediation has been assumed, the extent of remediation should be identified and the basis for arriving at the assumed scope of remediation should be described. The		

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	methodology for estimating the cost for such remediation should be explained. The WBS that includes this cost should be identified.		
PSD – 25	<u>SAS, § 1.4, pg. 11, first paragraph</u> : The significance of the statement that sampling in 1988 found lower contamination levels than in 1987 should be provided. The paragraph also states that a pathway dose assessment has been completed and this area is not of concern. The discussion should clarify if Entergy expects the pathways analysis for determining the Derived Concentration Guideline Levels (“DCGLs”) will confirm that the levels in this area will be acceptable. If so, the analysis, evaluation or other evidence supporting this conclusion should be identified.		
PSD – 26	<u>SAS, § 1.4, pg. 11, items numbered 1 through 4</u> : A description should be provided of the costs that have been included in the decommissioning cost estimate for remediation of the areas discussed. The WBS that includes these costs should be identified.		
PSD – 27	<u>SAS, § 1.4, pg. 12, first paragraph</u> . The discussion should be clarified to make clear whether the statement that the concentrations of radioactive material being well below the criteria specified in the permit is intended to indicate that no future remediation will be needed. If so, since the DCGLs to be used for license termination have not yet been established, the basis for such a conclusion should be included.		
PSD – 28	<u>SAS, § 1.5, pg. 13</u> : Identify in general, what costs have been included in the decommissioning estimate for remediation of		

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	<p>areas with such contamination. Provide any analysis, calculation or other evidence that supports the estimated costs for such work. Describe any uncertainty that exists in the estimated scope of work and estimated cost of any such remediation. This description should particularly address why the estimate is reasonable given that the existing text makes clear that characterization of the areas discussed has not yet been performed.</p>		
PSD – 29	<p><u>SAS, Site Characterization</u>: The previous comments about characterization raise another concern about when the characterization will be done. The characterization for radiological, non-radiological and groundwater contamination can result in increased scopes of work and increased costs. Since Entergy intends to place the plant into SAFSTOR and begin the decommissioning when the trust fund has grown sufficiently to cover the decommissioning work and certain other possible costs, the characterization must be done reasonably early in the process. Otherwise, the ultimate scope of work and cost will remain unknown and the decision of when the trust fund is sufficient will similarly be uncertain. The timing and costs included in the decommissioning cost estimate for each type of characterization (radiological, non-radiological and groundwater) should be identified. The basis for the estimate costs should be identified. The WBS numbers including these costs should be identified. Additionally, in identifying the timing of the characterization an explanation should be provided as to why the chosen timing allows for orderly accommodation of any unexpected results or why there is sufficient allowance provided in the estimated costs to cover such unexpected results.</p>		

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PSD – 30	<p><u>SAS, § 1.6, pg. 20, item 2</u>: The paragraph includes discussion of how the detection of tritium was due to the sampling method. However, the explanation raises the following concern. If purging water from the well before sampling induced the migration of tritium contaminated ground water, this confirms that there is tritium contamination. The explanation only indicates that, with respect to this specific well, the hydraulic pressure of water in the well somehow normally hinders migration of contamination into the well. Explain what has happened to the tritium contaminated shallow groundwater. Explain if there will be further characterization needed to determine the level of action necessary. Identify any costs in the decommissioning estimate to deal with such contaminated water including both characterization and remediation. Explain the basis for such costs. Discuss any assumptions concerning the migration of such contaminated water over the SAFSTOR period.</p>		
PSD – 31	<p><u>SAS, § 1.6, pg. 20, item 3</u>. This paragraph says that there is no data to evaluate the impact on groundwater that may have resulted from a leak in the chemistry laboratory sink or from fires at the main and auxiliary transformers. Identify if the decommissioning cost estimate includes any cost for characterization and remediation of the contaminants from these events. If not, explain the basis for not including costs given that it is acknowledged that currently no data is available to evaluate the possible impacts. If costs are included, describe the basis for the included costs and identify the WBS that includes these costs.</p>		
PSD – 32	<p><u>SAS, § 1.6, pg. 20, items 4</u>: This paragraph describes other events that may have created contamination that would require</p>		

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	<p>remediation. However, there is no discussion of the actions that have been taken or will be taken to determine the scope of the possible contamination and the scope of required remediation. Further, the text identifies that some areas have not be investigated because they are inaccessible. The section should be clarified to explain whether the decommissioning cost estimate includes any cost for characterization and remediation of the contaminants from these events. If not, the basis should be provided for not including costs given that it is acknowledged that currently no data is available to evaluate the possible impacts. If costs are included, identify the basis for the included costs and the WBS that includes these costs.</p>		
PSD – 33	<p><u>SAS, § 2, Spent Fuel Management</u>: Although not explicitly stated, based on the number of fuel assemblies and the number of casks discussed, the plan is based on use of the Holtec HI-STORM 100 system. Each cask of this system can hold 68 BWR spent fuel assemblies. Entergy is transitioning to the Holtec FW system at one of its other sites. The Holtec FW system holds 87 BWR assemblies and has less restrictive cooling times. Use of the Holtec FW would require 10 fewer casks. The Spent Fuel Management Plan states that Entergy is considering multiple cask vendors and cask designs. Describe any analysis that has been done or will be done to justify the use of a specific cask design.</p>		

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PSD – 34	<p><u>SAS, § 2, Spent Fuel Management</u>: Explain the impact on the estimated decommissioning costs if the assumed start date for DOE spent fuel acceptance is delayed. Explain the impact on the estimated costs if the assumed date for removal of all fuel from the VY site is delayed.</p>		
PSD – 35	<p><u>SAS, § 2, Spent Fuel Management</u>: Entergy states that from 2026 through 2052 based on the assumptions about DOE spent fuel acceptance, there will be costs for transfer of spent fuel from the dry storage facility to the DOE. Based on funding strategy, the costs in 2021 through 2025 are roughly the same or in some cases higher than in later years when the fuel transfer work would be ongoing. Identify the costs included in the estimate for the transfer of spent fuel from dry storage to DOE. Identify the basis for these costs and the WBS that includes these costs. The added discussion should explain why the total project cash flow does not change in any noticeable way when going from years of dry storage without transfer of fuel to years of dry storage with transfer of fuel.</p>		

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PSD – 36	<p><u>SAS, § 2.1, pg. 23</u>: Provide any analysis, evaluation or any other data supporting the assumption that all fuel will be placed into dry storage by late 2020. Identify the basis to assume that the necessary dry storage hardware (casks, canisters, and damaged fuel cans) can be procured in the numbers needed in time to support this assumed schedule. Describe any analysis that has been done of the inventory of spent fuel in the VY spent fuel pool against the cooling time requirement of the Certificate of Compliance for the cask system assumed to be used. Confirm that this analysis supports that no assemblies will require a cooling time that would preclude placing them in dry storage by late 2020.</p>		
PSD – 37	<p><u>SAS, § 2.2.1, pg. 23</u>: On several occasions, including at least one NDCAP meeting, Entergy officials have stated that the selection of a vendor for the second ISFSI has not occurred. Yet, this section indicates that this ISFSI “will fully comply with the requirements specified in the Holtec Final Safety Analysis Report.” Does this imply that Holtec is the preferred vendor for the second ISFSI? It would be more appropriate to state that the second ISFSI “will fully comply with the requirements specified in the FSAR of the selected ISFSI Vendor.” More generically, the discussion should state that the ISFSI will fully comply with 10 CFR 72, to which all ISFSIs (& their FSAR documentation) must comply.</p>		

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PSD – 38	<u>SAS, § 2.2.1, pg. 23</u> : The height of the ISFSI pad above mean sea level (MSL) is noted. Consider stating whether this elevation in proximity to the Connecticut River is outside of the 100-year flood plain (the current standard for nuclear power plant External Flood evaluations). Also state whether this elevation is outside of one or more additional, less probable flood plains (e.g. the 500 or 1000 year flood plain). Also state how recently the 100-year flood plain has been analyzed and whether that analysis took into account climate change.		
PSD – 39	<u>SAS, § 2.3.1, pg. 24</u> : Explain how an uninterrupted power supply to the Reactor Building and Intake Structure systems mentioned here will be maintained. Back-up supplies should be identified (e.g., Vernon Hydrostation, the current Emergency Diesel Generators and/or the Station Blackout Diesel Generator).		
PSD – 40	<u>SAS, § 2.3.1, pg. 24</u> : The CST is currently used as a makeup / letdown water source for the Spent Fuel Pool. It is subsequently stated in Section 3.1 that the CST will be drained & abandoned once modifications to the Torus are in place, meaning that the CST (and associated equipment to pump CST water to the Spent Fuel Pool) will be used for some period following cessation of power operations. Section 2.3.1 should note the CST and any additional systems that will be powered to support Spent Fuel Pool cooling during the early stages of the VY Station’s decommissioning.		
PSD – 41	<u>SAS, § 2.3.1, pg. 24</u> : This discussion should also identify systems that must be powered and maintained for spent fuel handling until the transfer to ISFSI storage is completed.		

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PSD – 42	<p><u>SAS, § 2.3.2, pg. 24</u>: This section discusses how the presence of the ISFSI could hinder demolition activities depending on the timing of DOE performance. Explain how this potential impact was considered in deciding the location for the new ISFSI pad. Explain if this potential impact was considered in deciding whether the new ISFSI pad would supplement the existing pad capacity or the new ISFSI pad would be sized such that it would have sufficient space for all 58 anticipated casks. Explain any evaluation performed of any scenario where the DOE performance is delayed long enough that in order to complete the license termination work within 60 years after shutdown, the work would have to be done with spent fuel still being stored on the current ISFSI pad. If no evaluation of such a scenario was done, explain why not.</p>		
PSD – 43	<p><u>SAS, § 3.1, pg. 25</u>: This section indicates that radioactive water will be transferred to the torus and maintained as a source of water for future use during the reactor vessel internals segmentation project. Describe the analysis, including seismic analysis, done to establish the maximum quantity of water that can be stored in the torus. Describe the controls that will be invoked to ensure the quantity of water stored does not exceed the maximum calculated. Explain the actions needed to maintain the torus during the SAFSTOR period and the estimated cost for these actions. Identify the specific WBS that includes these costs.</p>		
PSD – 44	<p><u>SAS, § 3.1, pg. 25</u>: Since this section briefly discusses modifications to components such as the Torus to supply additional spent fuel pool (SFP) water, it should identify any SFP instrumentation enhancements that will be made to improve</p>		

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	the ability to monitor SFP water level / inventory.		
PSD – 45	<p><u>SAS, § 3.2, pg. 25</u>: This section states that all activated materials “generally” have to be removed from the facility. Explain what criteria are used to establish the need to remove radioactive materials whether activated or contaminated for license termination or site restoration, other than the DCGLs established by the site-specific pathways analysis. Explain why the DCGLs (which have yet to be determined) or some other criteria support stating that activated material “generally” needs to be removed. Explain the significance of this statement. Clarify if there is there any intention to leave any activated material on the VY site.</p>		
PSD – 46	<p><u>SAS, § 3.2.1, pg. 26</u>: The discussion regarding removal of the control blades does not describe their ultimate disposal. By comparison, the 30 power range instrument strings are “loaded into a shipping container and transferred to a waste disposal site.” The section only states that the control blades are “compacted in the spent fuel pool.” Also, clarify whether the shipping containers used for the control blades and the instrument strings are the same as the ISFSI containers or something different.</p>		

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PSD – 47	<p><u>SAS, § 3.2.1, pg. 26, second paragraph</u>: If the control rod blades are not intended to be shipped off site prior to draining the spent fuel pool after all fuel is removed in 2020, explain where are these control rod blades will be stored given the very high radiation levels from them. Identify the basis for the estimated cost of compacting the blades and the estimated cost of disposing of the blades. Identify the WBS numbers that include the costs for compacting and disposing of the control blades.</p>		
PSD – 48	<p><u>SAS, § 3.2.1, pg. 26, third paragraph</u>: The power range instruments contain special nuclear material (SNM) and are likely to be Class B. Describe any evaluation that has been performed to determine if the amount of SNM in these instruments is low enough to allow the WCS facility to accept them for disposal. Identify the costs included in the estimate for disposal of these instruments. Describe the basis for the costs. Identify the WBS that contains these costs.</p>		
PSD – 49	<p><u>SAS, § 3.2.2, pg. 27</u>: This paragraph discusses intact removal of the reactor vessel although it states this is unlikely. Clarify that the decommissioning cost estimate is based on segmentation of the vessel or describe what other assumption forms the basis of the cost estimate.</p>		

