**NRC Comments on NASA Plum Brook Reactor Facility**
**Final Status Survey Report**
**Main Body of Report**

**Final Status Survey Report, Report of Main Body (ML12095A156)**

| ***Generic Comment*** | | | |
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| NASA Plum Brook Reactor Facility (PBRF) needs to consider making changes to the Final Status Survey Report (FSSR) Main Body of Report (MBR) based on the information that will be provided by NASA in response to NRC staff comments on FSSR Attachment 17, dated May 1, 2012. | | | |
| ***Cmt No.*** | ***Section &Page No.*** | ***Comment*** | ***Proposed Resolution*** |
| 1. | Sect. 1, Pg.1 | NASA states, "The PBRF Final Status Survey (FSS) Report comprises 19 volumes: this volume and 18 attachments". This statement does not encompass the Plum Brook project discussed in the MBR (e.g., page 14, 31, and 80) which is not an attachment. Brief mention of the Plum Brook project should be included up front in the MBR.<br><br>Reference to the Plum Brook project, should explain that characterization, surveying, and cleanup activities associated with this project were previously reviewed and evaluated. In that evaluation, NASA demonstrated that the dose to a member of the critical group (group of individuals expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances) from residual radioactivity in sediments from Plum Brook is well below the dose criterion for unrestricted use in 10 CFR 20.1402. | Revise the section to include brief reference or overview (couple sentences) of the Plum Brook project. |
| 2. | Sect. 2, Pg. 2 | Last paragraph of this section includes statement "By late 2011, all the PBRF buildings and most structures, except the Reactor Building, Hot Laboratory, and Primary Pump House, were demolished and excavated to 3 ft below grade and backfilled." Based on the current status of decommissioning activities, this statement is no longer true. | Update MBR to reflect the final state or condition of the site. |

Attachment

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| 3. | Sect. 2.3, Pg.14 | Under the "Plum Brook" heading, there is a summary discussion addressing offsite contamination. This section states "From discussions with NRC and Ohio DOH, it was agreed that the 25 mrem/year dose criterion approved for PBRF would also apply to the Plum Brook and environs. In accordance with this agreement, the Plum Brook and environs were shown to be suitable for release for unrestricted use through dose modeling calculations."<br><br>Since offsite contamination is not part of the NRC licensed facility, there would be no "release" of offsite areas for unrestricted use. | Revise wording to clarify that there is no "release" of offsite areas. |
| 4. | Sect. 3.4, Pg. 32 | The "Handling and Processing of Excavated Materials" heading includes a discussion of material disposition resulting from pre-excavation scan surveys. The discussion related to "action level" is confusing, for example:<br>1. Refers to **material determined to be above the action level for offsite disposal (>DCGL)** was, transported directly to an "above criterion" radwaste stockpile and staged for disposal as radioactive waste;<br>2. Refers to **material determined to be below the RAL** was transported to an "overburden stockpile"; and<br>3. Refers to **material above the RAL and below the DCGL** was transported to a "contaminated stockpile." | Clarify the meaning of "action level" in Item 1 and "RAL" in Items 2 and 3.<br><br>Also, as noted below under Minor and Editorial Comments, RAL should be spelled out or added to the List of Acronyms & Symbols in MBR. |
| 5. | Sect. 3.4, Tables 1 and 2, Pgs. 35-36 | According to a recent conference call on the status of PBRF decommissioning, NASA plans to make another waste shipment in 2012. | Update Tables 1 and 2, for 2012 waste shipments, as appropriate. |
| 6. | Sect. 4.1, Pg. 38 | Last paragraph states "The PBRF dose goal for EP is 1 mrem/y. However, a different dose goal may be applied in an area as long as the residual contamination on the structure surface in the survey unit | Clarify constraint of the selection of a different dose goal for EP consistent with NASA's FSSP. |

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| | | containing the given EP is sufficiently low to allow for the selected dose goal."<br><br>This sentence is unclear since it leaves open the value of the selected dose goal. NASA should clarify the constraint on the selection of a different dose goal for Embedded Piping (EP) survey unit consistent with NASA's Final Status Survey Plan (FSSP). The FSSP states that "…different dose goals could be applied in different areas as long as the residual contamination on the structure surface in the survey unit containing the given EP is sufficiently low to allow for the selected dose goal. For example, if the FSS results indicate that the residual contamination level in Hot Dry Storage is 0.5 times the DCGL, the dose from the two drains in this survey unit could be as high as 12.5 mrem/yr." Therefore, for a given survey unit, the dose contribution from both the structure surface and EP must be less than or equal to 25 mrem/yr. | |
| 7. | Sect. 4.5, and Table 17, Pg. 55 | This section states that for FSS of most of the excavated soil where Cs-137 is the predominate radionuclide, the most limiting $DCGL_{sur}$ value, 10.3 pCi/g, was used as the basis for scan survey investigation and action levels, but in Table 17, under the column Scan $DCGL_{sur}$ there are different values. This suggests the most limiting $DCGL_{sur}$ value, 10.3 pCi/g was not used in other areas. The values in Table 17, do not comport with the statement in the first paragraph. | Provide an explanation for the difference in the first paragraph or correct the values in Table 17. |
| 8. | Sect. 5.1, Pg..68 | NASA states "However, the scan action level was exceeded in only 76, or 11%, of the 665 PBRF structure survey units." Is this good or bad? Does this indicate a problem of non compliance? Are 76 survey units still not in compliance? | Provide more clarity to the statement and indicate the impact of this statement, if any? |
| 9. | Section 5.1, Table 26, Pg.70 | The foot note 2 to Table 26, "Systematic Total Surface Beta Activity Measurement Results for PBRF Structures", states that "The $DCGL_w$ values shown in the table for comparison to measurement results are the | Revise, as necessary, to correct apparent discrepancies. |

