

Health Physics Sample Records

Sample ID: 142481

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 140603BD 10 , CAMP MESA # 8

Common

Resp Org: P4000 - PROJECT MANAGEMEN

Cross Ref Sample ID:

Priority: N

Contact: COOPER, TERRY L

Survey No:

Reference ID:

Accounting Subcode:

Unknown Mat: NO

Hazardous Mat: NO

Comments: COUNT TO MDA

Reviewed: DYNES, WILLIAM J

Date: 06/05/14 09:41

Comments:

Origin

Mat. Size/Volume: 1397 GRAMS

Docmnt/MO/Act #:

Proposed Ship Date: 00/00/00 00:00

Description: CAMP MESA # 8

Collection

Sample Tech: DYNES, WILLIAM J

Sample Date: 06/03/14 15:50

Count Time: 900 (secs.)

Tritium Req: No

Sample Size/Volume: 1397 GRAMS

Instructions: COUNT TO MDA

Comments: COUNT TO MDA

RLSSS

Exempt: No

Evaluated: No

Chem Notification: No

State Permit: No

Offsite Analysis: No

Effluent Permit: No

Container Surveyed: No

Cleared For Release: Yes

Container Evaluated: Yes

Form 212 Ready:

Location

Unit: NON-UNIT RE

Area: MS

Elev: 100

Room:

Depth: (in.)

Equip ID:

Stored By: ,

Date: 00/00/00 00:00

Sample Loc:

Other:

Material Loc:

Health Physics Sample Records

Sample ID: **142481**

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 140603BD 10 , CAMP MESA # 8

Analysis

| Geometry | MCA ID | Quant. | Units | Method | FP/AP | Lab | Analysis By | Date | Mod ID | Mod Date |
|----------------------|--------|--------|-------|--------|-------|-----|-----------------|----------------|--------|----------|
| A_1L_marinelli_sand_ | 30363 | 1397 | GR | | .000 | | PARK, MICHAEL C | 06/05/14 15:43 | | |

| Isotope | Mode | Activity | Activity Uncert. | LLD/MDA | % Abund. | Atom. No. | Comments | Mod Id | Mod Date |
|---------|--------|----------|------------------|----------|----------|-----------|----------|--------|----------|
| 0 | K-40 | NT | 0.00001387 | 1.76E-6 | | 61.526% | 40 | | |
| 0 | TL-208 | NT | 3.681E-7 | 9.26E-8 | | 1.633% | 208 | | |
| 0 | PB-212 | NT | 7.591E-7 | 1.113E-7 | | 3.367% | 212 | | |
| 0 | BI-214 | NT | 7.217E-7 | 1.376E-7 | | 3.201% | 214 | | |
| 0 | PB-214 | NT | 9.641E-7 | 2.429E-7 | | 4.277% | 214 | | |
| 0 | RA-224 | NT | 1.912E-6 | 8.38E-7 | | 8.481% | 224 | | |
| 0 | RA-226 | NT | 2.655E-6 | 1.175E-6 | | 11.777% | 226 | | |
| 0 | AC-228 | NT | 1.129E-6 | 2.99E-7 | | 5.008% | 228 | | |
| 0 | U-235 | NT | 1.643E-7 | 7.27E-8 | | 0.729% | 235 | | |
| 0 | BE-7 | AP | 1.1386E-6 | | | 0.000% | 7 | | |
| 0 | MN-54 | AP | 9.8547E-8 | | | 0.000% | 54 | | |
| 0 | MN-56 | AP | 1.4405E-7 | | | 0.000% | 56 | | |
| 0 | CO-57 | AP | 8.216E-8 | | | 0.000% | 57 | | |
| 0 | CO-58 | AP | 1.5683E-7 | | | 0.000% | 58 | | |
| 0 | CO-60 | AP | 5.2945E-8 | | | 0.000% | 60 | | |
| 0 | SB-124 | AP | 7.4625E-8 | | | 0.000% | 124 | | |
| 0 | SB-125 | FP | 3.5808E-7 | | | 0.000% | 125 | | |
| 0 | CS-134 | FP | 1.0828E-7 | | | 0.000% | 134 | | |
| 0 | CS-137 | FP | 1.0056E-7 | | | 0.000% | 137 | | |

Analysis Review

Re-Analyze: No

Lic Rad Mat Present: No

Reviewed: COOPER, TERRY L

Date: 06/10/14 14:54

Hp Eng Rvw Req'd: Yes

Rad Mat Present: Yes

HP Notified Name:

Comments:

Health Physics Sample Records

Sample ID: 142481

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 140603BD 10 , CAMP MESA # 8