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PSD – 50	<p><u>SAS, § 3.2.4, pg. 28, fourth paragraph</u>: This states it is likely the majority of the equipment will be removed from the Reactor Building prior to dismantling. Identify any equipment that will not or may not be removed prior to dismantlement. Explain the basis for leaving any equipment in place. Identify any evaluation or analysis of how leaving equipment in place will affect the effort and cost of dismantlement of the Reactor Building.</p>		
PSD – 51	<p><u>SAS, § 3.2.4, pg. 29, first paragraph</u>: This paragraph states that non-contaminated material may be suitable as scrap or recycling. Describe the process for separating the non-contaminated material from contaminated material. Discuss how the clean and contaminated material will be controlled after separation to ensure no cross contamination or spread of contamination. Identify the cost for the separation and control of contaminated and non-contaminated material. Explain the basis for these estimated costs. Identify the WBS that contains these costs.</p>		
PSD – 52	<p><u>SAS, § 3.2.4, pg. 29, second paragraph</u>: This states that Entergy does not intend to use any construction debris as fill, but does not analyze whether material removed from the VY site may be used as scrap or recycled. If Entergy intends to use material for scrap or recycle it, discuss the established criteria for how material will be judged to be acceptable for these purposes. Identify what is assumed in the cost estimate with respect to use of VY materials being used as scrap or recycled. If the estimate assumes use of VY material as scrap or for recycling, explain the rationale for assuming that VY material can be used for scrap or recycling.</p>		

