# ADDENDUM A
# NRC LICENSE TERMINATION REPORT
# SENECA ARMY DEPOT ACTIVITY
# ROMULUS, NEW YORK

## DATA EVALUATION USING THE SCENARIO A NULL HYPOTHESIS

00755

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# 1.0 INTRODUCTION

## 1.1 PURPOSE OF ADDENDUM

The purpose of this addendum is to report the results of the use of the MARSSIM Scenario A null hypothesis (NRC, 2000) to evaluate radiological survey data in support of the termination of Nuclear Regulatory Commission (NRC) license SUC-1275, held by the US Army at Seneca Army Depot Activity (SEDA). Where noted, the information in this addendum supersedes information presented in the *NRC License Termination Report for Seneca Army Depot Activity* (the Report; Parsons, June 2004). Survey data in the Report were evaluated using the MARSSIM Scenario B approach that was ultimately rejected by NRC staff in correspondence dated September 7, 2005 (**Attachment 1**). Per a subsequent teleconference with the NRC staff on October 18, 2005, it was determined that an addendum presenting the results evaluated using MARSSIM Scenario A would be acceptable to continue the NRC license termination process at SEDA (**Attachment 1**).

## 1.2 ORGANIZATION OF ADDENDUM

The structure of Addendum A closely follows the organization of the Report. **Section 1** is the introduction. **Section 2** presents supplemental information, including the revised compliance approach and some additional details on changes from the original data evaluation. **Section 3** presents the results of the evaluation of survey data from the depleted uranium storage igloos, while **Section 4** presents the results of the survey data evaluation for the depleted uranium storage buildings. **Section 5** discusses the results of the evaluation of survey data from Building 612. **Section 6** of this addendum presents the conclusions from the use of MARSSIM Scenario A, and **Section 7** lists the references cited. In addition, a compact disc included with this addendum contains additional electronic files with spreadsheets of statistical tests and attachments of updated information.

## 2.0 SUPPLEMENTAL INFORMATION

### 2.1 COMPLIANCE APPROACH (supersedes Section 2.6 of the Report)

Survey data from SEDA were evaluated using the MARSSIM Scenario A null hypothesis that assumes that the median survey unit measurement exceeds that of the reference area by more than the wide area derived concentration guideline level ($DCGL_W$). In other words, the survey unit is assumed not to meet the release criterion unless it is statistically proven to be clean. The DCGLs developed in the License Termination Plan (LTP, **Appendix 1.A**) are presented in **Table A2-1**, and the gross activity DCGL calculation for depleted uranium is detailed in **Table A2-2**. Since all of the survey units potentially impacted by licensed commodities consisted of interior surfaces of buildings or structures, only the surface activity DCGLs were used in the evaluation of survey data in this addendum. The survey data were evaluated per the method described in MARSSIM Section 8 for measurements with the radionuclides of concern present in background. This method is summarized in **Table A2-3** and **Figure A2-1**. Summary statistics of the background datasets used in the statistical evaluation of the survey data presented in this addendum are presented in **Table A2-4.**

### 2.2 ADDITIONAL CHANGES FROM REPORT

In the course of preparing this addendum, rounding errors, typos, and other conversion errors were discovered in the Report, and have been corrected and/or updated in the tables included in this addendum. Updated or corrected information, where appropriate, has been shaded in the addendum tables to indicate a change from the Report. Global changes are discussed in further detail below, and are summarized in **Table A2-5**. Additional table-specific changes also appear in **Table A2-5**.

Information about the activities of the check sources used for the instrument function checks for the 2002 depleted uranium storage igloo and building surveys was corrected. In particular, the activity of the americium-241 (Am-241) source used for the FIDLER function checks was incorrect. The correct activity was added to the function check control sheets, and an updated average instrument efficiency was calculated and used in the determination of the instrument-specific DCGLs. The updated control sheets from the 2002 surveys (superseding Appendices 3.A and 4.A of the Report) are included with this addendum as **Attachment 2**.

Another global change was a correction in the weight fractions for the constituents of depleted uranium. The 0.0006% by weight for U-234 listed in WHO, 2001, was incorrectly included in the calculations as 0.0008%. Also, the probe areas for phoswich, floor monitor, and handheld gas proportional detectors were changed from the "open" area to the "physical" or "active" area, per MARSSIM Section 6.6.1.

## 3.0 EVALUATION OF DEPLETED URANIUM STORAGE IGLOO DATA

The depleted uranium storage igloos that were evaluated using MARSSIM Scenario A are listed in **Table A3-1**. The instrument-specific DCGLs, the minimum detectable activities (MDAs), and the number of required measurements per MARSSIM are presented in **Table A3-2**, **Table A3-3**, and **Table A3-4**, respectively.

### 3.1 SUMMARY STATISTICS AND WIDE AREA EVALUATION (Supersedes Section 3.3.2 of the Report)

**Tables A3-5** through A3-9 present the summary statistics (mean, median, standard deviation, minimum, and maximum) of the three datasets collected per igloo, organized by igloo block (e.g., A, B, C).

**Table A3-10** presents the initial Scenario A data reduction as described in MARSSIM Section 8, and outlined in **Table A2-3** and **Figure A2-1**. All of the alpha and beta datasets from all 125 igloos demonstrated a difference between the survey unit mean and the reference area mean that was less than the $DCGL_W$, and a difference between the survey unit maximum measurement and the reference area minimum measurement that was less than the $DCGL_W$. In addition, gamma datasets from 33 igloos demonstrated the same as the alpha and beta datasets. As such, those 33 igloos met the release criterion without any further statistical testing required, and are so noted in **Table A3-10**.

Gamma datasets from the remaining 92 igloos were evaluated using the Wilcoxon Rank Sum (WRS) test, per MARSSIM. The results of the WRS tests are presented in **Table A3-11**. Ninety of the 92 WRS tests with the gamma survey data rejected the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$, and as such, those 90 igloos passed (i.e., met the release criterion). The null hypothesis was accepted (i.e., the survey unit failed) for the gamma measurements from two igloos, Igloos A0317 and A0508. However, because the radionuclide of concern at these igloos was plutonium-239 (Pu-239), which is primarily an alpha emitter, and because the gamma $DCGL_W$ for Pu-239 was small relative to background (408 counts per minute [cpm], compared with an average background of 6445 cpm, or less than 10%), it was concluded that these igloos met the release criterion based on the alpha and beta measurements.

### 3.2 ELEVATED MEASUREMENT COMPARISON (Supersedes Section 3.3.3 of the Report)

As shown in **Table A3-12**, alpha/beta and gamma scanning measurements collected in the depleted uranium storage igloos were compared to conservative flag values based on the instrument $DCGL_W$ and average background measurement (**Table A3-2**). All alpha/beta scanning measurements were below the flag value. A number of gamma scanning measurements exceeded the flag value, but all gamma measurements were below the $DCGL_{EMC}$ (**Table A3-2**). It was concluded that there were no localized areas of elevated contamination within the depleted uranium storage igloos.

### 3.3 CONCLUSIONS (Supersedes Section 3.4 of the Report)

Based on the statistical analyses described above, it was concluded that all 125 survey units that were part of the depleted uranium storage igloo survey met the release criterion of 10 millirem per year (mrem/yr) and are suitable for unrestricted release.

## 4.0 EVALUATION OF DEPLETED URANIUM STORAGE BUILDING DATA

The 34 survey units in the depleted uranium storage buildings evaluated using Scenario A are listed in **Table A4-1**. The instrument-specific DCGLs, the MDAs, and the number of required measurements per MARSSIM are presented in **Table A4-2**, **Table A4-3**, and **Table A4-4**, respectively.

### 4.1 SUMMARY STATISTICS AND WIDE AREA EVALUATION (Supersedes Section 4.3.2 of the Report)

**Tables A4-5** through **A4-8** present the summary statistics (mean, median, standard deviation, minimum, and maximum) of the measurement datasets collected per survey unit, organized by instrument and building.

**Table A4-9** presents the initial Scenario A data reduction as described in MARSSIM Section 8, and outlined in **Table A2-3** and **Figure A2-1**. All of the alpha and beta datasets from the four depleted uranium storage buildings demonstrated a difference between the survey unit mean and the reference area mean less than the $DCGL_W$, and a difference between the survey unit maximum measurement and the reference area minimum measurement less than the $DCGL_W$. In addition, gamma datasets from 13 survey units from the depleted uranium storage buildings demonstrated the same as the alpha and beta datasets. As such, those 13 survey units met the release criterion without any further statistical testing required, and are so noted in **Table A4-9**.

Gamma datasets from the remaining 21 building survey units were evaluated using the WRS test, per MARSSIM. The results of the WRS tests are presented in **Table A4-10**. All 21 WRS tests with the gamma survey data from the depleted uranium storage buildings rejected the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$, and as such, those 21 survey units passed (i.e., met the release criterion).

### 4.2 ELEVATED MEASUREMENT COMPARISON (Supersedes Section 4.3.3 of the Report)

As shown in **Table A4-11**, alpha/beta and gamma scanning measurements collected in the depleted uranium storage buildings were compared to conservative flag values based on the instrument $DCGL_W$ and average background measurement (**Table A4-2**). All alpha/beta scanning measurements collected with the phoswich and gas proportional floor monitor detectors were below the flag value. Gamma scanning measurements from three survey units exceeded the flag value, but all gamma scanning measurements were below the $DCGL_{EMC}$ (**Table A4-2**). It was concluded that there were no localized areas of elevated contamination within the depleted uranium storage buildings.

### 4.3 CONCLUSIONS (Supersedes Section 4.4 of the Report)

Based on the statistical analyses described above, it was concluded that all 34 survey units that were part of the depleted uranium storage building survey met the release criterion of 10 mrem/yr and are suitable for unrestricted release.

## 5.0 EVALUATION OF BUILDING 612 DATA

The 28 survey unit from Building 612 evaluated using Scenario A are listed in **Table A5-1**. The instrument-specific DCGLs, the MDAs, and the number of required measurements per MARSSIM are presented in **Table A5-2**, **Table A5-3**, and **Table A5-4**, respectively.

### 5.1 SUMMARY STATISTICS AND WIDE AREA EVALUATION (Supersedes Section 5.3.2 of the Report)

**Table A5-5** presents the summary statistics (mean, median, standard deviation, minimum, and maximum) of the measurement datasets collected per survey unit, organized by instrument.

**Table A5-6** presents the initial Scenario A data reduction as described in MARSSIM Section 8, and outlined in **Table A2-3** and **Figure A2-1**. All of the alpha or beta datasets from the 28 survey units in Building 612 demonstrated a difference between the survey unit mean and the reference area mean less than the $DCGL_W$, and a difference between the survey unit maximum measurement and the reference area minimum measurement less than the $DCGL_W$. However, the gamma datasets from all 28 survey units required further statistical analysis with the WRS test.

Gamma datasets from the 28 Building 612 survey units were evaluated using the WRS test, per MARSSIM. The results of the WRS tests are presented in **Table A5-7**. Eighteen of the 28 WRS tests with the gamma survey data from the Building 612 rejected the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$, and as such, those 18 survey units passed (i.e., met the release criterion). The null hypothesis was accepted (i.e., the survey unit failed) for the gamma measurements from the remaining 10 survey units. However, due to the gamma $DCGL_W$ being small relative to background (301 cpm, compared with an average background of 3211 cpm, or less than 10%), it was concluded that these 10 survey units within Building 612 also met the release criterion based on the alpha and beta measurements. This methodology was discussed with NRC staff during the October 2005 teleconference, and was agreed upon to be a reasonable approach.

### 5.2 ELEVATED MEASUREMENT COMPARISON (Supersedes Section 5.3.3 of the Report)

All alpha and beta direct measurements from Building 612 were below the $DCGL_{EMC}$'s listed in **Table A5-2**. Six survey units from Building 612 had at least one gamma direct measurement that exceeded $DCGL_{EMC}$ (**Table A5-8**). However, based on the evaluation of the alpha and beta measurements, it was concluded that there were no localized areas of elevated contamination within the Building 612.

### 5.3 CONCLUSIONS (Supersedes Section 5.4 of the Report)

Based on the statistical analyses described above, it was concluded that all 28 survey units that were part of the Building 612 survey met the release criterion of 10 mrem/yr and are suitable for unrestricted release.

## 6.0 SUMMARY OF FINDINGS

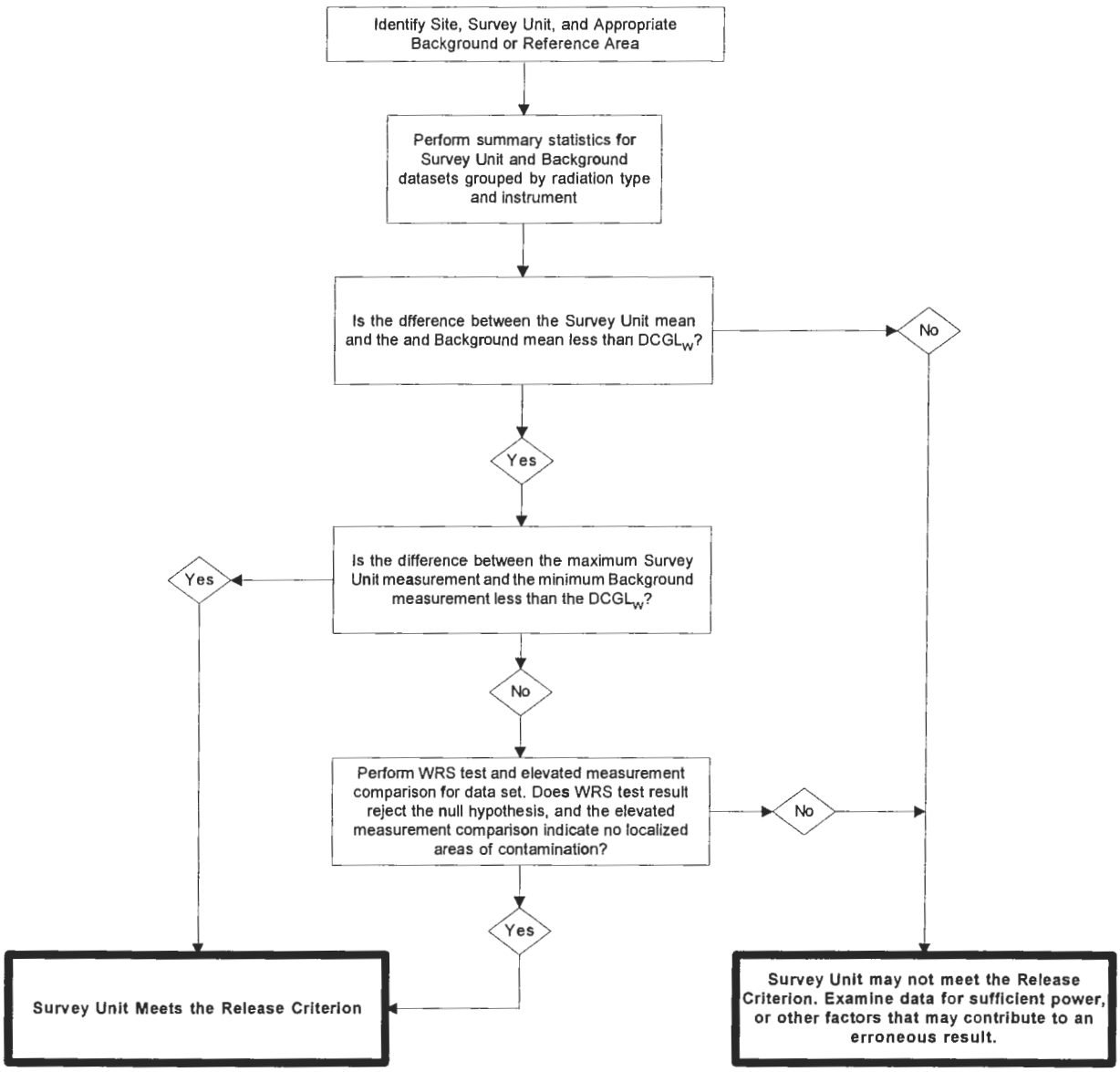
Survey data from the depleted uranium storage igloos, depleted uranium storage buildings, and Building 612 at SEDA were re-evaluated using the MARSSIM Scenario A null hypothesis and accompanying statistical tests. The analysis of the SEDA survey data using Scenario A was requested by NRC staff after their review of the *NRC License Termination Report for Seneca Army Depot Activity* (Parsons, June 2004). Based on this re-evaluation, there is sufficient evidence to conclude that all survey units evaluated at SEDA for determining license termination met the release criterion of 10 mrem/yr, as established in the LTP. Therefore, it is requested that SEDA be removed from all related licenses and be released for unrestricted use.

## 7.0 REFERENCES

NRC, 2000. Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575, Revision 1, August.

Parsons, 2004. NRC License Termination Report for Seneca Army Depot Activity, June.

**Figure A2-1**
**Scenario A Data Evaluation Process**
**License Termination Report Addendum**
**Seneca Army Depot Activity**




Adapted from Section 8 of
MARSSIM (NRC, 2000)

**Table A2-1**
**Derived Concentration Guideline Levels**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Radionuclide [1] | Soil $DCGL_w$ (pCi/g) [2] | | Surface DCGLw ($dpm/100\ cm^2$) [3] | |
|---|---|---|---|---|
| | | | | |
| Ac-227 | 6.9 | | 670 | |
| H-3 | 5800 | | 2.07E+08 | |
| Pa-231 | 2.5 | | 1360 | |
| Pb-210 | 5.6 | | 1790 | |
| Pm-147 | 46000 | | 1.69E+07 | |
| Pu-239 | 59 | | 4240 | |
| Ra-226 | 1.7 | | 2870 | |
| Ra-228 | 2.2 | | 3790 | |
| Sm-147 | 240 | | 57500 | |
| Th-228 | 3.8 | | 3950 | |
| Th-230 | 54 | | 16200 | |
| Th-232 | 1.5 | | 3090 | |
| U-234 | 180 | | 35100 | |
| U-235 | 33 | | 18200 | |
| U-238 | 98 | | 31600 | |
| | Gross Soil DCGLw | Gross Soil $DCGL_{EMC}$ | Gross Surface DCGLw | Gross Surface $DCGL_{EMC}$ |
| Depleted Uranium [4] | 100 | 450 [5] | 31647 | 376599 [5] |
| Pitchblende Ore [4] | 3.3 | 4.3 [6] | 4062 | 34119 [7] |

Notes:

(1) Soil and surface DCGLs for the listed radionuclides were developed in the Seneca Army Depot Activity License Termination and License Release Plan (ANL, 2003; **Appendix 1.A**)

(2) pCi/g = picocuries per gram.

(3) $dpm/100cm^2$ = decays per minute per 100 square centimeters.

(4) Gross activity DCGLs were calculated per MARSSIM for depleted uranium and pitchblende ore using expected mass/activity fractions from WHO, 2001 (depleted uranium, **Table A2-2**) and NCRP, 1987 (uranium ore).

(5) The $DCGL_{EMC}$'s for DU were calculated using the extrapolated area factors for a $4m^2$ survey grid for U-235 (AF = 4.5 soil, 11.9 surface) from ANL, 2003.

(6) The soil $DCGL_{EMC}$ for pitchblende was calculated using the area factor for a $100m^2$ survey grid for Ra-226 and Th-228 (AF = 1.6) from ANL, 2003.

(7) The surface $DCGL_{EMC}$ for pitchblende was calculated using the extrapolated area factor for a $4m^2$ survey grid for Ra-226 (AF = 8.4) from ANL, 2003.

## Table A2-2
## Calculation of Gross Activity $DCGL_W$ for Depleted Uranium
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Radionuclide | Half-life (yr) [1] | Half-life (sec) | Decay Constant ($sec^{-1}$) | Weight Fraction [2] | Activity (decays/sec) | Activity Fraction | $DCGL_W$ ($dpm/100cm^2$) [3] | Gross Activity $DCGL_W$ for Depleted Uranium ($dpm/100cm^2$) [4] |
|---|---|---|---|---|---|---|---|---|
| U-234 | 244500 | 7.71E+12 | 8.99E-14 | 6.00E-06 | 1387.62 | 0.099 | 35100 | **31647** |
| U-235 | 7.04E+08 | 2.22E+16 | 3.12E-17 | 0.002 | 160.00 | 0.011 | 18200 | |
| U-238 | 4.47E+09 | 1.41E+17 | 4.92E-18 | 0.998 | 12418.12 | 0.889 | 31600 | |
| | | | | Sum | 13965.74 | | | |
| | | | | | | | (pCi/g) [5] | (pCi/g) |
| U-234 | 244500 | 7.71E+12 | 8.99E-14 | 6.00E-06 | 1387.62 | 0.099 | 180 | **100** |
| U-235 | 7.04E+08 | 2.22E+16 | 3.12E-17 | 0.002 | 160.00 | 0.011 | 33 | |
| U-238 | 4.47E+09 | 1.41E+17 | 4.92E-18 | 0.998 | 12418.12 | 0.889 | 98 | |
| | | | | Sum | 13965.74 | | | |

Notes

(1) Half-life in years from *Handbook of Health Physics and Radiological Health*, 1998.

(2) Weight fractions for depleted uranium from WHO, 2001.

(3) $dpm/100cm^2$ = decays per minute per 100 square centimeters. From ANL, 2003.

(4) Calculated per Equation 4-4 of MARSSIM (NRC, 2001).

(5) pCi/g = picocuries per gram. From ANL, 2003.

# Table A2-3
## Summary of Statistical Tests
## Radionuclide in Background or Radionuclide Non-Specific (Gross) Measurements Made
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Result | Conclusion |
|---|---|
| Difference between largest survey unit measurement and smallest reference area measurement is less than the $DCGL_W$ | Survey unit meets the release criterion |
| Difference of survey unit average and reference area average is greater than the $DCGL_W$ | Survey unit does not meet the release criterion |
| Difference between any survey unit measurement and any reference area measurement is greater than the $DCGL_W$ and the difference of survey unit average and reference area average is less than the $DCGL_W$ | Conduct WRS test and elevated measurement comparison |

From MARSSIM, Table 8.2

## Table A2-4
## Summary Statistics of Background Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Reference Area | Instrument [1] | Number of Measurements | Mean (cpm) [2] | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) | Median (cpm) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| Bldg 722 | Alpha FM | 15 | 3.8 | 2.4 | 0 | 8 | 4 |
| Bldg 722 | Beta FM | 15 | 775 | 284.1 | 498 | 1435 | 715 |
| Bldg 722 | Alpha HH | 105 | 3 | 1.9 | 0 | 8 | 2 |
| Bldg 722 | Beta HH | 105 | 176 | 55.3 | 86 | 436 | 159 |
| Bldg 722 | Alpha PH | 100 | 4 | 2.3 | 0 | 14 | 3 |
| Bldg 722 | Beta PH | 100 | 365 | 186 | 160 | 1187 | 303.5 |
| Bldg 722 | Gamma - FIDLER out | 120 | 11265 | 3307 | 5267 | 19762 | 11235 |
| Bldg 2078 | Alpha FM | 31 | 7 | 3.4 | 1 | 13 | 7 |
| Bldg 2078 | Beta FM | 31 | 951 | 182.2 | 628 | 1209 | 1065 |
| Bldg 2078 | Alpha HH | 32 | 1 | 1.3 | 0 | 5 | 1 |
| Bldg 2078 | Beta HH | 32 | 186 | 70.5 | 99 | 336 | 166.5 |
| Building 612/DFC [3] | Gamma FIDLER | 40 | 3211 | 1156 | 1650 | 5286 | 3724.5 |
| Igloos - 2002 | Alpha PH | 150 | 5 | 12 | 0 | 111 | 3 |
| Igloos - 2002 | Beta PH | 150 | 222 | 56 | 111 | 596 | 216 |
| Igloos - 2002 | Gamma - FIDLER out | 150 | 6445 | 1251 | 2417 | 7915 | 6973.5 |

Notes:

(1) Instruments are as follows:

Alpha/Beta FM = gas proportional floor monitor.

Alpha/Beta HH = gas proportional hand-held detector.

Alpha/Beta PH = phoswich scintillation detector.

Gamma FIDLER out = low-energy gamma scintillation detector with energy window open

Gamma FIDLER in = low-energy gamma scintillation detector with energy window set for range of 50 to 250 keV.

(2) cpm = counts per minute.

(3) DFC = daily function checks. Gamma background for the Building 612 surveys was determined by the daily function check background measurements.

# Table A2-5
# Updated/Corrected Information
# License Termination Report Addendum A
# Seneca Army Depot Activity

| Addendum Table | Report Table | Change | Basis |
|---|---|---|---|
| | | | |
| **Global** | | | |
| All | All | Gross activity depleted uranium DCGLs | Previous calculation used 0.0008% U-234 rather than 0.0006% U-234 (WHO, 2001) |
| All | All | Probe area corrected from "open" area to "physical" or "active" area | MARSSIM Section 6.6.1 |
| All | All | FIDLER efficiency corrected for DU igloo and building surveys | Original FIDLER check source activity was listed as 0.138 uCi; corrected to 0.273 uCi (Attachment 2) |
| **Specific** | | | |
| A2-1 | 2-1 | Added Pu-239 DCGLs to table | In LTP but not listed in Table 2-1 |
| A2-1 | 2-1 | Volumetric $DCGL_{EMC}$ for DU - correct area factor | Previous volumetric $DCGL_{EMC}$ used area factor for surface DCGLs |
| A2-2 | -- | New table | Demonstration of gross activity DCGL calculation |
| A2-3 | -- | New table | Summary of Scenario A data evaluation |
| A2-4 | 2-3 | Addition of background data from FIDLER daily function checks for Building 612 | Data appeared elsewhere in Report, but not with other background data |
| A3-1 | 3-1 | Change C0808 to C0908 | Incorrect igloo listed |
| A3-4 | 3-4 | Added minimum number of measurements calculation based on Pu-239 DCGL | Not previously included |
| A3-5 to A3-9 | 3-5 to 3-9 | Summary statistics only | Data reduction and WRS test results moved to Tables A3-10 and A3-11, respectively |
| A3-10 | -- | New table | Scenario A data evaluation |
| A3-11 | -- | New table | Scenario A data evaluation |
| A4-5 to A4-8 | 4-5 to 4-8 | Summary statistics only | Data reduction and WRS test results moved to Tables A4-9 and A4-10, respectively |
| A4-9 | -- | New table | Scenario A data evaluation |

**Table A2-5**
**Updated/Corrected Information**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Addendum Table | Report Table | Change | Basis |
|---|---|---|---|
| | | | |
| A4-10 | -- | New table | Scenario A data evaluation |
| A5-2 and A5-3 | 5-2 and 5-3 | Efficiencies for handheld gas proportional and floor monitor | Incorrect efficiencies used in calculations |
| A5-5 | 5-5 | Summary statistics only | Data reduction and WRS test results moved to Tables A4-9 and A4-10, respectively |
| A5-6 | -- | New table | Scenario A data evaluation |
| A5-7 | -- | New table | Scenario A data evaluation |

# Table A3-1
# List of Depleted Uranium Storage Igloos
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| Igloo Number [1, 2] | | | | |
|---|---|---|---|---|
| A0201 [3] | B0709 | C0510 | D0107 | E0112 |
| A0316 [3] | B0711 | C0511 | D0108 | E0211 |
| A0317 [3] | B0801 | C0513 | D0110 | E0301 |
| A0508 [3] | B0802 | C0603 | D0113 | E0302 |
| A0701 [4] | B0804 | C0604 | D0206 | E0303 |
| A0706 | B0809 | C0605 | D0207 | E0312 |
| A0707 | B0810 | C0606 | D0305 | E0402 |
| A0710 | B0811 | C0608 | D0306 | E0410 |
| A0711 | B0909 | C0701 | D0312 | E0411 |
| A0901 | C0203 | C0706 | D0401 | E0413 |
| A0905 | C0303 | C0707 | D0406 | E0504 |
| A1108 | C0307 | C0708 | D0407 | E0506 |
| A1109 | C0308 | C0801 | D0413 | E0508 |
| B0109 | C0401 | C0803 | D0601 | E0510 |
| B0411 | C0403 | C0807 | D0604 | E0512 |
| B0501 | C0405 | C0809 | D0607 | E0602 |
| B0602 | C0406 | C0901 | D0704 | E0604 |
| B0603 | C0407 | C0902 | D0705 | E0609 |
| B0609 | C0408 | C0906 | D0711 | E0610 |
| B0610 | C0501 | C0907 | D0712 | E0702 |
| B0701 | C0503 | C0908 | D0801 | E0706 |
| B0705 | C0504 | C0909 | D0805 | E0711 |
| B0707 | C0505 | D0104 | E0103 | E0801 |
| B0708 | C0508 | D0105 | E0105 | E0802 |

Notes:
(1) Unless otherwise noted, igloos were used for storage of packaged DU ammunition (SUC-1275).
(2) Compiled from *Seneca Army Depot Activity License Termination and License Release Plan* (ANL, 2003).
(3) Also potentially used for storage of special weapons (ROCs - H-3 and Pu-239)
(4) Also used for the storage of light anti-tank rockets containing Pm-147 (BML 12-00722-07).

**Table A3-2**
**Derived Concentration Guideline Levels**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Instrument | Applicable $DCGL_W$ | $DCGL_W$ ($dpm/100cm^2$) [1] | $DCGL_{EMC}$ ($dpm/100cm^2$) [2] | Probe Area ($cm^2$) | Efficiency [3] | $DCGL_W$ (cpm) [4] | $DCGL_{EMC}$ (cpm) [4] | Background Average (cpm) | Background Dataset | Background Corrected $DCGL_W$ (cpm) [5] | Background Corrected $DCGL_{EMC}$ (cpm) [5] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| Alpha Phoswich | Depleted Uranium | 31647 | 376599 | 83 | 15% | 3940 | 46887 | 5 | Igloo - 2002 | 3945 | **46892** |
| Beta Phoswich | Depleted Uranium | 31647 | 376599 | 83 | 11% | 2889 | 34384 | 222 | Igloo - 2002 | 3111 | **34606** |
| Gamma FIDLER | Depleted Uranium | 31647 | 376599 | 126.7 | 7.6% | 3047 | 36263 | 6445 | Igloo - 2002 | 9492 | **42708** |
| | | | | | | | | | | | |
| Alpha Phoswich | Pu-239 [6] | 4240 | 50456 | 83 | 15% | 528 | 6282 | 5 | Igloo - 2002 | 533 | **6287** |
| Beta Phoswich | Pu-239 | 4240 | 50456 | 83 | 11% | 387 | 4607 | 222 | Igloo - 2002 | 609 | **4829** |
| Gamma FIDLER | Pu-239 | 4240 | 50456 | 126.7 | 7.6% | 408 | 4859 | 6445 | Igloo - 2002 | 6853 | **11304** |

Notes:

(1) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Depleted uranium DCGL calculated using equation 4-4 of MARSSIM. Expected activity fractions for depleted uranium based on uranium depleted to 99.8 weight percent U-238, 0.2 weight percent U-235, and 0.0006 weight percent U-234 (WHO, 2001).

(2) $DCGL_{EMC}$ based on area factor of 11.9 for 4 $m^2$ grid (from ANL, 2003, for worst-case radionuclide of concern [U-235]).

(3) Average efficiency for instrument as determined by daily function checks during survey (**Appendix 3.A**).

(4) The instrument-specific $DCGL_W$ and $DCGL_{EMC}$ in counts per minute (cpm) are calculated using the instrument efficiency and active probe area.

(5) The Background Corrected $DCGL_W$ and $DCGL_{EMC}$ for each instrument is the sum of the DCGL and the Background Average for that instrument.

(6) Pu-239 is an ROC at Igloos A0201, A0316, A0317, and A0508. H-3 is also an ROC at those igloos, but the DCGL for Pu-239 is significantly more conservative than the DCGL for H-3 (**Table A2-1**).

**Table A3-3**
**Survey Instrumentation**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Instrument | Measurement Type | Probe | Meter | Probe Area ($cm^2$) (1) | Average Instrument Efficiency (2) | 1-Minute Direct Measurement MDA ($dpm/100cm^2$) (3) | Scanning MDA ($dpm/100cm^2$) (3) | $DCGL_W$ for DU ($dpm/100cm^2$) (4) |
|---|---|---|---|---|---|---|---|---|
| Phoswich | Alpha/Beta | Ludlum Model 43-1-1 | Ludlum Model 2224 | 83 | Alpha: 15% Beta: 11% | Alpha: 46 Beta: 417 | 4925 | 31647 |
| FIDLER | Low-Energy Gamma | Bicron G5 FIDLER | Bicron Analyst | 126.7 | 7.6% | 2140 | 23439 | 31647 |
| Exposure Rate | Ambient Gamma Exposure Rate | Bicron MicroRem or Ludlum Model 19 | | -- (5) | -- | -- | -- | NA (6) |
| GM Pancake | Alpha/Beta/Gamma | Ludlum Model 44-9 | Ludlum Model 3 | 15 | 20% (7) | -- | 2200-5000 | NA |
| Gamma Spectrometer | In-Situ Gamma | Alpha Spectra FIDLER | RSA URSA-I MCA | 126.7 | 7.6% | 2140 for gross 1-minute count; otherwise measurement-specific | -- | 31647 |
| E-Perm | Radon | RadElec SST E-Perm | | -- | -- | 0.2 to 0.5 pCi/L (8) | -- | NA |

Notes:

(1) $cm^2$ = square centimeters. Areas listed and used in the calculations are the active or physical probe area listed by the manufacturer, per MARSSIM Section 6.6.1 (NRC, 2000).

(2) Except where noted, the average instrument efficiency was determined from the daily function check data (refer to **Appendix 3.A**).

(3) dpm/100cm2 = decays per minute per 100 square centimeters. Except where noted, the minimum detectable amounts (MDAs) were calculated using the procedures outlined in MARSSIM Section 6.7 (NRC, 2000).

(4) Gross activity $DCGL_W$ was calculated using radionuclide-specific DCGLs derived by ANL, 2003 (**Appendix 1.A**).

(5) "--" = Indicates that parameter was not used or calculated for instrument.

(6) NA= not applicable. DCGLs were not applied to exposure rate, personnel/equipment frisking, or radon measurements.

(7) GM Pancake efficiency for uranium from MARSSIM Table 6.4 (NRC, 2000).

(8) pCi/L = picocuries per liter; MDA values from MARSSIM Table 6.10 (NRC, 2000).

**Table A3-4**
**Total Number of Required Measurements**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Dataset [1] | Gross Activity $DCGL_W$ ($dpm/100cm^2$) [2] | Background Corrected $DCGL_W$ (cpm) [3] | LBGR [4] | Δ [5] | Observed Survey σ (cpm) [6] | Observed Bkgd σ (cpm) | Δ/σ [7] | Pr [8] | Z(1-α) [9] | Z(1-β) [9] | Total N [10] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **A Block** | | | | | | | | | | | |
| Gamma FIDLER & Igloo Background | 31647 | 9492 | 4746 | 4746 | 1440 | 1251 | 3.3 | 0.98 | 1.645 | 1.645 | 15 |
| Alpha PH & Igloo Background | 31647 | 3945 | 1973 | 1973 | 7.5 | 12 | 164.4 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 31647 | 3111 | 1556 | 1556 | 56 | 56 | 27.8 | 1.00 | 1.645 | 1.645 | 14 |
| Gamma FIDLER & Igloo Background | 4240 | 6853 | 3427 | 3427 | 1440 | 1251 | 2.4 | 0.94 | 1.645 | 1.645 | 18 |
| Alpha PH & Igloo Background | 4240 | 533 | 267 | 267 | 7.5 | 12 | 22.2 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 4240 | 644 | 322 | 322 | 56 | 56 | 5.8 | 1.00 | 1.645 | 1.645 | 14 |
| **B Block** | | | | | | | | | | | |
| Gamma FIDLER & Igloo Background | 31647 | 9492 | 4746 | 4746 | 1217 | 1251 | 3.8 | 0.99 | 1.645 | 1.645 | 15 |
| Alpha PH & Igloo Background | 31647 | 3945 | 1973 | 1973 | 5.7 | 12 | 164.4 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 31647 | 3111 | 1556 | 1556 | 43 | 56 | 27.8 | 1.00 | 1.645 | 1.645 | 14 |
| **C Block** | | | | | | | | | | | |
| Gamma FIDLER & Igloo Background | 31647 | 9492 | 4746 | 4746 | 899 | 1251 | 3.8 | 0.99 | 1.645 | 1.645 | 15 |
| Alpha PH & Igloo Background | 31647 | 3945 | 1973 | 1973 | 9.9 | 12 | 164.4 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 31647 | 3111 | 1556 | 1556 | 48 | 56 | 27.8 | 1.00 | 1.645 | 1.645 | 14 |

**Table A3-4**
**Total Number of Required Measurements**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Dataset [1] | Gross Activity $DCGL_W$ ($dpm/100cm^2$) [2] | Background Corrected $DCGL_W$ (cpm) [3] | LBGR [4] | $\Delta$ [5] | Observed Survey $\sigma$ (cpm) [6] | Observed Bkgd $\sigma$ (cpm) | $\Delta/\sigma$ [7] | Pr [8] | $Z(1-\alpha)$ [9] | $Z(1-\beta)$ [9] | Total N [10] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **D Block** | | | | | | | | | | | |
| Gamma FIDLER & Igloo Background | 31647 | 9492 | 4746 | 4746 | 1408 | 1251 | 3.4 | 0.98 | 1.645 | 1.645 | 15 |
| Alpha PH & Igloo Background | 31647 | 3945 | 1973 | 1973 | 5.7 | 12 | 164.4 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 31647 | 3111 | 1556 | 1556 | 45 | 56 | 27.8 | 1.00 | 1.645 | 1.645 | 14 |
| **E Block** | | | | | | | | | | | |
| Gamma FIDLER & Igloo Background | 31647 | 9492 | 4746 | 4746 | 1377 | 1251 | 3.4 | 0.98 | 1.645 | 1.645 | 15 |
| Alpha PH & Igloo Background | 31647 | 3945 | 1973 | 1973 | 12 | 12 | 164.4 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Igloo Background | 31647 | 3111 | 1556 | 1556 | 54 | 56 | 27.8 | 1.00 | 1.645 | 1.645 | 14 |

Notes:

(1) Calculation is combined for each "block" of igloos. Instruments: PH = alpha/beta phoswich detector; FIDLER = low-energy gamma scintillator.

(2) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Gross activity $DCGL_W$ for DU calculated per MARSSIM.

(3) cpm = counts per minute. Instrument-specific $DCGL_W$ calculated per MARSSIM. Includes average background count rate.

(4) LBGR = lower bound of gray region. Per MARSSIM, LBGR was set to 1/2 of the $DCGL_W$.

(5) $\Delta = DCGL_W - LBGR$.

(6) The standard deviation ($\sigma$) for the survey data includes all measurements collected with that instrument.

(7) $\Delta/\sigma$ calculated using the larger value between the survey standard deviation and the background standard deviation.

(8) Values of Pr are from Table 5.1 of MARSSIM using $\Delta/\sigma$. Pr is defined by MARSSIM as the probability that a random measurement from the survey unit exceeds a random measurement from the background reference area by less than the $DCGL_W$ when the survey unit median is equal to the LBGR above background.

**Table A3-4**
**Total Number of Required Measurements**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Dataset [1] | Gross Activity $DCGL_W$ ($dpm/100cm^2$) [2] | Background Corrected $DCGL_W$ (cpm) [3] | LBGR [4] | $\Delta$ [5] | Observed Survey $\sigma$ (cpm) [6] | Observed Bkgd $\sigma$ (cpm) | $\Delta/\sigma$ [7] | Pr [8] | $Z(1-\alpha)$ [9] | $Z(1-\beta)$ [9] | Total N [10] |
|---|---|---|---|---|---|---|---|---|---|---|---|

(9) Values of $Z(1-\alpha)$ and $Z(1-\beta)$ (decision error percentiles) are from Table 5.2 of MARSSIM for $\alpha=\beta=0.05$.

(10) N = total required number of measurements or samples (includes both survey and background areas).

# Table A3-5
## Summary Statistics
## A-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| A0201 | Alpha PH | 30 | 3 | 2 | 2 | 0 | 7 |
| A0201 | Beta PH | 30 | 214 | 218 | 38 | 108 | 277 |
| A0201 | Gamma FIDLER | 30 | 4554 | 4765 | 714 | 1894 | 5094 |
| A0316 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 6 |
| A0316 | Beta PH | 30 | 224 | 227 | 35 | 138 | 276 |
| A0316 | Gamma FIDLER | 30 | 4568 | 4806 | 807 | 1630 | 4985 |
| A0317 | Alpha PH | 30 | 3 | 2 | 2 | 0 | 6 |
| A0317 | Beta PH | 30 | 208 | 212 | 39 | 117 | 276 |
| A0317 | Gamma FIDLER | 30 | 6943 | 7278 | 1216 | 2696 | 7650 |
| A0508 | Alpha PH | 30 | 4 | 4 | 2 | 0 | 8 |
| A0508 | Beta PH | 30 | 232 | 230 | 51 | 116 | 361 |
| A0508 | Gamma FIDLER | 30 | 7157 | 7475 | 1150 | 3111 | 8056 |
| A0701 | Alpha PH | 30 | 2 | 2 | 1 | 0 | 4 |
| A0701 | Beta PH | 30 | 206 | 202 | 54 | 124 | 381 |
| A0701 | Gamma FIDLER | 30 | 4289 | 4429 | 478 | 2196 | 4785 |
| A0706 | Alpha PH | 30 | 5 | 4 | 3 | 1 | 18 |
| A0706 | Beta PH | 30 | 239 | 225 | 79 | 148 | 608 |
| A0706 | Gamma FIDLER | 30 | 7039 | 7233 | 828 | 3540 | 8007 |
| A0707 | Alpha PH | 30 | 3 | 2 | 3 | 0 | 17 |
| A0707 | Beta PH | 30 | 225 | 204 | 61 | 143 | 415 |
| A0707 | Gamma FIDLER | 30 | 7119 | 7261 | 535 | 5045 | 7559 |
| A0710 | Alpha PH | 30 | 3 | 2 | 5 | 0 | 29 |
| A0710 | Beta PH | 30 | 239 | 241 | 54 | 121 | 413 |
| A0710 | Gamma FIDLER | 30 | 4456 | 4546 | 424 | 2583 | 4920 |
| A0711 | Alpha PH | 30 | 7 | 4 | 11 | 1 | 64 |
| A0711 | Beta PH | 30 | 233 | 222 | 46 | 161 | 389 |
| A0711 | Gamma FIDLER | 30 | 6911 | 7040 | 689 | 3762 | 7861 |
| A0901 | Alpha PH | 30 | 2 | 1 | 5 | 0 | 30 |
| A0901 | Beta PH | 30 | 238 | 235 | 47 | 145 | 407 |
| A0901 | Gamma FIDLER | 30 | 4466 | 4582 | 582 | 2115 | 4908 |
| A0905 | Alpha PH | 30 | 3 | 1 | 9 | 0 | 49 |
| A0905 | Beta PH | 30 | 243 | 246 | 58 | 136 | 350 |
| A0905 | Gamma FIDLER | 30 | 4573 | 4684 | 505 | 2289 | 5060 |

## Table A3-5
## Summary Statistics
## A-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| A1108 | Alpha PH | 30 | 2 | 1 | 5 | 0 | 29 |
| A1108 | Beta PH | 30 | 198 | 194 | 40 | 140 | 334 |
| A1108 | Gamma FIDLER | 30 | 6587 | 6783 | 787 | 3234 | 7364 |
| A1109 | Alpha PH | 30 | 2 | 2 | 3 | 0 | 13 |
| A1109 | Beta PH | 30 | 233 | 228 | 65 | 144 | 513 |
| A1109 | Gamma FIDLER | 30 | 4472 | 4531 | 490 | 2287 | 4957 |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument.
Instruments: PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute.

