

EF-1 Sump #10

2008

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 4/29/08 1:10:20

Container Number Sump #10

Storage Location EF-1

J. Southward
Fermi 1 (signature)

4/29/08

B3308
Employee ID Number

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

4/29/08

B3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.22 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

AM Ithum
Chemistry (signature)

5.2.08

53441
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Southward
RP (signature)

6/4/08

B3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

K. H. H.
Radiological Engineering (signature)

6.10.08

2-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|-------------------------|------------|
| 1 . Sample Location | Sump #10 |
| 2 . Date Sampled | 04/29/2008 |
| 3 . Time Sampled | 10:20 |
| 4 . Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|--|----------------|
| 1 . Date Sample Counted | 05/01/2008 |
| 2 . Time Sample Counted | 16:18 |
| 3 . Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 8.1 cpm |
| 4 . Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 3031.8 cpm |
| Net Spike Count Rate (cpm) | 3023.7 cpm |
| H3 Spike Activity (dpm on count date) | 7776.1 dpm |
| Counter Efficiency | 0.3888 cpm/dpm |
| 5 . Sample Info: | |
| Sample Gross Count Rate (cpm) | 8.6 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.5 cpm |
| 6 . Critical Level: | |
| Critical Level Count Rate (cpm) | 2.1 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.22\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician

am / [signature]

Date

5-2-08

DETOIT EDISON FERMI-2 POWER PLANT

4-JUN-2008 15:11:27.84

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF-1 SUMP#10

Sample End Time: 29-APR-2008 10:00:00.00

REMARKS

PERFORMED BY:

J. Sauter

SIGNATURE

REVIEWED BY:

R. H. C.

SIGNATURE/DATE

Sample ID : EF-1 SUMP#10

Acquisition date : 4-JUN-2008 14:41:25

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF-1 SUMP#10
 Sample collection start date: 29-APR-2008 10:20:00.00
 Sample collection end date : 29-APR-2008 10:20:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : M2LL

Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 4-JUN-2008 14:41:25.94
 APreset live time : 0 00:30:00.00 Elapsed live time : 0 00:30:00.00
 Elapsed real time : 0 00:30:00.93 Percent dead time : 0.05 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 20-JUN-2007 12:16:46.16
 Kev/channel : 5.00091E-01 Zero offset: -1.34794E-01
 Daily cal date : 4-JUN-2008 06:32:04.62

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 2.00000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 139.02 | 52 | 51 | 1.16 | 279.06 | 276 | 9 | 2.91E-02 | 27.9 | |
| 2 | 0 | 199.11 | 26 | 57 | 0.99 | 398.42 | 394 | 9 | 1.47E-02 | 56.0 | |
| 3 | 0 | 511.53 | 157 | 73 | 2.05 | 1023.13 | 1013 | 25 | 8.74E-02 | 16.0 | |
| 4? | 0 | 558.46 | 45 | 30 | 0.95 | 1116.90 | 1112 | 10 | 2.50E-02 | 27.2 | |
| 5 | 0 | 1461.09 | 40 | 9 | 2.12 | 2921.02 | 2914 | 14 | 2.64E-02 | 20.3 | |

Page : 1

Acquisition Time = 4-JUN-2000 14:41:25.94

| It | Energy | Area | Bkgrnd | FWHM | Channel | Left | Pw | XErr | Fit | Nuclides |
|----|-------------------|---------------|---------------|-----------------|-------------------|----------------|--------------|-----------------|-----|-------------------|
| 0 | 139.82 | 52 | 51 | 1.16 | 279.86 | 276 | 9 | 27.9 | | As-75h |
| 0 | 499.41 | 26 | 57 | 0.99 | 394.42 | 394 | 9 | 56.0 | | ROJECT |
| 0 | 511.53 | 157 | 73 | 2.05 | 1023.13 | 1013 | 25 | 16.8 | | Annipial |
| 0 | 558.46 | 45 | 30 | 0.95 | 1116.98 | 1112 | 10 | 27.2 | | HwC |
| 0 | 1461.09 | 48 | 9 | 2.12 | 2921.82 | 2914 | 14 | 20.3 | | K-40 |

~~Re: 225~~ HWC
 REJECT
 ANN PRG K
 HWC
 K-42

Nuclide Line Activity Report ?
Sample ID : EF-1 SUMP#10

Page : 2
Acquisition date : 4-JUN-2008 14:41:25

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 48 | 10.67* | 2.501E+00 | 2.670E-07 | 2.670E-07 | 20.34 |

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : EF-1 SUMPW10

Acquisition date : 4-JUN-2008 14:41:25

Total number of lines in spectrum 5
Number of unidentified lines 0
Number of lines tentatively identified by NID 5 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 2.678E-07 | 2.678E-07 | 0.545E-07 | 20.34 | |
| Total Activity : | | | 2.678E-07 | 2.678E-07 | | | |

Grand Total Activity : 2.678E-07 2.678E-07

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

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

Rejected Report

Page : 4

Sample ID : EF-1 SUMP#10

Acquisition date : 4-JUN-2000 14:41:25

| Nuclide | Half-Life | | Energy | | Activity 1-Sigma | | Rejected by |
|---------|-----------|--------------|----------------|--------|------------------|-----------|--------------|
| | Half-life | Ratio | %Abund | %Error | (uCi/cc) | %Error | |
| F-18 | 109.74M | 474.91 | 511.00* | 193.46 | 1.070E+35 | 16.00 | Decay |
| | | % Abundances | Found = 100.00 | | | | |
| SE-75 | 119.78D | 0.30 | 66.05 | 1.02 | ----- | Not Found | ----- |
| | | | 96.73 | 3.41 | ----- | Not Found | ----- |
| | | | 121.12 | 16.70 | ----- | Not Found | ----- |
| | | | 136.00* | 59.20 | ----- | Not Found | ----- |
| | | | 198.60 | 1.45 | 5.122E-07 | 56.03 | |
| | | | 264.65 | 59.00 | ----- | Not Found | ----- |
| | | | 279.53 | 25.20 | ----- | Not Found | ----- |
| | | | 303.91 | 1.32 | ----- | Not Found | ----- |
| | | | 400.65 | 11.40 | ----- | Not Found | ----- |
| | | % Abundances | Found = 0.81 | | | | |
| AS-76 | 26.32H | 33.00 | 559.10* | 44.70 | 2.774E+02 | 27.22 | Decay, Abun. |
| | | | 563.23 | 1.17 | ----- | Not Found | ----- |
| | | | 571.30 | 0.14 | ----- | Not Found | ----- |
| | | | 657.03 | 6.10 | ----- | Not Found | ----- |
| | | | 665.31 | 0.39 | ----- | Not Found | ----- |
| | | | 740.12 | 0.12 | ----- | Not Found | ----- |
| | | | 771.76 | 0.12 | ----- | Not Found | ----- |
| | | | 867.63 | 0.12 | ----- | Not Found | ----- |
| | | | 1129.87 | 0.14 | ----- | Not Found | ----- |
| | | | 1212.72 | 1.63 | ----- | Not Found | ----- |
| | | | 1216.02 | 3.84 | ----- | Not Found | ----- |
| | | | 1228.52 | 1.39 | ----- | Not Found | ----- |
| | | | 1439.13 | 0.33 | ----- | Not Found | ----- |
| | | | 1453.60 | 0.13 | ----- | Not Found | ----- |
| | | | 1787.67 | 0.33 | ----- | Not Found | ----- |
| | | % Abundances | Found = 73.70 | | | | |
| MO-99 | 66.02H | 13.16 | 140.51 | 3.80 | 2.957E-03 | 27.94 | Decay, Abun. |
| | | | 181.06 | 6.20 | ----- | Not Found | ----- |
| | | | 366.43 | 1.37 | ----- | Not Found | ----- |
| | | | 739.58* | 12.80 | ----- | Not Found | ----- |
| | | | 778.00 | 4.50 | ----- | Not Found | ----- |
| | | % Abundances | Found = 13.25 | | | | |
| TC-99M | 6.02H | 144.29 | 140.50* | 89.07 | 1.000E+35 | 27.94 | Decay |
| | | % Abundances | Found = 100.00 | | | | |
| TE-131M | 30.00H | 20.95 | 102.06 | 7.90 | ----- | Not Found | ----- |
| | | | 149.72 | 5.10 | ----- | Not Found | ----- |
| | | | 200.63 | 7.56 | 4.142E+01 | 56.03 | |
| | | | 240.93 | 7.59 | ----- | Not Found | ----- |
| | | | 334.27 | 9.60 | ----- | Not Found | ----- |
| | | 0 | 773.67* | 38.20 | ----- | Not Found | ----- |
| | | | 782.49 | 7.79 | ----- | Not Found | ----- |
| | | | 793.75 | 13.90 | ----- | Not Found | ----- |
| | | | 822.78 | 6.12 | ----- | Not Found | ----- |
| | | | 852.21 | 20.70 | ----- | Not Found | ----- |
| | | | 1125.46 | 11.40 | ----- | Not Found | ----- |

Sample ID : EF-1 SUMPH10

Acquisition date : 4-JUN-2008 14:41:25

| Nuclide | Half-life | Ratio | Energy | %Abund0 | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|---------|--------------|---------|----------|---------|------------------------------|-----------|--------------|
| TE-131M | 30.00H | 20.95 | 1206.60 | 9.00 | ---- | Not Found | Decay, Abun. |
| | % Abundances | Found = | 5.19 | | | | |
| CS-130 | 32.20M | 1610.52 | 138.10 | 1.49 | 1.000E+35 | 27.94 | Decay, Abun. |
| | | | 227.76 | 1.51 | ---- | Not Found | ---- |
| | | | 408.98 | 4.66 | ---- | Not Found | ---- |
| | | | 462.79 | 30.70 | ---- | Not Found | ---- |
| | | | 546.94 | 10.80 | ---- | Not Found | ---- |
| | | | 671.00 | 5.11 | ---- | Not Found | ---- |
| | | | 1009.70 | 29.80 | ---- | Not Found | ---- |
| | | | 1147.22 | 1.24 | ---- | Not Found | ---- |
| | | | 1343.59 | 1.14 | ---- | Not Found | ---- |
| | | | 1435.86* | 76.30 | ---- | Not Found | ---- |
| | % Abundances | Found = | 0.92 | | | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : EF-1 SUMP#10

Page : 6
Acquisition date : 4-JUN-2000 14:41:25

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 139.82 | 52 | 51 | 1.16 | 279.86 | 276 | 9 | 2.91E-02 | 27.9 | 6.39E+00 | T |
| 0 | 199.11 | 26 | 57 | 0.99 | 398.42 | 394 | 9 | 1.47E-02 | 56.0 | 6.59E+00 | T |
| 0 | 511.53 | 157 | 73 | 2.85 | 1023.13 | 1013 | 25 | 8.74E-02 | 16.8 | 4.88E+00 | T |
| 0 | 558.46 | 45 | 30 | 0.95 | 1116.98 | 1112 | 10 | 2.50E-02 | 27.2 | 4.69E+00 | T |

Flags: "T" = Tentatively associated

* Sample ID : EF-1 SUMPN10 *

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| BE-7 | 22. | 477.59 | 1.1160E-07 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 4. | 1274.54 | 6.7812E-09 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MO-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 14. | 889.25 | 1.2606E-08 |
| CR-51 | 34. | 320.00 | 1.9137E-07 |
| MN-54 | 12. | 834.83 | 8.8901E-09 |
| CO-56 | 13. | 1238.25 | 2.1597E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 54. | 158.38 | 5.1186E-07 |
| CO-57 | 36. | 122.06 | 1.0214E-08 |
| CO-58 | 10. | 810.76 | 1.0552E-08 |
| FE-59 | 4. | 1099.22 | 1.9469E-08 |
| CO-60 | 9. | 1332.49 | 9.7429E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 12. | 1115.52 | 2.1459E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 39. | 136.00 | 1.5802E-08 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 40. | 513.99 | 2.3182E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 40. | 513.99 | 1.4691E-08 |
| RB-86 | 10. | 1076.63 | 3.9332E-07 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 5. | 1836.01 | 1.1378E-08 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 12. | 1204.90 | 5.2637E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : EF-1 SUMPH10

Acquisition date : 4-JUN-2000 14:41:25

| Nuclide | Bckgnd Sum | Energy (keV) < | MDA (uCi/cc) |
|---------|---------------|-------------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 14. | 702.63 | 7.2206E-09 |
| NB-95 | 14. | 765.79 | 1.6390E-08 |
| NB-95M | 0. | 235.69 | Half-Life too short |
| ZR-95 | 10. | 756.72 | 1.8477E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 20. | 497.08 | 1.5279E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 310.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 12. | 621.84 | 6.8871E-08 |
| CD-109 | 31. | 88.03 | 3.4374E-07 |
| AO-110M | 0. | 937.48 | 2.4233E-08 |
| SN-113 | 19. | 391.69 | 1.2097E-08 |
| SN-117M | 52. | 158.56 | 5.9640E-08 |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 20. | 602.71 | 1.2090E-08 |
| SB-125 | 21. | 427.89 | 2.4014E-08 |
| TE-125M | 38. | 109.28 | 5.0570E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 35. | 57.60 | 3.2257E-05 |
| XE-127 | 34. | 202.84 | 1.9072E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 17. | 695.88 | 5.0045E-07 |
| XE-129M | 45. | 196.56 | 2.7418E-06 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 38. | 123.80 | 2.3085E-07 |
| I-131 | 28. | 364.48 | 2.0249E-07 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 42. | 163.93 | 3.1053E-06 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 33. | 302.84 | 4.1410E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 31. | 81.00 | 4.8514E-06 |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 20. | 604.70 | 8.1969E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : EF-1 SUMPH10

Acquisition date : 4-JUN-2008 14:41:25

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| CS-136 | 18. | 818.50 | 6.3348E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 15. | 661.65 | 8.3629E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 37. | 165.85 | 1.0359E-08 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 9. | 537.32 | 1.4891E-07 |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 33. | 145.44 | 3.0238E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 41. | 133.54 | 7.9053E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 29. | 91.10 | 3.8849E-07 |
| PM-148M | 15. | 550.27 | 1.2616E-08 |
| EU-152 | 25. | 344.27 | 2.5819E-08 |
| EU-154 | 11. | 1004.76 | 5.0344E-08 |
| EU-156 | 14. | 646.29 | 4.9693E-07 |
| HF-181 | 16. | 482.03 | 1.4007E-08 |
| TA-182 | 17. | 1221.42 | 5.5149E-08 |
| W-187 | 0. | 685.81 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 41. | 279.19 | 1.7425E-08 |
| BI-207 | 26. | 569.67 | 8.8202E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 46. | 240.98 | 2.1037E-04 |
| RA-226 | 47. | 186.21 | 2.3601E-07 |
| AC-228 | 22. | 338.32 | 5.6909E-08 |
| TH-228 | 50. | 84.37 | 1.4313E-06 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 40. | 63.29 | 3.2983E-06 |
| U-235 | 42. | 143.76 | 7.2843E-08 |
| NP-239 | 0. | 106.13 | Half-Life too short |
| AM-241 | 35. | 59.54 | 1.8607E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 11/3/08 1:1000

Container Number Sump #10

Storage Location EF-1

Jennifer Saultwood 11/3/08
Fermi 1 (signature)

B 3308
Employee ID Number

2. Sample secured against tampering.

Jennifer Saultwood 11/3/08
Fermi 1 (signature)

B 3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.16E-6 uCi/ml
3-21-99

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

DL 8-21-08
Chemistry (signature)

56463
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Saultwood 5/14/09
RP (signature)

B 3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

R. Lindsey 5-14-09
Radiological Engineering (signature)

50027
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|------------|
| 1. Sample Location | Sump #10 |
| 2. Date Sampled | 11/03/2008 |
| 3. Time Sampled | 10:00 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 03/20/2009 |
| 2. Time Sample Counted | 14:00 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 7.8 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2972.5 cpm |
| Net Spike Count Rate (cpm) | 2964.7 cpm |
| H3 Spike Activity (dpm on count date) | 7397.6 dpm |
| Counter Efficiency | 0.4008 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 7.3 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 2.0 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.16\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician



Date

3-21-08

RADIATION PROTECTION DEPARTMENT
GAMMA SPECTROSCOPY ANALYSIS REPORT
HIGH EFFICIENCY DETECTOR

Sample ID Number: SUMPH10

Sample End Time: 3-NOV-2008 10:07:00.00

REMARKS

PERFORMED BY:

J. Sauterwald
SIGNATURE

REVIEWED BY:

KS 5-6-09
SIGNATURE/DATE

Sample ID : SUMP#10

Acquisition date : 23-MAR-2009 10:20:33

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: SUMP#10
 Sample collection start date: 3-NOV-2008 10:00:00.00
 Sample collection end date : 3-NOV-2008 10:00:00.00
 Type of sample : 71 L Mari. Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : MELL Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 23-MAR-2009 10:20:33.12
 Preset live time : 0 00:30:00.00 Elapsed live time : 0 00:30:00.00
 Elapsed real time : 0 00:30:01.52 Percent dead time : 0.11 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal gate : 20-JUN-2008 12:00:00.00
 Kev/channel : 4.99924E-01 Zero offset: 2.36636E-01
 Daily cal date : 23-MAR-2009 10:11:24.69

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 2.00000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 354.04 | 38 | 71 | 4.16 | 707.71 | 700 | 15 | 2.09E-02 | 52.6 | |
| 2 | 0 | 511.47 | 138 | 32 | 1.75 | 1022.62 | 1016 | 17 | 7.66E-02 | 12.9 | |
| 3 | 0 | 558.47 | 69 | 20 | 1.52 | 1116.64 | 1110 | 12 | 3.06E-02 | 17.7 | |
| 4 | 0 | 609.40 | 71 | 20 | 1.53 | 1210.50 | 1211 | 13 | 3.95E-02 | 17.5 | |
| 5 | 0 | 768.54 | 17 | 0 | 0.78 | 1536.82 | 1532 | 11 | 9.44E-03 | 24.3 | |
| 6 | 0 | 1460.56 | 62 | 3 | 2.59 | 2921.03 | 2914 | 14 | 3.42E-02 | 14.3 | |

Sample Title : SUMP#10

Page : 1

Decay Time = 140 00:20:33.12

Acquisition Time = 23-MAR-2009 10:20:33.

2

Post-MID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|-----|----------|
| 0 | 354.04 | 38 | 71 | 4.16 | 707.71 | 700 | 15 | 52.6 | | N. Error |
| 0 | 511.47 | 138 | 32 | 1.75 | 1022.62 | 1016 | 17 | 12.9 | | ANNI |
| 0 | 550.47 | 69 | 20 | 1.52 | 1116.64 | 1110 | 12 | 17.7 | | HWC |
| 0 | 609.40 | 71 | 20 | 1.53 | 1210.50 | 1211 | 13 | 17.5 | | B-214 |
| 0 | 760.54 | 17 | 0 | 0.70 | 1536.02 | 1532 | 11 | 24.3 | | B-214 |
| 0 | 1460.56 | 62 | 3 | 2.59 | 2921.03 | 2914 | 14 | 14.3 | | K-40 |

Nuclide Line Activity Report
Sample ID : SUMP#10

Page : 2
Acquisition date : 23-MAR-2009 10:20:33

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 62 | 10.67* | 2.502E+00 | 3.461E-07 | 3.461E-07 | 14.20 |

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : SUMPH10

Acquisition date : 23-MAR-2009 10:20:33

Total number of lines in spectrum 6
Number of unidentified lines 0
Number of lines tentatively identified by NID 6 - 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 3.461E-07 | 3.461E-07 | 0.494E-07 | 14.28 | |
| Total Activity : | | | 3.461E-07 | 3.461E-07 | | | |

Grand Total Activity : 3.461E-07 3.461E-07

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

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

| | | | | | | | |
|--------|--------|----------------------|---------|-------|-----------|-------|--------------|
| AS-76 | 26.32H | 127.68 | 559.10* | 44.70 | 1.359E+31 | 17.75 | Decay, Abun. |
| | | | 563.23 | 1.17 | Not Found | | |
| | | | 571.30 | 0.14 | Not Found | | |
| | | | 657.03 | 6.10 | Not Found | | |
| | | | 665.31 | 0.39 | Not Found | | |
| | | | 740.12 | 0.12 | Not Found | | |
| | | | 771.76 | 0.12 | Not Found | | |
| | | | 867.63 | 0.12 | Not Found | | |
| | | | 1129.87 | 0.14 | Not Found | | |
| | | | 1212.72 | 1.63 | Not Found | | |
| | | | 1216.02 | 3.84 | Not Found | | |
| | | | 1228.52 | 1.39 | Not Found | | |
| | | | 1439.13 | 0.33 | Not Found | | |
| | | | 1453.60 | 0.13 | Not Found | | |
| | | | 1787.67 | 0.33 | Not Found | | |
| | | % Abundances Found = | | 73.70 | | | |
| ZR-97 | 16.90H | 190.85 | 254.15 | 1.25 | Not Found | | Decay, Abun. |
| | | | 355.39 | 2.27 | 1.000E+35 | 52.59 | |
| | | | 507.63 | 5.30 | Not Found | | |
| | | | 602.52 | 1.39 | Not Found | | |
| | | | 743.36* | 98.00 | Not Found | | |
| | | | 1021.30 | 1.21 | Not Found | | |
| | | | 1147.95 | 2.60 | Not Found | | |
| | | | 1362.66 | 1.35 | Not Found | | |
| | | | 1750.46 | 1.35 | Not Found | | |
| | | % Abundances Found = | | 1.98 | | | |
| RU-103 | 39.35D | 3.56 | 497.08* | 89.00 | Not Found | | Abun. |
| | | | 610.33 | 5.60 | 4.976E-06 | 17.45 | |
| | | % Abundances Found = | | 5.92 | | | |
| BA-133 | 10.50Y | 0.04 | 79.62 | 2.55 | Not Found | | Abun. |
| | | | 81.00 | 33.00 | Not Found | | |
| | | | 276.40 | 6.90 | Not Found | | |
| | | | 302.84* | 17.80 | Not Found | | |
| | | | 356.00 | 60.00 | 1.695E-08 | 52.59 | |
| | | | 383.85 | 8.70 | Not Found | | |
| | | % Abundances Found = | | 46.53 | | | |
| I-134 | 52.60M | 3833.30 | 135.40 | 3.76 | Not Found | | Decay, Abun. |
| | | | 235.47 | 1.98 | Not Found | | |
| | | | 405.45 | 7.30 | Not Found | | |
| | | | 540.83 | 7.80 | Not Found | | |
| | | | 595.36 | 11.40 | Not Found | | |
| | | | 621.79 | 10.60 | Not Found | | |
| | | | 677.34 | 8.50 | Not Found | | |
| | | | 766.68 | 4.10 | 1.000E+35 | 24.25 | |
| | | | 847.03 | 95.41 | Not Found | | |

| Nuclide | Half-Life | | Activity 1-Sigma | | Rejected by |
|---------|-----------|----------|--|--------|-----------------|
| | Half-life | Ratio | Energy | %Abund | |
| I-134 | 52.60M | 3033.38 | 857.29 | 6.96 | Not Found |
| | | | 884.09* | 65.30 | Not Found |
| | | | 947.86 | 4.84 | Not Found |
| | | | 1072.55 | 15.30 | Not Found |
| | | | 1136.16 | 9.70 | Not Found |
| | | | 1613.80 | 4.36 | Not Found |
| | | | 1806.84 | 5.70 | Not Found |
| | | | % Abundances Found = 1.56 | | |
| TE-134 | 41.80M | 4823.82 | 79.45 | 21.00 | Not Found |
| | | | 180.89 | 18.00 | Not Found |
| | | | 201.24 | 8.70 | Not Found |
| | | | 210.47* | 21.90 | Not Found |
| | | | 277.95 | 21.30 | Not Found |
| | | | 435.86 | 18.60 | Not Found |
| | | | 461.00 | 10.80 | Not Found |
| | | | 464.64 | 5.10 | Not Found |
| | | | 565.99 | 18.90 | Not Found |
| | | | 742.59 | 14.70 | Not Found |
| | | | 767.20 | 30.00 | 1.000E+35 24.25 |
| | | | % Abundances Found = 15.87 | | |
| XE-135 | 9.11H | 365.89 | 249.79* | 89.90 | Not Found |
| | | | 608.19 | 2.89 | 1.000E+35 17.45 |
| | | | % Abundances Found = 3.11 | | |
| PM-148M | 41.30D | 3.39 0 | 288.11 | 12.56 | Not Found |
| | | | 414.87 | 18.66 | Not Found |
| | | | 432.78 | 5.35 | Not Found |
| | | | 501.26 | 6.75 | Not Found |
| | | | 550.27* | 94.90 | Not Found |
| | | | 599.74 | 12.54 | Not Found |
| | | | 611.26 | 5.40 | 4.526E-06 17.45 |
| | | | 629.97 | 89.00 | Not Found |
| | | | 725.70 | 32.80 | Not Found |
| | | | 915.33 | 17.17 | Not Found |
| | | | 1013.81 | 20.30 | Not Found |
| | | | % Abundances Found = 1.74 | | |
| BI-214 | 19.90M | 10132.44 | 609.31* | 46.30 | 1.000E+35 17.45 |
| | | | 768.36 | 5.84 | 1.000E+35 24.25 |
| | | | 934.86 | 3.21 | Not Found |
| | | | 1120.29 | 15.10 | Not Found |
| | | | 1238.11 | 5.94 | Not Found |
| | | | 1377.67 | 4.11 | Not Found |
| | | | 1764.49 | 15.80 | Not Found |
| | | | % Abundances Found = 53.76 (Abn. Limit = 48.48%) | | |

Flag: "*" = Keyline

Unidentified Energy Lines

Page : 6

Sample ID : SUPP#10

Acquisition date : 23-MAR-2009 10:20:33

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 354.04 | 38 | 71 | 4.16 | 707.71 | 700 | 15 | 2.09E-02 | 52.6 | 5.69E+00 | T |
| 0 | 511.47 | 138 | 32 | 1.75 | 1022.62 | 1016 | 17 | 7.66E-02 | 12.9 | 4.88E+00 | T |
| 0 | 558.47 | 69 | 20 | 1.52 | 1116.64 | 1110 | 12 | 3.06E-02 | 17.7 | 4.69E+00 | T |
| 0 | 609.40 | 71 | 20 | 1.53 | 1210.50 | 1211 | 13 | 3.95E-02 | 17.5 | 4.52E+00 | T |
| 0 | 768.54 | 17 | 0 | 0.78 | 1536.02 | 1532 | 11 | 9.44E-03 | 24.3 | 3.77E+00 | T |