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PSD – 53	<u>SAS, §§ 3.2.4 & 3.2.5, pgs. 28-29</u> : Energy should acknowledge that the rubblization of debris for use as on-site fill is strictly forbidden by the Settlement Agreement included in Appendix A.		
PSD – 54	<u>SAS, § 3.3, pg. 30</u> : The discussion should acknowledge that the results of this SAS will be used in the Planning, Implementation, Assessment and Decision phases described here.		
PSD – 55	<u>SAS, § 4.2, pg. 33</u> : This section says that the detailed characterization of the VY site will be performed prior to the start of dismantlement and the results will be incorporated into the dismantlement planning. This seems to make clear that the characterization of the site has not yet been performed. Explain when the characterization will be performed. Identify the costs included in the cost estimate for the characterization work. Given that the site has not been characterized, explain the basis for the scope of remediation or dismantlement work represented in the decommissioning cost estimate. Explain the uncertainty in the cost estimate given the lack of detailed characterization information.		
PSD – 56	<u>SAS, § 5.3, pg. 36</u> : Identify what site restoration standards have been assumed in the decommissioning cost estimate. Provide the basis for assuming these particular standards. If the radiological standard is based only on the NRC limit of 25 mrem per year, the discussion should include explanations as to how this compares to the site restoration criteria used by other reactor sites in New England. Other New England sites used more restrictive criteria than the 25 mrem per year.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 57	<p><u>SAS, § 7.2, pg. 42</u>: This section discusses benefits of SAFSTOR identified by the NRC. The third “benefit” would not appear to apply to VY. Looking at the waste volumes in the 2012 VY estimates for DECON and SAFSTOR scenarios, there is essentially no difference. Further, the waste volume identified for the current SAFSTOR estimate for the PSDAR is essentially the same as the 2012 volumes. Therefore, explain the purpose of identifying this NRC perceived benefit when the VY specific analysis does not support such a conclusion. This same logic would also apply to the fourth “benefit” concerning reduction in waste disposal space. For the reasons cited above, this NRC conclusion is not supported by VY specific analysis of waste volumes for DECON and SAFSTOR scenarios. An explanation should be provided relative to the fourth “benefit” as well.</p>		
PSD – 58	<p><u>SAS, § 7.2, pg. 42</u>: The last NRC “benefit” is a storage period compatible with the need to store spent fuel. Again, this is not consistent with the VY specific plan. The current plan assumes spent fuel will be removed by 2052 but the decommissioning will not be complete until 2075. Explain why it is relevant to identify the generic NRC benefits of SAFSTOR when the specific VY plan, evaluation or assumptions is not consistent with the NRC conclusions.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 59	<p><u>SAS, § 7.2.2, pg. 43</u>: The first paragraph discusses that SAFSTOR can result in the inventory of radioactive waste being reduced. The 2012 TLG/Entergy decommissioning estimates had essentially the same waste inventory for both DECON and SAFSTOR scenarios. The 2012 inventories are essentially the same as the inventory in the current SAFSTOR estimate. Explain the rationale or significance of stating this hypothetical possibility when it is contrary to the VY specific facts. Similarly, there is a discussion of hypothetical information from PNL studies from several decades ago concerning waste volumes. Explain the importance or relevance of citing to these hypothetical results when there is VY specific information.</p>		
PSD – 60	<p><u>SAS, § 7.2.2, pg. 44, third paragraph</u>: The discussion of the use of lower cost waste disposal facilities may be appropriate with regard to non-radioactive waste, however, as discussed later in the document, VY is obligated to dispose of radioactive waste at the WCS facility. Therefore, explain the relevance of identifying that others have been able to use less expensive radioactive waste disposal options when these options are not available to VY.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 61	<p><u>SAS, Table 8-1, pg. 49</u>: This table specifies a 1.3-year duration for “Large Component Removal.” It appears that this line item includes reactor vessel internals and reactor vessel segmentation. A 1.3-year duration is extremely optimistic for these activities. The Zion decommissioning currently underway began these activities in 2010 and the completion of one unit (vessel internals and vessel) is not complete and may take another year or so. This project includes the development and manufacture of tooling and testing of the tooling as well as actual segmentation work. Explain the basis for assuming a duration of 1.3 years for reactor internals and reactor vessel segmentation. Discuss how the cost for the segmentation work included in the VY estimate would change if the period of performance were four years or more consistent with Zion experience. Identify any effect such a change in the period of performance of this work has on the overall duration or cost of the license termination work.</p>		
PSD – 62	<p><u>SAS, § 8.1.2, pg. 51</u>: There is a discussion that the differences between the Entergy cost estimate and vendor cost estimate “can be explained” by various factors. However, there is no quantification as to the magnitude of difference from each of these factors or a discussion of which factors apply to which vendors. Such quantification should be provided.</p>		
PSD – 63	<p><u>SAS, § 8.3, pg. 53</u>: All three of the vendor DECON total cost estimates are larger than the SAFSTOR estimate. Given the added costs for SAFSTOR preparation, the added costs of the SAFSTOR period, and the lack of identified cost savings from SAFSTOR, explain why the DECON estimates are higher.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 64	<p><u>SAS, § 8.3, pg. 53</u>: Although not stated here, the Entergy license termination estimate not including dormancy costs is about \$639 million. This should represent a scope of work consistent with the DECON license termination estimated by the other vendors. Two of the 3 vendors have license termination costs that are almost \$200 million higher than the Entergy estimate. Specifically identify any quantitative explanation of this substantial difference. Explain the comparison of the vendor estimates with the Entergy estimate.</p>		
PSD – 65	<p><u>SAS, § 8.3, pg. 53</u>: The text preceding this section indicates that the vendor estimates were only for license termination work. The implication is that the vendor estimates of license termination were combined with Entergy estimates for spent fuel management and site restoration to arrive at a total estimate. Thus, one would expect the difference between each vendor license termination estimate and the total to be roughly the same. One would also expect the difference to be equal to the Entergy cost estimate of a total of about \$425 million in spent fuel management and site restoration costs (the difference between \$817 million in license termination costs and the total \$1.24 billion estimate). Yet neither is the case. Rather than \$425 million, each of the three vendor estimates adds in around \$694 to \$754 million for spent fuel management and site restoration. Explain what spent fuel management and site restoration costs were used to arrive at the total decommissioning cost for each of the vendors. Explain why there are different spent fuel management costs and site restoration costs when the vendors apparently were not asked to estimate those costs.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 66	<u>SAS, § 8.3, pg. 53</u> : The license termination duration for all three vendor estimates are significantly longer than the Entergy estimate. Explain why the durations are different. Explain why the Entergy estimate of 7 years is appropriate rather than the 8.5 to 13 years provided by the other three vendors.		
PSD – 67	<u>SAS, § 8.3, pg. 53</u> : For the three vendor estimates, all site work is complete in 2052. Given that it is assumed that the fuel is not completely removed until 2052, it is unclear how this can be correct. Once the fuel is removed, the ISFSI will have to be decommissioned and remaining site restoration work completed. For the vendor estimates explain the basis for assuming all work is completed by 2052.		
PSD – 68	<u>SAS, § 8.3, pg. 53</u> : Explain the purpose of comparing an Entergy SAFSTOR estimate with three vendor DECON estimates. Identify the conclusions that should be drawn from this comparison.		
PSD – 69	<u>SAS, § 8.3, pg. 53</u> : The asterisk note at the bottom of the table identifies that the vendor estimates do not include profit. Clarify the significance of this note. Identify any difference in assumptions for the Entergy and vendor estimates that make the noted fact relevant to understanding the comparison. If the Entergy estimate includes profit, identify the magnitude of profit included.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 70	<u>SAS, § 9.1, pg. 55</u> : Explain the relevance of last two sentences. These two sentences are comparing the full balance of the NDT to the present value needed for license termination based on the NRC formula. The license termination cost is not the VY-specific estimate.		
PSD – 71	<u>SAS, § 9.5, pg. 57</u> : Clarify if it is correct that the Entergy decommissioning, spent fuel management, and site restoration cost estimate of \$1.24 billion is the total cost for all site work without any credit for cost recovery from DOE.		
PSD – 72	<u>SAS, § 9.5, pg. 57</u> : The basis for assuming only a three-year lag between incurring costs and recovery from DOE should be provided. If this delay is predicated on Entergy reaching a settlement with DOE, this should be clearly stated. If not based on a settlement, describe the evidence or experience from litigation with DOE that supports a three-year recovery time.		
PSD – 73	<u>VYNPS Post-Shutdown Decommissioning Activities Report, Sept. 30, 2014 Draft (“PSDAR”), General</u> : Entergy has until December 2016 to submit its PSDAR and should use this time to engage in a more thorough site characterization so that it can incorporate a more accurate Decommissioning Cost Estimate into its PSDAR.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 74	<p><u>PSDAR, General</u>: In light of the uncertainty surrounding the ultimate site restoration standards, Entergy should not assume that site restoration will cost only \$57 million. The Department has presented evidence before the Public Service Board in Docket #7862 that a more reasonable estimate for site restoration would equate, adjusted for current 2014 dollars, to around \$100 million and could be as high as \$133 million once contingencies are taken into account. Entergy should assume that site restoration could cost as much as \$133 million.</p>		
PSD – 75	<p><u>PSDAR, General</u>: Entergy should acknowledge that the Nuclear Decommissioning Trust Fund is subject to a Master Trust Agreement that places legal restrictions on when and for what purposes Entergy can withdraw funds from this Fund.</p>		
PSD – 76	<p><u>PSDAR, General</u>: In particular, Entergy should acknowledge in the PSDAR that the Master Trust Agreement requires all radiological decontamination and decommissioning to be complete before any leftover money from the Nuclear Decommissioning Trust Fund can be used for spent fuel management or site restoration, and that even once radiological decontamination and decommissioning is complete, the only withdrawals allowed for spent fuel management costs are for expenses that were not recovered by DOE.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
PSD – 77	<u>PSDAR, General</u> : Entergy should note in the PSDAR that Vermont ratepayers contributed the majority of the funds that currently exist in the Nuclear Decommissioning Trust Fund, that Entergy has never contributed any money to this Fund, and that Vermont ratepayers have an existing 55% interest in any leftover funds.		
PSD – 78	<u>PSDAR, § 1.2, pg. 3</u> : Entergy acknowledges that site restoration standards fall under the State’s jurisdiction and are yet to be determined. In light of that uncertainty, Entergy should not assume (as it does, for instance, at p.6 and p.15) that remaining structures will be demolished only “to three-feet below grade.” Consistent with the Settlement Agreement and state law, the State may well require demolition beyond that level.		
PSD – 79	<u>PSDAR, § 2.0, pg. 6, third paragraph</u> : This paragraph discusses site staffing during dormancy and the expectation the staffing will change during the dormancy period. However, there is no qualitative or quantitative description of how the staffing is expected to change over time. A description of how the staffing will change along with the basis for the changes should be provided. A quantitative description of the staffing should also be provided to allow assessment of the staffing costs included in the cost estimate.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 80	<p><u>PSDAR, § 2.0, pg. 6, fourth paragraph</u>: This states that the spent fuel will remain in the pool until it meets the criteria for transfer but does not specify any specific dates. The SAS on the other hand states that the fuel will all be in dry storage by late 2020. The PSDAR discussion should be consistent with the SAS and explain why the criteria for transfer will be met in time to support the given date.</p>		
PSD – 81	<p><u>PSDAR, § 2.0, pg. 6</u>: Entergy notes that an “additional ISFSI pad will be added.” Entergy should clarify whether it intends to seek a new or amended NRC license for the additional ISFSI pad. Entergy also should note that its petition for approval for the additional ISFSI pad from the Vermont Public Service Board is pending.</p>		
PSD – 82	<p><u>PSDAR, § 2.0, pg. 6, last paragraph</u>: This paragraph states: “For the purposes of a current decommissioning cost estimate, it is assumed that the remaining structures are to be demolished to three-feet below grade and the excavations backfilled.” Indicate that this assumption carries significant uncertainty, as the depth to which structures will be removed is subject to the development of site restoration standards pursuant to state law. Provide a discussion of the uncertainty that the actual demolition will be different. Describe any alternative possibilities and relative likelihood of each. Include a discussion of how the cost estimate and funding analysis provide allowance or margin for the other alternatives.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 83	<u>PSDAR, § 2.0, pg. 7</u> ; Entergy should delete the assertion that there are “no identified or anticipated decommissioning activities that are unique to the VYNPS site outside the bounds considered in the GEIS.” Entergy should acknowledge, as detailed in part below, that there are a number of aspects of its planned decommissioning that were never analyzed or considered in the GEIS.		
PSD – 84	<u>PSDAR, Table 2.1, pg. 8</u> : A duration of 5.2 years is listed for the wet fuel storage period with a start date of 2016. Assuming this period begins Jan 1, 2016, the wet storage period would end in February or March 2021. However, the SAS states all fuel will be moved to dry storage by late 2020. In addition, Section 2.1.2 of the PSDAR also says fuel transfer will be complete by late 2020. The date that is the basis for the cost estimate should be unambiguously identified. The SAS and PSDAR should be modified to be consistent.		
PSD – 85	<u>PSDAR, Table 2.1, pg. 8</u> : Fifteen years is listed as the duration for the dormancy with no fuel storage period. Based on the other dormancy period lengths and a start of January 2016, the dormancy period with no fuel storage would end in late 2067 rather than 2068. This difference is small, but the years should be made consistent with the period lengths given.		
PSD – 86	<u>PSDAR, Table 2.1, pg. 8</u> : The Large Component Removal duration is given as 1.3 years. This appears to be overly optimistic. For more detail, see the comment PSD – 61.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 87	<u>PSDAR, § 2.1.1, pg. 10, seventh bullet</u> : Provide a description of what water and water filter and treatment media will be required to support dormancy so that the scope of this effort is more clearly defined. Identify the WBS that includes this cost.		
PSD – 88	<u>PSDAR, § 2.1.1, pg. 10, eighth bullet</u> : Explain whether there is a separate WBS for this waste disposal in the cost estimate. Provide a discussion of the inventory and the basis for that inventory that was used to calculate the costs included in the cost estimate for this waste disposal.		
PSD – 89	<u>PSDAR, § 2.1.1, pg. 10, tenth bullet</u> : Identify the cost included in the estimate for this work. Explain the basis for the estimated cost. If based on plant records, identify the records reviewed.		
PSD – 90	<u>PSDAR, § 2.1.2, pg. 12, fourth paragraph</u> : This discusses the reasons for security. The first is to safeguard fuel and the associated cost would reasonably be considered spent fuel management. The second reason is to prevent unauthorized access. The PSDAR or other documents should describe the allocation of security costs and the basis for this allocation among license termination, spent fuel management and site restoration. While the specific paragraph of the PSDAR referenced is only related to the dormancy period, the question of how security cost is allocated would apply to all periods of the decommissioning. The requested discussion should be provided for all periods of decommissioning.		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 91	<p><u>PSDAR, § 2.1.5, pg. 15, first paragraph</u>: This states that subject to the development of site restoration standards pursuant to the Settlement Agreement, it is being assumed that structures will be removed to three feet below grade. Description of any allowance in the cost estimate for standards that require some greater level of removal should be provided. If no allowance is provided, this should be identified along with a discussion as to why this is reasonable. Also, if no allowance is included there should be a discussion of how the added costs will be provided for if more stringent criteria are ultimately developed. Finally, there should be a description of how development of more stringent criteria would affect the funding plan/analysis.</p>		
PSD – 92	<p><u>PSDAR, § 2.1.5, pg. 15, last paragraph</u>: This paragraph indicates that intact removal of the reactor vessel may not be a viable option. If there is reason to believe that intact removal may be a viable option, provide a discussion of the rationale for such possibility. If the cost estimate is based on segmentation, the PSDAR should clearly state that the estimate and schedule are based on segmentation. If the basis of the cost estimate is other than segmentation, the PSDAR should identify the reactor vessel removal assumption on which the cost estimate is based.</p>		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 93	<p><u>PSDAR, § 2.2.3, pg. 16, first paragraph</u>: This paragraph states that radioactive decay during the SAFSTOR period will significantly reduce the quantity of contamination and radioactivity that must be disposed of during decommissioning. As noted in comments on the SAS (e.g., PSD – 57 & PSD – 59), there appears to be no reduction in waste volume based on decay during SAFSTOR. While decay would reduce the number of curies to be removed and in that sense decrease the quantity of radioactivity removed, the discussion should be clarified to note that waste volumes are not decreased. The discussion should also include some quantitative description of what is meant by “significantly” reduce.</p>		
PSD – 94	<p><u>PSDAR, § 2.2.4, pg. 16</u>: The discussion should be clarified to identify that the estimated cost of radioactive waste disposal is based on disposal of all low-level waste at the WCS facility in Texas. If this is not the basis of the estimated costs, the basis for the cost estimate should be clearly stated along with explaining the rationale for basing the cost on disposal of some or all of the radioactive waste at a different site.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 95	<p>PSDAR, § 2.2.4, pg. 16: Assuming that the current cost estimate is based on disposal of waste at the WCS facility, a comparison of waste disposal costs in the 2012 VY estimate and the current estimate is confusing. In the 2012 estimate, it was assumed that a large fraction of the low-level waste was sent to an off-site processing facility with the remainder being sent to Envirocare for burial. The total cost of waste processing and burial for a total of about 669,000 cubic feet of waste was a little over \$60 million dollars. However, in the current estimate it appears no waste is sent to a processor and all waste is sent for burial at WCS, with higher disposal cost than Envirocare, but the total waste burial cost is only about \$45 million for a total volume of about 666,000 cubic feet. It is unclear how shifting from the lower cost off-site processing and Envirocare assumption to the WCS assumption results in substantially lower cost. Further, the average cost per cubic foot for disposing of waste through a processor in the 2012 estimate is about \$66 per cubic foot. Calculating the average cost of waste disposal at WCS in the current estimate, the cost is about \$67 per cubic foot. It is unclear how the per cubic foot cost for disposal at WCS could be comparable to the 2012 cost for off-site processing which was cheaper than even disposal at Envirocare. In 2012, the rate for disposal at WCS was about \$150 per cubic foot. Using that rate the total waste burial cost would be about \$99 million rather than about \$45 million. The rates assumed for disposal of low-level waste and the basis for these rates should be specified.</p>		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 96	<p><u>PSDAR, § 2.2.7, pg. 17, second paragraph</u>: If this discussion is limited to remediation of tritium in ground water, that limitation should be clearly stated. If the discussion applies to more than groundwater, the basis for assuming that remediation or removal of structural materials or soil containing tritium will not be required even if the levels are less than those required by the NRC for license termination should be provided. The Yankee Rowe plant processed or removed all material with detectable tritium. Any discussion of why remediation will not be required or will be limited should include an explanation as to why the criteria for the VY site are expected to be less restrictive than the criteria for the Yankee Rowe site.</p>		
PSD – 97	<p><u>PSDAR, § 5.0, pg. 21</u>: Entergy states that “ENVY has concluded that the environmental impacts associated with planned VYNPS site-specific decommissioning activities” are bounded by previous environmental impact statements (PSDAR at p.21). Entergy should recognize that the NRC, not Entergy, is the entity legally responsible for compliance with the National Environmental Policy Act.</p>		
PSD – 98	<p><u>PSDAR, § 5.0, pg. 21</u>: Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, an operating elementary school is located just 1500 feet from the reactor building.</p>		
PSD – 99	<p><u>PSDAR, § 5.0, pg. 21</u>: Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, recreational activities take place on the Connecticut River bordering the plant.</p>		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 100	<u>PSDAR, § 5.0, pg. 21</u> : Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, in addition to what Entergy identifies as currently endangered and threatened species, over the next 60 years it is likely the list of endangered and threatened species will increase due to human activity, climate change and other factors.		
PSD – 101	<u>PSDAR, § 5.0, pg. 21</u> : Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, there is known and unknown contamination from previously identified tritium leaks and the effect of any delay during the SAFSTOR period in addressing such leaks (such as migration that increases the area that is contaminated).		
PSD – 102	<u>PSDAR, § 5.0, pg. 21</u> : Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, there are unique environmental and economic impacts related to the length of any SAFSTOR period, and numerous reasonable alternatives (each with unique environmental and economic impacts) to the SAFSTOR period that Entergy has elected.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
PSD – 103	<p>PSDAR, § 5.0, pg. 21: Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, there are negative economic impacts to the surrounding area resulting from Entergy’s decision to use the maximum SAFSTOR period rather than a shorter SAFSTOR. Regulations implementing the National Environmental Policy Act (such as 40 CFR § 1508.8) require the NRC to analyze the economic impacts of major federal actions significantly affecting the environment. Neither the NRC nor Entergy has ever done such an analysis, which would require, among other things, accounting for the economic costs of leaving the plant dormant, taking up space that could otherwise be used productively, as well as 60 years of downward pressure on property values and area development due to hesitancy to invest in an area that is slated for a major industrial deconstruction project (with attending noise, aesthetic, and other concerns). Entergy should acknowledge that this analysis is required by federal law.</p>		
PSD – 104	<p>PSDAR, § 5.0, pg. 21: Entergy should acknowledge that the GEIS never took into account the fact that, for this particular nuclear power plant, because it is owned by a merchant generator, unlike a regulated utility, Entergy cannot go back to ratepayers if it has underestimated the costs of decommissioning, spent fuel management, or site restoration.</p>		