# Table A3-6
## Summary Statistics
## B-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| B0109 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 6 |
| B0109 | Beta PH | 30 | 202 | 199 | 32 | 117 | 273 |
| B0109 | Gamma FIDLER | 30 | 6812 | 6937 | 779 | 3084 | 7399 |
| B0411 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 4 |
| B0411 | Beta PH | 30 | 215 | 210 | 40 | 130 | 277 |
| B0411 | Gamma FIDLER | 30 | 4332 | 4370 | 489 | 2381 | 4955 |
| B0501 | Alpha PH | 30 | 1 | 0 | 2 | 0 | 8 |
| B0501 | Beta PH | 30 | 181 | 177 | 31 | 97 | 252 |
| B0501 | Gamma FIDLER | 30 | 6477 | 6752 | 1109 | 2046 | 7274 |
| B0602 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 11 |
| B0602 | Beta PH | 30 | 191 | 189 | 32 | 131 | 256 |
| B0602 | Gamma FIDLER | 30 | 6803 | 6992 | 718 | 3624 | 7521 |
| B0603 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 10 |
| B0603 | Beta PH | 30 | 197 | 191 | 35 | 124 | 270 |
| B0603 | Gamma FIDLER | 30 | 6904 | 7079 | 738 | 3638 | 7532 |
| B0609 | Alpha PH | 30 | 3 | 2 | 3 | 0 | 19 |
| B0609 | Beta PH | 30 | 219 | 218 | 47 | 100 | 294 |
| B0609 | Gamma FIDLER | 30 | 6730 | 6834 | 738 | 3446 | 7636 |
| B0610 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 19 |
| B0610 | Beta PH | 30 | 203 | 195 | 44 | 132 | 278 |
| B0610 | Gamma FIDLER | 30 | 6851 | 6962 | 778 | 3477 | 7841 |
| B0701 | Alpha PH | 30 | 4 | 3 | 7 | 0 | 42 |
| B0701 | Beta PH | 30 | 205 | 212 | 41 | 113 | 267 |
| B0701 | Gamma FIDLER | 30 | 6923 | 7126 | 780 | 3628 | 7609 |
| B0705 | Alpha PH | 30 | 3 | 2 | 7 | 0 | 39 |
| B0705 | Beta PH | 30 | 204 | 203 | 45 | 108 | 291 |
| B0705 | Gamma FIDLER | 30 | 6755 | 6924 | 744 | 3373 | 7372 |
| B0707 | Alpha PH | 30 | 4 | 3 | 3 | 1 | 18 |
| B0707 | Beta PH | 30 | 207 | 207 | 39 | 126 | 287 |
| B0707 | Gamma FIDLER | 30 | 6595 | 6926 | 911 | 3476 | 7772 |
| B0708 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 16 |
| B0708 | Beta PH | 30 | 192 | 191 | 37 | 127 | 293 |
| B0708 | Gamma FIDLER | 30 | 6814 | 6976 | 747 | 3552 | 7347 |
| B0709 | Alpha PH | 30 | 1 | 1 | 2 | 0 | 9 |
| B0709 | Beta PH | 30 | 197 | 190 | 47 | 99 | 300 |
| B0709 | Gamma FIDLER | 30 | 6707 | 6975 | 958 | 3386 | 7513 |
| B0711 | Alpha PH | 30 | 1 | 0 | 3 | 0 | 13 |
| B0711 | Beta PH | 30 | 208 | 202 | 42 | 143 | 346 |
| B0711 | Gamma FIDLER | 30 | 6647 | 6824 | 773 | 3269 | 7346 |

**Table A3-6**
**Summary Statistics**
**B-Block Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| B0801 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 21 |
| B0801 | Beta PH | 30 | 196 | 198 | 31 | 120 | 247 |
| B0801 | Gamma FIDLER | 30 | 4555 | 4659 | 487 | 2512 | 5008 |
| B0802 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 20 |
| B0802 | Beta PH | 30 | 196 | 202 | 33 | 116 | 240 |
| B0802 | Gamma FIDLER | 30 | 4349 | 4454 | 486 | 2366 | 4910 |
| B0804 | Alpha PH | 30 | 1 | 1 | 2 | 0 | 13 |
| B0804 | Beta PH | 30 | 192 | 183 | 43 | 115 | 276 |
| B0804 | Gamma FIDLER | 30 | 4332 | 4431 | 438 | 2304 | 4675 |
| B0809 | Alpha PH | 30 | 6 | 5 | 10 | 0 | 57 |
| B0809 | Beta PH | 30 | 228 | 208 | 71 | 132 | 486 |
| B0809 | Gamma FIDLER | 30 | 6673 | 6855 | 665 | 3957 | 7168 |
| B0810 | Alpha PH | 30 | 5 | 4 | 5 | 0 | 31 |
| B0810 | Beta PH | 30 | 217 | 214 | 43 | 143 | 354 |
| B0810 | Gamma FIDLER | 30 | 6621 | 6800 | 758 | 3157 | 7241 |
| B0811 | Alpha PH | 30 | 2 | 1 | 6 | 0 | 36 |
| B0811 | Beta PH | 30 | 208 | 201 | 43 | 131 | 295 |
| B0811 | Gamma FIDLER | 30 | 6973 | 7136 | 802 | 3730 | 7736 |
| B0909 | Alpha PH | 30 | 3 | 1 | 8 | 0 | 42 |
| B0909 | Beta PH | 30 | 204 | 208 | 43 | 109 | 331 |
| B0909 | Gamma FIDLER | 30 | 7302 | 7416 | 835 | 3834 | 8358 |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument.
Instruments: PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute.

# Table A3-7
## Summary Statistics
## C-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| C0203 | Alpha PH | 30 | 5 | 4 | 4 | 1 | 21 |
| C0203 | Beta PH | 30 | 199 | 195 | 34 | 108 | 288 |
| C0203 | Gamma FIDLER | 30 | 6736 | 6731 | 730 | 3531 | 7599 |
| C0303 | Alpha PH | 30 | 5 | 1 | 18 | 0 | 101 |
| C0303 | Beta PH | 30 | 208 | 210 | 64 | 110 | 500 |
| C0303 | Gamma FIDLER | 30 | 6424 | 6525 | 714 | 3271 | 7233 |
| C0307 | Alpha PH | 30 | 5 | 2 | 16 | 0 | 91 |
| C0307 | Beta PH | 30 | 214 | 204 | 59 | 127 | 478 |
| C0307 | Gamma FIDLER | 30 | 6651 | 6755 | 780 | 3328 | 7461 |
| C0308 | Alpha PH | 30 | 6 | 3 | 18 | 0 | 101 |
| C0308 | Beta PH | 30 | 198 | 182 | 60 | 159 | 489 |
| C0308 | Gamma FIDLER | 30 | 6703 | 6771 | 628 | 3980 | 7317 |
| C0401 | Alpha PH | 30 | 5 | 2 | 13 | 0 | 71 |
| C0401 | Beta PH | 30 | 208 | 205 | 53 | 111 | 430 |
| C0401 | Gamma FIDLER | 30 | 6634 | 6722 | 711 | 3358 | 7290 |
| C0403 | Alpha PH | 30 | 4 | 2 | 10 | 0 | 57 |
| C0403 | Beta PH | 30 | 194 | 189 | 39 | 114 | 340 |
| C0403 | Gamma FIDLER | 30 | 6795 | 6911 | 646 | 3943 | 7380 |
| C0405 | Alpha PH | 30 | 3 | 2 | 5 | 0 | 30 |
| C0405 | Beta PH | 30 | 189 | 189 | 31 | 107 | 258 |
| C0405 | Gamma FIDLER | 30 | 6559 | 6708 | 741 | 3399 | 7262 |
| C0406 | Alpha PH | 30 | 4 | 2 | 12 | 0 | 68 |
| C0406 | Beta PH | 30 | 202 | 202 | 48 | 119 | 397 |
| C0406 | Gamma FIDLER | 30 | 6537 | 6714 | 704 | 3369 | 7012 |
| C0407 | Alpha PH | 30 | 3 | 1 | 11 | 0 | 63 |
| C0407 | Beta PH | 30 | 200 | 196 | 51 | 125 | 426 |
| C0407 | Gamma FIDLER | 30 | 6496 | 6595 | 658 | 3477 | 7174 |
| C0408 | Alpha PH | 30 | 1 | 1 | 2 | 0 | 11 |
| C0408 | Beta PH | 30 | 183 | 175 | 35 | 142 | 332 |
| C0408 | Gamma FIDLER | 30 | 6604 | 6754 | 673 | 3696 | 7324 |
| C0501 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 6 |
| C0501 | Beta PH | 30 | 186 | 191 | 34 | 115 | 264 |
| C0501 | Gamma FIDLER | 30 | 6611 | 6748 | 712 | 3352 | 7199 |
| C0503 | Alpha PH | 30 | 4 | 2 | 9 | 0 | 51 |
| C0503 | Beta PH | 30 | 191 | 190 | 32 | 149 | 318 |
| C0503 | Gamma FIDLER | 30 | 6815 | 6940 | 626 | 4031 | 7475 |
| C0504 | Alpha PH | 30 | 3 | 1 | 6 | 0 | 33 |
| C0504 | Beta PH | 30 | 193 | 194 | 35 | 122 | 321 |
| C0504 | Gamma FIDLER | 30 | 6716 | 6884 | 716 | 3552 | 7675 |

**Table A3-7**
**Summary Statistics**
**C-Block Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| C0505 | Alpha PH | 30 | 5 | 3 | 12 | 0 | 70 |
| C0505 | Beta PH | 30 | 205 | 206 | 54 | 137 | 451 |
| C0505 | Gamma FIDLER | 30 | 6852 | 6943 | 691 | 3631 | 7622 |
| C0508 | Alpha PH | 30 | 4 | 2 | 8 | 0 | 44 |
| C0508 | Beta PH | 30 | 196 | 194 | 43 | 135 | 372 |
| C0508 | Gamma FIDLER | 30 | 6782 | 6938 | 669 | 3845 | 7785 |
| C0510 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 21 |
| C0510 | Beta PH | 30 | 190 | 176 | 77 | 127 | 569 |
| C0510 | Gamma FIDLER | 30 | 6684 | 6931 | 769 | 3552 | 7165 |
| C0511 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 11 |
| C0511 | Beta PH | 30 | 188 | 188 | 30 | 135 | 248 |
| C0511 | Gamma FIDLER | 30 | 6217 | 6387 | 759 | 3367 | 7151 |
| C0513 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 6 |
| C0513 | Beta PH | 30 | 187 | 188 | 37 | 132 | 274 |
| C0513 | Gamma FIDLER | 30 | 6787 | 6942 | 726 | 3565 | 7660 |
| C0603 | Alpha PH | 30 | 7 | 2 | 25 | 0 | 139 |
| C0603 | Beta PH | 30 | 208 | 193 | 102 | 121 | 699 |
| C0603 | Gamma FIDLER | 30 | 6499 | 6663 | 620 | 3705 | 7065 |
| C0604 | Alpha PH | 30 | 3 | 1 | 8 | 0 | 46 |
| C0604 | Beta PH | 30 | 188 | 178 | 43 | 126 | 363 |
| C0604 | Gamma FIDLER | 30 | 6369 | 6524 | 712 | 3089 | 7638 |
| C0605 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 24 |
| C0605 | Beta PH | 30 | 204 | 196 | 39 | 138 | 308 |
| C0605 | Gamma FIDLER | 30 | 6333 | 6467 | 671 | 3207 | 6868 |
| C0606 | Alpha PH | 30 | 1 | 0 | 2 | 0 | 10 |
| C0606 | Beta PH | 30 | 194 | 192 | 32 | 118 | 304 |
| C0606 | Gamma FIDLER | 30 | 6416 | 6505 | 458 | 4517 | 6986 |
| C0608 | Alpha PH | 30 | 2 | 2 | 4 | 0 | 20 |
| C0608 | Beta PH | 30 | 182 | 182 | 29 | 113 | 268 |
| C0608 | Gamma FIDLER | 30 | 5246 | 5518 | 966 | 2884 | 6489 |
| C0701 | Alpha PH | 30 | 4 | 2 | 11 | 0 | 59 |
| C0701 | Beta PH | 30 | 203 | 191 | 62 | 124 | 474 |
| C0701 | Gamma FIDLER | 30 | 6774 | 6924 | 638 | 3971 | 7462 |
| C0706 | Alpha PH | 30 | 6 | 3 | 18 | 0 | 99 |
| C0706 | Beta PH | 30 | 202 | 195 | 65 | 140 | 512 |
| C0706 | Gamma FIDLER | 30 | 6611 | 6779 | 701 | 3562 | 7122 |
| C0707 | Alpha PH | 30 | 3 | 3 | 5 | 0 | 29 |
| C0707 | Beta PH | 30 | 204 | 205 | 33 | 129 | 287 |
| C0707 | Gamma FIDLER | 30 | 6780 | 6933 | 748 | 3446 | 7484 |

# Table A3-7
## Summary Statistics
## C-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| C0708 | Alpha PH | 30 | 3 | 2 | 6 | 0 | 31 |
| C0708 | Beta PH | 30 | 192 | 187 | 34 | 125 | 300 |
| C0708 | Gamma FIDLER | 30 | 6759 | 6929 | 766 | 3410 | 7411 |
| C0801 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 3 |
| C0801 | Beta PH | 30 | 188 | 188 | 33 | 127 | 297 |
| C0801 | Gamma FIDLER | 30 | 7039 | 7231 | 775 | 3551 | 7594 |
| C0803 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 3 |
| C0803 | Beta PH | 30 | 197 | 198 | 37 | 131 | 282 |
| C0803 | Gamma FIDLER | 30 | 7127 | 7265 | 746 | 3860 | 7737 |
| C0807 | Alpha PH | 30 | 1 | 1 | 2 | 0 | 13 |
| C0807 | Beta PH | 30 | 189 | 183 | 35 | 116 | 287 |
| C0807 | Gamma FIDLER | 30 | 6863 | 7033 | 731 | 3668 | 7582 |
| C0809 | Alpha PH | 30 | 3 | 1 | 7 | 0 | 37 |
| C0809 | Beta PH | 30 | 200 | 194 | 55 | 118 | 358 |
| C0809 | Gamma FIDLER | 30 | 6826 | 7002 | 750 | 3520 | 7364 |
| C0901 | Alpha PH | 30 | 2 | 1 | 8 | 0 | 43 |
| C0901 | Beta PH | 30 | 194 | 189 | 54 | 110 | 381 |
| C0901 | Gamma FIDLER | 30 | 7273 | 7400 | 787 | 3818 | 7904 |
| C0902 | Alpha PH | 30 | 4 | 3 | 7 | 0 | 42 |
| C0902 | Beta PH | 30 | 212 | 210 | 47 | 140 | 376 |
| C0902 | Gamma FIDLER | 30 | 7080 | 7387 | 1053 | 3437 | 7864 |
| C0906 | Alpha PH | 30 | 5 | 2 | 20 | 0 | 113 |
| C0906 | Beta PH | 30 | 222 | 207 | 70 | 100 | 470 |
| C0906 | Gamma FIDLER | 30 | 7212 | 7434 | 840 | 3637 | 7757 |
| C0907 | Alpha PH | 30 | 2 | 2 | 1 | 0 | 5 |
| C0907 | Beta PH | 30 | 191 | 190 | 31 | 114 | 254 |
| C0907 | Gamma FIDLER | 30 | 6908 | 7089 | 789 | 3481 | 7523 |
| C0908 | Alpha PH | 30 | 3 | 2 | 7 | 0 | 40 |
| C0908 | Beta PH | 30 | 201 | 207 | 37 | 129 | 316 |
| C0908 | Gamma FIDLER | 30 | 7117 | 7276 | 782 | 3428 | 7732 |
| C0909 | Alpha PH | 30 | 3 | 2 | 7 | 0 | 42 |
| C0909 | Beta PH | 30 | 206 | 199 | 48 | 132 | 369 |
| C0909 | Gamma FIDLER | 30 | 4894 | 4994 | 554 | 2535 | 5402 |

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument.
Instruments: PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute.

# Table A3-8
## Summary Statistics
## D-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| D0104 | Alpha PH | 30 | 5 | 2 | 13 | 0 | 72 |
| D0104 | Beta PH | 30 | 233 | 227 | 60 | 154 | 448 |
| D0104 | Gamma FIDLER | 30 | 4624 | 4698 | 506 | 2319 | 5432 |
| D0105 | Alpha PH | 30 | 3 | 2 | 5 | 0 | 25 |
| D0105 | Beta PH | 30 | 220 | 213 | 42 | 137 | 315 |
| D0105 | Gamma FIDLER | 30 | 4519 | 4617 | 463 | 2339 | 4885 |
| D0107 | Alpha PH | 30 | 3 | 1 | 8 | 0 | 47 |
| D0107 | Beta PH | 30 | 251 | 249 | 47 | 186 | 415 |
| D0107 | Gamma FIDLER | 30 | 4736 | 4769 | 701 | 2474 | 7483 |
| D0108 | Alpha PH | 30 | 4 | 1 | 15 | 0 | 81 |
| D0108 | Beta PH | 30 | 200 | 198 | 47 | 127 | 381 |
| D0108 | Gamma FIDLER | 30 | 7038 | 7233 | 803 | 3537 | 7624 |
| D0110 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 16 |
| D0110 | Beta PH | 30 | 206 | 206 | 44 | 134 | 355 |
| D0110 | Gamma FIDLER | 30 | 4393 | 4504 | 491 | 2225 | 4856 |
| D0113 | Alpha PH | 30 | 5 | 4 | 5 | 0 | 31 |
| D0113 | Beta PH | 30 | 208 | 205 | 41 | 138 | 302 |
| D0113 | Gamma FIDLER | 30 | 6586 | 6766 | 694 | 3152 | 7031 |
| D0206 | Alpha PH | 30 | 3 | 2 | 6 | 0 | 35 |
| D0206 | Beta PH | 30 | 207 | 195 | 47 | 135 | 318 |
| D0206 | Gamma FIDLER | 30 | 4708 | 4804 | 437 | 2559 | 5043 |
| D0207 | Alpha PH | 30 | 2 | 2 | 4 | 0 | 20 |
| D0207 | Beta PH | 30 | 224 | 217 | 46 | 120 | 361 |
| D0207 | Gamma FIDLER | 30 | 4496 | 4612 | 523 | 2176 | 5038 |
| D0305 | Alpha PH | 30 | 3 | 2 | 2 | 0 | 12 |
| D0305 | Beta PH | 30 | 223 | 225 | 35 | 131 | 309 |
| D0305 | Gamma FIDLER | 30 | 6945 | 7150 | 768 | 3544 | 7537 |
| D0306 | Alpha PH | 30 | 3 | 1 | 6 | 0 | 33 |
| D0306 | Beta PH | 30 | 198 | 195 | 39 | 122 | 315 |
| D0306 | Gamma FIDLER | 30 | 7052 | 7279 | 767 | 3633 | 7655 |
| D0312 | Alpha PH | 30 | 2 | 2 | 3 | 0 | 13 |
| D0312 | Beta PH | 30 | 198 | 203 | 30 | 120 | 266 |
| D0312 | Gamma FIDLER | 30 | 7123 | 7388 | 819 | 3550 | 7757 |
| D0401 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 14 |
| D0401 | Beta PH | 30 | 217 | 217 | 42 | 147 | 338 |

# Table A3-8
## Summary Statistics
## D-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| D0401 | Gamma FIDLER | 30 | 4579 | 4687 | 492 | 2341 | 4949 |
| D0406 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 24 |
| D0406 | Beta PH | 30 | 199 | 193 | 47 | 131 | 332 |
| D0406 | Gamma FIDLER | 30 | 7269 | 7534 | 880 | 3542 | 7968 |
| D0407 | Alpha PH | 30 | 2 | 1 | 5 | 0 | 28 |
| D0407 | Beta PH | 30 | 196 | 192 | 37 | 114 | 286 |
| D0407 | Gamma FIDLER | 30 | 7197 | 7479 | 835 | 3611 | 7810 |
| D0413 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 13 |
| D0413 | Beta PH | 30 | 211 | 221 | 35 | 136 | 274 |
| D0413 | Gamma FIDLER | 30 | 7156 | 7351 | 838 | 3448 | 7883 |
| D0601 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 7 |
| D0601 | Beta PH | 30 | 222 | 223 | 47 | 129 | 301 |
| D0601 | Gamma FIDLER | 30 | 7054 | 7192 | 791 | 3606 | 7729 |
| D0604 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 5 |
| D0604 | Beta PH | 30 | 238 | 239 | 51 | 128 | 360 |
| D0604 | Gamma FIDLER | 30 | 7148 | 7360 | 782 | 3762 | 7981 |
| D0607 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 13 |
| D0607 | Beta PH | 30 | 206 | 197 | 43 | 103 | 328 |
| D0607 | Gamma FIDLER | 30 | 4590 | 4688 | 510 | 2349 | 5026 |
| D0704 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 5 |
| D0704 | Beta PH | 30 | 199 | 197 | 34 | 143 | 312 |
| D0704 | Gamma FIDLER | 30 | 7049 | 7245 | 746 | 3687 | 7523 |
| D0705 | Alpha PH | 30 | 2 | 2 | 1 | 0 | 4 |
| D0705 | Beta PH | 30 | 230 | 227 | 36 | 134 | 306 |
| D0705 | Gamma FIDLER | 30 | 7121 | 7372 | 837 | 3461 | 7676 |
| D0711 | Alpha PH | 30 | 2 | 1 | 6 | 0 | 33 |
| D0711 | Beta PH | 30 | 205 | 200 | 36 | 134 | 306 |
| D0711 | Gamma FIDLER | 30 | 4591 | 4702 | 498 | 2286 | 4934 |
| D0712 | Alpha PH | 30 | 2 | 2 | 1 | 0 | 5 |
| D0712 | Beta PH | 30 | 195 | 197 | 29 | 121 | 248 |
| D0712 | Gamma FIDLER | 30 | 4745 | 4860 | 500 | 2464 | 5106 |
| D0801 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 20 |
| D0801 | Beta PH | 30 | 198 | 196 | 31 | 127 | 264 |
| D0801 | Gamma FIDLER | 30 | 4523 | 4618 | 496 | 2298 | 5040 |

## Table A3-8
## Summary Statistics
## D-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| D0805 | Alpha PH | 30 | 3 | 1 | 9 | 0 | 50 |
| D0805 | Beta PH | 30 | 228 | 219 | 54 | 143 | 370 |
| D0805 | Gamma FIDLER | 30 | 6953 | 7080 | 706 | 3837 | 7703 |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument.
Instruments: PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute.

# Table A3-9
## Summary Statistics
## E-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| E0103 | Alpha PH | 30 | 3 | 1 | 10 | 0 | 57 |
| E0103 | Beta PH | 30 | 215 | 214 | 44 | 125 | 377 |
| E0103 | Gamma FIDLER | 30 | 7340 | 7559 | 897 | 3344 | 7969 |
| E0105 | Alpha PH | 30 | 4 | 2 | 13 | 0 | 74 |
| E0105 | Beta PH | 30 | 235 | 218 | 76 | 157 | 514 |
| E0105 | Gamma FIDLER | 30 | 7131 | 7409 | 1040 | 3273 | 7829 |
| E0112 | Alpha PH | 30 | 3 | 3 | 3 | 1 | 17 |
| E0112 | Beta PH | 30 | 208 | 211 | 35 | 126 | 275 |
| E0112 | Gamma FIDLER | 30 | 7050 | 7313 | 877 | 3245 | 7603 |
| E0211 | Alpha PH | 30 | 4 | 2 | 10 | 0 | 56 |
| E0211 | Beta PH | 30 | 200 | 195 | 42 | 131 | 362 |
| E0211 | Gamma FIDLER | 30 | 6965 | 7143 | 777 | 3334 | 7535 |
| E0301 | Alpha PH | 30 | 3 | 2 | 6 | 0 | 31 |
| E0301 | Beta PH | 30 | 196 | 193 | 35 | 113 | 295 |
| E0301 | Gamma FIDLER | 30 | 4406 | 4512 | 503 | 2204 | 4840 |
| E0302 | Alpha PH | 30 | 3 | 2 | 4 | 0 | 23 |
| E0302 | Beta PH | 30 | 213 | 217 | 37 | 125 | 324 |
| E0302 | Gamma FIDLER | 30 | 6651 | 6834 | 846 | 3175 | 7619 |
| E0303 | Alpha PH | 30 | 6 | 4 | 13 | 0 | 75 |
| E0303 | Beta PH | 30 | 217 | 212 | 51 | 135 | 423 |
| E0303 | Gamma FIDLER | 30 | 7027 | 7175 | 843 | 3251 | 7830 |
| E0312 | Alpha PH | 30 | 2 | 2 | 4 | 0 | 23 |
| E0312 | Beta PH | 30 | 193 | 190 | 30 | 133 | 299 |
| E0312 | Gamma FIDLER | 30 | 6634 | 6828 | 791 | 3147 | 7237 |
| E0402 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 12 |
| E0402 | Beta PH | 30 | 199 | 199 | 34 | 95 | 283 |
| E0402 | Gamma FIDLER | 30 | 6696 | 6833 | 774 | 3125 | 7498 |
| E0410 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 13 |
| E0410 | Beta PH | 30 | 204 | 201 | 39 | 114 | 275 |
| E0410 | Gamma FIDLER | 30 | 6832 | 7197 | 1101 | 2850 | 7641 |
| E0411 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 18 |
| E0411 | Beta PH | 30 | 201 | 197 | 42 | 122 | 293 |
| E0411 | Gamma FIDLER | 30 | 4520 | 4659 | 513 | 2185 | 4910 |
| E0413 | Alpha PH | 30 | 2 | 2 | 1 | 0 | 5 |
| E0413 | Beta PH | 30 | 223 | 211 | 43 | 165 | 300 |
| E0413 | Gamma FIDLER | 30 | 6862 | 7139 | 887 | 3194 | 7467 |
| E0504 | Alpha PH | 30 | 2 | 1 | 5 | 0 | 26 |
| E0504 | Beta PH | 30 | 229 | 219 | 34 | 185 | 306 |
| E0504 | Gamma FIDLER | 30 | 7001 | 7221 | 859 | 3416 | 7860 |
| E0506 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 6 |

# Table A3-9
## Summary Statistics
## E-Block Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| E0506 | Beta PH | 30 | 224 | 224 | 52 | 132 | 361 |
| E0506 | Gamma FIDLER | 30 | 6948 | 7073 | 732 | 3667 | 7806 |
| E0508 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 5 |
| E0508 | Beta PH | 30 | 226 | 226 | 36 | 131 | 292 |
| E0508 | Gamma FIDLER | 30 | 7233 | 7487 | 867 | 3557 | 7888 |
| E0510 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 16 |
| E0510 | Beta PH | 30 | 225 | 213 | 60 | 148 | 467 |
| E0510 | Gamma FIDLER | 30 | 7036 | 7257 | 806 | 3566 | 7551 |
| E0512 | Alpha PH | 30 | 2 | 1 | 4 | 0 | 21 |
| E0512 | Beta PH | 30 | 190 | 197 | 40 | 94 | 277 |
| E0512 | Gamma FIDLER | 30 | 4482 | 4684 | 696 | 1818 | 4969 |
| E0602 | Alpha PH | 30 | 13 | 7 | 37 | 1 | 206 |
| E0602 | Beta PH | 30 | 245 | 231 | 127 | 172 | 902 |
| E0602 | Gamma FIDLER | 30 | 4523 | 4633 | 515 | 2399 | 5673 |
| E0604 | Alpha PH | 30 | 7 | 5 | 13 | 0 | 73 |
| E0604 | Beta PH | 30 | 220 | 216 | 52 | 126 | 438 |
| E0604 | Gamma FIDLER | 30 | 4624 | 4669 | 619 | 2486 | 6729 |
| E0609 | Alpha PH | 30 | 9 | 3 | 34 | 0 | 188 |
| E0609 | Beta PH | 30 | 232 | 207 | 117 | 134 | 820 |
| E0609 | Gamma FIDLER | 30 | 4642 | 4718 | 481 | 2447 | 5153 |
| E0610 | Alpha PH | 30 | 3 | 3 | 2 | 0 | 11 |
| E0610 | Beta PH | 30 | 212 | 205 | 43 | 121 | 312 |
| E0610 | Gamma FIDLER | 30 | 4713 | 4887 | 558 | 2436 | 5132 |
| E0702 | Alpha PH | 30 | 3 | 1 | 10 | 0 | 53 |
| E0702 | Beta PH | 30 | 219 | 220 | 45 | 114 | 340 |
| E0702 | Gamma FIDLER | 30 | 4419 | 4569 | 494 | 2213 | 4857 |
| E0706 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 13 |
| E0706 | Beta PH | 30 | 203 | 201 | 39 | 118 | 341 |
| E0706 | Gamma FIDLER | 30 | 6512 | 6623 | 770 | 3152 | 7361 |
| E0711 | Alpha PH | 30 | 2 | 1 | 3 | 0 | 16 |
| E0711 | Beta PH | 30 | 201 | 197 | 32 | 126 | 264 |
| E0711 | Gamma FIDLER | 30 | 6711 | 6909 | 845 | 3166 | 7245 |
| E0801 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 12 |
| E0801 | Beta PH | 30 | 222 | 227 | 34 | 162 | 307 |
| E0801 | Gamma FIDLER | 30 | 4586 | 4712 | 502 | 2309 | 5035 |
| E0802 | Alpha PH | 30 | 3 | 3 | 3 | 1 | 19 |
| E0802 | Beta PH | 30 | 225 | 217 | 41 | 168 | 330 |
| E0802 | Gamma FIDLER | 30 | 4575 | 4691 | 506 | 2281 | 5105 |

**Table A3-9**
**Summary Statistics**
**E-Block Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Standard Deviation (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument.
Instruments: PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute.

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| A0201 | Alpha PH | 3 | 7 | 5 | 0 | 528 | Yes | Yes | Perform WRS test for FIDLER data set |
| A0201 | Beta PH | 214 | 277 | 222 | 111 | 387 | Yes | Yes | |
| A0201 | Gamma FIDLER | 4554 | 5094 | 6445 | 2417 | 408 | Yes | **No** | |
| A0316 | Alpha PH | 2 | 6 | 5 | 0 | 528 | Yes | Yes | Perform WRS test for FIDLER data set |
| A0316 | Beta PH | 224 | 276 | 222 | 111 | 387 | Yes | Yes | |
| A0316 | Gamma FIDLER | 4568 | 4985 | 6445 | 2417 | 408 | Yes | **No** | |
| A0317 | Alpha PH | 3 | 6 | 5 | 0 | 528 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| A0317 | Beta PH | 208 | 276 | 222 | 111 | 387 | Yes | Yes | |
| A0317 | Gamma FIDLER | 6943 | 7650 | 6445 | 2417 | 408 | **No** | **No** | |
| A0508 | Alpha PH | 4 | 8 | 5 | 0 | 528 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| A0508 | Beta PH | 232 | 361 | 222 | 111 | 387 | Yes | Yes | |
| A0508 | Gamma FIDLER | 7157 | 8056 | 6445 | 2417 | 408 | **No** | **No** | |
| A0701 | Alpha PH | 2 | 4 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| A0701 | Beta PH | 206 | 381 | 222 | 111 | 2889 | Yes | Yes | |
| A0701 | Gamma FIDLER | 4289 | 4785 | 6445 | 2417 | 3047 | Yes | Yes | |
| A0706 | Alpha PH | 5 | 18 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| A0706 | Beta PH | 239 | 608 | 222 | 111 | 2889 | Yes | Yes | |
| A0706 | Gamma FIDLER | 7039 | 8007 | 6445 | 2417 | 3047 | Yes | **No** | |
| A0707 | Alpha PH | 3 | 17 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| A0707 | Beta PH | 225 | 415 | 222 | 111 | 2889 | Yes | Yes | |
| A0707 | Gamma FIDLER | 7119 | 7559 | 6445 | 2417 | 3047 | Yes | **No** | |
| A0710 | Alpha PH | 3 | 29 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| A0710 | Beta PH | 239 | 413 | 222 | 111 | 2889 | Yes | Yes | |
| A0710 | Gamma FIDLER | 4456 | 4920 | 6445 | 2417 | 3047 | Yes | Yes | |
| A0711 | Alpha PH | 7 | 64 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| A0711 | Beta PH | 233 | 389 | 222 | 111 | 2889 | Yes | Yes | |
| A0711 | Gamma FIDLER | 6911 | 7861 | 6445 | 2417 | 3047 | Yes | **No** | |
| A0901 | Alpha PH | 2 | 30 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| A0901 | Beta PH | 238 | 407 | 222 | 111 | 2889 | Yes | Yes | |
| A0901 | Gamma FIDLER | 4466 | 4908 | 6445 | 2417 | 3047 | Yes | Yes | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| A0905 | Alpha PH | 3 | 49 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| A0905 | Beta PH | 243 | 350 | 222 | 111 | 2889 | Yes | Yes | |
| A0905 | Gamma FIDLER | 4573 | 5060 | 6445 | 2417 | 3047 | Yes | Yes | |
| A1108 | Alpha PH | 2 | 29 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| A1108 | Beta PH | 198 | 334 | 222 | 111 | 2889 | Yes | Yes | |
| A1108 | Gamma FIDLER | 6587 | 7364 | 6445 | 2417 | 3047 | Yes | **No** | |
| A1109 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| A1109 | Beta PH | 233 | 513 | 222 | 111 | 2889 | Yes | Yes | |
| A1109 | Gamma FIDLER | 4472 | 4957 | 6445 | 2417 | 3047 | Yes | Yes | |
| B0109 | Alpha PH | 2 | 6 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0109 | Beta PH | 202 | 273 | 222 | 111 | 2889 | Yes | Yes | |
| B0109 | Gamma FIDLER | 6812 | 7399 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0411 | Alpha PH | 1 | 4 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| B0411 | Beta PH | 215 | 277 | 222 | 111 | 2889 | Yes | Yes | |
| B0411 | Gamma FIDLER | 4332 | 4955 | 6445 | 2417 | 3047 | Yes | Yes | |
| B0501 | Alpha PH | 1 | 8 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0501 | Beta PH | 181 | 252 | 222 | 111 | 2889 | Yes | Yes | |
| B0501 | Gamma FIDLER | 6477 | 7274 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0602 | Alpha PH | 2 | 11 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0602 | Beta PH | 191 | 256 | 222 | 111 | 2889 | Yes | Yes | |
| B0602 | Gamma FIDLER | 6803 | 7521 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0603 | Alpha PH | 2 | 10 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0603 | Beta PH | 197 | 270 | 222 | 111 | 2889 | Yes | Yes | |
| B0603 | Gamma FIDLER | 6904 | 7532 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0609 | Alpha PH | 3 | 19 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0609 | Beta PH | 219 | 294 | 222 | 111 | 2889 | Yes | Yes | |
| B0609 | Gamma FIDLER | 6730 | 7636 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0610 | Alpha PH | 2 | 19 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0610 | Beta PH | 203 | 278 | 222 | 111 | 2889 | Yes | Yes | |
| B0610 | Gamma FIDLER | 6851 | 7841 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| B0701 | Alpha PH | 4 | 42 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0701 | Beta PH | 205 | 267 | 222 | 111 | 2889 | Yes | Yes | |
| B0701 | Gamma FIDLER | 6923 | 7609 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0705 | Alpha PH | 3 | 39 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0705 | Beta PH | 204 | 291 | 222 | 111 | 2889 | Yes | Yes | |
| B0705 | Gamma FIDLER | 6755 | 7372 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0707 | Alpha PH | 4 | 18 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0707 | Beta PH | 207 | 287 | 222 | 111 | 2889 | Yes | Yes | |
| B0707 | Gamma FIDLER | 6595 | 7772 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0708 | Alpha PH | 2 | 16 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0708 | Beta PH | 192 | 293 | 222 | 111 | 2889 | Yes | Yes | |
| B0708 | Gamma FIDLER | 6814 | 7347 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0709 | Alpha PH | 1 | 9 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0709 | Beta PH | 197 | 300 | 222 | 111 | 2889 | Yes | Yes | |
| B0709 | Gamma FIDLER | 6707 | 7513 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0711 | Alpha PH | 1 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0711 | Beta PH | 208 | 346 | 222 | 111 | 2889 | Yes | Yes | |
| B0711 | Gamma FIDLER | 6647 | 7346 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0801 | Alpha PH | 2 | 21 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| B0801 | Beta PH | 196 | 247 | 222 | 111 | 2889 | Yes | Yes | |
| B0801 | Gamma FIDLER | 4555 | 5008 | 6445 | 2417 | 3047 | Yes | Yes | |
| B0802 | Alpha PH | 2 | 20 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| B0802 | Beta PH | 196 | 240 | 222 | 111 | 2889 | Yes | Yes | |
| B0802 | Gamma FIDLER | 4349 | 4910 | 6445 | 2417 | 3047 | Yes | Yes | |
| B0804 | Alpha PH | 1 | 13 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| B0804 | Beta PH | 192 | 276 | 222 | 111 | 2889 | Yes | Yes | |
| B0804 | Gamma FIDLER | 4332 | 4675 | 6445 | 2417 | 3047 | Yes | Yes | |
| B0809 | Alpha PH | 6 | 57 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0809 | Beta PH | 228 | 486 | 222 | 111 | 2889 | Yes | Yes | |
| B0809 | Gamma FIDLER | 6673 | 7168 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| B0810 | Alpha PH | 5 | 31 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0810 | Beta PH | 217 | 354 | 222 | 111 | 2889 | Yes | Yes | |
| B0810 | Gamma FIDLER | 6621 | 7241 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0811 | Alpha PH | 2 | 36 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0811 | Beta PH | 208 | 295 | 222 | 111 | 2889 | Yes | Yes | |
| B0811 | Gamma FIDLER | 6973 | 7736 | 6445 | 2417 | 3047 | Yes | **No** | |
| B0909 | Alpha PH | 3 | 42 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| B0909 | Beta PH | 204 | 331 | 222 | 111 | 2889 | Yes | Yes | |
| B0909 | Gamma FIDLER | 7302 | 8358 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0203 | Alpha PH | 5 | 21 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0203 | Beta PH | 199 | 288 | 222 | 111 | 2889 | Yes | Yes | |
| C0203 | Gamma FIDLER | 6736 | 7599 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0303 | Alpha PH | 5 | 101 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0303 | Beta PH | 208 | 500 | 222 | 111 | 2889 | Yes | Yes | |
| C0303 | Gamma FIDLER | 6424 | 7233 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0307 | Alpha PH | 5 | 91 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0307 | Beta PH | 214 | 478 | 222 | 111 | 2889 | Yes | Yes | |
| C0307 | Gamma FIDLER | 6651 | 7461 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0308 | Alpha PH | 6 | 101 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0308 | Beta PH | 198 | 489 | 222 | 111 | 2889 | Yes | Yes | |
| C0308 | Gamma FIDLER | 6703 | 7317 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0401 | Alpha PH | 5 | 71 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0401 | Beta PH | 208 | 430 | 222 | 111 | 2889 | Yes | Yes | |
| C0401 | Gamma FIDLER | 6634 | 7290 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0403 | Alpha PH | 4 | 57 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0403 | Beta PH | 194 | 340 | 222 | 111 | 2889 | Yes | Yes | |
| C0403 | Gamma FIDLER | 6795 | 7380 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0405 | Alpha PH | 3 | 30 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0405 | Beta PH | 189 | 258 | 222 | 111 | 2889 | Yes | Yes | |
| C0405 | Gamma FIDLER | 6559 | 7262 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| C0406 | Alpha PH | 4 | 68 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0406 | Beta PH | 202 | 397 | 222 | 111 | 2889 | Yes | Yes | |
| C0406 | Gamma FIDLER | 6537 | 7012 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0407 | Alpha PH | 3 | 63 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0407 | Beta PH | 200 | 426 | 222 | 111 | 2889 | Yes | Yes | |
| C0407 | Gamma FIDLER | 6496 | 7174 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0408 | Alpha PH | 1 | 11 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0408 | Beta PH | 183 | 332 | 222 | 111 | 2889 | Yes | Yes | |
| C0408 | Gamma FIDLER | 6604 | 7324 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0501 | Alpha PH | 2 | 6 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0501 | Beta PH | 186 | 264 | 222 | 111 | 2889 | Yes | Yes | |
| C0501 | Gamma FIDLER | 6611 | 7199 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0503 | Alpha PH | 4 | 51 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0503 | Beta PH | 191 | 318 | 222 | 111 | 2889 | Yes | Yes | |
| C0503 | Gamma FIDLER | 6815 | 7475 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0504 | Alpha PH | 3 | 33 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0504 | Beta PH | 193 | 321 | 222 | 111 | 2889 | Yes | Yes | |
| C0504 | Gamma FIDLER | 6716 | 7675 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0505 | Alpha PH | 5 | 70 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0505 | Beta PH | 205 | 451 | 222 | 111 | 2889 | Yes | Yes | |
| C0505 | Gamma FIDLER | 6852 | 7622 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0508 | Alpha PH | 4 | 44 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0508 | Beta PH | 196 | 372 | 222 | 111 | 2889 | Yes | Yes | |
| C0508 | Gamma FIDLER | 6782 | 7785 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0510 | Alpha PH | 2 | 21 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0510 | Beta PH | 190 | 569 | 222 | 111 | 2889 | Yes | Yes | |
| C0510 | Gamma FIDLER | 6684 | 7165 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0511 | Alpha PH | 2 | 11 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0511 | Beta PH | 188 | 248 | 222 | 111 | 2889 | Yes | Yes | |
| C0511 | Gamma FIDLER | 6217 | 7151 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| C0513 | Alpha PH | 1 | 6 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0513 | Beta PH | 187 | 274 | 222 | 111 | 2889 | Yes | Yes | |
| C0513 | Gamma FIDLER | 6787 | 7660 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0603 | Alpha PH | 7 | 139 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0603 | Beta PH | 208 | 699 | 222 | 111 | 2889 | Yes | Yes | |
| C0603 | Gamma FIDLER | 6499 | 7065 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0604 | Alpha PH | 3 | 46 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0604 | Beta PH | 188 | 363 | 222 | 111 | 2889 | Yes | Yes | |
| C0604 | Gamma FIDLER | 6369 | 7638 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0605 | Alpha PH | 2 | 24 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0605 | Beta PH | 204 | 308 | 222 | 111 | 2889 | Yes | Yes | |
| C0605 | Gamma FIDLER | 6333 | 6868 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0606 | Alpha PH | 1 | 10 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0606 | Beta PH | 194 | 304 | 222 | 111 | 2889 | Yes | Yes | |
| C0606 | Gamma FIDLER | 6416 | 6986 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0608 | Alpha PH | 2 | 20 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0608 | Beta PH | 182 | 268 | 222 | 111 | 2889 | Yes | Yes | |
| C0608 | Gamma FIDLER | 5246 | 6489 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0701 | Alpha PH | 4 | 59 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0701 | Beta PH | 203 | 474 | 222 | 111 | 2889 | Yes | Yes | |
| C0701 | Gamma FIDLER | 6774 | 7462 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0706 | Alpha PH | 6 | 99 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0706 | Beta PH | 202 | 512 | 222 | 111 | 2889 | Yes | Yes | |
| C0706 | Gamma FIDLER | 6611 | 7122 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0707 | Alpha PH | 3 | 29 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0707 | Beta PH | 204 | 287 | 222 | 111 | 2889 | Yes | Yes | |
| C0707 | Gamma FIDLER | 6780 | 7484 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0708 | Alpha PH | 3 | 31 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0708 | Beta PH | 192 | 300 | 222 | 111 | 2889 | Yes | Yes | |
| C0708 | Gamma FIDLER | 6759 | 7411 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| C0801 | Alpha PH | 1 | 3 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0801 | Beta PH | 188 | 297 | 222 | 111 | 2889 | Yes | Yes | |
| C0801 | Gamma FIDLER | 7039 | 7594 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0803 | Alpha PH | 1 | 3 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0803 | Beta PH | 197 | 282 | 222 | 111 | 2889 | Yes | Yes | |
| C0803 | Gamma FIDLER | 7127 | 7737 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0807 | Alpha PH | 1 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0807 | Beta PH | 189 | 287 | 222 | 111 | 2889 | Yes | Yes | |
| C0807 | Gamma FIDLER | 6863 | 7582 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0809 | Alpha PH | 3 | 37 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0809 | Beta PH | 200 | 358 | 222 | 111 | 2889 | Yes | Yes | |
| C0809 | Gamma FIDLER | 6826 | 7364 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0901 | Alpha PH | 2 | 43 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0901 | Beta PH | 194 | 381 | 222 | 111 | 2889 | Yes | Yes | |
| C0901 | Gamma FIDLER | 7273 | 7904 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0902 | Alpha PH | 4 | 42 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0902 | Beta PH | 212 | 376 | 222 | 111 | 2889 | Yes | Yes | |
| C0902 | Gamma FIDLER | 7080 | 7864 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0906 | Alpha PH | 5 | 113 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0906 | Beta PH | 222 | 470 | 222 | 111 | 2889 | Yes | Yes | |
| C0906 | Gamma FIDLER | 7212 | 7757 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0907 | Alpha PH | 2 | 5 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0907 | Beta PH | 191 | 254 | 222 | 111 | 2889 | Yes | Yes | |
| C0907 | Gamma FIDLER | 6908 | 7523 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0908 | Alpha PH | 3 | 40 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| C0908 | Beta PH | 201 | 316 | 222 | 111 | 2889 | Yes | Yes | |
| C0908 | Gamma FIDLER | 7117 | 7732 | 6445 | 2417 | 3047 | Yes | **No** | |
| C0909 | Alpha PH | 3 | 42 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| C0909 | Beta PH | 206 | 369 | 222 | 111 | 2889 | Yes | Yes | |
| C0909 | Gamma FIDLER | 4894 | 5402 | 6445 | 2417 | 3047 | Yes | Yes | |