Review/Approve

HP Eng Review

Reviewed: COOPER, TERRY L

Date: 06/10/14 14:55

Comments: U-235 is likely mis-ID'd off the Ra-226 peak

Disposition

Disposition: OTHER

Result: Sample contains only natural isotopes

Remarks:

Final Approval

Approved: COOPER, TERRY L

Date: 06/10/14 14:55

Comments:

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*****
*          SONGS                HEALTH PHYSICS REPORT                5-JUN-2014 15:39  *
*-----*
*                >>>> SAMPLE PARAMETERS <<<<<                *
*-----*
* Title       : 140603BD 10 , CAMP MESA # 8                *
* ID          : 30363                Acquisition date: 5-JUN-2014 15:36:24. *
* Start Time  : 5-JUN-2014 15:36:00.                *
* Stop Time   : 5-JUN-2014 15:36:00.                Counting System   : U2GSP *
* Quantity    : 1.39700E+03 GR                IHPS Sample Number: 142481 *
* Geometry    : A_1L_marinelli_sand_1        Analysis Library   : HP_NATURAL *
* Operator    : MICHAEL PARK                *
*-----*
*                >>>> A #41-TP11679B PARAMETERS <<<<<                *
*-----*
* Elapsed Live Time : 0 00:03:00.41 Calibration      : 5-JUN-2014 08:09: *
* Elapsed Real Time  : 0 00:03:00.46 Energy Offset   : 2.12659E-01 *
* Deadtime           : 0.0% Energy Slope            : 4.99528E-01 *
* Activity Mult Factor: 1.00000E+00 Energy Tolerance: 1.00000 *
* Half Life Ratio    : 8.00000 Sensitivity          : 5.00000 *
*-----*
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Post-NID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|----------|----------------------------|
| 1 | 77.07 | 40 | 34 | 0.99 | 153.86 | 151 | 7 | 30.2 | 3.92E-01 | BI-214 PB-212 PB-214 |
| 1 | 186.04 | 19 | 21 | 1.69 | 372.01 | 369 | 7 | 44.3 | 3.43E+00 | U-235 RA-226 |
| 1 | 238.51 | 64 | 9 | 0.87 | 477.04 | 474 | 6 | 14.7 | 1.55E+00 | PB-212 |
| 1 | 241.38 | 14 | 12 | 1.30 | 482.78 | 481 | 6 | 43.8 | 1.32E+00 | RA-224 PB-214 |
| 1 | 295.32 | 30 | 6 | 1.51 | 590.77 | 587 | 10 | 25.2 | 9.36E-01 | PB-214 |
| 1 | 338.15 | 18 | 4 | 1.86 | 676.51 | 673 | 7 | 27.2 | 4.37E-01 | AC-228 |
| 1 | 351.93 | 41 | 7 | 1.38 | 704.10 | 699 | 9 | 19.6 | 1.61E+00 | PB-214 |
| 1 | 462.75 | 17 | 8 | 2.64 | 925.96 | 922 | 10 | 36.2 | 9.82E-01 | AC-228 |
| 1 | 583.08 | 22 | 3 | 2.07 | 1166.84 | 1160 | 11 | 25.1 | 2.17E-01 | TL-208 |
| 1 | 609.27 | 31 | 2 | 1.49 | 1219.27 | 1215 | 8 | 19.1 | 1.55E-01 | BI-214 |
| 1 | 910.88 | 22 | 4 | 1.55 | 1823.06 | 1818 | 9 | 26.5 | 4.17E-01 | AC-228 |
| 1 | 1460.62 | 73 | 3 | 1.72 | 2923.58 | 2917 | 12 | 12.7 | 9.03E-01 | K-40 |

Summary of Nuclide Activity
 Sample ID : 30363

Page : 2
 Acquisition date : 5-JUN-2014 15:36:24

Total number of lines in spectrum 12
 Number of unidentified lines 0
 Number of lines tentatively identified by NID 12 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/GR | Decay Corr uCi/GR | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.28E+09Y | 1.00 | 1.387E-05 | 1.387E-05 | 0.176E-05 | 12.72 | A |
| TL-208 | 3.05M | 1.52 | 2.430E-07 | 3.681E-07 | 0.926E-07 | 25.15 | A |
| PB-212 | 10.64H | 1.00 | 7.576E-07 | 7.591E-07 | 1.113E-07 | 14.66 | A |
| BI-214 | 19.90M | 1.07 | 6.754E-07 | 7.217E-07 | 1.376E-07 | 19.06 | A |
| PB-214 | 26.80M | 1.05 | 9.178E-07 | 9.641E-07 | 2.429E-07 | 25.19 | A |
| RA-224 | 3.66D | 1.00 | 1.912E-06 | 1.912E-06 | 0.838E-06 | 43.82 | A |
| RA-226 | 1600.00Y | 1.00 | 2.655E-06 | 2.655E-06 | 1.175E-06 | 44.26 | A |
| AC-228 | 6.13H | 1.00 | 1.125E-06 | 1.129E-06 | 0.299E-06 | 26.49 | A |
| U-235 | 7.04E+08Y | 1.00 | 1.643E-07 | 1.643E-07 | 0.727E-07 | 44.26 | A |