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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 105	<p><u>PSDAR, § 5.0, pg. 21</u>: Entergy should acknowledge that its decommissioning plan raises numerous environmental, safety, and other impacts related to spent fuel storage that are not addressed by the GEIS, and Entergy should analyze all of those impacts. For example, the GEIS did not analyze any environmental, safety, or other impacts related to spent fuel storage, but rather explicitly relied on the NRC’s Waste Confidence Decision—a decision that has since been vacated by the U.S. Court of Appeals for the District of Columbia Circuit in <i>New York v. NRC I</i>.</p>		
PSD – 106	<p><u>PSDAR, § 5.0, pg. 21</u>: If, for purposes of analyzing the environmental and other impacts of spent fuel storage, Entergy is relying not on the GEIS, but on the NRC’s recently issued Continued Storage Rule, Entergy should explicitly state that it is doing so and should also note in the PSDAR that this Rule is the subject of a current court proceeding (<i>New York v. NRC II</i>).</p>		
PSD – 107	<p><u>PSDAR, § 5.0, pg. 21</u>: The NRC’s Continued Storage Rule recognizes that spent fuel may be stored indefinitely at each reactor site and assumes that, in that scenario, each reactor operator will use a Dry Fuel Transfer Station to move spent fuel into new dry casks every 100 years. Entergy should explain how it would address the contingency of indefinite onsite storage, including all safety and environmental concerns regarding such a transfer and identification of the funding source for: (a) the construction of a Dry Fuel Transfer Station; (b) the purchase of 58 new casks and all other labor and material costs for transferring the fuel every 100 years; and (c) the costs of maintaining security at the site indefinitely.</p>		

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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 108	<p><u>PSDAR, § 5.1, pg. 21</u>: Entergy should delete the assertion that because “VYNPS is smaller than the reference boiling water reactor used in the GEIS . . . [it] is therefore bounded by those assessments.” The size of a plant is not the exclusive factor for determining its potential environmental and other impacts during decommissioning.</p>		
PSD – 109	<p><u>PSDAR, § 5.1.3 & Reference List (Section 6.0), pg. 23</u>: Reference 9 refers to an NPDES permit that has been superseded. Entergy should cite the current (October 2014) NPDES permit.</p>		
PSD – 110	<p><u>PSDAR, § 5.1.7, pg. 32</u>: This section provides low-level waste volumes by Class. There should be some discussion, here or elsewhere in the PSDAR or supporting documents, describing how the plant equipment and material inventories were developed and how these inventories were then used to generate the waste volumes. This discussion should include identification of assumptions such as packing efficiencies and waste packaging weight limitations that were utilized in calculating the burial volume for low-level waste.</p>		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 111	<p><u>PSDAR § 5.1.9, pg. 28</u>: Does the NRC generic offsite radiological consequences analysis discussed in this section make any assumptions on the population likely to receive a radiological dose from any of its scenarios? Such assumptions should be identified, and the section should state whether the assumptions include the existence of an elementary school in close proximity to the site, as is the case with the VY site. Any change in the offsite radiological analysis due to the close proximity of a school to the VY and accompanying change to the generic offsite radiological analysis should be noted. For example, is the breathing rate for elementary school children different than the generic breathing rate used in the NRC generic analysis? Would any such differences warrant maintaining the EPZ for a period beyond that normally proscribed by the risk reduction for the zirconium fire event?</p>		
PSD – 112	<p><u>PSDAR, § 5.1.17, pg. 32</u>: The total disposal volume for Class A, B and C waste is identified as 666,399 cubic feet. However, in the actual cost estimate Maximum SAFSTOR Decommissioning Cost Estimate – DRAFT), on the last page shows a total of 666,336 cubic feet. Though close, this difference should be reconciled.</p>		
PSD – 113	<p><u>Spent Fuel Management Plan, Rev. 4, Jun. 2014 (“SFMP”), § 1.3, pg. 3</u>: Indicate where the figure identified as “Tab 1” can be located.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 114	<u>SFMP, §§ 1.3 & 2.1, pgs. 3-4</u> : The Dry Fuel System MOU, PSB Order and CPG should be added to the SAS for referencing here. Subsequent MOUs discussed in this Appendix (e.g. see Section 4.1) should also be included in the miscellaneous items appendix suggested previously.		
PSD – 115	<u>SFMP, § 3.1, pg. 5</u> : This section states that Entergy is evaluating the location of the second ISFSI pad. Based on the cash flow in the funding analysis, it appears that the assumption is that all spent fuel will be stored in proximity such that for security purposes, whether it is one or two pads, the operation is consistent with a single ISFSI. This should be clearly stated if it is true. If this assumption is not true, there should be an explanation provided as to how the costs during dormancy during dry storage are sufficient to provide for operation of two separate ISFSIs.		
PSD – 116	<u>SMFP, § 3.1, pg. 5</u> : The Public Service Department has received several public comments noting that Entergy previously committed to locate the second ISFSI away from the existing ISFSI. Explain the reasons behind the decision to locate the second ISFSI immediately adjacent to the existing one.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 117	<p><u>SFMP, § 3.2, pg. 5</u>: This section says Entergy is considering multiple cask vendors and cask for use at VY. An explanation should be provided as to how is this possible given the time frame for design and construction of the second ISFSI pad and procurement of casks within the constraint of the stated plan to have all fuel moved to dry storage by late 2020. Also, a discussion should be provided concerning the costs for the procurement of support equipment and implementation of plant modifications if a system other than the Holtec Hi-Storm 100 is used.</p>		
PSD – 118	<p><u>SFMP, § 3.4, pg. 5</u>: The current estimate assumes all spent fuel is removed from VY by 2052. Entergy should acknowledge that this plan depends upon DOE siting an interim storage facility by 2025, and that the GAO has stated that this type of plan requires congressional action because DOE’s current authority is limited to developing a permanent repository. Also, the 2006 Vermont Public Service Board Docket 7082 Order required VY to address the possibility of fuel remaining on site as long as through 2082. Apart from the discussion related to this on page 6, there is no discussion of the effect on cost and funding analysis if spent fuel remains on site beyond 2052 and potentially until 2082 or beyond. Such discussion should be included particularly given that, according to Entergy’s calculations, it currently falls \$82 million short of having enough money to pay for license termination and spent fuel management, and even if it made up for that shortfall, there would be no money left to pay the approximately \$57 million estimated by Entergy for site restoration.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 119	<p><u>SFMP, § 3.4, pg. 6</u>: The bullets on this page identify various actions that Entergy will undertake to develop and execute programs related to spent fuel storage. It is unclear from the SFMP or the PSDAR what costs, if any, are included in the decommissioning cost estimate relative to these various actions. There should be a discussion of the related estimated costs and the basis for these costs as well as identification of where such costs are included in the detailed cost estimate. If there are no estimated costs in the estimate for these actions, an explanation should be provided as to why such costs should not be included in the estimate.</p>		
PSD – 120	<p><u>SFMP, § 3.4, pg. 6, third bullet</u>: Explain why 2028 or 20 years after loading the first spent fuel canister at VY is the appropriate date. The Certificate of Compliance (COC) for the Holtec Hi-Storm 100 system currently in use at VY expires in 2020. Holtec, VY or someone else must renew the COC prior to 2020. That renewal would be for at least 20 years and perhaps 40 years so there would be no reason for 2028 to be an important deadline. If any date would be important, it would be 2020. Beyond this, if the renewal were for only 20 years, it would expire in 2040. The discussion should be provided as to what actions VY is committing to in order to ensure continued license validity for the Holtec Hi-Storm system beyond the next license renewal. If there is reason to question whether the license can be extended beyond the next renewal, a discussion of the reasons for such concern should be provided along with a discussion of the actions that would be needed if the license could not be renewed. The discussion of possible actions if the license cannot be renewed should identify the estimated costs for such actions.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 121	<p><u>SFMP, § 3.4, pg. 6, fourth and fifth bullets:</u> Any costs in the estimate for the actions discussed in this bullet should be identified. If there are no costs, an explanation should be included as to why no costs are in the estimate. If there are costs for these actions in the estimate, the location of these costs in the estimate should be identified along with the basis of the estimated costs. The discussion of the basis should identify how the estimate of cost for these actions takes into consideration the programs accepted by the NRC in relicensing other ISFSI's for an additional 40 years.</p>		
PSD – 122	<p><u>SFMP, § 3.4, pg. 6, fourth and fifth bullets:</u> Explain why 40 years after pad construction is the appropriate time for these actions. Explain how the need for these actions relates to the date of DOE performance. For example, the explanation should identify whether these actions will be undertaken if the DOE were on track to remove all fuel by 2052 (as is assumed in the PSDAR). Further, the explanation should identify if and how the level of effort estimated for aging management activities depend on the future expected date for DOE performance.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 123	<p><u>SFMP, § 4.2, pg. 7</u>: This section describes the method of transfer of spent fuel from the VY ISFSI to DOE. The method described uses the Hi-Trac transfer cask to move the sealed spent fuel canisters from the storage overpacks to Hi-Star transportation casks.</p> <p>a. As noted above, Section 3.2 says Entergy is considering multiple cask vendors and casks but the process described is only valid for the Holtec system. Unless the decision has been made to use a Holtec system, Section 4.2 should discuss the possible actions if other dry storage casks or systems are chosen.</p> <p>b. The process described utilizes a stack up. The Hi-Trac is stacked on top of the Hi-Storm storage cask to remove the canister and then moved and stacked on top of the Hi-Star to insert the canister. The NRC has raised issues concerning the seismic stability of such stack-up configurations based on findings at the Perry facility in 2011. Entergy made significant plant modifications at the Arkansas Nuclear One site to address the NRC concerns. Provide an explanation of how the NRC concerns about stack-up seismic stability for the transfer of spent fuel from the VY ISFSI to DOE transportation casks will be resolved. The method of addressing the NRC concerns should be discussed in the SFMP and PSDAR. Any costs in the estimate for equipment or processes related addressing the seismic stability issues should be identified. This identification should include discussion of the basis for the estimated costs. If there are not costs for such items in the estimate, an explanation should be provided as to why it is appropriate to exclude any such costs. (cont.)</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 123 Cont.	c. The process described requires lifting equipment and depending on the lifting equipment, equipment for protection from a cask-drop event. The type of lifting equipment planned for use should be described. Any costs that are included in the estimate for procurement or rental of the lifting equipment should be identified. Based on the type of lifting equipment Entergy plans to use, there should be a discussion of what, if any, equipment will be needed for cask-drop protection.		
PSD – 124	<u>SFMP, § 4.2, pg. 7</u> : Indicate when the Cask Transfer Facility noted here will be constructed. Explain whether Entergy has considered whether any existing onsite structures (e.g. the Reactor Building or the Containment Access Building) could be repurposed as the CTF.		
PSD – 125	<u>SFMP, § 4.2, pg. 7</u> : The eventual moving of spent fuel offsite will likely require improvements to infrastructure surrounding the VY site (e.g. roadways leading to I-91 or the freight / Amtrak railway near the VY site). Explain whether any of the VY decommissioning estimates to date have inherently or explicitly assumed a preference for transporting radiological waste and other contaminated materials offsite. With regard to radiological waste, explain whether Entergy foresees a need for transporting any radiological waste (high-level or low-level) in either a northerly or easterly direction for any great distance (i.e. shipments that would eventually travel through New Hampshire, northern New York or Canada) rather than the more likely transport directions leading to Massachusetts or central / southern New York.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 126	<p><u>TLG Maximum SAFSTOR Cost Estimate (“MSCE”), General:</u> Some of the detailed comments relating to other documents concern information from the MSCE. However, any detailed or thorough review of this estimate is complicated by the lack of supporting information. TLG estimates routinely are provided as part of a report that provides schedule information with description of the work done in the various periods listed in the cost estimate, some descriptive information concerning work activities and identification of many of the assumptions on which the estimate was based. The same type of information is not included in any of the documents associated with the PSDAR. Further, TLG estimates usually have a relatively large volume of supporting information and calculations that are useful in evaluating the estimated costs. Absent a complete delineation of the estimate assumptions and access to the detailed backup data and calculations, the ability to review the MSCE is very limited.</p>		
PSD – 127	<p><u>MSCE, General:</u> Entergy places all projected costs into three categories: NRC License Termination costs, Spent Fuel Management costs, and Site Restoration costs. Entergy should recognize that many costs fall outside of these three categories, and Entergy should add a fourth category for those costs.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 128	<p><u>MSCE, General:</u> Entergy should recognize that a number of costs that are currently listed as “NRC License Termination costs” belong in the fourth category noted above. In particular, Entergy should re-categorize all costs that do not reduce radiological contamination at the site. This includes:</p> <ul style="list-style-type: none"> a. The \$5 million payment (lines 1a.2.22 & 1b.2.22) that Entergy is making to the State as part of the Settlement Agreement; b. Emergency planning costs (e.g., line 1a.2.23); c. Asbestos shipments of non-radiological waste (e.g., line 1a.2.27); d. Insurance (e.g., line 1a.4.1); e. Property taxes (e.g., line 1a.4.2); f. Replacement of structures during SAFSTOR (e.g., line 2b.1.4); g. Any costs associated with offsite buildings; h. All other listed costs that relate to activities that do not reduce radiological contamination; and i. Costs not currently listed (e.g., employee pension fund liabilities). 		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 129	<u>MSCE, General:</u> Entergy should explain the basis for its estimates regarding property taxes, particularly the assertion that Entergy expects to pay only around \$7,000 per year beginning around 2020 (e.g., lines 2aa.4.2 & 2b.4.2). Entergy should clarify whether this estimated \$7,000 per year payment is based upon the VYNPS or an offsite building. If Entergy is relying on its current exemption to property taxes, it should recognize that that exemption is premised upon Entergy paying alternative taxes through its current generating tax.		
PSD – 130	<u>MSCE, General:</u> Entergy should explain what, if any, contingencies it has in place in the event that the Nuclear Decommissioning Trust Fund fails to obtain the expected stock-market returns over the next 60 years.		
PSD – 131	<u>MSCE, General:</u> Entergy should explain what, if any, contingencies it has in place in the event that the costs of radiological decommissioning increase at a greater-than-expected rate over the next 60 years.		
PSD – 132	<u>MSCE, General:</u> Given the uncertainty in DOE performance, the unknown results of future site characterization, the yet to be determined site release criteria, and uncertainty in cost escalation as well as other uncertainties all of which could result in increased costs, the meaning of the label “Maximum” is unclear. An explanation should be provided as to the significance or meaning of labeling the costs estimate as the “Maximum” SAFSTOR estimate.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
PSD – 133	<p><u>MSCE, General</u>: Security represents a significant cost particularly during the dormancy period with spent fuel on site. Security costs are highly dependent on the details of the site-specific security plan. In most instances decommissioning cost estimators are not allowed access to the detailed security plan. As a result, it is important that the site security management be involved in developing the estimate of security costs. This may be done by the security staff actually developing the estimate or by the security staff providing information on staffing levels and associated costs to the cost estimators without divulging safeguards information. A discussion should be provided of the interaction with and involvement of the VY security staff in developing the security costs for the various periods of the decommissioning.</p>		
PSD – 134	<p><u>MSCE, WBS 1a.2.38</u>: Entergy should re-categorize the “NEI Annual Fee” from a Spent Fuel Management cost to a cost that falls within the fourth category discussed above.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Public Service Department (PSD)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
PSD – 135	<p><u>MSCE, WBS 4b.2.7 & 5b.2.6</u>: These items include costs that appear to be for ISFSI dismantlement and decommissioning. The total cost of these two items is about \$6.4 million for ISFSI with pads holding 58 spent fuel casks. In December 2012, Entergy submitted a letter pursuant to 10 CFR § 72.30 to the NRC. This letter included the Entergy estimate for decommissioning of the VY ISFSI. The 2012 letter represent the cost for decommissioning an ISFSI sized for 42 casks as about \$2.75 million in 2012 dollars. Escalated to 2014 dollars this would be about \$2.85 (escalated consistent with CPI). Extrapolating this cost to 58 rather than 42 casks would yield a cost of about \$4 million. A discussion should be provided to explain how the ISFSI decommissioning costs in the Maximum SAFSTOR estimate is consistent with the ISFSI decommissioning estimate submitted to the NRC in 2012. If there are reasons that the more recent estimate is not consistent, the reasons should be explained along with a description of the contributors to the cost difference.</p>		
PSD – 136	<p><u>VYNPS Radiological Historical Site Assessment, General</u>: Several of the structures with contamination enumerated in this Appendix are slated for dismantling / removal in early 2015 (e.g. the North & South Warehouses and the Tan Building). Explain whether the related items in these tables and figures will be updated in mid-2015 to reflect any additional contamination surveys conducted after these structures are dismantled / removed.</p>		