Flags: "T" = Tentatively associated

 * Detroit Edison Fermi 2 MDA Report, Generated 23-MAR-2009 10:50:42.34

 * Sample ID: SUMPH10

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| BE-7 | 19. | 477.59 | 4.0675E-07 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 14. | 1274.54 | 1.2235E-08 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 8. | 889.25 | 2.3037E-08 |
| CR-51 | 39. | 320.08 | 2.7132E-06 |
| MN-54 | 15. | 834.83 | 1.2265E-08 |
| CO-56 | 10. | 1238.25 | 4.8746E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 0. | 158.38 | Half-Life too short |
| CO-57 | 48. | 122.06 | 1.5103E-08 |
| CO-58 | 11. | 810.76 | 3.0065E-08 |
| FE-59 | 12. | 1099.22 | 1.4780E-07 |
| CO-60 | 13. | 1332.49 | 1.1860E-08 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 16. | 1115.52 | 3.2637E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 44. | 136.00 | 3.0425E-08 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 52. | 513.99 | 2.6656E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 52. | 513.99 | 5.0322E-08 |
| RB-86 | 16. | 1076.63 | 2.2346E-05 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 1. | 1836.01 | 1.3017E-08 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RE-90 | 0. | 831.69 | Half-Life too short |
| RE-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 7. | 1204.90 | 1.3951E-05 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : SUMPH10

Acquisition date : 23-MAR-2009 10:20:33

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 9. | 702.63 | 6.1784E-09 |
| NB-95 | 5. | 765.79 | 8.2559E-08 |
| NB-95M | 0. | 235.69 | Half-Life too short |
| ZR-95 | 12. | 756.72 | 5.9769E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 14. | 497.00 | 8.0660E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 318.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 11. | 621.84 | 8.0673E-08 |
| CD-109 | 48. | 80.83 | 4.9379E-07 |
| AG-110M | 14. | 937.48 | 4.0924E-08 |
| SN-113 | 25. | 391.69 | 2.5488E-08 |
| SN-117M | 0. | 158.56 | Half-Life too short |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 25. | 602.71 | 4.3810E-08 |
| SB-125 | 24. | 427.89 | 2.6928E-08 |
| TE-125M | 30. | 109.28 | 1.7615E-05 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 30. | 57.60 | 5.8406E-05 |
| XE-127 | 47. | 202.84 | 1.6780E-07 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 18. | 695.88 | 4.4480E-06 |
| XE-129M | 0. | 196.56 | Half-Life too short |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 0. | 123.80 | Half-Life too short |
| I-131 | 0. | 364.48 | Half-Life too short |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 0. | 163.93 | Half-Life too short |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 27. | 302.84 | 3.8726E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 0. | < 81.00 | Half-Life too short |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 21. | 604.70 | 9.2102E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | < 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Sample ID : SUMP#10

Acquisition date : 23-MAR-2009 10:20:33

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| CS-136 | 0. | 818.50 | Half-Life too short |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 17. | 661.65 | 8.8376E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 51. | 165.85 | 2.0205E-08 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 0. | 537.32 | Half-Life too short |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 48. | 145.44 | 3.3062E-07 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 44. | 133.54 | 1.0521E-07 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 0. | 91.10 | Half-Life too short |
| PM-148M | 16. | 550.27 | 7.5372E-08 |
| EU-152 | 32. | 344.27 | 2.9063E-08 |
| EU-154 | 12. | 1004.76 | 5.2959E-08 |
| EU-155 | 50. | 105.31 | 5.6178E-08 |
| EU-156 | 18. | 646.29 | 6.3983E-05 |
| HF-181 | 19. | 482.03 | 8.1324E-08 |
| TA-182 | 10. | 1221.42 | 8.0446E-08 |
| W-187 | 0. | 685.81 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 46. | 279.19 | 8.6164E-08 |
| BI-207 | 23. | 569.67 | 8.3332E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PE-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PE-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 0. | 240.98 | Half-Life too short |
| RA-226 | 44. | 186.21 | 2.3038E-07 |
| AC-228 | 32. | 338.32 | 6.9330E-08 |
| TH-228 | 32. | 84.37 | 1.2952E-06 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 36. | 63.29 | 6.2600E-05 |
| U-235 | 43. | 143.76 | 7.2960E-08 |
| NP-239 | 0. | 106.13 | Half-Life too short |
| AM-241 | 26. | 59.54 | 1.6155E-07 |

EF-1 Sump #10

2009

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number NIA

Task

Performed By

Date

1. Representative sample collected.

Date/Time 12/3/09 11500

Container Number Sample #10

Storage Location EF-1

J. Southward
Fermi 1 (signature)

12/7/09

B3308
Employee ID Number

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

12/7/09

B3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.15 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

12-10-09

50580
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

Charles P. [Signature]
RP (signature)

12-16-09

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

12/7/09

2-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number _____

Task _____

Performed By _____

Date _____

6. Fluid approved for release.

Radiological Engineering
(signature)

Employee ID Number

Remarks: _____

Tritium Activity Calculation

Sample Information

| | |
|-------------------------|---------------|
| 1 . Sample Location | EF-1 Sump #10 |
| 2 . Date Sampled | 12/03/2009 |
| 3 . Time Sampled | 15:00 |
| 4 . Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|--|----------------|
| 1 . Date Sample Counted | 12/09/2009 |
| 2 . Time Sample Counted | 06:03 |
| 3 . Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 7.1 cpm |
| 4 . Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2747.5 cpm |
| Net Spike Count Rate (cpm) | 2740.4 cpm |
| H3 Spike Activity (dpm on count date) | 7101.9 dpm |
| Counter Efficiency | 0.3859 cpm/dpm |
| 5 . Sample Info: | |
| Sample Gross Count Rate (cpm) | 6.9 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6 . Critical Level: | |
| Critical Level Count Rate (cpm) | 1.9 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.15\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician 

Date 12-10-09

DE-FACIT EDISON FERRIS-2 POWER PLANT

13-DEC-2009 14:16:07.35

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID: Humbert EF-1 SURPA 13

Sample End Time: 3-DEC-2009 15:00:00.00

REMARKS: *Amu, HWC*

Charles Rupp

REVIEWED BY:

John J. B.

Sample ID : EF-1 BUNPH 10

Acquisition date : 16 DEC-2009 14:16:13

Fermi 2 Radiation Protection Gamma Spectroscopy Report

Sample Parameters

Sample ID Number : EF-1 BUNPH 10
 Sample collection start date : 3-DEC-2009 15:00:00.00
 Sample collection end date : 3-DEC-2009 15:00:00.00
 Type of sample : 1 L. var. liquid
 Sample quantity : 1.000000E+02 cc
 Sample geometry : WELL Operator : CLP

Acquisition Parameters

Detector number : DET 4 Acquire date : 16-DEC-2009 14:16:13.13
 Preset live time : 0 00:00:00.00 Elapsed live time : 0 00:00:00.00
 Elapsed real time : 0 00:00:00.00 Percent dead time : 0.00 %

Calibration Parameters

Detector number : DET 4 Yearly cal date : 3-JUN-2009 17:37:00.00
 Key/Channel : 5.00000E-01 Zero offset : 1.40000E-01
 Daily cal date : 16-DEC-2009 13:30:00.00

Peak Search Parameters

Start channel : 100 End channel : 4000
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

Isotope Identification Parameters

Energy tolerance : 1.70000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : decaisoel.lib
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| PK | It | Energy | A/A0 | Stand | FWHM | Channel | Left | PK | 214/213 | 214/213 | 214/213 | 214/213 |
|----|----|--------|------|-------|------|---------|------|----|----------|---------|----------|---------|
| 1 | 2 | 510.40 | 00 | 00 | 2.17 | 1203.10 | 1211 | 01 | 1.77E-02 | 05.0 | 1.00E-02 | |
| 2 | 2 | 511.05 | 00 | 00 | 2.11 | 1202.04 | 1211 | 01 | 1.60E-02 | 10.4 | | |
| 3 | 2 | 535.05 | 01 | 01 | 1.01 | 1117.10 | 1103 | 01 | 2.00E-02 | 05.0 | | |

Sample Title : EF-1 GROUP 12
 Decay Time : 12 23:16:52.13

Page : 1
 Acquisition Time : 12-DEC-2000 14:16:52.13

Fast-NIF Peak Search Report

| ID | Energy | Area | Signal | FWHM | Channel | Left | PW | %Err | Fit | Nuclides |
|----|--------|------|--------|------|---------|------|----|------|----------|----------------------------|
| 2 | 510.13 | 26 | 23 | 2.17 | 1000.40 | 1011 | 26 | 55.2 | 1.60E+00 | > Ann. HWC. 8-121200 |
| 3 | 511.55 | 23 | 250 | 2.41 | 1052.64 | 1011 | 23 | 19.4 | | |
| 9 | 550.85 | 54 | 31 | 1.91 | 1117.22 | 1109 | 14 | 25.9 | | |

Nuclide Line Activity Report
Sample ID : EF-1 SURFW 18

Page 1 2
Acquisition date : 18-DEC-2009 14:13:52

Flag: "W" = Keyline

Summary of Nuclide Activity
Sample ID : EF-1 DUMFW 12

Page : 3
Acquisition date : 10-DEC-2023 14:16:53

| | | |
|---|---|--------|
| Total number of lines in spectrum | 3 | |
| Number of unidentified lines | 1 | |
| Number of lines tentatively identified by NIT | 2 | 66.67% |

*** There are no nuclides meeting summary criteria ***

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

"F" = Manually accepted
"A" = Nuclide specific Abn. Limit

Rejected Report

Sample ID : EF-1 EUMPH 1E

Page 1

Acquisition date : 16-DEC-2009 14:16:58

| Radionuclide | Half-Life | Ratio | Energy (keV) | Activity (uCi/sec) | 1-Sigma Error | Rejected by |
|-----------------------------|-----------|--------|---------------|--------------------|---------------|-------------|
| F-18 | 109.74H | 170.00 | 511.00*193.46 | 1.000E+05 | 53.17 | Decay |
| % Abundances Found = 100.00 | | | | | | |

| AD-76 | 26.32H | 11.04 | 353.12* | 44.70 | 1.413E-04 | 25.93 | Decay; Abun. |
|----------------------|--------|-------|---------|-------|-----------|-----------|--------------|
| | | | 363.23 | 1.17 | --- | Not Found | --- |
| | | | 371.00 | 0.14 | --- | Not Found | --- |
| | | | 657.03 | 5.12 | --- | Not Found | --- |
| | | | 665.31 | 0.39 | --- | Not Found | --- |
| | | | 740.10 | 2.12 | --- | Not Found | --- |
| | | | 771.76 | 2.12 | --- | Not Found | --- |
| | | | 807.13 | 0.12 | --- | Not Found | --- |
| | | | 1109.07 | 0.14 | --- | Not Found | --- |
| | | | 1210.72 | 1.63 | --- | Not Found | --- |
| | | | 1216.02 | 3.04 | --- | Not Found | --- |
| | | | 1220.32 | 1.39 | --- | Not Found | --- |
| | | | 1439.13 | 0.33 | --- | Not Found | --- |
| | | | 1453.50 | 0.13 | --- | Not Found | --- |
| | | | 1707.07 | 0.33 | --- | Not Found | --- |
| % Abundances Found = | | | 73.72 | | | | |

Flag: "X" = Keyline

Unidentified Energy Lines
 Sample ID : EF-1 SUBPH 10

Page : 5
 Acquisition Date : 10-DEC-2009 14:16:53

| It | Energy | Area | Sknd | FWHM | Channel | Left | Pe | Std/Dev | MEAN | MEFF | Flags |
|----|--------|------|------|-------|---------|------|----|----------|------|----------|-------|
| 2 | 512.43 | 26 | 20 | 21.9 | 1023.42 | 1011 | 26 | 1.57E-02 | 25.2 | 4.60E+00 | T |
| 2 | 511.65 | 52 | 22 | 21.1 | 1022.04 | 1011 | 52 | 4.63E-02 | 19.4 | 4.99E+00 | |
| 3 | 570.35 | 51 | 31 | 17.21 | 1117.22 | 1109 | 14 | 2.00E-02 | 25.9 | 4.60E+00 | T |

Flags: "T" = Tentatively associated

 * Detroit Edison Fernald MDA Report, Generated 16-DEC-2003 14:47:31.31 *

 * Sample ID : EF-1 SURF 10 C : *

Minimum Detectable Activity Report

| Nuclide | Backgrnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|-----------------|-----------------|---------------------|
| BE-7 | 15. | 477.39 | 7.6317E-03 |
| F-18 | 3. | 511.02 | Half-Life too short |
| NA-22 | 5. | 1274.54 | 7.4388E-03 |
| NA-24 | 0. | 1368.52 | Half-Life too short |
| NO-27 | 2. | 1214.46 | Half-Life too short |
| CL-38 | 0. | 1542.42 | Half-Life too short |
| K-40 | 49. | 1460.61 | 1.9249E-07 |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 29. | 829.25 | 1.2106E-03 |
| CR-51 | 31. | 320.80 | 1.3129E-07 |
| MN-54 | 3. | 834.63 | 5.6324E-03 |
| CO-58 | 13. | 1239.23 | 1.6169E-03 |
| MN-56 | 0. | 1610.69 | Half-Life too short |
| NI-56 | 47. | 159.38 | 3.4376E-03 |
| CO-57 | 39. | 122.36 | 9.9732E-03 |
| CO-59 | 14. | 810.76 | 9.6347E-03 |
| FE-59 | 6. | 1099.22 | 1.6152E-03 |
| CO-60 | 4. | 1332.43 | 6.3953E-03 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1431.84 | Half-Life too short |
| ZN-65 | 12. | 1113.52 | 2.3377E-03 |
| ZN-69M | 0. | 438.32 | Half-Life too short |
| CE-75 | 53. | 136.00 | 1.6032E-03 |
| NO-71 | 0. | 659.18 | Half-Life too short |
| BR-82 | 10. | 771.49 | 3.2750E-03 |
| BR-83 | 0. | 587.04 | Half-Life too short |
| BR-84 | 2. | 381.52 | Half-Life too short |
| BR-85 | 0. | 392.41 | Half-Life too short |
| KT-88 | 55. | 513.99 | 2.5127E-03 |
| KT-105 | 2. | 151.12 | Half-Life too short |
| CR-88 | 75. | 513.99 | 1.3122E-03 |
| KT-86 | 10. | 1070.12 | 1.6321E-07 |
| KS-87 | 2. | 1382.33 | Half-Life too short |
| CT-117M | 2. | 1332.43 | Half-Life too short |
| IR-113 | 2. | 1194.32 | Half-Life too short |
| IR-112 | 1. | 1127.37 | Half-Life too short |
| Y-88 | 2. | 1836.31 | 1.2721E-03 |
| R-107 | 0. | 233.72 | Half-Life too short |
| KS-92 | 3. | 1831.63 | Half-Life too short |
| KR-90 | 0. | 1116.69 | Half-Life too short |

| | | | |
|-------|-----|---------|---------------------|
| Y-91 | 1. | 324.87 | Half-Life too short |
| Y-92 | 2. | 325.31 | Half-Life too short |
| OR-91 | 1. | 1724.13 | Half-Life too short |
| Y-91 | 12. | 1514.38 | 1.3511E-06 |
| OR-92 | 1. | 325.33 | Half-Life too short |
| OR-92 | 2. | 325.94 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page 2

Sample ID : EF-1 GUMPH 10

Acquisition date : 16-DEC-2009 14:16:53

| Radionuclide | Background Sum | Energy (keV) | MDA (LOI/cc) |
|--------------|----------------|--------------|---------------------|
| Y-92 | 0. | 934.46 | Half-Life too short |
| OR-93 | 0. | 935.88 | Half-Life too short |
| Y-93 | 0. | 936.98 | Half-Life too short |
| MB-94 | 22. | 782.63 | 3.9124E-09 |
| VB-95 | 7. | 745.79 | 7.6385E-09 |
| NR-95M | 38. | 235.19 | 3.6144E-07 |
| ZR-95 | 17. | 756.72 | 1.7937E-08 |
| MB-97 | 0. | 637.93 | Half-Life too short |
| ZR-97 | 0. | 742.36 | Half-Life too short |
| MO-99 | 13. | 739.56 | 1.5628E-06 |
| TC-99M | 0. | 148.58 | Half-Life too short |
| TC-101 | 0. | 326.31 | Half-Life too short |
| RU-103 | 27. | 437.08 | 1.1433E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RM-105 | 34. | 318.98 | 1.7786E-05 |
| RU-105 | 0. | 784.59 | Half-Life too short |
| RU-106 | 9. | 621.84 | 5.8295E-08 |
| OD-109 | 32. | 88.23 | 3.3811E-07 |
| AC-110M | 14. | 937.46 | 2.9267E-08 |
| BN-113 | 22. | 331.69 | 1.1034E-08 |
| BN-117M | 43. | 158.50 | 1.6922E-06 |
| GE-122 | 12. | 563.93 | 2.4116E-07 |
| GE-124 | 22. | 592.71 | 9.1567E-09 |
| SD-125 | 20. | 427.99 | 2.2044E-08 |
| TE-125M | 34. | 189.83 | 3.6476E-06 |
| TE-127 | 0. | 417.92 | Half-Life too short |
| TE-127M | 27. | 57.688 | 2.4465E-05 |
| XE-127 | 32. | 232.84 | 1.5049E-08 |
| TE-129 | 0. | 455.28 | Half-Life too short |
| TE-129M | 31. | 695.32 | 4.1838E-07 |
| XE-129M | 29. | 196.51 | 4.1019E-07 |
| I-130 | 0. | 552.87 | Half-Life too short |
| SA-131 | 26. | 123.20 | 5.9048E-08 |
| I-131 | 20. | 314.42 | 2.7033E-06 |
| TE-131 | 2. | 143.72 | Half-Life too short |
| TE-131M | 2. | 773.27 | Half-Life too short |
| TE-131M | 39. | 113.15 | 7.1783E-07 |
| I-132 | 0. | 113.15 | Half-Life too short |
| TE-132 | 39. | 222.15 | 1.3433E-07 |
| SA-132 | 37. | 322.74 | 4.4214E-06 |
| SA-132M | 37. | 271.87 | 1.3433E-07 |
| I-133 | 2. | 323.87 | Half-Life too short |
| TE-133M | 0. | 312.83 | Half-Life too short |
| XE-133 | 31. | 31.33 | 2.2708E-07 |
| XE-133M | 43. | 232.84 | 1.5049E-08 |

GROUP 1: 100% SUPPLY 10

Registration date : 16-MAR-2003 14:16:03

| Material | Exposure Days | Energy (MeV) | Yield (1.01/100) |
|----------|------------------|-----------------|---------------------|
| XE-135M | 3. | 523.56 | Half-Life too short |
| CE-136 | 12. | 818.58 | 1.5630E-03 |
| I-136 | 0. | 1313.32 | Half-Life too short |
| CO-137 | 16. | 651.65 | 3.3389E-03 |
| XE-137 | 3. | 485.43 | Half-Life too short |
| CO-138 | 0. | 1435.06 | Half-Life too short |
| XE-138 | 3. | 650.31 | Half-Life too short |
| BA-139 | 0. | 1422.52 | Half-Life too short |
| CE-139 | 23. | 165.35 | 9.3581E-03 |
| CO-139 | 0. | 1263.23 | Half-Life too short |
| BA-140 | 13. | 537.32 | 5.0494E-03 |
| LA-140 | 7. | 1596.49 | 2.1261E-03 |
| BA-141 | 0. | 130.22 | Half-Life too short |
| CE-141 | 35. | 145.44 | 1.3713E-03 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 955.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 30. | 230.26 | 1.2345E-03 |
| CE-144 | 45. | 123.54 | 7.7931E-03 |
| PR-144 | 0. | 1483.13 | Half-Life too short |
| NE-147 | 44. | 91.13 | 1.8763E-03 |
| PR-148M | 19. | 559.27 | 3.5241E-03 |
| EU-152 | 28. | 344.27 | 3.7158E-03 |
| EU-154 | 12. | 1204.76 | 5.2379E-03 |
| EU-155 | 30. | 125.31 | 4.2474E-03 |
| EU-156 | 11. | 346.23 | 1.5308E-03 |
| HF-151 | 14. | 462.33 | 3.1327E-03 |
| TA-152 | 13. | 1221.42 | 1.2535E-03 |
| W-157 | 7. | 532.01 | Half-Life too short |
| RE-158 | 0. | 152.82 | Half-Life too short |
| NO-222 | 42. | 379.19 | 1.9503E-03 |
| BI-227 | 12. | 527.67 | 3.7914E-03 |
| TL-228 | 0. | 562.14 | Half-Life too short |
| FE-218 | 0. | 333.12 | Half-Life too short |
| BI-214 | 0. | 507.31 | Half-Life too short |
| PO-211 | 0. | 321.32 | Half-Life too short |
| CA-224 | 70. | 243.22 | 2.3271E-03 |
| W-215 | 30. | 161.21 | 1.3333E-03 |
| AC-228 | 31. | 333.32 | 7.3032E-03 |
| TH-232 | 22. | 14.37 | 1.2332E-03 |
| PA-234 | 0. | 121.22 | Half-Life too short |
| TH-232 | 39. | 12.33 | 1.3131E-03 |
| U-235 | 40. | 143.13 | 1.3131E-03 |
| HF-239 | 37. | 100.13 | 1.3074E-03 |
| AC-234 | 26. | 33.34 | 1.3303E-03 |

EF-1 Sump #10

2010

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 5/10/10 1:450

Container Number Sump #10

Storage Location EF-1

J. Southward
Fermi 1 (signature)

5/10/10

B3308
Employee ID Number

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

5/10/10

B3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.2 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

RP
Chemistry (signature)

5-17-10

5922
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Southward
RP (signature)

6/15/10

B3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

RP
Radiological Engineering (signature)

6-22-10

50027
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|-------------------------|------------|
| 1 . Sample Location | Sump #10 |
| 2 . Date Sampled | 05/10/2010 |
| 3 . Time Sampled | 14:50 |
| 4 . Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | | |
|--|------------|---------|
| 1 . Date Sample Counted | 05/17/2010 | |
| 2 . Time Sample Counted | 13:40 | |
| 3 . Background Inf.: | | |
| Minutes Counted | 10 | min. |
| Background Count Rate (cpm) | 8.1 | cpm |
| 4 . Efficiency Inf.: (Daily Spike Source ID # 111) | | |
| Gross Spike Count Rate (cpm) | 2723.9 | cpm |
| Net Spike Count Rate (cpm) | 2715.8 | cpm |
| H3 Spike Activity (dpm on count date) | 6929.6 | dpm |
| Counter Efficiency | 0.3919 | cpm/dpm |
| 5 . Sample Info: | | |
| Sample Gross Count Rate (cpm) | 9.2 | cpm |
| Sample Count Time (min.) | 10.0 | min. |
| Net Sample Count Rate (cpm) | 1.1 | cpm |
| 6 . Critical Level: | | |
| Critical Level Count Rate (cpm) | 2.1 | cpm |

Minimum Detectable Activity

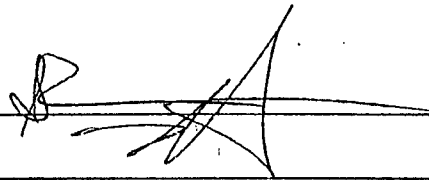
$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg mln.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl mln.})}} = 1.21\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician



Date 5-17-10

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF-1 SUMP#10

Sample End Time: 10-MAY-2010 14:50:00.00

REMARKS

PERFORMED BY:

Southward
SIGNATURE

REVIEWED BY:

R. Lindley 6-22-10
SIGNATURE/DATE

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF-1 SUMPH10
Sample collection start date: 10-MAY-2010 14:50:00.00
Sample collection end date : 10-MAY-2010 14:50:00.00
Type of sample : 1 L Mari. Liquid
Sample quantity : 1.00000E+03 cc
Sample geometry : MELL Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 15-JUN-2010 11:34:25.00
Preset live time : 0 00:45:00.00 Elapsed live time : 0 00:45:00.00
Elapsed real time : 0 00:45:00.69 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 3-JUN-2009 17:37:00.00
KeV/channel : 4.99767E-01 Zero offset: 3.33491E-01
Daily cal date : 15-JUN-2010 08:23:12.97

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
Height sensitivity : 5.00000 Shape sensitivity : 10.00000
Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 Half-life ratio : 10.00000
Abundance limit : 75.00000 Library : dacmaster.nlb
Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 511.00 | 148 | 59 | 2.47 | 1021.05 | 1012 | 21 | 5.49E-02 | 15.2 | |
| 2 | 0 | 558.06 | 53 | 21 | 4.14 | 1116.02 | 1107 | 21 | 1.96E-02 | 25.6 | |
| 3 | 0 | 1119.85 | 34 | 10 | 3.14 | 2240.27 | 2231 | 19 | 1.24E-02 | 20.0 | |
| 4 | 0 | 1460.90 | 104 | 0 | 2.38 | 2922.00 | 2915 | 15 | 3.95E-02 | 9.0 | |

Sample Title : EF-1 SUMPF410
Decay Time = 35 20:44:25.82
0

Page : 1
Acquisition Time = 15-JUN-2010 11:34:25.6

Post-NID Peak Search Report

| It | Energy | Area | Ekgrd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|-----|------------------|
| 0 | 511.00 | 140 | 59 | 2.47 | 1021.85 | 1012 | 21 | 15.2 | | <i>Anti Peak</i> |
| 0 | 556.06 | 53 | 21 | 4.14 | 1116.02 | 1107 | 21 | 25.6 | | <i>NaC</i> |
| 0 | 1119.85 | 34 | 10 | 3.14 | 2240.27 | 2231 | 19 | 20.0 | | <i>B-21</i> |
| 0 | 1460.90 | 104 | 0 | 2.30 | 2922.80 | 2915 | 15 | 9.0 | | <i>K-40</i> |

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 104 | 10.67* | 2.501E+00 | 3.901E-07 | 3.901E-07 | 9.81 |

Flag: "*" = Keyline

Total number of lines in spectrum 4
Number of unidentified lines 0
Number of lines tentatively identified by MID 4 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 3.901E-07 | 3.901E-07 | 0.302E-07 | 9.01 | |
| Total Activity : | | | 3.901E-07 | 3.901E-07 | | | |
| Grand Total Activity : | | | 3.901E-07 | 3.901E-07 | | | |

