

**Comments on the Draft Field Sampling and Dose Assessment Plan for The Western New York Nuclear Service Center In Follow Up to Aerial Gamma Radiation survey conducted in 2014**

<b>Comment No.</b>	<b>Page, Section, Paragraph</b>	<b>Agency</b>	<b>Comment Description</b>	<b>Response</b>
1	2, Section 1, 2 <sup>nd</sup> Paragraph	EPA	Two reasons for the two new areas of contamination are given. Isn't it also possibly due to migration of contamination from the site?	The report was updated to reflect that Areas 4 and 5 were not included in the previous surveys, and as such, could not have been identified in earlier surveys. Area 2 was surveyed in 1979 and contamination was not identified in this area. The presence of this area today could be related to uncertainty in the aerial survey, the deposition of additional contamination or improvements in instrumentation.
2	Section 3	EPA	I've not been involved in regional contamination issues for many years, but I'll just bring up a question of whether Region 2 requires/desires a risk assessment also be performed along with the dose assessments.	A second EPA reviewer responded to this comment – "Using RESRAD should suffice initially. Once the data is collected this may need to be re-thought." No further response is required from NYSERDA at this time.
3	Section 5	EPA	A copy of the QAPP should be available for review. It may have answers to some of the issues below, such as temperature correction for NaI detector use.	A copy of the QAPP will be available for review prior to the start of field activities.
4	Figure 1, Box Area 1	EPA	In Box Area 1, it appears that the southeastern sample location is projected to be taken in an uncontaminated area. However, review of other data indicate that the small circle with the same color where the sample is proposed is actually a higher contaminated area than that bordered by the blue line indicating "Areas Exceeding Background Threshold." This should be clarified, because as shown, it appears the sample plan is proposing a sample from an uncontaminated area within a contaminated area.	The contours shown are from the Cesium Extraction. A notation was added that the contours within contours indicate areas of higher counts from the Cesium Extraction.
5	Figure 1, Box Area 2	EPA	In Box Area 2, a large area of contamination in the southeastern most part of the box is	The area identified in this comment will be added as one of the confirmatory locations for the Cesium Prong. In addition, for clarity,

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			not a proposed sample location. Although it is close to one, I recommend another sample be proposed near that southeastern most circle.	the areas in the southeastern portion of Area 2 (as shown in the first draft of the Sampling Plan) were previously identified and investigated as part of the Cesium Prong Investigation. To avoid confusion with the newly identified areas observed in the 2014 Aerial Radiation Survey, the previously-investigated locations have been moved to Area 1. Area 2 now consists only of the newly identified areas.
6	Section 8.b.1	EPA	I assume the walkover survey will cover the entire area of each box?	The red boxes shown in the Draft Soil Sampling and Dose Assessment Plan were placed on the maps by RSL to identify clusters of points or large areas that met the RSL criteria for identifying areas for further evaluation (areas where <b>both</b> the anthropogenic extraction and the Cs-137 extraction indicate results that are 2σ above background or greater). The red box areas were not intended to designate the extent of the survey area. The figures have been revised and clarified and the red boxes have been removed.
7	Section 8.b.1	EPA	<p>Caution should be used concerning the NaI detector in this application due to its temperature dependency. In localized areas, this shouldn't be a problem since we are using the readings for relative radiation level purposes. However, using "hard coded" color schemes (3990 is a different color than 4010) may cause a change in color not due to radiation, but due to a temperature change.</p> <p>To provide an estimate of the effects of temperature, we recommend two things:</p> <ul style="list-style-type: none"> <li>- Record ambient temperature (using a NIST-traceable thermometer) with each NaI detector measurement.</li> <li>- Measure a reference source (and</li> </ul>	<p>A NIST traceable thermometer has been acquired and will be used to record temperature when the static readings are collected. In addition, the NIST traceable thermometer will be used in the completion of the daily in-field operability checks.</p> <p>Also, a Cs-137 check source will be taken into the field to verify instrument Cs-137 responses. This is not a calibration, but rather a check to confirm the instrument response is acceptable. Whenever practicable, the checks will be done in the same location. In all cases, it will be the elevation in count rate over local background that will be recorded.</p> <p>For each GPS survey, the increments in count rate associated with color changes will be subjectively and iteratively determined on a case-by-case basis. Increments will be selected that provide the most useful imagery for the purpose of determining potentially elevated areas.</p>

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			<p>ambient temperature) with the NaI detector at a constant distance/geometry from the detector at the beginning of the day, at approximately the hottest part of the day, and then at the end of the day to provide an understanding of the temperature dependency of the detector. Perform the three reference measurements at the same location on a given day, and select a reference activity and constant distance/geometry that will provide measurements not greater than 5 to 10 times typical of background measurements.</p> <p>These measurements, and a discussion of their significance, should be included in the report.</p>	
8	Section 8.b.2.c	EPA	<p>15 cm (6 in) seems to be a very deep sample, providing for possible dilution of the sample. I recommend the dimensions of the soil sample be coordinated with the geometry in which gamma spectrometry will be performed such that the volume of the sample collected is the volume that will go into the counting geometry. This prevents issues of homogenization, which can lead to increased uncertainty and possibly false positives or false negatives.</p>	<p>The revised sampling plan shows that samples are being collected in 0-5 cm or 0-15 cm soil cores, with the cores sent for analysis, as identified in the Plan. This approach is based on the historical data, specifically for the areas with an air deposition pathway (Areas 1 and 2), the shallow soil locations (i.e., &lt;5cm or 2”) contain the majority of the elevated concentrations. For the water deposition pathway, samples will be collected down to 3’, and will be divided into 6” intervals. The most elevated section of the 6” core section will be sent for analysis.</p>