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**State of Vermont
Agency of Natural Resources**

**ANR Comments on
Entergy Vermont Yankee Site Assessment Study**

December 2014

Overview

On December 23, 2013, the State of Vermont and Entergy entered into a settlement agreement that included a commitment by Entergy to prepare a Site Assessment Study (SAS) of the costs and tasks of radiological decommissioning, spent nuclear fuel management, site restoration of the Entergy Station, and a full assessment of non-radiological conditions at the Station site. The settlement agreement requires Entergy to review and consider any comments provided by the State for inclusion in the Post-Shutdown Decommissioning Activities Report (PSDAR) prior to filing the SAS, any site-specific cost estimate, or the PSDAR with the Nuclear Regulatory Commission (NRC).

The Agency of Natural Resources (ANR) has reviewed the SAS to prepare comments on the content of this report that fall within the ANR's authority. The ANR's review and comments provided today address the waste issues identified in the SAS regarding non-radiological hazardous materials and hazardous wastes. The comments in this document do not address radiological waste issues raised in the report, nor do the comments address asbestos or lead abatement issues as the Vermont Department of Health is the primary regulator of these areas.

The information contained in these Comments includes general comments to the overall content of the SAS (including requests for the production of additional information, records, or data relied upon or referenced in the SAS), and more specific comments relating to a certain section or page of the SAS. These Comments and requests for additional information represent only ANR's review of the information included in the SAS. ANR expects that Entergy will engage in constructive discussions with ANR staff, the public, and other State agencies to address the ANR's concerns in an efficient and transparent manner. To that end, we have attached a chart of our specific comments (see underlined text that follows) to facilitate Entergy's responses to the comments and inclusion of the comments in the PSDAR.

Due to the preliminary nature of the SAS and the breadth and complexity of the information presented in the SAS report (being presented for the first time in a comprehensive single source document), ANR reserves the right to modify or add to these Comments in the future. The submission of these Comments shall not limit ANR's rights to otherwise comment or participate in the NRC or any other process, and ANR expressly retains all authority and reserves all rights to take any actions authorized by law, including all appropriate evaluation of toxicological hazards. Nothing in this document shall be interpreted as prohibiting or restricting Entergy from complying with any NRC requirements or other obligations under its NRC license.

I. GENERAL COMMENTS ON SITE ASSESSMENT STUDY

Use of MARSSIM process

The SAS is designed to identify potential environmental issues that could remain at the facility after the power plant ceases energy production operations at the end of 2014. The ANR has no objection to Entergy using the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) guidance even though this process was not developed to evaluate non-radiological environmental issues. In general, the terminology used in and the organization (identifying potentially impacted areas into Class 1, Class 2, or Class 3 areas) of the MARSSIM process helps to organize the issues remaining at the plant. The MARSSIM analysis relies on an iterative process whereby a background study is updated with additional investigation to further characterize the degree and extent of contamination at a site. In this way, this process is similar to other environmental regulations and standards like the ASTM Phase 1 and Phase 2 Site Assessment Studies and Vermont's hazardous waste guidance titled "Investigation and Remediation of Contaminated Properties Procedure."

Underlying information and reports

The SAS and Appendix F of the SAS (the Non-Radiological Historical Site Assessment (NRHSA)) reference and rely upon a number of sources of information. These sources include reports related to incidents of non-radiological contamination; the file required by federal regulation 10 C.F.R. 50.75(g) to maintain a record of contamination incidents important to decommissioning; selected inspection reports prepared by American Nuclear Insurers (ANI); company records describing equipment leaks, spills of hazardous materials and an inventory of components containing elemental mercury; the spills database maintained by the Waste Management Division of ANR (Table 1-1); various permits related to environmental regulation of the plant; interviews of current or former long-time plant employees to identify incidents that may not have been documented in plant records; Phase I and II Environmental Site Assessment of Vermont Yankee Nuclear Power Corporation in 2001; and inspection of the site to observe each identified potentially impacted area. Though comprehensive, this list of informational sources is not specific enough to discern what sources may already be in the ANR's possession or the public domain. Additionally, there is no justification provided when only selected reports were analyzed and relied upon. In order for the ANR to conduct a thorough and independent review of the SAS, Entergy should ensure that all records listed above are available to the ANR. ANR should also be

provided with a list of employees interviewed for the SAS and either a transcript of the interview or list of questions asked in the event that ANR wishes to conduct its own interviews or respond to the information provided by employees in the SAS (ANR – 1, ANR – 2).

Further characterization of potentially impacted areas

The SAS identifies a number of areas potentially and/or actually impacted by chemical contaminants (identified as “potentially impacted areas”) and states that these areas will be further characterized “as [they] become more accessible during decommissioning to determine the extent to which [they] may have been impacted.” Entergy should explain the characterization process in greater detail so that ANR can determine the adequacy of this approach (ANR – 3). The SAS does not indicate what is meant by “characterization” of a potentially impacted area; what procedure (i.e., what new investigation, sampling, or analysis) will take place to determine whether additional remedial measures or clean-up of a potentially impacted area is needed.

Generator closure requirements and timeline

The Vermont Hazardous Waste Management Regulations (VHWMR) include Generator Closure requirements (VHWMR § 7-309(c)) that are not referenced in the SAS plan for site closure and clean-up. Entergy must consider how these requirements pertain to the facility and identify what steps Entergy will take during the post-closure process to comply with these requirements by submitting a comprehensive plan for phased closure of waste handling and storage areas on the site for approval by the Hazardous Waste Program of DEC (ANR – 4).

Underground storage tank systems

All underground storage tanks that are removed will be required to follow the Underground Storage Tank (UST) Closure and Site Assessment Requirements, formalized in June, 2010, to ensure a consistent closure process for all tanks on the site (ANR – 5). In addition to other requirements, notification of tank closure must be made at least 5 business days before the date scheduled for closure, and a copy of the report must be sent to the DEC UST Program.

II. SPECIFIC COMMENTS ON SAS

1.5 Non-Radiological Contaminants On-Site

- ***Update of NRHSA (Page 13)***

The SAS states that “The [Historical Site Assessment] process, as described in MARSSIM, is an iterative process in which knowledge about the site is obtained through records of past events and augmented over time through scoping surveys and characterization surveys. Entergy will periodically update the Non-Radiological HSA as information is gathered.” Entergy should specify what process will be used to obtain or update any additional information, and should notify and consult the State and the public with regard to any changes made as the result of additional or updated information (ANR –

6). ANR reserves the right to review and comment further on any additional scoping surveys and characterization surveys as they may be performed. ANR also reserves the right to request that additional work be performed at identified potentially impacted areas or at other areas at the facility as further information is obtained or as those areas become more accessible during the decommissioning process.

- ***Identification of potentially impacted areas (Page 15)***

The SAS states that, “The assessment identified one hundred thirty four (134) areas on or adjacent to the VYNPS site where current or former activities may have resulted in non-radiological impacts potentially significant to the decommissioning effort.” This list of “potentially impacted areas” does not appear to include the petroleum-impacted soils, identified during the 2010 tritium release investigation, that are located roughly 30 feet below ground surface at a location just northeast of the Radiological Waste Building. Entergy should identify the need for any further investigation of this area in the SAS (ANR – 7).

- ***Structural component materials; PCB management (Page 15)***

While abatement of areas of the plant where lead-based paint and asbestos are present is overseen by the Vermont Department of Health, Lead and Asbestos Abatement Program, lead waste (including waste resulting from abatement activities) must be tested to determine if it is subject to regulation as hazardous waste under the VHWMR (ANR – 8).

Entergy should also address possible PCB contamination in wire sheathing, caulking, and paints throughout the plant and how these potential hazardous wastes will be handled and managed throughout the decommissioning process (ANR – 9). Note that materials contaminated with PCBs at a concentration of 50 ppm or greater are regulated as hazardous waste under the VT01 listing (see, VHWMR § 7-211).