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

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

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|---------|-----------|--------------|-------------------------------------|--------|-------------------|----------------|--------------|
| F-18 | 109.74M | 470.81 | 511.00* | 193.46 | 1.000E+35 | 15.24 | Decay |
| | | % Abundances | Found = 100.00 | | | | |
| SC-46 | 83.83D | 0.43 | 142.53 | 62.70 | ---- | Not Found | ---- |
| | | | 889.25* | 99.98 | ---- | Not Found | ---- |
| | | | 1120.51 | 99.99 | 1.556E-08 | 28.02 | |
| | | % Abundances | Found = 38.07 | | | | |
| AS-76 | 26.32H | 32.72 | 559.10* | 44.70 | 1.786E+02 | 25.61 | Decay, Abun. |
| | | | 563.23 | 1.17 | ---- | Not Found | ---- |
| | | | 571.30 | 0.14 | ---- | Not Found | ---- |
| | | | 657.03 | 6.10 | ---- | Not Found | ---- |
| | | | 665.31 | 0.39 | ---- | Not Found | ---- |
| | | | 740.12 | 0.12 | ---- | Not Found | ---- |
| | | | 771.76 | 0.12 | ---- | Not Found | ---- |
| | | | 867.63 | 0.12 | ---- | Not Found | ---- |
| | | | 1129.87 | 0.14 | ---- | Not Found | ---- |
| | | | 1212.72 | 1.63 | ---- | Not Found | ---- |
| | | | 1216.02 | 3.84 | ---- | Not Found | ---- |
| | | | 1228.52 | 1.39 | ---- | Not Found | ---- |
| | | | 1439.13 | 0.33 | ---- | Not Found | ---- |
| | | | 1453.60 | 0.13 | ---- | Not Found | ---- |
| | | | 1787.67 | 0.33 | ---- | Not Found | ---- |
| | | % Abundances | Found = 73.70 | | | | |
| KR-90 | 32.32S | 95916.34 | 121.82 | 32.00 | ---- | Not Found | ---- |
| | | | 539.49 | 29.00 | ---- | Not Found | ---- |
| | | | 1118.69* | 37.00 | 1.000E+35 | 28.02 | |
| | | % Abundances | Found = 37.76 | | | | |
| BI-214 | 19.90M | 2596.33 | 609.31* | 46.30 | ---- | Not Found | ---- |
| | | | 768.36 | 5.04 | ---- | Not Found | ---- |
| | | | 934.06 | 3.21 | ---- | Not Found | ---- |
| | | | 1120.29 | 15.10 | 1.000E+35 | 28.02 | |
| | | | 1238.11 | 5.94 | ---- | Not Found | ---- |
| | | | 1377.67 | 4.11 | ---- | Not Found | ---- |
| | | | 1764.49 | 15.80 | ---- | Not Found | ---- |
| | | % Abundances | Found = 15.81 (Abn. Limit = 48.48%) | | | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : EF-1 SUMP#10

Page: 5
Acquisition date : 15-JUN-2010 11:34:23

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 511.00 | 140 | 59 | 2.47 | 1021.05 | 1012 | 21 | 5.49E-02 | 15.2 | 4.88E+00 | T |
| 0 | 550.06 | 53 | 21 | 4.14 | 1116.02 | 1107 | 21 | 1.36E-02 | 25.6 | 4.69E+00 | T |
| 0 | 1119.05 | 34 | 10 | 3.14 | 2240.27 | 2231 | 19 | 1.24E-02 | 28.0 | 2.90E+00 | T |

Flags: "T" = Tentatively associated

* Sample ID : EF-1 SUMP#10 *

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| BE-7 | 22. | 477.59 | 7.4644E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 9. | 1274.54 | 6.4664E-09 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 16. | 899.25 | 8.7491E-09 |
| CR-51 | 35. | 320.08 | 1.2725E-07 |
| MN-54 | 23. | 834.83 | 7.7556E-09 |
| CO-56 | 12. | 1238.25 | 1.4840E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 41. | 158.38 | 2.9114E-07 |
| CO-57 | 31. | 122.06 | 6.3577E-09 |
| CO-58 | 16. | 810.76 | 8.5224E-09 |
| FE-59 | 12. | 1099.22 | 1.9923E-08 |
| CO-60 | 12. | 1332.49 | 7.1566E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 11. | 1115.52 | 1.3776E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 49. | 136.00 | 1.1668E-08 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 52. | 513.99 | 1.7472E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 52. | 513.99 | 1.1036E-08 |
| RB-86 | 9. | 1076.63 | 2.4067E-07 |
| KR-87 | 0. | 482.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 4. | 1836.01 | 6.9801E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.80 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 12. | 1284.90 | 3.4720E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Sample ID : EF-1 SUMPW13

Acquisition date : 15-JUN-2010 11:34:25

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 16. | 702.63 | 5.2471E-09 |
| NB-95 | 20. | 765.79 | 1.2555E-08 |
| NB-95M | 49. | 235.69 | 2.1055E-05 |
| ZR-95 | 15. | 756.72 | 1.4514E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 34. | 497.08 | 1.2710E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 318.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 17. | 621.84 | 5.3972E-08 |
| CD-109 | 36. | 88.03 | 2.4547E-07 |
| AG-110M | 16. | 937.48 | 2.2959E-08 |
| SN-113 | 24. | 391.69 | 8.9411E-09 |
| SN-117M | 42. | 158.56 | 3.5536E-08 |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 22. | 602.71 | 8.3528E-09 |
| SB-125 | 30. | 427.89 | 1.8723E-08 |
| TE-125M | 30. | 109.28 | 3.3710E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 29. | 57.60 | 1.9734E-05 |
| XE-127 | 48. | 202.84 | 1.5550E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 25. | 695.88 | 4.0022E-07 |
| XE-129M | 62. | 196.56 | 2.0656E-06 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 49. | 123.80 | 1.7009E-07 |
| I-131 | 30. | 364.48 | 1.3669E-07 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 49. | 163.93 | 2.1930E-06 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 43. | 302.84 | 3.1024E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 30. | 81.00 | 3.0736E-06 |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 23. | 604.70 | 5.8431E-09 |
| I-134 | 0. | 864.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Sample ID : EF-1 SUMPV16

Acquisition date : 15-JUN-2010 11:34:25

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| CS-136 | 6. | 819.50 | 2.6200E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 20. | 661.65 | 6.4242E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.06 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 51. | 165.05 | 7.9896E-09 |
| CS-139 | 0. | 1293.23 | Half-Life too short |
| BA-140 | 26. | 537.32 | 1.5463E-07 |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 48. | 145.44 | 2.3756E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 52. | 133.54 | 5.8685E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 37. | 91.10 | 2.8093E-07 |
| PM-148M | 21. | 550.27 | 9.8244E-09 |
| EU-152 | 30. | 344.27 | 1.8632E-08 |
| EU-154 | 12. | 1004.76 | 3.4125E-08 |
| EU-155 | 36. | 105.31 | 3.0890E-08 |
| EU-156 | 19. | 646.29 | 3.7930E-07 |
| MF-181 | 23. | 482.03 | 1.8093E-08 |
| TA-182 | 8. | 1221.42 | 2.6413E-08 |
| W-187 | 0. | 695.01 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 43. | 279.19 | 1.1906E-08 |
| BI-207 | 27. | 569.67 | 5.8955E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PE-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PE-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 53. | 240.98 | 1.4068E-04 |
| RA-226 | 56. | 186.21 | 1.7164E-07 |
| AC-228 | 35. | 338.32 | 4.6481E-08 |
| TH-228 | 55. | 84.37 | 9.9386E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 43. | 63.29 | 2.2602E-06 |
| U-235 | 64. | 143.76 | 5.8647E-08 |
| NP-239 | 0. | 106.13 | Half-Life too short |
| AM-241 | 31. | 59.54 | 1.1663E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 12/7/10 10840

Container Number Sump # 10

Storage Location EF-1

[Signature]
Fermi 1 (signature)

B3305
Employee ID Number

12/7/10

2. Sample secured against tampering.

[Signature]
Fermi 1 (signature)

B3308
Employee ID Number

12/7/10

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 2.140 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

56230
Employee ID Number

12/14/10

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

[Signature]
RP (signature)

21225
Employee ID Number

1-18-11

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

Z-1151
Employee ID Number

1-18-11

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

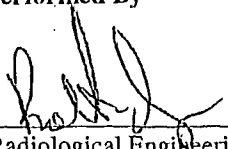
Log Number _____

Task

Performed By

Date

6. Fluid approved for release.



Radiological Engineering
(signature)

1-18-11

2-1151

Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|-------------|
| 1. Sample Location | EF1 SUMP 10 |
| 2. Date Sampled | 12/07/2010 |
| 3. Time Sampled | 08:40 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 12/10/2010 |
| 2. Time Sample Counted | 19:30 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 9.3 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2435.0 cpm |
| Net Spike Count Rate (cpm) | 2425.7 cpm |
| H3 Spike Activity (dpm on count date) | 6711.4 dpm |
| Counter Efficiency | 0.3614 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 7.0 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 2.2 cpm |

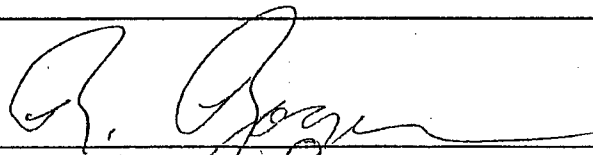
Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg mln.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl mln.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.40\text{E-06 uCi/ml}$$

Sample Activity

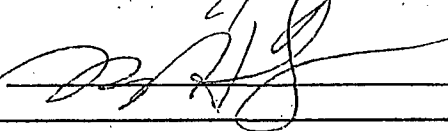
$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician



Date 12/14/10

Reviewed By:



Date 12/15/10

12/14/10

DETOIT EDISON FERMI-2 POWER PLANT

18-JAN-2011 17:14:56.34

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: SUNF #10

Sample End Time: 7-DEC-2010 08:40:00.00

REMARKS

PERFORMED BY:

A. Rayner

SIGNATURE

REVIEWED BY:

[Signature]

SIGNATURE/DATE

Sample ID : SUMP #10

Acquisition date : 18-JAN-2011 16:29:55

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: SUMP #10
 Sample collection start date: 7-DEC-2010 08:40:00.00
 Sample collection end date : 7-DEC-2010 08:40:00.00
 Type of sample : 1 L Marin Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : MELL Operator: DP

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 18-JAN-2011 16:29:55.02
 Preset live time : 0 00:45:00.00 Elapsed live time : 0 00:45:00.00
 Elapsed real time : 0 00:45:00.70 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 23-JUN-2010 12:20:00.00
 Kev/channel : 5.00027E-01 Zero offset: -4.90268E-02
 Daily cal date : 18-JAN-2011 13:42:00.04

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|----------|
| 1 | 0 | 198.71 | 44 | 106 | 1.16 | 397.51 | 392 | 10 | 1.63E-02 | 46.5 | |
| 2 | 0 | 295.38 | 102 | 55 | 1.85 | 590.82 | 584 | 14 | 3.78E-02 | 18.4 | |
| 3 | 0 | 352.46 | 101 | 94 | 1.36 | 704.98 | 698 | 15 | 3.74E-02 | 23.2 | |
| 4 | 3 | 509.96 | 74 | 59 | 2.00 | 1019.96 | 1016 | 13 | 2.76E-02 | 22.3 | 1.05E+00 |
| 5 | 3 | 511.77 | 65 | 66 | 1.95 | 1023.58 | 1016 | 13 | 2.39E-02 | 29.6 | |
| 6 | 0 | 558.47 | 56 | 40 | 1.14 | 1116.97 | 1112 | 12 | 2.08E-02 | 26.0 | |
| 7 | 0 | 609.35 | 166 | 39 | 1.64 | 1218.74 | 1212 | 14 | 6.16E-02 | 11.1 | |
| 8 | 0 | 1120.74 | 59 | 19 | 2.00 | 2241.45 | 2234 | 16 | 2.18E-02 | 22.4 | |
| 9 | 0 | 1460.82 | 91 | 14 | 3.22 | 2921.56 | 2913 | 18 | 3.38E-02 | 14.1 | |
| 10 | 0 | 1764.52 | 56 | 4 | 1.42 | 3528.93 | 3520 | 15 | 2.06E-02 | 15.4 | |

Sample Title : SUMF #10
Decay Time = 42 07:49:55.02

Page : 1
Acquisition Time = 18-JAN-2011 16:29:55.0

Post-MID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|----------|----------|
| 0 | 198.71 | 44 | 106 | 1.16 | 397.51 | 392 | 10 | 46.5 | _____ | HeSc |
| 0 | 295.38 | 102 | 55 | 1.85 | 590.82 | 584 | 14 | 18.4 | _____ | Pb-214 |
| 0 | 352.46 | 101 | 94 | 1.36 | 704.98 | 698 | 15 | 23.2 | _____ | Pb-214 |
| 3 | 509.96 | 74 | 59 | 2.00 | 1019.96 | 1016 | 43 | 22.3 | 1.05E+00 | AmBeck |
| 3 | 511.77 | 65 | 66 | 1.95 | 1023.58 | 1016 | 13 | 29.6 | _____ | |
| 0 | 558.47 | 56 | 40 | 1.14 | 1116.97 | 1112 | 12 | 26.0 | _____ | HeSc |
| 0 | 609.35 | 166 | 39 | 1.64 | 1218.74 | 1212 | 14 | 11.1 | _____ | Bi-214 |
| 0 | 1120.74 | 59 | 19 | 2.00 | 2241.45 | 2234 | 16 | 22.4 | _____ | Bi-214 |
| 0 | 1460.82 | 91 | 14 | 3.22 | 2921.56 | 2913 | 10 | 14.1 | _____ | K-40 |
| 0 | 1764.52 | 56 | 4 | 1.42 | 3528.93 | 3520 | 15 | 15.4 | _____ | Bi-214 |

h -1-18-11

Nuclide Line Activity Report
Sample ID : SUMP H10

Page : 2
Acquisition date : 10-JAN-2011 16:29:55

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 91 | 10.67* | 2.501E+00 | 3.426E-07 | 3.426E-07 | 14.09 |

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : SUMP #10

Acquisition date : 18-JAN-2011 16:29:55

Total number of lines in spectrum 10
Number of unidentified lines 1
Number of lines tentatively identified by MID 9 90.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 3.426E-07 | 3.426E-07 | 0.483E-07 | 14.09 | |
| Total Activity : | | | 3.426E-07 | 3.426E-07 | | | |

Grand Total Activity : 3.426E-07 3.426E-07

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

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

Page : 4
Acquisition date : 18-JAN-2011 16:29:55

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|--|-----------|---------|---------|--------|-------------------|----------------|--------------|
| F-19 | 109.74M | 555.61 | 511.00* | 193.46 | 1.000E+35 | 29.63 | Decay |
| % Abundances Found = 100.00 | | | | | | | |
| SC-46 | 83.83D | 0.51 | 142.53 | 62.70 | Not Found | | Abun. |
| | | | 889.25* | 99.98 | Not Found | | |
| | | | 1120.51 | 99.99 | 2.880E-08 | 22.45 | |
| % Abundances Found = 30.07 | | | | | | | |
| SE-75 | 119.78D | 0.35 | 66.05 | 1.02 | Not Found | | Abun. |
| | | | 96.73 | 3.41 | Not Found | | |
| | | | 121.12 | 16.70 | Not Found | | |
| | | | 136.00* | 59.20 | Not Found | | |
| | | | 198.60 | 1.45 | 5.879E-07 | 46.54 | |
| | | | 264.65 | 59.80 | Not Found | | |
| | | | 279.53 | 25.20 | Not Found | | |
| | | | 303.91 | 1.32 | Not Found | | |
| | | | 400.65 | 11.40 | Not Found | | |
| % Abundances Found = 0.81 | | | | | | | |
| AS-76 | 26.32H | 38.61 | 559.10* | 44.70 | 1.125E+04 | 26.00 | Decay, Abun. |
| | | | 563.23 | 1.17 | Not Found | | |
| | | | 571.30 | 0.14 | Not Found | | |
| | | | 657.03 | 6.10 | Not Found | | |
| | | | 665.31 | 0.39 | Not Found | | |
| | | | 740.12 | 0.12 | Not Found | | |
| | | | 771.76 | 0.12 | Not Found | | |
| | | | 867.63 | 0.12 | Not Found | | |
| | | | 1129.87 | 0.14 | Not Found | | |
| | | | 1212.72 | 1.63 | Not Found | | |
| | | | 1216.02 | 3.84 | Not Found | | |
| | | | 1228.52 | 1.39 | Not Found | | |
| | | | 1439.13 | 0.33 | Not Found | | |
| | | | 1453.60 | 0.13 | Not Found | | |
| | | | 1787.67 | 0.33 | Not Found | | |
| % Abundances Found = 73.70 | | | | | | | |
| RU-103 | 39.35D | 1.08 | 497.08* | 89.00 | Not Found | | Abun. |
| | | | 610.33 | 5.60 | 1.307E-06 | 11.08 | |
| % Abundances Found = 5.92 | | | | | | | |
| XE-135 | 9.11H | 111.55 | 249.79* | 89.90 | Not Found | | Decay, Abun. |
| | | | 608.19 | 2.89 | 4.840E+27 | 11.08 | |
| % Abundances Found = 3.11 | | | | | | | |
| BI-214 | 19.90M | 3063.94 | 609.31* | 46.30 | 1.000E+35 | 11.08 | Decay |
| | | | 768.36 | 5.04 | Not Found | | |
| | | | 934.06 | 3.21 | Not Found | | |
| | | | 1120.29 | 15.10 | 1.000E+35 | 22.45 | |
| | | | 1238.11 | 5.94 | Not Found | | |
| | | | 1377.67 | 4.11 | Not Found | | |
| | | | 1764.49 | 15.80 | 1.000E+35 | 15.45 | |
| % Abundances Found = 80.84 (Abn. Limit = 48.48%) | | | | | | | |

Rejected Report (continued)
Sample ID : SUMF H10

Page : 5
Acquisition date : 10-JAN-2011 16:29:55

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|--|-----------|---------|---------|--------|-------------------|----------------|-------------|
| PB-214 | 26.80M | 2275.09 | 87.30 | 4.67 | ---- | Not Found | Decay |
| | | | 241.98 | 7.49 | ---- | Not Found | ---- |
| | | | 295.21 | 19.20 | 1.000E+35 | 18.41 | |
| | | | 351.92* | 37.20 | 1.000E+35 | 23.17 | |
| | | | 765.91 | 1.10 | ---- | Not Found | ---- |
| % Abundances Found = 80.96 (Abn. Limit = 37.20%) | | | | | | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : SUMP #10

Page : 6
Acquisition date : 18-JAN-2011 16:29:55

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 198.71 | 44 | 106 | 1.16 | 397.51 | 392 | 10 | 1.63E-02 | 46.5 | 6.60E+00 | T |
| 0 | 295.38 | 102 | 55 | 1.85 | 590.82 | 584 | 14 | 3.78E-02 | 18.4 | 6.09E+00 | T |
| 0 | 352.46 | 101 | 94 | 1.36 | 704.90 | 698 | 15 | 3.74E-02 | 23.2 | 5.70E+00 | T |
| 3 | 509.96 | 74 | 59 | 2.00 | 1019.96 | 1016 | 13 | 2.76E-02 | 22.3 | 4.88E+00 | |
| 3 | 511.77 | 65 | 66 | 1.95 | 1023.58 | 1016 | 13 | 2.39E-02 | 29.6 | 4.88E+00 | T |
| 0 | 558.47 | 56 | 40 | 1.14 | 1116.97 | 1112 | 12 | 2.08E-02 | 26.0 | 4.69E+00 | T |
| 0 | 609.35 | 166 | 39 | 1.64 | 1218.74 | 1212 | 14 | 6.16E-02 | 11.1 | 4.52E+00 | T |
| 0 | 1120.74 | 59 | 19 | 2.00 | 2241.45 | 2234 | 16 | 2.10E-02 | 22.4 | 2.90E+00 | T |
| 0 | 1764.52 | 56 | 4 | 1.42 | 3528.93 | 3520 | 15 | 2.06E-02 | 15.4 | 2.26E+00 | T |

Flags: "T" = Tentatively associated

```

*****
*      Detroit Edison Fermi 2  MDA Report, Generated 18-JAN-2011 17:15:00.34      *
*****
* Sample ID : SUMP H10                                                              *
*****

```

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| BE-7 | 30. | 477.59 | 1.0352E-07 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 14. | 1274.54 | 7.6960E-09 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 22. | 889.25 | 1.0530E-08 |
| CR-51 | 45. | 320.08 | 1.6789E-07 |
| MN-54 | 40. | 834.83 | 1.0129E-08 |
| CO-56 | 31. | 1238.25 | 2.2543E-08 |
| MN-56 | 0. | 1010.69 | Half-Life too short |
| NI-56 | 75. | 158.38 | 7.9959E-07 |
| CO-57 | 58. | 122.06 | 8.5542E-09 |
| CO-58 | 23. | 810.76 | 1.0679E-08 |
| FE-59 | 15. | 1099.22 | 2.4266E-08 |
| CO-60 | 21. | 1332.49 | 9.3461E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 21. | 1115.52 | 1.8325E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 54. | 136.00 | 1.2624E-08 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 68. | 513.99 | 1.9739E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 68. | 513.99 | 1.3345E-08 |
| RB-86 | 18. | 1076.63 | 4.1327E-07 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 3. | 1836.01 | 6.5807E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 12. | 1204.90 | 3.6520E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : SUMP #10

Acquisition date : 18-JAN-2011 16:29:55

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 24. | 702.63 | 6.2021E-09 |
| NB-95 | 17. | 765.79 | 1.3535E-08 |
| NB-95M | 0. | 235.69 | Half-Life too short |
| ZR-95 | 17. | 756.72 | 1.6348E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 26. | 497.08 | 1.2650E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 318.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 30. | 621.84 | 6.9884E-08 |
| CD-109 | 48. | 88.03 | 2.8319E-07 |
| AG-110M | 19. | 937.48 | 2.3646E-08 |
| SN-113 | 29. | 391.69 | 1.0012E-08 |
| SN-117M | 74. | 158.56 | 6.3941E-08 |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 41. | 602.71 | 1.1896E-08 |
| SB-125 | 33. | 427.89 | 1.9404E-08 |
| TE-125M | 53. | 109.28 | 4.2401E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 47. | 57.60 | 2.5563E-05 |
| XE-127 | 61. | 202.84 | 1.9608E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 24. | 695.88 | 4.4935E-07 |
| XE-129M | 79. | 196.56 | 3.8091E-06 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 61. | 123.80 | 2.7594E-07 |
| I-131 | 31. | 364.48 | 2.3983E-07 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 66. | 163.93 | 3.6863E-06 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 60. | 302.84 | 3.6360E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 56. | 81.00 | 9.5637E-06 |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 21. | 604.70 | 5.6757E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : SUMP #10

Acquisition date : 10-JAN-2011 16:29:55

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| CS-136 | 12. | 818.50 | 4.9937E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 24. | 661.65 | 6.8833E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 46. | 165.85 | 7.8950E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 25. | 537.32 | 2.1694E-07 |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 56. | 145.44 | 2.9484E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 62. | 133.54 | 6.5042E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 59. | 91.10 | 5.2697E-07 |
| PM-148M | 29. | 550.27 | 1.2668E-08 |
| EU-152 | 45. | 344.27 | 2.2401E-08 |
| EU-154 | 14. | 1004.76 | 3.7467E-08 |
| EU-155 | 52. | 105.31 | 3.6769E-08 |
| EU-156 | 22. | 646.29 | 5.3956E-07 |
| HF-181 | 38. | 482.03 | 1.5072E-08 |
| TA-182 | 13. | 1221.42 | 3.4096E-08 |
| W-187 | 0. | 685.81 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 57. | 279.19 | 1.4906E-08 |
| BI-207 | 33. | 569.67 | 6.5189E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 0. | 240.98 | Half-Life too short |
| RA-226 | 76. | 186.21 | 1.9795E-07 |
| AC-228 | 46. | 338.32 | 5.2570E-08 |
| TH-228 | 54. | 84.37 | 9.9075E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 47. | 63.29 | 2.8153E-06 |
| U-235 | 62. | 143.76 | 5.7868E-08 |
| NP-239 | 0. | 106.13 | Half-Life too short |
| AM-241 | 46. | 59.54 | 1.3976E-07 |

EF-1 Sump #10

2011

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number EF1-L-110027

Task

Performed By

Date

1. Representative sample collected.

Date/Time 5/13/11 1100

Container Number Sump #10

Storage Location ER1

[Signature]
Fermi 1 (signature)

5-13-11

B4016
Employee ID Number

2. Sample secured against tampering.

[Signature]
Fermi 1 (signature)

5-13-11

B4016
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.18E-10 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

5-15-11

5192
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

[Signature]
RP (signature)

5-15-11

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

5-16-11

Z-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT


Log Number EC1-L-110023

Task

Performed By

Date

6. Fluid approved for release.


Radiological Engineering
(signature)

5-16-11

Z-1151

Employee ID Number

Remarks:

1. Spec for discharge determined is not for discharge.


5-16-11

Tritium Activity Calculation

Sample Information

| | |
|------------------------|--------------|
| 1. Sample Location | EF1-L-110027 |
| 2. Date Sampled | 05/13/2011 |
| 3. Time Sampled | 16:00 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 05/15/2011 |
| 2. Time Sample Counted | 18:55 |
| 3. Background Inf.: Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 6.7 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) Gross Spike Count Rate (cpm) | 2397.9 cpm |
| Net Spike Count Rate (cpm) | 2391.2 cpm |
| H3 Spike Activity (dpm on count date) | 6551.6 dpm |
| Counter Efficiency | 0.3650 cpm/dpm |
| 5. Sample Info: Sample Gross Count Rate (cpm) | 6.4 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: Critical Level Count Rate (cpm) | 1.9 cpm |

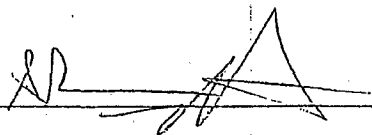
Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.18\text{E-06 uCi/ml}$$

Sample Activity

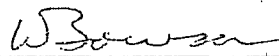
$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician



Date 5-15-11

Reviewed By:



Date 5-16-11

DETROIT EDISON FERMI-2 POWER PLANT

15-MAY-2011 16:55:12.16

RADIATION PROTECTION DEPARTMENT
GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF1-L-110027 SUMP #10

Sample End Time: 13-MAY-2011 16:00:00.00

REMARKS

Natural

PERFORMED BY:

Charles J. Pappas
SIGNATURE

REVIEWED BY:

[Signature]
SIGNATURE/DATE

Sample ID : EF1-L-110027 SUM

Acquisition date : 15-MAY-2011 16:11:09

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF1-L-110027 SUMP W10
 Sample collection start date: 13-MAY-2011 16:00:00.00
 Sample collection end date : 13-MAY-2011 16:00:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : MELL Operator: CLF