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9	Section 8.b.2.d	EPA	Why is Survey Box 3 going to be sampled down to 100 cm when the others are only 30 cm? Will this be a series of cores, or just a sampling of the first meter of soil? Note that I have not used RESRAD in many years, so the depth may be associated with the resident farmer scenario.	The revised Sampling and Dose Assessment Plan shows that samples will be collected down to 3' for all areas other than Area 1. For Area 1, the previous sampling activity for the Cesium Prong showed that the contamination (associated with an air deposition event) is in the upper 4" of the soil column.
10	Section 8.b.2	EPA	Will there be an independent verification (e.g., DOE-WVDP or a DOE-WVDP contractor, EPA Region 2) of the locations chosen for sampling or the number of samples to be taken? This could be done at the end of each day so if additional locations are found that should be sampled, that can be communicated to the sampling team who would still be assembled in the area with their equipment so the sample could be collected without delaying the project.	There is no plan to have a daily independent evaluation of the walkover or static survey data. NYSERDA would welcome representatives from EPA or the other regulatory agencies to observe both the survey activity and selection of the sampling points.  If the walkover survey results do not identify elevated areas, a minimum number of sample locations will be identified based on the size of the area of interest. The number of sample locations is shown in Table 3 of the revised Soil Sampling and Dose Assessment Plan, and the method for identifying the sample locations is described in Section 10.
11	Section 8.c.2	EPA	Is Ra-226 a concern for this site? If so, note that the NaI is much more efficient for the 186 keV gamma emitted from Ra-226 than it is for the 662 keV emitted from the Cs-137. The small intensity of the 186 keV gamma should prevent this from being a huge issue, but if the Ra-26 to Cs-137 ratio becomes high, this may affect the outcome of the conclusions developed based on NaI data.	There is the potential that Ra-226 and other NORM isotopes may potentially interfere with the NaI 2x2 surveys, and to minimize the impact from these interferences, all evaluations will be completed using the analytical data only.
12	Section 8.c.2	EPA	Is there any possibility of using the NaI detector as a spectrometer? The spectrum	The NaI detectors that will be used do not have the capability to be used a spectrometers.

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			would allow determination of the relative Cs-137 contribution to the dose rate and could help identify changes due to natural radiation versus increased Cs-137. This would have to be done very carefully if the spectrum is not energy compensated for temperature. It certainly wouldn't be feasible for every spectrum to be analyzed, but a spectrum in a questionable area may help clarify interpretation of survey results.	All surface soil samples are being sent for gross alpha, gross beta and gamma spectroscopy. This will provide a detailed inventory of the gamma-emitting radionuclides present in each soil sample.
13	Section 8.c	EPA	Why are two of the background samples (Hamburg and Eden) so close to each other in the same direction from the site? Seems like a better idea of background could be obtained by measuring north, east, and south of the site (since contamination transport is potentially to the west).	The Revised Plan states that the WVDP background data will be used for comparison with the samples collected near the Western New York Nuclear Service Center Property (see Section 9 of the revised report, "Areas Selected for Background Locations"). A separate set of background locations will be collected for the Seneca Nation territory samples.
14	Table 1	EPA	Is there really a need for all of the samples to undergo these complex analyses listed under expanded analyses? Seems like a lot of money being used to analyze for some very unusual radionuclides. Personally, I'd like to see that money go into more samples collected for gamma analyses or perhaps additional depth zones of the core (0-5 cm, 5-15 cm, and 50-30 cm, for example) since Cs-137 is the key radionuclide (assuming it is). Notwithstanding, the selection of isotopes for the expanded analysis does correctly include C-14, H-3, Pu-239, I-129	The sampling and analytical approach has been revised per this comment. All shallow soil samples are being sent for gross alpha, gross beta, and gamma spectroscopy. Selected samples, including quality control samples, will be sent for expanded analysis.

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			which are or would be isotopes regulated under 40 CFR 190. So while you may want to cut back on the number of samples getting the expanded analysis we concur with the choice of radionuclides selected.	
15	Section 8.d	EPA	I recommend doing dose assessment for Box 1 based on the residential scenario, if for nothing else, for verification purposes. The data are being collected, and some dose assessment scenarios have changed in the 20 years since the Box 1 area dose assessment was performed.	A dose assessment for Area 1 will be completed if the results are not in agreement with the previously collected samples. Additional information on the comparison of the new data with the previous data is provided in Section 11 of the revised Soil Sampling and Dose Assessment Plan. If dose assessments are required based on the analytical results, differences between the new dose assessments and the previously conducted dose assessments will be described in the results report.
16	Section 8.d.4	EPA	What criteria will be used for determining if an alpha or a beta result “statistically exceeds background”? Without seeing the QAPP, I would caution that gross alpha and beta can vary simply due to non-homogeneity of the radionuclides. This often isn’t a major concern when dealing with natural radionuclides, but when dealing with anthropogenic radionuclides, there is a greater chance for non-homogeneity. Proper sample preparation can reduce the likelihood of this problem, but I’ve seen from the ISCORS Sewage Sludge project where non-homogeneous aliquots of samples caused a major problem that almost shut the entire analytical process down.	The sample results will be compared to the background gross alpha, gross beta and gamma spectroscopy results. A result will statistically exceed background if the soil sample results are greater than background values plus 2 standard deviations.
17	Section 8.d.4	EPA	If all alpha are considered Am-241 and all	The sample results for gross alpha will be compared to background

