

Health Physics Sample Records

Sample ID: 142503

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 14060614BD 03 NORTH LAYDOWN #5

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: 06/09/14 08:14

Comments:

Origin

Mat. Size/Volume: 2196 GRAMS

Docmnt/MO/Act #:

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

Description: NORTH LAYDOWN # 5

Collection

Sample Tech: DYNES, WILLIAM J

Sample Date: 06/06/14 08:45

Count Time: 900 (secs.)

Tritium Req: No

Sample Size/Volume: 2196 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: COUNT TO MDA

Material Loc:

Health Physics Sample Records

Sample ID: **142503**

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 14060614BD 03 NORTH LAYDOWN #5

Analysis

| Geometry | MCA ID | Quant. | Units | Method | FP/AP | Lab | Analysis By | Date | Mod ID | Mod Date |
|----------------------|--------|--------|-------|--------|-------|-----|----------------|----------------|--------|----------|
| A_1L_marinelli_sand_ | 30420 | 2196 | GR | | .000 | | NEEBE, DAVID J | 06/09/14 20:28 | | |

| Isotope | Mode | Activity | Activity Uncert. | LLD/MDA | % Abund. | Atom. No. | Comments | Mod Id | Mod Date |
|---------|--------|----------|------------------|----------|-------------------------------------|-----------|----------|--------|----------|
| 0 | K-40 | NT | 0.00001074 | 1.21E-6 | <input type="checkbox"/> | 82.622% | 40 | | |
| 0 | TL-208 | NT | 3.063E-7 | 5.37E-8 | <input type="checkbox"/> | 2.356% | 208 | | |
| 0 | PB-212 | NT | 3.241E-7 | 8.35E-8 | <input type="checkbox"/> | 2.493% | 212 | | |
| 0 | BI-214 | NT | 7.438E-7 | 1.148E-7 | <input type="checkbox"/> | 5.722% | 214 | | |
| 0 | PB-214 | NT | 3.433E-7 | 1.547E-7 | <input type="checkbox"/> | 2.641% | 214 | | |
| 0 | AC-228 | NT | 5.414E-7 | 1.699E-7 | <input type="checkbox"/> | 4.165% | 228 | | |
| 0 | BE-7 | AP | 7.072E-7 | | <input checked="" type="checkbox"/> | 0.000% | 7 | | |
| 0 | MN-54 | AP | 1.0838E-7 | | <input checked="" type="checkbox"/> | 0.000% | 54 | | |
| 0 | MN-56 | AP | 7.0661E-8 | | <input checked="" type="checkbox"/> | 0.000% | 56 | | |
| 0 | CO-57 | AP | 7.2284E-8 | | <input checked="" type="checkbox"/> | 0.000% | 57 | | |
| 0 | CO-58 | AP | 6.1205E-8 | | <input checked="" type="checkbox"/> | 0.000% | 58 | | |
| 0 | CO-60 | AP | 9.1628E-8 | | <input checked="" type="checkbox"/> | 0.000% | 60 | | |
| 0 | SB-124 | AP | 4.6848E-8 | | <input checked="" type="checkbox"/> | 0.000% | 124 | | |
| 0 | SB-125 | FP | 1.6609E-7 | | <input checked="" type="checkbox"/> | 0.000% | 125 | | |
| 0 | CS-134 | FP | 5.9418E-8 | | <input checked="" type="checkbox"/> | 0.000% | 134 | | |
| 0 | CS-137 | FP | 1.0514E-7 | | <input checked="" type="checkbox"/> | 0.000% | 137 | | |

Analysis Review

Re-Analyze: No

Lic Rad Mat Present: No

Reviewed: COOPER, TERRY L

Date: 06/11/14 07:40

Hp Eng Rvw Req'd: Yes

Rad Mat Present: Yes

HP Notified Name:

Comments:

Health Physics Sample Records

Sample ID: 142503

Type: RLSSS

Type Detail: SAND

Status: APPROVED

Rasterized:

Description: 14060614BD 03 NORTH LAYDOWN #5

Review/Approve

HP Eng Review

Reviewed: COOPER, TERRY L

Date: 06/11/14 07:43

Comments: the FWHM for the 65 keV peak is > 3.0; the 284 keV peak is not due to any plant-produced nuclide

Disposition

Disposition: OTHER

Result: Sample contains only natural isotopes

Remarks:

Final Approval

Approved: COOPER, TERRY L

Date: 06/11/14 07:43

Comments:

```

*****
*          SONGS                      HEALTH PHYSICS REPORT          9-JUN-2014 20:18  *
*-----*
*          >>>> SAMPLE PARAMETERS <<<<<          *
*
* Title      : 14060614BD 03 NORTH LAYDOWN #5          *
*
* ID         : 30420          Acquisition date: 9-JUN-2014 20:15:16. *
* Start Time: 9-JUN-2014 20:15:00.          *
* Stop Time : 9-JUN-2014 20:15:00.          Counting System : U2GSP          *
* Quantity  : 2.19600E+03 GR          IHPS Sample Number: 142503          *
* Geometry  : A_1L_marinelli_sand_1          Analysis Library : HP_NATURAL          *
*          Operator: DAVID NEEBE          *
*-----*
*          >>>> A #41-TP11679B PARAMETERS <<<<<          *
*
* Elapsed Live Time : 0 00:03:00.41          Calibration : 9-JUN-2014 19:32:          *
* Elapsed Real Time : 0 00:03:00.47          Energy Offset : 2.30553E-01          *
* Deadtime          : 0.0%          Energy Slope : 4.99505E-01          *
* Activity Mult Factor: 1.00000E+00          Energy Tolerance: 1.00000          *
* Half Life Ratio   : 8.00000          Sensitivity : 5.00000          *
*
*****

```

Post-NID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|----------|----------------------------|
| 1 | 64.92 | 41 | 34 | 4.33 | 129.51 | 126 | 11 | 30.6 | 4.12E+00 | |
| 1 | 77.18 | 33 | 52 | 1.38 | 154.05 | 151 | 7 | 39.9 | 7.05E+00 | BI-214 PB-212 PB-214 |
| 1 | 238.43 | 43 | 19 | 1.59 | 476.87 | 471 | 10 | 25.8 | 2.09E+00 | PB-212 |
| 1 | 283.58 | 13 | 4 | 1.93 | 567.27 | 565 | 6 | 32.5 | 2.21E+00 | |
| 1 | 295.49 | 17 | 12 | 1.58 | 591.12 | 586 | 10 | 45.1 | 6.31E-01 | PB-214 |
| 1 | 351.86 | 51 | 10 | 0.91 | 703.96 | 701 | 8 | 17.7 | 2.33E-01 | PB-214 |
| 1 | 583.05 | 30 | 0 | 1.87 | 1166.83 | 1162 | 9 | 17.5 | 6.77E-02 | TL-208 |
| 1 | 609.24 | 51 | 3 | 1.61 | 1219.26 | 1214 | 11 | 15.4 | 2.55E-01 | BI-214 |
| 1 | 911.07 | 17 | 4 | 1.57 | 1823.57 | 1819 | 8 | 31.4 | 8.87E-01 | AC-228 |
| 1 | 1460.79 | 89 | 3 | 1.89 | 2924.23 | 2918 | 12 | 11.3 | 5.44E-01 | K-40 |

Summary of Nuclide Activity
Sample ID : 30420

Page : 2
Acquisition date : 9-JUN-2014 20:15:16

Total number of lines in spectrum 10
Number of unidentified lines 2
Number of lines tentatively identified by NID 8 80.00%

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 | 1.074E-05 | 1.074E-05 | 0.121E-05 | 11.26 | A |
| TL-208 | 3.05M | 1.47 | 2.084E-07 | 3.063E-07 | 0.537E-07 | 17.53 | A |
| PB-212 | 10.64H | 1.00 | 3.234E-07 | 3.241E-07 | 0.835E-07 | 25.76 | A |
| BI-214 | 19.90M | 1.06 | 6.993E-07 | 7.438E-07 | 1.148E-07 | 15.44 | A |
| PB-214 | 26.80M | 1.05 | 3.279E-07 | 3.433E-07 | 1.547E-07 | 45.07 | A |
| AC-228 | 6.13H | 1.00 | 5.396E-07 | 5.414E-07 | 1.699E-07 | 31.39 | A |
| Total Activity : | | | 1.284E-05 | 1.300E-05 | | | |

Grand Total Activity : 1.284E-05 1.300E-05

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

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

Unidentified Energy Lines
Sample ID : 30420

Page : 3
Acquisition date : 9-JUN-2014 20:15:16

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1 | 64.92 | 41 | 34 | 4.33 | 129.51 | 126 | 11 | 2.26E-01 | 30.6 | 1.19E+00 | |
| 1 | 283.58 | 13 | 4 | 1.93 | 567.27 | 565 | 6 | 7.35E-02 | 32.5 | 1.90E+00 | |