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 15-MAY-2011 16:11:09.55
 Preset live time : 0 00:45:00.00 Elapsed live time : 0 00:45:00.00
 Elapsed real time : 0 00:45:00.63 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 23-JUN-2010 12:28:00.00
 Kev/channel : 4.99792E-01 Zero offset: 2.10929E-01
 Daily cal date : 15-MAY-2011 08:18:27.54

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 198.57 | 51 | 102 | 1.20 | 396.89 | 390 | 13 | 1.90E-02 | 42.7 | |
| 2 | 0 | 352.17 | 56 | 47 | 1.55 | 704.20 | 701 | 5 | 2.07E-02 | 24.9 | |
| 3 | 0 | 511.32 | 192 | 43 | 2.52 | 1022.65 | 1014 | 21 | 7.09E-02 | 11.1 | |
| 4 | 0 | 559.31 | 33 | 40 | 1.98 | 1118.67 | 1112 | 12 | 1.20E-02 | 43.4 | |
| 5 | 0 | 610.29 | 62 | 81 | 2.34 | 1220.67 | 1213 | 21 | 2.30E-02 | 30.9 | |
| 6 | 0 | 1119.93 | 30 | 27 | 1.67 | 2240.49 | 2231 | 18 | 1.11E-02 | 44.6 | |
| 7 | 0 | 1461.45 | 69 | 7 | 2.92 | 2923.70 | 2916 | 14 | 2.55E-02 | 14.6 | |

Sample Title : EF1-L-110027 SURP #10

Page : 1

Decay Time = 2 00:11:09.55

Acquisition Time = 15-MAY-2011 16:11:09.5

5

Post-MID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err |
|----|---------|------|-------|------|---------|------|----|------|
| 0 | 198.57 | 51 | 102 | 1.20 | 396.89 | 390 | 13 | 42.7 |
| 0 | 352.17 | 56 | 47 | 1.55 | 704.20 | 701 | 8 | 24.9 |
| 0 | 511.32 | 192 | 43 | 2.52 | 1022.65 | 1014 | 21 | 11.1 |
| 0 | 559.31 | 33 | 40 | 1.98 | 1118.67 | 1112 | 12 | 43.4 |
| 0 | 610.29 | 62 | 81 | 2.34 | 1220.67 | 1213 | 21 | 38.9 |
| 0 | 1119.99 | 30 | 27 | 1.67 | 2240.49 | 2231 | 10 | 44.6 |
| 0 | 1461.45 | 69 | 7 | 2.92 | 2923.70 | 2916 | 14 | 14.6 |

Fit Nuclides

cosmic irradiation (Wg)
Pb-214
Acid. Peak
cosmic irradiation (Wg)
Bi-214
Bi-214
K-40

f -5.16-11

Nuclide Line Activity Report
Sample ID : EF1-L-110027 SUM

Page : 2
Acquisition date : 15-MAY-2011 16:11:09

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 69 | 10.67% | 2.501E+00 | 2.579E-07 | 2.579E-07 | 14.58 |

Flag: "x" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : EF1-L-110027 SUM

Acquisition date : 15-MAY-2011 16:11:09

Total number of lines in spectrum 7
Number of unidentified lines 0
Number of lines tentatively identified by NID 7 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 2.579E-07 | 2.579E-07 | 0.376E-07 | 14.58 | |
| Total Activity : | | | 2.579E-07 | 2.579E-07 | | | |

Grand Total Activity : 2.579E-07 2.579E-07

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

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

Rejected Report

Sample ID : EF1-L-110027 SUM

Page : 4

Acquisition date : 15-MAY-2011 16:11:09

| Nuclide | Half-life | Half-Life Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|---------|-----------|-----------------|-----------------------------|--------|-------------------|----------------|-------------|
| F-18 | 109.74M | 26.55 | 511.00* | 193.46 | 1.990E+00 | 11.14 | Decay |
| | | | % Abundances Found = 100.00 | | | | |
| SC-46 | 83.83D | 0.02 | 142.53 | 62.70 | ---- | Not Found | ---- |
| | | | 889.25* | 99.98 | ---- | Not Found | ---- |
| | | | 1120.51 | 99.99 | 1.052E-08 | 44.56 | |
| | | | % Abundances Found = 38.07 | | | | |
| SE-75 | 119.78D | 0.02 | 66.05 | 1.02 | ---- | Not Found | ---- |
| | | | 96.73 | 3.41 | ---- | Not Found | ---- |
| | | | 121.12 | 16.70 | ---- | Not Found | ---- |
| | | | 136.00* | 59.20 | ---- | Not Found | ---- |
| | | | 198.60 | 1.45 | 5.432E-07 | 42.72 | |
| | | | 264.65 | 59.80 | ---- | Not Found | ---- |
| | | | 279.53 | 25.20 | ---- | Not Found | ---- |
| | | | 303.91 | 1.32 | ---- | Not Found | ---- |
| | | | 400.65 | 11.40 | ---- | Not Found | ---- |
| | | | % Abundances Found = 0.81 | | | | |
| AS-76 | 26.32H | 1.85 | 559.10* | 44.70 | 5.585E-08 | 43.40 | Abun. |
| | | | 563.23 | 1.17 | ---- | Not Found | ---- |
| | | | 571.30 | 0.14 | ---- | Not Found | ---- |
| | | | 657.03 | 6.10 | ---- | Not Found | ---- |
| | | | 665.31 | 0.39 | ---- | Not Found | ---- |
| | | | 740.12 | 0.12 | ---- | Not Found | ---- |
| | | | 771.76 | 0.12 | ---- | Not Found | ---- |
| | | | 867.63 | 0.12 | ---- | Not Found | ---- |
| | | | 1129.87 | 0.14 | ---- | Not Found | ---- |
| | | | 1212.72 | 1.63 | ---- | Not Found | ---- |
| | | | 1216.02 | 3.04 | ---- | Not Found | ---- |
| | | | 1228.52 | 1.39 | ---- | Not Found | ---- |
| | | | 1439.13 | 0.33 | ---- | Not Found | ---- |
| | | | 1453.60 | 0.13 | ---- | Not Found | ---- |
| | | | 1787.67 | 0.33 | ---- | Not Found | ---- |
| | | | % Abundances Found = 73.70 | | | | |
| KR-90 | 32.32S | 5409.03 | 121.82 | 32.00 | ---- | Not Found | ---- |
| | | | 539.49 | 29.00 | ---- | Not Found | ---- |
| | | | 1118.69* | 37.00 | 1.000E+35 | 44.56 | |
| | | | % Abundances Found = 37.76 | | | | |
| RU-103 | 39.35D | 0.05 | 497.00* | 89.00 | ---- | Not Found | ---- |
| | | | 616.33 | 5.60 | 2.548E-07 | 38.90 | |
| | | | % Abundances Found = 5.92 | | | | |
| PP-142M | 41.30D | 0.05 | 288.11 | 12.56 | ---- | Not Found | ---- |
| | | | 414.07 | 16.66 | ---- | Not Found | ---- |
| | | | 432.78 | 5.35 | ---- | Not Found | ---- |
| | | | 501.26 | 6.75 | ---- | Not Found | ---- |
| | | | 550.27* | 94.98 | ---- | Not Found | ---- |
| | | | 599.74 | 12.54 | ---- | Not Found | ---- |
| | | | 611.26 | 5.48 | 2.599E-07 | 38.90 | |

Rejected Report (continued)
Sample ID : EF1-L-110027 SUR

Page : 5
Acquisition date : 15-MAY-2011 16:11:09

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|---------|-----------|----------------------|---------|--------|-------------------|----------------|-------------|
| PM-140M | 41.30D | 0.05 | 629.97 | 89.00 | ---- | Not Found | ---- |
| | | | 725.70 | 32.00 | ---- | Not Found | ---- |
| | | | 915.33 | 17.17 | ---- | Not Found | ---- |
| | | | 1013.01 | 20.30 | ---- | Not Found | ---- |
| | | % Abundances Found = | | 1.74 | | | |
| BI-214 | 19.90M | 146.42 | 609.31* | 46.30 | 1.000E+35 | 39.90 | Decay |
| | | | 769.36 | 5.04 | ---- | Not Found | ---- |
| | | | 934.06 | 3.21 | ---- | Not Found | ---- |
| | | | 1120.29 | 15.10 | 1.000E+35 | 44.56 | |
| | | | 1239.11 | 5.94 | ---- | Not Found | ---- |
| | | | 1377.67 | 4.11 | ---- | Not Found | ---- |
| | | | 1764.49 | 15.00 | ---- | Not Found | ---- |
| | | % Abundances Found = | | 64.29 | (Abn. Limit = | 49.48%) | |
| PB-214 | 26.80M | 108.72 | 87.30 | 4.67 | ---- | Not Found | Decay |
| | | | 241.98 | 7.49 | ---- | Not Found | ---- |
| | | | 295.21 | 19.20 | ---- | Not Found | ---- |
| | | | 351.92* | 37.20 | 1.336E+25 | 24.94 | |
| | | | 785.91 | 1.10 | ---- | Not Found | ---- |
| | | % Abundances Found = | | 53.40 | (Abn. Limit = | 37.20%) | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : EF1-L-110027 SUM

Page : 6
Acquisition date : 15-MAY-2011 16:11:09

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 198.57 | 51 | 102 | 1.20 | 396.89 | 390 | 13 | 1.90E-02 | 42.7 | 6.60E+00 | T |
| 0 | 352.17 | 56 | 47 | 1.55 | 704.20 | 701 | 8 | 2.07E-02 | 24.9 | 5.70E+00 | T |
| 0 | 511.32 | 192 | 43 | 2.52 | 1022.65 | 1014 | 21 | 7.09E-02 | 11.1 | 4.88E+00 | T |
| 0 | 559.31 | 33 | 40 | 1.98 | 1118.67 | 1112 | 12 | 1.20E-02 | 43.4 | 4.68E+00 | T |
| 0 | 610.29 | 62 | 81 | 2.34 | 1220.67 | 1213 | 21 | 2.30E-02 | 38.9 | 4.52E+00 | T |
| 0 | 1119.99 | 30 | 27 | 1.67 | 2240.49 | 2231 | 18 | 1.11E-02 | 44.6 | 2.90E+00 | T |

Flags: "T" = Tentatively associated

 * Detroit Edison Fermi 2 MDA Report, Generated 15-MAY-2011 16:56:16.38 *

 * Sample ID : EF1-L-110027 SUMP #10 *

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| BE-7 | 33. | 477.59 | 5.7538E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 9. | 1274.54 | 6.1702E-09 |
| NA-24 | 13. | 1368.53 | 7.0912E-08 |
| MG-27 | 0. | 1814.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 17. | 809.25 | 6.7166E-09 |
| CR-51 | 32. | 320.08 | 5.2902E-08 |
| MN-54 | 37. | 834.83 | 8.9029E-09 |
| CO-56 | 21. | 1238.25 | 1.3274E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 53. | 158.38 | 6.9876E-09 |
| CO-57 | 49. | 122.06 | 7.1439E-09 |
| CO-58 | 25. | 810.76 | 7.4717E-09 |
| FE-59 | 17. | 1099.22 | 1.3663E-08 |
| CO-60 | 13. | 1332.49 | 7.4463E-09 |
| CU-64 | 18. | 1345.90 | 3.8966E-05 |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 28. | 1115.52 | 1.5882E-08 |
| ZN-69M | 28. | 439.63 | 6.3606E-08 |
| SE-75 | 50. | 136.00 | 9.6529E-09 |
| AS-76 | 62. | 559.10 | 6.7649E-08 |
| BR-82 | 21. | 776.49 | 2.0179E-08 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 57. | 513.99 | 1.8157E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 57. | 513.99 | 8.0342E-09 |
| RB-86 | 13. | 1876.63 | 8.1836E-08 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 383.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 13. | 1836.01 | 8.8575E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 624.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 12. | 1024.30 | 6.6963E-07 |
| Y-91 | 9. | 1204.90 | 2.0410E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1363.94 | Half-Life too short |

* Detroit Edison Fermi 2 MDA Report, Generated 15-MAY-2011 16:56:16.38

* Sample ID : EF1-L-110027 SUMP #10

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| BE-7 | 33. | 477.59 | 5.7538E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 9. | 1274.54 | 6.1702E-09 |
| NA-24 | 13. | 1368.53 | 7.0912E-08 |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-36 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 17. | 889.25 | 6.7166E-09 |
| CR-51 | 32. | 320.08 | 5.2902E-08 |
| MN-54 | 37. | 834.83 | 8.9029E-09 |
| CO-56 | 21. | 1238.25 | 1.3274E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 53. | 158.38 | 6.9876E-09 |
| CO-57 | 49. | 122.06 | 7.1439E-09 |
| CO-58 | 25. | 810.76 | 7.4717E-09 |
| FE-59 | 17. | 1099.22 | 1.3663E-08 |
| CO-60 | 13. | 1332.49 | 7.4463E-09 |
| CU-64 | 18. | 1345.90 | 3.8966E-05 |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 20. | 1115.52 | 1.5082E-08 |
| ZN-69M | 28. | 438.63 | 6.3606E-08 |
| SE-75 | 50. | 136.00 | 9.6529E-09 |
| AS-76 | 62. | 559.10 | 6.7649E-08 |
| BR-82 | 21. | 776.49 | 2.0179E-08 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 57. | 513.99 | 1.8157E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 57. | 513.99 | 8.0342E-09 |
| RB-86 | 13. | 1076.63 | 8.1836E-08 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RE-88 | 0. | 1392.39 | Half-Life too short |
| Y-88 | 13. | 1836.01 | 8.8575E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RE-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1112.69 | Half-Life too short |
| RE-90 | 0. | 831.69 | Half-Life too short |
| RE-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 12. | 1024.30 | 6.6963E-07 |
| Y-91 | 9. | 1204.90 | 2.0410E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1363.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : EF1-L-110027 SUM

Acquisition date : 15-MAY-2011 16:11:09

| Nuclide | Bckgrd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 49. | 266.90 | 2.2942E-06 |
| NB-94 | 21. | 702.63 | 5.7883E-09 |
| NB-95 | 21. | 765.79 | 6.5970E-09 |
| NB-95M | 45. | 235.69 | 3.1553E-08 |
| ZR-95 | 15. | 756.72 | 9.8894E-09 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 13. | 743.36 | 3.6863E-08 |
| MO-99 | 17. | 739.58 | 7.3427E-08 |
| TC-99M | 61. | 140.50 | 1.8279E-06 |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 26. | 497.08 | 6.2161E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 32. | 318.90 | 6.6478E-08 |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 26. | 621.84 | 6.0429E-08 |
| CD-109 | 30. | 88.03 | 2.1675E-07 |
| AG-110M | 17. | 937.48 | 2.0330E-08 |
| SN-113 | 35. | 391.69 | 8.5640E-09 |
| SN-117M | 54. | 158.56 | 7.1130E-09 |
| SB-122 | 29. | 563.93 | 1.4186E-08 |
| SB-124 | 33. | 602.71 | 6.7682E-09 |
| SB-125 | 33. | 427.89 | 1.9064E-08 |
| TE-125M | 42. | 109.28 | 2.3470E-06 |
| TE-127 | 29. | 417.90 | 1.9336E-05 |
| TE-127M | 29. | 57.60 | 1.5517E-05 |
| XE-127 | 51. | 202.84 | 8.3552E-09 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 23. | 695.88 | 1.9195E-07 |
| XE-129M | 60. | 196.56 | 1.4525E-07 |
| I-130 | 26. | 536.09 | 8.4873E-08 |
| BA-131 | 51. | 123.00 | 2.3816E-08 |
| I-131 | 37. | 364.48 | 8.1085E-09 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 22. | 773.67 | 5.2248E-08 |
| XE-131M | 46. | 163.93 | 2.9291E-07 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 45. | 226.16 | 9.3168E-09 |
| BA-133 | 40. | 302.84 | 2.9778E-08 |
| BA-133M | 40. | 276.09 | 6.8855E-08 |
| I-133 | 26. | 529.87 | 3.2144E-08 |
| TE-133M | 0. | 912.56 | Half-Life too short |
| XE-133 | 46. | 81.00 | 4.2516E-08 |
| XE-133M | 45. | 233.22 | 9.8915E-08 |
| CS-134 | 40. | 604.70 | 7.2520E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 48. | 268.24 | 1.1345E-07 |
| I-135 | 10. | 1260.41 | 3.6504E-06 |
| XE-135 | 68. | 249.79 | 2.7570E-07 |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : EF1-L-110027 SUM

Acquisition date : 15-MAY-2011 16:11:09

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| CS-136 | 13. | 810.50 | 6.2095E-09 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 17. | 661.65 | 5.8443E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 50. | 165.85 | 6.6978E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 26. | 537.32 | 2.4568E-08 |
| LA-140 | 7. | 1596.49 | 1.5227E-08 |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 57. | 145.44 | 1.2519E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 44. | 293.26 | 3.6223E-08 |
| CE-144 | 44. | 133.54 | 5.0236E-08 |
| PR-144 | 0. | 1409.15 | Half-Life too short |
| ND-147 | 42. | 91.10 | 3.5206E-08 |
| PM-148M | 25. | 550.27 | 6.0130E-09 |
| EU-152 | 39. | 344.27 | 2.0045E-08 |
| EU-154 | 11. | 1004.76 | 3.3021E-08 |
| EU-155 | 42. | 105.31 | 3.2041E-08 |
| EU-156 | 20. | 646.29 | 8.2040E-08 |
| HF-181 | 30. | 482.03 | 6.9024E-09 |
| TA-182 | 12. | 1221.42 | 2.5663E-08 |
| W-187 | 10. | 685.01 | 7.5622E-08 |
| RE-188 | 52. | 155.03 | 2.6409E-07 |
| AU-199 | 53. | 150.38 | 2.3292E-08 |
| HG-203 | 36. | 279.19 | 6.6246E-09 |
| BI-207 | 20. | 569.67 | 5.9970E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 81. | 238.63 | 3.7375E-07 |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 66. | 240.98 | 2.3902E-07 |
| RA-226 | 67. | 106.21 | 1.0615E-07 |
| AC-228 | 37. | 338.32 | 4.7195E-08 |
| TH-228 | 35. | 84.37 | 7.0076E-07 |
| PA-234 | 47. | 131.20 | 4.1932E-06 |
| TH-234 | 40. | 63.29 | 8.2500E-07 |
| U-235 | 55. | 143.76 | 5.4846E-08 |
| NP-239 | 43. | 106.13 | 5.3967E-08 |
| AM-241 | 36. | 59.54 | 1.2568E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number EF-1-110056

Task

Performed By

Date

1. Representative sample collected.

Date/Time 11-23-11 1:08:27

Container Number Sump #10

Storage Location CF

[Signature]
Fermi 1 (signature)

11-23-11

B4016
Employee ID Number

2. Sample secured against tampering.

[Signature]
Fermi 1 (signature)

11-23-11

B4016
Employee ID Number

3. Tritium LLD $\leq 2 \text{ B-6 } \mu\text{Ci/ml}$

Actual tritium LLD = 1.28×10^{-6} $\mu\text{Ci/ml}$

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

11-24-11

50580
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

[Signature]
RF (signature)

11-30-11

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

12-1-11

50553
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number FFI-L-110056

Task

Performed By

Date

6. Fluid approved for release.

DA Keate
Radiological Engineering
(signature)

12-1-11

50553
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|--------------|
| 1. Sample Location | EF1-L-110056 |
| 2. Date Sampled | 11/23/2011 |
| 3. Time Sampled | 08:27 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 11/24/2011 |
| 2. Time Sample Counted | 03:37 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 9.5 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2550.6 cpm |
| Net Spike Count Rate (cpm) | 2541.1 cpm |
| H3 Spike Activity (dpm on count date) | 6359.1 dpm |
| Counter Efficiency | 0.3996 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 8.4 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 2.2 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.28\text{E-06 uCi/ml}$$

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician AKD

Date 11-24-11

Reviewed By: A. Wabuland

Date 11-24-11

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF1-L-110056 SUMP #10

Sample End Time: 23-NOV-2011 08:27:00.00

REMARKS

Natural

PERFORMED BY:

Charles J. [Signature]
SIGNATURE

REVIEWED BY:

J. 12-5-11 [Signature] 12-7-11
SIGNATURE DATE

Sample ID: EF1-L-110056 SUMP #10

Acquisition date: 30-NOV-2011 10:26:02

Termi-2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF1-L-110056 SUMP #10
 Sample collection start date: 23-NOV-2011 08:27:00.00
 Sample collection end date: 23-NOV-2011 08:27:00.00
 Type of sample: 1 L Marin. Liquid
 Sample quantity: 1.00000E+03 cc ✓
 Sample geometry: WELL Operator: CLP

***** Acquisition Parameters *****

Detector number: DET 4 Acquire date: 30-NOV-2011 10:26:02.64
 Preset live time: 0 00:45:00.00 ✓ Elapsed live time: 0 00:45:00.00
 Elapsed real time: 0 00:45:00.60 Percent dead time: 0.03 %

***** Calibration Parameters *****

Detector number: DET 4 ✓ Yearly cal date: 14-JUN-2011 14:50:56.41 ✓
 KeV/channel: 5.00235E-01 Zero offset: -6.02154E-01
 Daily cal date: 30-NOV-2011 09:13:02.30

***** Peak Search Parameters *****

Start channel: 100 End channel: 4096
 Height sensitivity: 5.00000 Shape sensitivity: 10.00000
 Maximum number of iterations to resolve multiplets: 5

***** Nuclide Identification Parameters *****

Energy tolerance: 1.75000 ✓ Half-life ratio: 10.00000
 Abundance limit: 75.00000 Library: dacmaster.nlb
 Efficiency file: EFF04_m211 Efficiencies at: Peak energy

| PK | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | XErr | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 198.53 | 81 | 94 | 1.54 | 394.00 | 391 | 13 | 2.90E-02 | 27.2 | |
| 2 | 0 | 352.70 | 40 | 57 | 1.29 | 706.20 | 703 | 11 | 1.48E-02 | 41.2 | |
| 3 | 0 | 511.50 | 150 | 57 | 2.17 | 1023.00 | 1015 | 10 | 5.97E-02 | 13.0 | |
| 4 | 0 | 1461.21 | 76 | 0 | 2.12 | 2922.29 | 2912 | 20 | 2.01E-02 | 11.5 | |

Sample Name : L111-110006 SUMP H10
Decay Time : 7 (11:53:00.00)

Page : 1
Acquisition Time : 06 NOV 2011 10:56:02.00

Post-HID Peak Search Report

| IC | Energy | Area | Orgad | FWHM Channel | Left | Po | SErr | Fit | Nuclides |
|----|---------|------|-------|--------------|------|----|------|-----|----------|
| 0 | 196.55 | 51 | 94 | 1.54 398.60 | 391 | 13 | 27.2 | | Ge N-8 |
| 0 | 352.70 | 40 | 57 | 1.29 706.20 | 703 | 11 | 41.2 | | Pb-214 |
| 0 | 511.50 | 155 | 57 | 2.17 1023.00 | 1015 | 10 | 13.8 | | Ann. PoK |
| 0 | 1561.21 | 75 | 0 | 2.12 2922.29 | 2912 | 20 | 11.5 | | R-40 |

R-40

6-12-5-11

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | SEff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma SErrer |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 76 | 10.67* | 2.353E+00 | 3.031E-07 | 3.031E-07 | 11.47 |

Flag: "X" = Keyline

Summary of Nuclide Activity
Sample: IE - LEI-1-110656 309

Page: 1 2
Acquisition date: 30 NOV 2011 16:26:02

Total number of lines in spectrum: 4
Number of unidentified lines: 0
Number of lines tentatively identified by HLD: 4 100.00%

Nuclide type: natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|---------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 3.031E-07 | 3.031E-07 | 0.348E-07 | 11.47 | |

Total Activity: 3.031E-07 3.031E-07

Grand Total Activity: 3.031E-07 3.031E-07

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

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

Rejected Report

Sample ID: 121-12-116050, 50H

Page 1 of 1

Acquisition date: 20-003-2011 10:20:00

| Nuclide | Half-Life | Ratio | Energy (keV) | Abund. | Activity 1-Sigma (uCi/sec) | % Error | Rejected by |
|--|-----------|-----------|--------------|--------|----------------------------|---------|-------------|
| C-14 | 189.740 | 93.14 | 511.00* | 193.46 | 1.950E+20 | 13.80 | Decay |
| % Abundances Found = 100.00 | | | | | | | |
| SE-75 | 119.780 | 0.06 | 66.05 | 1.02 | Not Found | ---- | Abun. |
| | | | 96.73 | 3.41 | Not Found | ---- | |
| | | | 121.12 | 16.70 | Not Found | ---- | |
| | | | 136.00* | 59.20 | Not Found | ---- | |
| | | | 190.60 | 1.45 | 9.147E-07 | 27.22 | |
| | | | 264.65 | 59.60 | Not Found | ---- | |
| | | | 279.53 | 25.20 | Not Found | ---- | |
| | | | 303.91 | 1.32 | Not Found | ---- | |
| 400.65 | 11.40 | Not Found | ---- | | | | |
| % Abundances Found = 0.81 | | | | | | | |
| PB-214 | 26.900 | 391.40 | 87.30 | 4.67 | Not Found | ---- | Decay |
| | | | 241.90 | 7.49 | Not Found | ---- | |
| | | | 295.21 | 19.20 | Not Found | ---- | |
| | | | 351.52* | 37.20 | 1.000E+35 | 41.18 | |
| | | | 785.91 | 1.10 | Not Found | ---- | |
| % Abundances Found = 53.40 (Abn. Limit = 37.20%) | | | | | | | |

Flag: "*" = Keyline

Condensed Energy Lines
 Sample ID : E1-L 116056 SUM

Page : 5
 Acquisition date : 20-NOV-2011 19:26:06

| IS | Energy | Area | Height | FWHM | Channel | Left Po | Count/Sec | SLTT | SLFT | Flag |
|----|--------|------|--------|------|---------|---------|-----------|------|----------|-------------------|
| 0 | 133.52 | 91 | 94 | 1.34 | 398.08 | 391 13 | 2.99E-02 | 17.2 | 6.34E+00 | Se-B TL Too Short |
| 0 | 352.70 | 40 | 57 | 1.27 | 706.28 | 703 11 | 1.40E-02 | 41.2 | 5.30E+00 | 1 Pb 214 |
| 0 | 511.52 | 150 | 57 | 2.17 | 1023.69 | 1015 19 | 5.07E-02 | 13.9 | 4.59E+00 | 1 Annihilation |