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			beta are considered Sr-90, I again question the need to perform the unusual analyses listed in Table 1. Also, although Am-241 has been the standard “default alpha,” ICRP-60 based dose coefficients show Pu-239 has slightly higher committed effective inhalation and ingestion dose factors (TurboFRMAC – Radionuclide Viewer 2013).	plus two standard deviations. If the results are greater, the alpha activity will be attributed to Am-241 or Pu-239, depending on which is the more limiting alpha-emitting radionuclide.
18	General Comment	EPA	Provide Quality Assurance Project Plan (QAPP) and include the reference to it throughout the Draft where appropriate, especially where QAPP, QA and QC terms are mentioned.	A copy of the QAPP will be available prior to the start of field activities. The DQO and data validation sections provided in the first draft of the Soil Sampling and Dose Assessment Plan have been moved to the QAPP.
19	General Comment	EPA	Suggest using High Pressure Ionization Chamber (HPIC) instruments instead of or in addition to the proposed “tissue equivalent micro R” (page 10) and “Bicron MicroRem Meter” (page 14).	MJW has determined it is impractical to carry an HPIC instrument into the field due to the remoteness of each location, and the varying terrain in the areas of study.
20	General Comment	EPA	Include description of additional samples that are to be taken for QA/QC purposes.	Additional samples will be collected in each area for QA/QC purposes. These samples are defined in the QAPP.
21	Page 4, 2 <sup>nd</sup> Paragraph	EPA	Suggest correcting QAPP acronym spelling. EPA and MARSSIM guidance recommend using term Quality Assurance Project Plan (QAPP), not “Program” Plan.	Comment has been incorporated.
22	Page 6, After Last Paragraph	EPA	Suggest including surveying and sampling in Zoar Valley.	The analysts from the Remote Sensing Laboratory are confident that the Aerial Radiation Survey results along Zoar Valley are due to the detector response to the three-dimensional nature of the gorge. Surveys and sampling are not planned for Zoar Valley at this time.

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23	Page 7, Figure 1	EPA	Suggest sampling in those locations with elevated readings.	All new or previously unevaluated elevated areas will be surveyed and sampled. The areas in the southeastern portion of Area 2 were analyzed previously as part of the Cesium Prong investigation, and to avoid further confusion, have been moved into Area 1, with the balance of the Cesium Prong. Confirmation samples will be taken in several areas of the Cesium Prong. The analytical results will be compared to the data collected during the 1995 Western New York Nuclear Service Center Off-Site Radiation Investigation (Dames and Moore, 1995) to determine whether the conditions in this area today are consistent with decay-corrected concentrations measured in the 1990s.
24	Page 8, Figure 2	EPA	Provide undistorted map.	A new map has been provided in the Revised Soil Sampling and Dose Assessment Plan.
25	Page 8, Figure 2	EPA	Suggest adding sampling points in those locations with elevated readings along Cattaraugus Creek.	All areas meeting the criteria identified by the Remote Sensing Laboratory for further evaluation have been identified for surveys and sampling. The criteria are provided in Section 7 of the revised Soil Sampling and Dose Assessment Plan.
26	Page 10, 2 <sup>nd</sup> Paragraph, a.	EPA	Suggest changing "one centimeter" to "contact".	Language was revised per comment.
27	Page 10, 4 <sup>th</sup> Paragraph	EPA	Provide background sampling points along with justifications on their selections.	The Revised Plan now states that the WVDP background data will be used for comparison with the samples collected near the Western New York Nuclear Service Center Property (see Section 9 of the revised report, "Areas Selected for Background Locations"). A separate set of background locations will be collected for the Seneca Nation territory samples.
28	Page 12, 5 <sup>th</sup> Paragraph	EPA	Correct typo "us."  Provide criterion to be used for gross counts to be considered as statistically exceeding background.	This section has been revised.  The sample results will be compared to the background gross alpha, gross beta results. Samples will be considered as statistically exceeding background if the soil sample location results are greater than background values plus 2 standard deviations.

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29	Page 13, Table 2	EPA	Suggest providing dose assessments for both, Resident Farmer and Recreational Use, scenarios for all identified survey and sampling areas.	The dose evaluation will be conducted using the current land use. Additional information on the scenarios is included in Section 11 of the revised Plan. In addition, sampling data will be compared to the DOE Surface Soil DCGLs for the Resident Farmer scenario as a check against a conservative land use scenario.
30	Page 15	EPA	Suggest following the following additional documents and including them in the References section of the Draft: <ul style="list-style-type: none"> <li>- 40 CFR Part 190</li> <li>- EPA, SOP# 2001, General Field Sampling Guidelines, 1994.</li> <li>- EPA, SOP# 2012, Soil Sampling, 2000.</li> </ul>	MJW has added these reference documents as appropriate.
31	General Question	NYSDEC	Is the intent to complete the “second phase” of the survey operation before a presentation of the results at a QPM, or only the first phase?	The intent is to complete all ground-truth survey and sampling activities, and to conduct the exposure assessments prior to the presentation of results to the public.
32	Page 2, Item 1, 2 <sup>nd</sup> Paragraph	NYSDEC	Were the 2 new locations outside of the areas covered by the previous aerial surveys? If so, it would be appropriate to clearly state that here rather than say it is a one of two possibilities. Not to say the instrumentation issue should be ignored, just make it clear they could not have been identified during earlier surveys because those area were not covered.	The report was updated to reflect that Areas 4 and 5 were not included in the previous surveys, and as such, could not have been identified in earlier surveys. Area 2 was surveyed in 1979 and contamination was not identified in this area. The presence of this area today could be related to uncertainty in the aerial survey, deposition of additional contamination or improvements in instrumentation.
33	Page 2, 3 <sup>rd</sup> Paragraph	NYSDEC	Add as another reason determining more accurate radiological constituent concentration values to aid in the evaluation of exposure values.	NYSERDA has included this in the sampling rationale.