Finally, devices containing elemental mercury (e.g., mercury switches, thermostats, gauges), batteries, cathode ray tubes and lamps must be managed either as hazardous waste or as universal waste in accordance with Subchapter 9 of the VHWMR (ANR – 10). (Note: the VHWMR are in effect in Vermont in lieu of the U.S. EPA RCRA hazardous waste regulations).

- ***SMAC designated sites (Page 16)***

The SAS identifies that two of the Class 1 areas at which petroleum products have been released have been designated by the Vermont Department of Environmental Conservation (DEC) as “Site Management Activities Complete” (SMAC) sites. In these cases, institutional controls (primarily notice to land records) were implemented as notification of any remnant contamination left in place due to the area not being currently accessible. In one case, involving a release from a 5,000-gallon underground fuel oil storage tank, petroleum constituents may remain in low concentrations at the site. Once the decommissioning process makes these areas of the site more accessible, Entergy should conduct

additional investigation and perform any remedial work required at this site.¹ Entergy should submit a work plan for such additional investigation, outlining all work to be performed, for approval by the ANR (ANR – 11). Such additional remediation of these SMAC sites may supersede the current notice to the land record with a notice that all of the remnant contamination has been addressed.

- ***Transformers (Page 16)***

To ensure that the oil-water separators on site do not contribute to contamination of the surrounding soil or other environmental media, Entergy should conduct further sampling at and around the separators upon their excavation (ANR – 12). At a minimum, one sample should be obtained for total petroleum hydrocarbons (TPH) and PCBs. If field observations determine that this area is contaminated, then Entergy should perform further characterization of the area in order to determine the degree and extent of the contamination.

The SAS identifies a fire at the Main Transformer that occurred in June 2004, whereby “transformer oil and fire-fighting foam were spread outside of the transformer containment.” Entergy should indicate whether any residuals or contaminants of concerns (such as perfluorinated compounds, or PFOAs) from the foam remain on the site that may require clean-up. Entergy shall submit a work plan for such additional investigation required, outlining all work to be performed, for approval by ANR (ANR – 13).

The SAS identifies a leak in the Auto Transformer that occurred within the fenced area of the 345kV switchyard in 2003. The SAS indicates that the spill was remediated by excavation and removal of approximately 25 cubic yards of impacted soil, but that impacted soil may remain beneath the concrete pad on which the Auto Transformer sits. The information included in Table 1-1 indicates that there were two transformer leaks that occurred in 2003 (identified as “WMD 136” and “WMD 394”). Entergy should clarify which leak is being referenced in this section, and if any additional remediation is needed at the location of the leak (ANR – 14).

- ***Chemistry laboratory (Page 17)***

The SAS provides minimal detail of the purpose and historical use of the chemistry laboratory. Entergy should provide additional details such as what materials were tested or analyzed for in the lab; what activities, testing, and analytical methods were conducted in the lab; and what materials (chemicals) were used or managed in the lab (ANR – 15). This information is critical for the ANR to have in order to determine what potential contaminants may have been released as a result of laboratory activities and to ensure that the lab site is properly remediated.

The SAS indicates that no non-radiological contaminants were detected in a 1991 investigation (conducted upon discovery of a leaking sink drain), but that the investigation inquiry was limited in scope “due to limited accessibility.” Though the SAS indicates that further characterization of the area will be conducted during decommissioning, Entergy should clarify the timing and scope of further

¹ This may also be true for the tetrachloroethylene (PCE) contamination stemming from the former dry cleaning operation at the facility.

investigation and what contaminants/chemicals will be sampled or analyzed for in such investigation (ANR – 16).

- ***Former Edson’s Gulf (Page 18)***

The ANR concurs that the hydraulic lift cylinder and the former floor drain at the former Edson’s Gulf site may need further investigation and possible remediation. However, once the garage is no longer used for maintenance activities, Entergy should conduct further investigation into possible releases from these operations, as well as mitigation measures that may be required, if any contamination is identified (ANR – 17).

- ***Table 1-1; Summary of Vermont Waste Management Division Spills Database for Vermont Yankee (Page 19)***

Table 1-1 appears to consist of information related to spills that occurred at the facility and that were reported to the DEC. The manner in which the information is presented in the table is confusing and inconsistent with how the information is recorded and maintained by DEC. For instance, DEC identifies reported spills by a Spill Number, which include a reference to the year (i.e., 2014WMD100). However, the table does not include the spill number with an associated year/date, and thus the information included in the table is not presented chronologically. Entergy should recreate this table to include Spill Numbers and order the information in the table chronologically (ANR – 18).

3.2.3 Systems and Equipment

- ***Release criteria (Page 29)***

The SAS states that debris produced during demolition will be designated for off-site disposal. “Contaminated materials” (those that are “exceeding the release criteria”) will be sent to a controlled disposal facility (or licensed landfill), while non-contaminated materials may be used as scrap or recovery. Entergy should clarify what is meant by “contaminated materials” in this instance, as well as what is meant by “release criteria”; whether these are NRC criteria or are yet-to-be determined by either state or federal authorities (ANR – 19). This information is necessary for the ANR to determine and anticipate the potential impact of any non-radiological debris and waste being shipped offsite for disposal and/or for reuse or local recycling.

4.0 Hazardous Materials Remediation (Pages 33-34)

As systems are abandoned throughout the decommissioning process, areas that contain hazardous materials (e.g., oil reservoirs, battery storage areas, tanks) must be assessed for possible releases. At least one sample for analysis should be collected and analyzed to confirm that an area is clean, or alternatively, to identify areas that will require further characterization. The identification of contamination (through visual observation, field analysis, or lab analysis) should prompt further characterization and a determination of whether further remediation is required. Entergy shall submit a work plan as to how it will assess areas for possible releases, including all work to be performed and how sampling will be conducted, for approval by ANR (ANR – 20).

5.3 Site Restoration Standards

- **Testing of PCBs (Page 36)**

The SAS identifies paints used at industrial sites as the most common source of PCB materials with concentrations of greater than 50 ppm total PCBs in them that would invoke provisions of the Toxic Substances Control Act (TSCA). Other materials, such as caulking, wire/cable sheathing, and/or any untested oils may also contain PCBs at concentrations of greater than 50 ppm. Entergy’s plans for remediation of the site should include testing of these materials in order to ensure they do not contain excessive levels of PCBs in them (ANR – 21). As noted above, materials containing PCBs at a concentration of 50 ppm or greater are regulated in Vermont under the VT01 hazardous waste listing (see VHWMR § 7-211).

- **Future reuse determination (Page 37)**

Entergy stated, “Entergy ...will continue to work in good faith to determine in a timely and cost-effective means a set of site restoration standards required and necessary to support future use of the VY property without limitation.” As part of this commitment, Entergy should determine future possible uses of the property as early in the decommissioning process as possible, and recommend further site characterization and remediation activities that will be necessary based on the future use (ANR – 22). The public and appropriate State entities should be consulted in this planning.

APPENDIX F: NON-RADIOLOGICAL HISTORICAL SITE ASSESSMENT

Appendix F of the SAS identifies numerous areas where environmental media may have been impacted by non-radiological contaminants throughout the history of the plant, including areas that may require further characterization and remediation. During the decommissioning and decontamination processes, Entergy should ensure that the following areas and materials are addressed adequately:

- **Potentially impacted areas (App. F; Page 3)**

Entergy should investigate the area outside Radiological Waste Building for possible chlorinated VOCs (i.e., any spills, possible blowdown, drain). Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR (ANR – 23).

Entergy should investigate all manholes (MH-A, MH-B, and MH-C) and oil/water separators for releases for TPH and PCBs. The 3 storm water outfalls should also be investigated for TPH and PCBs due to possible deposition of these compounds in soils and groundwater stemming from any releases from transformers in the switchyard. Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR (ANR – 24).

As referenced above, UST removals and AST closures conducted by Entergy must comply with the procedures in the “2010 Underground Storage Tank Closure and Site Assessment Requirements”.

- ***Specific materials testing (App. F; Page 6-7)***

Entergy should test all wiring, caulking and any remnants from foam application in fire-fighting operations for PCB's and PFOA's during the decommissioning process. Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR (ANR – 25, ANR – 26).

A licensed technician will be required to perform lead abatement per the Vermont Department of Health regulations. Entergy should ensure compliance with these requirements by contacting the VDH Lead and Asbestos Abatement Program specifically (ANR – 27).

- ***Heating Boiler Fuel Oil UST; transformers (App. F; 8-9)***

In order to obtain unrestricted closure without implementation of any institutional controls (such as notice to land records), all soils measuring at above 200 mg/kg TPH must be remediated. Entergy should further investigate the presence of VOCs in groundwater measurements that may stem from the former dry cleaning site or the 5,000-gallon UST site; any VOCs measuring above standards must be further assessed and remediated. Entergy shall submit a work plan for such additional investigation and remediation, outlining all work to be performed, for approval by ANR (ANR – 28).

- ***Chemistry lab and sink drain (App. F; Page 9)***

As referenced above, Entergy's characterization of lab drain pipe should include list of chemicals used or otherwise managed in lab so that the ANR will know what chemicals to look for.

- ***Nearby Off-Site Properties Owned by Entergy (App. F; Page 10)***

Entergy should engage in further characterization of the dry well and hydraulic lift cylinder during removal at the Former Edson's Gulf (Site No. 93-1485). Entergy shall submit a work plan for such additional characterization, outlining all work to be performed, for approval by ANR (ANR – 29).

ECS 2001 REPORT

The SAS relies, in part, on information from the 2001 Environmental Site Assessment conducted by ECS. The ECS report identifies certain areas that may require further characterization and potential remediation; however, it is unclear whether Entergy has identified the need for further characterization of these sites in its plan for decommissioning and decontamination of the site (as outlined in the SAS). Entergy should therefore further characterize the following areas during its decommissioning and decontamination process, and should submit a work plan to ANR Entergy for such additional characterization and any required remediation, outlining all work to be performed (ANR – 30):

TPH Areas of Concern (and reported concentrations*):

- North Field (43 to 410 mg/kg);
- South Field (39 to 230 mg/kg); and
- Drainage system of 115Kv switchyard (87 to 250 mg/kg).

*Vermont's current residential soil standard for TPH is 200 mg/kg. This standard may be revised in accordance with revisions to EPA's soil standard for TPH.

PCB Areas of Concern (and reported concentrations**):

- MH-A oil (Arochlor-1260 at 11,600 ug/Kg);
- Spare Main Transformer (composite sample at 200 ug/Kg).

** Vermont's current soil standard for PCBs is 0.22 mg/kg.

Lastly, to be able to conduct a thorough and independent review of the SAS, including information from underlying reports, ANR requests copies of the Appendices from ECS 6/4/2001 report, including Appendix S – Lab Results (ANR – 31).