Flags: "T" = Tentatively associated

Interference Report
Sample ID : 30420

Page : 4
Acquisition date : 9-JUN-2014 20:15:16

No interference correction performed

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected Decay Corr | | 1-Sigma |
|---------|---------|-------|-----------|-----------|------------------------|----------------|----------------|
| | | | | | uCi/GR | uCi/GR | |
| K-40 | 1460.83 | 89 | 10.67* | 5.314E-01 | 1.074E-05 | 1.074E-05 | 11.26 |
| 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 | 30 | 86.00* | 1.128E+00 | 2.084E-07 | 3.063E-07 | 17.53 |
| | 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 | | 33 | 17.70 | 1.785E+00 | 7.144E-07 | 7.157E-07 | 39.87 |
| 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 | | 43 | 43.60* | 2.083E+00 | 3.234E-07 | 3.241E-07 | 25.76 |
| 300.03 | | ----- | 3.34 | 1.834E+00 | ----- | Line Not Found | ----- |
| BI-214 | 76.86 | 33 | 0.58 | 1.785E+00 | 2.180E-05 | 2.319E-05 | 39.87 |
| | 79.29 | ----- | 0.97 | 1.869E+00 | ----- | Line Not Found | ----- |
| | 609.31 | 51 | 46.10* | 1.084E+00 | 6.993E-07 | 7.438E-07 | 15.44 |
| | 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 | ----- |
| | 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 | ----- | |
| PB-214 | 53.17 | ----- | 1.10 | 5.543E-01 | ----- | Line Not Found | ----- |
| | 74.81 | ----- | 6.52 | 1.685E+00 | ----- | Line Not Found | ----- |
| | 77.11 | 33 | 11.00 | 1.785E+00 | 1.149E-06 | 1.203E-06 | 39.87 |
| | 87.19 | ----- | 3.88 | 2.129E+00 | ----- | Line Not Found | ----- |
| | 90.13 | ----- | 1.15 | 2.206E+00 | ----- | Line Not Found | ----- |
| | 241.92 | ----- | 7.46 | 2.067E+00 | ----- | Line Not Found | ----- |
| | 258.94 | ----- | 0.55 | 1.994E+00 | ----- | Line Not Found | ----- |
| | 295.09 | 17 | 19.20* | 1.851E+00 | 3.279E-07 | 3.433E-07 | 45.07 |
| | 351.87 | 51 | 37.10 | 1.662E+00 | 5.688E-07 | 5.955E-07 | 17.72 |
| | 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 uCi/GR | Decay Corr uCi/GR | 1-Sigma %Error |
|---------|---------|-------|--------|-----------|-----------------------|----------------------|-------------------|
| 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 | ----- | 12.40 | 1.704E+00 | ----- | Line Not Found | ----- |
| | 340.94 | ----- | 0.52 | 1.696E+00 | ----- | Line Not Found | ----- |
| | 409.62 | ----- | 2.20 | 1.499E+00 | ----- | Line Not Found | ----- |
| | 463.10 | ----- | 4.60 | 1.368E+00 | ----- | Line Not Found | ----- |
| | 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 | 17 | 29.00* | 7.350E-01 | 5.396E-07 | 5.414E-07 | 31.39 |
| | 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 | ----- |

Flag: "*" = Keyline

Minimum Detectable Activity Report
Sample ID : 30420

Page : 7
Acquisition date : 9-JUN-2014 20:15:16

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/GR) |
|---------|---------------|-----------------|-----------------|
| BE-7 | 6. | 477.61 | 7.0720E-07 |
| MN-54 | 5. | 834.83 | 1.0838E-07 |
| MN-56 | 1. | 846.81 | 7.0661E-08 |
| CO-57 | 19. | 122.06 | 7.2284E-08 |
| CO-58 | 1. | 810.79 | 6.1205E-08 |
| CO-60 | 1. | 1332.50 | 9.1628E-08 |
| SB-124 | 1. | 602.73 | 4.6848E-08 |
| SB-125 | 3. | 427.88 | 1.6609E-07 |
| CS-134 | 2. | 604.71 | 5.9418E-08 |
| CS-137 | 5. | 661.66 | 1.0514E-07 |