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34	Page 3, Item 2	NYSDEC	Wouldn't 2.b. and c. perform surveys and soil sampling and dose assessment be the same as what is said in a. perform ground-truthing? Ground-truthing consists of surveys and soil sampling, followed by the dose assessments in c., correct? If so, then maybe revise it to say that you will perform ground-truthing that consists of items b. and c.	Section has been revised.
35	Page 4, Item 4	NYSDEC	Shouldn't the reference to the application to the NRC for reciprocity say "if approved"?	The application to the NRC for reciprocity has been approved. Section has been revised to reflect this.
36	Page 5, Item 7	NYSDEC	This description does not state that any background samples will be collected. It should be made clear here that background values will be developed as part of this effort.	The Revised Plan now states that the WVDP background data will be used for comparison with the samples collected near the Western New York Nuclear Service Center Property (see Section 9 of the revised report, "Areas Selected for Background Locations"). A separate set of background locations will be collected for the Seneca Nation territory samples.
37	Page 6, Figure 1.c Text	NYSDEC	The text about the Cesium Prong area went into some detail about it having been identified in the past. Yet even though the area in Survey Box 3 has been known about for probably at least as long, no mention of it being a known contamination location was included. This should be addressed.	Reference information from the 1984 Aerial Survey regarding Survey Area 3 has been included in the report.
38	Page 6, Figure 2.d and e	NYSDEC	If these areas were not previously identified, it should state that here for consistency and clarity.	NYSERDA revised this language accordingly.
39	Page 9, Item	NYSDEC	Selection of the data ranges is a critical step	The data ranges will be selected after the survey has been completed

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	8.B.1		<p>in this process in order to ensure that they have significance to the purpose of the effort, and do not potentially mask important trends. To the extent feasible, the lowest level range(s) should be tied to readings that represent background soil concentrations. If sufficient data on both anthropogenic and NORM content is available to do so, one data range should be selected to approximate a range of known soil concentration of Cs-137, possibly from within the highest concentration area of the Cesium Prong. This may not be possible with available data, or the variability may be too great to accomplish such a correlation, but it should be considered. This is particularly important since the “subjective observation of the count rate patterns, as displayed in the graphical image, will then be utilized to plan the second phase of the survey operations . . .”, and “the color coded GPS count rate data can be used to evaluate if the elevated count rate areas determined by the ground data are smaller or larger, or alternatively shaped than areas derived from the aerial data.”</p>	<p>and the data is downloaded for analysis. The basis for range determination will be to graphically display the data in the most useful manner. The flexible assignment of the color ranges is key to the purpose of this step, which is to identify the most elevated regions within the area. It is not possible to correlate this GPS data with background without significant expansion of the scope of this project. It is important to note the GPS data will not be used to calculate exposures to the public.</p> <p>If no elevated locations are identified through the walkover survey, locations will be selected for survey and sampling on a grid pattern commensurate the shape of the area, as well as terrain and related physical conditions. The minimum number of survey and sampling locations are subsequently described in Table 3 of the revised Sampling Plan.</p>
40	Page 10, Item 8.b.2.d	NYSDEC	<p>In addition to survey box 3 area, consideration should be given to collection of deeper samples for any areas assessed along the Cattaraugus Creek. Location</p>	<p>Samples will be collected to 3’ for all of the areas in the surface water floodplains.</p> <p>In addition, the areas meeting RSL’s criterial for further evaluation will</p>

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			<p>specific assessment of potential depth of sediment deposition, along with scanning of either soil cores, bagged or containerized samples, or readings at the bottom of standard size and depth sample pits, should be used to determine if there is a reasonable potential for deeper deposits of contaminants. The collection of deeper samples may not be feasible with field equipment available at that point in the operation, but data collection and field observations should be performed with that possibility in mind.</p>	<p>be assessed using the walkover surveys to determine whether elevated areas can be further discerned within those larger elevated areas. As such, we do not believe that potential doses will be underestimated.</p> <p>The entire 3' sample core will not be composited, and as such, higher concentration horizons will not be mixed with soil from lower concentration horizons within the soil column. Information on the manner in which samples will be taken, composited, and processed has been included in Section 10 of the Sampling and Dose Assessment Plan.</p>
41	Page 10, Item 8.b.2.c	NYSDEC	<p>Discussion of informal comparison background samples includes Springville. Can it be confirmed that past environmental sampling efforts show that the Springville area has never been impacted by site related contamination?</p>	<p>The Revised Plan now states that the WVDP background data will be used for comparison with the samples collected near the Western New York Nuclear Service Center Property (see Section 9 of the revised report, "Areas Selected for Background Locations"). A separate set of background locations will be collected for the Seneca Nation territory samples.</p>
42	General Comment 1	NRC	<p>The objective of the U.S. Nuclear Regulatory Commission's (NRC's) review of New York State Energy Research and Development Authority's (NYSERDA's) Draft Field Sampling and Dose Assessment Plan (Plan) is to provide comments regarding whether the NRC believes that NYSEDA's proposed strategy appears to be reasonable for 1) the characterization of the off-site areas of potential concern for use in its public dose compliance demonstration and 2) the</p>	<p>The purpose of this project is to conduct surveys and collect soil samples to evaluate whether the areas identified as having elevated radiation levels in the 2014 aerial survey are confirmed to have elevated levels of radionuclides in the soil. If the radionuclide levels in the soil are elevated, a dose assessment will be conducted to confirm that there is no health and safety concern. The radiological surveys results and soil and stream sediment sample data will be used in a dose assessment (described in Section 11), and, because the areas sampled are off-site and are unrestricted, will be compared to the dose limits included in 10 CFR 20.1402 - Radiological Criteria for Unrestricted Use.</p>