## Table A3-10
## Initial Scenario A Data Reduction
## Depleted Uranium Storage Igloos - Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| D0104 | Alpha PH | 5 | 72 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0104 | Beta PH | 233 | 448 | 222 | 111 | 2889 | Yes | Yes | |
| D0104 | Gamma FIDLER | 4624 | 5432 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0105 | Alpha PH | 3 | 25 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0105 | Beta PH | 220 | 315 | 222 | 111 | 2889 | Yes | Yes | |
| D0105 | Gamma FIDLER | 4519 | 4885 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0107 | Alpha PH | 3 | 47 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0107 | Beta PH | 251 | 415 | 222 | 111 | 2889 | Yes | Yes | |
| D0107 | Gamma FIDLER | 4736 | 7483 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0108 | Alpha PH | 4 | 81 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0108 | Beta PH | 200 | 381 | 222 | 111 | 2889 | Yes | Yes | |
| D0108 | Gamma FIDLER | 7038 | 7624 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0110 | Alpha PH | 2 | 16 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0110 | Beta PH | 206 | 355 | 222 | 111 | 2889 | Yes | Yes | |
| D0110 | Gamma FIDLER | 4393 | 4856 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0113 | Alpha PH | 5 | 31 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0113 | Beta PH | 208 | 302 | 222 | 111 | 2889 | Yes | Yes | |
| D0113 | Gamma FIDLER | 6586 | 7031 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0206 | Alpha PH | 3 | 35 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0206 | Beta PH | 207 | 318 | 222 | 111 | 2889 | Yes | Yes | |
| D0206 | Gamma FIDLER | 4708 | 5043 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0207 | Alpha PH | 2 | 20 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0207 | Beta PH | 224 | 361 | 222 | 111 | 2889 | Yes | Yes | |
| D0207 | Gamma FIDLER | 4496 | 5038 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0305 | Alpha PH | 3 | 12 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0305 | Beta PH | 223 | 309 | 222 | 111 | 2889 | Yes | Yes | |
| D0305 | Gamma FIDLER | 6945 | 7537 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0306 | Alpha PH | 3 | 33 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0306 | Beta PH | 198 | 315 | 222 | 111 | 2889 | Yes | Yes | |
| D0306 | Gamma FIDLER | 7052 | 7655 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| D0312 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0312 | Beta PH | 198 | 266 | 222 | 111 | 2889 | Yes | Yes | |
| D0312 | Gamma FIDLER | 7123 | 7757 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0401 | Alpha PH | 2 | 14 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0401 | Beta PH | 217 | 338 | 222 | 111 | 2889 | Yes | Yes | |
| D0401 | Gamma FIDLER | 4579 | 4949 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0406 | Alpha PH | 2 | 24 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0406 | Beta PH | 199 | 332 | 222 | 111 | 2889 | Yes | Yes | |
| D0406 | Gamma FIDLER | 7269 | 7968 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0407 | Alpha PH | 2 | 28 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0407 | Beta PH | 196 | 286 | 222 | 111 | 2889 | Yes | Yes | |
| D0407 | Gamma FIDLER | 7197 | 7810 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0413 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0413 | Beta PH | 211 | 274 | 222 | 111 | 2889 | Yes | Yes | |
| D0413 | Gamma FIDLER | 7156 | 7883 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0601 | Alpha PH | 2 | 7 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0601 | Beta PH | 222 | 301 | 222 | 111 | 2889 | Yes | Yes | |
| D0601 | Gamma FIDLER | 7054 | 7729 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0604 | Alpha PH | 1 | 5 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0604 | Beta PH | 238 | 360 | 222 | 111 | 2889 | Yes | Yes | |
| D0604 | Gamma FIDLER | 7148 | 7981 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0607 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0607 | Beta PH | 206 | 328 | 222 | 111 | 2889 | Yes | Yes | |
| D0607 | Gamma FIDLER | 4590 | 5026 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0704 | Alpha PH | 1 | 5 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0704 | Beta PH | 199 | 312 | 222 | 111 | 2889 | Yes | Yes | |
| D0704 | Gamma FIDLER | 7049 | 7523 | 6445 | 2417 | 3047 | Yes | **No** | |
| D0705 | Alpha PH | 2 | 4 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0705 | Beta PH | 230 | 306 | 222 | 111 | 2889 | Yes | Yes | |
| D0705 | Gamma FIDLER | 7121 | 7676 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| D0711 | Alpha PH | 2 | 33 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0711 | Beta PH | 205 | 306 | 222 | 111 | 2889 | Yes | Yes | |
| D0711 | Gamma FIDLER | 4591 | 4934 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0712 | Alpha PH | 2 | 5 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0712 | Beta PH | 195 | 248 | 222 | 111 | 2889 | Yes | Yes | |
| D0712 | Gamma FIDLER | 4745 | 5106 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0801 | Alpha PH | 2 | 20 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| D0801 | Beta PH | 198 | 264 | 222 | 111 | 2889 | Yes | Yes | |
| D0801 | Gamma FIDLER | 4523 | 5040 | 6445 | 2417 | 3047 | Yes | Yes | |
| D0805 | Alpha PH | 3 | 50 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| D0805 | Beta PH | 228 | 370 | 222 | 111 | 2889 | Yes | Yes | |
| D0805 | Gamma FIDLER | 6953 | 7703 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0103 | Alpha PH | 3 | 57 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0103 | Beta PH | 215 | 377 | 222 | 111 | 2889 | Yes | Yes | |
| E0103 | Gamma FIDLER | 7340 | 7969 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0105 | Alpha PH | 4 | 74 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0105 | Beta PH | 235 | 514 | 222 | 111 | 2889 | Yes | Yes | |
| E0105 | Gamma FIDLER | 7131 | 7829 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0112 | Alpha PH | 3 | 17 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0112 | Beta PH | 208 | 275 | 222 | 111 | 2889 | Yes | Yes | |
| E0112 | Gamma FIDLER | 7050 | 7603 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0211 | Alpha PH | 4 | 56 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0211 | Beta PH | 200 | 362 | 222 | 111 | 2889 | Yes | Yes | |
| E0211 | Gamma FIDLER | 6965 | 7535 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0301 | Alpha PH | 3 | 31 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0301 | Beta PH | 196 | 295 | 222 | 111 | 2889 | Yes | Yes | |
| E0301 | Gamma FIDLER | 4406 | 4840 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0302 | Alpha PH | 3 | 23 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0302 | Beta PH | 213 | 324 | 222 | 111 | 2889 | Yes | Yes | |
| E0302 | Gamma FIDLER | 6651 | 7619 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| E0303 | Alpha PH | 6 | 75 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0303 | Beta PH | 217 | 423 | 222 | 111 | 2889 | Yes | Yes | |
| E0303 | Gamma FIDLER | 7027 | 7830 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0312 | Alpha PH | 2 | 23 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0312 | Beta PH | 193 | 299 | 222 | 111 | 2889 | Yes | Yes | |
| E0312 | Gamma FIDLER | 6634 | 7237 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0402 | Alpha PH | 2 | 12 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0402 | Beta PH | 199 | 283 | 222 | 111 | 2889 | Yes | Yes | |
| E0402 | Gamma FIDLER | 6696 | 7498 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0410 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0410 | Beta PH | 204 | 275 | 222 | 111 | 2889 | Yes | Yes | |
| E0410 | Gamma FIDLER | 6832 | 7641 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0411 | Alpha PH | 2 | 18 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0411 | Beta PH | 201 | 293 | 222 | 111 | 2889 | Yes | Yes | |
| E0411 | Gamma FIDLER | 4520 | 4910 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0413 | Alpha PH | 2 | 5 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0413 | Beta PH | 223 | 300 | 222 | 111 | 2889 | Yes | Yes | |
| E0413 | Gamma FIDLER | 6862 | 7467 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0504 | Alpha PH | 2 | 26 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0504 | Beta PH | 229 | 306 | 222 | 111 | 2889 | Yes | Yes | |
| E0504 | Gamma FIDLER | 7001 | 7860 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0506 | Alpha PH | 2 | 6 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0506 | Beta PH | 224 | 361 | 222 | 111 | 2889 | Yes | Yes | |
| E0506 | Gamma FIDLER | 6948 | 7806 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0508 | Alpha PH | 1 | 5 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0508 | Beta PH | 226 | 292 | 222 | 111 | 2889 | Yes | Yes | |
| E0508 | Gamma FIDLER | 7233 | 7888 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0510 | Alpha PH | 2 | 16 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0510 | Beta PH | 225 | 467 | 222 | 111 | 2889 | Yes | Yes | |
| E0510 | Gamma FIDLER | 7036 | 7551 | 6445 | 2417 | 3047 | Yes | **No** | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| E0512 | Alpha PH | 2 | 21 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0512 | Beta PH | 190 | 277 | 222 | 111 | 2889 | Yes | Yes | |
| E0512 | Gamma FIDLER | 4482 | 4969 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0602 | Alpha PH | 13 | 206 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0602 | Beta PH | 245 | 902 | 222 | 111 | 2889 | Yes | Yes | |
| E0602 | Gamma FIDLER | 4523 | 5673 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0604 | Alpha PH | 7 | 73 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0604 | Beta PH | 220 | 438 | 222 | 111 | 2889 | Yes | Yes | |
| E0604 | Gamma FIDLER | 4624 | 6729 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0609 | Alpha PH | 9 | 188 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0609 | Beta PH | 232 | 820 | 222 | 111 | 2889 | Yes | Yes | |
| E0609 | Gamma FIDLER | 4642 | 5153 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0610 | Alpha PH | 3 | 11 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0610 | Beta PH | 212 | 312 | 222 | 111 | 2889 | Yes | Yes | |
| E0610 | Gamma FIDLER | 4713 | 5132 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0702 | Alpha PH | 3 | 53 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0702 | Beta PH | 219 | 340 | 222 | 111 | 2889 | Yes | Yes | |
| E0702 | Gamma FIDLER | 4419 | 4857 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0706 | Alpha PH | 2 | 13 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0706 | Beta PH | 203 | 341 | 222 | 111 | 2889 | Yes | Yes | |
| E0706 | Gamma FIDLER | 6512 | 7361 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0711 | Alpha PH | 2 | 16 | 5 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| E0711 | Beta PH | 201 | 264 | 222 | 111 | 2889 | Yes | Yes | |
| E0711 | Gamma FIDLER | 6711 | 7245 | 6445 | 2417 | 3047 | Yes | **No** | |
| E0801 | Alpha PH | 2 | 12 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0801 | Beta PH | 222 | 307 | 222 | 111 | 2889 | Yes | Yes | |
| E0801 | Gamma FIDLER | 4586 | 5035 | 6445 | 2417 | 3047 | Yes | Yes | |
| E0802 | Alpha PH | 3 | 19 | 5 | 0 | 3940 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| E0802 | Beta PH | 225 | 330 | 222 | 111 | 2889 | Yes | Yes | |
| E0802 | Gamma FIDLER | 4575 | 5105 | 6445 | 2417 | 3047 | Yes | Yes | |

**Table A3-10**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Igloos - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Igloo | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than $DCGL_W$? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments:PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute. Refer to **Tables A3-5** through **A3-9** for complete summary statistics for each survey unit.
(3) Measurements from five unimpacted igloos were used as the reference area for the Depleted Uranium storage igloos . Refer to **Table A2-3** for complete summary statistics for the reference areas.
(4) The instrument-specific $DCGL_W$ was calculated using the physical or active probe area in $cm^2$ and the instrument efficiency (**Table A3-2**), and does not include background.
(5) Per MARSSIM Section 8 and Figure 2-1 of this addendum.

**Table A3-11**
**Wilcoxon Rank Sum Test Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| A0201 | Gamma FIDLER - Pu-239 $DCGL_W$ | 30 | 150 | 14003.6 | 15568.5 | Reject | **Survey Unit Meets Release Criterion** |
| A0316 | Gamma FIDLER - Pu-239 $DCGL_W$ | 30 | 150 | 14003.6 | 15569 | Reject | **Survey Unit Meets Release Criterion** |
| A0317 | Gamma FIDLER - Pu-239 $DCGL_W$ | 30 | 150 | 14003.6 | 13804 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| A0508 | Gamma FIDLER - Pu-239 $DCGL_W$ | 30 | 150 | 14003.6 | 13369 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| A0706 | Gamma FIDLER | 30 | 150 | 14003.6 | 15576.5 | Reject | **Survey Unit Meets Release Criterion** |
| A0707 | Gamma FIDLER | 30 | 150 | 14003.6 | 15599 | Reject | **Survey Unit Meets Release Criterion** |
| A0711 | Gamma FIDLER | 30 | 150 | 14003.6 | 15608 | Reject | **Survey Unit Meets Release Criterion** |
| A1108 | Gamma FIDLER | 30 | 150 | 14003.6 | 15658 | Reject | **Survey Unit Meets Release Criterion** |
| B0109 | Gamma FIDLER | 30 | 150 | 14003.6 | 15628 | Reject | **Survey Unit Meets Release Criterion** |
| B0501 | Gamma FIDLER | 30 | 150 | 14003.6 | 15662 | Reject | **Survey Unit Meets Release Criterion** |
| B0602 | Gamma FIDLER | 30 | 150 | 14003.6 | 15635 | Reject | **Survey Unit Meets Release Criterion** |
| B0603 | Gamma FIDLER | 30 | 150 | 14003.6 | 15618 | Reject | **Survey Unit Meets Release Criterion** |
| B0609 | Gamma FIDLER | 30 | 150 | 14003.6 | 15639 | Reject | **Survey Unit Meets Release Criterion** |
| B0610 | Gamma FIDLER | 30 | 150 | 14003.6 | 15612 | Reject | **Survey Unit Meets Release Criterion** |
| B0701 | Gamma FIDLER | 30 | 150 | 14003.6 | 15615 | Reject | **Survey Unit Meets Release Criterion** |
| B0705 | Gamma FIDLER | 30 | 150 | 14003.6 | 15639 | Reject | **Survey Unit Meets Release Criterion** |
| B0707 | Gamma FIDLER | 30 | 150 | 14003.6 | 15655.5 | Reject | **Survey Unit Meets Release Criterion** |
| B0708 | Gamma FIDLER | 30 | 150 | 14003.6 | 15630 | Reject | **Survey Unit Meets Release Criterion** |
| B0709 | Gamma FIDLER | 30 | 150 | 14003.6 | 15636 | Reject | **Survey Unit Meets Release Criterion** |
| B0711 | Gamma FIDLER | 30 | 150 | 14003.6 | 15652 | Reject | **Survey Unit Meets Release Criterion** |
| B0809 | Gamma FIDLER | 30 | 150 | 14003.6 | 15653 | Reject | **Survey Unit Meets Release Criterion** |
| B0810 | Gamma FIDLER | 30 | 150 | 14003.6 | 15652 | Reject | **Survey Unit Meets Release Criterion** |
| B0811 | Gamma FIDLER | 30 | 150 | 14003.6 | 15594 | Reject | **Survey Unit Meets Release Criterion** |
| B0909 | Gamma FIDLER | 30 | 150 | 14003.6 | 15433.5 | Reject | **Survey Unit Meets Release Criterion** |
| C0203 | Gamma FIDLER | 30 | 150 | 14003.6 | 15642 | Reject | **Survey Unit Meets Release Criterion** |
| C0303 | Gamma FIDLER | 30 | 150 | 14003.6 | 15691 | Reject | **Survey Unit Meets Release Criterion** |

**Table A3-11**
**Wilcoxon Rank Sum Test Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| C0307 | Gamma FIDLER | 30 | 150 | 14003.6 | 15653.5 | Reject | Survey Unit Meets Release Criterion |
| C0308 | Gamma FIDLER | 30 | 150 | 14003.6 | 15647 | Reject | Survey Unit Meets Release Criterion |
| C0401 | Gamma FIDLER | 30 | 150 | 14003.6 | 15657 | Reject | Survey Unit Meets Release Criterion |
| C0403 | Gamma FIDLER | 30 | 150 | 14003.6 | 15634 | Reject | Survey Unit Meets Release Criterion |
| C0405 | Gamma FIDLER | 30 | 150 | 14003.6 | 15663.5 | Reject | Survey Unit Meets Release Criterion |
| C0406 | Gamma FIDLER | 30 | 150 | 14003.6 | 15664.5 | Reject | Survey Unit Meets Release Criterion |
| C0407 | Gamma FIDLER | 30 | 150 | 14003.6 | 15682 | Reject | Survey Unit Meets Release Criterion |
| C0408 | Gamma FIDLER | 30 | 150 | 14003.6 | 15661 | Reject | Survey Unit Meets Release Criterion |
| C0501 | Gamma FIDLER | 30 | 150 | 14003.6 | 15660 | Reject | Survey Unit Meets Release Criterion |
| C0503 | Gamma FIDLER | 30 | 150 | 14003.6 | 15632 | Reject | Survey Unit Meets Release Criterion |
| C0504 | Gamma FIDLER | 30 | 150 | 14003.6 | 15643 | Reject | Survey Unit Meets Release Criterion |
| C0505 | Gamma FIDLER | 30 | 150 | 14003.6 | 15625 | Reject | Survey Unit Meets Release Criterion |
| C0508 | Gamma FIDLER | 30 | 150 | 14003.6 | 15630 | Reject | Survey Unit Meets Release Criterion |
| C0510 | Gamma FIDLER | 30 | 150 | 14003.6 | 15647.5 | Reject | Survey Unit Meets Release Criterion |
| C0511 | Gamma FIDLER | 30 | 150 | 14003.6 | 15715.5 | Reject | Survey Unit Meets Release Criterion |
| C0513 | Gamma FIDLER | 30 | 150 | 14003.6 | 15632 | Reject | Survey Unit Meets Release Criterion |
| C0603 | Gamma FIDLER | 30 | 150 | 14003.6 | 15678 | Reject | Survey Unit Meets Release Criterion |
| C0604 | Gamma FIDLER | 30 | 150 | 14003.6 | 15696 | Reject | Survey Unit Meets Release Criterion |
| C0605 | Gamma FIDLER | 30 | 150 | 14003.6 | 15707 | Reject | Survey Unit Meets Release Criterion |
| C0606 | Gamma FIDLER | 30 | 150 | 14003.6 | 15700 | Reject | Survey Unit Meets Release Criterion |
| C0608 | Gamma FIDLER | 30 | 150 | 14003.6 | 15787 | Reject | Survey Unit Meets Release Criterion |
| C0701 | Gamma FIDLER | 30 | 150 | 14003.6 | 15638 | Reject | Survey Unit Meets Release Criterion |
| C0706 | Gamma FIDLER | 30 | 150 | 14003.6 | 15659 | Reject | Survey Unit Meets Release Criterion |
| C0707 | Gamma FIDLER | 30 | 150 | 14003.6 | 15632 | Reject | Survey Unit Meets Release Criterion |
| C0708 | Gamma FIDLER | 30 | 150 | 14003.6 | 15632 | Reject | Survey Unit Meets Release Criterion |
| C0801 | Gamma FIDLER | 30 | 150 | 14003.6 | 15601 | Reject | Survey Unit Meets Release Criterion |
| C0803 | Gamma FIDLER | 30 | 150 | 14003.6 | 15581 | Reject | Survey Unit Meets Release Criterion |

**Table A3-11**
**Wilcoxon Rank Sum Test Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| C0807 | Gamma FIDLER | 30 | 150 | 14003.6 | 15626 | Reject | Survey Unit Meets Release Criterion |
| C0809 | Gamma FIDLER | 30 | 150 | 14003.6 | 15626 | Reject | Survey Unit Meets Release Criterion |
| C0901 | Gamma FIDLER | 30 | 150 | 14003.6 | 15519 | Reject | Survey Unit Meets Release Criterion |
| C0902 | Gamma FIDLER | 30 | 150 | 14003.6 | 15555 | Reject | Survey Unit Meets Release Criterion |
| C0906 | Gamma FIDLER | 30 | 150 | 14003.6 | 15555 | Reject | Survey Unit Meets Release Criterion |
| C0907 | Gamma FIDLER | 30 | 150 | 14003.6 | 15619 | Reject | Survey Unit Meets Release Criterion |
| C0908 | Gamma FIDLER | 30 | 150 | 14003.6 | 15581.5 | Reject | Survey Unit Meets Release Criterion |
| D0107 | Gamma FIDLER | 30 | 150 | 14003.6 | 15816 | Reject | Survey Unit Meets Release Criterion |
| D0108 | Gamma FIDLER | 30 | 150 | 14003.6 | 15598.5 | Reject | Survey Unit Meets Release Criterion |
| D0113 | Gamma FIDLER | 30 | 150 | 14003.6 | 15657 | Reject | Survey Unit Meets Release Criterion |
| D0305 | Gamma FIDLER | 30 | 150 | 14003.6 | 15615.5 | Reject | Survey Unit Meets Release Criterion |
| D0306 | Gamma FIDLER | 30 | 150 | 14003.6 | 15593 | Reject | Survey Unit Meets Release Criterion |
| D0312 | Gamma FIDLER | 30 | 150 | 14003.6 | 15576 | Reject | Survey Unit Meets Release Criterion |
| D0406 | Gamma FIDLER | 30 | 150 | 14003.6 | 15498.5 | Reject | Survey Unit Meets Release Criterion |
| D0407 | Gamma FIDLER | 30 | 150 | 14003.6 | 15541.5 | Reject | Survey Unit Meets Release Criterion |
| D0413 | Gamma FIDLER | 30 | 150 | 14003.6 | 15555.5 | Reject | Survey Unit Meets Release Criterion |
| D0601 | Gamma FIDLER | 30 | 150 | 14003.6 | 15588 | Reject | Survey Unit Meets Release Criterion |
| D0604 | Gamma FIDLER | 30 | 150 | 14003.6 | 15550.5 | Reject | Survey Unit Meets Release Criterion |
| D0704 | Gamma FIDLER | 30 | 150 | 14003.6 | 15600 | Reject | Survey Unit Meets Release Criterion |
| D0705 | Gamma FIDLER | 30 | 150 | 14003.6 | 15583 | Reject | Survey Unit Meets Release Criterion |
| D0805 | Gamma FIDLER | 30 | 150 | 14003.6 | 15610 | Reject | Survey Unit Meets Release Criterion |
| E0103 | Gamma FIDLER | 30 | 150 | 14003.6 | 15461.5 | Reject | Survey Unit Meets Release Criterion |
| E0105 | Gamma FIDLER | 30 | 150 | 14003.6 | 15549.5 | Reject | Survey Unit Meets Release Criterion |
| E0112 | Gamma FIDLER | 30 | 150 | 14003.6 | 15594 | Reject | Survey Unit Meets Release Criterion |
| E0211 | Gamma FIDLER | 30 | 150 | 14003.6 | 15609 | Reject | Survey Unit Meets Release Criterion |
| E0302 | Gamma FIDLER | 30 | 150 | 14003.6 | 15652 | Reject | Survey Unit Meets Release Criterion |
| E0303 | Gamma FIDLER | 30 | 150 | 14003.6 | 15580 | Reject | Survey Unit Meets Release Criterion |

**Table A3-11**
**Wilcoxon Rank Sum Test Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Igloo | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| E0312 | Gamma FIDLER | 30 | 150 | 14003.6 | 15653 | Reject | **Survey Unit Meets Release Criterion** |
| E0402 | Gamma FIDLER | 30 | 150 | 14003.6 | 15646 | Reject | **Survey Unit Meets Release Criterion** |
| E0410 | Gamma FIDLER | 30 | 150 | 14003.6 | 15615 | Reject | **Survey Unit Meets Release Criterion** |
| E0413 | Gamma FIDLER | 30 | 150 | 14003.6 | 15621 | Reject | **Survey Unit Meets Release Criterion** |
| E0504 | Gamma FIDLER | 30 | 150 | 14003.6 | 15581 | Reject | **Survey Unit Meets Release Criterion** |
| E0506 | Gamma FIDLER | 30 | 150 | 14003.6 | 15600 | Reject | **Survey Unit Meets Release Criterion** |
| E0508 | Gamma FIDLER | 30 | 150 | 14003.6 | 15521.5 | Reject | **Survey Unit Meets Release Criterion** |
| E0510 | Gamma FIDLER | 30 | 150 | 14003.6 | 15602 | Reject | **Survey Unit Meets Release Criterion** |
| E0602 | Gamma FIDLER | 30 | 150 | 14003.6 | 15824 | Reject | **Survey Unit Meets Release Criterion** |
| E0604 | Gamma FIDLER | 30 | 150 | 14003.6 | 15819 | Reject | **Survey Unit Meets Release Criterion** |
| E0706 | Gamma FIDLER | 30 | 150 | 14003.6 | 15673 | Reject | **Survey Unit Meets Release Criterion** |
| E0711 | Gamma FIDLER | 30 | 150 | 14003.6 | 15638 | Reject | **Survey Unit Meets Release Criterion** |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument. Four igloos had low-energy gamma datasets compared with $DCGL_W$ for Pu-239.
(2) The Valid N for a dataset refers to the number of measurements from that dataset used in the WRS test.
(3) The Critical Value for the WRS test was calculated for the number of measurements in the survey unit and background areas per MARSSIM Appendix I.
(4) Per MARSSIM for Scenario A, if the Sum of Reference Area Ranks is greater than the Critical Value, the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$ is rejected, and the survey unit passes (i.e., the survey unit meets the release criterion). Electronic versions of the WRS test spreadsheets (per MARSSIM Appendix I) are available in the **Supporting Files**.
(5) Conclusions for these survey units are based on the WRS test results, and the initial data reduction shown in **Table A3-10**.

**Table A3-12**
**Summary of Igloo Scanning Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | Alpha/Beta Scanning with Phoswich | | | | | Gamma Scanning with FIDLER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Igloo | Minimum (cpm) [1,2] | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] | Minimum (cpm) | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] |
| A0201 | 100 | 340 | 236 | 48 | No | 1500 | 7000 | 4423 | 1077 | No |
| A0316 | 80 | 340 | 208 | 38 | No | 1000 | 7000 | 4308 | 1251 | No |
| A0317 | 80 | 340 | 210 | 41 | No | 2000 | 10000 | 6962 | 1677 | Yes [5] |
| A0508 | 60 | 400 | 201 | 46 | No | 2000 | 11000 | 7115 | 1816 | Yes |
| A0701 | 60 | 380 | 201 | 42 | No | 1000 | 7000 | 4154 | 774 | No |
| A0706 | 100 | 700 | 240 | 84 | No | 3000 | 10000 | 6962 | 1198 | Yes |
| A0707 | 60 | 460 | 226 | 59 | No | 3000 | 11000 | 7346 | 987 | Yes |
| A0710 | 100 | 460 | 242 | 49 | No | 2000 | 6000 | 4462 | 803 | No |
| A0711 | 100 | 500 | 233 | 57 | No | 3000 | 10000 | 7038 | 1127 | Yes |
| A0901 | 100 | 500 | 243 | 55 | No | 1800 | 6000 | 4223 | 850 | No |
| A0905 | 100 | 480 | 249 | 63 | No | 1000 | 7000 | 4231 | 665 | No |
| A1107 | 100 | 900 | 261 | 93 | No | 2000 | 8000 | 6423 | 1205 | No |
| A1108 | 60 | 400 | 193 | 47 | No | 3000 | 8000 | 6500 | 1080 | No |
| A1109 | 100 | 400 | 222 | 45 | No | 1000 | 7000 | 4231 | 927 | No |
| B0109 | 80 | 360 | 192 | 42 | No | 3000 | 8000 | 6615 | 893 | No |
| B0411 | 100 | 360 | 218 | 33 | No | 2000 | 7000 | 4077 | 732 | No |
| B0501 | 60 | 300 | 178 | 34 | No | 1000 | 10000 | 6538 | 1738 | Yes |
| B0602 | 80 | 360 | 190 | 35 | No | 3000 | 10000 | 6885 | 1044 | Yes |
| B0603 | 80 | 360 | 195 | 41 | No | 3000 | 10000 | 7077 | 976 | Yes |
| B0609 | 100 | 400 | 219 | 32 | No | 3000 | 10000 | 7231 | 1285 | Yes |
| B0610 | 80 | 340 | 195 | 36 | No | 3000 | 10000 | 7038 | 1163 | Yes |
| B0701 | 80 | 460 | 213 | 47 | No | 3000 | 11000 | 7154 | 1281 | Yes |
| B0705 | 80 | 380 | 210 | 51 | No | 3000 | 10000 | 7000 | 1118 | Yes |
| B0707 | 80 | 380 | 208 | 46 | No | 3000 | 10000 | 6654 | 774 | Yes |
| B0708 | 80 | 300 | 178 | 29 | No | 2000 | 10000 | 6808 | 1164 | Yes |
| B0709 | 40 | 360 | 202 | 47 | No | 2000 | 10000 | 6500 | 1258 | Yes |
| B0711 | 80 | 340 | 202 | 29 | No | 3000 | 10000 | 7000 | 1080 | Yes |
| B0801 | 100 | 280 | 188 | 18 | No | 1000 | 7000 | 4269 | 696 | No |
| B0802 | 60 | 360 | 198 | 38 | No | 2000 | 7000 | 4154 | 516 | No |
| B0804 | 100 | 380 | 202 | 33 | No | 1000 | 6000 | 4038 | 721 | No |
| B0806 | 80 | 600 | 218 | 61 | No | 3000 | 10000 | 7115 | 870 | Yes |
| B0809 | 80 | 600 | 230 | 89 | No | 3000 | 10000 | 6731 | 881 | Yes |
| B0810 | 100 | 440 | 231 | 57 | No | 3000 | 10000 | 6923 | 1115 | Yes |

**Table A3-12**
**Summary of Igloo Scanning Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | Alpha/Beta Scanning with Phoswich | | | | | Gamma Scanning with FIDLER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Igloo | Minimum (cpm) [1,2] | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] | Minimum (cpm) | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] |
| B0811 | 60 | 380 | 195 | 39 | No | 3000 | 10000 | 7269 | 1092 | Yes |
| B0909 | 80 | 500 | 212 | 69 | No | 3000 | 11000 | 7308 | 1200 | Yes |
| C0203 | 80 | 380 | 200 | 42 | No | 3000 | 10000 | 6769 | 1013 | Yes |
| C0303 | 60 | 600 | 210 | 94 | No | 3000 | 9000 | 6385 | 1024 | No |
| C0307 | 80 | 600 | 219 | 74 | No | 3000 | 9000 | 6462 | 1050 | No |
| C0308 | 120 | 600 | 232 | 84 | No | 3000 | 10000 | 6769 | 971 | Yes |
| C0401 | 80 | 600 | 204 | 95 | No | 3000 | 10000 | 7115 | 982 | Yes |
| C0403 | 60 | 500 | 193 | 53 | No | 3000 | 11000 | 6962 | 1050 | Yes |
| C0405 | 40 | 500 | 201 | 58 | No | 3000 | 9000 | 6615 | 939 | No |
| C0406 | 100 | 500 | 218 | 63 | No | 3000 | 10000 | 6962 | 1163 | Yes |
| C0407 | 80 | 440 | 195 | 47 | No | 3000 | 10000 | 6923 | 1058 | Yes |
| C0408 | 40 | 300 | 182 | 26 | No | 3000 | 9000 | 6577 | 1115 | No |
| C0501 | 80 | 300 | 174 | 21 | No | 3000 | 10000 | 6769 | 927 | Yes |
| C0503 | 100 | 500 | 200 | 47 | No | 3000 | 10000 | 6962 | 877 | Yes |
| C0504 | 100 | 300 | 186 | 29 | No | 3000 | 10000 | 6846 | 1028 | Yes |
| C0505 | 100 | 500 | 198 | 52 | No | 3000 | 10000 | 6923 | 1058 | Yes |
| C0508 | 80 | 500 | 191 | 55 | No | 3000 | 11000 | 6962 | 946 | Yes |
| C0510 | 80 | 600 | 202 | 65 | No | 3000 | 10000 | 6808 | 947 | Yes |
| C0511 | 100 | 300 | 183 | 26 | No | 3000 | 9000 | 6038 | 967 | No |
| C0513 | 40 | 300 | 172 | 33 | No | 3000 | 10000 | 6615 | 820 | Yes |
| C0603 | 60 | 600 | 183 | 73 | No | 3000 | 10000 | 6577 | 838 | Yes |
| C0604 | 80 | 600 | 186 | 68 | No | 2000 | 9000 | 6346 | 966 | No |
| C0605 | 80 | 400 | 209 | 51 | No | 2000 | 9000 | 6500 | 1021 | No |
| C0606 | 60 | 300 | 184 | 32 | No | 3000 | 9000 | 6346 | 899 | No |
| C0608 | 60 | 420 | 193 | 44 | No | 2000 | 7000 | 5000 | 1137 | No |
| C0701 | 80 | 600 | 193 | 71 | No | 3000 | 9000 | 6577 | 1058 | No |
| C0706 | 80 | 600 | 194 | 65 | No | 3000 | 9000 | 6500 | 1000 | No |
| C0707 | 80 | 320 | 204 | 36 | No | 3000 | 10000 | 6692 | 902 | Yes |
| C0708 | 80 | 360 | 192 | 34 | No | 3000 | 10000 | 6846 | 1008 | Yes |
| C0801 | 80 | 320 | 171 | 29 | No | 3000 | 10000 | 7154 | 1049 | Yes |
| C0803 | 80 | 280 | 172 | 21 | No | 3000 | 9000 | 6538 | 989 | No |
| C0807 | 80 | 320 | 188 | 29 | No | 3000 | 9000 | 6500 | 979 | No |
| C0809 | 60 | 420 | 192 | 47 | No | 3000 | 9000 | 6654 | 1068 | No |

**Table A3-12**
**Summary of Igloo Scanning Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | Alpha/Beta Scanning with Phoswich | | | | | Gamma Scanning with FIDLER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Igloo | Minimum (cpm) [1,2] | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] | Minimum (cpm) | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] |
| C0901 | 60 | 450 | 177 | 55 | No | 3000 | 9000 | 6962 | 1181 | No |
| C0902 | 100 | 420 | 209 | 58 | No | 3000 | 10000 | 7038 | 1089 | Yes |
| C0906 | 80 | 400 | 197 | 56 | No | 3000 | 11000 | 7192 | 1217 | Yes |
| C0907 | 80 | 340 | 184 | 28 | No | 3000 | 9000 | 6654 | 1049 | No |
| C0908 | 100 | 460 | 205 | 46 | No | 3000 | 10000 | 7077 | 1134 | Yes |
| C0909 | 100 | 480 | 194 | 38 | No | 2000 | 7000 | 4423 | 813 | No |
| C0912 | 40 | 420 | 201 | 41 | No | 2000 | 6000 | 4327 | 800 | No |
| D0104 | 80 | 500 | 236 | 58 | No | 2000 | 7000 | 4038 | 721 | No |
| D0105 | 100 | 420 | 216 | 39 | No | 2000 | 6000 | 3962 | 477 | No |
| D0107 | 120 | 450 | 258 | 43 | No | 1000 | 10000 | 4577 | 1239 | Yes |
| D0108 | 80 | 600 | 192 | 87 | No | 3000 | 9000 | 6577 | 1017 | No |
| D0110 | 80 | 360 | 188 | 36 | No | 2000 | 6000 | 3808 | 522 | No |
| D0113 | 40 | 400 | 199 | 41 | No | 3000 | 9000 | 6615 | 893 | No |
| D0206 | 80 | 360 | 198 | 45 | No | 2000 | 6000 | 3962 | 431 | No |
| D0207 | 80 | 440 | 218 | 59 | No | 2000 | 6000 | 4000 | 577 | No |
| D0305 | 100 | 340 | 217 | 48 | No | 3000 | 10000 | 6923 | 932 | Yes |
| D0306 | 80 | 400 | 188 | 46 | No | 3000 | 11000 | 7192 | 1128 | Yes |
| D0312 | 80 | 340 | 198 | 35 | No | 2000 | 10000 | 6692 | 1234 | Yes |
| D0401 | 80 | 400 | 197 | 43 | No | 2000 | 6000 | 3923 | 572 | No |
| D0405 | 100 | 400 | 215 | 59 | No | 2000 | 11000 | 7115 | 1244 | Yes |
| D0406 | 100 | 400 | 208 | 46 | No | 2000 | 11000 | 7385 | 1402 | Yes |
| D0407 | 60 | 440 | 202 | 45 | No | 3000 | 10000 | 6731 | 949 | Yes |
| D0413 | 100 | 400 | 208 | 61 | No | 3000 | 11000 | 7231 | 1268 | Yes |
| D0601 | 100 | 400 | 207 | 46 | No | 3000 | 10000 | 7038 | 1145 | Yes |
| D0604 | 100 | 400 | 235 | 35 | No | 3000 | 10000 | 6808 | 723 | Yes |
| D0607 | 80 | 360 | 193 | 39 | No | 2000 | 6000 | 3885 | 506 | No |
| D0704 | 100 | 440 | 191 | 43 | No | 3000 | 10000 | 7115 | 961 | Yes |
| D0705 | 100 | 300 | 204 | 25 | No | 3000 | 10000 | 7115 | 1044 | Yes |
| D0711 | 60 | 420 | 214 | 51 | No | 2000 | 6000 | 3808 | 522 | No |
| D0712 | 60 | 420 | 206 | 49 | No | 1000 | 7000 | 4346 | 658 | No |
| D0801 | 100 | 280 | 183 | 17 | No | 1000 | 6000 | 4115 | 768 | No |
| D0805 | 100 | 420 | 229 | 35 | No | 2000 | 10000 | 6769 | 1317 | Yes |
| E0103 | 80 | 600 | 212 | 51 | No | 2000 | 10000 | 7115 | 1227 | Yes |

**Table A3-12**
**Summary of Igloo Scanning Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | Alpha/Beta Scanning with Phoswich | | | | | Gamma Scanning with FIDLER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Igloo | Minimum (cpm) [1,2] | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] | Minimum (cpm) | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] |
| E0105 | 100 | 600 | 234 | 89 | No | 2000 | 11000 | 7269 | 1467 | Yes |
| E0112 | 80 | 400 | 210 | 53 | No | 3000 | 10000 | 7000 | 1275 | Yes |
| E0211 | 80 | 500 | 194 | 51 | No | 3000 | 11000 | 7077 | 1239 | Yes |
| E0301 | 80 | 340 | 203 | 29 | No | 1000 | 7000 | 4231 | 665 | No |
| E0302 | 60 | 400 | 212 | 46 | No | 3000 | 8000 | 6538 | 1145 | No |
| E0303 | 100 | 420 | 191 | 57 | No | 2000 | 11000 | 7077 | 1397 | Yes |
| E0312 | 60 | 380 | 179 | 43 | No | 2000 | 10000 | 6692 | 1109 | Yes |
| E0402 | 80 | 340 | 185 | 27 | No | 3000 | 8000 | 6538 | 1145 | No |
| E0403 | 80 | 440 | 212 | 44 | No | 2000 | 11000 | 7077 | 1718 | Yes |
| E0410 | 80 | 400 | 196 | 43 | No | 2000 | 11000 | 7038 | 1520 | Yes |
| E0411 | 80 | 300 | 185 | 30 | No | 1000 | 7000 | 4192 | 805 | No |
| E0413 | 100 | 320 | 213 | 34 | No | 3000 | 9000 | 6731 | 1129 | No |
| E0504 | 100 | 360 | 233 | 26 | No | 3000 | 10000 | 7000 | 1275 | Yes |
| E0506 | 100 | 400 | 218 | 41 | No | 2000 | 11000 | 7038 | 1361 | Yes |
| E0508 | 80 | 380 | 215 | 37 | No | 3000 | 10000 | 7154 | 1197 | Yes |
| E0510 | 100 | 400 | 222 | 36 | No | 2000 | 12000 | 7423 | 1441 | Yes |
| E0512 | 60 | 300 | 173 | 36 | No | 1000 | 7000 | 4231 | 971 | No |
| E0602 | 100 | 1000 | 255 | 195 | No | 1000 | 6000 | 4192 | 663 | No |
| E0604 | 100 | 600 | 232 | 84 | No | 1000 | 7000 | 4269 | 665 | No |
| E0609 | 100 | 1200 | 278 | 222 | No | 1000 | 7000 | 4308 | 723 | No |
| E0610 | 100 | 400 | 212 | 44 | No | 1000 | 7000 | 4423 | 838 | No |
| E0702 | 80 | 460 | 214 | 50 | No | 1000 | 8000 | 4346 | 922 | No |
| E0706 | 80 | 500 | 212 | 46 | No | 3000 | 8000 | 6462 | 1145 | No |
| E0711 | 60 | 300 | 182 | 34 | No | 2000 | 8000 | 6269 | 1301 | No |
| E0801 | 80 | 400 | 220 | 29 | No | 1000 | 7000 | 4346 | 689 | No |
| E0802 | 100 | 380 | 227 | 44 | No | 1000 | 6000 | 4038 | 776 | No |

Notes:
(1) All Alpha/Beta measurements collected in the igloos were collected with a phoswich detector. Thirteen scanning measurements were collected in each igloo.
(2) cpm = counts per minute
(3) The scanning mean for the survey unit was calculated by averaging the average scanning measurement from the thirteen scanning locations for each igloo, and the standard deviation of the scanning mean is the standard deviation of the thirteen averages.

**Table A3-12**
**Summary of Igloo Scanning Results**
**Depleted Uranium Storage Igloos**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | Alpha/Beta Scanning with Phoswich | | | | | Gamma Scanning with FIDLER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Igloo | Minimum (cpm) [1,2] | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] | Minimum (cpm) | Maximum (cpm) | Scanning Mean (cpm) [3] | Standard Deviation of Scanning Mean (cpm) [3] | Is Maximum Reading Greater than Flag? [4] |

(4) The flag values used for the scanning measurements within the igloos were the background corrected DU $DCGL_W$'s (**Table A3-2**). The flag value for the alpha/beta phoswich scanning was 7056 cpm, which is the sum of the individual alpha and beta DU $DCGL_W$'s. The flag value for the FIDLER scanning was 9492 cpm.

(5) All FIDLER measurements from Igloos A0317 and A0508 were below the $DCGL_{EMC}$ for Pu-239 (11304 cpm; **Table A3-2**). All other FIDLER measurements were below the $DCGL_{EMC}$ for DU (42708 cpm).

**Table A4-1**
**List of Depleted Uranium Storage Buildings and Survey Units**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Building | Room | Survey Unit Designation | MARSSIM Classification | Applicable Licenses |
|---|---|---|---|---|
| | | | | |
| 5 | 1 | 5-1 | 2 | SUC-1275; SUC-1380 |
| | 2 | 5-2 | 2 | SUC-1275; SUC-1380 |
| | 3 | 5-3 | 2 | SUC-1275; SUC-1380 |
| | 4 | 5-4 | 2 | SUC-1275; SUC-1380 |
| | 5 | 5-5 | 2 | SUC-1275; SUC-1380 |
| | 6 | 5-6 | 2 | SUC-1275; SUC-1380 |
| | 7 | 5-7 | 2 | SUC-1275; SUC-1380 |
| | 8 | 5-8 | 2 | SUC-1275; SUC-1380 |
| | 9 | 5-9 | 2 | SUC-1275; SUC-1380 |
| | 10 | 5-10 | 2 | SUC-1275; SUC-1380 |
| | 11 | 5-11 | 3 | SUC-1275; SUC-1380 |
| | 12 | 5-12 | 3 | SUC-1275; SUC-1380 |
| | 13 | 5-13 | 3 | SUC-1275; SUC-1380 |
| | 14 | 5-14 | 3 | SUC-1275; SUC-1380 |
| | 15 | 5-15 | 3 | SUC-1275; SUC-1380 |
| | 16 | 5-16 | 2 | SUC-1275; SUC-1380 |
| 306 | 1 | 306-1 | 3 | SUC-1275; SUC-1380 |
| | 2 | 306-2 | 3 | SUC-1275; SUC-1380 |
| | 3 | 306-3 | 3 | SUC-1275; SUC-1380 |
| | 4 | 306-4 | 3 | SUC-1275; SUC-1380 |
| | 5 | 306-5 | 3 | SUC-1275; SUC-1380 |
| | 6 | 306-6 | 3 | SUC-1275; SUC-1380 |
| | 7 | 306-7 | 3 | SUC-1275; SUC-1380 |
| | 8 | 306-8 | 3 | SUC-1275; SUC-1380 |
| | 10 | 306-10 | 2 | SUC-1275; SUC-1380 |
| | 11 | 306-11 | 2 | SUC-1275; SUC-1380 |
| | 12 | 306-12 | 2 | SUC-1275; SUC-1380 |
| | 13 | 306-13 | 2 | SUC-1275; SUC-1380 |
| 2073 | 1 | 2073-1 | 2 | SUC-1275; SUC-1380 |
| | 2 | 2073-2 | 2 | SUC-1275; SUC-1380 |
| | 3 | 2073-3 | 2 | SUC-1275; SUC-1380 |
| S-2084 | 2 | 2084-2 | 2 | SUC-1275; SUC-1380 |
| | 3 | 2084-3 | 2 | SUC-1275; SUC-1380 |
| | 6 | 2084-6 | 2 | SUC-1275; SUC-1380 |

Notes:
(1) Buildings were used for receipt and storage of packaged DU ammunition (SUC-1275).
(2) Compiled from *Seneca Army Depot Activity License Termination and License Release Plan* (ANL, 2003).