Flags: "T" = Tentatively associated

Sample ID: EPI-110050 GUM-410

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| BE-7 | 22. | 477.55 | 5.4591E-09 |
| F-18 | 0. | 511.00 | Half-Life too short |
| MG-22 | 11. | 1274.54 | 7.1707E-09 |
| MG-24 | 0. | 1360.52 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-32 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 15. | 889.25 | 7.0987E-09 |
| CR-51 | 56. | 320.00 | 9.1211E-09 |
| PM-54 | 26. | 834.83 | 8.2002E-09 |
| CO-56 | 18. | 1238.25 | 1.3067E-08 |
| PM-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 42. | 150.38 | 1.1704E-08 |
| CO-57 | 36. | 122.06 | 6.7112E-09 |
| CO-58 | 19. | 810.76 | 7.2203E-09 |
| FE-59 | 10. | 1099.22 | 1.2190E-08 |
| CO-60 | 13. | 1332.49 | 7.9414E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1461.84 | Half-Life too short |
| ZN-65 | 16. | 1115.52 | 1.5691E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 51. | 136.00 | 1.0671E-08 |
| AS-76 | 49. | 559.10 | 1.4566E-06 |
| BR-82 | 9. | 776.49 | 1.5795E-07 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 882.41 | Half-Life too short |
| KR-85 | 63. | 513.99 | 2.0105E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 63. | 513.99 | 9.4206E-09 |
| RB-86 | 15. | 1076.63 | 1.1008E-07 |
| KR-87 | 0. | 402.50 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 0. | 1836.01 | 7.9782E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 924.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 20. | 1204.90 | 3.2526E-06 |
| Y-91H | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Sample ID: 20-CT-1-11652-108

Acquisition date: 20 NOV 2011 10:26:01

| Radclide | Count Sum | Energy (keV) | MCN (nCi/ea) |
|----------|--------------|-----------------|---------------------|
| SR-93 | 5. | 290.28 | Half-Life too short |
| P-93 | 0. | 266.90 | Half-Life too short |
| HB-94 | 24. | 702.63 | 6.5916E-09 |
| HB-95 | 10. | 765.79 | 7.2601E-09 |
| HB-95M | 49. | 835.69 | 9.1353E-08 |
| ZR-95 | 23. | 756.72 | 1.3540E-08 |
| HB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 26. | 739.58 | 3.3450E-07 |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 20. | 497.00 | 7.4578E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RU-105 | 40. | 318.90 | 9.0945E-07 |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 29. | 821.04 | 6.8260E-08 |
| CD-109 | 37. | 93.03 | 2.4900E-07 |
| AG-110M | 13. | 937.40 | 1.9359E-08 |
| SN-113 | 25. | 291.69 | 9.0909E-09 |
| SN-117M | 43. | 159.56 | 0.8779E-09 |
| SB-122 | 27. | 563.93 | 5.4079E-08 |
| SB-124 | 41. | 602.71 | 0.4129E-09 |
| SB-125 | 24. | 427.89 | 1.7534E-08 |
| TE-125M | 47. | 109.20 | 2.7994E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 23. | 57.60 | 1.7206E-05 |
| XE-127 | 62. | 202.84 | 1.0470E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 29. | 695.08 | 2.4757E-07 |
| XE-129M | 67. | 196.56 | 2.3614E-07 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 33. | 123.80 | 2.7011E-08 |
| I-131 | 30. | 364.40 | 1.2136E-08 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 13. | 773.67 | 7.4032E-07 |
| XE-131M | 53. | 163.93 | 4.4234E-07 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 40. | 220.16 | 2.9491E-08 |
| BA-133 | 40. | 302.84 | 3.1418E-08 |
| BA-133M | 41. | 276.09 | 6.3041E-07 |
| I-133 | 20. | 529.87 | 2.0393E-06 |
| TE-133M | 0. | 912.50 | Half-Life too short |
| XE-133 | 39. | 81.00 | 7.9514E-08 |
| XE-133M | 46. | 233.22 | 5.1950E-07 |
| CS-134 | 41. | 604.70 | 7.0345E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 46. | 260.24 | 2.1970E-06 |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Sample ID: CT1-11035E CUM

Acquisition date: 20 Feb 2011 16:02:02

| RadL00 | RadL00 Sum | Energy (keV) | MSA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| CS-136 | 21. | 812.50 | 1.0450E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 21. | 661.65 | 6.9431E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 250.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 76. | 165.95 | 9.3310E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 24. | 537.32 | 3.3420E-08 |
| LA-140 | 11. | 1596.49 | 1.5822E-07 |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 57. | 145.44 | 1.4781E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 41. | 293.26 | 4.7504E-07 |
| CE-144 | 60. | 133.54 | 6.2231E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 49. | 91.10 | 5.4355E-08 |
| PM-148M | 19. | 550.27 | 6.2015E-09 |
| EU-152 | 37. | 344.27 | 2.1527E-08 |
| EU-154 | 15. | 1004.76 | 3.9740E-08 |
| EU-155 | 39. | 105.31 | 3.3582E-08 |
| EU-156 | 11. | 646.29 | 8.4905E-08 |
| HF-181 | 27. | 482.03 | 7.7706E-09 |
| TA-182 | 12. | 1221.42 | 2.7639E-08 |
| W-197 | 22. | 605.01 | 2.9850E-06 |
| RE-188 | 0. | 155.03 | Half-Life too short |
| AU-199 | 42. | 158.38 | 6.7193E-08 |
| HG-203 | 36. | 279.19 | 7.4349E-09 |
| BI-207 | 31. | 569.67 | 6.6913E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 0. | 230.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 48. | 240.90 | 5.6963E-07 |
| RA-226 | 25. | 186.21 | 1.9050E-07 |
| AC-228 | 51. | 330.32 | 5.7695E-08 |
| TH-228 | 39. | 84.37 | 8.5532E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 36. | 63.29 | 9.6866E-07 |
| U-235 | 56. | 143.76 | 5.8305E-08 |
| NP-239 | 39. | 106.13 | 2.4464E-07 |
| AM-241 | 35. | 59.54 | 1.3613E-07 |

EF-1 Sump #11

2008

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 4/29/08 1 1045

J. Southward
Fermi 1 (signature)

4/29/08

Container Number SWMP # 11

B 3308
Employee ID Number

Storage Location EF-1

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

4/29/08

B 3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$
Actual tritium LLD = 1.22 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

am i hume
Chemistry (signature)

5-2-08

53461
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Southward
RP (signature)

4/4/08

B 3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering
(signature)

6-10-08

2-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|------------|
| 1. Sample Location | Sump #11 |
| 2. Date Sampled | 04/29/2008 |
| 3. Time Sampled | 10:45 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 05/01/2008 |
| 2. Time Sample Counted | 16:18 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 8.1 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 3031.8 cpm |
| Net Spike Count Rate (cpm) | 3023.7 cpm |
| H3 Spike Activity (dpm on count date) | 7776.1 dpm |
| Counter Efficiency | 0.3888 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 8.1 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 2.1 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.22\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician

Am / hawane

Date

5/2/08

DETOIT EDISON FERMI-2 POWER PLANT

4-JUN-2008 15:44:27.11

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF-1 SUMP #11

Sample End Time: 29-APR-2008 10:45:00.00

REMARKS

PERFORMED BY:

J. Scutts
SIGNATURE

REVIEWED BY:

Bob J.
SIGNATURE/DATE

Sample ID : EF-1 SUMP #11

Acquisition date : 4-JUN-2008 15:14:23

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF-1 SUMP #11
 Sample collection start date: 29-APR-2008 10:45:00.00
 Sample collection end date : 29-APR-2008 10:45:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : MELL Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 4-JUN-2008 15:14:23.74
 Preset live time : 0 00:30:00.00 Elapsed live time : 0 00:30:00.00
 Elapsed real time : 0 00:30:01.04 Percent dead time : 0.05 %

***** Calibration Parameters *****

Detector number : 0 DET 4 Yearly cal date : 20-JUN-2007 12:16:46.16
 Kev/channel : 5.00091E-01 Zero offset: -1.34794E-01
 Daily cal date : 4-JUN-2008 06:32:04.62

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 2.00000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| PK | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|----------|
| 1 | 0 | 511.12 | 138 | 54 | 2.25 | 1022.31 | 1012 | 18 | 7.67E-02 | 15.1 | |
| 2 | 0 | 558.90 | 72 | 28 | 1.25 | 1117.85 | 1111 | 14 | 3.98E-02 | 19.6 | |
| 3 | 1 | 1460.31 | 20 | 4 | 2.61 | 2920.27 | 2910 | 18 | 1.14E-02 | 42.9 | 7.88E-01 |
| 4 | 1 | 1461.10 | 28 | 4 | 2.37 | 2922.00 | 2910 | 18 | 1.56E-02 | 29.2 | |
| 5 | 0 | 1764.98 | 16 | 2 | 1.08 | 3529.44 | 3521 | 13 | 8.67E-03 | 34.2 | |

Sample Title : EF-1 SUMP #11
Decay Time = 36 04:29:23.74

Page : 1
Acquisition Time = 4-JUN-2000 15:17:23.74

Post-MID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|----|------|----------|----------|
| 0 | 511.12 | 138 | 54 | 2.25 | 1022.31 | 1012 | 18 | 15.1 | | ANNAL |
| 0 | 558.90 | 72 | 28 | 1.25 | 1117.05 | 1111 | 14 | 19.6 | | HWC |
| 1 | 1460.31 | 20 | 4 | 2.61 | 2920.27 | 2910 | 18 | 42.9 | 7.88E-01 | K-40 |
| 1 | 1461.18 | 28 | 4 | 2.37 | 2922.00 | 2910 | 18 | 29.2 | | K-40 |
| 0 | 1764.98 | 16 | 2 | 1.08 | 3529.44 | 3521 | 13 | 34.2 | | RA-223 |

Nuclide Line Activity Report
Sample ID : EF-1 SUMP #11

Page : 2
Acquisition date : 4-JUN-2008 15:14:23

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 28 | 10.67% | 2.501E+00 | 1.575E-07 | 1.575E-07 | 29.23 |

Flag: "x" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : EF-1 SUMP #11

Acquisition date : 4-JUN-2008 15:14:23

Total number of lines in spectrum 5
Number of unidentified lines 1
Number of lines tentatively identified by NID 4 80.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 1.575E-07 | 1.575E-07 | 0.461E-07 | 29.23 | |
| Total Activity : | | | 1.575E-07 | 1.575E-07 | | | |

Grand Total Activity : 1.575E-07 1.575E-07

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

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

Rejected Report

Page : 4

Sample ID : EF-1 SUMP #11

Acquisition date : 4-JUN-2008 15:14:23

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|---------|-----------|---------|--------|--|------------------------------|-----------|--------------|
| F-18 | 109.74M | 474.98 | 511.00 | 193.46 | 1.000E+35 | 15.11 | Decay |
| | | | | % Abundances Found = 100.00 | | | |
| AS-76 | 26.32H | 33.81 | 559.10 | 44.70 | 4.438E+02 | 19.62 | Decay, Abun. |
| | | | | 563.23 | 1.17 | ---- | Not Found |
| | | | | 571.30 | 0.14 | ---- | Not Found |
| | | | | 657.03 | 6.10 | ---- | Not Found |
| | | | | 665.31 | 0.39 | ---- | Not Found |
| | | | | 740.12 | 0.12 | ---- | Not Found |
| | | | | 771.76 | 0.12 | ---- | Not Found |
| | | | | 867.63 | 0.12 | ---- | Not Found |
| | | | | 1129.87 | 0.14 | ---- | Not Found |
| | | | | 1212.72 | 1.63 | ---- | Not Found |
| | | | | 1216.02 | 3.84 | ---- | Not Found |
| | | | | 1228.52 | 1.39 | ---- | Not Found |
| | | | | 1439.13 | 0.33 | ---- | Not Found |
| | | | | 1453.60 | 0.13 | ---- | Not Found |
| | | | | 1787.67 | 0.33 | ---- | Not Found |
| | | | | % Abundances Found = 73.70 | | | |
| BI-214 | 19.90M | 2619.32 | 609.31 | 46.30 | ---- | ---- | Decay, Abun. |
| | | | | 768.36 | 5.04 | ---- | Not Found |
| | | | | 934.06 | 3.21 | ---- | Not Found |
| | | | | 1120.29 | 15.10 | ---- | Not Found |
| | | | | 1238.11 | 5.94 | ---- | Not Found |
| | | | | 1377.67 | 4.11 | ---- | Not Found |
| | | | | 1764.49 | 15.80 | 1.000E+35 | 34.23 |
| | | | | % Abundances Found = 16.54 (Abn. Limit = 48.48%) | | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : EF-1 SUMP #11

Page : 5
Acquisition date : 4-JUN-2008 15:14:23

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 511.12 | 138 | 54 | 2.25 | 1022.31 | 1012 | 18 | 7.67E-02 | 15.1 | 4.88E+00 | T |
| 0 | 558.98? | 72 | 28 | 1.25 | 1117.85 | 1111 | 14 | 3.98E-02 | 19.6 | 4.68E+00 | T |
| 1 | 1460.31 | 20 | 4 | 2.61 | 2920.27 | 2910 | 18 | 1.14E-02 | 42.9 | 2.50E+00 | |
| 0 | 1764.98 | 16 | 2 | 1.08 | 3529.44 | 3521 | 13 | 8.67E-03 | 34.2 | 2.26E+00 | T |

Flags: "T" = Tentatively associated

* Sample ID : EF-1 SUMP #11 *

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| BE-7 | 25. | 477.59 | 1.1809E-07 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 9. | 1274.54 | 9.5818E-09 |
| NA-24) | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 11. | 889.25 | 1.1280E-08 |
| CR-51 | 30. | 320.08 | 1.7921E-07 |
| MN-54 | 21. | 834.83 | 1.1202E-08 |
| CO-56 | 9. | 1238.25 | 1.8758E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 54. | 158.38 | 5.1115E-07 |
| CO-57 | 46. | 122.06 | 1.1391E-08 |
| CO-58 | 10. | 810.76 | 1.0500E-08 |
| FE-59 | 13. | 1099.22 | 3.0774E-08 |
| CO-60 | 9. | 1332.49 | 9.5443E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 8. | 1115.52 | 1.7770E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 42. | 136.00 | 1.6292E-08 |
| AS-76 | > 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 45. | 513.99 | 2.4418E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 45. | 513.99 | 1.5475E-08 |
| RB-86 | 10. | 1076.63 | 3.8594E-07 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 5. | 1836.01 | 1.1345E-08 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 11. | 1204.90 | 5.0783E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : EF-1 SUMP #11

Acquisition date : 4-JUN-2000 15:14:23

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 0 21. | 702.63 | 8.6699E-09 |
| NB-95 | 12. | 765.79 | 1.5387E-08 |
| NB-95M | 0. | 235.69 | Half-Life too short |
| ZR-95 | 16. | 756.72 | 2.2420E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 20. | 497.08 | 1.5216E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 318.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 16. | 621.84 | 7.7590E-08 |
| CD-109 | 36. | 88.03 | 3.7138E-07 |
| AG-110M | 8. | 937.48 | 2.3914E-08 |
| SN-113 | 24. | 391.69 | 1.3267E-08 |
| SN-117M | 53. | 158.56 | 6.0294E-08 |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 21. | 602.71 | 1.2353E-08 |
| SB-125 | 29. | 427.89 | 2.7542E-08 |
| TE-125M | 39. | 109.28 | 5.1183E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 34. | 57.60 | 3.1545E-05 |
| XE-127 | 37. | 202.84 | 2.0771E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 18. | 695.88 | 5.1543E-07 |
| XE-129M | 47. | 196.56 | 2.7816E-06 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 43. | 123.80 | 2.4630E-07 |
| I-131 | 26. | 364.48 | 1.9513E-07 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 38. | 163.93 | 2.9840E-06 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 52. | 302.84 | 5.1076E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 37. | 181.00 | 5.3101E-06 |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 27. | 604.70 | 9.4319E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3.

Sample ID : EF-1 SUMP #11

Acquisition date : 4-JUN-2008 15:14:23

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| CS-136 | 13. | 818.50 | 5.4592E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 16. | 661.65 | 8.6682E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 33. | 165.85 | 9.8848E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 0. | 537.32 | 1.4471E-07 |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 52. | 145.44 | 3.7394E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 37. | 133.54 | 7.5383E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 40. | 91.10 | 4.4555E-07 |
| PM-148M | 19. | 550.27 | 1.4155E-08 |
| EU-152 | 35. | 344.27 | 3.0137E-08 |
| EU-154 | 8. | 1004.76 | 4.4744E-08 |
| EU-156 | 15. | 646.29 | 5.1344E-07 |
| HF-181 | 20. | 482.03 | 1.7736E-08 |
| TA-182 | 7. | 1221.42 | 3.7119E-08 |
| W-187 | 0. | 685.81 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 54. | 279.19 | 1.9880E-08 |
| BI-207 | 9. | 569.67 | 5.5840E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PE-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PE-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 38. | 240.98 | 1.9241E-04 |
| RA-226 | 45. | 186.21 | 2.3146E-07 |
| AC-228 | 28. | 338.32 | 6.3056E-08 |
| TH-228 | 34. | 84.37 | 1.1963E-06 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 40. | 63.29 | 3.3021E-06 |
| U-235 | 48. | 143.76 | 7.7324E-08 |
| NP-239 | 0. | 106.13 | Half-Life too short |
| AM-241 | 37. | 59.54 | 1.8986E-07 |

EF-1 Sump #11
2009

**FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT**

Log Number NIA

Task

Performed By

Date

1. Representative sample collected.

Date/Time 3/18/09 1 1430

J. Southward
Fermi 1 (signature)

3/19/09

Container Number Sump #11

Storage Location EF-1

B3308
Employee ID Number

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

3/19/09

B3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.16E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

3-21-09

56463
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Southward
RP (signature)

5/14/09

B3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

5-14-09

50027
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|------------|
| 1. Sample Location | Sump #11 |
| 2. Date Sampled | 03/18/2009 |
| 3. Time Sampled | 14:30 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 03/20/2009 |
| 2. Time Sample Counted | 14:00 |
| 3. Background Inf.: Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 7.8 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) Gross Spike Count Rate (cpm) | 2972.5 cpm |
| Net Spike Count Rate (cpm) | 2964.7 cpm |
| H3 Spike Activity (dpm on count date) | 7397.6 dpm |
| Counter Efficiency | 0.4008 cpm/dpm |
| 5. Sample Info: Sample Gross Count Rate (cpm) | 7.3 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: Critical Level Count Rate (cpm) | 2.0 cpm |

Minimum Detectable Activity

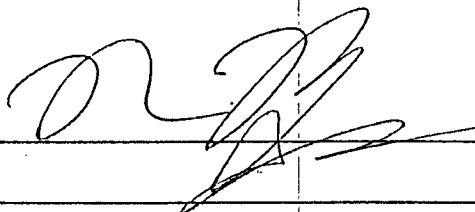
$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.16\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician



Date

3-21-09

RADIATION PROTECTION DEPARTMENT
GAMMA SPECTROSCOPY ANALYSIS REPORT
HIGH EFFICIENCY DETECTOR

Sample ID Number: SUPFW11

Sample End Time: 18-MAR-2009 14:30:00.00

REMARKS

PERFORMED BY:

J. Santoro
SIGNATURE

REVIEWED BY:

D. Cole 3-6-09
SIGNATURE/DATE

Sample ID : SUMPH11

Acquisition date : 23-MAR-2009 10:53:42

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: SUMPH11
 Sample collection start date: 18-MAR-2009 14:30:00.00
 Sample collection end date : 18-MAR-2009 14:30:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.000000E+03 cc
 Sample geometry : MELL Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 23-MAR-2009 10:53:42.88
 Preset live time : 0 00:30:00.00 Elapsed live time : 0 00:30:00.00
 Elapsed real time : 0 00:30:01.44 Percent dead time : 0.05 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 20-JUN-2008 12:00:00.00
 KeV/channel : 4.99924E-01 Zero offset: 2.36636E-01
 Daily cal date : 23-MAR-2009 10:11:24.69

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 2.00000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 296.02 | 112 | 68 | 3.70 | 591.66 | 585 | 14 | 6.24E-02 | 18.4 | |
| 2 | 0 | 352.10 | 158 | 54 | 1.55 | 703.83 | 697 | 16 | 8.80E-02 | 12.9 | |
| 3 | 0 | 511.16 | 141 | 34 | 2.49 | 1022.00 | 1016 | 13 | 7.85E-02 | 11.8 | |
| 4 | 0 | 559.56 | 50 | 53 | 2.31 | 1118.80 | 1110 | 21 | 2.90E-02 | 37.2 | |
| 5 | 0 | 609.44 | 168 | 13 | 2.29 | 1218.58 | 1212 | 14 | 9.31E-02 | 9.0 | |
| 6 | 0 | 1120.40 | 49 | 6 | 2.39 | 2240.64 | 2235 | 12 | 2.72E-02 | 17.4 | |
| 7 | 0 | 1461.97 | 35 | 16 | 2.36 | 2923.86 | 2913 | 15 | 1.94E-02 | 29.7 | |

Sample Title : SUMP#11

Page : 1

Decay Time = 4 20:23:42.00

Acquisition Time = 23-MAR-2009 10:53:42.

A

Post-NID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | %Err | Fit | Nuclides |
|----|---------|------|-------|-------|---------|------|----|------|-----|-------------|
| 0 | 296.02 | 112 | 68 | 3.70 | 591.66 | 585 | 14 | 18.4 | | Pb-214 |
| 0 | 352.10 | 158 | 54 | 1.550 | 703.03 | 697 | 16 | 12.9 | | Pb-214 |
| 0 | 511.16 | 141 | 34 | 2.49 | 1022.00 | 1016 | 13 | 11.8 | | Ann 1022 |
| 0 | 559.56 | 50 | 53 | 2.31 | 1110.00 | 1110 | 21 | 37.2 | | |
| 0 | 609.44 | 168 | 13 | 2.29 | 1210.58 | 1212 | 14 | 9.0 | | B-214 |
| 0 | 1120.40 | 49 | 6 | 2.39 | 2240.64 | 2235 | 12 | 17.4 | | B-214 |
| 0 | 1461.97 | 35 | 16 | 2.36 | 2923.06 | 2913 | 15 | 29.7 | | K-40 |

Nuclide Line Activity Report
Sample ID : SUMP#11

Page : 2
Acquisition date : 23-MAR-2009 10:53:42

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.81 | 35 | 10.67% | 2.500E+00 | 1.961E-07 | 1.961E-07 | 29.73 |

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : SUMPW11

Page : 3
Acquisition date : 23-MAR-2009 10:53:42

Total number of lines in spectrum 7
Number of unidentified lines 0
Number of lines tentatively identified by NID 7 100.00%

Nuclide Type : natural

| Nuclide | HLife | Decay | Uncorrected uCi/cc | Decay Corr. uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|-----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 1.961E-07 | 1.961E-07 | 0.583E-07 | 29.73 | |
| Total Activity : | | | 1.961E-07 | 1.961E-07 | | | |

Grand Total Activity : 1.961E-07 1.961E-07

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

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

Rejected Report
Sample ID : SUMP#11

Page : 4
Acquisition date : 23-MAR-2009 10:53:42

| Nuclide | Half-life | Half-Life Ratio | Energy | %Abund | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|---------|-----------|-----------------|----------------|--------|------------------------------|-----------|-------------|
| F-18 | 109.74M | 63.78 | 511.00* | 193.46 | 3.546E+11 | 11.85 | Decay |
| | | % Abundances | Found = 100.00 | | | | |
| SC-46 | 83.83D | 0.06 | 142.53 | 62.70 | ----- | Not Found | ----- |
| | | | 889.25* | 99.98 | ----- | Not Found | ----- |
| | | | 1120.51 | 99.99 | 2.641E-08 | 17.44 | |
| | | % Abundances | Found = 38.07 | | | | |
| AS-76 | 26.32H | 4.43 | 559.10* | 44.70 | 7.800E-07 | 37.20 | Abun. |
| | | | 563.23 | 1.17 | ----- | Not Found | ----- |
| | | | 571.30 | 0.14 | ----- | Not Found | ----- |
| | | | 657.03 | 6.10 | ----- | Not Found | ----- |
| | | | 665.31 | 0.39 | ----- | Not Found | ----- |
| | | | 740.12 | 0.12 | ----- | Not Found | ----- |
| | | | 771.76 | 0.12 | ----- | Not Found | ----- |
| | | | 867.63 | 0.12 | ----- | Not Found | ----- |
| | | | 1129.87 | 0.14 | ----- | Not Found | ----- |
| | | | 1212.72 | 1.63 | ----- | Not Found | ----- |
| | | | 1216.02> | 3.84 | ----- | Not Found | ----- |
| | | | 1228.52 | 1.39 | ----- | Not Found | ----- |
| | | | 1439.13 | 0.33 | ----- | Not Found | ----- |
| | | | 1453.60 | 0.13 | ----- | Not Found | ----- |
| | | | 1787.67 | 0.33 | ----- | Not Found | ----- |
| | | % Abundances | Found = 73.70 | | | | |
| BR-84 | 31.80M | 220.09 | 604.80 | 1.80 | ----- | Not Found | ----- |
| | | | 736.50 | 1.31 | ----- | Not Found | ----- |
| | | | 802.20 | 6.10 | ----- | Not Found | ----- |
| | | | 881.50* | 42.00 | ----- | Not Found | ----- |
| | | | 1015.90 | 6.20 | ----- | Not Found | ----- |
| | | | 1213.30 | 2.60 | ----- | Not Found | ----- |
| | | | 1463.80 | 2.00 | 1.000E+35 | 29.73 | |
| | | | 1741.20 | 1.60 | ----- | Not Found | ----- |
| | | | 1877.50 | 1.14 | ----- | Not Found | ----- |
| | | | 1897.30 | 14.90 | ----- | Not Found | ----- |
| | | | 2029.60 | 2.10 | ----- | Not Found | ----- |
| | | % Abundances | Found = 2.45 | | | | |
| KR-90 | 32.32S | 12992.69 | 121.82 | 32.00 | ----- | Not Found | ----- |
| | | | 539.49 | 29.00 | ----- | Not Found | ----- |
| | | | 1118.69* | 37.00 | 1.000E+35 | 17.44 | |
| | | % Abundances | Found = 37.76 | | | | |
| Y-92 | 3.54H | 32.95 | 448.50 | 2.30 | ----- | Not Found | ----- |
| | | | 561.10 | 2.40 | 5.586E+03 | 37.20 | |
| | | | 844.30 | 1.25 | ----- | Not Found | ----- |
| | | | 934.46* | 13.90 | ----- | Not Found | ----- |
| | | | 1405.40 | 4.80 | ----- | Not Found | ----- |
| | | % Abundances | Found = 9.74 | | | | |
| RU-103 | 39.35D | 0.12 | 497.00* | 89.00 | ----- | Not Found | ----- |
| | | | 610.33 | 5.60 | 1.083E-06 | 9.05 | |
| | | % Abundances | Found = 5.92 | | | | |