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 1	<u>Underlying information and reports:</u> In order for the ANR to conduct a thorough and independent review of the SAS, Entergy should ensure that the reports and other identified sources of information on which the SAS relies are available to the ANR.		
ANR – 2	<u>Underlying information and reports:</u> In order for the ANR to conduct a thorough and independent review of the SAS, Entergy should provide the ANR with a list of employees interviewed for the SAS and either a transcript of the interview or list of questions asked in the event that ANR wishes to conduct its own interviews or respond to the information provided by employees in the SAS.		
ANR – 3	<u>Further characterization of potentially impacted areas:</u> Entergy should explain the process for characterization (for potentially impacted areas) in greater detail so that ANR can determine the adequacy of this approach.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
ANR – 4	<u>Generator closure requirements and timeline:</u> Entergy should consider how Generator Closure requirements (as required by the VHWMR) pertain to the facility and identify what steps Entergy will take during the post-closure process to comply with these requirements by submitting a comprehensive plan for phased closure of waste handling and storage areas on the site for approval by the Hazardous Waste Program of the Department of Environmental Conservation.		
ANR – 5	<u>Underground storage tank systems:</u> UST removals and AST closures conducted by Entergy must comply with the procedures in the “2010 Underground Storage Tank Closure and Site Assessment Requirements”.		
ANR – 6	<u>Update of NRSHA:</u> Entergy should specify what process will be used to obtain or update additional information in the NRSHA, and notify and consult the State and the public with regard to any such changes made as the result of additional or updated information.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 7	<u>Identification of potentially impacted areas:</u> Entergy should identify the need for any further investigation of any petroleum-impacted soils identified during the 2010 tritium release investigation (located roughly 30 feet below ground surface just northeast of the Radiological Waste Building).		
ANR – 8	<u>Structural components; PCB management:</u> Entergy should test lead waste (including wastes resulting from abatement activities) to determine if the waste is subject to regulation as hazardous waste under the VHWMR.		
ANR – 9	<u>Structural components; PCB management:</u> Entergy should address possible PCB contamination in wire sheathing, caulking, and paints throughout the plant, including how these potential hazardous wastes will be handled and managed throughout the decommissioning process.		
ANR - 10	<u>Structural components; PCB management:</u> Entergy must manage devices containing elemental mercury (e.g., mercury switches, thermostats, gauges, batteries, cathode ray tubes and lamps) as hazardous waste or as universal waste in accordance with Subchapter 9 of the VHWMR.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 11	<p><u>SMAC designated sites</u>: Entergy should conduct additional investigation and any required remedial work at the area where there was a release from 5,000-gallon fuel oil UST, and where petroleum constituents may remain in low concentrations) (Sites No. 992617). Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.</p>		
ANR – 12	<p><u>Transformers</u>: Entergy should conduct further sampling at and around the oil-water separator(s) on-site to ensure that the separators do not contribute to contamination of the surrounding soils or other environmental media. Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.</p>		
ANR – 13	<p><u>Transformers</u>: Entergy should indicate whether any residuals or contaminants of concern (i.e., perfluorinated compounds, or PFOAs) from fire-fighting foam used during the 2004 transformer fire remain on-site (and whether they require clean-up). Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR - 14	<u>Transformers:</u> Entergy should clarify which 2003 leak is being referenced in this section of the SAS (whereby impacted soils may remain), and if any additional remediation is needed at or around this location.		
ANR – 15	<u>Chemistry laboratory:</u> Entergy should provide additional details of the historical purpose and use of the chemistry laboratory, such as: what materials were tested or analyzed for in the lab; what activities, testing, and analytical methods were conducted in the lab; and what materials (chemicals) were used or managed in the lab.		
ANR – 16	<u>Chemistry laboratory:</u> With regard to further characterizing the chemistry laboratory’s leaking sink drain, Entergy should clarify the timing and scope of further investigation and what contaminants and chemicals will be sampled or analyzed for in such investigation.		
ANR - 17	<u>Former Edson’s Gulf (Sites No. 93-1485):</u> Once the garage is no longer used for maintenance activities, Entergy should conduct further investigation into possible releases from operations conducted therein, as well as what mitigation measures may be required (if contamination is identified).		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 18	<u>Table 1-1; Summary of WMPD Spills Database for VY:</u> Energy should include Spill Numbers and order the information presented in the table in a chronological order.		
ANR – 19	<u>Release criteria:</u> Energy should clarify what is meant by “contaminated materials” and “release criteria” in this section (and whether the “release criteria” are NRC criteria or are yet-to-be determined by either state or federal authorities).		
ANR – 20	<u>Hazardous materials remediation:</u> As systems are abandoned during the decommissioning process, Energy must assess areas that contain hazardous materials (e.g., oil reservoirs, battery storage areas, tanks) for possible releases. At least one sample for analysis should be collected and analyzed to confirm that an area is clean, or to identify areas that require further characterization. The identification of contamination (through visual observation, field analysis, or lab analysis) will prompt further characterization and a determination of whether further remediation is required. Energy shall submit a work plan as to how it will assess areas for possible releases, including all work to be performed and sampling to be conducted, for approval by ANR.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 21	<u>Testing of PCBs:</u> Entergy’s plans for remediation of the site should include testing of materials (such as caulking, wire/cable sheathing, and/or any untested oils that may contain PCBs at concentrations of greater than 50 ppm) in order to ensure that these materials do not contain excessive levels of PCBs.		
ANR – 22	<u>Future reuse determination:</u> In consultation with the State and the public, Entergy should determine future possible uses of the property as early in the decommissioning process as possible, and recommend further site characterization and remediation activities that will be necessary based on the future use.		
ANR – 23	<u>Appendix F: Potentially impacted areas:</u> Entergy should investigate the area outside Radiological Waste Building for possible chlorinated VOCs (spills, possible blowdown, drain). Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
ANR – 24	<p><u>Appendix F: Potentially impacted areas:</u> Entergy should investigate all manholes (MH-A, MH-B, and MH-C) and oil/water separators for releases of TPH and PCBs. The 3 storm water outfalls should also be investigated. Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.</p>		
ANR – 25	<p><u>Appendix F; NRSHA: Specific materials testing:</u> Entergy should test all wiring, and caulking for PCBs during the decommissioning process.</p>		
ANR – 26	<p><u>Appendix F; NRSHA: Specific materials testing:</u> Entergy should test all areas where fire-fighting was applied during fire-fighting operations for PCBs and PFOA's. Entergy shall submit a work plan for such additional investigation, outlining all work to be performed, for approval by ANR.</p>		
ANR – 27	<p><u>Appendix F; NRSHA; Specific materials testing:</u> Entergy should ensure compliance with lead abatement requirements by contacting the VDH Lead and Asbestos Abatement Program specifically.</p>		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
ANR – 28	<u>Appendix F; NRSHA; Heating boiler fuel oil UST; transformers:</u> Entergy shall remediate all soils measuring above 200 mg/kg of TPH. Additionally, VOCs in groundwater measuring above standards from the former dry cleaner and 5,000 gallon UST must be further assessed and remediated. Entergy shall submit a work plan for such additional investigation and remediation, outlining all work to be performed, for approval by ANR.		
ANR – 29	<u>Appendix F; NRSHA; Nearby off-site properties owned by Entergy:</u> Entergy should engage in further characterization of the dry well and hydraulic lift cylinder during removal at the Former Edson’s Gulf (Site No. 93-1485). Entergy shall submit a work plan for such additional characterization, outlining all work to be performed, for approval by ANR.		
ANR – 30	<u>ECS 2001 Report:</u> Entergy should clarify whether the specified areas of concern are addressed in SAS report, and if not, Entergy shall submit a work plan for such additional investigation and remediation, outlining all work to be performed, for approval by ANR.		

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Agency of Natural Resources (ANR)

Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
ANR – 31	<u>ECS 2001 Report</u> : Entergy should provide ANR with copies of the Appendices from the ECS 2001 Report, including Appendix S – Lab Results.		



Vermont Department of Health Comments on Entergy Vermont Yankee Site Assessment Study

DECEMBER 10, 2014

Overview

The Vermont Department of Health (VDH) received its copy of the Entergy Vermont Yankee Site Assessment Study (SAS) the week of October 17, 2014. The document was reviewed for comments that may improve the processes and outcomes for decommissioning of the Vermont Yankee Nuclear Power Station (VYNPS). VDH requests that Entergy include these improvements in the next revision of the Post Shutdown Decommissioning Activities Report (PSDAR).

VYNPS is scheduled to cease operations by the end of December 2014. Soon after, Entergy will implement its plans for decommissioning, including the complete defueling of the reactor and preparing the plant structures, systems and components for an extended period of dormancy (SAFSTOR). Later steps in the process include transfer of all nuclear fuel from the reactor building spent fuel pool to dry casks and storage on the independent spent fuel storage installation (ISFSI). Final steps include decontamination and dismantling of the plant structures, systems and components (DECON), a final site survey to verify that residual radioactivity will not lead to doses that exceed limits for the release of the site for unrestricted use, and site restoration and termination of the US Nuclear Regulatory Commission (NRC) license.

The October 2014 Site Assessment Study describes some details about these decommissioning activities, and describes some of the radiological and non-radiological conditions of the site at VYNPS. The SAS helps the VDH plan its monitoring of VYNPS decommissioning based on three processes used since the early planning and construction stages of the facility in the late 1960s:

1. Continuous engagement with all relevant parties to verify the necessary steps to protect public health are planned and executed effectively,
2. Periodic inspection of VYNPS to obtain first-hand verification that work and conditions remain protective of public health, and

3. Comprehensive monitoring of the environment around VYNPS to independently identify if and when radioactive materials migrate off site to expose members of the public and contaminate the environment.

In this document, the VDH focused mainly on radiological elements of the SAS, recognizing that other agencies of the State of Vermont will focus on non-radiological contamination, financial considerations and other issues. The VDH also comments on the section of the SAS related to asbestos and lead. Like radiological effluents and direct gamma radiation, these contaminants are regulated by the Health Department, too.

Findings of the VDH in the SAS

Generally, the SAS describes the various steps planned to decommission the VYNPS. It also includes brief description of some of the radiological events that will present challenges during decommissioning. The SAS explains that decommissioning begins with prompt defueling of the reactor in early 2015 followed by preparations for SAFSTOR concluding by April 30, 2016. It describes the transfer of spent fuel from the spent fuel pool to dry casks by the end of 2020 and decontamination and dismantling of plant structures, systems and equipment once there are sufficient funds are in the Nuclear Decommissioning Trust Fund to do so. Entergy states that under the maximum SAFSTOR timeframe, decontamination and dismantlement will begin in 2069 with license termination in 2073 and site restoration completed by 2075. The SAS acknowledges that decontamination and dismantling could begin much earlier than that.

Relative to these stages of decommissioning, the Health Department has concerns for public health especially during the time to prepare for SAFSTOR and the time to transfer spent fuel from the spent nuclear fuel pool to dry casks starting after the cessation of operations through 2020 as well as during the period of decontamination and dismantling (DECON) just prior to license termination. The concerns during this time are due to the complex and unique radiological industrial and transportation activities planned. The Health Department also has concerns for public health protection throughout these high work activity periods and the SAFSTOR years in between because very large quantities of radioactive materials in solid and liquid form will be left in storage on site where leaks have occurred in the past, and may occur again. A key concern is fire protection for the structures, systems and components containing radioactive materials in storage. Another is leak detection and radioactive liquid storage volume monitoring. The Site Assessment Study should fully address these concerns.

Specific comments of the Vermont Department of Health that will improve the PSDAR and future planning follow, starting on the next page.

It should be noted that the Health Department acknowledges that, as appropriate and in consultation with the Health Department, the Agency of Natural Resources is reserving the

authority to evaluate the environmental risks associated with radioactive isotopes that are identified at the site.

Independent Spent Fuel Storage

The ISFSI is separately licensed by the NRC and the Vermont Public Service Board. There are currently 884 spent fuel assemblies on the ISFSI in thirteen casks on one pad. After all spent fuel is moved from the spent fuel pool into casks, a total of 3,880 spent fuel assemblies will be stored in 58 dry fuel storage casks on two ISFSI pads. Continuous temperature and radiation monitoring results for the casks on the ISFSI are currently sent to the Health Department on a monthly basis. Entergy should commit to continuing to do so. This information is important, as found by the Public Service Board, and the Health Department requests that the monitoring results continue to be communicated to VDH until all spent fuel assemblies are removed from the site, which Entergy states it does not expect to occur until 2052.

Three of the 58 casks will be used for the storage of what is called greater than class C waste (GTCC). This is the low level radioactive waste having the highest radiation levels, levels so high as to make transportation and land disposal difficult. During DECON, the reactor vessel internals, control rod blades and other components will be cut up and placed into these three spent fuel casks and stored with the 55 casks containing spent fuel. The Health Department was informed that the radiation levels from these casks may make compliance with the direct gamma radiation level limits (20 milliroentgen per year at the site boundary) in the VDH Radiological Health Rule (Rule) difficult. As described below, Entergy committed to complying with the Rule in the December 2013 Settlement Agreement, and has reaffirmed that commitment in its Draft PSDAR (at page 34). In addition, the Health Department must continue to independently verify that direct gamma radiation levels remain below this limit.