**Table A4-2**
**Derived Concentration Guideline Levels**
**Depleted Uranium Storage Buildings**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Instrument | Applicable $DCGL_W$ | $DCGL_W$ ($dpm/100cm^2$) [1] | $DCGL_{EMC}$ ($dpm/100cm^2$) [2] | Area ($cm^2$) | Efficiency [3] | $DCGL_W$ (cpm) [4] | $DCGL_{EMC}$ (cpm) [4] | Background Average (cpm) | Background Dataset | Background Corrected $DCGL_W$ (cpm) [5] | Background Corrected $DCGL_{EMC}$ (cpm) [5] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alpha Floor Monitor | Depleted Uranium | 31647 | 376599 | 582 | 5% | 9209 | 109590 | 4 | Bldg 722 | 9213 | **109594** |
| Beta Floor Monitor | Depleted Uranium | 31647 | 376599 | 582 | 18.5% | 34074 | 405484 | 775 | Bldg 722 | 34849 | **406259** |
| Alpha Phoswich | Depleted Uranium | 31647 | 376599 | 83 | 15% | 3940 | 46887 | 4 | Bldg 722 | 3944 | **46891** |
| Beta Phoswich | Depleted Uranium | 31647 | 376599 | 83 | 11% | 2889 | 34384 | 365 | Bldg 722 | 3254 | **34749** |
| Gamma FIDLER | Depleted Uranium | 31647 | 376599 | 126.7 | 7.6% | 3047 | 36263 | 11265 | Bldg 722 | 14312 | **47528** |

Notes:

(1) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Depleted uranium DCGL calculated using equation 4-4 of MARSSIM. Expected activity fractions for depleted uranium based on uranium depleted to 99.8 weight percent U-238, 0.2 weight percent U-235, and 0.0006 weight percent U-234 (WHO, 2001).

(2) $DCGL_{EMC}$ based on area factor of 11.9 for 4 $m^2$ grid (from ANL, 2003, for worst-case radionuclide [U-235]).

(3) Average efficiency for instrument as determined by daily function checks during survey (**Appendix 4.A**).

(4) The instrument-specific $DCGL_W$ and $DCGL_{EMC}$ in counts per minute (cpm) are calculated using the instrument efficiency and active probe area.

(5) The Background Corrected $DCGL_W$ and $DCGL_{EMC}$ for each instrument is the sum of the DCGL and the Background Average for that instrument.

# Table A4-3
# Survey Instrumentation
# Depleted Uranium Storage Buildings
# License Termination Report Addendum A
# Seneca Army Depot Activity

| Instrument | Measurement Type | Probe | Meter | Probe Area ($cm^2$) (1) | Average Instrument Efficiency (2) | 1-Minute Direct Measurement MDA ($dpm/100cm^2$) (3) | Scanning MDA ($dpm/100cm^2$) (3) | $DCGL_W$ for DU ($dpm/100cm^2$) (4) |
|---|---|---|---|---|---|---|---|---|
| Phoswich | Alpha/Beta | Ludlum Model 43-1-1 | Ludlum Model 2224 | 83 | Alpha: 15% Beta: 11% | Alpha: 41 Beta: 535 | 6176 | 31647 |
| Floor Monitor | Alpha/Beta | Ludlum Model 43-37 | Ludlum Model 2360 | 582 | Alpha: 5% Beta: 18.5% | Alpha: 18 Beta: 66 | 916 | 31647 |
| FIDLER | Low-Energy Gamma | Bicron G5 FIDLER | Bicron Analyst | 126.7 | 15% | 2817 | 30857 | 31647 |
| Exposure Rate | Ambient Gamma Exposure Rate | Bicron MicroRem or Ludlum Model 19 | | _ (5) | -- | -- | -- | NA (6) |
| GM Pancake | Alpha/Beta/Gamma | Ludlum Model 44-9 | Ludlum Model 3 | 15 | 20% (7) | -- | 2200-5000 | NA |
| Gamma Spectrometer | In-Situ Gamma | Alpha Spectra FIDLER | RSA URSA-I MCA | 126.7 | 15% | 2817 for gross 1-minute count; otherwise measurement-specific | -- | 31647 |

Notes:

1) $cm^2$ = square centimeters. Areas listed and used in the calculations are the active or physical probe area listed by the manufacturer, per MARSSIM Section 6.6.1 (NRC, 2000).

2) Except where noted, the average instrument efficiency was determined from the daily function check data (refer to **Appendix 4.A**).

3) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Except where noted, the minimum detectable activities (MDAs) were calculated using the procedures outlined in MARSSIM Section 6.7 (NRC, 2000).

4) Gross activity $DCGL_w$ was calculated using radionuclide-specific DCGLs derived by ANL, 2003 (**Appendix 1.A**).

5) "--" = Indicates that parameter was not used or calculated for instrument.

6) NA= not applicable. DCGLs were not applied to exposure rate or personnel/equipment frisking measurements.

7) GM efficiency of 20% for uranium based on Table 6.4 of MARSSIM.

**Table A4-4**
**Total Number of Required Measurements**
**Depleted Uranium Storage Buildings**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Dataset [1] | Gross Activity $DCGL_W$ (dpm/100cm2) [2] | Background Corrected $DCGL_W$ (cpm) [3] | LBGR [4] | $\Delta$ [5] | Observed Survey $\sigma$ (cpm) [6] | Observed Bkgd $\sigma$ (cpm) | $\Delta/\sigma$ [7] | Pr [8] | $Z(1-\alpha)$ [9] | $Z(1-\beta)$ [9] | Total N [10] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gamma FIDLER & Blgd 722 Background | 31647 | 14312 | 7156 | 7156 | 2415 | 3307 | 2.2 | 0.92 | 1.645 | 1.645 | 20 |
| Alpha PH & Bldg 722 Background | 31647 | 3944 | 1972 | 1972 | 1.25 | 2.3 | 857 | 1.00 | 1.645 | 1.645 | 14 |
| Beta PH & Bldg 722 Background | 31647 | 3254 | 1627 | 1627 | 63 | 186 | 9 | 1.00 | 1.645 | 1.645 | 14 |
| Alpha FM & Bldg 722 Background | 31647 | 9213 | 4607 | 4607 | 2.6 | 2.4 | 1785 | 1.00 | 1.645 | 1.645 | 14 |
| Beta FM & Bldg 722 Background | 31647 | 34849 | 17425 | 17425 | 137 | 284 | 61 | 1.00 | 1.645 | 1.645 | 14 |

Notes:

(1) All measurements for all survey units are combined for this evaluation. Instruments: FM = alpha/beta gas proportional floor monitor; FIDLER = low-energy gamma scintillator; PH = alpha/beta phoswich detector.

(2) dpm/100cm$^2$ = decays per minute per 100 square centimeters. Gross activity $DCGL_W$ for DU calculated per MARSSIM.

(3) cpm = counts per minute. Instrument-specific DCGLw calculated per MARSSIM. Includes average background count rate.

(4) LBGR = lower bound of gray region. Per MARSSIM, LBGR was set to 1/2 of the $DCGL_W$.

(5) $\Delta = DCGL_W$ - LBGR.

(6) The standard deviation ($\sigma$) for the survey data includes all measurements collected with that instrument.

(7) $\Delta/\sigma$ calculated using the larger value between the survey standard deviation and the background standard deviation.

(8) Values of Pr are from Table 5.1 of MARSSIM using $\Delta/\sigma$. Pr is defined by MARSSIM as the probability that a random measurement from the survey unit exceeds a random measurement from the background reference area by less than the $DCGL_W$ when the survey unit median is equal to the LBGR above background.

(9) Values of $Z(1-\alpha)$ and $Z(1-\beta)$ (decision error percentiles) are from Table 5.2 of MARSSIM for $\alpha=\beta=0.05$.

(10) N = total required number of measurements or samples (includes both survey and background areas).

# Table A4-5
## Summary Statistics
## Building 5 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 1 | Alpha FM | 53 | 5 | 5 | 2 | 1 | 11 |
| 5 | 1 | Beta FM | 53 | 661 | 671 | 112 | 401 | 1043 |
| 5 | 1 | Alpha PH | 32 | 1 | 1 | 2 | 0 | 8 |
| 5 | 1 | Beta PH | 32 | 170 | 154.5 | 46 | 118 | 336 |
| 5 | 1 | Gamma FIDLER | 85 | 5172 | 4466 | 1546 | 3572 | 10791 |
| 5 | 2 | Alpha FM | 14 | 5 | 4.5 | 3 | 2 | 11 |
| 5 | 2 | Beta FM | 14 | 693 | 676.5 | 143 | 444 | 1087 |
| 5 | 2 | Alpha PH | 6 | 1 | 1 | 1 | 0 | 3 |
| 5 | 2 | Beta PH | 6 | 175 | 183 | 35 | 129 | 212 |
| 5 | 2 | Gamma FIDLER | 20 | 6317 | 6436.5 | 2104 | 3457 | 12071 |
| 5 | 3 | Alpha FM | 11 | 6 | 5 | 3 | 2 | 10 |
| 5 | 3 | Beta FM | 11 | 663 | 676 | 105 | 390 | 809 |
| 5 | 3 | Alpha PH | 6 | 1 | 1 | 1 | 0 | 2 |
| 5 | 3 | Beta PH | 6 | 177 | 169.5 | 23 | 146 | 211 |
| 5 | 3 | Gamma FIDLER | 17 | 4258 | 4338 | 700 | 2488 | 5494 |
| 5 | 4 | Alpha FM | 11 | 5 | 5 | 2 | 2 | 9 |
| 5 | 4 | Beta FM | 11 | 672 | 666 | 73 | 540 | 816 |
| 5 | 4 | Alpha PH | 6 | 1 | 0 | 1 | 0 | 2 |
| 5 | 4 | Beta PH | 6 | 220 | 200.5 | 57 | 184 | 335 |
| 5 | 4 | Gamma FIDLER | 17 | 4874 | 4665 | 888 | 3877 | 7619 |
| 5 | 5 | Alpha FM | 30 | 5 | 5 | 3 | 0 | 11 |
| 5 | 5 | Beta FM | 30 | 678 | 684 | 50 | 564 | 754 |
| 5 | 5 | Alpha PH | 59 | 1 | 0 | 1 | 0 | 4 |
| 5 | 5 | Beta PH | 59 | 143 | 140 | 23 | 107 | 223 |
| 5 | 5 | Gamma FIDLER | 89 | 4419 | 4277 | 796 | 3181 | 7493 |
| 5 | 6 | Alpha FM | 30 | 5 | 5 | 3 | 1 | 12 |
| 5 | 6 | Beta FM | 30 | 649 | 664.5 | 72 | 449 | 754 |
| 5 | 6 | Alpha PH | 18 | 1 | 1 | 1 | 0 | 3 |
| 5 | 6 | Beta PH | 18 | 162 | 163.5 | 20 | 133 | 207 |
| 5 | 6 | Gamma FIDLER | 48 | 4981 | 4392 | 1213 | 3536 | 7462 |
| 5 | 7 | Alpha FM | 7 | 3 | 3 | 1 | 1 | 5 |
| 5 | 7 | Beta FM | 7 | 813 | 808 | 55 | 726 | 887 |
| 5 | 7 | Alpha PH | 17 | 1 | 1 | 1 | 0 | 3 |
| 5 | 7 | Beta PH | 17 | 252 | 208 | 77 | 163 | 385 |
| 5 | 7 | Gamma FIDLER | 24 | 8261 | 8009.5 | 2717 | 3378 | 13108 |
| 5 | 8 | Alpha FM | 13 | 4 | 4 | 1 | 1 | 6 |
| 5 | 8 | Beta FM | 13 | 787 | 830 | 180 | 575 | 1059 |
| 5 | 8 | Alpha PH | 8 | 2 | 2 | 1 | 0 | 4 |
| 5 | 8 | Beta PH | 8 | 274 | 274 | 82 | 178 | 377 |
| 5 | 8 | Gamma FIDLER | 21 | 8829 | 8441 | 2172 | 5344 | 13109 |

**Table A4-5**
**Summary Statistics**
**Building 5 Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|---|
| 5 | 9 | Alpha FM | 27 | 4 | 4 | 2 | 0 | 12 |
| 5 | 9 | Beta FM | 27 | 703 | 726 | 92 | 415 | 802 |
| 5 | 9 | Alpha PH | 36 | 1 | 1 | 1 | 0 | 5 |
| 5 | 9 | Beta PH | 36 | 169 | 169 | 19 | 129 | 201 |
| 5 | 9 | Gamma FIDLER | 63 | 4825 | 4069 | 1303 | 3152 | 7284 |
| 5 | 10 | Alpha FM | 16 | 5 | 4 | 2 | 2 | 8 |
| 5 | 10 | Beta FM | 16 | 761 | 783 | 137 | 559 | 1031 |
| 5 | 10 | Alpha PH | 9 | 2 | 2 | 1 | 0 | 3 |
| 5 | 10 | Beta PH | 9 | 209 | 175 | 61 | 163 | 331 |
| 5 | 10 | Gamma FIDLER | 25 | 6625 | 7314 | 2072 | 3478 | 11742 |
| 5 | 11 | Alpha FM | 3 | 5 | 5 | 1 | 4 | 6 |
| 5 | 11 | Beta FM | 3 | 764 | 752 | 22 | 751 | 790 |
| 5 | 11 | Alpha PH | 27 | 1 | 1 | 1 | 0 | 2 |
| 5 | 11 | Beta PH | 27 | 182 | 173 | 60 | 131 | 409 |
| 5 | 11 | Gamma FIDLER | 30 | 9021 | 9085.5 | 1350 | 6061 | 11913 |
| 5 | 12 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 3 |
| 5 | 12 | Beta PH | 30 | 263 | 249 | 56 | 182 | 369 |
| 5 | 12 | Gamma FIDLER | 30 | 10822 | 11026.5 | 1596 | 8096 | 13713 |
| 5 | 13 | Alpha FM | 3 | 6 | 5 | 2 | 4 | 8 |
| 5 | 13 | Beta FM | 3 | 781 | 775 | 16 | 769 | 799 |
| 5 | 13 | Alpha PH | 27 | 1 | 0 | 2 | 0 | 10 |
| 5 | 13 | Beta PH | 27 | 210 | 200 | 41 | 143 | 291 |
| 5 | 13 | Gamma FIDLER | 30 | 6757 | 6631.5 | 1091 | 4543 | 9098 |
| 5 | 14 | Alpha FM | 4 | 4 | 5 | 2 | 2 | 5 |
| 5 | 14 | Beta FM | 4 | 505 | 497 | 45 | 460 | 564 |
| 5 | 14 | Alpha PH | 26 | 1 | 0 | 1 | 0 | 4 |
| 5 | 14 | Beta PH | 26 | 155 | 141 | 51 | 111 | 365 |
| 5 | 14 | Gamma FIDLER | 30 | 5196 | 5004 | 926 | 3884 | 7693 |
| 5 | 15 | Alpha FM | 2 | 5 | 5 | 0 | 5 | 5 |
| 5 | 15 | Beta FM | 2 | 684 | 684 | 48 | 650 | 718 |
| 5 | 15 | Alpha PH | 28 | 1 | 1 | 1 | 0 | 3 |
| 5 | 15 | Beta PH | 28 | 230 | 213 | 66 | 153 | 444 |
| 5 | 15 | Gamma FIDLER | 30 | 9220 | 9193 | 1339 | 5878 | 11574 |
| 5 | 16 | Alpha FM | 8 | 5 | 4 | 3.0 | 1 | 10 |
| 5 | 16 | Beta FM | 8 | 699 | 644 | 110 | 599 | 873 |
| 5 | 16 | Alpha PH | 5 | 0.6 | 0 | 0.89 | 0 | 2 |
| 5 | 16 | Beta PH | 5 | 217 | 178 | 73 | 169 | 343 |
| 5 | 16 | Gamma FIDLER | 13 | 7420 | 7662 | 1539 | 4519 | 9388 |

## Table A4-5
## Summary Statistics
## Building 5 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute.

**Table A4-6**
**Summary Statistics**
**Building 306 Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 306 | 1 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 3 |
| 306 | 1 | Beta PH | 30 | 162 | 166 | 19 | 115 | 208 |
| 306 | 1 | Gamma FIDLER | 30 | 9450 | 9189 | 2071 | 5283 | 13635 |
| 306 | 2 | Alpha PH | 30 | 2 | 1 | 2 | 0 | 7 |
| 306 | 2 | Beta PH | 30 | 184 | 190 | 31 | 114 | 231 |
| 306 | 2 | Gamma FIDLER | 30 | 8142 | 8064 | 1342 | 4281 | 11294 |
| 306 | 3 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 5 |
| 306 | 3 | Beta PH | 30 | 252 | 237 | 60 | 174 | 410 |
| 306 | 3 | Gamma FIDLER | 30 | 10457 | 9938 | 2538 | 6750 | 17053 |
| 306 | 4 | Alpha PH | 30 | 2 | 2 | 2 | 0 | 6 |
| 306 | 4 | Beta PH | 30 | 287 | 264 | 77 | 152 | 475 |
| 306 | 4 | Gamma FIDLER | 30 | 10752 | 10396 | 2629 | 5468 | 15915 |
| 306 | 5 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 5 |
| 306 | 5 | Beta PH | 30 | 218 | 199 | 65 | 119 | 339 |
| 306 | 5 | Gamma FIDLER | 30 | 7737 | 7292 | 1778 | 4083 | 11176 |
| 306 | 6 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 5 |
| 306 | 6 | Beta PH | 30 | 239 | 236 | 47 | 165 | 346 |
| 306 | 6 | Gamma FIDLER | 30 | 8787 | 8682 | 1846 | 6194 | 12980 |
| 306 | 7 | Alpha PH | 30 | 1 | 1 | 1 | 0 | 3 |
| 306 | 7 | Beta PH | 30 | 209 | 200 | 46 | 142 | 348 |
| 306 | 7 | Gamma FIDLER | 30 | 7837 | 7709 | 1921 | 4346 | 10787 |
| 306 | 8 | Alpha PH | 30 | 2 | 1 | 1 | 0 | 4 |
| 306 | 8 | Beta PH | 30 | 197 | 183 | 50 | 137 | 347 |
| 306 | 8 | Gamma FIDLER | 30 | 6290 | 6079 | 1512 | 4605 | 12064 |
| 306 | 10 | Alpha FM | 23 | 7 | 7 | 3 | 1 | 13 |
| 306 | 10 | Beta FM | 23 | 723 | 645 | 272 | 421 | 1311 |
| 306 | 10 | Alpha PH | 18 | 1 | 1 | 1 | 0 | 4 |
| 306 | 10 | Beta PH | 18 | 181 | 163 | 50 | 149 | 363 |
| 306 | 10 | Gamma FIDLER | 41 | 6394 | 5787 | 1858 | 4216 | 12382 |
| 306 | 11 | Alpha FM | 18 | 6 | 5 | 3 | 3 | 12 |
| 306 | 11 | Beta FM | 18 | 607 | 571 | 141 | 436 | 1034 |
| 306 | 11 | Alpha PH | 28 | 1 | 1 | 1 | 0 | 4 |
| 306 | 11 | Beta PH | 28 | 151 | 155 | 20 | 112 | 181 |
| 306 | 11 | Gamma FIDLER | 46 | 5835 | 5743 | 902 | 3627 | 8451 |
| 306 | 12 | Alpha FM | 42 | 5 | 5 | 3 | 0 | 12 |
| 306 | 12 | Beta FM | 42 | 593 | 581 | 129 | 415 | 971 |
| 306 | 12 | Alpha PH | 47 | 1 | 1 | 1 | 0 | 4 |
| 306 | 12 | Beta PH | 47 | 147 | 145 | 21 | 93 | 189 |
| 306 | 12 | Gamma FIDLER | 89 | 5163 | 5190 | 1490 | 2616 | 10669 |
| 306 | 13 | Alpha FM | 21 | 7 | 7 | 4 | 1 | 18 |
| 306 | 13 | Beta FM | 21 | 667 | 636 | 130 | 557 | 1106 |
| 306 | 13 | Alpha PH | 21 | 1 | 1 | 1 | 0 | 3 |
| 306 | 13 | Beta PH | 21 | 200 | 180 | 119 | 140 | 711 |
| 306 | 13 | Gamma FIDLER | 42 | 4866 | 4556 | 976 | 3723 | 7393 |

**Table A4-6**
**Summary Statistics**
**Building 306 Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute.

# Table A4-7
## Summary Statistics
## Building 2073 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|---|
| 2073 | 1 | Alpha FM | 56 | 5 | 5 | 3 | 0 | 12 |
| 2073 | 1 | Beta FM | 56 | 578 | 609 | 82 | 397 | 686 |
| 2073 | 1 | Alpha PH | 67 | 1 | 1 | 1 | 0 | 5 |
| 2073 | 1 | Beta PH | 67 | 161 | 160 | 23 | 105 | 213 |
| 2073 | 1 | Gamma FIDLER | 123 | 3854 | 3693 | 850 | 2139 | 6819 |
| 2073 | 2 | Alpha PH | 25 | 2 | 2 | 1 | 0 | 4 |
| 2073 | 2 | Beta PH | 25 | 188 | 196 | 40 | 91 | 234 |
| 2073 | 2 | Gamma FIDLER | 25 | 5184 | 5496 | 930 | 2891 | 6077 |
| 2073 | 3 | Alpha FM | 32 | 7 | 7 | 2 | 3 | 11 |
| 2073 | 3 | Beta FM | 32 | 522 | 555 | 100 | 368 | 684 |
| 2073 | 3 | Alpha PH | 31 | 1 | 1 | 1 | 0 | 3 |
| 2073 | 3 | Beta PH | 31 | 146 | 142 | 20 | 110 | 179 |
| 2073 | 3 | Gamma FIDLER | 63 | 5516 | 5499 | 524 | 3949 | 6765 |

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute.

# Table A4-8
## Summary Statistics
## Building S-2084 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 2084 | 2 | Alpha FM | 20 | 4 | 3.5 | 2 | 0 | 9 |
| 2084 | 2 | Beta FM | 20 | 594 | 642 | 104 | 400 | 716 |
| 2084 | 2 | Alpha Phoswich | 14 | 1 | 1 | 1 | 0 | 4 |
| 2084 | 2 | Beta Phoswich | 14 | 132 | 126 | 29 | 91 | 193 |
| 2084 | 2 | Gamma FIDLER | 34 | 5569 | 5574 | 534 | 3336 | 6558 |
| 2084 | 3 | Alpha FM | 74 | 6 | 5 | 3 | 1 | 15 |
| 2084 | 3 | Beta FM | 74 | 631 | 660 | 126 | 371 | 823 |
| 2084 | 3 | Alpha Phoswich | 99 | 1 | 1 | 1 | 0 | 7 |
| 2084 | 3 | Beta Phoswich | 99 | 126 | 122 | 24 | 90 | 221 |
| 2084 | 3 | Gamma FIDLER | 173 | 3994 | 3757 | 832 | 2287 | 6176 |
| 2084 | 6 | Alpha FM | 15 | 4 | 5 | 2 | 1 | 9 |
| 2084 | 6 | Beta FM | 15 | 512 | 447 | 121 | 378 | 760 |
| 2084 | 6 | Gamma FIDLER | 15 | 5335 | 5291 | 486 | 4553 | 6187 |

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute.

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 5 | 1 | Alpha FM | 5 | 11 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 1 | Beta FM | 661 | 1043 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 1 | Alpha PH | 1 | 8 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 1 | Beta PH | 170 | 336 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 1 | Gamma FIDLER | 5172 | 10791 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 2 | Alpha FM | 5 | 11 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 2 | Beta FM | 693 | 1087 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 2 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 2 | Beta PH | 175 | 212 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 2 | Gamma FIDLER | 6317 | 12071 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 3 | Alpha FM | 6 | 10 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 3 | Beta FM | 663 | 809 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 3 | Alpha PH | 1 | 2 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 3 | Beta PH | 177 | 211 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 3 | Gamma FIDLER | 4258 | 5494 | 11265 | 5267 | 3047 | Yes | Yes | |
| 5 | 4 | Alpha FM | 5 | 9 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 4 | Beta FM | 672 | 816 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 4 | Alpha PH | 1 | 2 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 4 | Beta PH | 220 | 335 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 4 | Gamma FIDLER | 4874 | 7619 | 11265 | 5267 | 3047 | Yes | Yes | |
| 5 | 5 | Alpha FM | 5 | 11 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 5 | Beta FM | 678 | 754 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 5 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 5 | Beta PH | 143 | 223 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 5 | Gamma FIDLER | 4419 | 7493 | 11265 | 5267 | 3047 | Yes | Yes | |
| 5 | 6 | Alpha FM | 5 | 12 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 6 | Beta FM | 649 | 754 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 6 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 6 | Beta PH | 162 | 207 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 6 | Gamma FIDLER | 4981 | 7462 | 11265 | 5267 | 3047 | Yes | Yes | |

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 5 | 7 | Alpha FM | 3 | 5 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 7 | Beta FM | 813 | 887 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 7 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 7 | Beta PH | 252 | 385 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 7 | Gamma FIDLER | 8261 | 13108 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 8 | Alpha FM | 4 | 6 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 8 | Beta FM | 787 | 1059 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 8 | Alpha PH | 2 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 8 | Beta PH | 274 | 377 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 8 | Gamma FIDLER | 8829 | 13109 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 9 | Alpha FM | 4 | 12 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 9 | Beta FM | 703 | 802 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 9 | Alpha PH | 1 | 5 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 9 | Beta PH | 169 | 201 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 9 | Gamma FIDLER | 4825 | 7284 | 11265 | 5267 | 3047 | Yes | Yes | |
| 5 | 10 | Alpha FM | 5 | 8 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 10 | Beta FM | 761 | 1031 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 10 | Alpha PH | 2 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 10 | Beta PH | 209 | 331 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 10 | Gamma FIDLER | 6625 | 11742 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 11 | Alpha FM | 5 | 6 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 11 | Beta FM | 764 | 790 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 11 | Alpha PH | 1 | 2 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 11 | Beta PH | 182 | 409 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 11 | Gamma FIDLER | 9021 | 11913 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 12 | Alpha PH | 1 | 3 | 4 | 0 | 3959 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 12 | Beta PH | 263 | 369 | 365 | 160 | 2903 | Yes | Yes | |
| 5 | 12 | Gamma FIDLER | 10822 | 13713 | 11265 | 5267 | 3047 | Yes | **No** | |

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 5 | 13 | Alpha FM | 6 | 8 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 13 | Beta FM | 781 | 799 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 13 | Alpha PH | 1 | 10 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 13 | Beta PH | 210 | 291 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 13 | Gamma FIDLER | 6757 | 9098 | 11265 | 5267 | 3047 | Yes | **No** | |
| 5 | 14 | Alpha FM | 4 | 5 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 5 | 14 | Beta FM | 505 | 564 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 14 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 14 | Beta PH | 155 | 365 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 14 | Gamma FIDLER | 5196 | 7693 | 11265 | 5267 | 3047 | Yes | Yes | |
| 5 | 15 | Alpha FM | 5 | 5 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 15 | Beta FM | 684 | 718 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 15 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 15 | Beta PH | 230 | 444 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 15 | Gamma FIDLER | 9220 | 11574 | 11265 | 5267 | 6015 | Yes | **No** | |
| 5 | 16 | Alpha FM | 5 | 10 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 5 | 16 | Beta FM | 699 | 873 | 775 | 498 | 34074 | Yes | Yes | |
| 5 | 16 | Alpha PH | 0.6 | 2 | 4 | 0 | 3940 | Yes | Yes | |
| 5 | 16 | Beta PH | 217 | 343 | 365 | 160 | 2889 | Yes | Yes | |
| 5 | 16 | Gamma FIDLER | 7420 | 9388 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 1 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 1 | Beta PH | 162 | 208 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 1 | Gamma FIDLER | 9450 | 13635 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 2 | Alpha PH | 2 | 7 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 2 | Beta PH | 184 | 231 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 2 | Gamma FIDLER | 8142 | 11294 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 3 | Alpha PH | 2 | 5 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 3 | Beta PH | 252 | 410 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 3 | Gamma FIDLER | 10457 | 17053 | 11265 | 5267 | 3047 | Yes | **No** | |

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 306 | 4 | Alpha PH | 2 | 6 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 4 | Beta PH | 287 | 475 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 4 | Gamma FIDLER | 10752 | 15915 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 5 | Alpha PH | 1 | 5 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 5 | Beta PH | 218 | 339 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 5 | Gamma FIDLER | 7737 | 11176 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 6 | Alpha PH | 1 | 5 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 6 | Beta PH | 239 | 346 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 6 | Gamma FIDLER | 8787 | 12980 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 7 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 7 | Beta PH | 209 | 348 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 7 | Gamma FIDLER | 7837 | 10787 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 8 | Alpha PH | 2 | 4 | 4 | 0 | 3940 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 8 | Beta PH | 197 | 347 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 8 | Gamma FIDLER | 6290 | 12064 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 10 | Alpha FM | 7 | 13 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 10 | Beta FM | 723 | 1311 | 775 | 498 | 34074 | Yes | Yes | |
| 306 | 10 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 306 | 10 | Beta PH | 181 | 363 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 10 | Gamma FIDLER | 6394 | 12382 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 11 | Alpha FM | 6 | 12 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 11 | Beta FM | 607 | 1034 | 775 | 498 | 34074 | Yes | Yes | |
| 306 | 11 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 306 | 11 | Beta PH | 151 | 181 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 11 | Gamma FIDLER | 5835 | 8451 | 11265 | 5267 | 3047 | Yes | **No** | |
| 306 | 12 | Alpha FM | 5 | 12 | 3.8 | 0 | 9209 | Yes | Yes | Perform WRS test for FIDLER data set |
| 306 | 12 | Beta FM | 593 | 971 | 775 | 498 | 34074 | Yes | Yes | |
| 306 | 12 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 306 | 12 | Beta PH | 147 | 189 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 12 | Gamma FIDLER | 5163 | 10669 | 11265 | 5267 | 3047 | Yes | **No** | |

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 306 | 13 | Alpha FM | 7 | 18 | 3.8 | 0 | 9209 | Yes | Yes | Survey Unit Meets Release Criterion |
| 306 | 13 | Beta FM | 667 | 1106 | 775 | 498 | 34074 | Yes | Yes | |
| 306 | 13 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 306 | 13 | Beta PH | 200 | 711 | 365 | 160 | 2889 | Yes | Yes | |
| 306 | 13 | Gamma FIDLER | 4866 | 7393 | 11265 | 5267 | 3047 | Yes | Yes | |
| 2073 | 1 | Alpha FM | 5 | 12 | 3.8 | 0 | 9209 | Yes | Yes | Survey Unit Meets Release Criterion |
| 2073 | 1 | Beta FM | 578 | 686 | 775 | 498 | 34074 | Yes | Yes | |
| 2073 | 1 | Alpha PH | 1 | 5 | 4 | 0 | 3940 | Yes | Yes | |
| 2073 | 1 | Beta PH | 161 | 213 | 365 | 160 | 2889 | Yes | Yes | |
| 2073 | 1 | Gamma FIDLER | 3854 | 6819 | 11265 | 5267 | 3047 | Yes | Yes | |
| 2073 | 2 | Alpha PH | 2 | 4 | 4 | 0 | 3940 | Yes | Yes | Survey Unit Meets Release Criterion |
| 2073 | 2 | Beta PH | 188 | 234 | 365 | 160 | 2889 | Yes | Yes | |
| 2073 | 2 | Gamma FIDLER | 5184 | 6077 | 11265 | 5267 | 3047 | Yes | Yes | |
| 2073 | 3 | Alpha FM | 7 | 11 | 3.8 | 0 | 9209 | Yes | Yes | Survey Unit Meets Release Criterion |
| 2073 | 3 | Beta FM | 522 | 684 | 775 | 498 | 34074 | Yes | Yes | |
| 2073 | 3 | Alpha PH | 1 | 3 | 4 | 0 | 3940 | Yes | Yes | |
| 2073 | 3 | Beta PH | 146 | 179 | 365 | 160 | 2889 | Yes | Yes | |
| 2073 | 3 | Gamma FIDLER | 5516 | 6765 | 11265 | 5267 | 3047 | Yes | Yes | |
| 2084 | 2 | Alpha FM | 4 | 9 | 3.8 | 0 | 9209 | Yes | Yes | Survey Unit Meets Release Criterion |
| 2084 | 2 | Beta FM | 594 | 716 | 775 | 498 | 34074 | Yes | Yes | |
| 2084 | 2 | Alpha PH | 1 | 4 | 4 | 0 | 3940 | Yes | Yes | |
| 2084 | 2 | Beta PH | 132 | 193 | 365 | 160 | 2889 | Yes | Yes | |
| 2084 | 2 | Gamma FIDLER | 5569 | 6558 | 11265 | 5267 | 3047 | Yes | Yes | |
| 2084 | 3 | Alpha FM | 6 | 15 | 3.8 | 0 | 9209 | Yes | Yes | Survey Unit Meets Release Criterion |
| 2084 | 3 | Beta FM | 631 | 823 | 775 | 498 | 34074 | Yes | Yes | |
| 2084 | 3 | Alpha PH | 1 | 7 | 4 | 0 | 3940 | Yes | Yes | |
| 2084 | 3 | Beta PH | 126 | 221 | 365 | 160 | 2889 | Yes | Yes | |
| 2084 | 3 | Gamma FIDLER | 3994 | 6176 | 11265 | 5267 | 3047 | Yes | Yes | |

**Table A4-9**
**Initial Scenario A Data Reduction**
**Depleted Uranium Storage Buildings - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Survey Unit** | | **Dataset [1]** | **Mean (cpm) [2]** | **Maximum (cpm) [2]** | **Mean (cpm) [3]** | **Minimum (cpm) [3]** | **$DCGL_W$ (cpm) [4]** | **Difference between SU mean and bkgd mean less than DCGLw?** | **Difference between SU max and bkgd min less than $DCGL_W$?** | **Conclusion [5]** |
| 2084 | 6 | Alpha FM | 4 | 9 | 3.8 | 0 | 9209 | Yes | Yes | **Survey Unit Meets Release Criterion** |
| 2084 | 6 | Beta FM | 512 | 760 | 775 | 498 | 34074 | Yes | Yes | |
| 2084 | 6 | Gamma FIDLER | 5335 | 6187 | 11265 | 5267 | 3047 | Yes | Yes | |

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; PH = alpha/beta phoswich scintillator; FIDLER = low-energy gamma scintillator.

(2) cpm = counts per minute. Refer to **Tables A4-5** through **A4-8** for complete summary statistics for each survey unit.

(3) The reference area for the DU Storage Buildings was Building 722. Refer to **Table A2-3** for complete summary statistics for the reference areas.

(4) The instrument-specific $DCGL_W$ was calculated using the physical or active probe area in $cm^2$ and the instrument efficiency (**Table A4-2**), and does not include background.

(5) Per MARSSIM Section 8 and **Figure A2-1** of this addendum.

**Table A4-10**
**Wilcoxon Rank Sum Test Results**
**Depleted Uranium Storage Buildings**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| 5-1 | Gamma FIDLER | 85 | 120 | 13048.3 | 17405 | Reject | Survey Unit Meets Release Criterion |
| 5-2 | Gamma FIDLER | 20 | 120 | 8736.2 | 9623 | Reject | Survey Unit Meets Release Criterion |
| 5-7 | Gamma FIDLER | 24 | 120 | 9006.9 | 9910 | Reject | Survey Unit Meets Release Criterion |
| 5-8 | Gamma FIDLER | 21 | 120 | 8804.1 | 9568 | Reject | Survey Unit Meets Release Criterion |
| 5-10 | Gamma FIDLER | 25 | 120 | 9074.3 | 10210.5 | Reject | Survey Unit Meets Release Criterion |
| 5-11 | Gamma FIDLER | 30 | 120 | 9410.1 | 10609.5 | Reject | Survey Unit Meets Release Criterion |
| 5-12 | Gamma FIDLER | 30 | 120 | 9410.1 | 10174.5 | Reject | Survey Unit Meets Release Criterion |
| 5-13 | Gamma FIDLER | 30 | 120 | 9410.1 | 10845 | Reject | Survey Unit Meets Release Criterion |
| 5-15 | Gamma FIDLER | 30 | 120 | 9410.1 | 10568 | Reject | Survey Unit Meets Release Criterion |
| 5-16 | Gamma FIDLER | 13 | 120 | 8257.1 | 8798 | Reject | Survey Unit Meets Release Criterion |
| 306-1 | Gamma FIDLER | 30 | 120 | 9410.1 | 10447 | Reject | Survey Unit Meets Release Criterion |
| 306-2 | Gamma FIDLER | 30 | 120 | 9410.1 | 10742 | Reject | Survey Unit Meets Release Criterion |
| 306-3 | Gamma FIDLER | 30 | 120 | 9410.1 | 10225 | Reject | Survey Unit Meets Release Criterion |
| 306-4 | Gamma FIDLER | 30 | 120 | 9410.1 | 10110 | Reject | Survey Unit Meets Release Criterion |
| 306-5 | Gamma FIDLER | 30 | 120 | 9410.1 | 10721 | Reject | Survey Unit Meets Release Criterion |
| 306-6 | Gamma FIDLER | 30 | 120 | 9410.1 | 10591 | Reject | Survey Unit Meets Release Criterion |
| 306-7 | Gamma FIDLER | 30 | 120 | 9410.1 | 10723 | Reject | Survey Unit Meets Release Criterion |
| 306-8 | Gamma FIDLER | 30 | 120 | 9410.1 | 10810 | Reject | Survey Unit Meets Release Criterion |
| 306-10 | Gamma FIDLER | 41 | 120 | 10144 | 12069 | Reject | Survey Unit Meets Release Criterion |
| 306-11 | Gamma FIDLER | 46 | 120 | 10475.9 | 12776 | Reject | Survey Unit Meets Release Criterion |
| 306-12 | Gamma FIDLER | 89 | 120 | 13311.2 | 17893 | Reject | Survey Unit Meets Release Criterion |

Notes:

(1) Measurements from each survey unit were grouped by radiation type and instrument.

(2) The Valid N for a dataset refers to the number of measurements from that dataset used in the WRS test.

(3) The Critical Value for the WRS test was calculated per MARSSIM Appendix I.

(4) Per MARSSIM for Scenario A, if the Sum of Reference Area Ranks is greater than the Critical Value, the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$ is rejected, and the survey unit passes (i.e., the survey unit meets the release criterion). Electronic versions of the WRS test spreadsheets (per MARSSIM Appendix I) are available in the **Supporting Files**.

(5) Conclusions for these survey units are based on the WRS test results, and the initial data reduction shown in **Table A4-9**.

**Table A4-11**
**Summary of Building Scanning Results**
**Depleted Uranium Storage Buildings**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/ Room) | | Number of Grids Scanned | Scanning Minimum (cpm) [1] | Scanning Maximum (cpm) | Average of Scanning Mean (cpm) [2] | Standard Deviation of Scanning Mean (cpm) | Flag Value (cpm) [3] | Maximum Reading Greater than Flag? |
|---|---|---|---|---|---|---|---|---|
| **ALPHA/BETA FLOOR MONITOR** | | | | | | | | |
| 5 | 1 | 53 | 300 | 1200 | 609 | 113 | 44062 | No |
| 5 | 2 | 14 | 200 | 1300 | 654 | 117 | 44062 | No |
| 5 | 3 | 11 | 300 | 900 | 627 | 61 | 44062 | No |
| 5 | 4 | 11 | 400 | 900 | 659 | 58 | 44062 | No |
| 5 | 5 | 30 | 400 | 900 | 657 | 64 | 44062 | No |
| 5 | 6 | 30 | 300 | 1000 | 645 | 79 | 44062 | No |
| 5 | 7 | 7 | 600 | 1100 | 814 | 48 | 44062 | No |
| 5 | 8 | 13 | 400 | 1300 | 785 | 149 | 44062 | No |
| 5 | 9 | 27 | 300 | 1000 | 685 | 88 | 44062 | No |
| 5 | 10 | 16 | 400 | 1200 | 744 | 83 | 44062 | No |
| 5 | 16 | 8 | 400 | 1200 | 744 | 105 | 44062 | No |
| 306 | 10 | 23 | 300 | 1400 | 643 | 125 | 44062 | No |
| 306 | 11 | 18 | 300 | 1200 | 603 | 117 | 44062 | No |
| 306 | 12 | 42 | 300 | 1200 | 589 | 89 | 44062 | No |
| 306 | 13 | 21 | 400 | 1200 | 660 | 103 | 44062 | No |
| 2073 | 1 | 56 | 200 | 900 | 563 | 83 | 44062 | No |
| 2073 | 3 | 32 | 200 | 800 | 500 | 97 | 44062 | No |
| 2084 | 2 | 20 | 200 | 800 | 615 | 110 | 44062 | No |
| 2084 | 3 | 74 | 200 | 1000 | 572 | 116 | 44062 | No |
| 2084 | 6 | 15 | 200 | 800 | 473 | 112 | 44062 | No |
| **ALPHA/BETA PHOSWICH** | | | | | | | | |
| 5 | 1 | 32 | 80 | 400 | 176 | 33 | 7198 | No |
| 5 | 2 | 6 | 80 | 300 | 182 | 32 | 7198 | No |
| 5 | 3 | 6 | 100 | 380 | 193 | 32 | 7198 | No |
| 5 | 4 | 6 | 100 | 400 | 222 | 43 | 7198 | No |
| 5 | 5 | 59 | 40 | 300 | 151 | 23 | 7198 | No |
| 5 | 6 | 18 | 80 | 280 | 165 | 19 | 7198 | No |
| 5 | 7 | 17 | 80 | 460 | 247 | 64 | 7198 | No |
| 5 | 8 | 8 | 100 | 420 | 258 | 50 | 7198 | No |
| 5 | 9 | 32 | 80 | 320 | 173 | 20 | 7198 | No |
| 5 | 10 | 9 | 100 | 480 | 220 | 61 | 7198 | No |
| 5 | 11 | 2 | 100 | 240 | 170 | 28 | 7198 | No |
| 5 | 12 | 2 | 120 | 380 | 240 | 42 | 7198 | No |
| 5 | 13 | 4 | 100 | 300 | 193 | 19 | 7198 | No |
| 5 | 14 | 2 | 80 | 380 | 195 | 78 | 7198 | No |
| 5 | 15 | 2 | 140 | 380 | 245 | 35 | 7198 | No |
| 5 | 16 | 5 | 120 | 460 | 238 | 55 | 7198 | No |
| 306 | 1 | 5 | 60 | 240 | 148 | 16 | 7198 | No |
| 306 | 2 | 4 | 60 | 300 | 160 | 37 | 7198 | No |
| 306 | 3 | 1 | 100 | 320 | 210 | 156 | 7198 | No |
| 306 | 4 | 1 | 180 | 320 | 250 | 99 | 7198 | No |
| 306 | 5 | 2 | 140 | 400 | 240 | 42 | 7198 | No |

## Table A4-11
## Summary of Building Scanning Results
## Depleted Uranium Storage Buildings
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/ Room) | | Number of Grids Scanned | Scanning Minimum (cpm) [1] | Scanning Maximum (cpm) | Average of Scanning Mean (cpm) [2] | Standard Deviation of Scanning Mean (cpm) | Flag Value (cpm) [3] | Maximum Reading Greater than Flag? |
|---|---|---|---|---|---|---|---|---|
| 306 | 6 | 3 | 120 | 380 | 247 | 6 | 7198 | No |
| 306 | 7 | 6 | 100 | 300 | 202 | 19 | 7198 | No |
| 306 | 8 | 3 | 100 | 360 | 200 | 30 | 7198 | No |
| 306 | 10 | 18 | 60 | 480 | 184 | 53 | 7198 | No |
| 306 | 11 | 28 | 60 | 300 | 161 | 19 | 7198 | No |
| 306 | 12 | 47 | 60 | 300 | 154 | 17 | 7198 | No |
| 306 | 13 | 21 | 60 | 800 | 195 | 119 | 7198 | No |
| 2073 | 1 | 67 | 80 | 300 | 166 | 22 | 7198 | No |
| 2073 | 2 | 25 | 60 | 340 | 195 | 29 | 7198 | No |
| 2073 | 3 | 31 | 40 | 260 | 157 | 17 | 7198 | No |
| 2084 | 2 | 14 | 60 | 220 | 137 | 18 | 7198 | No |
| 2084 | 3 | 99 | 40 | 280 | 134 | 20 | 7198 | No |
| **GAMMA FIDLER** | | | | | | | | |
| 5 | 1 | 85 | 2000 | 14000 | 5253 | 1654 | 14312 | No |
| 5 | 2 | 20 | 2000 | 15000 | 6738 | 2203 | 14312 | Yes [4] |
| 5 | 3 | 17 | 2000 | 7000 | 4368 | 531 | 14312 | No |
| 5 | 4 | 17 | 2000 | 10000 | 4824 | 814 | 14312 | No |
| 5 | 5 | 89 | 2000 | 10000 | 4480 | 715 | 14312 | No |
| 5 | 6 | 48 | 2000 | 10000 | 5182 | 1345 | 14312 | No |
| 5 | 7 | 24 | 2000 | 16000 | 8344 | 2511 | 14312 | Yes |
| 5 | 8 | 21 | 4000 | 15000 | 9024 | 2159 | 14312 | Yes |
| 5 | 9 | 59 | 2000 | 10000 | 5140 | 1507 | 14312 | No |
| 5 | 10 | 25 | 3200 | 13000 | 6554 | 1809 | 14312 | No |
| 5 | 11 | 2 | 5000 | 11000 | 8500 | 2121 | 14312 | No |
| 5 | 12 | 2 | 8000 | 13000 | 10500 | 0 [5] | 14312 | No |
| 5 | 13 | 4 | 4000 | 9000 | 6000 | 408 | 14312 | No |
| 5 | 14 | 2 | 3000 | 7000 | 5000 | 0 [5] | 14312 | No |
| 5 | 15 | 2 | 5000 | 12000 | 8750 | 1768 | 14312 | No |
| 5 | 16 | 13 | 3000 | 13000 | 7769 | 1666 | 14312 | No |
| 306 | 1 | 5 | 6000 | 12000 | 9200 | 758 | 14312 | No |
| 306 | 2 | 4 | 5000 | 11000 | 8000 | 913 | 14312 | No |
| 306 | 3 | 1 | 7000 | 12000 | 9500 | 3536 | 14312 | No |
| 306 | 4 | 1 | 8000 | 12000 | 10000 | 2828 | 14312 | No |
| 306 | 5 | 2 | 5000 | 10000 | 7500 | 0 [5] | 14312 | No |
| 306 | 6 | 3 | 6000 | 10000 | 8333 | 289 | 14312 | No |
| 306 | 7 | 6 | 4000 | 11000 | 6667 | 1033 | 14312 | No |
| 306 | 8 | 3 | 4000 | 9000 | 6333 | 289 | 14312 | No |
| 306 | 10 | 41 | 3000 | 13000 | 6510 | 1613 | 14312 | No |
| 306 | 11 | 46 | 3000 | 10000 | 6239 | 861 | 14312 | No |
| 306 | 12 | 89 | 2000 | 12000 | 5242 | 1429 | 14312 | No |
| 306 | 13 | 42 | 2000 | 9000 | 4764 | 1113 | 14312 | No |
| 2073 | 1 | 123 | 1000 | 8000 | 3809 | 816 | 14312 | No |

## Table A4-11
## Summary of Building Scanning Results
## Depleted Uranium Storage Buildings
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/ Room) | | Number of Grids Scanned | Scanning Minimum (cpm) [1] | Scanning Maximum (cpm) | Average of Scanning Mean (cpm) [2] | Standard Deviation of Scanning Mean (cpm) | Flag Value (cpm) [3] | Maximum Reading Greater than Flag? |
|---|---|---|---|---|---|---|---|---|
| 2073 | 2 | 25 | 2000 | 8000 | 5040 | 776 | 14312 | No |
| 2073 | 3 | 63 | 3000 | 8000 | 5083 | 447 | 14312 | No |
| 2084 | 2 | 34 | 2000 | 8000 | 5250 | 448 | 14312 | No |
| 2084 | 3 | 173 | 1000 | 8000 | 3893 | 788 | 14312 | No |
| 2084 | 6 | 15 | 3000 | 7000 | 4933 | 458 | 14312 | No |

Notes:

(1) cpm = counts per minute.