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			associated public dose compliance demonstration to verify that there is not a public health and safety concern.	
43	General Comment 2	NRC	The NRC does not approve characterization plans. Licensees can summarize their data and conclusions in a document; however, upon NRC staff evaluation of submittals or upon inspection, details such as actual data sets may be requested.	The soil sampling program is being conducted to provide data that will be used to confirm the aerial radiation survey and estimate potential radiation exposures to confirm there is no public health and safety concern. NYSEDA will provide the results of the sampling and dose assessment activities to NRC, EPA, NYSDEC, and NYSDOH when they are available.
44	General Comment 3		Does NYSEDA plan on submitting its dose assessment to the NRC or have it available for inspection? The NRC estimates that it will need approximately 10 - 30 business days to independently evaluate the land use survey, characterization and dose assessment information.	NYSEDA will provide the results of the soil sampling and dose assessment activities to NRC, EPA, NYSDEC, and NYSDOH when the results are available. NYSEDA has included a 30-day review period for regulatory review of the soil sampling and dose assessment results.
45	General Comment 4	NRC	Will the work be conducted under a health and safety plan? If so, what is the health and safety plan based on and clarify whether NYSEDA will require that it be used for the activities.	<p>Yes, MJW will work to their health and safety plan. The MJW Health and Safety Plan (HASP) details compliance with the Occupational Health and Safety Administration requirements detailed in 29 CFR 1910. NYSEDA has reviewed and verified that MJW's HASP fully complies with the industrial health and safety requirements for work conducted at the Western New York Nuclear Service Center.</p> <p>For the radiological safety aspects of this work, MJW has a Radioactive Materials License and a Radiation Protection Program under 10 NYCRR Part 16 that will govern these work activities under the NRC-approved reciprocity application. As MJW will work to their approved</p>

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				radioactive materials license and reciprocity application, NYSERDA will not need to provide radiation safety oversight for these activities. MJW will use their radiation protection program plans and procedures to ensure that the work is completed in a safe manner that is fully compliant with their licensed activities and regulatory requirements.
46	NRC Comment 1	NRC	The Draft Plan indicates that radiation exposures to members of the public will be determined using the current land use specific to each area (page 3). However, no detailed discussion was included in the Plan on methods used to determine current land use. Licensees may confirm current land through the use of land use surveys, or interviews with members of the public in affected areas.	As part of this activity, MJW will prepare a dose assessment using current land uses. The land use information will be obtained by interviewing the property owners or residents.
47	NRC Comment 2	NRC	Current land use should be considered in calculating exposure from discharges of radioactivity and radiation resulting from site operations for evaluation of compliance with 40 CFR 190 (and 10 CFR 20.1301(e)). As stated in Comment 1, to better understand current land use, one could conduct land use surveys or perform interviews with persons residing in the area to better understand pathways of exposure. For example, consultation with the Seneca Nation of Indians was conducted during preparation of the West Valley Environmental Impact Statement (EIS), and	NYSERDA will identify current land use information by speaking with the property owners or residents. The current evaluation is focused on determining whether the areas identified in the aerial survey as having elevated levels of radioactivity also have elevated radionuclide concentrations in the soil. If elevated concentrations in the soil are identified, a dose assessment will be conducted to confirm there is no health and safety concern for the identified areas. Because the areas sampled are off-site and are unrestricted, the dose assessment results will be compared to 10 CFR 20.1402, Radiological Criteria for Unrestricted Use. Additional information on the dose assessment methodology is provided in Section 11 of the revised Sampling and Dose Assessment Plan.

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			Final EIS assumptions regarding pathways of exposure for this population may be sufficiently supported for use in this assessment.	
48	NRC Comment 3	NRC	The pathways of exposure assumed for evaluation of compliance with 40 CFR 190 (and 10 CFR 20.1301(e)) should be listed in the Draft Plan. For example, item 3 on page 12 of the Plan indicates that the Derived Concentration Guideline Levels (DCGLs) listed in Table 5-11a of the Phase 1 Decommissioning Plan (DP) will be used in assessing the dose for the resident farmer exposure scenario. However, no reference is made to DCGL tables in the Phase 1 DP under item 2 when referring to a hiker exposure scenario, and no detail is provided on how hiker doses will be assessed. Therefore, it is not clear how the dose estimates will be determined for the “hiker scenario” listed in Table 2 (second to last column labeled “40 CFR 190...” for evaluation of compliance with the uranium fuel cycle standard in 40 CFR 190.	<p>The purpose of the soil sampling program is to determine whether the areas identified in the aerial survey as having elevated levels of radioactivity also have elevated radionuclide concentrations in the soil. If elevated concentrations in the soil are identified, a dose assessment will be conducted to confirm there is no health and safety concern for the identified areas. Because the areas sampled are off-site and are unrestricted, the dose assessment results will be compared to 10 CFR 20.1402, Radiological Criteria for Unrestricted Use. Additional information on the dose assessment methodology is provided in Section 11 of the revised Sampling and Dose Assessment Plan.</p> <p>The comparison of the soil sampling results to Table 5-11a of the Phase 1 Decommissioning plan is being conducted in response to NRC’s request that NYSERDA compare soil sampling results to the DCGLs in the WVDP Decommissioning Plan. The surface soil DCGLs in Table 5-11a of the Decommissioning Plan will provide a check of the soil sampling results against a conservative exposure scenario.</p>
49	NRC Comment 4	NRC	The fish pathway was determined to be an important pathway of exposure to the Seneca Nation of Indians population potentially affected by West Valley Demonstration Project (WVDP) decommissioning in the FEIS. However, it is not clear if the fish pathway is being	NYSERDA will consider the results of our land use discussions with those individuals owning or residing upon the properties when identifying the specifics of the exposure scenario to be conducted. Fish consumption will be included if it is a requisite part of the applicable exposure scenario, based on the land use discussion with property owners.