Total Activity : 2.232E-05 2.254E-05

Grand Total Activity : 2.232E-05 2.254E-05

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 30363

Page : 3
Acquisition date : 5-JUN-2014 15:36:24

None

Flags: "T" = Tentatively associated

Interference Report
Sample ID : 30363

Page : 4
Acquisition date : 5-JUN-2014 15:36:24

No interference correction performed

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected Decay Corr | | 1-Sigma %Error |
|---------|---------|-------|-----------|-----------|------------------------|----------------|-------------------|
| | | | | | uCi/GR | uCi/GR | |
| K-40 | 1460.83 | 73 | 10.67* | 5.314E-01 | 1.387E-05 | 1.387E-05 | 12.72 |
| TL-208 | 72.80 | ----- | 2.14 | 1.594E+00 | ----- | Line Not Found | ----- |
| | 74.97 | ----- | 3.60 | 1.692E+00 | ----- | Line Not Found | ----- |
| | 84.79 | ----- | 1.27 | 2.058E+00 | ----- | Line Not Found | ----- |
| | 252.45 | ----- | 0.80 | 2.021E+00 | ----- | Line Not Found | ----- |
| | 277.28 | ----- | 6.80 | 1.920E+00 | ----- | Line Not Found | ----- |
| | 510.61 | ----- | 21.60 | 1.265E+00 | ----- | Line Not Found | ----- |
| | 583.02 | 22 | 86.00* | 1.128E+00 | 2.430E-07 | 3.681E-07 | 25.15 |
| | 763.06 | ----- | 1.64 | 8.744E-01 | ----- | Line Not Found | ----- |
| | 860.30 | ----- | 12.00 | 7.770E-01 | ----- | Line Not Found | ----- |
| | PB-212 | 74.81 | ----- | 10.50 | 1.685E+00 | ----- | Line Not Found |
| 77.11 | | 40 | 17.70 | 1.781E+00 | 1.344E-06 | 1.347E-06 | 30.20 |
| 87.19 | | ----- | 6.27 | 2.129E+00 | ----- | Line Not Found | ----- |
| 90.13 | | ----- | 1.86 | 2.206E+00 | ----- | Line Not Found | ----- |
| 115.12 | | ----- | 0.59 | 2.535E+00 | ----- | Line Not Found | ----- |
| 238.58 | | 64 | 43.60* | 2.083E+00 | 7.576E-07 | 7.591E-07 | 14.66 |
| BI-214 | 300.03 | ----- | 3.34 | 1.834E+00 | ----- | Line Not Found | ----- |
| | 76.86 | 40 | 0.58 | 1.781E+00 | 4.103E-05 | 4.383E-05 | 30.20 |
| | 79.29 | ----- | 0.97 | 1.869E+00 | ----- | Line Not Found | ----- |
| | 609.31 | 31 | 46.10* | 1.084E+00 | 6.754E-07 | 7.217E-07 | 19.06 |
| | 665.44 | ----- | 1.56 | 9.985E-01 | ----- | Line Not Found | ----- |
| | 768.35 | ----- | 4.88 | 8.685E-01 | ----- | Line Not Found | ----- |
| | 806.16 | ----- | 1.23 | 8.283E-01 | ----- | Line Not Found | ----- |
| | 934.04 | ----- | 3.16 | 7.177E-01 | ----- | Line Not Found | ----- |
| | 1120.27 | ----- | 15.00 | 6.114E-01 | ----- | Line Not Found | ----- |
| | 1155.18 | ----- | 1.69 | 5.973E-01 | ----- | Line Not Found | ----- |
| | 1238.11 | ----- | 5.92 | 5.697E-01 | ----- | Line Not Found | ----- |
| | 1280.95 | ----- | 1.47 | 5.585E-01 | ----- | Line Not Found | ----- |
| | 1377.66 | ----- | 4.02 | 5.401E-01 | ----- | Line Not Found | ----- |
| | 1385.30 | ----- | 0.78 | 5.391E-01 | ----- | Line Not Found | ----- |
| | 1401.48 | ----- | 1.39 | 5.370E-01 | ----- | Line Not Found | ----- |
| | 1407.97 | ----- | 2.48 | 5.362E-01 | ----- | Line Not Found | ----- |
| | 1509.22 | ----- | 2.19 | 5.292E-01 | ----- | Line Not Found | ----- |
| PB-214 | 1583.22 | ----- | 0.72 | 5.296E-01 | ----- | Line Not Found | ----- |
| | 1661.26 | ----- | 1.15 | 5.351E-01 | ----- | Line Not Found | ----- |
| | 1729.58 | ----- | 3.05 | 5.442E-01 | ----- | Line Not Found | ----- |
| | 1764.49 | ----- | 15.90 | 5.503E-01 | ----- | Line Not Found | ----- |
| | 1847.41 | ----- | 2.12 | 5.694E-01 | ----- | Line Not Found | ----- |
| | 53.17 | ----- | 1.10 | 5.543E-01 | ----- | Line Not Found | ----- |
| | 74.81 | ----- | 6.52 | 1.685E+00 | ----- | Line Not Found | ----- |
| | 77.11 | 40 | 11.00 | 1.781E+00 | 2.163E-06 | 2.272E-06 | 30.20 |
| | 87.19 | ----- | 3.88 | 2.129E+00 | ----- | Line Not Found | ----- |
| | 90.13 | ----- | 1.15 | 2.206E+00 | ----- | Line Not Found | ----- |
| | 241.92 | 14 | 7.46 | 2.070E+00 | 9.993E-07 | 1.050E-06 | 43.82 |
| | 258.94 | ----- | 0.55 | 1.994E+00 | ----- | Line Not Found | ----- |
| | 295.09 | 30 | 19.20* | 1.851E+00 | 9.178E-07 | 9.641E-07 | 25.19 |
| 351.87 | 41 | 37.10 | 1.662E+00 | 7.182E-07 | 7.545E-07 | 19.55 | |
| 785.83 | ----- | 1.09 | 8.495E-01 | ----- | Line Not Found | ----- | |
| 839.00 | ----- | 0.59 | 7.964E-01 | ----- | Line Not Found | ----- | |