(2) The scanning mean for the survey unit was calculated by averaging the average scanning measurement from the total number of scanning locations from each survey unit, and the standard deviation of the scanning mean is the standard deviation of the those averages.

(3) The scanning flag values for measurements in the Class 2 and 3 survey units are based on the gross activity $DCGL_W$ for DU. Average background is included in the flag value. The alpha/beta flag values are the sum of the alpha and beta DU $DCGL_W$'s for that instrument (**Table A4-2**).

(4) All FIDLER scanning measurements were below the background corrected $DCGL_{EMC}$ of 47528 cpm (**Table A4-2**).

(5) Three survey grids were scanned with this instrument and each had the same range and average measurement; therefore, the standard deviation for the average scanning measurment for this survey unit is zero.

## Table A5-1
## List of Building 612 Survey Units [1,2]
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Building | Room | Survey Unit Designation | MARSSIM Classification | Applicable Licenses |
|---|---|---|---|---|
| | | | | |
| 612 | A | 612-A | 1 | SUC-1275; SUC-1380 |
| | B | 612-B | 1 | SUC-1275; SUC-1380 |
| | C | 612-C | 1 | SUC-1275; SUC-1380 |
| | D | 612-D | 1 | SUC-1275; SUC-1380 |
| | E | 612-E | 1 | SUC-1275; SUC-1380 |
| | F | 612-F | 1 | SUC-1275; SUC-1380 |
| | G | 612-G | 1 | SUC-1275; SUC-1380 |
| | H | 612-H | 1 | SUC-1275; SUC-1380 |
| | I | 612-I | 1 | SUC-1275; SUC-1380 |
| | J | 612-J | 1 | SUC-1275; SUC-1380 |
| | K | 612-K | 1 | SUC-1275; SUC-1380 |
| | L | 612-L | 1 | SUC-1275; SUC-1380 |
| | M | 612-M | 1 | SUC-1275; SUC-1380 |
| | N | 612-N | 1 | SUC-1275; SUC-1380 |
| | O | 612-O | 1 | SUC-1275; SUC-1380 |
| | P | 612-P | 1 | SUC-1275; SUC-1380 |
| | Q | 612-Q | 1 | SUC-1275; SUC-1380 |
| | R | 612-R | 1 | SUC-1275; SUC-1380 |
| | S | 612-S | 1 | SUC-1275; SUC-1380 |
| | T | 612-T | 1 | SUC-1275; SUC-1380 |
| | U | 612-U | 1 | SUC-1275; SUC-1380 |
| | V | 612-V | 1 | SUC-1275; SUC-1380 |
| | W | 612-W | 1 | SUC-1275; SUC-1380 |
| | X | 612-X | 1 | SUC-1275; SUC-1380 |
| | Y | 612-Y | 1 | SUC-1275; SUC-1380 |
| | Z | 612-Z | 1 | SUC-1275; SUC-1380 |
| | AA | 612-AA | 1 | SUC-1275; SUC-1380 |
| | BB | 612-BB | 1 | SUC-1275; SUC-1380 |

Notes:
(1) Buildings were used for receipt and storage of packaged DU ammunition (SUC-1275).
(2) Compiled from *Seneca Army Depot Activity License Termination and License Release Plan* (ANL, 2003).

**Table A5-2**
**Derived Concentration Guideline Levels**
**Building 612**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Instrument | Applicable DCGLw | $DCGL_W$ ($dpm/100cm^2$) [1] | $DCGL_{EMC}$ ($dpm/100cm^2$) [2] | Area ($cm^2$) | Efficiency [3] | $DCGL_W$ (cpm) [4] | $DCGL_{EMC}$ (cpm) [4] | Background Average (cpm) | Background Dataset | Background Corrected $DCGL_W$ (cpm) [5] | Background Corrected $DCGL_{EMC}$ (cpm) [5] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| Alpha Floor Monitor | Depleted Uranium | 31647 | 376599 | 582 | 18.2% | 33522 | 398909 | 7 | Blgd 2078 | **33529** | **398916** |
| Beta Floor Monitor | Depleted Uranium | 31647 | 376599 | 582 | 33.4% | 61518 | 732064 | 951 | Blgd 2078 | **62469** | **733015** |
| Alpha Handheld Gas Proportional | Depleted Uranium | 31647 | 376599 | 126 | 17.7% | 7058 | 83989 | 1 | Blgd 2078 | **7059** | **83990** |
| Beta Handheld Gas Proportional | Depleted Uranium | 31647 | 376599 | 126 | 24% | 9570 | 113884 | 186 | Blgd 2078 | **9756** | **114070** |
| Gamma FIDLER | Depleted Uranium | 31647 | 376599 | 126.7 | 0.75% | 301 | 3579 | 3211 | DFC [6] | **3512** | **6790** |

Notes:

(1) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Depleted uranium DCGL calculated using equation 4-4 of MARSSIM. Expected activity fractions for depleted uranium based on uranium depleted to 99.8 weight percent U-238, 0.2 weight percent U-235, and 0.0006 weight percent U-234 (WHO, 2001).

(2) $DCGL_{EMC}$ based on area factor of 11.9 for 4 $m^2$ grid (from ANL, 2003, for worst-case radionuclide [U-235]).

(3) Average efficiency for instrument as determined by daily function checks during survey (**Appendix 5.A**).

(4) The instrument-specific $DCGL_W$ and $DCGL_{EMC}$ in counts per minute (cpm) are calculated using the instrument efficiency and active probe area.

(5) The Background Corrected $DCGL_W$ and $DCGL_{EMC}$ for each instrument is the sum of the DCGL and the Background Average for that instrument.

(6) DFC = daily function checks. The background average used in this calculation for the FIDLER was from the background measurements conducted as part of the daily function check.

# Table A5-3
# Survey Instrumentation
# Building 612
# License Termination Report Addendum A
# Seneca Army Depot Activity

| Instrument | Measurement Type | Probe | Meter | Probe Area ($cm^2$) (1) | Average Instrument Efficiency (2) | 1-Minute Direct Measurement MDA ($dpm/100cm^2$) (3) | Scanning MDA ($dpm/100cm^2$) (3) | $DCGL_w$ for DU ($dpm/100cm^2$) (4) |
|---|---|---|---|---|---|---|---|---|
| Hand-Held Gas Proportional | Alpha/Beta | Ludlum Model 43-68 | Ludlum Model 2360 | 126 | Alpha: 17.7% Beta: 24% | Alpha: 11 Beta: 115 | 1352 | 31647 |
| Floor Monitor | Alpha/Beta | Ludlum Model 43-37 | Ludlum Model 2360 | 582 | Alpha: 18.2% Beta: 33.4% | Alpha: 8 Beta: 56 | 514 | 31647 |
| FIDLER | Low-Energy Gamma | Bicron G5 FIDLER | Bicron Analyst | 126.7 | 0.75% | 15239 (5) | 166939 (5) | 31647 |
| Exposure Rate | Ambient Gamma Exposure Rate | No data available | | -- (6) | -- | -- | -- | NA (7) |
| GM Pancake | Alpha/Beta/Gamma | No data available | | -- | -- | -- | -- | NA |

Notes:

(1) $cm^2$ = square centimeters. Areas listed and used in the calculations are the active or physical probe area listed by the manufacturer, per MARSSIM Section 6.6.1 (NRC, 2000).

(2) Except where noted, the average instrument efficiency was determined from the daily function check data (refer to **Appendix 5.A**).

(3) $dpm/100cm^2$ = decays per minute per 100 square centimeters. Except where noted, the minimum detectable activities (MDAs) were calculated using the procedures outlined in MARSSIM Section 6.7 (NRC, 2000).

(4) Gross activity $DCGL_w$ was calculated using radionuclide-specific DCGLs derived by ANL, 2003 (**Appendix 1.A**).

(5) Average background from daily function checks used in MDA calculations for FIDLER (**Appendix 5.A**).

(6) "--" = Indicates that parameter was not used or calculated for instrument.

(7) NA= not applicable. DCGLs were not applied to exposure rate or personnel/equipment frisking measurements.

**Table A5-4**
**Total Number of Required Measurements**
**Building 612**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Dataset [1] | Gross Activity $DCGL_W$ ($dpm/100cm^2$) [2] | Background Corrected $DCGL_W$ (cpm) [3] | LBGR [4] | Δ [5] | Observed Survey σ (cpm) [6] | Observed Bkgd σ (cpm) | Δ/σ [7] | Pr [8] | Z(1-α) [9] | Z(1-β) [9] | Total N [10] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FIDLER - DFC bkgd [11] | 31647 | 3512 | 1756 | 1756 | 1270 | 1156 | 1.4 | 0.84 | 1.645 | 1.645 | 31 |
| Alpha HH - 2078 | 31647 | 7059 | 3530 | 3530 | 1 | 1 | 2675 | 1.00 | 1.645 | 1.645 | 14 |
| Beta HH - 2078 | 31647 | 9570 | 4785 | 4785 | 45 | 71 | 68 | 1.00 | 1.645 | 1.645 | 14 |
| Alpha FM - 2078 | 31647 | 33522 | 16761 | 16761 | 2 | 3 | 4883 | 1.00 | 1.645 | 1.645 | 14 |
| Beta FM - 2078 | 31647 | 61518 | 30759 | 30759 | 70 | 182 | 169 | 1.00 | 1.645 | 1.645 | 14 |

Notes:

(1) All measurements for all survey units are combined for this evaluation. Instruments: FM = alpha/beta gas proportional floor monitor; FIDLER = low-energy gamma scintillator; HH = alpha/beta gas proportional hand-held detector.

(2) dpm/100cm2 = decays per minute per 100 square centimeters. Gross activity DCGLw for DU calculated per MARSSIM.

(3) cpm = counts per minute. Instrument-specific DCGLw calculated per MARSSIM. Includes average background count rate.

(4) LBGR = lower bound of gray region. Per MARSSIM, LBGR was set to 1/2 of the DCGLw.

(5) Δ = DCGLw - LBGR.

(6) The standard deviation ($\sigma$) for the survey data includes all measurements collected with that instrument.

(7) Δ/σ calculated using the larger value between the survey standard deviation and the background standard deviation.

(8) Values of Pr are from Table 5.1 of MARSSIM using Δ/σ. Pr is defined by MARSSIM as the probability that a random measurement from the survey unit exceeds a random measurement from the background reference area by less than the DCGLW when the survey unit median is equal to the LBGR above background.

(9) Values of Z(1-α) and Z(1-β) (decision error percentiles) are from Table 5.2 of MARSSIM for $\alpha=\beta=0.05$.

(10) N = total required number of measurements or samples (includes both survey and background areas).

(11) Background measurements used for the 612 FIDLER data were the background measurements from the daily instrument function check data (DFC).

# Table A5-5
## Summary Statistics
## Building 612 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset (1) | Number of Measurements | Mean (cpm) (2) | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 612-A | Alpha HH | 47 | 1 | 1 | 1 | 0 | 4 |
| 612-A | Beta HH | 47 | 161 | 158 | 31 | 115 | 262 |
| 612-A | Alpha FM | 12 | 3 | 3 | 2 | 0 | 5 |
| 612-A | Beta FM | 12 | 670 | 666.5 | 51 | 559 | 733 |
| 612-A | Gamma FIDLER | 59 | 3939 | 4638 | 1424 | 1733 | 5749 |
| 612-AA | Alpha HH | 97 | 1 | 1 | 1 | 0 | 4 |
| 612-AA | Beta HH | 97 | 126 | 123 | 35 | 66 | 221 |
| 612-AA | Alpha FM | 45 | 4 | 4 | 2 | 0 | 10 |
| 612-AA | Beta FM | 45 | 853 | 852 | 43 | 748 | 958 |
| 612-AA | Gamma FIDLER | 142 | 2619 | 2448 | 775 | 372 | 4569 |
| 612-B | Alpha HH | 22 | 2 | 1 | 1 | 0 | 4 |
| 612-B | Beta HH | 22 | 195 | 192 | 31 | 144 | 245 |
| 612-B | Gamma FIDLER | 22 | 5818 | 5983.5 | 751 | 4552 | 7271 |
| 612-BB | Alpha HH | 27 | 1 | 1 | 1 | 0 | 3 |
| 612-BB | Beta HH | 27 | 131 | 138 | 32 | 70 | 181 |
| 612-BB | Alpha FM | 10 | 4 | 4.5 | 2 | 0 | 6 |
| 612-BB | Beta FM | 10 | 907 | 899.5 | 44 | 850 | 1003 |
| 612-BB | Gamma FIDLER | 37 | 2583 | 2169 | 776 | 1640 | 3995 |
| 612-C | Alpha HH | 11 | 2 | 2 | 1 | 0 | 3 |
| 612-C | Beta HH | 11 | 175 | 185 | 26 | 137 | 205 |
| 612-C | Alpha FM | 2 | 4 | 4 | 0 | 4 | 4 |
| 612-C | Beta FM | 2 | 709 | 709 | 49 | 674 | 744 |
| 612-C | Gamma FIDLER | 13 | 5964 | 5918 | 566 | 4978 | 6824 |
| 612-D | Alpha HH | 14 | 2 | 2 | 1 | 0 | 5 |
| 612-D | Beta HH | 14 | 158 | 160.5 | 26 | 118 | 209 |
| 612-D | Alpha FM | 4 | 6 | 6.5 | 3 | 2 | 10 |
| 612-D | Beta FM | 4 | 728 | 727.5 | 43 | 676 | 782 |
| 612-D | Gamma FIDLER | 18 | 5969 | 6173.5 | 909 | 4432 | 7019 |
| 612-E | Alpha HH | 16 | 1 | 1 | 1 | 0 | 4 |
| 612-E | Beta HH | 16 | 174 | 181 | 30 | 124 | 242 |
| 612-E | Alpha FM | 6 | 5 | 4.5 | 1 | 4 | 5 |
| 612-E | Beta FM | 6 | 696 | 704 | 52 | 619 | 763 |
| 612-E | Gamma FIDLER | 22 | 5747 | 5719.5 | 577 | 4898 | 6882 |
| 612-F | Alpha HH | 33 | 1 | 1 | 1 | 0 | 3 |
| 612-F | Beta HH | 33 | 154 | 152 | 33 | 98 | 210 |
| 612-F | Alpha FM | 12 | 3 | 3.5 | 2 | 0 | 6 |
| 612-F | Beta FM | 12 | 713 | 714 | 33 | 653 | 762 |
| 612-F | Gamma FIDLER | 44 | 4918 | 4840 | 944 | 2873 | 7078 |
| 612-G | Alpha HH | 9 | 1 | 1 | 1 | 0 | 2 |
| 612-G | Beta HH | 9 | 130 | 131 | 21 | 94 | 157 |
| 612-G | Gamma FIDLER | 9 | 4097 | 4002 | 176 | 3922 | 4420 |
| 612-H | Alpha HH | 9 | 1 | 1 | 1 | 0 | 3 |
| 612-H | Beta HH | 9 | 153 | 147 | 24 | 115 | 187 |

**Table A5-5**
**Summary Statistics**
**Building 612 Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 612-H | Gamma FIDLER | 9 | 4183 | 4000 | 592 | 3253 | 5269 |
| 612-I | Alpha HH | 16 | 2 | 1.5 | 2 | 0 | 6 |
| 612-I | Beta HH | 16 | 165 | 167 | 27 | 121 | 207 |
| 612-I | Gamma FIDLER | 16 | 3992 | 4326 | 1280 | 1947 | 5812 |
| 612-J | Alpha HH | 17 | 1 | 1 | 1 | 0 | 3 |
| 612-J | Beta HH | 17 | 178 | 189 | 34 | 121 | 237 |
| 612-J | Gamma FIDLER | 17 | 6049 | 5761 | 601 | 5402 | 7016 |
| 612-K | Alpha HH | 27 | 1 | 1 | 1 | 0 | 3 |
| 612-K | Beta HH | 27 | 117 | 96 | 44 | 70 | 230 |
| 612-K | Alpha FM | 5 | 8 | 8 | 3 | 4 | 13 |
| 612-K | Beta FM | 5 | 908 | 890 | 36 | 876 | 955 |
| 612-K | Gamma FIDLER | 32 | 2430 | 2415 | 508 | 1418 | 3589 |
| 612-L | Alpha HH | 23 | 1 | 0 | 1 | 0 | 2 |
| 612-L | Beta HH | 23 | 129 | 133 | 45 | 61 | 217 |
| 612-L | Alpha FM | 6 | 4 | 4 | 2 | 3 | 6 |
| 612-L | Beta FM | 6 | 880 | 879 | 31 | 843 | 922 |
| 612-L | Gamma FIDLER | 29 | 2479 | 2501 | 513 | 1535 | 3469 |
| 612-M | Alpha HH | 170 | 1 | 1 | 1 | 0 | 5 |
| 612-M | Beta HH | 170 | 114 | 101 | 53 | 60 | 627 |
| 612-M | Alpha FM | 62 | 4 | 3.5 | 3 | 0 | 12 |
| 612-M | Beta FM | 62 | 855 | 859 | 37 | 781 | 933 |
| 612-M | Gamma FIDLER | 232 | 2440 | 2429.5 | 656 | 1114 | 4229 |
| 612-N | Alpha HH | 27 | 1 | 1 | 2 | 0 | 6 |
| 612-N | Beta HH | 27 | 124 | 102 | 44 | 72 | 231 |
| 612-N | Alpha FM | 10 | 4 | 4 | 2 | 1 | 6 |
| 612-N | Beta FM | 10 | 883 | 890 | 35 | 815 | 926 |
| 612-N | Gamma FIDLER | 37 | 2338 | 2018 | 745 | 1082 | 3650 |
| 612-O | Alpha HH | 26 | 1 | 1 | 1 | 0 | 5 |
| 612-O | Beta HH | 26 | 119 | 118 | 31 | 70 | 194 |
| 612-O | Alpha FM | 10 | 2 | 2.5 | 1 | 1 | 4 |
| 612-O | Beta FM | 10 | 850 | 847 | 41 | 779 | 910 |
| 612-O | Gamma FIDLER | 36 | 2373 | 1988 | 730 | 1521 | 3704 |
| 612-P | Alpha HH | 31 | 1 | 1 | 1 | 0 | 4 |
| 612-P | Beta HH | 31 | 149 | 140 | 54 | 84 | 383 |
| 612-P | Alpha FM | 10 | 3 | 3 | 1 | 1 | 6 |
| 612-P | Beta FM | 10 | 863 | 891 | 120 | 525 | 939 |
| 612-P | Gamma FIDLER | 41 | 2410 | 1979 | 870 | 1323 | 4035 |
| 612-Q | Alpha HH | 31 | 1 | 1 | 1 | 0 | 3 |
| 612-Q | Beta HH | 31 | 147 | 154 | 35 | 77 | 213 |
| 612-Q | Alpha FM | 9 | 5 | 5 | 3 | 0 | 10 |
| 612-Q | Beta FM | 9 | 977 | 999 | 42 | 904 | 1023 |
| 612-Q | Gamma FIDLER | 41 | 2408 | 2095 | 589 | 1714 | 3822 |
| 612-R | Alpha HH | 18 | 1 | 1 | 1 | 0 | 4 |

## Table A5-5
## Summary Statistics
## Building 612 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 612-R | Beta HH | 18 | 132 | 137.5 | 30 | 61 | 172 |
| 612-R | Alpha FM | 10 | 3 | 2 | 2 | 0 | 7 |
| 612-R | Beta FM | 10 | 868 | 880.5 | 44 | 759 | 910 |
| 612-R | Gamma FIDLER | 37 | 2951 | 2017 | 1528 | 1455 | 5766 |
| 612-S | Alpha HH | 25 | 1 | 1 | 1 | 0 | 5 |
| 612-S | Beta HH | 25 | 128 | 131 | 39 | 74 | 241 |
| 612-S | Alpha FM | 10 | 4 | 4 | 2 | 1 | 7 |
| 612-S | Beta FM | 10 | 839 | 875.5 | 95 | 641 | 920 |
| 612-S | Gamma FIDLER | 35 | 2226 | 1839 | 742 | 1406 | 3704 |
| 612-T | Alpha HH | 26 | 1 | 1 | 1 | 0 | 3 |
| 612-T | Beta HH | 26 | 127 | 128.5 | 35 | 79 | 229 |
| 612-T | Alpha FM | 10 | 4 | 3.5 | 1 | 2 | 6 |
| 612-T | Beta FM | 10 | 863 | 868 | 25 | 811 | 897 |
| 612-T | Gamma FIDLER | 36 | 2289 | 1966 | 698 | 1421 | 3551 |
| 612-U | Alpha HH | 64 | 1 | 1 | 1 | 0 | 4 |
| 612-U | Beta HH | 64 | 115 | 106 | 33 | 67 | 228 |
| 612-U | Alpha FM | 30 | 4 | 4 | 2 | 1 | 11 |
| 612-U | Beta FM | 30 | 864 | 871.5 | 41 | 785 | 955 |
| 612-U | Gamma FIDLER | 95 | 2021 | 1747 | 807 | 523 | 3934 |
| 612-V | Alpha HH | 73 | 1 | 1 | 1 | 0 | 4 |
| 612-V | Beta HH | 73 | 116 | 117 | 39 | 45 | 233 |
| 612-V | Alpha FM | 45 | 5 | 4 | 2 | 0 | 11 |
| 612-V | Beta FM | 45 | 888 | 900 | 46 | 785 | 971 |
| 612-V | Gamma FIDLER | 117 | 1967 | 1775 | 645 | 602 | 4569 |
| 612-W | Alpha HH | 68 | 1 | 1 | 1 | 0 | 4 |
| 612-W | Beta HH | 68 | 113 | 91.5 | 59 | 66 | 419 |
| 612-W | Alpha FM | 35 | 5 | 4 | 3 | 1 | 10 |
| 612-W | Beta FM | 35 | 852 | 863 | 43 | 723 | 906 |
| 612-W | Gamma FIDLER | 103 | 2138 | 2065 | 654 | 529 | 3453 |
| 612-X | Alpha HH | 72 | 1 | 1 | 1 | 0 | 5 |
| 612-X | Beta HH | 72 | 105 | 99.5 | 29 | 53 | 173 |
| 612-X | Alpha FM | 35 | 5 | 5 | 2 | 0 | 10 |
| 612-X | Beta FM | 35 | 877 | 886 | 47 | 774 | 963 |
| 612-X | Gamma FIDLER | 107 | 2245 | 2271 | 675 | 610 | 3802 |
| 612-Y | Alpha HH | 100 | 1 | 1 | 1 | 0 | 5 |
| 612-Y | Beta HH | 100 | 112 | 101 | 41 | 61 | 328 |
| 612-Y | Alpha FM | 44 | 5 | 4 | 3 | 0 | 18 |
| 612-Y | Beta FM | 44 | 873 | 871.5 | 42 | 785 | 976 |
| 612-Y | Gamma FIDLER | 146 | 2002 | 1992 | 777 | 425 | 4433 |
| 612-Z | Alpha HH | 63 | 1 | 1 | 1 | 0 | 4 |
| 612-Z | Beta HH | 63 | 124 | 121 | 40 | 66 | 308 |
| 612-Z | Alpha FM | 30 | 5 | 4 | 2 | 1 | 12 |
| 612-Z | Beta FM | 30 | 901 | 900 | 44 | 813 | 975 |

## Table A5-5
## Summary Statistics
## Building 612 Direct Measurements
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset [1] | Number of Measurements | Mean (cpm) [2] | Median (cpm) | Std. Dev. (cpm) | Minimum (cpm) | Maximum (cpm) |
|---|---|---|---|---|---|---|---|
| 612-Z | Gamma FIDLER | 93 | 2090 | 1996 | 755 | 502 | 4291 |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; HH = alpha/beta handheld gas proportional;
(2) cpm = counts per minute.

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 612-A | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-A | Beta HH | 161 | 262 | 186 | 99 | 9570 | Yes | Yes | |
| 612-A | Alpha FM | 3 | 5 | 7 | 1 | 33522 | Yes | Yes | |
| 612-A | Beta FM | 670 | 733 | 951 | 628 | 61518 | Yes | Yes | |
| 612-A | Gamma FIDLER | 3939 | 5749 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-AA | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-AA | Beta HH | 126 | 221 | 186 | 99 | 9570 | Yes | Yes | |
| 612-AA | Alpha FM | 4 | 10 | 7 | 1 | 33522 | Yes | Yes | |
| 612-AA | Beta FM | 853 | 958 | 951 | 628 | 61518 | Yes | Yes | |
| 612-AA | Gamma FIDLER | 2619 | 4569 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-B | Alpha HH | 2 | 4 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-B | Beta HH | 195 | 245 | 186 | 99 | 9570 | Yes | Yes | |
| 612-B | Gamma FIDLER | 5818 | 7271 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-BB | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-BB | Beta HH | 131 | 181 | 186 | 99 | 9570 | Yes | Yes | |
| 612-BB | Alpha FM | 4 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-BB | Beta FM | 907 | 1003 | 951 | 628 | 61518 | Yes | Yes | |
| 612-BB | Gamma FIDLER | 2583 | 3995 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-C | Alpha HH | 2 | 3 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-C | Beta HH | 175 | 205 | 186 | 99 | 9570 | Yes | Yes | |
| 612-C | Alpha FM | 4 | 4 | 7 | 1 | 33522 | Yes | Yes | |
| 612-C | Beta FM | 709 | 744 | 951 | 628 | 61518 | Yes | Yes | |
| 612-C | Gamma FIDLER | 5964 | 6824 | 3211 | 1650 | 301 | **No** | **No** | |

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 612-D | Alpha HH | 2 | 5 | 1 | 0 | 7058 | Yes | Yes | |
| 612-D | Beta HH | 158 | 209 | 186 | 99 | 9570 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-D | Alpha FM | 6 | 10 | 7 | 1 | 33522 | Yes | Yes | |
| 612-D | Beta FM | 728 | 782 | 951 | 628 | 61518 | Yes | Yes | |
| 612-D | Gamma FIDLER | 5969 | 7019 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-E | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | |
| 612-E | Beta HH | 174 | 242 | 186 | 99 | 9570 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-E | Alpha FM | 5 | 5 | 7 | 1 | 33522 | Yes | Yes | |
| 612-E | Beta FM | 696 | 763 | 951 | 628 | 61518 | Yes | Yes | |
| 612-E | Gamma FIDLER | 5747 | 6882 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-F | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | |
| 612-F | Beta HH | 154 | 210 | 186 | 99 | 9570 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-F | Alpha FM | 3 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-F | Beta FM | 713 | 762 | 951 | 628 | 61518 | Yes | Yes | |
| 612-F | Gamma FIDLER | 4918 | 7078 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-G | Alpha HH | 1 | 2 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-G | Beta HH | 130 | 157 | 186 | 99 | 9570 | Yes | Yes | |
| 612-G | Gamma FIDLER | 4097 | 4420 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-H | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-H | Beta HH | 153 | 187 | 186 | 99 | 9570 | Yes | Yes | |
| 612-H | Gamma FIDLER | 4183 | 5269 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-I | Alpha HH | 2 | 6 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-I | Beta HH | 165 | 207 | 186 | 99 | 9570 | Yes | Yes | |
| 612-I | Gamma FIDLER | 3992 | 5812 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-J | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | Survey unit meets release criterion based on alpha and beta measurements |
| 612-J | Beta HH | 178 | 237 | 186 | 99 | 9570 | Yes | Yes | |
| 612-J | Gamma FIDLER | 6049 | 7016 | 3211 | 1650 | 301 | **No** | **No** | |
| 612-K | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | |

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 612-K | Beta HH | 117 | 230 | 186 | 99 | 9570 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-K | Alpha FM | 8 | 13 | 7 | 1 | 33522 | Yes | Yes | |
| 612-K | Beta FM | 908 | 955 | 951 | 628 | 61518 | Yes | Yes | |
| 612-K | Gamma FIDLER | 2430 | 3589 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-L | Alpha HH | 1 | 2 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-L | Beta HH | 129 | 217 | 186 | 99 | 9570 | Yes | Yes | |
| 612-L | Alpha FM | 4 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-L | Beta FM | 880 | 922 | 951 | 628 | 61518 | Yes | Yes | |
| 612-L | Gamma FIDLER | 2479 | 3469 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-M | Alpha HH | 1 | 5 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-M | Beta HH | 114 | 627 | 186 | 99 | 9570 | Yes | Yes | |
| 612-M | Alpha FM | 4 | 12 | 7 | 1 | 33522 | Yes | Yes | |
| 612-M | Beta FM | 855 | 933 | 951 | 628 | 61518 | Yes | Yes | |
| 612-M | Gamma FIDLER | 2440 | 4229 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-N | Alpha HH | 1 | 6 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-N | Beta HH | 124 | 231 | 186 | 99 | 9570 | Yes | Yes | |
| 612-N | Alpha FM | 4 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-N | Beta FM | 883 | 926 | 951 | 628 | 61518 | Yes | Yes | |
| 612-N | Gamma FIDLER | 2338 | 3650 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-O | Alpha HH | 1 | 5 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-O | Beta HH | 119 | 194 | 186 | 99 | 9570 | Yes | Yes | |
| 612-O | Alpha FM | 2 | 4 | 7 | 1 | 33522 | Yes | Yes | |
| 612-O | Beta FM | 850 | 910 | 951 | 628 | 61518 | Yes | Yes | |
| 612-O | Gamma FIDLER | 2373 | 3704 | 3211 | 1650 | 301 | Yes | **No** | |

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 612-P | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-P | Beta HH | 149 | 383 | 186 | 99 | 9570 | Yes | Yes | |
| 612-P | Alpha FM | 3 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-P | Beta FM | 863 | 939 | 951 | 628 | 61518 | Yes | Yes | |
| 612-P | Gamma FIDLER | 2410 | 4035 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-Q | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-Q | Beta HH | 147 | 213 | 186 | 99 | 9570 | Yes | Yes | |
| 612-Q | Alpha FM | 5 | 10 | 7 | 1 | 33522 | Yes | Yes | |
| 612-Q | Beta FM | 977 | 1023 | 951 | 628 | 61518 | Yes | Yes | |
| 612-Q | Gamma FIDLER | 2408 | 3822 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-R | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-R | Beta HH | 132 | 172 | 186 | 99 | 9570 | Yes | Yes | |
| 612-R | Alpha FM | 3 | 7 | 7 | 1 | 33522 | Yes | Yes | |
| 612-R | Beta FM | 868 | 910 | 951 | 628 | 61518 | Yes | Yes | |
| 612-R | Gamma FIDLER | 2951 | 5766 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-S | Alpha HH | 1 | 5 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-S | Beta HH | 128 | 241 | 186 | 99 | 9570 | Yes | Yes | |
| 612-S | Alpha FM | 4 | 7 | 7 | 1 | 33522 | Yes | Yes | |
| 612-S | Beta FM | 839 | 920 | 951 | 628 | 61518 | Yes | Yes | |
| 612-S | Gamma FIDLER | 2226 | 3704 | 3211 | 1650 | 301 | Yes | **No** | |
| 612-T | Alpha HH | 1 | 3 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-T | Beta HH | 127 | 229 | 186 | 99 | 9570 | Yes | Yes | |
| 612-T | Alpha FM | 4 | 6 | 7 | 1 | 33522 | Yes | Yes | |
| 612-T | Beta FM | 863 | 897 | 951 | 628 | 61518 | Yes | Yes | |
| 612-T | Gamma FIDLER | 2289 | 3551 | 3211 | 1650 | 301 | Yes | **No** | |

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survey Unit | Dataset [1] | Mean (cpm) [2] | Maximum (cpm) [2] | Mean (cpm) [3] | Minimum (cpm) [3] | $DCGL_W$ (cpm) [4] | Difference between SU mean and bkgd mean less than DCGLw? | Difference between SU max and bkgd min less than $DCGL_W$? | Conclusion [5] |
| 612-U | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-U | Beta HH | 115 | 228 | 186 | 99 | 9570 | Yes | Yes | |
| 612-U | Alpha FM | 4 | 11 | 7 | 1 | 33522 | Yes | Yes | |
| 612-U | Beta FM | 864 | 955 | 951 | 628 | 61518 | Yes | Yes | |
| 612-U | Gamma FIDLER | 2021 | 3934 | 3211 | 1650 | 301 | Yes | No | |
| 612-V | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-V | Beta HH | 116 | 233 | 186 | 99 | 9570 | Yes | Yes | |
| 612-V | Alpha FM | 5 | 11 | 7 | 1 | 33522 | Yes | Yes | |
| 612-V | Beta FM | 888 | 971 | 951 | 628 | 61518 | Yes | Yes | |
| 612-V | Gamma FIDLER | 1967 | 4569 | 3211 | 1650 | 301 | Yes | No | |
| 612-W | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-W | Beta HH | 113 | 419 | 186 | 99 | 9570 | Yes | Yes | |
| 612-W | Alpha FM | 5 | 10 | 7 | 1 | 33522 | Yes | Yes | |
| 612-W | Beta FM | 852 | 906 | 951 | 628 | 61518 | Yes | Yes | |
| 612-W | Gamma FIDLER | 2138 | 3453 | 3211 | 1650 | 301 | Yes | No | |
| 612-X | Alpha HH | 1 | 5 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-X | Beta HH | 105 | 173 | 186 | 99 | 9570 | Yes | Yes | |
| 612-X | Alpha FM | 5 | 10 | 7 | 1 | 33522 | Yes | Yes | |
| 612-X | Beta FM | 877 | 963 | 951 | 628 | 61518 | Yes | Yes | |
| 612-X | Gamma FIDLER | 2245 | 3802 | 3211 | 1650 | 301 | Yes | No | |
| 612-Y | Alpha HH | 1 | 5 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-Y | Beta HH | 112 | 328 | 186 | 99 | 9570 | Yes | Yes | |
| 612-Y | Alpha FM | 5 | 18 | 7 | 1 | 33522 | Yes | Yes | |
| 612-Y | Beta FM | 873 | 976 | 951 | 628 | 61518 | Yes | Yes | |
| 612-Y | Gamma FIDLER | 2002 | 4433 | 3211 | 1650 | 301 | Yes | No | |

**Table A5-6**
**Initial Data Reduction**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| | | Survey Unit | | Reference Area | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Survey Unit** | **Dataset [1]** | **Mean (cpm) [2]** | **Maximum (cpm) [2]** | **Mean (cpm) [3]** | **Minimum (cpm) [3]** | **$DCGL_W$ (cpm) [4]** | **Difference between SU mean and bkgd mean less than DCGLw?** | **Difference between SU max and bkgd min less than $DCGL_W$?** | **Conclusion [5]** |
| 612-Z | Alpha HH | 1 | 4 | 1 | 0 | 7058 | Yes | Yes | Perform WRS Test for FIDLER Data Set |
| 612-Z | Beta HH | 124 | 308 | 186 | 99 | 9570 | Yes | Yes | |
| 612-Z | Alpha FM | 5 | 12 | 7 | 1 | 33522 | Yes | Yes | |
| 612-Z | Beta FM | 901 | 975 | 951 | 628 | 61518 | Yes | Yes | |
| 612-Z | Gamma FIDLER | 2090 | 4291 | 3211 | 1650 | 301 | Yes | **No** | |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument. Instruments: FM = alpha/beta gas proportional floor monitor; HH = alpha/beta gas proportional hand-held; FIDLER = low-energy gamma scintillator.
(2) cpm = counts per minute. Refer to **Table A5-5** for complete summary statistics for each survey unit.
(3) The reference area for the Building 612 was Building 2078. Refer to **Table A2-3** for complete summary statistics for the reference areas.
(4) The instrument-specific $DCGL_W$ was calculated using the physical or active probe area in $cm^2$ and the instrument efficiency (**Table A5-2**), and does not include background.
(5) Per MARSSIM Section 8 and **Figure A2-1** of this addendum.

**Table A5-7**
**Wilcoxon Rank Sum Test Results**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| 612-A | Gamma FIDLER | 59 | 40 | 2230.7 | 1727.5 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-AA | Gamma FIDLER | 142 | 40 | 4144.1 | 5123 | Reject | **Survey unit meets release criterion** |
| 612-B | Gamma FIDLER | 22 | 40 | 1371.8 | 839 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-BB | Gamma FIDLER | 37 | 40 | 1721.3 | 1968.5 | Reject | **Survey unit meets release criterion** |
| 612-C | Gamma FIDLER | 13 | 40 | 1159.6 | 825.5 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-D | Gamma FIDLER | 18 | 40 | 1277.9 | 843 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-E | Gamma FIDLER | 22 | 40 | 1371.8 | 839 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-F | Gamma FIDLER | 44 | 40 | 1883.7 | 1147.5 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-G | Gamma FIDLER | 9 | 40 | 1063.7 | 983 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-H | Gamma FIDLER | 9 | 40 | 1063.7 | 957 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-I | Gamma FIDLER | 16 | 40 | 1230.7 | 1071.5 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-J | Gamma FIDLER | 17 | 40 | 1254.3 | 830 | Accept | Survey unit meets release criterion based on alpha and beta measurements |
| 612-K | Gamma FIDLER | 32 | 40 | 1605.2 | 1765 | Reject | **Survey unit meets release criterion** |
| 612-L | Gamma FIDLER | 29 | 40 | 1535.3 | 1668.5 | Reject | **Survey unit meets release criterion** |
| 612-M | Gamma FIDLER | 232 | 40 | 6215.8 | 7909 | Reject | **Survey unit meets release criterion** |
| 612-N | Gamma FIDLER | 37 | 40 | 1721.3 | 2019 | Reject | **Survey unit meets release criterion** |
| 612-O | Gamma FIDLER | 36 | 40 | 1698.1 | 1994 | Reject | **Survey unit meets release criterion** |
| 612-P | Gamma FIDLER | 41 | 40 | 1814.1 | 2156 | Reject | **Survey unit meets release criterion** |

**Table A5-7**
**Wilcoxon Rank Sum Test Results**
**Building 612 - Direct Measurements**
**License Termination Report Addendum A**
**Seneca Army Depot Activity**

| Survey Unit (Bldg/Room) | Dataset [1] | Valid N Survey [2] | Valid N Background [2] | Critical Value [3] | Sum of Reference Area Ranks | Accept/Reject Null Hypothesis? [4] | Conclusion [5] |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 612-Q | Gamma FIDLER | 41 | 40 | 1814.1 | 2100.5 | Reject | **Survey unit meets release criterion** |
| 612-R | Gamma FIDLER | 37 | 40 | 1721.3 | 1797 | Reject | **Survey unit meets release criterion** |
| 612-S | Gamma FIDLER | 35 | 40 | 1674.9 | 1977 | Reject | **Survey unit meets release criterion** |
| 612-T | Gamma FIDLER | 36 | 40 | 1698.1 | 2008.5 | Reject | **Survey unit meets release criterion** |
| 612-U | Gamma FIDLER | 95 | 40 | 3061.4 | 4024 | Reject | **Survey unit meets release criterion** |
| 612-V | Gamma FIDLER | 117 | 40 | 3568.3 | 4819.5 | Reject | **Survey unit meets release criterion** |
| 612-W | Gamma FIDLER | 103 | 40 | 3245.8 | 4205.5 | Reject | **Survey unit meets release criterion** |
| 612-X | Gamma FIDLER | 107 | 40 | 3337.9 | 4238.5 | Reject | **Survey unit meets release criterion** |
| 612-Y | Gamma FIDLER | 146 | 40 | 4236.3 | 5755.5 | Reject | **Survey unit meets release criterion** |
| 612-Z | Gamma FIDLER | 93 | 40 | 3015.3 | 3922 | Reject | **Survey unit meets release criterion** |

Notes:
(1) Measurements from each survey unit were grouped by radiation type and instrument.
(2) The Valid N for a dataset refers to the number of measurements from that dataset used in the WRS test.
(3) The Critical Value for the WRS test was calculated per MARSSIM Appendix I.
(4) Per MARSSIM for Scenario A, if the Sum of Reference Area Ranks is greater than the Critical Value, the Scenario A null hypothesis that the median survey unit measurement exceeds that in the reference area by more than the $DCGL_W$ is rejected, and the survey unit passes (i.e., the survey unit meets the release criterion).
(5) Conclusions for these survey units are based on the WRS test results, and the initial data reduction shown in **Table A5-6**.

## Table A5-8
## Survey Units with Measurements Exceeding $DCGL_{EMC}$
## Building 612
## License Termination Report Addendum A
## Seneca Army Depot Activity

| Survey Unit (Bldg/Room) | Dataset | Total Number of Measurements | Measurements Exceeding $DCGL_{EMC}$ | Maximum Measurement (cpm) [1] | Background Corrected $DCGL_{EMC}$ (cpm) [2] |
|---|---|---|---|---|---|
| | | | | | |
| 612-B | Gamma FIDLER | 22 | 3 | 7271 | 6790 |
| 612-C | Gamma FIDLER | 13 | 1 | 6824 | 6790 |
| 612-D | Gamma FIDLER | 18 | 4 | 7019 | 6790 |
| 612-E | Gamma FIDLER | 22 | 2 | 6882 | 6790 |
| 612-F | Gamma FIDLER | 45 | 2 | 7078 | 6790 |
| 612-J | Gamma FIDLER | 17 | 3 | 7016 | 6790 |

Notes:
(1) cpm = counts per minute. Complete survey data is presented in **Appendix 5.C**.
(2) Background corrected $DCGL_{EMC}$ from **Table A5-2**.

**Seneca Army Depot Activity**
**License Termination Report Addendum**
**Attachment 1**

**Correspondence from NRC Staff**
**September and October 2005**

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

September 7, 2005

Docket No. 04008526 License No. SUC-1275
Control No. 135163

Stephen M. Absolom
Installation Manager
Caretaker Office
Seneca Army Depot Activity
5786 State Route 96
P.O. Box 9
Romulus, NY 14541-0009

SUBJECT: SENECA ARMY DEPOT ACTIVITY, REQUEST FOR ADDITIONAL INFORMATION CONCERNING APPLICATION FOR AMENDMENT TO LICENSE, CONTROL NO. 135163

Dear Mr. Absolom:

This is in reference to your letter dated February 28, 2005 providing additional information concerning your license termination request for Seneca Army Depot Activity (SEDA). We have completed our review of the additional information you have provided. This review was conducted by both NRC Region I staff and NRC Office of Nuclear Materials Safety and Safeguards staff. As a result of our review we have determined that the use of Scenario B to demonstrate compliance with the NRC criteria for the unrestricted release of SEDA is inappropriate.