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			<p>considered for calculation of potential doses to receptors who may reside or participate in activities in areas along Cattaraugus Creek. Information from the WVDP Annual Site Environmental Report may be used to evaluate the potential risk significance of this pathway based on environmental sampling.</p>	
50	NRC Comment 5	NRC	<p>The last column of Table 2 of the Plan (page 13) indicates that “WVDP Phase 1 DP DCGLs” will be used to assess dose. Reasonably foreseeable land use should be considered for comparison against radiological criteria for license termination. The WVDP Phase 1 DP DCGLs were derived for specific areas of the Project Premises or site. Table 2 of the Plan should provide additional detail on what Phase 1 DP DCGLs will be used and provide support for use of those DCGLs in areas outside of their intended use.<sup>2</sup> For example, the recreational scenario evaluated in the Phase 1 DP for streambed sediments is applicable to on-site areas with steep slopes. The Phase 1 DP rationale for use of a recreational scenario in these areas was based on the argument that a resident would not be able to construct a house in certain areas next to site streams due to uneven and steep topography. Additionally, recreational use of the site as well as residential use of the site was considered in</p>	<p>The comparison of the soil sampling results to Table 5-11a of the Phase 1 Decommissioning plan is being conducted in response to NRC’s request that NYSERDA compare soil sampling results to the DCGLs in the WVDP Decommissioning Plan. The surface soil DCGLs identified in the Decommissioning Plan are for the resident farmer, so the soil sampling results will be compared to the values in Table 5-11a as a check against this conservative exposure scenario. In addition to the comparison with the WVDP Decommissioning Plan DCGLs, the dose assessment approach has been modified to include RESRAD runs for each of the identified exposure scenarios based on current land use.</p>

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			<p>a limited site-wide dose assessment where a portion of the total dose limit was apportioned to recreational uses, while the remainder was associated with residential use of the site. If the streambed DCGLs in the Phase 1 DP will be used to calculate a dose for the hiker in this assessment, rationale should be provided on why these areas could not support residential use. Most of the boxed areas appear to be located near residential areas, and many of the boxed areas are located in regions that could support a residence in the future (see Figures 1 and 2).</p>	
51	NRC Comment 6	NRC	<p>For Box Area 1, results of a previous assessment (Dames and Moore, 1995) will be relied on for the “Cesium Prong” area of the site. It is not clear how methods used to estimate dose in the 1995 study compare to currently proposed methods. Some discussion regarding differences in scenarios and assumptions would be beneficial to better interpret differences in results/.</p>	<p>Area 1 was extensively characterized in the mid-1990s and the results of the site-specific RESRAD dose assessment calculations for each of the land use scenarios were well below the applicable health and safety regulations. Therefore, this activity is focused on confirming the analytical results for select locations within this area, recognizing that the dose assessment calculations are less than the mid-1990s, due to half-life decay. If these results are greater than previously calculated, the newly collected data will be analyzed further as detailed in Section 11. If dose assessments are required based on the analytical results, differences between the new dose assessments and the previously conducted dose assessments will be described in the results report.</p>
52	NRC Comment 7	NRC	<p>For samples that will be analyzed for gamma spectroscopy, gross alpha, and gross beta (and the gross results statistically exceed background), Am-241 and Sr-90 are selected as limiting alpha and beta emitting radionuclides for the purpose of calculating</p>	<p>The revised plan includes information on the basis for selection of Am-241 and Sr-90, and includes additional information on comparing the Pu-239 values against the Am-241 values to ensure that the most limiting alpha-emitting radionuclides are used in the dose assessment calculations.</p>

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			dose (page 12). However, the basis for selection of Am-241 and Sr-90 are not provided.	
53	NRC Comment 8	NRC	It is not clear how source concentrations will be calculated for use in the dose assessment or how doses will be directly calculated. For example, on page 12, item #2, three different methods are listed for calculation of exposure rates. Insufficient detail is provided on how data from different sources will be integrated and processed for development of source concentrations or for calculation of dose.	<p>Source concentrations will be determined through the analytical analysis of soil and sediment samples.</p> <p>RESRAD will be used to calculate the exposures due to anthropogenic sources based on results of the soil and sediment analysis. In addition, external exposure will be calculated based on the aerial survey data and the microrem meter readings for comparison purposes.</p>
54	NRC Comment 9	NRC	It is not clear how samples will be spatially averaged for comparison against DCGLs. It may be appropriate to consider average concentration for comparison against DCGLs for larger areas and point measurements for comparison against Elevated Measurement Comparison (EMC) DCGLs for smaller, elevated areas of residual radioactivity.	We will compare the results to the WVDP DCGLs as requested by NRC in their comments on the Draft Aerial Survey Report. The arithmetic mean of the data will be used in this comparison.
55	NRC Comment 10	NRC	The Draft Plan indicates that survey and sampling actions will be more extensive in survey areas that have not been historically evaluated or where the historical data is sparse compared to areas that have previously been well characterized. With regard to confirmation sampling of previously characterized areas, licensees should also consider the quality of the data	Area 1 is in the Cesium Prong, an area that was thoroughly evaluated in the 1990s. NYSERDA does not intend to reanalyze the Cesium Prong through this activity. Soil samples will, however, be collected in several areas as described in Table 3, and the analytical results will be compared to the data collected during the 1995 Western New York Nuclear Service Center Off-Site Radiation Investigation (Dames and Moore, 1995) to determine whether the conditions in this area today are consistent with decay-corrected concentrations measured in the 1990s.

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			<p>when determining the extent to which additional samples need to be taken to confirm previous sampling. Licensees who plan to use supplemental sampling, should also provide decision criteria on how supplemental sampling will be used to confirm previous sampling results, and when additional sampling should be conducted when sampling results support variability from previously measured values.</p>	
56	NRC Comment 11	NRC	<p>It is not clear why subsurface samples from 0 to 1 m are planned for Survey Box 3, while depth discrete samples from 0 to 15 cm and 15 to 30 cm are planned for other Survey Box areas (page 10). Depth of sample collection should be based on the depth of residual radioactivity above background. Page 27 of the “Aerial Radiological Survey of the Western New York Nuclear Service Center” indicates that Cs-137 activity along Buttermilk Creek and areas southeast of Scoby Hill Dam and north of Schwartz Road may have migrated deeper into the soil column or into creek bed sediment over time as an explanation for differences in the Cs-137 versus anthropogenic extraction figures produced in the report. Areas of potential subsurface Cs-137 may, therefore, be located in Survey Box Areas 2 and 3 (see Figure 1 below). Survey Box Area 3 may have been selected for subsurface sampling, because this is the</p>	<p>The sampling strategy has been revised to include the collection of samples down to 3’ for all areas in the surface water floodplains. The deeper samples will also be collected in Area 2, based on RSL’s opinion that the response from those areas may be indicative of Cs-137 that is buried in the soil column.</p> <p>In addition, the areas meeting RSL’s criterial for further evaluation will be assessed using the walkover surveys to determine whether elevated areas can be further discerned within those larger elevated areas. Using this approach, we are attempting to sample the most elevated of the elevated areas. If elevated areas are not identified in the walkover survey, samples will be collected on a grid pattern as described in the revised sampling plan. We do not believe that potential doses will be underestimated.</p> <p>The entire 3’ sample core will not be composited, and as such, higher concentration horizons will not be mixed with soil from lower concentration horizons within the soil column. Information on the manner in which samples will be taken, composited, and processed will be included in the project specific field procedures</p>