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|---------|-----------|--------------|---------|--------|------------------------------|--------|--------------|
| XE-135 | 9.11H | 12.80 | 249.79* | 89.90 | Not Found | | Decay, Abun. |
| | | | 608.19 | 2.89 | 1.378E-02 | 9.05 | |
| ? | | % Abundances | Found = | 3.11 | | | |
| PM-148M | 41.30D | 0.12 | 288.11 | 12.56 | Not Found | | Abun. |
| | | | 414.07 | 19.66 | Not Found | | |
| | | | 432.78 | 5.35 | Not Found | | |
| | | | 501.26 | 6.75 | Not Found | | |
| | | | 550.27* | 94.90 | Not Found | | |
| | | | 599.74 | 12.54 | Not Found | | |
| | | | 611.26 | 5.48 | 1.103E-06 | 9.05 | |
| | | | 629.97 | 89.00 | Not Found | | |
| | | | 725.70 | 32.80 | Not Found | | |
| | | | 915.33 | 17.17 | Not Found | | |
| | | | 1013.81 | 20.30 | Not Found | | |
| | | % Abundances | Found = | 1.74 | | | |
| BI-214 | 19.90M | 351.69 | 609.31* | 46.30 | 1.000E+35 | 9.05 | Decay |
| | | | 768.36 | 5.04 | Not Found | | |
| | | | 934.06 | 3.21 | Not Found | | |
| | | | 1120.29 | 15.10 | 1.000E+35 | 17.44 | |
| | | | 1238.11 | 5.94 | Not Found | | |
| | | | 1377.67 | 4.11 | Not Found | | |
| | | | 1764.49 | 15.80 | Not Found | | |
| | | % Abundances | Found = | 64.29 | (Abn. Limit = 48.48%) | | |
| PO-214 | 26.80M | 261.15 | 87.30 | 4.67 | Not Found | | Decay |
| | | | 241.90 | 7.49 | Not Found | | |
| | | | 295.21 | 19.20 | 1.000E+35 | 18.35 | |
| | | | 351.92* | 37.20 | 1.000E+35 | 12.93 | |
| | | | 785.91 | 1.10 | Not Found | | |
| | | % Abundances | Found = | 80.96 | (Abn. Limit = 37.20%) | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : SUPP#11

Page : 6
Acquisition date : 23-MAR-2009 10:53:42

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|----------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 296.02 | 112 | 68 | 3.70 | 591.66 | 585 | 14 | 6.24E-02 | 18.4 | 6.08E+00 | T |
| 0 | 352.10 | 150 | 54 | 1.55 | 703.83 | 697 | 16 | 8.00E-02 | 12.9 | 5.70E+00 | T |
| 0 | 511.16 | 141 | 34 | 2.49 | 1022.00 | 1016 | 13 | 7.85E-02 | 11.8 | 4.88E+00 | T |
| 0 | 559.56 | 50 | 53 | 2.31 | 1118.00 | 1110 | 21 | 2.80E-02 | 37.2 | 4.68E+00 | T |
| 0 | 609.44 | 168 | 13 | 2.29 | 1218.58 | 1212 | 14 | 9.31E-02 | 9.0 | 4.52E+00 | T |
| 0 | 41120.40 | 49 | 6 | 2.39 | 2240.64 | 2235 | 12 | 2.72E-02 | 17.4 | 2.90E+00 | T |

Flags: "T" = Tentatively associated

 * Detroit Edison Fermi 2 MDA Report, Generated 23-MAR-2009 11:23:51.69

 * Sample ID : SUMF#11

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| BE-7 | 30. | 477.59 | 69.5677E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 10. | 1274.54 | 9.5445E-09 |
| NA-24 | 15. | 1368.53 | 2.6322E-06 |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 16. | 889.25 | 1.0023E-08 |
| CR-51 | 34. | 320.08 | 8.7033E-08 |
| MN-54 | 8 20. | 834.83 | 1.0213E-08 |
| CO-56 | 30. | 1238.25 | 2.4005E-08 |
| MN-56 | 0. | 1010.69 | Half-Life too short |
| NI-56 | 59. | 150.38 | 1.5213E-08 |
| CO-57 | 47. | 122.06 | 1.0667E-08 |
| CO-58 | 13. | 810.76 | 8.7251E-09 |
| FE-59 | 9. | 1099.22 | 1.6008E-08 |
| CO-60 | 7. | 1332.49 | 8.4677E-09 |
| CU-64 | 9. | 1345.90 | 1.7935E-03 |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 10. | 1115.52 | 1.8233E-08 |
| ZN-69M | 15. | 438.63 | 2.2499E-06 |
| SE-75 | 52. | 136.00 | 1.5068E-08 |
| AS-76 | 73. | 559.10 | 6.5487E-07 |
| BR-82 | 11. | 776.49 | 8.5094E-08 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 00. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 49. | 513.99 | 2.5368E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 49. | 513.99 | 1.1565E-08 |
| RB-86 | 6. | 1076.63 | 9.7587E-08 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 8. | 1836.01 | 1.1391E-08 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.08 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RE-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 5. | 1204.90 | 2.4596E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable?Activity Report (continued)

Page : 2

Sample ID : SUMP#11

Acquisition date : 23-MAR-2009 10:53:42

| Nuclide | Eckgrnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|----------------|-----------------|---------------------|
| SR-90 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 23. | 702.63 | 9.1363E-09 |
| NB-95 | 24. | 765.79 | 1.1178E-08 |
| NB-95M | 52. | 235.69 | 8.7089E-08 |
| ZR-95 | 16. | 756.72 | 1.5761E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 17. | 743.36 | 1.0339E-06 |
| NO-99 | 14. | 739.58 | 2.0630E-07 |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.01 | Half-Life too short |
| RU-103 | 17. | 497.00 | 8.1535E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 43. | 310.90 | 4.3079E-07 |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 12. | 621.84 | 6.5225E-08 |
| CD-109 | 54. | 88.03 | 4.2685E-07 |
| AG-110M | 17. | 937.48 | 3.0396E-08 |
| SN-113 | 24. | 391.69 | 1.1127E-08 |
| SN-117M | 61. | 150.56 | 1.3000E-08 |
| SB-122 | 19. | 563.93 | 3.6241E-08 |
| SB-124 | 20. | 602.71 | 8.4170E-09 |
| SB-125 | 34. | 427.89 | 2.9119E-08 |
| TE-125M | 44. | 109.28 | 3.7391E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 28. | 57.60 | 2.3004E-05 |
| XE-127 | 46. | 202.04 | 1.2574E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 12. | 695.08 | 2.2004E-07 |
| XE-129M | 57. | 196.56 | 2.6355E-07 |
| I-130 | 26. | 536.09 | 5.8483E-06 |
| BA-131 | 48. | 123.00 | 4.0099E-08 |
| I-131 | 28. | 364.48 | 1.3707E-08 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 10. | 773.67 | 2.6717E-07 |
| XE-131M | 53. | 163.93 | 5.5603E-07 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 53. | 228.16 | 2.7599E-08 |
| BA-133 | 36. | 302.04 | 4.2876E-08 |
| BA-133M | 40. | 276.09 | 3.4395E-07 |
| I-133 | 16. | 529.87 | 3.7606E-07 |
| TE-133M | 0. | 912.50 | Half-Life too short |
| XE-133 | 35. | 81.00 | 8.1506E-08 |
| XE-133M | 46. | 233.22 | 3.6539E-07 |
| CS-134 | 16. | 604.70 | 7.2709E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 43. | 268.24 | 8.3924E-07 |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : SUMPH11

Acquisition date : 23-MAR-2009 10:53:42

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| CS-136 | 19. | 818.50 | 1.2541E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 20. | 661.65 | 9.4588E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 60. | 165.85 | 1.1034E-08 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 21. | 537.32 | 3.9441E-08 |
| LA-140 | 0. | 1596.49 | 7.7217E-08 |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 49. | 145.44 | 1.8605E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 65. | 293.26 | 2.7215E-07 |
| CE-144 | 51. | 133.54 | 8.1388E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 54. | 91.10 | 7.0945E-08 |
| PM-148M | 25. | 550.27 | 9.5250E-09 |
| EU-152 | 34. | 344.27 | 2.9282E-08 |
| EU-154 | 10. | 1004.76 | 4.7508E-08 |
| EU-155 | 40. | 105.31 | 5.2237E-08 |
| EU-156 | 17. | 646.29 | 1.3196E-07 |
| HF-181 | 29. | 482.03 | 1.0826E-08 |
| TA-182 | 12. | 1221.42 | 3.8638E-08 |
| W-187 | 9. | 685.81 | 6.1272E-07 |
| RE-188 | 56. | 155.03 | 6.6005E-06 |
| HG-203 | 40. | 279.19 | 1.0865E-08 |
| BI-207 | 21. | 569.67 | 7.9728E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 92. | 240.98 | 7.2160E-07 |
| RA-226 | 54. | 186.21 | 2.5217E-07 |
| AC-228 | 32. | 338.32 | 6.6561E-08 |
| TH-228 | 41. | 84.37 | 1.2692E-06 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 39. | 63.29 | 1.3232E-06 |
| U-235 | 60. | 143.76 | 9.5360E-08 |
| NP-239 | 44. | 106.13 | 1.8828E-07 |
| AM-241 | 31. | 59.54 | 1.7459E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number NIA

Task

Performed By

Date

1. Representative sample collected.

Date/Time 12/3/09 1425

Container Number Sample #11

Storage Location EF-1

J. Seachurn
Fermi 1 (signature)

12/7/09

B 3308
Employee ID Number

2. Sample secured against tampering.

J. Seachurn
Fermi 1 (signature)

12/7/09

B 3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.15 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

W. Dye
Chemistry (signature)

12-7-09

50580
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

Charles Druff
RP (signature)

12-16-09

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

12-22-09

2-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number

Task

Performed By

Date

6. Fluid approved for release.

Radiological Engineering
(signature)

Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|---------------|
| 1. Sample Location | EF-1 Sump #11 |
| 2. Date Sampled | 12/03/2009 |
| 3. Time Sampled | 14:25 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 12/09/2009 |
| 2. Time Sample Counted | 06:03 |
| 3. Background Inf.: Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 7.1 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) Gross Spike Count Rate (cpm) | 2747.5 cpm |
| Net Spike Count Rate (cpm) | 2740.4 cpm |
| H3 Spike Activity (dpm on count date) | 7101.9 dpm |
| Counter Efficiency | 0.3859 cpm/dpm |
| 5. Sample Info: Sample Gross Count Rate (cpm) | 8.3 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 1.2 cpm |
| 6. Critical Level: Critical Level Count Rate (cpm) | 1.9 cpm |

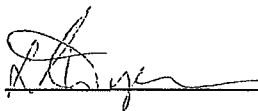
Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.15\text{E-06 uCi/ml}$$

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician



Date 12-10-09

DETROIT EDISON FERMIL-2 POWER PLANT

17-DM 1009 13:14:39.11

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF150MPC 11

Sample End Time: 3-DEC-2009 14:25:00.00

REMARKS

PERFORMED BY

Charles Proffitt
SIGNATURE

REVIEWED BY

[Signature]
SIGNATURE

Sample Title : EF1SUMPR 11

Page : 1

Decay Time : 14 00:19:36.27

Acquisition Time : 17-DEC 2002 14:44:36.2

7

Post-HID Peak Search Report

| It | Energy | Area | Blind | CHM | Channel | Left | FWHM | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|---------|-------------|----------|
| 0 | 40.49 | 33 | 44 | 1.00 | 102.05 | 102 | 0.30.0 | Fluorine-18 | 12-22-07 |
| 3 | 510.04 | 84 | 45 | 2.45 | 1021.35 | 1014 | 31 22.2 | 1.11E+00 | |
| 3 | 512.31 | 43 | 41 | 2.49 | 1021.22 | 1014 | 31 12.1 | | |
| 0 | 558.58 | 61 | 17 | 1.60 | 1140.81 | 1111 | 12 10.7 | | |
| 0 | 609.10 | 35 | 21 | 1.67 | 1210.02 | 1211 | 12 31.2 | | |
| 0 | 806.77 | 11 | 3 | 1.22 | 1613.22 | 1607 | 0 01.1 | | |
| 0 | 1460.43 | 37 | 16 | 0.67 | 2920.41 | 2913 | 13 27.6 | | |

f-12-22-09

Sample ID : CF150MFH 1.1

Acquisition date 01 DEC 1997 145442Z

Form 42 Radiation Protection Gamma Spectroscopy Report

የቴሌፎን ቁጥር፡ 011-551-1111 | ኢሜል፡ info@addisnews.com | ስልክ፡ 011-551-1111 | ስልክ፡ 011-551-1111

Sample ID Number: EF1GUMFH 11

Sample collection start date: 3-DEC-2009 14:25:00.00

Sample collection end date 3 DEC 2000 14:25:00.00

Type of sample : 1 1 L. Flat 3. Liquid

Sample quantity = 1.000000E+06 cc

Sample geometry: HELL Operator: CLP

የግል ስራ ዕቅድ

Detector number # 0E148 Acquire date # 12-DEC-2009 11:44:36.27

```

Preset live time : 0:00:30.00.00 Elapsed live time : 0:00:23.00.00

```

Elapsed real time : 0:00:50:00.92 Percent dead time : 0.05 %

[illegible]

Detector number : PET 4 Yearly cal date : 3 JUN-2009 17:37:04.00

Key/channel : 5.00000E-01 : Zero offset 1.50000E-01

Daily cal date : 17-DEC-1969 UC: 22:33.19

[illegible]

Start channel = 100 End channel = 4076

Helpful sensitivity : 5.000000 Clapnet sensitivity : 10.000000

Maximum number of iterations to resolve multiplets : 5

[illegible]

Energy tolerance : 2.750000 Hal. f-lite ratio : 14.000000

Abundance limit = 75.000000 library = dacmaster.nlb

Efficiency file # EFFD4_mell Efficiencies at a Fixed energy

... ..

| PK | It | Energy | Area | Background | FWHM | Channel | Left | PO | cts/sec | % of | Fitted |
|----|----|---------|------|------------|------|---------|------|----|----------|-------|----------|
| 1 | 0 | 66.49 | 33 | 41 | 0.67 | 132.65 | 129 | 8 | 1.83E-02 | 30.9 | |
| 2 | 3 | 510.84 | 84 | 40 | 2.35 | 1021.35 | 1014 | 31 | 3.35E-02 | 122.8 | 1.11E+02 |
| 3 | 3 | 512.31 | 43 | 41 | 2.59 | 1024.29 | 1014 | 31 | 2.39E-02 | 45.1 | |
| 4 | 0 | 558.58 | 61 | 17 | 1.60 | 1116.81 | 1111 | 12 | 3.42E-02 | 19.7 | |
| 5 | 0 | 609.12 | 35 | 21 | 1.67 | 1210.02 | 1211 | 17 | 1.94E-02 | 31.2 | |
| 6 | 0 | 806.79 | 11 | 3 | 1.22 | 1613.72 | 1609 | 3 | 5.07E-03 | 44.3 | |
| 7 | 0 | 1460.43 | 37 | 16 | 0.67 | 2920.43 | 2913 | 13 | 1.97E-02 | 17.9 | |

1235.34 15.70 Not Found
 % Abundances Found = 4.20

Th-182 114.74D 0.12 67.75 32.30 0.903E 20 30.92 Abund.

Rejected Report (continued)

Page 11

Sample ID: EF1SUMFH-11 Acquisition Date: 17-DEC-2007 14:44:00

| Nuclide | Half-life | Ratio | Energy | Abund | Activity (uCi/g) | 1 Sigma | %Error | Rejected by |
|----------------------|-----------|-------|---------|-------|------------------|-----------|--------|-------------|
| Th-182 | 114.74D | 0.12 | 100.10 | 14.10 | --- | Not Found | --- | Abund. |
| | | | 1162.05 | 11.30 | --- | Not Found | --- | |
| | | | 1321.42 | 27.10 | --- | Not Found | --- | |
| | | | 1839.73 | 11.30 | --- | Not Found | --- | |
| % Abundances Found = | | | | 32.01 | | | | |

| | | | | | | | |
|----------------------|--------|---------|---------|-------|-----------------------|-----------|--------|
| U-234 | 19.90M | 1014.00 | 509.310 | 62.30 | 1.000E-72 | 31.24 | Not s. |
| | | | 769.16 | 3.04 | --- | Not Found | --- |
| | | | 934.06 | 3.21 | --- | Not Found | --- |
| | | | 1120.29 | 15.10 | --- | Not Found | --- |
| | | | 1238.11 | 5.94 | --- | Not Found | --- |
| | | | 1377.67 | 4.11 | --- | Not Found | --- |
| | | | 1761.40 | 15.86 | --- | Not Found | --- |
| % Abundances Found = | | | | 48.46 | (Abn. Limit = 46.46%) | | |

Flags: "x" = Keyline

U-234 19.90M 1014.00 509.310 62.30 1.000E-72 31.24 Not s.
 U-234 19.90M 769.16 3.04 --- Not Found ---
 U-234 19.90M 934.06 3.21 --- Not Found ---
 U-234 19.90M 1120.29 15.10 --- Not Found ---
 U-234 19.90M 1238.11 5.94 --- Not Found ---
 U-234 19.90M 1377.67 4.11 --- Not Found ---
 U-234 19.90M 1761.40 15.86 --- Not Found ---

Rejected Report

Sample ID : EF1SUNPH 11

Acquisition date : 17-DEC-2000 14:00:30

Page 1 4

| Nuclide | Half-life | Ratio | Energy | Abund | Activity | 1 Sigma | Activity | 1 Sigma | Activity | 1 Sigma | Activity | 1 Sigma |
|-----------------------------|-----------|--------|--------|--------|-----------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| F-18 | 109.74M | 184.02 | 511.00 | 193.46 | 1.000E-03 | 22.21 | Not Found | Not Found | Not Found | Not Found | Not Found | Not Found |
| % Abundances Found = 100.00 | | | | | | | | | | | | |

| | | | | | | | |
|---------------------------|---------|------|--------|-------|-----------|-----------|-----------|
| SE-75 | 119.76D | 0.12 | 66.05 | 1.02 | 3.679E-06 | 30.92 | Abun. |
| | | | 96.73 | 0.11 | Not Found | Not Found | Not Found |
| | | | 121.12 | 14.70 | Not Found | Not Found | Not Found |
| | | | 136.00 | 50.26 | Not Found | Not Found | Not Found |
| | | | 190.00 | 1.45 | Not Found | Not Found | Not Found |
| | | | 264.65 | 50.80 | Not Found | Not Found | Not Found |
| | | | 279.53 | 35.20 | Not Found | Not Found | Not Found |
| | | | 303.71 | 1.32 | Not Found | Not Found | Not Found |
| | | | 400.65 | 11.40 | Not Found | Not Found | Not Found |
| % Abundances Found = 0.57 | | | | | | | |

| | | | | | | | |
|----------------------------|--------|-------|---------|-------|-----------|-----------|--------------|
| AS-76 | 26.32H | 12.79 | 559.10 | 44.70 | 3.117E-07 | 10.59 | Decay, Abun. |
| | | | 563.23 | 1.17 | Not Found | Not Found | Not Found |
| | | | 571.30 | 0.14 | Not Found | Not Found | Not Found |
| | | | 657.03 | 6.10 | Not Found | Not Found | Not Found |
| | | | 667.31 | 0.39 | Not Found | Not Found | Not Found |
| | | | 740.12 | 0.18 | Not Found | Not Found | Not Found |
| | | | 771.76 | 0.12 | Not Found | Not Found | Not Found |
| | | | 867.63 | 0.12 | Not Found | Not Found | Not Found |
| | | | 1129.87 | 0.14 | Not Found | Not Found | Not Found |
| | | | 1110.72 | 1.63 | Not Found | Not Found | Not Found |
| | | | 1216.02 | 3.84 | Not Found | Not Found | Not Found |
| | | | 1226.52 | 1.39 | Not Found | Not Found | Not Found |
| | | | 1439.13 | 0.33 | Not Found | Not Found | Not Found |
| | | | 1453.60 | 0.13 | Not Found | Not Found | Not Found |
| | | | 1787.67 | 0.33 | Not Found | Not Found | Not Found |
| % Abundances Found = 13.70 | | | | | | | |

| | | | | | | | |
|---------------------------|--------|------|--------|-------|-----------|-----------|-------|
| RU-103 | 39.35D | 0.36 | 497.00 | 69.00 | Not Found | Not Found | Abun. |
| | | | 616.33 | 5.60 | 2.652E-07 | 51.24 | |
| % Abundances Found = 5.92 | | | | | | | |

| | | | | | | | |
|---------------------------|-------|-------|--------|-------|-----------|-----------|--------------|
| XE-135 | 9.11H | 36.05 | 249.70 | 69.90 | Not Found | Not Found | Decay, Abun. |
| | | | 608.19 | 2.89 | 5.314E-04 | 31.24 | |
| % Abundances Found = 3.11 | | | | | | | |

| | | | | | | | |
|--------|--------|------|--------|-------|-----------|-----------|-----------|
| CS-136 | 13.16D | 1.97 | 66.91 | 12.50 | 5.794E-07 | 30.92 | Abun. |
| | | | 66.29 | 0.30 | Not Found | Not Found | Not Found |
| | | | 115.22 | 7.46 | Not Found | Not Found | Not Found |
| | | | 163.80 | 4.61 | Not Found | Not Found | Not Found |
| | | | 176.55 | 13.56 | Not Found | Not Found | Not Found |
| | | | 273.65 | 12.00 | Not Found | Not Found | Not Found |
| | | | 340.57 | 48.50 | Not Found | Not Found | Not Found |
| | | | 510.50 | 20.70 | Not Found | Not Found | Not Found |
| | | | 640.02 | 30.00 | Not Found | Not Found | Not Found |

Unidentified Energy Lines

Sample ID : EF13UMPH.11 Acquisition date : 17-DEC 2007 14:44:33 Page : 6

| It | Energy | Area | Bgnd | FWHM | Channel | Left | Pw | Clb | Sec | %Err | %Diff | Flags |
|----|--------|------|------|------|---------|------|----|----------|------|----------|-------|-------|
| 0 | 66.49 | 33 | 14 | 0.67 | 132.65 | 129 | 8 | 1.03E-02 | 38.9 | 1.43E+00 | | |
| 3 | 510.84 | 84 | 45 | 2.45 | 1021.35 | 1014 | 31 | 4.63E-02 | 22.2 | 4.38E+00 | | T |
| 0 | 558.58 | 61 | 17 | 1.60 | 1116.81 | 1111 | 12 | 3.42E-02 | 18.7 | 4.69E+00 | | T |
| 0 | 609.18 | 35 | 21 | 1.67 | 1219.02 | 1211 | 12 | 1.74E-02 | 31.2 | 3.52E+00 | | T |
| 0 | 806.79 | 11 | 3 | 1.22 | 1613.82 | 1609 | 8 | 5.07E-03 | 44.1 | 3.68E+00 | | |

Flags: "T" = tentatively associated

Detroit Edison Form 12 MDA Report, Generated 17 DEC 2009 11:11:43.59

Sample ID: EF15UMPH 11

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|-----------|--------------|---------------------|
| BE-7 | 19. | 477.59 | 7.8663E-00 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 9. | 1274.57 | 9.5232E-03 |
| NA-24 | 0. | 1360.57 | Half-Life too short |
| MO-87 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1542.42 | Half-Life too short |
| AR-41 | 0. | 1243.64 | Half-Life too short |
| SC-46 | 9. | 802.25 | 8.6364E-03 |
| CR-51 | 33. | 320.00 | 1.0778E-02 |
| MN-54 | 14. | 834.83 | 9.0252E-03 |
| CO-56 | 16. | 1238.25 | 1.9537E-03 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 51. | 158.30 | 4.0268E-00 |
| CO-57 | 49. | 122.00 | 1.1097E-00 |
| CO-58 | 12. | 810.76 | 9.0051E-03 |
| FE-59 | 12. | 1099.22 | 2.1448E-03 |
| CO-60 | 10. | 1332.49 | 9.0980E-03 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.04 | Half-Life too short |
| ZN-65 | 12. | 1115.52 | 1.9961E-03 |
| ZN-69M | 0. | 478.63 | Half-Life too short |
| SE-75 | 36. | 136.90 | 1.3420E-00 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 7. | 776.49 | 5.2223E-00 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 801.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KE-85M | 0. | 151.16 | Half-Life too short |
| KB-86 | 17. | 1076.63 | 7.1336E-03 |
| KR-87 | 0. | 1402.50 | Half-Life too short |
| BR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 198.42 | Half-Life too short |
| RL-88 | 0. | 1502.37 | Half-Life too short |
| Y-88 | 11. | 1036.61 | 1.3499E-03 |
| KR-89 | 0. | 220.00 | Half-Life too short |
| SB-89 | 0. | 1031.00 | Half-Life too short |
| KR-90 | 0. | 1110.69 | Half-Life too short |
| RE-90 | 0. | 831.62 | Half-Life too short |
| RB-90M | 0. | 824.22 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |

| | | | |
|-------|----|---------|---------------------|
| | 0. | 555.63 | Half-Life too short |
| | 0. | 1363.97 | Half-Life too short |
| | 0. | 934.46 | Half-Life too short |
| NR-93 | 0. | 596.34 | Half-Life too short |
| Y-93 | 0. | 266.72 | Half-Life too short |