NUREG-1757, Consolidated NMSS Decommissioning Guidance, Volume 2, *Characterization, Survey, and Determination of Radiological Criteria*, Section 2.4 states that:

> "... NRC staff's default assumption is that the use of Scenario A is appropriate. The use of Scenario B is expected only for a small number of facilities, and the considerations for any given facility are expected to be site specific. Therefore, NRC staff recommends that licensees contact NRC early in the licensee's FSS design process to discuss considerations for their situation."

In your *License Termination and License Release Plan*, which was transmitted by your letter dated February 11, 2003, you provided information indicating that Scenario A would be used to demonstrate compliance with the NRC criteria for unrestricted release. Our letter to you dated June 11, 2003 transmitted Amendment 13 of your license which incorporated by reference your *License Termination and License Release Plan* in condition 15 of the license. Therefore, based on Condition 15 of your license, you had committed to use Scenario A for the SEDA decommissioning.

When applying Scenario B to a site decommissioning, the key assumption is that the $DCGL_w$ is small when compared to measurement and/or background variability. For the SEDA decommissioning, however, it appears that your $DCGL_w$ values are large compared to

background/measurement variability which would allow the use of Scenario A. Additionally, we noted that you used Scenario B even though some reference areas failed the K-W test, reference areas were established based on different materials (although background from different materials is not expected to be similar), and reference areas were established based on an artificial separation of high and low measurements.

Since we have determined that the use of Scenario B is inappropriate for your facility, please provide us with your plans for license termination relative to the conditions of your license and the considerations of NUREG-1757, Volume 2.

We will continue our review of your license amendment application for license termination upon receipt of this information. Please reply to my attention at the Region I Office and refer to Mail Control No. 135163. If you have any technical questions regarding this letter, please call me at (610) 337-5214.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we will assume that you do not wish to pursue your license amendment application.

Sincerely,

James Kottan
Senior Health Physicist
Decommissioning Branch
Division of Nuclear Materials Safety

cc:
John Cleary, Radiation Safety Officer

## Hackett, John

**From:** Hackett, John
**Sent:** Wednesday, October 19, 2005 8:28 AM
**To:** 'Stephen Absolom'; 'john.f.cleary@us.army.mil'; 'Tom Enroth (E-mail)'
**Cc:** 'Picel, Kurt C.'; Travers, Jacqueline; 'James Kottan'; Kadlubak, Kathleen
**Subject:** Summary of Conference Call with NRC 10-18-05

To all,

Attached is a summary of our conference call this morning regarding License Termination at the Seneca Army Depot.

Attendees:

Jackie Travers/John Hackett - Parsons

Tom Enroth/John Cleary - Seneca

Kurt Picel - ANL

Jim Kottan/Dave Everhart - NRC

The following was discussed (Conclusions from the discussion are shown in red).

1. Use of Scenario A:

Regarding the re-submittal, the Army asked what the NRC would like to see. Spreadsheets will be generated to show the data comparison per MARSSIM Appendix I. Parsons could submit electronic copies, hard copies, examples or a summary. *NRC requested electronic copies and additional explanatory text as addendum to original report. It will not be necessary to resubmit the whole report.*

The Army wanted to confirm that the use of measurement units of cpm for the data comparison was acceptable. *Use of counts per minute is acceptable.*

The Army discussed how to handle the data in survey areas where a small number of measurements come from one instrument compared to the background data set. For example, if there were 10 alpha locations and 3 of these locations were from the floor monitor and 7 from the phoswich. Could the data be compared directly to the DCGL rather than using the WRS test? *Comparison directly with DCGL in these circumstances is ok. If using the WRS test is necessary (i.e. some data points exceed the DCGL), all alpha data would need to be put in comparable units for a comparison with background data.*

2. The Army asked if there were any Issues with previous requests for information? *NRC indicated it was a safe assumption that there were no issues with previous comment/response.*

3. The Army asked if the use of a gross surface activity DCGL for depleted uranium was acceptable. *NRC indicated that use of DU DCGL listed on Table 2.1 of the report was acceptable.*

4. The results of Building 612 were discussed. Using FIDLER efficiencies available from source checks done during that survey, 10 survey units did not pass using the gamma measurements under a Scenario A comparison. However, they do for alpha and beta. Can we rely upon alpha/beta to demonstrate those survey units pass?

*NRC indicated that additional alpha/beta measurements could be used to justify passing these survey units despite the issues with the FIDLER measurements.*

5. A due date was discussed. *No specific timeframe was indicated by NRC. A sixty-day window was established. However, the Army believes they can have the addendum out to NRC sooner.*

Please feel free to contact me should you have any questions.

John R. Hackett, P.E.
**PARSONS**
1700 Broadway, Suite 900
Denver, CO 80290
(303) 764-8774 office
(720) 284-9495 cell
(303) 831-8208 fax

# Seneca Army Depot Activity
# License Termination Report Addendum
# Attachment 2

## Instrument Function Check Data from DU Igloo and DU Building Surveys

## (Supersedes Appendices 3.A and 4.A)

## FIDLER A983P

Parameter Being Tracked Am-241 Source Data

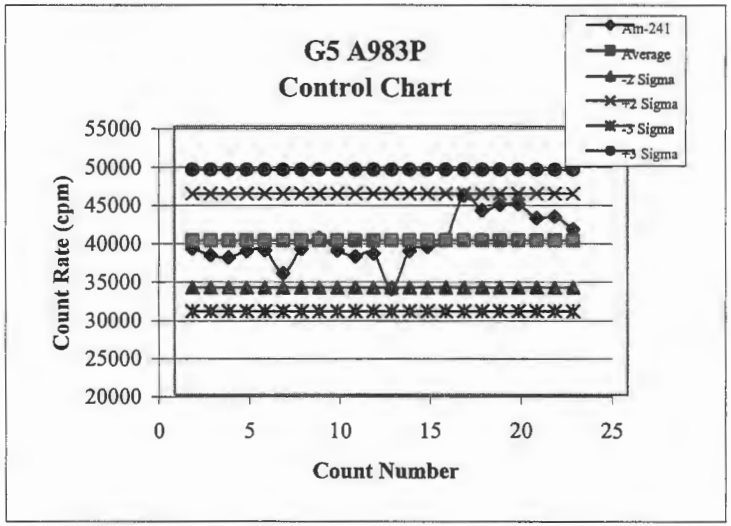
Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A983P |

Detector

| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A394Q |
| Geometry | Jig |
| ROI | |

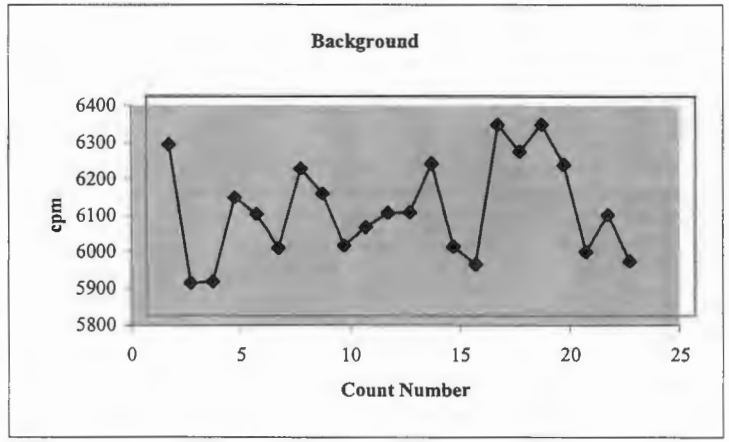
| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 40172.95 | High | 46308.01 | 49375.54 |
| STDEV= | 3067.529 | Low | 34037.9 | 30970.37 |




Avg. Efficiency
6.6%

Am-241

| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 8/25/2002 8:35 | 1st | 6269 | 39106 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/25/2002 14:20 | 2nd | 5889 | 38259 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/25/2002 16:00 | 3rd | 5892 | 37937 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/26/2002 7:00 | 4th | 6123 | 38788 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/26/2002 12:35 | 5th | 6078 | 38892 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/26/2002 17:30 | 6th | 5984 | 35885 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/27/2002 7:00 | 7th | 6203 | 39086 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 8/27/2002 12:20 | 8th | 6134 | 40495 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 8/27/2002 17:25 | 9th | 5992 | 38851 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 9/9/2002 7:00 | 10th | 6041 | 38112 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 9/9/2002 12:15 | 11th | 6081 | 38466 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 9/9/2002 16:00 | 12th | 6083 | 33849 | 40172.95 | 34037.9 | 46308.01 | Investigate | 6% | |
| 9/10/2002 7:00 | 13th | 6217 | 38801 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 9/10/2002 11:45 | 14th | 5988 | 39320 | 40172.95 | 34037.9 | 46308.01 | OK | 6% | |
| 9/11/2002 7:00 | 15th | 5940 | 40225 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/11/2002 12:40 | 16th | 6321 | 46037 | 40172.95 | 34037.9 | 46308.01 | OK | 8% | recheck in evening |
| 9/11/2002 18:00 | 17th | 6249 | 44067 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/12/2002 7:00 | 18th | 6322 | 44801 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/12/2002 12:10 | 19th | 6213 | 44868 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/12/2002 17:30 | 20th | 5974 | 43069 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/13/2002 7:00 | 21st | 6076 | 43261 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | |
| 9/13/2002 12:00 | 22nd | 5949 | 41630 | 40172.95 | 34037.9 | 46308.01 | OK | 7% | End of program |



## FIDLER A978P

Parameter Being Tracked Am-241 Source Data

Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A951P |

Detector

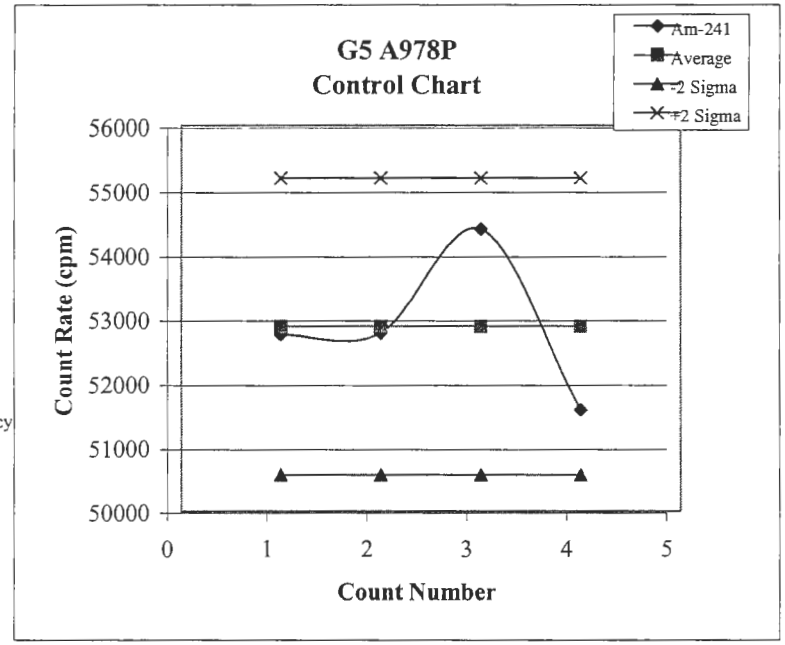
| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A365Q |
| Geometry | Jig |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 52879.25 | High | 55192.09 | 56348.5 |
| STDEV= | 1156.418 | Low | 50566.41 | 49410 |

Avg. Efficiency
8.7%

Am-241

| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|
| 9/12/2002 13:30 | 1st | 5594 | 52756 | | OK | 9% |
| 9/12/2002 17:00 | 2nd | 5655 | 52780 | | OK | 9% |
| 9/13/2002 7:00 | 3rd | 5933 | 54398 | | OK | 9% |
| 9/13/2002 12:00 | 4th | 5692 | 51583 | | OK | 9% |



## FIDLER A974P

Parameter Being Tracked Am-241 Source Data

Electronics

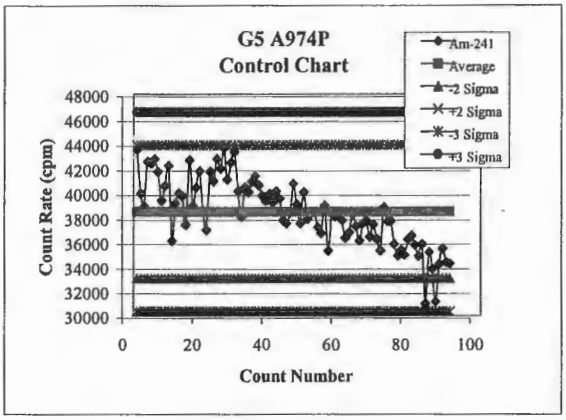
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A974P |

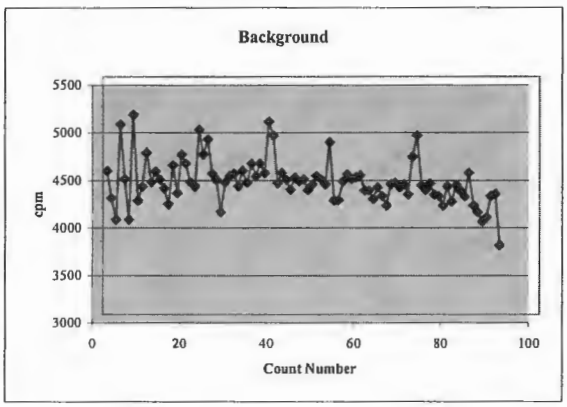
Detector

| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A381Q |
| Geometry | Jig |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 38464.43 | High | 43869.14 | 46571.5 |
| STDEV= | 2702.357 | Low | 33059.71 | 30357.36 |

Avg. Efficiency 6.3%




| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 4516 | 43532 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/11/2002 11:20 | 2nd | 4230 | 39961 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/11/2002 17:00 | 3rd | 4000 | 38909 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/12/2002 7:00 | 4th | 5000 | 42555 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/12/2002 11:30 | 5th | 4427 | 42422 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/12/2002 16:25 | 6th | 4000 | 42767 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/13/2002 7:00 | 7th | 5103 | 41726 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/13/2002 11:20 | 8th | 4200 | 39371 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/13/2002 15:30 | 9th | 4348 | 40577 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/14/2002 8:00 | 10th | 4703 | 42,229 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/14/2002 12:05 | 11th | 4397 | 36106 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/14/2002 15:45 | 12th | 4505 | 39170 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/15/2002 7:00 | 13th | 4422 | 39987 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/15/2002 11:30 | 14th | 4330 | 39766 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/15/2002 16:55 | 15th | 4161 | 37418 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/16/2002 7:00 | 16th | 4574 | 42674 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/16/2002 11:40 | 17th | 4282 | 38986 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/16/2002 17:00 | 18th | 4685 | 40463 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/17/2002 7:15 | 19th | 4590 | 41757 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/17/2002 11:40 | 20th | 4398 | 38551 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/17/2002 15:30 | 21st | 4355 | 36987 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/22/2002 7:00 | 22nd | 4945 | 41737 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/23/2002 7:00 | 23rd | 4686 | 40964 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/23/2002 11:30 | 24th | 4842 | 42776 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/23/2002 17:00 | 25th | 4485 | 41992 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/24/2002 7:00 | 26th | 4420 | 43665 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/24/2002 11:45 | 27th | 4081 | 41123 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/24/2002 17:00 | 28th | 4391 | 42467 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/25/2002 7:00 | 29th | 4459 | 43334 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/25/2002 11:45 | 30th | 4483 | 40167 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/25/2002 17:00 | 31st | 4355 | 38054 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/26/2002 7:00 | 32nd | 4515 | 40472 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/26/2002 12:00 | 33rd | 4389 | 40046 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/26/2002 17:00 | 34th | 4591 | 40937 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/27/2002 7:00 | 35th | 4458 | 41378 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/27/2002 12:00 | 36th | 4594 | 40624 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/27/2002 17:00 | 37th | 4489 | 39779 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/28/2002 8:00 | 38th | 5029 | 39372 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/28/2002 12:40 | 39th | 4884 | 39940 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/28/2002 16:20 | 40th | 4384 | 39231 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/29/2002 7:00 | 41st | 4492 | 40164 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/29/2002 12:00 | 42nd | 4419 | 39573 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 7/30/2002 7:00 | 43rd | 4318 | 37760 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/30/2002 12:20 | 44th | 4444 | 37541 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/30/2002 17:15 | 45th | 4406 | 38398 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 7/31/2002 7:00 | 46th | 4424 | 40755 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 8/8/2002 7:20 | 47th | 4312 | 39072 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/8/2002 12:45 | 48th | 4371 | 37532 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/8/2002 17:55 | 49th | 4461 | 40057 | 38464.43 | 33059.71 | 43869.14 | OK | 7% | |
| 8/9/2002 7:00 | 50th | 4424 | 37899 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/11/2002 9:00 | 51st | 4373 | 38381 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/11/2002 14:20 | 52nd | 4816 | 38468 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/11/2002 17:50 | 53rd | 4204 | 37216 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/12/2002 7:00 | 54th | 4204 | 36725 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/12/2002 12:30 | 55th | 4402 | 39000 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/12/2002 17:50 | 56th | 4478 | 35328 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | reads low will recheck in morning |
| 8/13/2002 7:00 | 57th | 4428 | 38326 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/13/2002 12:30 | 58th | 4449 | 38089 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/13/2002 17:30 | 59th | 4469 | 38369 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/20/2002 13:15 | 60th | 4307 | 37804 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/20/2002 17:35 | 61st | 4307 | 36362 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/21/2002 7:00 | 62nd | 4218 | 36781 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/21/2002 12:50 | 63rd | 4342 | 38282 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/21/2002 17:20 | 64th | 4251 | 37287 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | Batteries changed after check |
| 8/22/2002 7:00 | 65th | 4149 | 36125 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/22/2002 13:15 | 66th | 4372 | 37538 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |

## FIDLER A974P

Parameter Being Tracked Am-241 Source Data

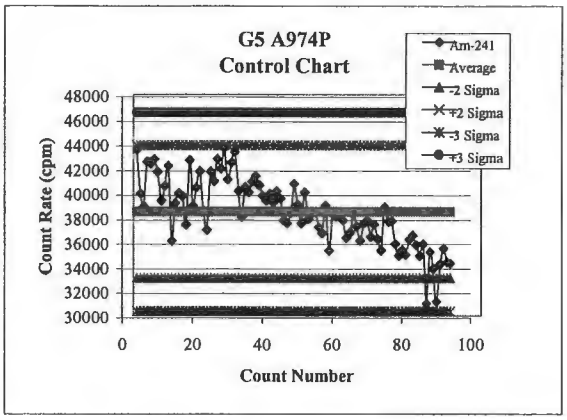
Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A974P |

Detector

| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A381Q |
| Geometry | Jig |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 38464.43 | High | 43869.14 | 46571.5 |
| STDEV= | 2702.357 | Low | 33059.71 | 30357.36 |




Avg. Efficiency
6.3%

Am-241

| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 8/22/2002 18:05 | 67th | 4390 | 37789 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/23/2002 7:05 | 68th | 4340 | 36445 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/23/2002 13:00 | 69th | 4372 | 37435 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/23/2002 17:00 | 70th | 4266 | 36268 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/24/2002 7:00 | 71st | 4662 | 35336 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/24/2002 13:30 | 72nd | 4886 | 38851 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/24/2002 18:00 | 73rd | 4364 | 37688 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/25/2002 8:00 | 74th | 4312 | 37713 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/25/2002 12:20 | 75th | 4378 | 35866 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/26/2002 7:00 | 76th | 4264 | 34901 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/26/2002 12:35 | 77th | 4251 | 35388 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/26/2002 17:30 | 78th | 4146 | 34976 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/27/2002 7:00 | 79th | 4350 | 36244 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/27/2002 12:20 | 80th | 4193 | 36566 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 8/27/2002 17:25 | 81st | 4363 | 35772 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/9/2002 7:00 | 82nd | 4303 | 34877 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/9/2002 12:15 | 83rd | 4243 | 35824 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/9/2002 17:00 | 84th | 4493 | 31012 | 38464.43 | 33059.71 | 43869.14 | Investigate | 5% | |
| 9/10/2002 7:00 | 85th | 4148 | 35189 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/10/2002 13:00 | 86th | 4081 | 33827 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | battery changed |
| 9/10/2002 17:50 | 87th | 3982 | 31152 | 38464.43 | 33059.71 | 43869.14 | Investigate | 5% | |
| 9/11/2002 7:00 | 88th | 4023 | 34226 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/11/2002 11:10 | 89th | 4246 | 35492 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/11/2002 17:30 | 90th | 4270 | 34368 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | |
| 9/12/2002 12:10 | 91st | 3731 | 34254 | 38464.43 | 33059.71 | 43869.14 | OK | 6% | End of program |

## FIDLER A978P

Parameter Being Tracked Am-241 Source Data

Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A978P |

Detector

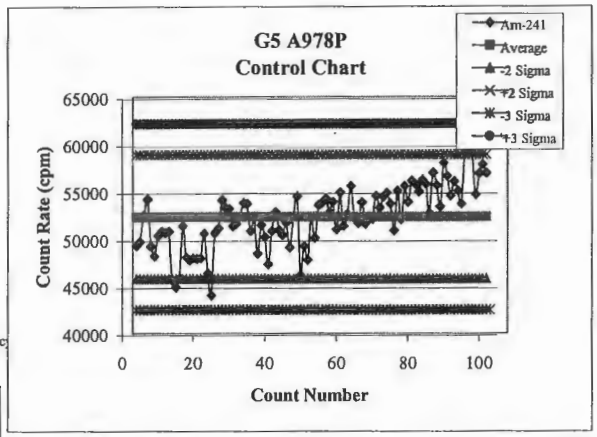
| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A379Q |
| Geometry | Jig |
| ROI | |

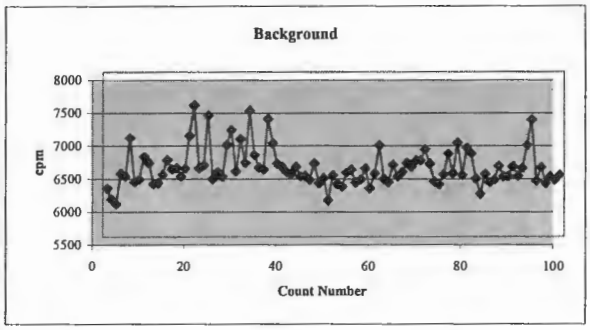
| Count Data | | 2 Sigma | 3 Sigma |
|---|---|---|---|
| Mean= | 52330.34 | High 58892.96 | 62174.27 |
| STDEV= | 3281.307 | Low 45767.73 | 42486.42 |

Avg. Efficiency
8.6%

Am-241

| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 6231 | 49296 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/11/2002 11:20 | 2nd | 6067 | 49718 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/11/2002 17:00 | 3rd | 6000 | 52519 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/12/2002 7:00 | 4th | 6461 | 54204 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/12/2002 11:30 | 5th | 6425 | 49235 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/12/2002 16:25 | 6th | 7000 | 48183 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/13/2002 7:00 | 7th | 6333 | 50348 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/13/2002 12:05 | 8th | 6374 | 50803 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/13/2002 15:30 | 9th | 6719 | 50639 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/14/2002 13:30 | 10th | 6619 | 50799 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/14/2002 15:45 | 11th | 6300 | 45605 | 52330.34 | 45767.73 | 58892.96 | Investigate | 8% | |
| 7/14/2002 16:00 | 12th | 6314 | 44865 | 52330.34 | 45767.73 | 58892.96 | Investigate | 7% | |
| 7/14/2002 16:05 | 13th | 6440 | 45829 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/15/2002 7:00 | 14th | 6664 | 51371 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/15/2002 11:30 | 15th | 6526 | 48074 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/15/2002 17:00 | 16th | 6543 | 47747 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/16/2002 7:00 | 17th | 6420 | 47965 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/16/2002 11:40 | 18th | 6534 | 47893 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/16/2002 17:00 | 19th | 7028 | 47967 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/17/2002 7:15 | 20th | 7495 | 50577 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/17/2002 11:40 | 21st | 6543 | 46365 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/17/2002 15:30 | 22nd | 6586 | 44012 | 52330.34 | 45767.73 | 58892.96 | Investigate | 7% | |
| 7/22/2002 7:15 | 23rd | 7341 | 50596 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/24/2002 7:00 | 24th | 6383 | 51108 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/24/2002 11:45 | 25th | 6485 | 54121 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/24/2002 17:00 | 26th | 6416 | 53284 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/25/2002 7:00 | 27th | 6897 | 53182 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/25/2002 11:45 | 28th | 7122 | 51362 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/25/2002 17:00 | 29th | 6493 | 51595 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/26/2002 7:00 | 30th | 6981 | 52327 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/26/2002 12:00 | 31st | 6623 | 53810 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/26/2002 17:00 | 32nd | 7414 | 53712 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/27/2002 7:00 | 33rd | 6744 | 50845 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/27/2002 12:00 | 34th | 6553 | 52183 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/27/2002 17:00 | 35th | 6523 | 48426 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/28/2002 8:00 | 36th | 7285 | 51440 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/28/2002 12:40 | 37th | 6924 | 50193 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/28/2002 18:00 | 38th | 6609 | 47305 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/29/2002 7:00 | 39th | 6562 | 50830 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/29/2002 12:00 | 40th | 6484 | 52846 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/29/2002 17:00 | 41st | 6454 | 50945 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/30/2002 7:00 | 42nd | 6565 | 50402 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/30/2002 12:35 | 43rd | 6420 | 51711 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/30/2002 17:15 | 44th | 6427 | 49086 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 7/31/2002 7:00 | 45th | 6361 | 52425 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/31/2002 12:00 | 46th | 6616 | 54502 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 7/31/2002 15:15 | 47th | 6318 | 46172 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/5/2002 7:00 | 48th | 6396 | 49229 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/5/2002 12:00 | 49th | 6052 | 47769 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | batteries changed |
| 8/5/2002 16:45 | 50th | 6432 | 52199 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/6/2002 7:35 | 51st | 6302 | 50127 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/6/2002 12:20 | 52nd | 6260 | 53584 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/6/2002 18:00 | 53rd | 6473 | 53851 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/7/2002 7:20 | 54th | 6515 | 54254 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/7/2002 12:20 | 55th | 6327 | 52780 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/7/2002 17:30 | 56th | 6370 | 53900 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/8/2002 7:20 | 57th | 6534 | 50997 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/8/2002 12:45 | 58th | 6232 | 54871 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/8/2002 17:55 | 59th | 6459 | 51389 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/9/2002 7:30 | 60th | 6892 | 52656 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/9/2002 12:30 | 61st | 6380 | 55608 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/9/2002 17:45 | 62nd | 6328 | 52255 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/10/2002 7:00 | 63rd | 6595 | 51681 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/10/2002 12:05 | 64th | 6420 | 53882 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/10/2002 17:15 | 65th | 6486 | 51589 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/11/2002 9:15 | 66th | 6618 | 51997 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |



## FIDLER A978P

Parameter Being Tracked Am-241 Source Data

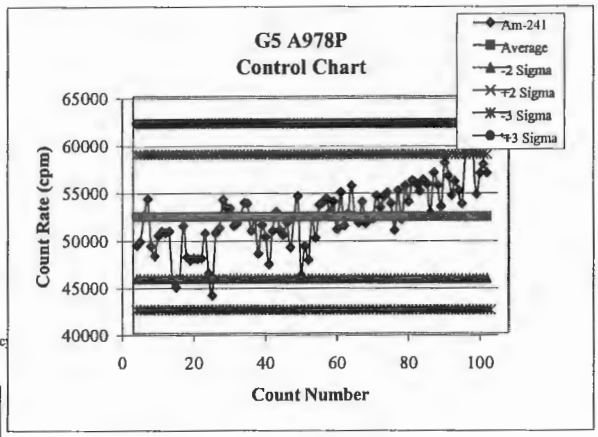
Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | Analyst |
| Manufacturer | Bicron |
| Serial Number | A978P |

Detector

| | |
|---|---|
| Instrument Type | FIDLER |
| Model Number | G5 |
| Manufacturer | Bicron |
| Serial Number | A379Q |
| Geometry | Jig |
| ROI | |

| Count Data | | 2 Sigma | 3 Sigma |
|---|---|---|---|
| Mean= | 52330.34 | High 58892.96 | 62174.27 |
| STDEV= | 3281.307 | Low 45767.73 | 42486.42 |




Avg. Efficiency
8.6%

Am-241

| Date/Time | Data Number | Bkgd Data (cpm) | Am-241 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 8/11/2002 14:20 | 67th | 6563 | 52118 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/11/2002 17:50 | 68th | 6662 | 54555 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/12/2002 7:00 | 69th | 6663 | 53275 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/12/2002 12:30 | 70th | 6826 | 54470 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/12/2002 17:50 | 71st | 6612 | 54861 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/13/2002 7:00 | 72nd | 6340 | 53741 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/13/2002 12:30 | 73rd | 6293 | 50891 | 52330.34 | 45767.73 | 58892.96 | OK | 8% | |
| 8/13/2002 17:30 | 74th | 6449 | 55079 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/14/2002 7:00 | 75th | 6758 | 52035 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/14/2002 12:15 | 76th | 6464 | 55602 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/19/2002 7:00 | 77th | 6926 | 53916 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/19/2002 12:30 | 78th | 6439 | 56135 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | batteries changed |
| 8/19/2002 17:30 | 79th | 6854 | 55785 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/20/2002 7:00 | 80th | 6762 | 55011 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/20/2002 12:20 | 81st | 6381 | 56258 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/20/2002 17:35 | 82nd | 6152 | 55811 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/21/2002 7:00 | 83rd | 6451 | 52725 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/21/2002 12:50 | 84th | 6327 | 56966 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/21/2002 17:45 | 85th | 6367 | 55659 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/22/2002 7:00 | 86th | 6575 | 53406 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/22/2002 11:35 | 87th | 6418 | 58024 | 52330.34 | 45767.73 | 58892.96 | OK | 10% | |
| 8/22/2002 17:40 | 88th | 6419 | 56655 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/23/2002 7:05 | 89th | 6563 | 54582 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/23/2002 13:10 | 90th | 6422 | 56057 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/23/2002 17:00 | 91st | 6546 | 55093 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/24/2002 7:00 | 92nd | 6888 | 53706 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/24/2002 13:30 | 93rd | 7278 | 59461 | 52330.34 | 45767.73 | 58892.96 | Investigate | 10% | likely due to rain |
| 8/24/2002 18:45 | 94th | 6348 | 60209 | 52330.34 | 45767.73 | 58892.96 | Investigate | 10% | likely due to rain |
| 8/25/2002 8:00 | 95th | 6554 | 59206 | 52330.34 | 45767.73 | 58892.96 | Investigate | 10% | |
| 8/25/2002 12:35 | 96th | 6310 | 54689 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/26/2002 7:00 | 97th | 6417 | 56902 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | |
| 8/26/2002 0:35 | 98th | 6362 | 57844 | 52330.34 | 45767.73 | 58892.96 | OK | 10% | |
| 8/27/2002 13:25 | 99th | 6436 | 56937 | 52330.34 | 45767.73 | 58892.96 | OK | 9% | End of use |

## MicroRem C251A

Parameter Being Tracke Cs-137 Source Data

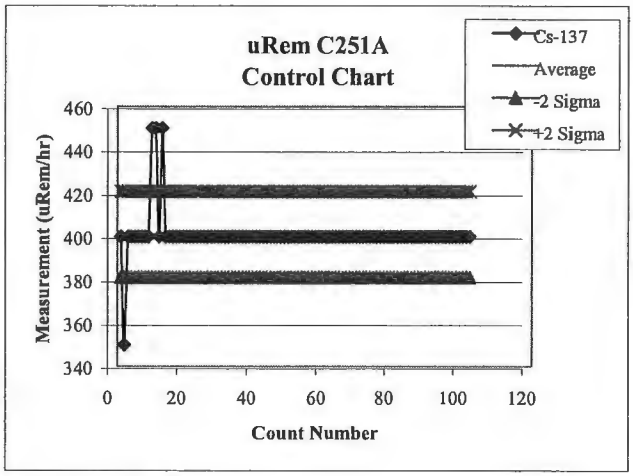
Electronics

| | |
|---|---|
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |

Detector

| | |
|---|---|
| Instrument Type | Exposure Ratemeter (1xI inch NaI) |
| Model Number | MicroRem |
| Manufacturer | Bicron |
| Serial Number | C251A |
| Geometry | Contact |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 400.9804 | High | 420.7833 | 430.6848 |
| STDEV= | 9.901475 | Low | 381.1774 | 371.276 |




| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status | |
|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/11/2002 11:20 | 2nd | 6 | 350 | 400.9804 | 381.1774 | 420.7833 | Investigate | |
| 7/11/2002 17:00 | 3rd | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/12/2002 7:00 | 4th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/12/2002 11:30 | 5th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/12/2002 16:25 | 6th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/13/2002 7:00 | 7th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/13/2002 11:30 | 8th | 14 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/13/2002 15:30 | 9th | 14 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/22/2002 7:15 | 10th | 14 | 450 | 400.9804 | 381.1774 | 420.7833 | Investigate | |
| 7/23/2002 13:12 | 11th | 15 | 450 | 400.9804 | 381.1774 | 420.7833 | Investigate | |
| 7/23/2002 17:00 | 12th | 15 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/24/2002 7:00 | 13th | 12 | 450 | 400.9804 | 381.1774 | 420.7833 | Investigate | |
| 7/24/2002 11:45 | 14th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/24/2002 17:00 | 15th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/25/2002 7:00 | 16th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/25/2002 11:45 | 17th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/26/2002 7:00 | 18th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/26/2002 12:00 | 19th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/26/2002 17:00 | 20th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/27/2002 7:00 | 21st | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/27/2002 12:00 | 22nd | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/27/2002 17:00 | 23rd | 9.5 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/28/2002 8:00 | 24th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/28/2002 12:40 | 25th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/28/2002 16:30 | 26th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/29/2002 7:00 | 27th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/29/2002 12:00 | 28th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/29/2002 17:15 | 29th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/30/2002 7:00 | 30th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/30/2002 12:35 | 31st | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/30/2002 17:15 | 32nd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/31/2002 7:00 | 33rd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/31/2002 12:00 | 34th | 11 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 7/31/2001 15:15 | 35th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/5/2002 7:00 | 36th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/5/2002 12:00 | 37th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/5/2002 16:45 | 38th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/6/2002 7:35 | 39th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/6/2002 12:20 | 40th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | batteries changed |
| 8/6/2002 18:00 | 41st | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/7/2002 7:20 | 42nd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/7/2002 12:20 | 43rd | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/7/2002 17:30 | 44th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 8/8/2002 7:20 | 45th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |

## MicroRem C251A

Parameter Being Tracke Cs-137 Source Data

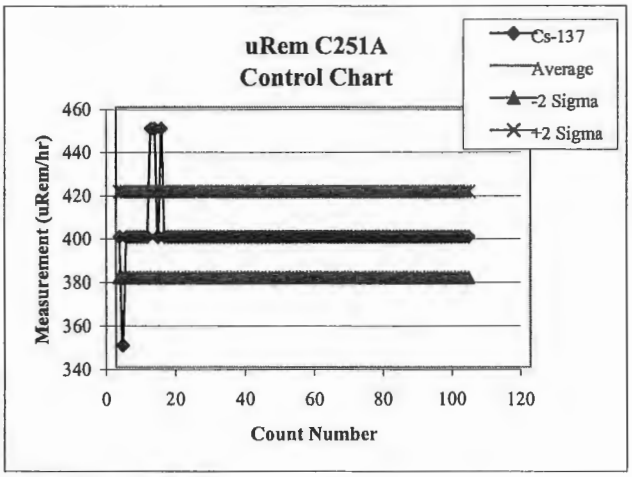
Electronics

| | |
|---|---|
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |

Detector

| | |
|---|---|
| Instrument Type | Exposure Ratemeter (1x1 inch NaI) |
| Model Number | MicroRem |
| Manufacturer | Bicron |
| Serial Number | C251A |
| Geometry | Contact |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 400.9804 | High | 420.7833 | 430.6848 |
| STDEV= | 9.901475 | Low | 381.1774 | 371.276 |




| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status |
|---|---|---|---|---|---|---|---|
| 8/8/2002 12:45 | 46th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/8/2002 17:55 | 47th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/9/2002 7:00 | 48th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/9/2002 12:30 | 49th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/9/2002 17:45 | 50th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/10/2002 7:00 | 51st | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/10/2002 12:05 | 52nd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/10/2002 17:15 | 53rd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/11/2002 9:00 | 54th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/11/2002 14:20 | 55th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/11/2002 17:50 | 56th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/12/2002 7:00 | 57th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/12/2002 12:30 | 58th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/12/2002 17:50 | 59th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/13/2002 7:00 | 60th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/13/2002 12:30 | 61st | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/13/2002 17:30 | 62nd | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/14/2002 7:00 | 63rd | 5 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/14/2002 12:15 | 64th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/19/2002 7:00 | 65th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/19/2002 12:30 | 66th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/19/2002 17:30 | 67th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/20/2002 7:00 | 68th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/20/2002 12:20 | 69th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/20/2002 17:35 | 70th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/21/2002 7:00 | 71st | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/21/2002 12:50 | 72nd | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/21/2002 17:20 | 73rd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/22/2002 7:00 | 74th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/22/2002 13:15 | 75th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/22/2002 18:05 | 76th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/23/2002 7:05 | 77th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/23/2002 13:00 | 78th | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/23/2002 17:00 | 79th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/24/2002 7:00 | 80th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/24/2002 13:30 | 81st | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/24/2002 19:00 | 82nd | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/25/2002 8:00 | 83rd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/25/2002 12:35 | 84th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/26/2002 7:00 | 85th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/26/2002 12:35 | 86th | 5 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/27/2002 7:00 | 87th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/27/2002 12:20 | 88th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 8/27/2002 17:30 | 89th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |
| 9/9/2002 7:00 | 90th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK |

## MicroRem C251A

Parameter Being Tracked: Cs-137 Source Data

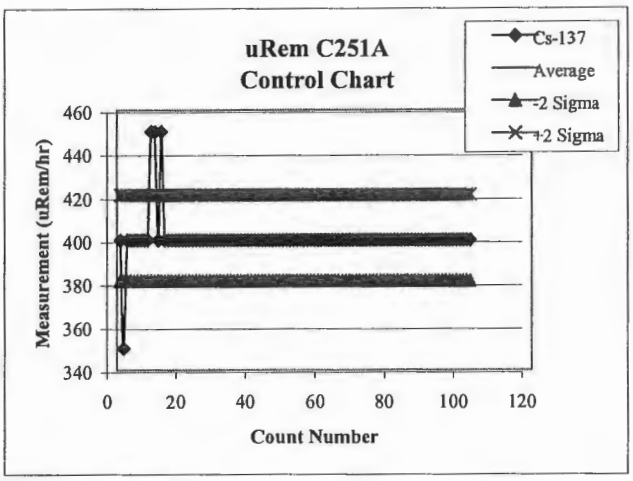
Electronics

| | |
|---|---|
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |

Detector

| | |
|---|---|
| Instrument Type | Exposure Ratemeter (1x1 inch NaI) |
| Model Number | MicroRem |
| Manufacturer | Bicron |
| Serial Number | C251A |
| Geometry | Contact |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 400.9804 | High | 420.7833 | 430.6848 |
| STDEV= | 9.901475 | Low | 381.1774 | 371.276 |



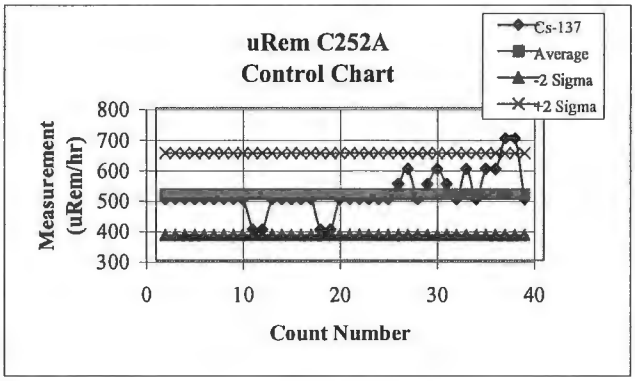

| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status | |
|---|---|---|---|---|---|---|---|---|
| 9/9/2002 11:45 | 91st | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/9/2002 17:00 | 92nd | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/10/2002 7:00 | 93rd | 8 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/11/2002 7:00 | 94th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/11/2002 12:40 | 95th | 9 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/11/2002 18:00 | 96th | 10 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/12/2002 7:00 | 97th | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/12/2002 12:10 | 98th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/12/2002 17:25 | 99th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/13/2002 7:00 | 100th | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/13/2002 12:00 | 101st | 6 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | |
| 9/13/2002 16:20 | 102nd | 7 | 400 | 400.9804 | 381.1774 | 420.7833 | OK | End of Program |

## MicroRem C252A

Parameter Being Tracked: Cs-137 Source Data

| | |
|---|---|
| **Electronics** | |
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |
| **Detector** | |
| Instrument Type | Exposure Ratemeter (1x1 NaI detector) |
| Model Number | micro rem |
| Manufacturer | Bicron |
| Serial Number | C252A |
| Geometry | Contact |
| ROI | |
| Count Data | |

| | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 517.1053 | High | 651.2216 | 718.2798 |
| STDEV= | 67.05818 | Low | 382.9889 | 315.9307 |




| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status | |
|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 9 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/11/2002 11:20 | 2nd | 7.5 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/11/2002 17:00 | 3rd | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/12/2002 7:00 | 4th | 7.5 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/12/2002 11:30 | 5th | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/12/2002 16:30 | 6th | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/13/2002 7:00 | 7th | 7 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/13/2002 11:30 | 8th | 7 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/13/2002 15:30 | 9th | 7 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/14/2002 8:00 | 10th | 7 | 400 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/14/2002 12:05 | 11th | 8 | 400 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/15/2002 7:00 | 12th | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/15/2002 11:30 | 13th | 10 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/15/2002 17:00 | 14th | 10 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/16/2002 7:00 | 15th | 9 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/16/2002 11:40 | 16th | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/16/2002 17:00 | 17th | 8 | 400 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/17/2002 7:15 | 18th | 9 | 400 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/17/2002 11:40 | 19th | 9 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/17/2002 15:30 | 20th | 8 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/22/2002 7:15 | 21st | 9 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/22/2002 11:45 | 22nd | 11 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | |
| 7/23/2002 13:05 | 23rd | 16 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/24/2002 7:00 | 24th | 13 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/24/2002 11:45 | 25th | 12 | 550 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/24/2002 17:00 | 26th | 15 | 600 | 517.1053 | 382.9889 | 651.2216 | OK | HV high, will recheck in morning |
| 7/25/2002 7:00 | 27th | 13 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/25/2002 11:45 | 28th | 15 | 550 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/25/2002 17:00 | 29th | 17 | 600 | 517.1053 | 382.9889 | 651.2216 | OK | HV high, will recheck in morning |
| 7/26/2002 7:00 | 30th | 17 | 550 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/26/2002 12:00 | 31st | 14 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/26/2002 17:00 | 32nd | 19 | 600 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/27/2002 7:00 | 33rd | 16 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/27/2002 12:00 | 34th | 18 | 600 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/27/2002 17:00 | 35th | 20 | 600 | 517.1053 | 382.9889 | 651.2216 | OK | HV high |
| 7/28/2002 8:00 | 36th | 20 | 700 | 517.1053 | 382.9889 | 651.2216 | Investigate | HV high |
| 7/28/2002 12:40 | 37th | 30 | 700 | 517.1053 | 382.9889 | 651.2216 | Investigate | HV high |
| 7/28/2002 18:00 | 38th | 10 | 500 | 517.1053 | 382.9889 | 651.2216 | OK | HV high Taken out of service. |

## Model 19 33054

Parameter Being Tracked Cs-137 Source Data

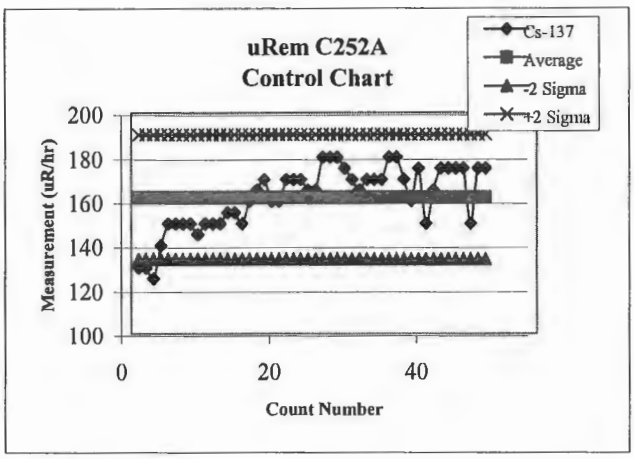
Electronics

| | |
|---|---|
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |

Detector

| | |
|---|---|
| Instrument Type | Exposure Ratemeter (1x1 inch NaI) |
| Model Number | Model 19 |
| Manufacturer | Ludlum |
| Serial Number | 33054 |
| Geometry | Contact |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 161.9792 | High | 190.1685 | 204.2631 |
| STDEV= | 14.09465 | Low | 133.7899 | 119.6952 |