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			<p>only Survey Box Area where the residential scenario was selected for use. However, the depth of sampling should not be based on the exposure scenario. Furthermore, DCGLs developed in the Phase 1 DP for surface soil and streambed sediments were both based on a 1 m source. As stated in the NRC staff's Technical Evaluation Report for the Phase 1 DP, the vertical and lateral extent of the source will need to be confirmed in the field to ensure the source concentrations and resulting doses are not underestimated. Irrespective of the rationale for the depth of sampling, elevated surface radioactivity, if it exists, should not be diluted in a 1 m column of soil if significantly lower concentrations exist below the surface. Information on variability in concentration with depth is needed to justify the sampling approach. Insufficient detail is provided in the current Plan to determine the manner in which samples will be taken, composited, and otherwise processed; and information on soil concentrations extracted for use in the dose assessment.</p>	
57	NRC Comment 12	NRC	Page 11 of the Draft Plan indicates that at least 1 sample will be collected for each sub zone. However, it is not clear what constitutes a sub zone. Please define this term in the Plan.	The revised plan details each sub-area, type of samples that will be collected, sampling depth, and the standard and expanded analyses to be completed.
58	NRC	NRC	The types of environmental media to be	Because the purpose of this activity is to ground-truth the aerial

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	Comment 13		sampled (i.e., soil, sediments, etc.) and methods to be used to perform the sampling are not discussed in sufficient detail in the Plan. Box Areas are located at various distances from affected streams (see Figures 1 and 2). Additional detail is needed to better understand the sampling strategy.	radiation survey, the sampling emphasis is on soil, and for areas within the floodplains of Buttermilk and Cattaraugus Creeks, the samples collected will likely consist of stream sediments. Where other media are part of an exposure scenario, samples of other media may be collected if those materials are available to be sampled, or published data from previous site activities will be used (e.g., the WVDP Annual Site Environmental Reports).
59	NRC Comment 14	NRC	On Page 3, calculation of maximum exposures are not necessary. Still, it is not clear that maximum exposures are being calculated.	The areas meeting RSL's criterial for further evaluation will be assessed using the walkover surveys to determine whether elevated areas can be further discerned within the elevated areas identified by RSL. Using this approach, we are attempting to sample elevated areas within the elevated areas. If elevated areas cannot be identified using the walkover surveys, a number of random samples will be collected. While this may not be a maximum exposure, we do not believe that potential doses will be underestimated.
60	NRC Comment 15	NRC	On Page 2, although not required, use of MARSSIM protocols to conduct the radiological survey should be considered to ensure proper source characterization for the purpose of developing source concentrations for use in dose modeling.	The current evaluation is focused on determining whether the areas identified in the aerial survey as having elevated levels of radioactivity have elevated radionuclide concentrations in the soil. If elevated concentrations in the soil are identified, a dose assessment will be conducted to confirm there is no health and safety concern for the identified areas. The sampling strategy is identified in the revised Soil Sampling and Dose Assessment Plan.
61	NRC Comment 16	NRC	On Page 4, it is stated that "... all activities will be completed per the requirements identified in the QAPP." A description of the QAPP should be included to understand how the QAPP applies to the sampling and analysis plan.	A copy of the QAPP will be available for review prior to the start of field activities.
62	NRC Comment	NRC	On Page 6, Survey Box 4 seems to also be near residential property, similar to Survey	NYSDERDA will prepare an exposure assessment using current land uses. The land use information will be determined through direct

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	17		Box 5.	observation and by speaking with the property owners or residents.
63	NRC Comment 18	NRC	Clarify the descriptions of the survey boxes. The NRC staff could not find the basis for the selection of boundaries of each survey box.	The red boxes included on the maps were placed by RSL to identify a grouping of subareas that met their criteria for further evaluation. The boxes are not meant to represent the boundaries of the analysis or the area to be surveyed. The maps have been revised to remove the red boxes.
64	NRC Comment 19	NRC	In Section 8.b, Survey and Sampling Strategy, the rationale for the size of the grid spacing for the gamma walkover survey should be provided. Not enough information is provided to evaluate whether or not the grid size is appropriate with regard to detection of elevated measurements that could exceed the dose limit. Will the grid spacing be used for other purposes?	The grid spacing will not be used for other purposes. For this scoping effort, the grid spaces are determined based on practical aspects such as the size of the sub-areas to be evaluated and the impacts of GPS signal quality and varying terrain.  If no elevated locations are identified through the walkover survey, locations will be selected for survey and sampling on a grid pattern commensurate the shape of the area, as well as terrain and related physical conditions. The minimum number of survey and sampling locations are subsequently described in Table 3 of the revised Sampling Plan.
65	NRC Comment 20	NRC	On Page 9, it is unclear how much of each survey box will be scanned or the percentage of land surface area that will be covered by gamma surveys in each of the survey boxes.	As stated above, the red boxes included on the maps were placed by RSL to identify a grouping of sub-areas that met their criteria for further evaluation. The boxes are not meant to represent the boundaries of the analysis or the area to be surveyed. The actual areas surveyed will be larger than the sub-areas identified on the maps (typically 10% larger).
66	NRC Comment 21	NRC	Since the survey boxes are in flood plains and some survey boxes show stream systems, how will scanning be addressed under wet conditions?	The surveys will be completed during dry weather conditions to the degree possible.
67	NRC Comment 22	NRC	It is unclear how the detection sensitivities of equipment used for dynamic and static measurements will be determined for the field survey activities.	There is no intent to correlate the scanning data or utilize it to assess dose. Dose assessment will be based on the microrem meter readings and the isotopic concentrations (see Comment 46).