Minimum Detectable Activity Report (continued) Page 11
Sample ID : EF1SUMPH 11 Acquisition date : 17-DEC-1991 14:34:52

| Nuclide | Backgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|----------------|-----------------|---------------------|
| NR-94 | 19. | 762.63 | 0.4147E-02 |
| NR-95 | 18. | 765.72 | 1.1719E-00 |
| NR-95M | 41. | 235.69 | 4.5286E-07 |
| ZR-95 | 10. | 756.72 | 1.4632E-03 |
| DE-97 | 0. | 657.90 | Half-Life too short |
| ER-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 21. | 739.50 | 2.4874E-06 |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 15. | 447.08 | 0.9748E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 39. | 318.90 | 3.0704E-05 |
| RU-105 | 0. | 724.30 | Half-Life too short |
| RU-106 | 15. | 621.84 | 7.1668E-00 |
| CD-109 | 36. | 00.00 | 7.5643E-07 |
| AG-110M | 11. | 937.40 | 2.6077E-08 |
| SN-113 | 26. | 391.69 | 1.8185E-00 |
| SN-117M | 51. | 150.56 | 1.9147E-08 |
| SB-122 | 20. | 563.93 | 5.9230E-07 |
| SB-124 | 27. | 602.71 | 1.0643E-08 |
| SB-125 | 19. | 427.99 | 2.2384E-08 |
| TE-125M | 19. | 109.22 | 2.8710E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 20. | 57.60 | 2.1907E-05 |
| XE-127 | 40. | 202.84 | 1.4009E-03 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 23. | 695.88 | 3.6658E-07 |
| XE-129M | 41. | 196.56 | 4.6645E-07 |
| I-130 | 0. | 330.09 | Half-Life too short |
| BA-131 | 40. | 123.80 | 6.4748E-08 |
| I-131 | 29. | 364.48 | 0.0745E-08 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 20. | 163.93 | 7.1358E-07 |
| I-132 | 0. | 067.09 | Half-Life too short |
| TE-132 | 35. | 228.16 | 1.6043E-07 |
| RA-133 | 30. | 202.84 | 3.9363E-00 |
| BA-133M | 32. | 276.09 | 1.5702E-05 |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.53 | Half-Life too short |
| XE-133 | 22. | 91.00 | 2.2401E-07 |
| XE-133M | 36. | 233.82 | 5.9170E-06 |
| CS-134 | 27. | 604.70 | 9.3041E-02 |
| I-134 | 0. | 884.89 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 262.24 | Half-Life too short |
| T-135 | 0. | 1260.31 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page 1 3

Sample ID: EFISUMPH 11

Acquisition date: 17-DEC 2007 14:41:36

| Naclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| CS-137 | 18. | 661.65 | 8.9987E-03 |
| XE-137 | 0. | 455.40 | Half-Life too short |
| CS-138 | 0. | 1435.80 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 39. | 165.85 | 9.4602E-07 |
| CS-139 | 0. | 1283.25 | Half-Life too short |
| BA-140 | 12. | 537.32 | 5.0454E-08 |
| LA-140 | 5. | 1590.49 | 2.7581E-06 |
| BA-141 | 0. | 190.30 | Half-Life too short |
| CE-141 | 33. | 145.83 | 2.0510E-06 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 855.10 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 893.26 | Half-Life too short |
| CE-144 | 33. | 103.54 | 6.0373E-06 |
| PT-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 24. | 91.10 | 8.7660E-03 |
| PM-148M | 13. | 550.27 | 8.1424E-09 |
| EU-152 | 24. | 344.07 | 2.5250E-03 |
| EU-154 | 11. | 1804.76 | 5.0482E-08 |
| EU-155 | 35. | 105.51 | 4.5414E-08 |
| EU-156 | 19. | 640.29 | 8.0905E-07 |
| HF-181 | 14. | 488.03 | 9.1064E-06 |
| TA-182 | 11. | 1221.42 | 3.9081E-08 |
| W-187 | 0. | 605.01 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| MG-203 | 39. | 279.10 | 1.2300E-03 |
| BI-207 | 19. | 569.67 | 7.5294E-09 |
| TL-208 | 0. | 583.11 | Half-Life too short |
| PB-212 | 0. | 238.60 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.02 | Half-Life too short |
| RA-224 | 41. | 240.38 | 2.0546E-06 |
| RA-226 | 41. | 186.21 | 2.2103E-07 |
| AC-228 | 29. | 203.91 | 6.3791E-08 |
| TH-228 | 30. | 84.37 | 1.1005E-06 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 35. | 63.27 | 1.6324E-06 |
| U-235 | 34. | 143.76 | 0.5769E-08 |
| NP-239 | 35. | 106.13 | 2.5142E-06 |
| AM-241 | 28. | 57.54 | 1.0061E-07 |

EF-1 Sump #11

2010

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 5/10/10 11525

J. Southward
Fermi 1 (signature)

5/10/10

Container Number Sump # 11

B3308
Employee ID Number

Storage Location EF-1

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

5/10/10

B3308
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = ~~5.12E-6~~ 1 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

JP
Chemistry (signature)

5-17-10

51922
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

J. Southward
RP (signature)

6/15/10

B3308
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

K. P. D. sey
Radiological Engineering (signature)

6-22-10

50027
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

6. Fluid approved for release.

N/A
Radiological Engineering
(signature)

N/A
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|-------------------------|------------|
| 1 . Sample Location | Sump #11 |
| 2 . Date Sampled | 05/10/2010 |
| 3 . Time Sampled | 15:25 |
| 4 . Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|--|----------------|
| 1 . Date Sample Counted | 05/17/2010 |
| 2 . Time Sample Counted | 15:28 |
| 3 . Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 7.9 cpm |
| 4 . Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2703.1 cpm |
| Net Spike Count Rate (cpm) | 2695.2 cpm |
| H3 Spike Activity (dpm on count date) | 6929.6 dpm |
| Counter Efficiency | 0.3889 cpm/dpm |
| 5 . Sample Info: | |
| Sample Gross Count Rate (cpm) | 8.4 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.5 cpm |
| 6 . Critical Level: | |
| Critical Level Count Rate (cpm) | 2.0 cpm |

Minimum Detectable Activity

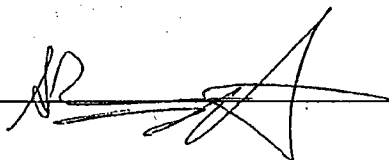
$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.20\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician



Date 5-17-10

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF-1 SUNPW11

Sample End Time: 10-MAY-2010 15:25:00.00

REMARKS

PERFORMED BY:

Southward

SIGNATURE

REVIEWED BY:

R. L. Lacey

SIGNATURE/DATE

6-22-10

Sample ID : EF-1 SUMPH11

Acquisition date : 15-JUN-2010 13:25:26

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF-1 SUMPH11
 Sample collection start date: 10-MAY-2010 15:25:00.00
 Sample collection end date : 10-MAY-2010 15:25:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.000000E+03 cc
 Sample geometry : PELL Operator: JNS

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 15-JUN-2010 13:25:26.36
 Preset live time : 0 00:45:00.00 Elapsed live time : 0 00:45:00.00
 Elapsed real time : 0 00:45:00.67 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 3-JUN-2009 17:37:00.00
 Kev/channel : 4.99767E-01 Zero offset: 3.33491E-01
 Daily cal date : 15-JUN-2010 08:23:12.97

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 510.89 | 160 | 52 | 1.34 | 1021.62 | 1014 | 15 | 5.92E-02 | 12.7 | |
| 2 | 0 | 1461.09 | 110 | 5 | 1.96 | 2923.19 | 2913 | 20 | 4.07E-02 | 10.9 | |

Sample Title : EF-1 SUMP#11
Decay Time = 35 22:00:26.36

Page : 1
Acquisition Time = 15-JUN-2010 13:25:26.3

Post-NID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Right | %Err | Fit | Nuclides |
|----|---------|------|-------|------|---------|------|-------|------|-----|----------------|
| 0 | 510.89 | 160 | 52 | 1.34 | 1021.62 | 1014 | 15 | 12.7 | | <i>Am Peak</i> |
| 0 | 1461.09 | 110 | 5 | 1.96 | 2923.19 | 2913 | 20 | 10.8 | | K-40 |

Nuclide Line Activity Report
Sample ID : EF-1 SUMPW11

Page : 2
Acquisition date : 15-JUN-2010 13:25:26

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected | Decay Corr | 1-Sigma |
|---------|---------|------|--------|-----------|-------------|------------|---------|
| | | | | | uCi/cc | uCi/cc | %Error |
| K-40 | 1460.81 | 110 | 10.67* | 2.501E+00 | 4.127E-07 | 4.127E-07 | 10.75 |

Flags: "*" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : EF-1 SUMPH11

Acquisition date : 15-JUN-2010 13:25:26

Total number of lines in spectrum

2

Number of unidentified lines

0

Number of lines tentatively identified by NID

2

100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 4.127E-07 | 4.127E-07 | 0.444E-07 | 10.75 | |
| Total Activity : | | | 4.127E-07 | 4.127E-07 | | | |

Grand Total Activity : 4.127E-07 4.127E-07

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"Q" = Nuclide specific abn. limit

Rejected Report

Page : 4

Sample ID : EF-1 SURPH11

Acquisition date : 15-JUN-2010 13:25:26

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity (uCi/cc) | 1-Sigma %Error | Rejected by |
|---------|-----------|--------|--------|--------|-------------------|----------------|-------------|
| F-18 | 109.74M | 471.50 | 511.00 | 100.00 | 1.000E+25 | 12.65 | Decay |

% Abundances Found = 100.00

Flag: "*" = Keyline

Unidentified Energy Lines

Page : 5

Sample ID : EF-1 SUMP#11

Acquisition date : 15-JUN-2010 13:25:26

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 510.89 | 160 | 52 | 1.34 | 1021.62 | 1014 | 15 | 5.92E-02 | 12.7 | 4.88E+00 | T |

Flags: "T" = Tentatively associated

Minimum Detectable Activity Report

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| BE-7 | 21. | 477.59 | 7.2479E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 10. | 1274.54 | 6.7719E-09 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 10. | 889.25 | 7.1366E-09 |
| CR-51 | 36. | 320.08 | 1.2898E-07 |
| MN-54 | 14. | 834.83 | 6.3186E-09 |
| CO-56 | 16. | 1238.25 | 1.6089E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 44. | 158.38 | 3.0243E-07 |
| CO-57 | 43. | 122.06 | 7.3952E-09 |
| CO-58 | 20. | 810.76 | 9.3744E-09 |
| FE-59 | 9. | 1099.22 | 1.7614E-08 |
| CO-60 | 8. | 1332.49 | 6.1561E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 14. | 1115.52 | 1.5106E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 61. | 136.00 | 1.2084E-08 |
| AS-76 | 0. | 559.10 | Half-Life too short |
| BR-82 | 0. | 776.49 | Half-Life too short |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 881.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 51. | 513.99 | 1.7273E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 51. | 513.99 | 1.0916E-08 |
| RE-86 | 11. | 1076.63 | 2.6544E-07 |
| KR-87 | 0. | 402.58 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RE-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 5. | 1836.01 | 7.7863E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RE-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RE-90 | 0. | 831.69 | Half-Life too short |
| RE-90M | 0. | 924.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 11. | 1204.90 | 3.2723E-06 |
| Y-91M | 0. | 555.62 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : EF-1 SUMPW11

Acquisition date : 15-JUN-2010 13:25:26

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NE-94 | 24. | 702.63 | 6.2053E-09 |
| NE-95 | 14. | 765.79 | 1.0712E-08 |
| NE-95M | 54. | 235.69 | 2.3251E-05 |
| ZR-95 | 17. | 756.72 | 1.5300E-08 |
| NE-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| MO-99 | 0. | 739.58 | Half-Life too short |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 21. | 497.08 | 1.0309E-08 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 0. | 318.90 | Half-Life too short |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 26. | 621.84 | 6.4798E-08 |
| CD-109 | 39. | 88.03 | 2.5571E-07 |
| AG-110M | 18. | 937.46 | 2.2962E-08 |
| SN-113 | 32. | 391.69 | 1.0117E-08 |
| SN-117M | 44. | 158.56 | 3.6251E-08 |
| SB-122 | 0. | 563.93 | Half-Life too short |
| SB-124 | 32. | 602.71 | 9.9057E-09 |
| SB-125 | 25. | 427.89 | 1.7084E-08 |
| TE-125M | 47. | 109.28 | 3.7146E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 27. | 57.60 | 1.9166E-05 |
| XE-127 | 65. | 202.84 | 1.7842E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 23. | 695.88 | 3.8324E-07 |
| XE-129M | 55. | 196.56 | 1.9612E-06 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 45. | 123.80 | 1.6465E-07 |
| I-131 | 30. | 364.48 | 1.3700E-07 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 0. | 773.67 | Half-Life too short |
| XE-131M | 47. | 163.93 | 2.1590E-06 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 0. | 228.16 | Half-Life too short |
| BA-133 | 36. | 302.84 | 2.8685E-08 |
| BA-133M | 0. | 276.09 | Half-Life too short |
| I-133 | 0. | 529.87 | Half-Life too short |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 28. | 81.00 | 2.9744E-06 |
| XE-133M | 0. | 233.22 | Half-Life too short |
| CS-134 | 31. | 604.70 | 6.6405E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 0. | 268.24 | Half-Life too short |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : EF-1 SUPP411

Acquisition date : 15-JUN-2018 13:25:26

| Nuclide | Bckgrnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|----------------|-----------------|---------------------|
| CS-136 | 15. | 818.50 | 3.9348E-08 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 21. | 661.65 | 6.5094E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 56. | 165.85 | 8.3549E-09 |
| CS-139 | 0. | 1293.23 | Half-Life too short |
| BA-140 | 21. | 537.32 | 1.4054E-07 |
| LA-140 | 0. | 1596.49 | Half-Life too short |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 43. | 145.44 | 2.2750E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 0. | 293.26 | Half-Life too short |
| CE-144 | 58. | 133.54 | 6.1799E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 37. | 91.10 | 2.8131E-07 |
| PM-148M | 21. | 550.27 | 9.7261E-09 |
| EU-152 | 34. | 344.27 | 1.9623E-08 |
| EU-154 | 18. | 1004.76 | 4.1016E-08 |
| EU-155 | 41. | 105.31 | 3.2963E-08 |
| EU-156 | 21. | 646.29 | 3.9716E-07 |
| HF-181 | 34. | 482.03 | 1.2926E-08 |
| TA-182 | 8. | 1221.42 | 2.6804E-08 |
| W-187 | 0. | 685.81 | Half-Life too short |
| RE-188 | 0. | 155.03 | Half-Life too short |
| HG-203 | 48. | 279.19 | 1.2441E-08 |
| BI-207 | 28. | 569.67 | 6.0424E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PB-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 54. | 240.98 | 1.4352E-04 |
| RA-226 | 65. | 186.21 | 1.8394E-07 |
| AC-228 | 32. | 338.32 | 4.4776E-08 |
| TH-228 | 37. | 84.37 | 8.3373E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 43. | 63.29 | 2.2474E-06 |
| U-235 | 52. | 143.76 | 5.3185E-08 |
| NP-239 | 0. | 186.13 | Half-Life too short |
| AM-241 | 34. | 59.54 | 1.2246E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number N/A

Task

Performed By

Date

1. Representative sample collected.

Date/Time 12/7/10 , 0925

J. Southward
Fermi 1 (signature)

12/7/10

Container Number Sample # 11

63308

Storage Location EF-1

Employee ID Number

2. Sample secured against tampering.

J. Southward
Fermi 1 (signature)

12/7/10

63308

Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 4.40E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

A. Rogers
Chemistry (signature)

12/11/10

56330

Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

Charles Proffert
RP (signature)

1-14-11

B4016

Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

1-18-11

2-1151

Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

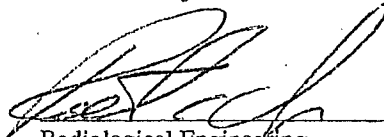
Log Number _____

Task

Performed By

Date

6. Fluid approved for release.



Radiological Engineering
(signature)

1-18-11

2-1151
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|-------------|
| 1. Sample Location | EF1 SUMP 11 |
| 2. Date Sampled | 12/07/2010 |
| 3. Time Sampled | 09:25 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 12/10/2010 |
| 2. Time Sample Counted | 19:30 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 9.3 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2435.0 cpm |
| Net Spike Count Rate (cpm) | 2425.7 cpm |
| H3 Spike Activity (dpm on count date) | 6711.4 dpm |
| Counter Efficiency | 0.3614 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 6.6 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 0.0 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 2.2 cpm |

Minimum Detectable Activity

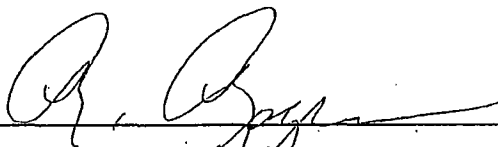
$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \sqrt{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}} = 1.40\text{E-06 uCi/ml}$$

Efficiency x 2.22E6 dpm/uCi x Sample Volume

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency x 2.22E6 uCi/ml x Sample Volume}} < \text{MDA}$$

Technician



Date

12/11/10

Reviewed By:



Date

12/13/10

12/14/10

DATA EFFICIENCY ANALYSIS REPORT

HIGH EFFICIENCY DETECTION

Sample ID: 1234567890

Sample End Time: 7-DEC-2010 09:25:02.00

REMARKS

Charles R. Papp
[Signature]

11/22/11 11:11:11

Acquisition Date: 14-JUN-2011 12:23:53

Term 2 Radiation Protection: Gamma Spectroscopy, Report

***** Sample Parameters *****

Sample ID Number: SUNF #11
 Sample collection start date: 7-DEC-2010 09:25:00.00
 Sample collection end date: 7-DEC-2010 09:25:00.00
 Type of sample: 1 L Mari. Liquid
 Sample quantity: 1.00000E+02 ml
 Sample geometry: WELL Operator: CLF

***** Acquisition Parameters *****

Detector number: DET 4 Acquire date: 14-JUN-2011 12:23:47.85
 Preset live time: 2 00:45:00.00 Elapsed live time: 0 00:43:00.00
 Elapsed real time: 0 00:45:00.64 Percent dead time: 0.03 %

***** Calibration Parameters *****

Detector number: DET 4 Yearly cal date: 23-JUN-2010 12:23:00.00
 Co./channel: 5.0007E-01 Zero offset: 1.1345E 01
 Daily cal date: 14-JUN-2011 12:23:53.74

***** Peak Search Parameters *****

Start channel: 133 End channel: 4090
 Height sensitivity: 5.00000 Shape sensitivity: 10.00000
 Maximum number of iterations to resolve multiplets: 5

***** Nuclide Identification Parameters *****

Energy tolerance: 1.75000 Half-life ratio: 10.00000
 Abundance limit: 75.00000 Library: dacmaster.nlt
 Efficiency file: EFFD4_m011 Efficiencies at: Peak energy

| PK | ID | Energy | Area | Bkgnd | FWHM | Channel | Left | FW | Cts/Sec | WErr | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|----------|
| 1 | 1 | 66.51 | 50 | 59 | 2.61 | 132.72 | 130 | 9 | 1.54E-02 | 30.4 | |
| 2 | 2 | 297.54 | 72 | 75 | 1.03 | 598.40 | 585 | 10 | 2.01E-02 | 24.2 | |
| 3 | 0 | 332.06 | 107 | 58 | 1.82 | 733.42 | 633 | 16 | 7.01E-02 | 10.4 | |
| 4 | 1 | 510.02 | 35 | 57 | 2.07 | 1000.32 | 1014 | 14 | 3.15E-02 | 22.9 | 1.00E+00 |
| 5 | 1 | 511.52 | 45 | 62 | 2.87 | 1022.32 | 1014 | 14 | 1.50E-02 | 40.5 | |
| 6 | 3 | 559.02 | 24 | 39 | 3.71 | 1117.12 | 1112 | 11 | 1.34E-02 | 37.8 | |
| 7 | 1 | 567.57 | 103 | 40 | 1.58 | 1217.03 | 1202 | 14 | 5.66E-02 | 12.4 | |
| 8 | 3 | 609.21 | 39 | 4 | 6.57 | 1235.17 | 1231 | 17 | 1.45E-02 | 25.0 | |
| 9 | 0 | 1120.27 | 17 | 11 | 1.73 | 2236.27 | 2233 | 11 | 1.40E-02 | 22.7 | |
| 10 | 0 | 1411.43 | 27 | 12 | 2.37 | 2752.77 | 2311 | 23 | 2.40E-02 | 10.1 | |

DATE: 10/10/81
 TIME: 10:00 AM

ANALYST: J. L. ...

Multi-View Peak Search Report

| ID | Time | Area | Height | FWHM | Channel | Left | Right | FWHM | FWHM |
|----|---------|------|--------|------|---------|------|-------|------|----------|
| 1 | 56.51 | 132 | 59 | 2.81 | 132.72 | 132 | 9 | 32.4 | |
| 2 | 205.54 | 70 | 75 | 1.33 | 205.13 | 205 | 10 | 24.2 | |
| 3 | 302.06 | 107 | 35 | 1.02 | 302.15 | 300 | 10 | 10.4 | |
| 4 | 510.12 | 35 | 57 | 2.37 | 510.35 | 514 | 14 | 22.0 | 1.50E+00 |
| 5 | 511.02 | 42 | 60 | 1.87 | 510.35 | 514 | 14 | 40.7 | |
| 6 | 553.02 | 31 | 25 | 0.71 | 553.12 | 552 | 11 | 20.3 | |
| 7 | 632.10 | 152 | 42 | 1.57 | 632.56 | 632 | 14 | 12.4 | |
| 8 | 632.21 | 39 | 4 | 0.37 | 632.17 | 632 | 17 | 22.2 | |
| 9 | 1102.27 | 37 | 11 | 1.75 | 1102.33 | 1102 | 11 | 22.7 | |
| 10 | 1401.43 | 57 | 12 | 2.37 | 1401.77 | 1411 | 23 | 10.1 | |

HWC
 Pb-214
 Pb-214
 Ann. Peak
 FWHM Low
 Bi-214
 High FWHM
 Bi-214
 X-40
 J-1-1411

Summary of Results Report
Sample: 1000000000

Analysis Date: 10/10/2000 10:10:10

Table Type: Normal

| Index | Energy | Rise | Area | Rate | Corrected Data | Count | Rate |
|-------|---------|------|--------|-----------|----------------|-----------|--------|
| 100 | 1450.01 | 57 | 10.07% | 5.001E+00 | 5.400E-07 | 5.400E-07 | 10.07% |

Flag: 000 = Normal

Sample Name: 100112-01
 Sample No: 100112-01

Acquisition Date: 10/17/2012 12:17:11

Total number of lines in spectrum: 10
 Number of identified lines: 1
 Number of lines tentatively identified by NID: 9 99.00%

Isotope Type: 1 Natural

| Isotope | Wavelength | Decay | Unsubtracted | Decay Corr | Decay Corr | 1-Sigma | 1-Sigma Error | Source Flag |
|-----------------|------------|-------|--------------|------------|------------|---------|---------------|-------------|
| | nm | | cts/sec | cts/sec | cts/sec | | | |
| K-40 | 1.460467 | 1.90 | 2.495E-07 | 2.495E-07 | 2.495E-07 | 18.35 | | |
| Total Activity: | | | 2.495E-07 | 2.495E-07 | | | | |

Grand Total Activity: 2.495E-07 2.495E-07

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

"M" = Manually accepted
 "A" = Isotope specific abbr. label

Final Report
 1/1/77 10:10 AM

Acquisition Date: 1/1/77 10:10 AM

| Isotope | Half-Life | Period | Energy, MeV | Abundance | 1-Sigma | Decay |
|-----------------------------|-----------|-----------|---------------|-----------|-----------|--------------|
| 100-100 | 100.74M | 500.40 | 511.00+100.40 | 1.000E+00 | 22.00 | Decay |
| % Abundances Found = 100.00 | | | | | | |
| 100-45 | 80.00E | 2.40 | 140.00 | 50.70 | Not Found | Abun. |
| | | | 300.00 | 37.00 | Not Found | |
| | | | 1100.00 | 70.00 | 1.000E+00 | 22.00 |
| % Abundances Found = 31.07 | | | | | | |
| 100-70 | 110.70E | 0.00 | 60.00 | 1.00 | 4.400E-00 | 30.40 |
| | | | 90.00 | 0.10 | Not Found | |
| | | | 101.10 | 10.70 | Not Found | |
| | | | 130.00 | 09.00 | Not Found | |
| | | | 100.00 | 1.40 | Not Found | |
| | | | 200.00 | 09.00 | Not Found | |
| | | | 270.00 | 00.00 | Not Found | |
| | | | 300.00 | 1.00 | Not Found | |
| | | | 400.00 | 11.40 | Not Found | |
| % Abundances Found = 0.07 | | | | | | |
| 100-70 | 80.00E | 34.70 | 500.00 | 44.70 | 4.700E+00 | 39.01 |
| | | | 500.00 | 1.17 | Not Found | |
| | | | 570.00 | 0.14 | Not Found | |
| | | | 600.00 | 0.10 | Not Found | |
| | | | 600.00 | 0.39 | Not Found | |
| | | | 700.00 | 0.10 | Not Found | |
| | | | 770.00 | 0.10 | Not Found | |
| | | | 800.00 | 0.10 | Not Found | |
| | | | 1100.00 | 0.14 | Not Found | |
| | | | 1010.00 | 1.00 | Not Found | |
| | | | 1010.00 | 3.04 | Not Found | |
| | | | 1000.00 | 1.00 | Not Found | |
| | | | 1400.00 | 0.00 | Not Found | |
| | | | 1400.00 | 0.10 | Not Found | |
| | | | 1700.00 | 0.00 | Not Found | |
| % Abundances Found = 70.70 | | | | | | |
| 100-00 | 30.00E | 101001.00 | 101.00 | 30.00 | Not Found | Decay, Abun. |
| | | | 500.00 | 09.00 | Not Found | |
| | | | 1100.00 | 07.00 | 1.000E+00 | 22.00 |
| % Abundances Found = 37.70 | | | | | | |
| 100-100 | 80.00E | 0.00 | 400.00 | 09.00 | Not Found | Abun. |
| | | | 010.00 | 0.00 | 1.104E-00 | 12.00 |
| % Abundances Found = 0.00 | | | | | | |
| 100-100 | 0.10E | 100.00 | 010.00 | 07.00 | Not Found | Decay, Abun. |
| | | | 000.00 | 0.00 | 0.074E-04 | 10.00 |
| % Abundances Found = 0.00 | | | | | | |
| 100-100 | 10.00E | 1.00 | 01.00 | 10.00 | Not Found | Abun. |
| | | | 01.00 | 0.00 | Not Found | |
| | | | 100.00 | 0.00 | Not Found | |

Sample ID: 1000 101

Acquisition Date: 11/28/2012 11:21:17

| Sample ID | Mass (g) | Ratio | Energy (keV) | Wavelength (nm) | Activity (Bq) | 1-Sigma Error | Flag |
|-----------|----------|----------------------|--------------|-----------------|-----------------------|---------------|-------|
| 70-100 | 10.100 | 2.00 | 102.30 | 4.61 | Not Found | Abn. | |
| | | | 170.30 | 13.27 | Not Found | | |
| | | | 270.30 | 12.66 | Not Found | | |
| | | | 340.30 | 10.30 | Not Found | | |
| | | | 610.30* | 20.70 | 8.245E+02 | 12.99 | |
| | | | 1040.30 | 11.66 | Not Found | | |
| | | | 1200.30 | 10.73 | Not Found | | |
| | | % Abundances Found = | 32.34 | | | | |
| 70-100 | 114.740 | 3.30 | 57.70 | 40.30 | 1.228E+07 | 30.40 | Abn. |
| | | | 100.10 | 14.18 | Not Found | | |
| | | | 1100.30 | 10.30 | Not Found | | |
| | | | 1200.30* | 10.73 | Not Found | | |
| | | | 1200.30 | 11.66 | Not Found | | |
| | | % Abundances Found = | 32.34 | | | | |
| 21-214 | 10.900 | 2750.90 | 600.31* | 40.30 | 1.000E+05 | 12.30 | Decay |
| | | | 700.30 | 5.34 | Not Found | | |
| | | | 800.30 | 3.11 | Not Found | | |
| | | | 1100.30 | 10.10 | 1.000E+05 | 22.30 | |
| | | | 1200.30 | 5.94 | Not Found | | |
| | | | 1377.67 | 4.11 | Not Found | | |
| | | | 1700.40 | 15.00 | Not Found | | |
| | | % Abundances Found = | 64.20 | | (Abn. Limit = 40.40%) | | |
| 72-214 | 25.300 | 2049.30 | 37.30 | 4.67 | Not Found | | Decay |
| | | | 241.02 | 7.43 | Not Found | | |
| | | | 200.30 | 10.30 | 1.000E+05 | 24.21 | |
| | | | 351.92* | 37.30 | 1.000E+05 | 13.44 | |
| | | | 700.30 | 1.10 | Not Found | | |
| | | % Abundances Found = | 80.30 | | (Abn. Limit = 37.00%) | | |

Flag: "X" = Rayline

... ..