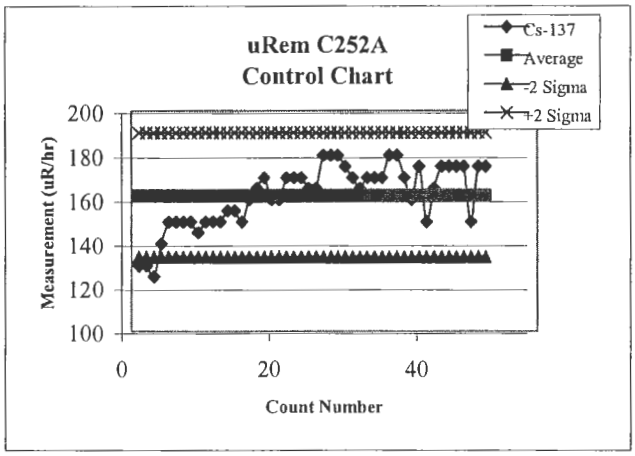

| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status |
|---|---|---|---|---|---|---|---|
| 7/29/2002 7:00 | 1st | 2.5 | 130 | 161.9792 | 133.7899 | 190.1685 | Investigate |
| 7/29/2002 12:00 | 2nd | 3 | 130 | 161.9792 | 133.7899 | 190.1685 | Investigate |
| 7/29/2002 17:00 | 3rd | 3 | 125 | 161.9792 | 133.7899 | 190.1685 | Investigate |
| 7/30/2002 7:00 | 4th | 3 | 140 | 161.9792 | 133.7899 | 190.1685 | OK |
| 7/30/2002 12:20 | 5th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 7/30/2002 17:15 | 6th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 7/31/2002 7:00 | 7th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/8/2002 7:20 | 8th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/8/2002 12:45 | 9th | 3 | 145 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/8/2001 17:55 | 10th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/11/2002 9:00 | 11th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/11/2002 14:20 | 12th | 3 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/11/2002 17:50 | 13th | 3 | 155 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/12/2002 7:00 | 14th | 3.5 | 155 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/12/2002 12:30 | 15th | 4 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/12/2002 17:50 | 16th | 3.5 | 160 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/13/2002 7:00 | 17th | 3.5 | 165 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/13/2002 12:30 | 18th | 3.5 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/13/2002 17:30 | 19th | 3 | 160 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/20/2002 13:15 | 20th | 3 | 160 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/20/2002 17:35 | 21st | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/21/2002 7:00 | 22nd | 3 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/21/2002 12:50 | 23rd | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/21/2002 17:45 | 24th | 4 | 165 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/22/2002 7:00 | 25th | 4 | 165 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/22/2002 11:35 | 26th | 4 | 180 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/22/2002 17:40 | 27th | 4 | 180 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/23/2002 7:05 | 28th | 4 | 180 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/23/2002 13:10 | 29th | 3 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/23/2002 17:00 | 30th | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/24/2002 7:00 | 31st | 4 | 165 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/24/2002 13:30 | 32nd | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/24/2002 17:00 | 33rd | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/25/2002 8:00 | 34th | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/25/2002 12:20 | 35th | 4.5 | 180 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/26/2002 7:00 | 36th | 4 | 180 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/26/02 12:35 | 37th | 4 | 170 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/26/2002 17:30 | 38th | 3 | 160 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/27/2002 7:00 | 39th | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 8/27/2002 12:20 | 40th | 4 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/9/2002 7:00 | 41st | 3.5 | 165 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/9/2002 12:15 | 42nd | 5 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/9/2002 16:00 | 43rd | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/10/2002 7:00 | 44th | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/11/2002 7:00 | 45th | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/11/2002 11:10 | 46th | 4 | 150 | 161.9792 | 133.7899 | 190.1685 | OK |
| 9/11/2002 17:30 | 47th | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK |

## Model 19 33054

Parameter Being Tracked Cs-137 Source Data

| | |
|---|---|
| | Electronics |
| Instrument Type | NA |
| Model Number | NA |
| Manufacturer | NA |
| Serial Number | NA |
| | Detector |
| Instrument Type | Exposure Ratemeter (1x1 inch NaI) |
| Model Number | Model 19 |
| Manufacturer | Ludlum |
| Serial Number | 33054 |
| Geometry | Contact |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 161.9792 | High | 190.1685 | 204.2631 |
| STDEV= | 14.09465 | Low | 133.7899 | 119.6952 |



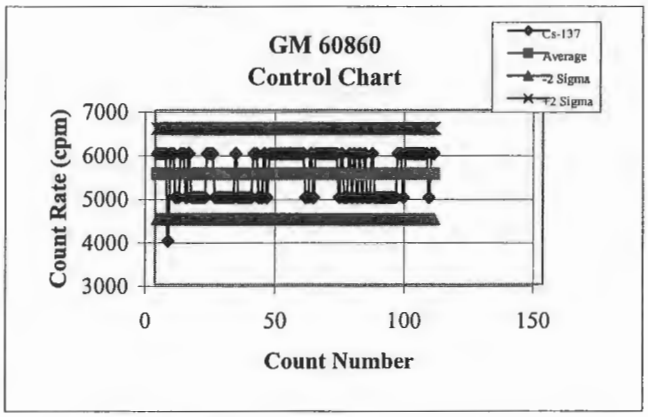

| Date/Time | Data Number | Bkgd Data (urem/h) | Cs-137 Data (urem/h) | Pull Block | | | Status | |
|---|---|---|---|---|---|---|---|---|
| 9/12/2002 7:00 | 48th | 4 | 175 | 161.9792 | 133.7899 | 190.1685 | OK | End of program |

## GM 60860

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 60860 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | Not recorded |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 5537.037 | High | 6575.581 | 7094.853 |
| STDEV= | 519.2721 | Low | 4498.493 | 3979.221 |




Avg. Efficiency
0.3%

Cs-137

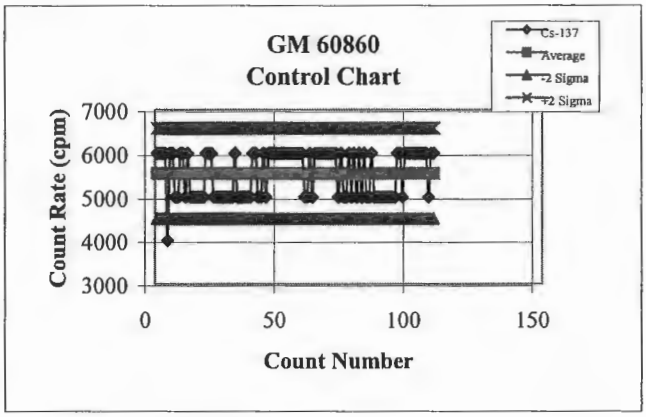
| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/11/2002 11:20 | 2nd | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/11/2002 17:00 | 3rd | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/12/2002 7:00 | 4th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/12/2002 11:30 | 5th | 30 | 4000 | 5537.037 | 4498.493 | 6575.581 | Investigate | 0.2% |
| 7/12/2002 16:30 | 6th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/13/2002 7:00 | 7th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/13/2002 12:10 | 8th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/13/2002 15:30 | 9th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/15/2002 7:00 | 10th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/15/2002 11:40 | 11th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/17/2002 7:15 | 12th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/17/2002 11:40 | 13th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/22/2002 7:00 | 14th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/22/2002 11:45 | 15th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/22/2002 16:30 | 16th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/23/2002 7:00 | 17th | 40 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/23/2002 11:30 | 18th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/23/2002 17:00 | 19th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/24/2002 7:00 | 20th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/24/2002 11:45 | 21st | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/24/2002 17:00 | 22nd | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/25/2002 7:00 | 23rd | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/25/2002 11:45 | 24th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/25/2002 17:00 | 25th | 40 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/26/2002 7:00 | 26th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/26/2002 12:00 | 27th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/26/2002 17:00 | 28th | 25 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/27/2002 7:00 | 29th | 25 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/27/2002 12:00 | 30th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/27/2002 17:00 | 31st | 25 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/28/2002 8:00 | 32nd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/28/2002 12:40 | 33rd | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/28/2002 17:45 | 34th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/29/2002 7:00 | 35th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/29/2002 12:00 | 36th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/29/2002 17:15 | 37th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/30/2002 7:00 | 38th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/30/2002 12:35 | 39th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/30/2002 17:15 | 40th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/31/2002 7:00 | 41st | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 7/31/2002 12:00 | 42nd | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 7/31/2001 15:15 | 43rd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/5/2002 7:00 | 44th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/5/2002 12:00 | 45th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/5/2002 17:00 | 46th | 50 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/6/2002 7:35 | 47th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |

## GM 60860

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 60860 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | Not recorded |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 5537.037 | High | 6575.581 | 7094.853 |
| STDEV= | 519.2721 | Low | 4498.493 | 3979.221 |




Avg. Efficiency
0.3%

Cs-137

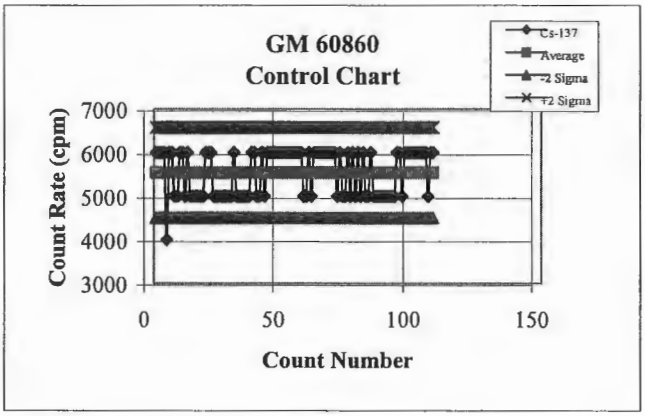
| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|---|---|
| 8/6/2002 12:20 | 48th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/6/2002 18:00 | 49th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/7/2002 7:20 | 50th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/8/2002 7:20 | 51st | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/8/2002 12:45 | 52nd | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/8/2002 17:55 | 53rd | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/11/2002 9:00 | 54th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/11/2002 14:20 | 55th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/11/2002 17:50 | 56th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/12/2002 7:00 | 57th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/12/2002 12:30 | 58th | 40 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/12/2002 17:50 | 59th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/13/2002 7:00 | 60th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/13/2002 12:30 | 61st | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/13/2002 17:30 | 62nd | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/20/2002 13:20 | 63rd | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/20/2002 17:35 | 64th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/21/2002 7:00 | 65th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/21/2002 12:50 | 66th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/21/2002 17:30 | 67th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/22/2002 7:00 | 68th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/22/2002 11:35 | 69th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/22/2002 18:05 | 70th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/23/2002 7:05 | 71st | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/23/2002 13:00 | 72nd | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/23/2002 17:00 | 73rd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/24/2002 7:00 | 74th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/24/2002 13:30 | 75th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/24/2002 19:00 | 76th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/25/2002 8:00 | 77th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/25/2002 12:35 | 78th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/26/2002 7:00 | 79th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/26/2002 12:35 | 80th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/27/2002 7:00 | 81st | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/27/2002 12:20 | 82nd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/27/2002 17:30 | 83rd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 8/28/2002 7:15 | 84th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 8/28/2002 11:30 | 85th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/9/2002 7:00 | 86th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/9/2002 12:15 | 87th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/9/2002 17:00 | 88th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/10/2002 7:00 | 89th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/10/2002 12:15 | 90th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/10/2002 18:00 | 91st | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/11/2002 7:00 | 92nd | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/11/2002 12:40 | 93rd | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/11/2002 18:00 | 94th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |

## GM 60860

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 60860 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | Not recorded |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 5537.037 | High | 6575.581 | 7094.853 |
| STDEV= | 519.2721 | Low | 4498.493 | 3979.221 |




Avg. Efficiency
0.3%

Cs-137

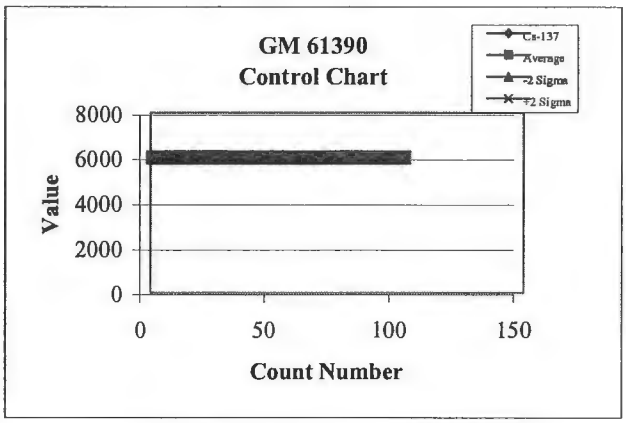
| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|---|---|
| 9/12/2002 7:00 | 95th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/12/2002 12:10 | 96th | 30 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/12/2002 17:30 | 97th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/13/2002 7:00 | 98th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/13/2002 12:00 | 99th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/14/2002 7:00 | 100th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/14/2002 11:30 | 101st | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/14/2002 15:40 | 102nd | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/16/2002 7:00 | 103rd | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/16/2002 12:00 | 104th | 40 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/16/2002 18:00 | 105th | 20 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/17/2002 7:00 | 106th | 20 | 5000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.3% |
| 9/17/2002 11:30 | 107th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |
| 9/17/2002 16:05 | 108th | 30 | 6000 | 5537.037 | 4498.493 | 6575.581 | OK | 0.4% |

## GM 61390

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 61390 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | PR019247 |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 6000 | High | 6000 | 6000 |
| STDEV= | 0 | Low | 6000 | 6000 |




Avg. Efficiency
0.4%

Cs-137

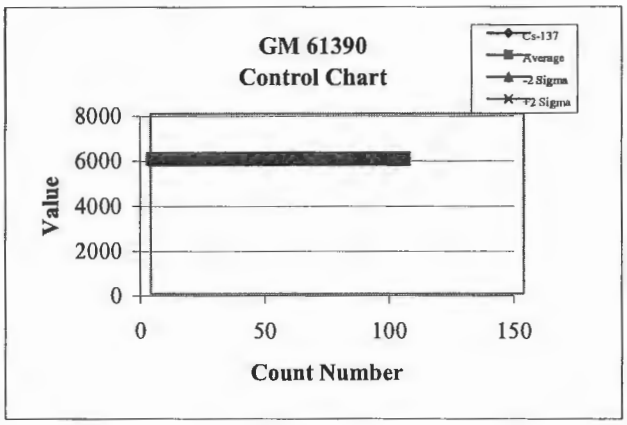
| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|---|---|
| 7/10/2002 15:25 | 1st | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/11/2002 11:20 | 2nd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/11/2002 17:00 | 3rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/12/2002 7:00 | 4th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/12/2002 11:30 | 5th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/12/2002 16:25 | 6th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/13/2002 7:10 | 7th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/13/2002 12:05 | 8th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/13/2002 15:30 | 9th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/14/2002 8:00 | 10th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/14/2002 12:05 | 11th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/14/2002 15:45 | 12th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/15/2002 17:00 | 13th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/16/2002 7:00 | 14th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/16/2002 11:40 | 15th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/16/2002 17:00 | 16th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/17/2002 7:15 | 17th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/17/2002 11:40 | 18th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/17/2002 15:30 | 19th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/22/2002 7:00 | 20th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/23/2002 8:15 | 21st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/23/2002 11:30 | 22nd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/23/2002 17:00 | 23rd | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/24/2002 7:00 | 24th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/24/2002 11:45 | 25th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/24/2002 17:00 | 26th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/25/2002 7:00 | 27th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/25/2002 11:45 | 28th | 60 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/25/2002 17:00 | 29th | 50 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/26/2002 7:00 | 30th | 50 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/26/2002 12:00 | 31st | 60 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/26/2002 17:00 | 32nd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/27/2002 7:00 | 33rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/27/2002 12:00 | 34th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/28/2002 8:00 | 35th | 60 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/28/2002 12:40 | 36th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/28/2002 17:45 | 37th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/29/2002 7:00 | 38th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/29/2002 12:00 | 39th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/29/2002 17:00 | 40th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/30/2002 7:00 | 41st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/30/2002 12:20 | 42nd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/30/2002 17:15 | 43rd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 7/31/2002 7:00 | 44th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/7/2002 12:20 | 45th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |

## GM 61390

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 61390 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | PR019247 |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 6000 | High | 6000 | 6000 |
| STDEV= | 0 | Low | 6000 | 6000 |




Avg. Efficiency
0.4%

Cs-137

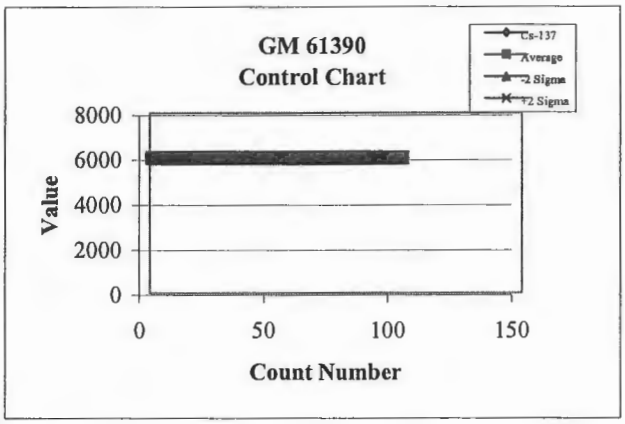
| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) |
|---|---|---|---|---|---|---|---|---|
| 8/7/2002 17:30 | 46th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/8/2002 7:20 | 47th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/8/2002 12:45 | 48th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/8/2002 17:55 | 49th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/9/2002 7:00 | 50th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/9/2002 12:30 | 51st | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/9/2002 17:45 | 52nd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/10/2002 7:00 | 53rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/10/2002 12:05 | 54th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/10/2002 17:15 | 55th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/11/2002 9:00 | 56th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/11/2002 14:20 | 57th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/11/2001 17:50 | 58th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/12/2002 7:00 | 59th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/12/2002 12:30 | 60th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/12/2002 17:50 | 61st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/13/2002 7:00 | 62nd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/13/2002 12:30 | 63rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/13/2002 17:30 | 64th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/14/2002 7:00 | 65th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/14/2002 12:15 | 66th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/19/2002 7:00 | 67th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/19/2002 12:30 | 68th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/19/2002 17:30 | 69th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/20/2002 7:00 | 70th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/20/2002 12:20 | 71st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/20/2002 17:35 | 72nd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/21/2002 7:00 | 73rd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/21/2002 12:50 | 74th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/21/2002 17:45 | 75th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/22/2002 7:00 | 76th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/22/2002 13:15 | 77th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/22/2002 17:40 | 78th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/23/2002 7:05 | 79th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/23/2002 13:10 | 80th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/23/2002 17:00 | 81st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/24/2002 7:00 | 82nd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/24/2002 13:30 | 83rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/24/2002 18:30 | 84th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/25/2002 8:00 | 85th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/25/2002 12:20 | 86th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/26/2002 7:00 | 87th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/26/2002 12:35 | 88th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/26/2002 17:30 | 89th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |
| 8/27/2002 7:00 | 90th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% |

## GM 61390

Parameter Being Tracked Cs-137 Source Data

| | Electronics |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 3 |
| Manufacturer | Ludlum |
| Serial Number | 61390 |
| | **Detector** |
| Instrument Type | GM Pancake Probe |
| Model Number | 44-9 |
| Manufacturer | Ludlum |
| Serial Number | PR019247 |
| Geometry | Contact, active side out |
| ROI | |

| Count Data | | | 2 Sigma | 3 Sigma |
|---|---|---|---|---|
| Mean= | 6000 | High | 6000 | 6000 |
| STDEV= | 0 | Low | 6000 | 6000 |




Avg. Efficiency
0.4%

Cs-137

| Date/Time | Data Number | Bkgd Data (cpm) | Cs-137 Data (cpm) | Pull Block | | | Status | 4 Pi Eff (%) | |
|---|---|---|---|---|---|---|---|---|---|
| 8/27/2002 12:20 | 91st | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 8/27/2002 17:30 | 92nd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/9/2002 7:00 | 93rd | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/9/2002 12:15 | 94th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/9/2002 17:00 | 95th | 20 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/10/2002 7:00 | 96th | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/10/2002 11:45 | 97th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/10/2002 17:35 | 98th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/11/2002 7:00 | 99th | 40 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/11/2002 11:10 | 100th | 50 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/11/2002 17:30 | 101st | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | |
| 9/12/2002 7:00 | 102nd | 30 | 6000 | 6000 | 6000 | 6000 | OK | 0.4% | End of program |

## Floor Monitor 138256

Parameter Being Tracked: Tc-99 Beta and Th-230 Alpha Source Data

**Electronics**

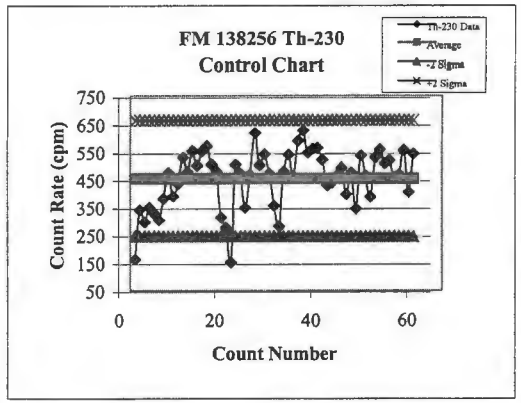
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2360 |
| Manufacturer | Ludlum |
| Serial Number | 138256 |

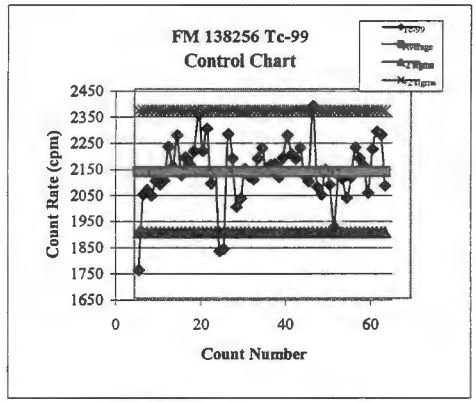
**Detector**

| | |
|---|---|
| Instrument Type | Gas Proportional Floor Monitor |
| Model Number | 43-37 |
| Manufacturer | Ludlum |
| Serial Number | Not recorded |
| Geometry | Center of probe, 1 cm |
| ROI | |

**Count Data**

| | Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 452.2881 | 2133.424 | 661.0672 | 2365.871 | high cutoff (+2 Sigma) |
| STDEV= | 104.3895 | 116.2237 | 243.5091 | 1900.976 | low cutoff (-2 Sigma) |




| Avg. Efficiency | |
|---|---|
| Beta | Alpha |
| 18.5% | 4.8% |

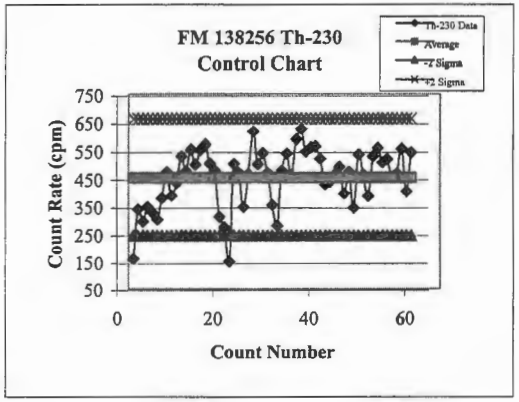
| | | Bkgd Data | | Tc-99 | | Tc-99 Data | | | | Th-230 | | Th-230 Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) | |
| 7/10/2002 0:00 | 1st | 1 | 319 | 2 | 1756 | 2133.424 | 1900.976 | 2365.871 | Investigate | 160 | 740 | 452.2881 | 243.5091 | 661.0672 | Investigate | 15.2% | 1.7% | |
| 7/11/2002 13:00 | 2nd | 3 | 507 | 4 | 2046 | 2133.424 | 1900.976 | 2365.871 | OK | 338 | 901 | 452.2881 | 243.5091 | 661.0672 | OK | 17.7% | 3.6% | |
| 7/11/2002 17:00 | 3rd | 5 | 529 | 1 | 2062 | 2133.424 | 1900.976 | 2365.871 | OK | 294 | 822 | 452.2881 | 243.5091 | 661.0672 | OK | 17.9% | 3.1% | |
| 7/12/2002 7:00 | 4th | 8 | 487 | 4 | 2041 | 2133.424 | 1900.976 | 2365.871 | OK | 347 | 815 | 452.2881 | 243.5091 | 661.0672 | OK | 17.7% | 3.7% | |
| 7/12/2002 11:30 | 5th | 2 | 528 | 0 | 2098 | 2133.424 | 1900.976 | 2365.871 | OK | 326 | 827 | 452.2881 | 243.5091 | 661.0672 | OK | 18.2% | 3.4% | |
| 7/12/2002 16:25 | 6th | 5 | 491 | 3 | 2085 | 2133.424 | 1900.976 | 2365.871 | OK | 302 | 889 | 452.2881 | 243.5091 | 661.0672 | OK | 18.1% | 3.2% | |
| 7/13/2002 7:25 | 7th | 6 | 520 | 7 | 2099 | 2133.424 | 1900.976 | 2365.871 | OK | 379 | 899 | 452.2881 | 243.5091 | 661.0672 | OK | 18.2% | 4.0% | |
| 7/13/2002 11:55 | 8th | 10 | 569 | 5 | 2229 | 2133.424 | 1900.976 | 2365.871 | OK | 473 | 898 | 452.2881 | 243.5091 | 661.0672 | OK | 19.3% | 5.0% | |
| 7/13/2002 15:30 | 9th | 5 | 543 | 3 | 2152 | 2133.424 | 1900.976 | 2365.871 | OK | 388 | 846 | 452.2881 | 243.5091 | 661.0672 | OK | 18.6% | 4.1% | |
| 7/14/2002 8:30 | 10th | 11 | 519 | 12 | 2272 | 2133.424 | 1900.976 | 2365.871 | OK | 432 | 833 | 452.2881 | 243.5091 | 661.0672 | OK | 19.7% | 4.6% | |
| 7/14/2002 15:45 | 11th | 5 | 523 | 8 | 2119 | 2133.424 | 1900.976 | 2365.871 | OK | 529 | 883 | 452.2881 | 243.5091 | 661.0672 | OK | 18.4% | 5.6% | mylar replaced |
| 7/15/2002 7:00 | 12th | 18 | 563 | 10 | 2188 | 2133.424 | 1900.976 | 2365.871 | OK | 476 | 939 | 452.2881 | 243.5091 | 661.0672 | OK | 19.0% | 5.0% | |
| 7/15/2002 11:30 | 13th | 9 | 601 | 6 | 2159 | 2133.424 | 1900.976 | 2365.871 | OK | 552 | 922 | 452.2881 | 243.5091 | 661.0672 | OK | 18.7% | 5.8% | |
| 7/15/2002 17:00 | 14th | 7 | 584 | 6 | 2213 | 2133.424 | 1900.976 | 2365.871 | OK | 499 | 887 | 452.2881 | 243.5091 | 661.0672 | OK | 19.2% | 5.3% | |
| 7/16/2002 7:00 | 15th | 6 | 537 | 7 | 2352 | 2133.424 | 1900.976 | 2365.871 | OK | 551 | 914 | 452.2881 | 243.5091 | 661.0672 | OK | 20.4% | 5.8% | |
| 7/16/2002 11:45 | 16th | 5 | 566 | 3 | 2212 | 2133.424 | 1900.976 | 2365.871 | OK | 570 | 852 | 452.2881 | 243.5091 | 661.0672 | OK | 19.2% | 6.0% | |
| 7/16/2002 17:00 | 17th | 1 | 534 | 1 | 2298 | 2133.424 | 1900.976 | 2365.871 | OK | 503 | 897 | 452.2881 | 243.5091 | 661.0672 | OK | 19.9% | 5.3% | |
| 7/17/2002 7:15 | 18th | 4 | 536 | 2 | 2087 | 2133.424 | 1900.976 | 2365.871 | OK | 478 | 906 | 452.2881 | 243.5091 | 661.0672 | OK | 18.1% | 5.1% | |
| 7/17/2002 11:40 | 19th | 9 | 480 | 2 | 2134 | 2133.424 | 1900.976 | 2365.871 | OK | 311 | 868 | 452.2881 | 243.5091 | 661.0672 | OK | 18.5% | 3.3% | |
| 7/17/2002 15:30 | 20th | 5 | 422 | 5 | 1828 | 2133.424 | 1900.976 | 2365.871 | Investigate | 273 | 810 | 452.2881 | 243.5091 | 661.0672 | OK | 15.8% | 2.9% | low gas |
| 7/22/2002 7:15 | 21st | 6 | 381 | 5 | 1837 | 2133.424 | 1900.976 | 2365.871 | Investigate | 149 | 811 | 452.2881 | 243.5091 | 661.0672 | Investigate | 15.9% | 1.6% | low gas/purge |
| 7/22/2002 13:00 | 22nd | 2 | 494 | 6 | 2276 | 2133.424 | 1900.976 | 2365.871 | OK | 502 | 862 | 452.2881 | 243.5091 | 661.0672 | OK | 19.7% | 5.3% | |
| 7/22/2002 16:30 | 23rd | 2 | 587 | 5 | 2184 | 2133.424 | 1900.976 | 2365.871 | OK | 469 | 951 | 452.2881 | 243.5091 | 661.0672 | OK | 18.9% | 5.0% | |
| 7/23/2002 7:00 | 24th | 5 | 443 | 2 | 1997 | 2133.424 | 1900.976 | 2365.871 | OK | 346 | 846 | 452.2881 | 243.5091 | 661.0672 | OK | 17.3% | 3.7% | |
| 7/23/2002 11:30 | 25th | 3 | 513 | 4 | 2031 | 2133.424 | 1900.976 | 2365.871 | OK | 466 | 903 | 452.2881 | 243.5091 | 661.0672 | OK | 17.6% | 4.9% | |
| 7/23/2002 17:00 | 26th | 1 | 487 | 3 | 2145 | 2133.424 | 1900.976 | 2365.871 | OK | 616 | 991 | 452.2881 | 243.5091 | 661.0672 | OK | 18.6% | 6.5% | |
| 7/24/2002 7:00 | 27th | 3 | 517 | 3 | 2114 | 2133.424 | 1900.976 | 2365.871 | OK | 500 | 866 | 452.2881 | 243.5091 | 661.0672 | OK | 18.3% | 5.3% | |
| 7/25/2002 7:00 | 28th | 10 | 521 | 4 | 2102 | 2133.424 | 1900.976 | 2365.871 | OK | 540 | 908 | 452.2881 | 243.5091 | 661.0672 | OK | 18.2% | 5.7% | |
| 7/25/2002 11:45 | 29th | 6 | 512 | 3 | 2184 | 2133.424 | 1900.976 | 2365.871 | OK | 470 | 854 | 452.2881 | 243.5091 | 661.0672 | OK | 18.9% | 5.0% | |
| 7/25/2002 17:00 | 30th | 7 | 494 | 3 | 2224 | 2133.424 | 1900.976 | 2365.871 | OK | 353 | 841 | 452.2881 | 243.5091 | 661.0672 | OK | 19.3% | 3.7% | |
| 7/26/2002 7:00 | 31st | 4 | 448 | 4 | 2144 | 2133.424 | 1900.976 | 2365.871 | OK | 279 | 891 | 452.2881 | 243.5091 | 661.0672 | OK | 18.6% | 3.0% | |

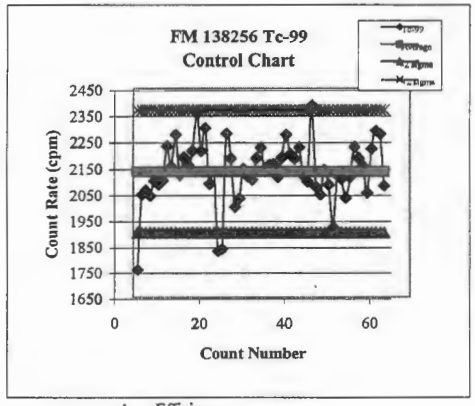
## Floor Monitor 138256

Parameter Being Tracked: Tc-99 Beta and Th-230 Alpha Source Data

| Electronics | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2360 |
| Manufacturer | Ludlum |
| Serial Number | 138256 |
| **Detector** | |
| Instrument Type | Gas Proportional Floor Monitor |
| Model Number | 43-37 |
| Manufacturer | Ludlum |
| Serial Number | Not recorded |
| Geometry | Center of probe, 1 cm |
| ROI | |

| Count Data | Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 452.2881 | 2133.424 | 661.0672 | 2365.871 | high cutoff (+2 Sigma) |
| STDEV= | 104.3895 | 116.2237 | 243.5091 | 1900.976 | low cutoff (-2 Sigma) |




| Avg. Efficiency | Beta | Alpha |
|---|---|---|
| | 18.5% | 4.8% |

| | | Bkgd Data | | Tc-99 | | Tc-99 Data | | | | Th-230 | | Th-230 Data | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) |
| 7/26/2002 12:00 | 32nd | 7 | 484 | 11 | 2158 | 2133.424 | 1900.976 | 2365.871 | OK | 478 | 883 | 452.2881 | 243.5091 | 661.0672 | OK | 18.7% | 5.1% |
| 7/26/2002 17:00 | 33rd | 2 | 494 | 2 | 2163 | 2133.424 | 1900.976 | 2365.871 | OK | 538 | 876 | 452.2881 | 243.5091 | 661.0672 | OK | 18.7% | 5.7% |
| 7/27/2002 7:00 | 34th | 4 | 484 | 6 | 2112 | 2133.424 | 1900.976 | 2365.871 | OK | 461 | 832 | 452.2881 | 243.5091 | 661.0672 | OK | 18.3% | 4.9% |
| 7/27/2002 12:00 | 35th | 9 | 550 | 7 | 2186 | 2133.424 | 1900.976 | 2365.871 | OK | 588 | 954 | 452.2881 | 243.5091 | 661.0672 | OK | 18.9% | 6.2% |
| 7/27/2002 17:00 | 36th | 2 | 536 | 2 | 2271 | 2133.424 | 1900.976 | 2365.871 | OK | 624 | 938 | 452.2881 | 243.5091 | 661.0672 | OK | 19.7% | 6.6% |
| 7/28/2002 8:00 | 37th | 3 | 531 | 7 | 2200 | 2133.424 | 1900.976 | 2365.871 | OK | 545 | 934 | 452.2881 | 243.5091 | 661.0672 | OK | 19.1% | 5.8% |
| 7/28/2002 12:40 | 38th | 7 | 530 | 5 | 2183 | 2133.424 | 1900.976 | 2365.871 | OK | 559 | 858 | 452.2881 | 243.5091 | 661.0672 | OK | 18.9% | 5.9% |
| 7/30/2002 13:25 | 39th | 7 | 527 | 5 | 2226 | 2133.424 | 1900.976 | 2365.871 | OK | 563 | 866 | 452.2881 | 243.5091 | 661.0672 | OK | 19.3% | 6.0% |
| 7/3/2002 17:15 | 40th | 3 | 552 | 8 | 2119 | 2133.424 | 1900.976 | 2365.871 | OK | 520 | 935 | 452.2881 | 243.5091 | 661.0672 | OK | 18.4% | 5.5% |
| 8/8/2002 7:20 | 41st | 4 | 532 | 5 | 2096 | 2133.424 | 1900.976 | 2365.871 | OK | 427 | 869 | 452.2881 | 243.5091 | 661.0672 | OK | 18.2% | 4.5% |
| 8/8/2002 12:45 | 42nd | 3 | 486 | 5 | 2385 | 2133.424 | 1900.976 | 2365.871 | Investigate | 437 | 837 | 452.2881 | 243.5091 | 661.0672 | OK | 20.7% | 4.6% |
| 8/8/2002 17:55 | 43rd | 3 | 518 | 8 | 2074 | 2133.424 | 1900.976 | 2365.871 | OK | 462 | 836 | 452.2881 | 243.5091 | 661.0672 | OK | 18.0% | 4.9% |
| 8/26/2002 12:50 | 44th | 5 | 473 | 3 | 2045 | 2133.424 | 1900.976 | 2365.871 | OK | 491 | 885 | 452.2881 | 243.5091 | 661.0672 | OK | 17.7% | 5.2% |
| 8/27/2002 7:00 | 45th | 1 | 495 | 2 | 2140 | 2133.424 | 1900.976 | 2365.871 | OK | 394 | 860 | 452.2881 | 243.5091 | 661.0672 | OK | 18.5% | 4.2% |
| 8/27/2002 12:20 | 46th | 4 | 507 | 7 | 2082 | 2133.424 | 1900.976 | 2365.871 | OK | 473 | 872 | 452.2881 | 243.5091 | 661.0672 | OK | 18.0% | 5.0% |
| 9/9/2002 12:45 | 47th | 1 | 390 | 2 | 1920 | 2133.424 | 1900.976 | 2365.871 | OK | 342 | 765 | 452.2881 | 243.5091 | 661.0672 | OK | 16.6% | 3.6% |
| 9/9/2002 17:00 | 48th | 3 | 570 | 2 | 2118 | 2133.424 | 1900.976 | 2365.871 | OK | 534 | 941 | 452.2881 | 243.5091 | 661.0672 | OK | 18.3% | 5.6% |
| 9/10/2002 7:15 | 49th | 6 | 532 | 3 | 2105 | 2133.424 | 1900.976 | 2365.871 | OK | 462 | 843 | 452.2881 | 243.5091 | 661.0672 | OK | 18.2% | 4.9% |
| 9/10/2002 12:30 | 50th | 1 | 464 | 3 | 2033 | 2133.424 | 1900.976 | 2365.871 | OK | 386 | 826 | 452.2881 | 243.5091 | 661.0672 | OK | 17.6% | 4.1% |
| 9/10/2002 17:45 | 51st | 4 | 560 | 4 | 2111 | 2133.424 | 1900.976 | 2365.871 | OK | 528 | 1894 | 452.2881 | 243.5091 | 661.0672 | OK | 18.3% | 5.6% |
| 9/11/2002 7:00 | 52nd | 5 | 585 | 3 | 2227 | 2133.424 | 1900.976 | 2365.871 | OK | 558 | 923 | 452.2881 | 243.5091 | 661.0672 | OK | 19.3% | 5.9% |
| 9/11/2002 12:40 | 53rd | 6 | 538 | 2 | 2184 | 2133.424 | 1900.976 | 2365.871 | OK | 507 | 878 | 452.2881 | 243.5091 | 661.0672 | OK | 18.9% | 5.4% |
| 9/11/2002 18:00 | 54th | 4 | 498 | 1 | 2154 | 2133.424 | 1900.976 | 2365.871 | OK | 518 | 853 | 452.2881 | 243.5091 | 661.0672 | OK | 18.7% | 5.5% |
| 9/12/2002 7:00 | 55th | 6 | 537 | 4 | 2052 | 2133.424 | 1900.976 | 2365.871 | OK | 454 | 905 | 452.2881 | 243.5091 | 661.0672 | OK | 17.8% | 4.8% |
| 9/12/2002 12:10 | 56th | 3 | 529 | 5 | 2220 | 2133.424 | 1900.976 | 2365.871 | OK | 467 | 883 | 452.2881 | 243.5091 | 661.0672 | OK | 19.2% | 4.9% |
| 9/12/2002 17:00 | 57th | 5 | 491 | 3 | 2287 | 2133.424 | 1900.976 | 2365.871 | OK | 555 | 855 | 452.2881 | 243.5091 | 661.0672 | OK | 19.8% | 5.9% |
| 9/13/2002 7:00 | 58th | 0 | 526 | 3 | 2274 | 2133.424 | 1900.976 | 2365.871 | OK | 402 | 868 | 452.2881 | 243.5091 | 661.0672 | OK | 19.7% | 4.3% |
| 9/13/2002 12:00 | 59th | 5 | 492 | 9 | 2079 | 2133.424 | 1900.976 | 2365.871 | OK | 541 | 881 | 452.2881 | 243.5091 | 661.0672 | OK | 18.0% | 5.7% |

End of program

## Phoswich 119803

Parameter Being Tracked: Tc-99 Beta and Th-230 Alpha Source Data

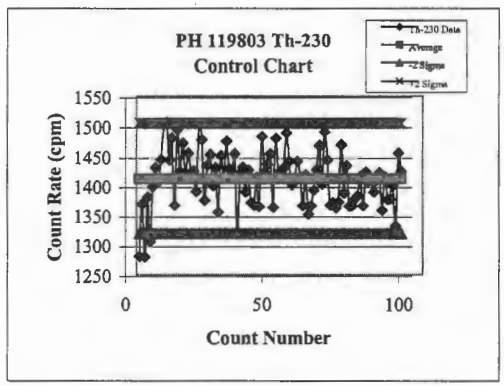
Electronics

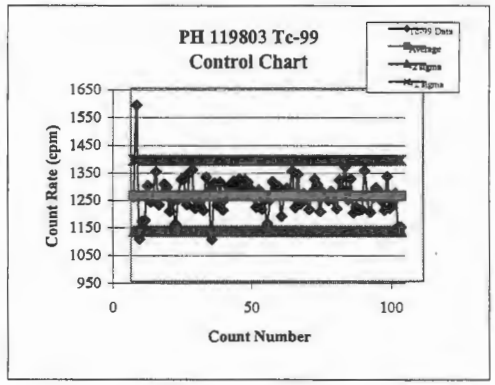
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119803 |

Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR166008 |
| Geometry | Jig, 1 cm |
| ROI | |

| | Count Data Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1411.392 | 1259.536 | 1504.53 | 1388.62 | high cutoff (+2 Sigma) |
| STDEV= | 46.56907 | 64.54215 | 1318.254 | 1130.452 | low cutoff (-2 Sigma) |