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68	NRC Comment 23	NRC	On Page 9, It is unclear when sediment samples will be taken, how many will be taken, where they will be taken and what they will be analyzed for, and how they will be used to characterize each survey box.	Sediment samples will be collected in Areas 3 and 4. Details related to the locations, number of samples and analytical parameters are provided in Tables 3, 4 and 5.
69	NRC Comment 24	NRC	Clarify whether sediment samples will be collected for the purpose of background evaluation.	Sediment samples will be collected both in the floodplain and outside of the floodplain for the SNI Background areas.
70	NRC Comment 25	NRC	In Survey and Sampling Strategy Section, it states that “if all count rates are low, a limited number of samples and static survey points will be taken.” What is considered “low” and what is meant by “limited”? Not enough information is provided regarding the technical basis for determining the number of samples to take for each survey unit and the selection of sampling locations and static measurement locations. Provide the criteria that will be used or the rationale regarding the number and location of sampling and static measurements.	As discussed in Section 10 of the revised Soil Sampling and Dose Assessment Plan, if no elevated locations are identified through the walkover survey, locations will be selected for survey and sampling on a grid pattern commensurate the shape of the area, as well as terrain and related physical conditions. The minimum number of survey and sampling locations are subsequently described in Table 3 of the revised Sampling Plan.
71	NRC Comment 26	NRC	In Section 8.c.2, Expanded Analysis, it states that “selected samples will be analyzed more extensively, based upon initial sample results, information gathered in the field, and project Quality Control Requirements. Not enough information is provided regarding the technical basis or decision criteria for determining which samples should be screened or evaluated further for	A specific number of samples will be sent for full analysis as specified in the QAPP. Additional samples may also be sent for expanded analyses, based on professional judgement, or if needed to refine the dose assessment.

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			an expanded analysis.	
72	NRC Comment 27	NRC	On Page 11, Table 1, Rationale for the selection of the list of analytes should be provided.	The analytes listed in Table 5 are those radionuclides specific to the former reprocessing activities at West Valley. These radionuclides were identified in the WVDP Phase 1 Decommissioning Plan as the Radioisotopes of Interest (ROIs) and Potential Radioisotopes of Interest (PROIs).
73	NRC Comment 28	NRC	On Page 11, Table 1, Standard and Expanded Analysis Information, in third column, NYSERDA listed certain MDC values. The basis for the MDC values should be provided.	The MDC values were identified as the best achievable in a reasonable time frame, and will allow MJW to confirm the aerial radiation survey results, and estimate potential radiation exposures to determine if there are any public health and safety concerns.
74	NRC Comment 29	NRC	It is unclear what radionuclides will be measured or accounted for the dose assessment. Clearly identify the radionuclides that NYSERDA will require be included (measured or accounted for) in the dose assessment for each survey unit. If the radionuclides differ from those identified in the Phase I Decommissioning Plan, explain why.	All samples will be analyzed for gross alpha, gross beta and gamma spectroscopy. Based on these results, additional expanded analyses detailed in Table 5 may be completed, and at a minimum, each sub-area will have a minimum of two samples sent for expanded analyses. If expanded analyses are not completed and the gross alpha values are greater than background plus two standard deviations, the most limiting alpha-emitting radionuclide (either Am-241 or Pu-239) will be assumed. If gross beta values are greater than background plus two standard deviations, Sr-90 will be assumed as the beta-emitting radionuclide.
75	NRC Comment 30	NRC	The Draft Plan lists methods of soil and sediment analysis in Table 1. EPA 900.0 Mod/SW 9310 Mod are listed. It appears these methods are for water and not for soils and sediments. Please clarify how these methods will be used to measure radioactivity in soil.	This section has been revised to include the correct EPA Standard Operating Procedures.
76	NRC Comment 31	NRC	Please indicate how the suite of standard analysis (gross alpha, gross beta, and gamma scan (spectroscopy) will be	All samples will be analyzed for gross alpha, gross beta and gamma spectroscopy. Based on these results, additional expanded analyses detailed in Table 5 may be completed, and at a minimum, each sub-

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			sufficient to detect all radionuclides of concern.	area will have a minimum of two samples sent for expanded analyses. If expanded analyses are not completed and the gross alpha values are greater than background plus two standard deviations, the most limiting alpha-emitting radionuclide (either Am-241 or Pu-239) will be assumed. If gross beta values are greater than background plus two standard deviations, Sr-90 will be assumed as the beta-emitting radionuclide.
77	NRC Comment 32	NRC	The Draft Plan should address how the measurement results will be reported. For example, per MARLAP (Multi-Agency Radiological Laboratory Analytical Protocols Manual, NUREG-1576), the reported value of a measurement result: (1) be reported directly as obtained, with appropriate units, even if it is are negative, (2) be expressed in an appropriate number of significant figures, and (3) include an unambiguous statement of the uncertainty.	The lab data will be reported per MARLAP.
78	NRC Comment 33	NRC	Clarify whether NYSERDA will require the list of “applicable” procedures listed in Section 10, Applicable Field Procedures, be used. How do the applicable procedures relate to the New York State Service Provider’s license requirements?	The list of procedures in Section 10 will be used.
79	NRC Comment 34	NRC	How does the Draft Field Sampling and Dose Assessment Plan and procedures relate to the reference standards and practices listed in Section 11, Reference Standards and Practices.	The section has been revised to include only those standards and practices that were directly used in the development of the Sampling and Dose Assessment Plan.