Entergy should explain what steps will be taken, for example shielding the three GTCC casks with spent fuel casks, to maintain direct gamma radiation levels from them in compliance with the Rule and as low as reasonably achievable (ALARA).

Compliance with the VDH Radiological Health Rule

The Settlement Agreement (paragraph 4) requires that the company “conduct all activities in Vermont, including at the VY Station, in accordance with federal and state laws, including VDH’s Radiological Health Rule.” Entergy has reaffirmed this commitment in its Draft PSDAR (at page 34). The Rule requires that Entergy assure annual doses from each of five exposure pathways be less than five millirem total effective dose equivalent. The pathways are liquid effluents, radioactive particulates, radioactive iodines, noble gases and direct gamma radiation. The Rule also requires Entergy to allow site access by the Commissioner of Health to inspect the facility and to obtain samples relevant to public health protection. Entergy should explicitly acknowledge that it will comply with all parts of the Rule until the NRC license is terminated

and include an express provision in the PSDAR for coordinating the above processes with VDH during post-closure activities.

The State of Vermont, and likely other jurisdictions, have benefitted from independent verification of the radiological conditions in the environment around Vermont Yankee. The Health Department should continue to receive splits of samples obtained throughout every phase of decommissioning, and especially during preparations for SAFSTOR, transfer of spent fuel from the spent fuel pool to dry casks, decontamination and dismantling, and the final status survey. VDH also should be provided a copy of the final status survey for comprehensive review and comment given that it represents the best evidence of public health protection for all future uses of the land once it is released for unrestricted use by the NRC.

Challenges due to the size of the site and nearby elementary school

The VYNPS site is small in size and close to populated areas, including an elementary school. The closest site boundary is only 910 feet west of the reactor and the Vernon Elementary School is only 1500 feet west of the reactor building. Industrial and transportation accidents involving radioactive materials onsite may easily have offsite impacts. During decommissioning activities, especially decontamination and dismantling, radiological environmental monitoring will remain important to independently verify that residents are not exposed to excessive radiation and that agricultural and other uses of the land are not exposed to excessive amounts of radioactive material contamination.

The SAS's provisions for radiological environmental monitoring are insufficient given the proximity of the plant to the surrounding population. Entergy's monitoring should be augmented by continuing the independent radiological environmental surveillance provided by the VDH, proven effective for the last 45 years. Entergy should support this augmentation.

Because the site is small, it is likely that decontamination and dismantlement activities involving heavy industrial equipment and many workers will stretch well beyond current radiologically controlled area boundaries. Entergy should address in future planning and in the PSDAR whether the radiologically controlled area boundaries during decontamination and dismantling should be expanded.

Challenges presented by the electrical infrastructure

The VYNPS site is densely packed with electrical generation and transmission infrastructure, as well as waste management facilities and spaces. Most of the 125 acre site, including the many acres occupied by this infrastructure, will require remediation of radioactive contamination. There is inadequate information about how this will be accomplished. Entergy should fully explain its plan for remediation, including how it will accomplish the remediation if the electrical infrastructure remains energized as part of the New England grid during that time.

Radioactive materials on site are not fully characterized

The SAS describes a number of events that have left significant amounts of land, as well as many structures, systems and components, in a radiological condition that has not been fully characterized. Records of spills, interviews with personnel and limited sampling of the environment from various activities provide only limited insight into what might be expected, and thorough assessments will not be conducted until decades from now. These assessments include those necessary for detailed planning of the decontamination and dismantling work that will occur after an extended SAFSTOR period and the final site survey to be conducted to verify that decontamination and dismantling was effective in reducing residual radioactive materials to levels that allow for unrestricted release of the site and NRC license termination. The lack of a thorough characterization of each of the 72 Class 1, 2 and 3 areas identified in the historical site assessment, makes comprehensive sampling of the environment until that final site survey critical. Entergy should include a comprehensive sampling plan for the 72 areas.

Even without more thorough characterization, it is clear that the VYNPS site will continue to store a very large quantity of radioactive materials until decontamination and dismantling. Until the final site survey proves there is no further impact on the public health and the environment by these materials in storage, given the risks of leakage proven to have occurred in the past and likely to occur in the future, continued receipt of relevant information by the State of Vermont is critical. The Health Department requests an estimated inventory of radioactive materials by radioisotope, total activity and location within the structure, systems and components remaining at the plant SAFSTOR.

Monitor the ventilation in the reactor building until license termination

In the SAS, Entergy only commits to monitoring the reactor building ventilation system for radioactive material releases while spent fuel is in the spent fuel pool. The Health Department is concerned about the millions of gallons of highly radioactive water stored in the torus within the reactor building. This radioactive source provides sufficient reason to monitor the exhaust air from this building for radioactive contamination. Entergy should also explain whether disposal of this water will occur before decontamination and dismantling, which may be decades from closure. Further, Entergy should identify what kind of instrumentation will be used for monitoring torus water levels and what kind of inspection regimen for possible leakage will be used until this water is properly disposed of as radioactive waste.

Entergy should monitor groundwater after cessation of operations

After tritium contamination was measured in groundwater at many nuclear power plants, the Nuclear Energy Institute developed the Groundwater Protection Initiative. The SAS states that the bases for groundwater monitoring will be evaluated throughout the different phases of decommissioning. Entergy should, at a minimum, comply with the NEI Groundwater Protection

Initiative at the VY facility until NRC license termination. This is especially so since radioactive materials will remain in storage for decades before decontamination and dismantling.

Analysis of adequate waste disposal capacity

According to Entergy, decontamination and dismantling is not likely before the 2040s and could begin as late as 2069. Between now and then, a large amount of radiological waste disposal will likely occur from a growing number of nuclear power plants entering or contemplating decommissioning. This disposal could occur at what may be the primary site for large volumes of waste from the dismantling and decontamination of Vermont Yankee, the Waste Control Specialist facility in Texas. It is recommended that an analysis of the capacity of this facility to accept all the waste from the decontamination of Vermont Yankee decades from now be undertaken, especially since Vermont is a party to the Texas Low Level Radioactive Waste Compact that manages the facility.

An estimate of the number and timing of radioactive waste shipments

When it occurs, the decontamination and dismantling of Vermont Yankee will likely be the largest industrial activity ever conducted in Vermont. It is slated to be completed in around four years. It would be very instructive to know how many of the different types of radioactive waste shipments are likely and how frequently they will occur, for example by shipments per month. Total waste volume estimates are given in section 7.2.2 of the SAS, so calculations for waste shipments by type and their possible frequency would appear highly feasible.

The disadvantages of SAFSTOR

In section 7.2 of the SAS, it is stated that there are advantages and disadvantages to DECON and SAFSTOR. A list of six advantages attributed to the NRC is provided. It would be appropriate that a list of the recognized disadvantages be provided in the SAS.

Definition of ARO and TLG and recognition that TLG is an Entergy subsidiary

The term ARO is used in section 8.1.1 of the SAS. It would be useful to have this defined. It does not appear in the list of acronyms in the preface (neither does VDH). Another acronym deserving attention is TLG. It should be disclosed that this company is an Entergy subsidiary.

Asbestos and lead

The SAS vaguely describes the presence of asbestos containing materials and lead-based paint. The general reference statement that these materials “have been reviewed or will be sampled during the decommissioning” is made in the report. The State of Vermont needs to know now what asbestos and lead-based paint exists at Entergy Nuclear Vermont Yankee. Entergy should address this through an inspection survey report. This report would inventory the materials that exist, their quantities, locations and their current condition. Additionally, abatement

specifications and cost estimates for removal and disposal should be developed as related to decommissioning. The inspection survey report, abatement specifications and cost estimates should be filed with the State of Vermont as soon as possible. This will serve as a baseline inventory and status of condition and can be reviewed with periodic surveillance inspections up until the point of demolition.

Vermont Yankee SAS / PSDAR Review Comments
Reviewing Agency: Vermont Department of Health (VDH)

Comment #	Document Section & Description of Reviewer(s) Comment	Energy Response	Response Accepted? (Yes / No)
VDH – 1	<p><u>General</u>: Based on comments reviewed from other Agencies and the public, an overall description of the assumed conditions at the start of Vermont Yankee’s (VY’s) decommissioning is warranted. This would go a long way to address many of the questions that indicate that the Reviewers are uncertain what conditions are assumed for the technical descriptions or their related financial estimates. In instances where items are assumptions that will be updated once better data is available (such as after some demolition of VY structures has occurred) this should be stated.</p>		
VDH-2	<p><u>PSDAR Section 5.1.3 & Reference List (Section 6.0)</u>: Reference 9 refers to an NPDES permit that has been superseded. Please cite current (October 2014) NPDES permit.</p>		
VDH-3	<p><u>Follow-up to Comment VDH-2</u>: It may be preferable to cite both the 2006 & the 2014 permits.</p>		
VDH-4	<p>Fully address fire protection, radioactive liquid storage leak detection and volume monitoring.</p>		
VDH-5	<p>Continuing to do continuous temperature and radiation monitoring of the casks on the ISFSI and continue sending results to VDH on</p>		

Vermont Yankee SAS / PSDAR Review Comments
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Comment #	Document Section & Description of Reviewer(s) Comment	Entergy Response	Response Accepted? (Yes / No)
	a monthly basis.		
VDH-6	Explicitly acknowledge that it will comply with all parts of the VDH Radiological Health Rule until the NRC license is terminated and include an express provision in the PSDAR for coordinating the above processes with VDH during post-closure activities.		
VDH-7	VDH should continue to receive splits of samples obtained throughout every phase of decommissioning, and especially during preparations for SAFSTOR, transfer of spent fuel from the spent fuel pool to dry casks, decontamination and dismantling, and the final status survey.		
VDH-8	VDH also should be provided a copy of the final status survey for comprehensive review and comment.		
VDH-9	Entergy's environmental monitoring should be augmented by independent radiological environmental surveillance provided by VDH and Entergy should support this augmentation.		
VDH-10	Entergy should address in future planning and in the PSDAR whether the radiologically controlled area boundaries during decontamination and dismantling should be		

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	expanded.		
VDH-11	Entergy should fully explain its plan for remediation of the switchyard property, including how it will accomplish the remediation if the electrical infrastructure remains energized as part of the New England grid during that time.		
VDH-12	The lack of a thorough characterization of each of the 72 Class 1, 2 and 3 areas identified in the historical site assessment, makes comprehensive sampling of the environment until that final site survey critical. Entergy should include a comprehensive environmental sampling plan to monitor for contamination migration in these 72 areas.		
VDH-13	Entergy should provide an estimated inventory of radioactive materials by radioisotope, total activity and location within the structure, systems and components remaining at the plant during SAFSTOR.		

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VDH-14	Either monitor the exhaust air from the reactor building for radioactive contamination, or explain why this is not necessary given the large volume of radioactive water stored within the structure during SAFSTOR.		
VDH-15	Explain whether disposal of the water consolidated in the torus during SAFSTOR will occur before decontamination and dismantling, which may be decades from closure.		
VDH-16	Identify what kind of instrumentation will be used for monitoring torus water levels and what kind of inspection regimen for possible leakage will be used until this water is properly disposed of as radioactive waste.		
VDH-17	Comply with the NEI Groundwater Protection Initiative at the VY facility until NRC license termination. This is especially so since radioactive materials will remain in storage for decades before decontamination and dismantling.		

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VDH-18	Provide an analysis of the capacity of the Texas Low Level Radioactive Waste Compact to accept all the waste from the decontamination of Vermont Yankee decades from now.		
VDH-19	Describe how many of the different types of radioactive waste shipments are likely and how frequently they will occur, for example by shipments per month.		
VDH-20	Provide a list of the recognized disadvantages of SAFSTOR in the SAS.		
VDH-21	Define ARO, VDH and TLG in the glossary and add recognition that TLG is an Entergy subsidiary.		
VDH-22	Describe what asbestos and lead-based paint exists at Entergy Nuclear Vermont Yankee through an inspection survey report. This report would inventory the materials that exist, their quantities, locations and their current condition.		
VDH-23	Asbestos and lead abatement specifications and cost estimates for removal and disposal should be developed as related to decommissioning.		