Avg. Efficiency

| Beta | Alpha |
|---|---|
| 10.9% | 14.92% |

| | | Bkgd Data | | Tc-99 | | | | | | Th-230 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tc-99 Data | | | | | | Th-230 Data | | | | | | | |
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) | |
| 7/22/2002 7:40 | 1st | 1 | 162 | 0 | 1256 | 1259.536 | 1130.452 | 1388.62 | OK | 1280 | 316 | 1411.392 | 1318.254 | 1504.53 | Investigate | 10.9% | 13.5% | |
| 7/22/2002 11:45 | 2nd | 0 | 154 | 1 | 1587 | 1259.536 | 1130.452 | 1388.62 | Investigate | 1369 | 305 | 1411.392 | 1318.254 | 1504.53 | OK | 13.7% | 14.5% | |
| 7/22/2002 16:30 | 3rd | 0 | 146 | 1 | 1102 | 1259.536 | 1130.452 | 1388.62 | Investigate | 1279 | 294 | 1411.392 | 1318.254 | 1504.53 | Investigate | 9.5% | 13.5% | |
| 7/23/2002 7:00 | 4th | 0 | 158 | 2 | 1165 | 1259.536 | 1130.452 | 1388.62 | OK | 1381 | 287 | 1411.392 | 1318.254 | 1504.53 | OK | 10.1% | 14.6% | |
| 7/23/2002 11:30 | 5th | 0 | 126 | 1 | 1169 | 1259.536 | 1130.452 | 1388.62 | OK | 1305 | 276 | 1411.392 | 1318.254 | 1504.53 | Investigate | 10.1% | 13.8% | Mylar replaced |
| 7/24/2002 7:00 | 6th | 0 | 143 | 1 | 1296 | 1259.536 | 1130.452 | 1388.62 | OK | 1398 | 274 | 1411.392 | 1318.254 | 1504.53 | OK | 11.2% | 14.8% | |
| 7/24/2002 11:45 | 7th | 0 | 152 | 3 | 1236 | 1259.536 | 1130.452 | 1388.62 | OK | 1430 | 293 | 1411.392 | 1318.254 | 1504.53 | OK | 10.7% | 15.1% | |
| 7/24/2002 17:00 | 8th | 0 | 139 | 0 | 1252 | 1259.536 | 1130.452 | 1388.62 | OK | 1405 | 294 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.9% | |
| 7/25/2002 7:00 | 9th | 1 | 153 | 2 | 1347 | 1259.536 | 1130.452 | 1388.62 | OK | 1444 | 297 | 1411.392 | 1318.254 | 1504.53 | OK | 11.7% | 15.3% | |
| 7/25/2005 11:45 | 10th | 0 | 148 | 0 | 1226 | 1259.536 | 1130.452 | 1388.62 | OK | 1504 | 268 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 15.9% | |
| 7/25/2002 17:00 | 11th | 0 | 138 | 0 | 1264 | 1259.536 | 1130.452 | 1388.62 | OK | 1506 | 305 | 1411.392 | 1318.254 | 1504.53 | Investigate | 10.9% | 15.9% | |
| 7/26/2002 7:00 | 12th | 0 | 152 | 0 | 1302 | 1259.536 | 1130.452 | 1388.62 | OK | 1443 | 338 | 1411.392 | 1318.254 | 1504.53 | OK | 11.3% | 15.3% | |
| 7/26/2002 12:00 | 13th | 0 | 169 | 0 | 1292 | 1259.536 | 1130.452 | 1388.62 | OK | 1480 | 293 | 1411.392 | 1318.254 | 1504.53 | OK | 11.2% | 15.6% | |
| 7/26/2002 17:00 | 14th | 0 | 153 | 0 | 1202 | 1259.536 | 1130.452 | 1388.62 | OK | 1367 | 271 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 14.5% | |
| 7/27/2002 7:00 | 15th | 0 | 137 | 1 | 1239 | 1259.536 | 1130.452 | 1388.62 | OK | 1494 | 312 | 1411.392 | 1318.254 | 1504.53 | OK | 10.7% | 15.8% | |
| 7/27/2002 12:00 | 16th | 0 | 114 | 1 | 1155 | 1259.536 | 1130.452 | 1388.62 | OK | 1423 | 276 | 1411.392 | 1318.254 | 1504.53 | OK | 10.0% | 15.0% | |
| 7/27/2002 17:00 | 17th | 2 | 143 | 1 | 1247 | 1259.536 | 1130.452 | 1388.62 | OK | 1471 | 280 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 15.6% | |
| 7/28/2002 8:00 | 18th | 3 | 141 | 0 | 1318 | 1259.536 | 1130.452 | 1388.62 | OK | 1413 | 342 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 14.9% | |
| 7/28/2002 12:40 | 19th | 3 | 148 | 2 | 1321 | 1259.536 | 1130.452 | 1388.62 | OK | 1455 | 323 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.4% | |
| 7/28/2002 16:20 | 20th | 1 | 157 | 0 | 1227 | 1259.536 | 1130.452 | 1388.62 | OK | 1421 | 278 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 15.0% | |
| 7/29/2002 7:00 | 21st | 0 | 147 | 1 | 1344 | 1259.536 | 1130.452 | 1388.62 | OK | 1425 | 277 | 1411.392 | 1318.254 | 1504.53 | OK | 11.6% | 15.1% | |
| 7/29/2002 12:00 | 22nd | 0 | 151 | 1 | 1354 | 1259.536 | 1130.452 | 1388.62 | OK | 1390 | 279 | 1411.392 | 1318.254 | 1504.53 | OK | 11.7% | 14.7% | |
| 7/29/2002 17:15 | 23rd | 1 | 178 | 0 | 1214 | 1259.536 | 1130.452 | 1388.62 | OK | 1502 | 292 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 15.9% | |
| 7/30/2002 7:00 | 24th | 1 | 154 | 2 | 1240 | 1259.536 | 1130.452 | 1388.62 | OK | 1477 | 283 | 1411.392 | 1318.254 | 1504.53 | OK | 10.7% | 15.6% | |
| 7/30/2002 12:35 | 25th | 2 | 165 | 0 | 1218 | 1259.536 | 1130.452 | 1388.62 | OK | 1375 | 297 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 14.5% | |
| 7/30/2002 17:15 | 26th | 0 | 140 | 1 | 1206 | 1259.536 | 1130.452 | 1388.62 | OK | 1434 | 291 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 15.2% | |
| 7/31/2002 7:00 | 27th | 0 | 143 | 1 | 1327 | 1259.536 | 1130.452 | 1388.62 | OK | 1453 | 315 | 1411.392 | 1318.254 | 1504.53 | OK | 11.5% | 15.4% | |
| 7/31/2002 12:00 | 28th | 1 | 167 | 2 | 1276 | 1259.536 | 1130.452 | 1388.62 | OK | 1400 | 302 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 14.8% | |
| 7/31/2002 15:15 | 29th | 0 | 162 | 1 | 1101 | 1259.536 | 1130.452 | 1388.62 | Investigate | 1430 | 303 | 1411.392 | 1318.254 | 1504.53 | OK | 9.5% | 15.1% | recheck in morning |
| 8/5/2002 7:00 | 30th | 1 | 139 | 0 | 1305 | 1259.536 | 1130.452 | 1388.62 | OK | 1355 | 298 | 1411.392 | 1318.254 | 1504.53 | OK | 11.3% | 14.3% | |
| 8/5/2002 12:00 | 31st | 1 | 146 | 0 | 1227 | 1259.536 | 1130.452 | 1388.62 | OK | 1451 | 318 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 15.3% | |
| 8/5/2002 17:00 | 32nd | 0 | 149 | 2 | 1308 | 1259.536 | 1130.452 | 1388.62 | OK | 1412 | 326 | 1411.392 | 1318.254 | 1504.53 | OK | 11.3% | 14.9% | |

## Phoswich 119803

Parameter Being Tracked: Tc-99 Beta and Th-230 Alpha Source Data

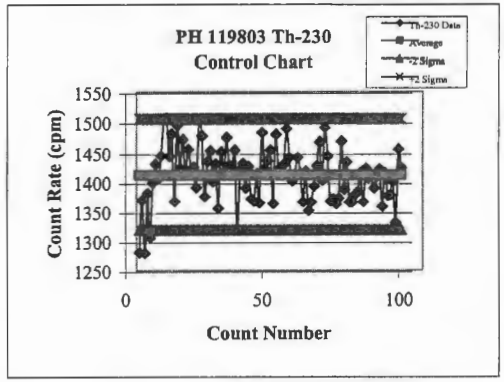
Electronics

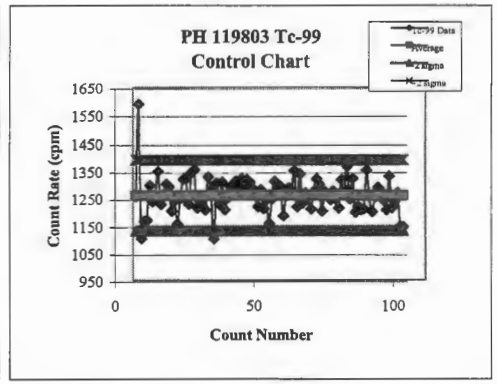
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119803 |

Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR166008 |
| Geometry | Jig, 1 cm |
| ROI | |

| | Count Data Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1411.392 | 1259.536 | 1504.53 | 1388.62 | high cutoff (+2 Sigma) |
| STDEV= | 46.56907 | 64.54215 | 1318.254 | 1130.452 | low cutoff (-2 Sigma) |




Avg. Efficiency

| Beta | Alpha |
|---|---|
| 10.9% | 14.92% |

| | | Bkgd Data | | Tc-99 Data | | | | | | Th-230 Data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) |
| 8/6/2002 7:35 | 33rd | 2 | 149 | 0 | 1207 | 1259.536 | 1130.452 | 1388.62 | OK | 1474 | 315 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 15.6% |
| 8/6/2002 12:20 | 34th | 0 | 160 | 2 | 1249 | 1259.536 | 1130.452 | 1388.62 | OK | 1428 | 345 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 15.1% |
| 8/6/2002 18:00 | 35th | 1 | 177 | 3 | 1292 | 1259.536 | 1130.452 | 1388.62 | OK | 1421 | 313 | 1411.392 | 1318.254 | 1504.53 | OK | 11.2% | 15.0% |
| 8/7/2002 7:20 | 36th | 2 | 141 | 1 | 1268 | 1259.536 | 1130.452 | 1388.62 | OK | 1454 | 384 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 15.4% |
| 8/7/2002 12:20 | 37th | 3 | 177 | 3 | 1312 | 1259.536 | 1130.452 | 1388.62 | OK | 1319 | 277 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 13.9% |
| 8/7/2002 17:30 | 38th | 0 | 158 | 0 | 1286 | 1259.536 | 1130.452 | 1388.62 | OK | 1420 | 270 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 15.0% |
| 8/8/2002 7:20 | 39th | 0 | 158 | 1 | 1321 | 1259.536 | 1130.452 | 1388.62 | OK | 1431 | 301 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.1% |
| 8/8/2002 12:45 | 40th | 0 | 150 | 2 | 1277 | 1259.536 | 1130.452 | 1388.62 | OK | 1389 | 304 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 14.7% |
| 8/8/2002 17:55 | 41st | 0 | 159 | 0 | 1317 | 1259.536 | 1130.452 | 1388.62 | OK | 1426 | 333 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.1% |
| 8/9/2002 7:00 | 42nd | 0 | 163 | 1 | 1308 | 1259.536 | 1130.452 | 1388.62 | OK | 1371 | 284 | 1411.392 | 1318.254 | 1504.53 | OK | 11.3% | 14.5% |
| 8/9/2002 12:30 | 43rd | 0 | 155 | 0 | 1285 | 1259.536 | 1130.452 | 1388.62 | OK | 1367 | 314 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 14.5% |
| 8/9/2002 17:45 | 44th | 0 | 154 | 2 | 1257 | 1259.536 | 1130.452 | 1388.62 | OK | 1414 | 301 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 15.0% |
| 8/10/2002 7:00 | 45th | 0 | 156 | 1 | 1218 | 1259.536 | 1130.452 | 1388.62 | OK | 1364 | 279 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 14.4% |
| 8/10/2002 12:05 | 46th | 0 | 147 | 0 | 1280 | 1259.536 | 1130.452 | 1388.62 | OK | 1482 | 330 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 15.7% |
| 8/10/2002 17:15 | 47th | 2 | 214 | 1 | 1210 | 1259.536 | 1130.452 | 1388.62 | OK | 1422 | 286 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 15.0% |
| 8/11/2002 9:00 | 48th | 1 | 132 | 0 | 1242 | 1259.536 | 1130.452 | 1388.62 | OK | 1436 | 287 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 15.2% |
| 8/11/2002 14:20 | 49th | 2 | 131 | 0 | 1158 | 1259.536 | 1130.452 | 1388.62 | OK | 1454 | 280 | 1411.392 | 1318.254 | 1504.53 | OK | 10.0% | 15.4% mylar repaired |
| 8/11/2002 17:50 | 50th | 0 | 141 | 1 | 1245 | 1259.536 | 1130.452 | 1388.62 | OK | 1363 | 280 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.4% |
| 8/12/2002 7:00 | 51st | 1 | 169 | 0 | 1311 | 1259.536 | 1130.452 | 1388.62 | OK | 1479 | 296 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.6% |
| 8/12/2002 12:30 | 52nd | 0 | 146 | 2 | 1275 | 1259.536 | 1130.452 | 1388.62 | OK | 1420 | 286 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 15.0% |
| 8/12/2002 17:50 | 53rd | 2 | 169 | 1 | 1293 | 1259.536 | 1130.452 | 1388.62 | OK | 1421 | 278 | 1411.392 | 1318.254 | 1504.53 | OK | 11.2% | 15.0% |
| 8/13/2002 7:00 | 54th | 1 | 160 | 0 | 1184 | 1259.536 | 1130.452 | 1388.62 | OK | 1429 | 278 | 1411.392 | 1318.254 | 1504.53 | OK | 10.3% | 15.1% |
| 8/13/2002 12:30 | 55th | 1 | 135 | 1 | 1263 | 1259.536 | 1130.452 | 1388.62 | OK | 1488 | 304 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 15.7% |
| 8/13/2002 17:30 | 56th | 0 | 132 | 0 | 1286 | 1259.536 | 1130.452 | 1388.62 | OK | 1441 | 253 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 15.2% |
| 8/14/2002 7:00 | 57th | 0 | 116 | 1 | 1269 | 1259.536 | 1130.452 | 1388.62 | OK | 1401 | 308 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 14.8% |
| 8/14/2002 12:15 | 58th | 1 | 131 | 5 | 1350 | 1259.536 | 1130.452 | 1388.62 | OK | 1413 | 282 | 1411.392 | 1318.254 | 1504.53 | OK | 11.7% | 14.9% |
| 8/19/2002 7:00 | 59th | 2 | 143 | 1 | 1217 | 1259.536 | 1130.452 | 1388.62 | OK | 1441 | 295 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 15.2% |
| 8/19/2002 12:30 | 60th | 0 | 151 | 1 | 1337 | 1259.536 | 1130.452 | 1388.62 | OK | 1414 | 339 | 1411.392 | 1318.254 | 1504.53 | OK | 11.6% | 15.0% |
| 8/19/2002 17:30 | 61st | 0 | 141 | 1 | 1230 | 1259.536 | 1130.452 | 1388.62 | OK | 1366 | 295 | 1411.392 | 1318.254 | 1504.53 | OK | 10.7% | 14.4% |
| 8/20/2002 7:00 | 62nd | 2 | 135 | 2 | 1268 | 1259.536 | 1130.452 | 1388.62 | OK | 1418 | 324 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 15.0% |
| 8/20/2002 12:20 | 63rd | 0 | 143 | 2 | 1260 | 1259.536 | 1130.452 | 1388.62 | OK | 1351 | 303 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 14.3% |
| 8/20/2002 17:35 | 64th | 0 | 120 | 2 | 1209 | 1259.536 | 1130.452 | 1388.62 | OK | 1366 | 305 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 14.4% |

## Phoswich 119803

Parameter Being Tracked: Tc-99 Beta and Th-230 Alpha Source Data

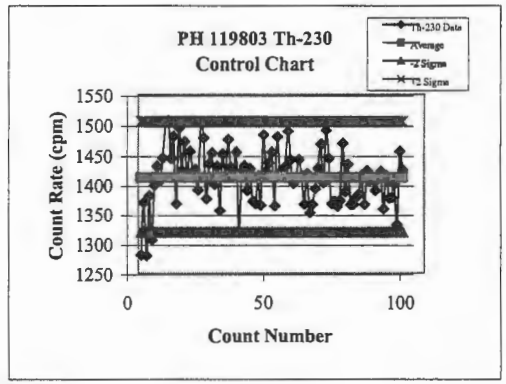
Electronics

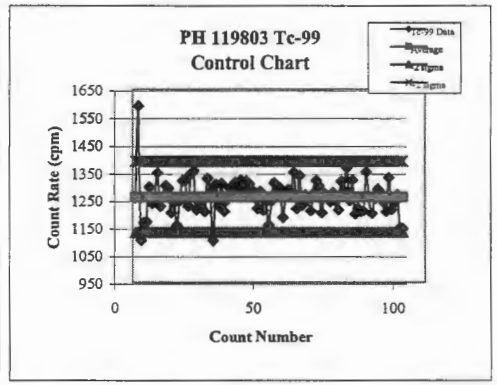
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119803 |

Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR166008 |
| Geometry | Jig, 1 cm |
| ROI | |

| | Count Data Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1411.392 | 1259.536 | 1504.53 | 1388.62 | high cutoff (+2 Sigma) |
| STDEV= | 46.56907 | 64.54215 | 1318.254 | 1130.452 | low cutoff (-2 Sigma) |




Avg. Efficiency

| Beta | Alpha |
|---|---|
| 10.9% | 14.92% |

| | | Bkgd Data | | Tc-99 Data | | | | | | Th-230 Data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) |
| 8/21/2002 7:00 | 65th | 0 | 150 | 0 | 1273 | 1259.536 | 1130.452 | 1388.62 | OK | 1392 | 300 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 14.7% |
| 8/21/2002 12:50 | 66th | 2 | 154 | 0 | 1320 | 1259.536 | 1130.452 | 1388.62 | OK | 1427 | 305 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.1% |
| 8/21/2002 17:20 | 67th | 1 | 139 | 1 | 1300 | 1259.536 | 1130.452 | 1388.62 | OK | 1467 | 297 | 1411.392 | 1318.254 | 1504.53 | OK | 11.3% | 15.5% |
| 8/22/2002 7:00 | 68th | 1 | 154 | 2 | 1201 | 1259.536 | 1130.452 | 1388.62 | OK | 1402 | 263 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 14.8% |
| 8/22/2002 13:15 | 69th | 0 | 167 | 1 | 1271 | 1259.536 | 1130.452 | 1388.62 | OK | 1490 | 275 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 15.8% |
| 8/22/2002 18:05 | 70th | 0 | 152 | 1 | 1258 | 1259.536 | 1130.452 | 1388.62 | OK | 1443 | 330 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 15.3% |
| 8/23/2002 7:05 | 71st | 2 | 134 | 0 | 1243 | 1259.536 | 1130.452 | 1388.62 | OK | 1367 | 251 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.5% |
| 8/23/2002 13:10 | 72nd | 1 | 162 | 1 | 1275 | 1259.536 | 1130.452 | 1388.62 | OK | 1371 | 329 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 14.5% |
| 8/23/2002 16:50 | 73rd | 1 | 187 | 1 | 1245 | 1259.536 | 1130.452 | 1388.62 | OK | 1362 | 310 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.4% |
| 8/24/2002 7:00 | 74th | 2 | 151 | 2 | 1212 | 1259.536 | 1130.452 | 1388.62 | OK | 1372 | 292 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 14.5% |
| 8/24/2002 13:30 | 75th | 0 | 164 | 0 | 1316 | 1259.536 | 1130.452 | 1388.62 | OK | 1468 | 317 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 15.5% |
| 8/24/2002 19:00 | 76th | 0 | 160 | 1 | 1283 | 1259.536 | 1130.452 | 1388.62 | OK | 1387 | 300 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 14.7% |
| 8/25/2002 8:00 | 77th | 0 | 151 | 0 | 1365 | 1259.536 | 1130.452 | 1388.62 | OK | 1433 | 320 | 1411.392 | 1318.254 | 1504.53 | OK | 11.8% | 15.2% |
| 8/25/2002 12:35 | 78th | 4 | 167 | 1 | 1246 | 1259.536 | 1130.452 | 1388.62 | OK | 1365 | 283 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.4% |
| 8/26/2002 7:00 | 79th | 1 | 147 | 2 | 1321 | 1259.536 | 1130.452 | 1388.62 | OK | 1365 | 323 | 1411.392 | 1318.254 | 1504.53 | OK | 11.4% | 14.4% |
| 8/26/2002 12:35 | 80th | 0 | 145 | 0 | 1197 | 1259.536 | 1130.452 | 1388.62 | OK | 1377 | 317 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 14.6% |
| 8/26/2002 17:30 | 81st | 0 | 163 | 2 | 1218 | 1259.536 | 1130.452 | 1388.62 | OK | 1383 | 296 | 1411.392 | 1318.254 | 1504.53 | OK | 10.6% | 14.6% |
| 8/27/2002 7:00 | 82nd | 1 | 145 | 2 | 1206 | 1259.536 | 1130.452 | 1388.62 | OK | 1415 | 318 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 15.0% |
| 8/27/2002 12:20 | 83rd | 1 | 152 | 1 | 1209 | 1259.536 | 1130.452 | 1388.62 | OK | 1366 | 364 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 14.4% |
| 9/9/2002 7:00 | 84th | 2 | 158 | 2 | 1351 | 1259.536 | 1130.452 | 1388.62 | OK | 1423 | 278 | 1411.392 | 1318.254 | 1504.53 | OK | 11.7% | 15.0% |
| 9/9/2002 12:15 | 85th | 0 | 147 | 0 | 1256 | 1259.536 | 1130.452 | 1388.62 | OK | 1406 | 263 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 14.9% |
| 9/9/2002 16:00 | 86th | 0 | 138 | 0 | 1199 | 1259.536 | 1130.452 | 1388.62 | OK | 1413 | 328 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 14.9% |
| 9/10/2002 7:00 | 87th | 0 | 152 | 0 | 1253 | 1259.536 | 1130.452 | 1388.62 | OK | 1389 | 318 | 1411.392 | 1318.254 | 1504.53 | OK | 10.9% | 14.7% |
| 9/11/2002 7:00 | 88th | 1 | 158 | 1 | 1288 | 1259.536 | 1130.452 | 1388.62 | OK | 1409 | 296 | 1411.392 | 1318.254 | 1504.53 | OK | 11.2% | 14.9% |
| 9/11/2002 12:00 | 89th | 0 | 131 | 0 | 1276 | 1259.536 | 1130.452 | 1388.62 | OK | 1422 | 308 | 1411.392 | 1318.254 | 1504.53 | OK | 11.1% | 15.0% |
| 9/11/2002 18:00 | 90th | 0 | 143 | 2 | 1241 | 1259.536 | 1130.452 | 1388.62 | OK | 1358 | 286 | 1411.392 | 1318.254 | 1504.53 | OK | 10.8% | 14.4% |
| 9/12/2002 7:00 | 91st | 0 | 161 | 4 | 1206 | 1259.536 | 1130.452 | 1388.62 | OK | 1415 | 304 | 1411.392 | 1318.254 | 1504.53 | OK | 10.4% | 15.0% |
| 9/12/2002 12:10 | 92nd | 1 | 141 | 2 | 1330 | 1259.536 | 1130.452 | 1388.62 | OK | 1376 | 307 | 1411.392 | 1318.254 | 1504.53 | OK | 11.5% | 14.5% |
| 9/12/2002 17:30 | 93rd | 0 | 146 | 1 | 1213 | 1259.536 | 1130.452 | 1388.62 | OK | 1377 | 283 | 1411.392 | 1318.254 | 1504.53 | OK | 10.5% | 14.6% |
| 9/13/2002 7:00 | 94th | 1 | 123 | 2 | 1237 | 1259.536 | 1130.452 | 1388.62 | OK | 1400 | 328 | 1411.392 | 1318.254 | 1504.53 | OK | 10.7% | 14.8% |
| 9/13/2002 12:00 | 95th | 0 | 151 | 0 | 1269 | 1259.536 | 1130.452 | 1388.62 | OK | 1331 | 281 | 1411.392 | 1318.254 | 1504.53 | OK | 11.0% | 14.1% |
| 9/14/2002 7:00 | 96th | 0 | 140 | 1 | 1146 | 1259.536 | 1130.452 | 1388.62 | OK | 1455 | 287 | 1411.392 | 1318.254 | 1504.53 | OK | 9.9% | 15.4% |

## Phoswich 119803

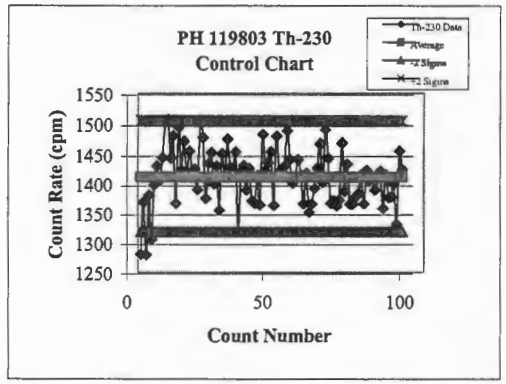
Parameter Being Tracked Tc-99 Beta and Th-230 Alpha Source Data

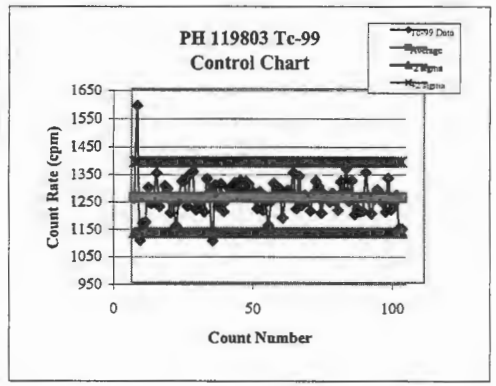
Electronics

| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119803 |

Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR166008 |
| Geometry | Jig, 1 cm |
| ROI | |




| Count Data | Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1411.392 | 1259.536 | 1504.53 | 1388.62 | high cutoff (+2 Sigma) |
| STDEV= | 46.56907 | 64.54215 | 1318.254 | 1130.452 | low cutoff (-2 Sigma) |

| Avg. Efficiency | |
|---|---|
| Beta | Alpha |
| 10.9% | 14.92% |

| | | Bkgd Data | | Tc-99 | | Tc-99 Data | | | | Th-230 | | Th-230 Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) | |
| 9/14/2002 11:30 | 97th | 3 | 131 | 1 | 1144 | 1259.536 | 1130.452 | 1388.62 | OK | 1424 | 272 | 1411.392 | 1318.254 | 1504.53 | OK | 9.9% | 15.1% | End of program |

## Phoswich 119815

Parameter Being Tracked Tc-99 Beta and Th-230 Alpha Source Data

Electronics

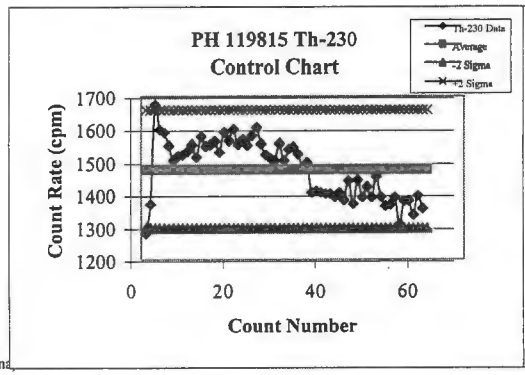
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119815 |

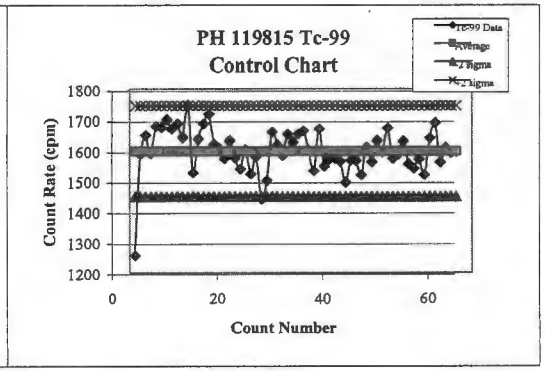
Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR155183 |
| Geometry | Jig, 1 cm |
| ROI | |

Count Data

| | Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1476.951 | 1596.242 | 1656.9 | 1744.672 | high cutoff (+2 Sigma) |
| STDEV= | 89.97471 | 74.21495 | 1297.001 | 1447.812 | low cutoff (-2 Sigma) |




Avg. Efficiency

| Beta | Alpha |
|---|---|
| 13.8% | 15.6% |

| | | Bkgd Data | | Tc-99 | | | | | | Th-230 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tc-99 Data | | | | | | Th-230 Data | | | | | | | |
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) | |
| 7/22/2002 7:40 | 1st | 1 | 162 | 0 | 1256 | 1596.242 | 1447.812 | 1744.672 | Investigate | 1280 | 316 | 1476.951 | 1297.001 | 1656.9 | Investigate | 10.9% | 13.5% | |
| 7/22/2002 11:45 | 2nd | 0 | 154 | 1 | 1587 | 1596.242 | 1447.812 | 1744.672 | OK | 1369 | 305 | 1476.951 | 1297.001 | 1656.9 | OK | 13.7% | 14.5% | |
| 7/22/2002 16:30 | 3rd | 1 | 175 | 1 | 1647 | 1596.242 | 1447.812 | 1744.672 | OK | 1674 | 359 | 1476.951 | 1297.001 | 1656.9 | Investigate | 14.3% | 17.7% | |
| 7/23/2002 7:00 | 4th | 0 | 177 | 0 | 1589 | 1596.242 | 1447.812 | 1744.672 | OK | 1598 | 286 | 1476.951 | 1297.001 | 1656.9 | OK | 13.8% | 16.9% | |
| 7/23/2002 11:30 | 5th | 0 | 184 | 0 | 1678 | 1596.242 | 1447.812 | 1744.672 | OK | 1588 | 296 | 1476.951 | 1297.001 | 1656.9 | OK | 14.5% | 16.8% | |
| 7/23/2002 17:00 | 6th | 2 | 149 | 1 | 1673 | 1596.242 | 1447.812 | 1744.672 | OK | 1550 | 302 | 1476.951 | 1297.001 | 1656.9 | OK | 14.5% | 16.4% | |
| 7/24/2002 7:00 | 7th | 1 | 175 | 1 | 1700 | 1596.242 | 1447.812 | 1744.672 | OK | 1505 | 313 | 1476.951 | 1297.001 | 1656.9 | OK | 14.7% | 15.9% | |
| 7/24/2002 11:45 | 8th | 1 | 175 | 1 | 1668 | 1596.242 | 1447.812 | 1744.672 | OK | 1518 | 301 | 1476.951 | 1297.001 | 1656.9 | OK | 14.4% | 16.1% | |
| 7/24/2002 17:00 | 9th | 3 | 193 | 2 | 1686 | 1596.242 | 1447.812 | 1744.672 | OK | 1522 | 328 | 1476.951 | 1297.001 | 1656.9 | OK | 14.6% | 16.1% | |
| 7/25/2002 7:00 | 10th | 0 | 210 | 0 | 1640 | 1596.242 | 1447.812 | 1744.672 | OK | 1531 | 328 | 1476.951 | 1297.001 | 1656.9 | OK | 14.2% | 16.2% | |
| 7/25/2002 11:45 | 11th | 1 | 187 | 3 | 1746 | 1596.242 | 1447.812 | 1744.672 | Investigate | 1553 | 341 | 1476.951 | 1297.001 | 1656.9 | OK | 15.1% | 16.4% | mylar replaced |
| 7/25/2002 17:00 | 12th | 2 | 177 | 1 | 1526 | 1596.242 | 1447.812 | 1744.672 | OK | 1514 | 299 | 1476.951 | 1297.001 | 1656.9 | OK | 13.2% | 16.0% | |
| 7/26/2002 7:00 | 13th | 1 | 173 | 1 | 1635 | 1596.242 | 1447.812 | 1744.672 | OK | 1577 | 328 | 1476.951 | 1297.001 | 1656.9 | OK | 14.2% | 16.7% | |
| 7/26/2002 12:00 | 14th | 0 | 189 | 3 | 1686 | 1596.242 | 1447.812 | 1744.672 | OK | 1547 | 291 | 1476.951 | 1297.001 | 1656.9 | OK | 14.6% | 16.4% | |
| 7/26/2002 17:00 | 15th | 4 | 164 | 2 | 1717 | 1596.242 | 1447.812 | 1744.672 | OK | 1552 | 283 | 1476.951 | 1297.001 | 1656.9 | OK | 14.9% | 16.4% | |
| 7/27/2002 7:00 | 16th | 0 | 166 | 0 | 1619 | 1596.242 | 1447.812 | 1744.672 | OK | 1562 | 320 | 1476.951 | 1297.001 | 1656.9 | OK | 14.0% | 16.5% | |
| 7/27/2002 12:00 | 17th | 0 | 161 | 0 | 1606 | 1596.242 | 1447.812 | 1744.672 | OK | 1529 | 301 | 1476.951 | 1297.001 | 1656.9 | OK | 13.9% | 16.2% | |
| 7/27/2002 17:00 | 18th | 0 | 168 | 1 | 1572 | 1596.242 | 1447.812 | 1744.672 | OK | 1590 | 284 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 16.8% | |
| 7/28/2002 8:00 | 19th | 2 | 192 | 0 | 1630 | 1596.242 | 1447.812 | 1744.672 | OK | 1564 | 328 | 1476.951 | 1297.001 | 1656.9 | OK | 14.1% | 16.5% | |
| 7/28/2002 12:40 | 20th | 2 | 183 | 2 | 1574 | 1596.242 | 1447.812 | 1744.672 | OK | 1599 | 353 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 16.9% | |
| 7/28/2002 17:45 | 21st | 0 | 167 | 0 | 1538 | 1596.242 | 1447.812 | 1744.672 | OK | 1553 | 282 | 1476.951 | 1297.001 | 1656.9 | OK | 13.3% | 16.4% | |
| 7/29/2002 7:00 | 22nd | 0 | 178 | 0 | 1602 | 1596.242 | 1447.812 | 1744.672 | OK | 1567 | 301 | 1476.951 | 1297.001 | 1656.9 | OK | 13.9% | 16.6% | |
| 7/29/2002 12:00 | 23rd | 0 | 156 | 2 | 1522 | 1596.242 | 1447.812 | 1744.672 | OK | 1551 | 276 | 1476.951 | 1297.001 | 1656.9 | OK | 13.2% | 16.4% | |
| 7/30/2002 7:00 | 24th | 0 | 160 | 1 | 1577 | 1596.242 | 1447.812 | 1744.672 | OK | 1579 | 316 | 1476.951 | 1297.001 | 1656.9 | OK | 13.7% | 16.7% | |
| 7/30/2002 12:20 | 25th | 1 | 138 | 2 | 1439 | 1596.242 | 1447.812 | 1744.672 | Investigate | 1605 | 265 | 1476.951 | 1297.001 | 1656.9 | OK | 12.5% | 17.0% | |
| 7/30/2002 17:15 | 26th | 0 | 188 | 0 | 1500 | 1596.242 | 1447.812 | 1744.672 | OK | 1555 | 320 | 1476.951 | 1297.001 | 1656.9 | OK | 13.0% | 16.4% | |
| 7/31/2002 7:00 | 27th | 3 | 155 | 0 | 1658 | 1596.242 | 1447.812 | 1744.672 | OK | 1522 | 364 | 1476.951 | 1297.001 | 1656.9 | OK | 14.4% | 16.1% | |
| 8/8/2002 7:20 | 28th | 1 | 155 | 1 | 1616 | 1596.242 | 1447.812 | 1744.672 | OK | 1511 | 280 | 1476.951 | 1297.001 | 1656.9 | OK | 14.0% | 16.0% | |
| 8/8/2002 12:45 | 29th | 0 | 170 | 1 | 1581 | 1596.242 | 1447.812 | 1744.672 | OK | 1504 | 282 | 1476.951 | 1297.001 | 1656.9 | OK | 13.7% | 15.9% | |
| 8/8/2002 17:55 | 30th | 2 | 161 | 0 | 1651 | 1596.242 | 1447.812 | 1744.672 | OK | 1556 | 303 | 1476.951 | 1297.001 | 1656.9 | OK | 14.3% | 16.5% | |
| 8/10/2002 14:45 | 31st | 0 | 157 | 2 | 1625 | 1596.242 | 1447.812 | 1744.672 | OK | 1504 | 313 | 1476.951 | 1297.001 | 1656.9 | OK | 14.1% | 15.9% | |
| 8/11/2002 9:00 | 32nd | 1 | 173 | 0 | 1651 | 1596.242 | 1447.812 | 1744.672 | OK | 1539 | 290 | 1476.951 | 1297.001 | 1656.9 | OK | 14.3% | 16.3% | |
| 8/11/2002 14:20 | 33rd | 0 | 242 | 0 | 1662 | 1596.242 | 1447.812 | 1744.672 | OK | 1545 | 302 | 1476.951 | 1297.001 | 1656.9 | OK | 14.4% | 16.3% | mylar repaired |
| 8/11/2002 17:50 | 34th | 0 | 256 | 0 | 1601 | 1596.242 | 1447.812 | 1744.672 | OK | 1524 | 315 | 1476.951 | 1297.001 | 1656.9 | OK | 13.9% | 16.1% | |
| 8/12/2002 7:00 | 35th | 1 | 155 | 1 | 1532 | 1596.242 | 1447.812 | 1744.672 | OK | 1484 | 263 | 1476.951 | 1297.001 | 1656.9 | OK | 13.3% | 15.7% | |

## Phoswich 119815

Parameter Being Tracked Tc-99 Beta and Th-230 Alpha Source Data

Electronics

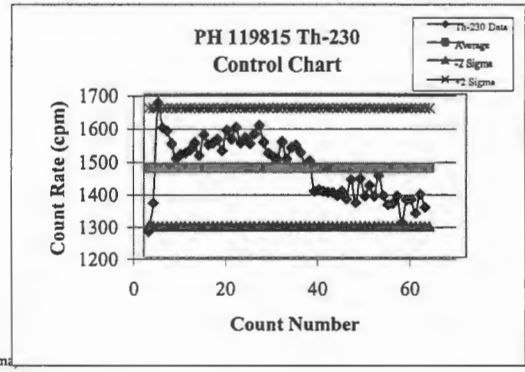
| | |
|---|---|
| Instrument Type | Ratemeter |
| Model Number | 2224 |
| Manufacturer | Ludlum |
| Serial Number | 119815 |

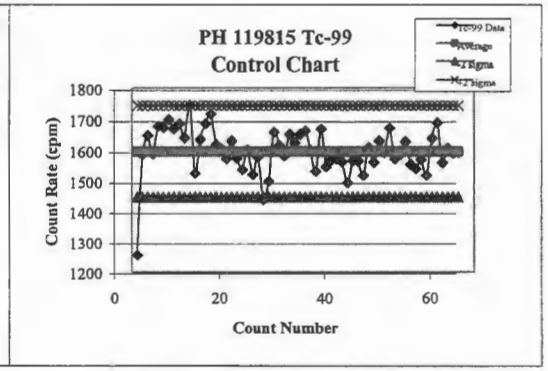
Detector

| | |
|---|---|
| Instrument Type | Phoswich |
| Model Number | 43-1-1 |
| Manufacturer | Ludlum |
| Serial Number | PR155183 |
| Geometry | Jig, 1 cm |
| ROI | |

Count Data

| | Th-230 Alpha | Tc-99 Beta | Alpha | Beta | |
|---|---|---|---|---|---|
| Mean= | 1476.951 | 1596.242 | 1656.9 | 1744.672 | high cutoff (+2 Sigma) |
| STDEV= | 89.97471 | 74.21495 | 1297.001 | 1447.812 | low cutoff (-2 Sigma) |




Avg. Efficiency

| Beta | Alpha |
|---|---|
| 13.8% | 15.6% |

| | | Bkgd Data | | Tc-99 | | | | | | Th-230 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tc-99 Data | | | | | | Th-230 Data | | | | | | | |
| Date/Time | Data Number | Alpha Counts (cpm) | Beta Counts (cpm) | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Alpha Counts (cpm) | Beta Counts (cpm) | Pull Block | | | Status | Tc-99 Eff (%) | Th-230 Eff (%) |
| 8/12/2002 12:30 | 36th | 1 | 167 | 1 | 1668 | 1596.242 | 1447.812 | 1744.672 | OK | 1498 | 325 | 1476.951 | 1297.001 | 1656.9 | OK | 14.4% | 15.8% |
| 8/12/2002 17:50 | 37th | 1 | 190 | 0 | 1547 | 1596.242 | 1447.812 | 1744.672 | OK | 1405 | 274 | 1476.951 | 1297.001 | 1656.9 | OK | 13.4% | 14.9% |
| 8/13/2002 7:00 | 38th | 4 | 184 | 0 | 1569 | 1596.242 | 1447.812 | 1744.672 | OK | 1410 | 304 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.9% |
| 8/13/2002 12:30 | 39th | 0 | 173 | 1 | 1572 | 1596.242 | 1447.812 | 1744.672 | OK | 1405 | 246 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.9% |
| 8/13/2002 17:30 | 40th | 0 | 157 | 0 | 1563 | 1596.242 | 1447.812 | 1744.672 | OK | 1401 | 288 | 1476.951 | 1297.001 | 1656.9 | OK | 13.5% | 14.8% |
| 8/20/2002 13:15 | 41st | 1 | 148 | 3 | 1494 | 1596.242 | 1447.812 | 1744.672 | OK | 1401 | 198 | 1476.951 | 1297.001 | 1656.9 | OK | 12.9% | 14.8% |
| 8/20/2002 17:35 | 42nd | 1 | 168 | 1 | 1566 | 1596.242 | 1447.812 | 1744.672 | OK | 1391 | 307 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.7% |
| 8/21/2002 7:00 | 43rd | 1 | 199 | 0 | 1565 | 1596.242 | 1447.812 | 1744.672 | OK | 1405 | 288 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.9% |
| 8/21/2002 12:50 | 44th | 0 | 174 | 1 | 1519 | 1596.242 | 1447.812 | 1744.672 | OK | 1381 | 301 | 1476.951 | 1297.001 | 1656.9 | OK | 13.2% | 14.6% |
| 8/21/2002 17:45 | 45th | 1 | 231 | 1 | 1610 | 1596.242 | 1447.812 | 1744.672 | OK | 1441 | 358 | 1476.951 | 1297.001 | 1656.9 | OK | 13.9% | 15.2% |
| 8/22/2002 7:00 | 46th | 1 | 171 | 1 | 1561 | 1596.242 | 1447.812 | 1744.672 | OK | 1370 | 291 | 1476.951 | 1297.001 | 1656.9 | OK | 13.5% | 14.5% |
| 8/22/2002 13:15 | 47th | 0 | 183 | 0 | 1630 | 1596.242 | 1447.812 | 1744.672 | OK | 1444 | 295 | 1476.951 | 1297.001 | 1656.9 | OK | 14.1% | 15.3% |
| 8/22/2002 17:40 | 48th | 1 | 164 | 0 | 1593 | 1596.242 | 1447.812 | 1744.672 | OK | 1390 | 341 | 1476.951 | 1297.001 | 1656.9 | OK | 13.8% | 14.7% |
| 8/23/2002 7:05 | 49th | 0 | 165 | 1 | 1671 | 1596.242 | 1447.812 | 1744.672 | OK | 1423 | 283 | 1476.951 | 1297.001 | 1656.9 | OK | 14.5% | 15.0% |
| 8/23/2002 13:00 | 50th | 3 | 189 | 2 | 1572 | 1596.242 | 1447.812 | 1744.672 | OK | 1390 | 299 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.7% |
| 8/23/2002 17:00 | 51st | 0 | 184 | 2 | 1585 | 1596.242 | 1447.812 | 1744.672 | OK | 1453 | 296 | 1476.951 | 1297.001 | 1656.9 | OK | 13.7% | 15.4% |
| 8/24/2002 7:00 | 52nd | 0 | 172 | 0 | 1628 | 1596.242 | 1447.812 | 1744.672 | OK | 1392 | 391 | 1476.951 | 1297.001 | 1656.9 | OK | 14.1% | 14.7% |
| 8/24/2002 13:30 | 53rd | 1 | 158 | 1 | 1554 | 1596.242 | 1447.812 | 1744.672 | OK | 1363 | 291 | 1476.951 | 1297.001 | 1656.9 | OK | 13.5% | 14.4% |
| 8/24/2002 18:45 | 54th | 1 | 170 | 1 | 1540 | 1596.242 | 1447.812 | 1744.672 | OK | 1367 | 342 | 1476.951 | 1297.001 | 1656.9 | OK | 13.3% | 14.5% |
| 8/25/2002 8:00 | 55th | 2 | 153 | 1 | 1570 | 1596.242 | 1447.812 | 1744.672 | OK | 1391 | 309 | 1476.951 | 1297.001 | 1656.9 | OK | 13.6% | 14.7% |
| 8/25/2002 12:20 | 56th | 1 | 159 | 2 | 1519 | 1596.242 | 1447.812 | 1744.672 | OK | 1307 | 302 | 1476.951 | 1297.001 | 1656.9 | OK | 13.2% | 13.8% |
| 8/26/2002 7:00 | 57th | 1 | 174 | 2 | 1638 | 1596.242 | 1447.812 | 1744.672 | OK | 1378 | 270 | 1476.951 | 1297.001 | 1656.9 | OK | 14.2% | 14.6% |
| 8/26/2002 12:35 | 58th | 2 | 181 | 1 | 1689 | 1596.242 | 1447.812 | 1744.672 | OK | 1379 | 282 | 1476.951 | 1297.001 | 1656.9 | OK | 14.6% | 14.6% |
| 8/27/2002 7:00 | 59th | 1 | 159 | 2 | 1560 | 1596.242 | 1447.812 | 1744.672 | OK | 1337 | 296 | 1476.951 | 1297.001 | 1656.9 | OK | 13.5% | 14.1% |
| 8/27/2002 12:20 | 60th | 0 | 200 | 0 | 1609 | 1596.242 | 1447.812 | 1744.672 | OK | 1395 | 318 | 1476.951 | 1297.001 | 1656.9 | OK | 13.9% | 14.8% |
| 8/27/2002 17:30 | 61st | 0 | 175 | 1 | 1591 | 1596.242 | 1447.812 | 1744.672 | OK | 1356 | 295 | 1476.951 | 1297.001 | 1656.9 | OK | 13.8% | 14.3% |
| 9/9/2002 7:00 | 62nd | 0 | 157 | 1 | 1594 | 1596.242 | 1447.812 | 1744.672 | OK | | | 1476.951 | 1297.001 | 1656.9 | Investigate | 13.8% | 0.0% End of use |

**SOURCES USED**

| Serial # | Radionuclide | Half-life | Unit | Activity (uCi) | Activity (dpm) |
|---|---|---|---|---|---|
| 8921 | Am-241 | 433 | yr | 0.273 | 606060 |
| 1842-94 | Th-230 | 7.54E+04 | yr | 0.00426 | 9457.2 |
| 1843-94 | Tc-99 | 2.13E+05 | yr | 0.0052 | 11544 |
| 1844-94 | Cs-137 | 30 | yr | 0.733 | 1627260 |

AMSAM-TMD-SRN

CALIBRATION RESULTS

| Isotope | S/N | Emission Rate (2 pi geometry) | Activity |
|---|---|---|---|
| | (Sources Included in DNS-9, S/N L8681) | | |
| $^{230}$Th | 1842-94 | 4,728 alphas / minute | 0.004 uCi |
| $^{99}$Tc | 1843-94 | 5,772 betas / minute | 0.005 uCi |
| $^{137}$Cs | 1844-94 | --------- | 0.733 uCi |
| $^{241}$Am | 8921 | 303,391 alphas / minute | 0.273 uCi |