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected Decay Corr | | 1-Sigma %Error |
|---------|--------|--------|-----------|-----------|------------------------|----------------|-------------------|
| | | | | | uCi/GR | uCi/GR | |
| RA-224 | 83.79 | ----- | 0.20 | 2.027E+00 | ----- | Line Not Found | ----- |
| | 240.76 | 14 | 3.90* | 2.070E+00 | 1.912E-06 | 1.912E-06 | 43.82 |
| RA-226 | 81.07 | ----- | 0.18 | 1.934E+00 | ----- | Line Not Found | ----- |
| | 186.11 | 19 | 3.28* | 2.339E+00 | 2.655E-06 | 2.655E-06 | 44.26 |
| AC-228 | 89.96 | ----- | 3.40 | 2.201E+00 | ----- | Line Not Found | ----- |
| | 93.35 | ----- | 5.60 | 2.279E+00 | ----- | Line Not Found | ----- |
| | 99.55 | ----- | 1.30 | 2.389E+00 | ----- | Line Not Found | ----- |
| | 105.36 | ----- | 2.00 | 2.463E+00 | ----- | Line Not Found | ----- |
| | 108.99 | ----- | 0.67 | 2.496E+00 | ----- | Line Not Found | ----- |
| | 129.03 | ----- | 2.90 | 2.562E+00 | ----- | Line Not Found | ----- |
| | 153.89 | ----- | 0.84 | 2.496E+00 | ----- | Line Not Found | ----- |
| | 209.39 | ----- | 4.10 | 2.221E+00 | ----- | Line Not Found | ----- |
| | 216.24 | ----- | 0.80 | 2.187E+00 | ----- | Line Not Found | ----- |
| | 270.26 | ----- | 3.80 | 1.948E+00 | ----- | Line Not Found | ----- |
| | 328.07 | ----- | 3.50 | 1.738E+00 | ----- | Line Not Found | ----- |
| | 338.42 | 18 | 12.40 | 1.705E+00 | 9.350E-07 | 9.384E-07 | 27.19 |
| | 340.94 | ----- | 0.52 | 1.696E+00 | ----- | Line Not Found | ----- |
| | 409.62 | ----- | 2.20 | 1.499E+00 | ----- | Line Not Found | ----- |
| | 463.10 | 17 | 4.60 | 1.368E+00 | 2.895E-06 | 2.905E-06 | 36.16 |
| | 562.65 | ----- | 1.01 | 1.164E+00 | ----- | Line Not Found | ----- |
| | 581.52 | ----- | 3.00 | 1.131E+00 | ----- | Line Not Found | ----- |
| | 726.63 | ----- | 0.87 | 9.173E-01 | ----- | Line Not Found | ----- |
| 755.28 | ----- | 1.32 | 8.833E-01 | ----- | Line Not Found | ----- | |
| 772.28 | ----- | 1.09 | 8.641E-01 | ----- | Line Not Found | ----- | |
| 782.12 | ----- | 0.59 | 8.534E-01 | ----- | Line Not Found | ----- | |
| 794.79 | ----- | 4.60 | 8.400E-01 | ----- | Line Not Found | ----- | |
| 830.59 | ----- | 0.63 | 8.043E-01 | ----- | Line Not Found | ----- | |
| 835.60 | ----- | 1.71 | 7.996E-01 | ----- | Line Not Found | ----- | |
| 840.44 | ----- | 0.94 | 7.951E-01 | ----- | Line Not Found | ----- | |
| 904.29 | ----- | 0.89 | 7.403E-01 | ----- | Line Not Found | ----- | |
| 911.16 | 22 | 29.00* | 7.351E-01 | 1.125E-06 | 1.129E-06 | 26.49 | |
| 964.64 | ----- | 5.80 | 6.962E-01 | ----- | Line Not Found | ----- | |
| 968.97 | ----- | 17.40 | 6.933E-01 | ----- | Line Not Found | ----- | |
| 1246.60 | ----- | 0.57 | 5.673E-01 | ----- | Line Not Found | ----- | |
| 1459.19 | ----- | 1.06 | 5.315E-01 | ----- | Line Not Found | ----- | |
| 1496.00 | ----- | 1.05 | 5.296E-01 | ----- | Line Not Found | ----- | |
| 1501.44 | ----- | 0.58 | 5.294E-01 | ----- | Line Not Found | ----- | |
| 1580.30 | ----- | 0.71 | 5.295E-01 | ----- | Line Not Found | ----- | |
| 1588.23 | ----- | 3.60 | 5.298E-01 | ----- | Line Not Found | ----- | |
| 1630.47 | ----- | 1.95 | 5.324E-01 | ----- | Line Not Found | ----- | |
| 1638.10 | ----- | 0.54 | 5.330E-01 | ----- | Line Not Found | ----- | |
| U-235 | 89.96 | ----- | 3.36 | 2.201E+00 | ----- | Line Not Found | ----- |
| | 93.35 | ----- | 5.50 | 2.279E+00 | ----- | Line Not Found | ----- |
| | 105.36 | ----- | 1.98 | 2.463E+00 | ----- | Line Not Found | ----- |
| | 109.18 | ----- | 1.50 | 2.498E+00 | ----- | Line Not Found | ----- |
| | 143.79 | ----- | 10.50 | 2.533E+00 | ----- | Line Not Found | ----- |
| | 163.38 | ----- | 4.70 | 2.453E+00 | ----- | Line Not Found | ----- |
| | 185.74 | 19 | 53.00* | 2.339E+00 | 1.643E-07 | 1.643E-07 | 44.26 |
| 194.96 | ----- | 0.59 | 2.294E+00 | ----- | Line Not Found | ----- | |