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| | | smaller of the original or revised $DCGL_w$ values for the structure survey units in each building or structures". However, the values provided in the last column of Table 26, ($DCGL_w$) do not seem to reflect this statement.<br><br>For example, in Appendix L (Building Structural Surface DCGLs) of the Technical Basis document (PBRF-TBD-07-001, Rev. 0), the lowest DCGL value for Reactor Building is shown as 11,563. Whereas, in Table 26 the DCGL value for the Reactor Building is listed as 18,463 which is inconsistent with the foot note 2. | |
| 10. | Sect.5.3 , Pg. 74 | NASA needs to revise this section (and other areas in this report that reference Buried Piping (BP) or Miscellaneous Piping (MP) consistent with the response to the NRC staff request for additional information (RAI) on Attachment 17. | Review and update the MBR to accurately reflect the response to NRC staff RAI on Attachment 17. |
| 11. | Sect.5.3 , Table 31, Pg. 75 | According to NASA, some values for maximum activity in Table 31 are not correct. | Correct maximum activity values in Table 31. |
| 12. | Sect.5.3 , Pg.74 | Under heading "Buried and Miscellaneous Piping", the description of MP is not consistent with the description of MP used elsewhere in the FSSR. NASA's description of MP should be consistent with description MP in FSSR Attachment 17, which states MP is "any piping, conduit or similar piping which does not meet the definition of Buried Piping or Embedded Piping as defined in the PBRF FSS plan, **but will remain in the structure."** | Ensure description of MP in MBR is consistent with description in FSSR Attachment 17. |
| 13. | Sect.5.4 , Pg. 80 | Based on discussion under "Water Sample Results", NRC staff could not determine if other radionuclides (i.e., Co-60, Cs-137, or Sr-90) were considered when conducting analyses.<br><br>NRC staff suggests that NASA reference PBRF Technical Basis Document on groundwater monitoring and incorporate | NASA needs to clarify if other radionuclides, such as Co-60, Cs-137, or Sr-90, were present during analysis of groundwater and state accordingly. |

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| | | relevant information from this document into MBR to address this point. . | |
| 14. | Sect. 6.0, Pg. 88 | Based on NRC comments on MBR, NASA needs to revise and update conclusion section. More specifically, the very last statement would have to be revised and updated based on Comment 10. | Revise and update conclusion section based on NRC comments on MBR and FSSR Attachment 17. |

**Minor and Editorial Comments**

| Section & Page | Comment | Proposed Resolution |
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| Pg. iv | List of Effective Pages, update Revision Level Column to reflect latest revision number for Attachments | Update list |
| Sect. 2.1, Pgs. 5-11 | The nomenclature should be consistent. Under Reactor Building (Building 1111), it begins with "The Reactor Building (RB)…" The nomenclature for other subtopics are not consistent with the nomenclature used in the Reactor Building. For example, the next subtopic is Hot Laboratory and there is no nomenclature (HL). In other subtopics, NASA uses only nomenclatures and not the identity of the structure (see pg. 6). NASA on some occasions uses only nomenclatures to identify an issue in the report. | Use consistent nomenclature in each subtopic. |
| Sect. 2.1, Pg. 7 | The title begins with un-numbered Buildings and Structures. This subtopic is not tied to an Attachment and it is uncertain as to what the author is describing. | As with other subtopics, tie the subtopic to an Attachment. Each subtopic should be traced to an Attachment. |
| Sect. 3.4, Pg. 32 | Use of acronym "RAL" in item #2. This is not in List of Acronyms and Symbols, and it is not clearly define in text. | Spell out what is "RAL". |
| Sect. 4.1, Pg. 38 | Last paragraph incorrectly refers to EP DCGL values in Table 3. The DCGL values for EP are actually listed in Table 5. Table 3 provides DCGL values for PBRF structures. | Correct reference to correct table for EP. |

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| Sect. 4.1, Table 3, Pg. 38 | Table 3 identifies U-236 as a Radionuclide. This is not consistent with TBD-11-002, Table 5, which shows U-238. Is this the correct uranium radionuclide in Table 3? | Use the correct radionuclide or provide an explanation as to why U-236 should be there. |
| Sect. 4.5, Table 19, Pg. 57 | The purpose of Table 19 is not readily apparent based on the discussion preceding this table. | MBR discussion should clarify purpose of Table 19. |
| Sect. 4.8, Pg. 67 | In 3rd paragraph (middle of page) correct spelling of embedded “pie” to embedded pipe.<br><br>In 4th paragraph, which includes 5 items on data analysis and statistical testing, check No. 2 for accuracy?<br><br>No. 5, is missing a parenthisis. In sentence “ If the results of the statistical test (S+ for Sign Test, or W for the WRS test**)** > the critical value, the survey unit passes. If not true the survey unit fails. However, No. 5 doesn’t state what happens if survey unit fails. Should it add if survey unit fails, further remediation and resurvey required? | Correct spelling error |
| Sect. 5.2, Pg. 71 | In Table28, Column titled “Investigative Sample Results (pCi/g)” first description uses “pi/g”. This is not the correct units. | Correct units to pCi/g. |