Nuclide Line Activity Report (continued)
Sample ID : 30363

Page : 7
Acquisition date : 5-JUN-2014 15:36:24

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/GR | Decay Corr uCi/GR | 1-Sigma %Error |
|---------|--------|-------|------|-----------|-----------------------|----------------------|-------------------|
| | 202.13 | ----- | 1.00 | 2.257E+00 | ----- | Line Not Found | ----- |
| | 205.33 | ----- | 4.70 | 2.241E+00 | ----- | Line Not Found | ----- |

Flag: "*" = Keyline

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/GR) |
|---------|---------------|-----------------|-----------------|
| BE-7 | 7. | 477.61 | 1.1386E-06 |
| MN-54 | 1. | 834.83 | 9.8547E-08 |
| MN-56 | 3. | 846.81 | 1.4405E-07 |
| CO-57 | 9. | 122.06 | 8.2160E-08 |
| CO-58 | 4. | 810.79 | 1.5683E-07 |
| CO-60 | 0. | 1332.50 | 5.2945E-08 |
| SB-124 | 1. | 602.73 | 7.4625E-08 |
| SB-125 | 6. | 427.88 | 3.5808E-07 |
| CS-134 | 3. | 604.71 | 1.0828E-07 |
| CS-137 | 1. | 661.66 | 1.0056E-07 |