... ..

| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
|-----|---------|-----|-----|------|---------|------|-----|----------|------|----------|-----|
| 1 | 10.51 | 52 | 57 | 2.31 | 132.72 | 172 | 3 | 1.01E-02 | 22.1 | 2.41E-02 | 1 |
| 2 | 235.54 | 70 | 75 | 1.32 | 555.70 | 557 | 15 | 1.51E-02 | 21.1 | 2.52E-02 | 7 |
| 3 | 311.02 | 133 | 58 | 1.32 | 733.72 | 555 | 10 | 7.04E-02 | 22.1 | 3.72E-02 | 7 |
| 4 | 511.02 | 15 | 57 | 2.37 | 1003.32 | 1017 | 14 | 3.13E-02 | 22.0 | 4.55E-02 | 7 |
| 5 | 711.02 | 12 | 63 | 2.37 | 1222.22 | 1217 | 14 | 1.52E-02 | 13.0 | 4.62E-02 | |
| 6 | 959.52 | 34 | 39 | 0.71 | 1117.32 | 1112 | 14 | 1.21E-02 | 33.5 | 4.52E-02 | 7 |
| 7 | 107.17 | 153 | 61 | 1.72 | 1217.72 | 1212 | 14 | 3.03E-02 | 12.1 | 4.52E-02 | 7 |
| 8 | 353.21 | 35 | 4 | 1.37 | 1339.17 | 1331 | 17 | 1.45E-02 | 22.0 | 3.55E-02 | 7 |
| 9 | 1123.57 | 35 | 11 | 1.73 | 2233.37 | 2232 | 14 | 1.43E-02 | 22.5 | 2.52E-02 | 7 |

... ..

1. The first step is to identify the problem. In this case, the problem is that the company is not meeting its sales targets.

[illegible]
$$\begin{aligned} \frac{1}{2} \log \frac{1}{2} &= \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 1 = \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 = \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 \\ &= \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 = \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 \\ &= \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 = \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 \\ &= \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 = \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log \frac{1}{2} + \frac{1}{2} \log 2 \end{aligned}$$

| Model | Background | Energy | Notes |
|----------|------------|---------|---------------------|
| 10-11-11 | 36. | 477.87 | 3.3355E-03 |
| 10-11 | 0. | 511.37 | Half-Life too short |
| 10-12 | 0. | 1274.84 | 3.8233E-09 |
| 10-13 | 0. | 1332.51 | Half-Life too short |
| 10-14 | 0. | 1314.44 | Half-Life too short |
| 10-15 | 0. | 1342.42 | Half-Life too short |
| 10-16 | 0. | 1293.14 | Half-Life too short |
| 10-17 | 15. | 533.37 | 3.5814E-03 |
| 10-18 | 42. | 323.38 | 1.4773E-07 |
| 10-19 | 15. | 374.17 | 3.8233E-09 |
| 10-20 | 38. | 1233.28 | 3.8233E-09 |
| 10-21 | 0. | 1613.07 | Half-Life too short |
| 10-22 | 53. | 153.38 | 4.2447E-07 |
| 10-23 | 40. | 122.86 | 7.6103E-09 |
| 10-24 | 15. | 318.76 | 3.3355E-03 |
| 10-25 | 10. | 1339.22 | 1.8738E-03 |
| 10-26 | 14. | 1332.49 | 7.8248E-09 |
| 10-27 | 0. | 1343.90 | Half-Life too short |
| 10-28 | 0. | 1431.84 | Half-Life too short |
| 10-29 | 18. | 1115.82 | 1.7343E-02 |
| 10-30 | 3. | 435.63 | Half-Life too short |
| 10-31 | 52. | 132.38 | 1.2303E-03 |
| 10-32 | 0. | 359.13 | Half-Life too short |
| 10-33 | 2. | 775.43 | Half-Life too short |
| 10-34 | 0. | 329.64 | Half-Life too short |
| 10-35 | 0. | 531.80 | Half-Life too short |
| 10-36 | 0. | 322.41 | Half-Life too short |
| 10-37 | 60. | 513.37 | 1.3640E-03 |
| 10-38 | 0. | 151.13 | Half-Life too short |
| 10-39 | 60. | 513.37 | 1.2063E-03 |
| 10-40 | 13. | 1276.23 | 3.7592E-07 |
| 10-41 | 0. | 462.53 | Half-Life too short |
| 10-42 | 0. | 388.43 | Half-Life too short |
| 10-43 | 0. | 172.32 | Half-Life too short |
| 10-44 | 0. | 1332.51 | Half-Life too short |
| 10-45 | 1. | 1332.51 | 3.4255E-03 |
| 10-46 | 0. | 253.98 | Half-Life too short |
| 10-47 | 1. | 1332.51 | Half-Life too short |
| 10-48 | 0. | 1115.82 | Half-Life too short |
| 10-49 | 7. | 531.37 | Half-Life too short |
| 10-50 | 3. | 554.23 | Half-Life too short |
| 10-51 | 3. | 202.71 | Half-Life too short |
| 10-52 | 0. | 1332.51 | Half-Life too short |
| 10-53 | 0. | 1332.51 | Half-Life too short |
| 10-54 | 0. | 359.13 | Half-Life too short |
| 10-55 | 0. | 1332.51 | Half-Life too short |
| 10-56 | 0. | 1332.51 | Half-Life too short |

| Sample No. | Depth (m) | Energy (kWh) | Time (h:m:s) |
|------------|-----------|--------------|---------------------|
| 10-10-67 | 25. | 512.53 | 3.4243E-03 |
| 10-10-67 | 3. | 1312.02 | Half-Life too short |
| 10-10-67 | 25. | 621.63 | 7.1327E-07 |
| 10-10-67 | 3. | 403.43 | Half-Life too short |
| 10-10-67 | 3. | 1435.66 | Half-Life too short |
| 10-10-67 | 6. | 253.31 | Half-Life too short |
| 10-10-67 | 3. | 1429.50 | Half-Life too short |
| 10-10-67 | 27. | 105.15 | 3.4723E-07 |
| 10-10-67 | 3. | 1222.23 | Half-Life too short |
| 10-10-67 | 27. | 557.22 | 1.0207E-07 |
| 10-10-67 | 3. | 1556.49 | Half-Life too short |
| 10-10-67 | 3. | 173.22 | Half-Life too short |
| 10-10-67 | 47. | 145.44 | 2.5355E-08 |
| 10-10-67 | 3. | 1354.52 | Half-Life too short |
| 10-10-67 | 3. | 255.12 | Half-Life too short |
| 10-10-67 | 3. | 341.17 | Half-Life too short |
| 10-10-67 | 3. | 293.26 | Half-Life too short |
| 10-10-67 | 34. | 133.74 | 6.5335E-08 |
| 10-10-67 | 3. | 1429.15 | Half-Life too short |
| 10-10-67 | 42. | 31.10 | 3.4031E-07 |
| 10-10-67 | 25. | 553.27 | 1.1273E-08 |
| 10-10-67 | 33. | 344.27 | 2.8941E-08 |
| 10-10-67 | 16. | 1264.76 | 3.5952E-08 |
| 10-10-67 | 43. | 125.31 | 3.5353E-08 |
| 10-10-67 | 24. | 346.29 | 4.3715E-07 |
| 10-10-67 | 28. | 463.63 | 1.1323E-08 |
| 10-10-67 | 3. | 1221.42 | 2.7240E-08 |
| 10-10-67 | 3. | 635.31 | Half-Life too short |
| 10-10-67 | 3. | 135.23 | Half-Life too short |
| 10-10-67 | 31. | 273.19 | 1.3709E-08 |
| 10-10-67 | 27. | 563.67 | 3.9267E-03 |
| 10-10-67 | 3. | 583.14 | Half-Life too short |
| 10-10-67 | 3. | 236.63 | Half-Life too short |
| 10-10-67 | 3. | 355.31 | Half-Life too short |
| 10-10-67 | 3. | 351.92 | Half-Life too short |
| 10-10-67 | 3. | 243.72 | Half-Life too short |
| 10-10-67 | 36. | 152.21 | 1.7161E-07 |
| 10-10-67 | 33. | 331.32 | 5.7141E-03 |
| 10-10-67 | 44. | 34.37 | 3.9224E-07 |
| 10-10-67 | 3. | 131.22 | Half-Life too short |
| 10-10-67 | 41. | 32.29 | 2.3513E-08 |
| 10-10-67 | 48. | 143.72 | 5.1244E-03 |
| 10-10-67 | 3. | 126.13 | Half-Life too short |
| 10-10-67 | 27. | 33.74 | 1.0413E-07 |

EF-1 Sump #11
2011

FERMI I NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number EFI-2-110028

Task

Performed By

Date

1. Representative sample collected.

Date/Time 5/13/11 11:40

CP.affort
Fermi 1 (signature)

5-13-11

Container Number Summit 11

B4016
Employee ID Number

Storage Location EF1

2. Sample secured against tampering.

CP.affort
Fermi 1 (signature)

5-13-11

B4016
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.1E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

AD
Chemistry (signature)

5-15-11

592
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

CP.affort
RP (signature)

5-15-11

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

[Signature]
Radiological Engineering (signature)

5-20-11

Z-1151
Employee ID Number

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

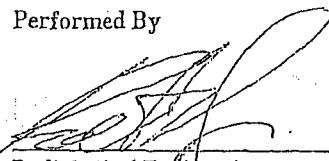
Log Number EPI-L-110028

Task

Performed By

Date

6. Fluid approved for release.


Radiological Engineering
(signature)

21151
Employee ID Number

Remarks:

Tritium Activity Calculation

Sample Information

| | |
|------------------------|--------------|
| 1. Sample Location | EF1-L-110028 |
| 2. Date Sampled | 05/13/2011 |
| 3. Time Sampled | 15:40 |
| 4. Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | |
|---|----------------|
| 1. Date Sample Counted | 05/15/2011 |
| 2. Time Sample Counted | 18:55 |
| 3. Background Inf.: | |
| Minutes Counted | 10 min. |
| Background Count Rate (cpm) | 6.7 cpm |
| 4. Efficiency Inf.: (Daily Spike Source ID # 111) | |
| Gross Spike Count Rate (cpm) | 2397.9 cpm |
| Net Spike Count Rate (cpm) | 2391.2 cpm |
| H3 Spike Activity (dpm on count date) | 6551.6 dpm |
| Counter Efficiency | 0.3650 cpm/dpm |
| 5. Sample Info: | |
| Sample Gross Count Rate (cpm) | 8.2 cpm |
| Sample Count Time (min.) | 10.0 min. |
| Net Sample Count Rate (cpm) | 1.5 cpm |
| 6. Critical Level: | |
| Critical Level Count Rate (cpm) | 1.9 cpm |

Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smpl min.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.18\text{E-06 uCi/ml}$$

Sample Activity

$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician [Signature]

Date 5-15-11

Reviewed By: W. Bausen

Date 5-16-11

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: EF1-L-110029 SUMP #11

Sample End Time: 13-MAY-2011 15:40:00.00

REMARKS

Natural

PERFORMED BY:

Charles Proffitt

SIGNATURE

REVIEWED BY:

[Signature]

SIGNATURE/DATE

Sample ID : EF1-L-110028 SUM

Acquisition date : 20-MAY-2011 12:03:30

Fermi 2 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number: EF1-L-110028 SUMP #11
 Sample collection start date: 13-MAY-2011 15:40:00.00
 Sample collection end date : 13-MAY-2011 15:40:00.00
 Type of sample : 1 L Mari. Liquid
 Sample quantity : 1.00000E+03 cc
 Sample geometry : M2LL Operator: CLP

***** Acquisition Parameters *****

Detector number : DET 4 Acquire date : 20-MAY-2011 12:03:30.17
 Preset live time : 0 00:45:00.00 Elapsed live time : 0 00:45:00.00
 Elapsed real time : 0 00:45:00.59 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 23-JUN-2010 12:28:00.00
 Kev/channel : 4.99766E-01 Zero offset: 1.89593E-01
 Daily cal date : 20-MAY-2011 10:42:08.12

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dacmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 139.36 | 48 | 92 | 0.95 | 278.48 | 274 | 11 | 1.79E-02 | 40.9 | |
| 2 | 0 | 352.15 | 79 | 56 | 1.93 | 704.25 | 697 | 15 | 2.91E-02 | 23.7 | |
| 3 | 0 | 511.16 | 175 | 46 | 1.72 | 1022.48 | 1014 | 17 | 6.50E-02 | 11.7 | |
| 4 | 0 | 558.67 | 29 | 22 | 0.96 | 1117.50 | 1114 | 10 | 1.06E-02 | 35.0 | |
| 5 | 0 | 609.98 | 67 | 40 | 2.01 | 1220.16 | 1215 | 15 | 2.47E-02 | 24.2 | |
| 6 | 0 | 1461.76 | 70 | 15 | 1.47 | 2924.62 | 2916 | 21 | 2.60E-02 | 18.4 | |

Post-MID Peak Search Report

| It | Energy | Area | Bkgnd | FWHM Channel | Left | PW | MEFF | Fit | Nuclides |
|----|---------|------|-------|--------------|---------|------|------|------|------------------|
| 0 | 139.36 | 48 | 92 | 0.95 | 270.48 | 274 | 11 | 40.9 | Ge(V-7) (cont'd) |
| 0 | 352.15 | 79 | 56 | 1.93 | 704.25 | 697 | 15 | 23.7 | Pb-214 |
| 0 | 511.16 | 175 | 46 | 1.72 | 1022.48 | 1014 | 17 | 11.7 | Ann Peak |
| 0 | 550.67 | 29 | 22 | 0.96 | 1117.50 | 1114 | 10 | 35.0 | Ge(V-7) (cont'd) |
| 0 | 609.98 | 67 | 40 | 2.01 | 1220.16 | 1215 | 15 | 24.2 | Pb-214 |
| 0 | 1461.76 | 70 | 15 | 1.47 | 2924.62 | 2916 | 21 | 18.4 | K-40 |

f-5-20-11

Nuclide Line Activity Report
Sample ID : EF1-L-110023 SUM

Page : 2
Acquisition date : 20-MAY-2011 12:03:30

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn | %Eff | Uncorrected uCi/cc | Decay Corr uCi/cc | 1-Sigma %Error |
|---------|---------|------|--------|-----------|-----------------------|----------------------|-------------------|
| K-40 | 1460.61 | 70 | 10.67* | 2.500E+00 | 2.637E-07 | 2.637E-07 | 10.42 |

Flag: "x" = Keyline

Summary of Nuclide Activity

Page : 3

Sample ID : EFi-L-116023 SUR

Acquisition date : 26-MAY-2011 12:03:00

Total number of lines in spectrum 6
Number of unidentified lines 0
Number of lines tentatively identified by NID 6 100.00%

Nuclide Type : natural

| Nuclide | Hlife | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 2.637E-07 | 2.637E-07 | 0.406E-07 | 15.42 | |
| Total Activity : | | | 2.637E-07 | 2.637E-07 | | | |

Grand Total Activity : 2.637E-07 2.637E-07

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"Q" = Nuclide specific abn. limit

Rejected Report

Page : 3

Sample ID : EPI-L-110020 SUM

Acquisition date : 20-MAY-2011 12:03:30

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|---------|-----------|--------|---------|-----------------------------|------------------------------|-----------|--------------|
| F-18 | 109.74M | 90.09 | 511.00* | 193.46 | 2.436E+19 | 11.68 | Decay |
| | | | | % Abundances Found = 100.00 | | | |
| AS-76 | 26.32H | 6.26 | 559.10* | 44.70 | 1.053E-06 | 35.01 | Abun. |
| | | | | 563.23 | 1.17 | ---- | Not Found |
| | | | | 571.30 | 0.14 | ---- | Not Found |
| | | | | 657.03 | 6.10 | ---- | Not Found |
| | | | | 665.31 | 0.39 | ---- | Not Found |
| | | | | 740.12 | 0.12 | ---- | Not Found |
| | | | | 771.76 | 0.12 | ---- | Not Found |
| | | | | 867.63 | 0.12 | ---- | Not Found |
| | | | | 1129.87 | 0.14 | ---- | Not Found |
| | | | | 1212.72 | 1.63 | ---- | Not Found |
| | | | | 1216.02 | 3.84 | ---- | Not Found |
| | | | | 1220.52 | 1.39 | ---- | Not Found |
| | | | | 1439.13 | 0.33 | ---- | Not Found |
| | | | | 1453.60 | 0.13 | ---- | Not Found |
| | | | | 1787.67 | 0.33 | ---- | Not Found |
| | | | | % Abundances Found = 73.70 | | | |
| MO-99 | 66.02H | 2.50 | 140.51 | 3.80 | 1.123E-06 | 40.92 | Abun. |
| | | | | 181.06 | 6.20 | ---- | Not Found |
| | | | | 366.43 | 1.37 | ---- | Not Found |
| | | | | 739.58* | 12.80 | ---- | Not Found |
| | | | | 778.00 | 4.50 | ---- | Not Found |
| | | | | % Abundances Found = 13.25 | | | |
| TC-99M | 6.02H | 27.37 | 140.50* | 89.07 | 1.472E+00 | 40.92 | Decay |
| | | | | % Abundances Found = 100.00 | | | |
| RU-103 | 39.35D | 0.17 | 497.08* | 89.00 | ---- | Not Found | Abun. |
| | | | | 610.33 | 5.60 | 2.980E-07 | 24.25 |
| | | | | % Abundances Found = 5.92 | | | |
| CS-138 | 32.20M | 307.02 | 138.10 | 1.49 | 1.000E+35 | 40.92 | Decay, Abun. |
| | | | | 227.76 | 1.51 | ---- | Not Found |
| | | | | 400.98 | 4.66 | ---- | Not Found |
| | | | | 462.79 | 30.70 | ---- | Not Found |
| | | | | 546.94 | 10.80 | ---- | Not Found |
| | | | | 871.80 | 5.11 | ---- | Not Found |
| | | | | 1009.78 | 29.80 | ---- | Not Found |
| | | | | 1147.22 | 1.24 | ---- | Not Found |
| | | | | 1343.59 | 1.14 | ---- | Not Found |
| | | | | 1435.86* | 76.30 | ---- | Not Found |
| | | | | % Abundances Found = 0.92 | | | |
| PM-148M | 41.36D | 0.17 | 288.11 | 12.56 | ---- | Not Found | Abun. |
| | | | | 414.07 | 18.66 | ---- | Not Found |
| | | | | 432.78 | 5.35 | ---- | Not Found |
| | | | | 501.26 | 5.75 | ---- | Not Found |
| | | | | 550.27* | 94.90 | ---- | Not Found |
| | | | | 599.74 | 12.54 | ---- | Not Found |

Rejected Report (continued)
Sample ID : EF1-L-110023 SUM

Page: 5
Acquisition date : 20-MAY-2011 12:03:30

| Nuclide | Half-life | Ratio | Energy | %Abund | Activity 1-Sigma (uCi/cc) | %Error | Rejected by |
|----------------------|-----------|-------|---------|--------|------------------------------|-----------|-------------|
| PM-148M | 41.38D | 0.17 | 611.26 | 5.46 | 3.027E-07 | 24.25 | Abun. |
| | | | 629.97 | 89.80 | ---- | Not Found | ---- |
| | | | 725.70 | 32.80 | ---- | Not Found | ---- |
| | | | 915.33 | 17.17 | ---- | Not Found | ---- |
| | | | 1013.01 | 20.30 | ---- | Not Found | ---- |
| % Abundances Found = | | | | 1.74 | | | |

| | | | | | | | |
|----------------------|--------|--------|---------|-------|-----------------------|-----------|-------|
| BI-214 | 19.90M | 496.78 | 609.31* | 46.30 | 1.000E+35 | 24.25 | Decay |
| | | | 760.36 | 5.04 | ---- | Not Found | ---- |
| | | | 934.06 | 3.21 | ---- | Not Found | ---- |
| | | | 1120.29 | 15.10 | ---- | Not Found | ---- |
| | | | 1230.11 | 5.94 | ---- | Not Found | ---- |
| | | | 1377.67 | 4.11 | ---- | Not Found | ---- |
| | | | 1764.49 | 15.80 | ---- | Not Found | ---- |
| % Abundances Found = | | | | 48.40 | (Abn. Limit = 48.40%) | | |

| | | | | | | | |
|----------------------|--------|--------|---------|-------|-----------------------|-----------|-------|
| PB-214 | 26.80M | 368.88 | 87.30 | 4.67 | ---- | Not Found | Decay |
| | | | 241.98 | 7.49 | ---- | Not Found | ---- |
| | | | 295.21 | 19.20 | ---- | Not Found | ---- |
| | | | 351.92* | 37.20 | 1.000E+35 | 23.67 | |
| | | | 705.91 | 1.10 | ---- | Not Found | ---- |
| % Abundances Found = | | | | 53.40 | (Abn. Limit = 37.20%) | | |

Flag: "*" = Keyline

Unidentified Energy Lines
Sample ID : EFi-L-116026 SUR

Page : 6
Acquisition date : 20-MAY-2011 12:03:26

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0 | 139.36 | 48 | 92 | 0.95 | 270.48 | 274 | 11 | 1.79E-02 | 40.9 | 6.38E+00 | T |
| 0 | 352.15 | 79 | 56 | 1.93 | 704.25 | 697 | 15 | 2.91E-02 | 23.7 | 5.70E+00 | T |
| 0 | 511.18 | 175 | 46 | 1.72 | 1022.48 | 1014 | 17 | 6.50E-02 | 11.7 | 4.88E+00 | T |
| 0 | 558.67 | 29 | 22 | 0.96 | 1117.50 | 1114 | 10 | 1.06E-02 | 35.0 | 4.69E+00 | T |
| 0 | 609.99 | 67 | 40 | 2.01 | 1220.16 | 1215 | 15 | 2.47E-02 | 24.2 | 4.52E+00 | T |

Flags: "T" = Tentatively associated

* Detroit Edison Fermi 2 MDA Report, Generated 20-MAY-2011 12:48:36.63 *

* Sample ID : EF1-L-110028 SUMP #11 *

Minimum Detectable Activity Report

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|------------|--------------|---------------------|
| BE-7 | 31. | 477.59 | 5.9453E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 11. | 1274.54 | 6.6316E-09 |
| NA-24 | 0. | 1368.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-38 | 0. | 1642.42 | Half-Life too short |
| AR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 12. | 809.25 | 6.0661E-09 |
| CR-51 | 30. | 320.00 | 5.7913E-08 |
| MN-54 | 42. | 834.83 | 9.5405E-09 |
| CO-56 | 13. | 1238.25 | 1.1221E-08 |
| MN-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 50. | 158.38 | 1.1750E-08 |
| CO-57 | 52. | 122.06 | 7.4871E-09 |
| CO-58 | 20. | 810.76 | 7.1171E-09 |
| FE-59 | 15. | 1099.22 | 1.3909E-08 |
| CO-60 | 17. | 1332.49 | 8.2733E-09 |
| CU-64 | 0. | 1345.90 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 19. | 1115.52 | 1.5995E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 44. | 136.00 | 9.3412E-09 |
| AS-76 | 47. | 559.10 | 1.2636E-06 |
| BR-82 | 22. | 776.49 | 1.9967E-07 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 981.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 53. | 513.99 | 1.7548E-06 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 53. | 513.99 | 8.1699E-09 |
| RB-86 | 12. | 1076.63 | 9.2126E-08 |
| KR-87 | 0. | 482.50 | Half-Life too short |
| SR-87M | 0. | 388.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| RB-88 | 0. | 1382.39 | Half-Life too short |
| Y-88 | 8. | 1836.01 | 7.5639E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.88 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RB-90 | 0. | 831.69 | Half-Life too short |
| RB-90M | 0. | 824.23 | Half-Life too short |
| Y-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Y-91 | 14. | 1204.90 | 2.5696E-06 |
| Y-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Y-92 | 0. | 934.46 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 2

Sample ID : EF1-L-110628 SUR

Acquisition date : 20-MAY-2011 12:03:30

| Nuclide | Bkgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|--------------|-----------------|---------------------|
| SR-93 | 0. | 590.28 | Half-Life too short |
| Y-93 | 0. | 266.90 | Half-Life too short |
| NB-94 | 19. | 702.63 | 5.6164E-09 |
| NB-95 | 18. | 765.79 | 6.8385E-09 |
| NB-95M | 49. | 235.69 | 8.3248E-08 |
| ZR-95 | 18. | 756.72 | 1.1404E-08 |
| NB-97 | 0. | 657.90 | Half-Life too short |
| ZR-97 | 16. | 743.36 | 4.7882E-06 |
| MO-99 | 22. | 739.58 | 2.7534E-07 |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.81 | Half-Life too short |
| RU-103 | 34. | 497.09 | 7.6650E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 37. | 318.90 | 6.9119E-07 |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 31. | 621.84 | 6.5832E-08 |
| CD-109 | 55. | 88.03 | 2.8719E-07 |
| AG-110M | 14. | 937.48 | 1.8933E-08 |
| SN-113 | 35. | 391.69 | 8.8486E-09 |
| SN-117M | 50. | 158.56 | 8.7420E-09 |
| SB-122 | 23. | 563.93 | 4.4271E-08 |
| SB-124 | 33. | 602.71 | 7.1427E-09 |
| SB-125 | 29. | 427.89 | 1.7842E-08 |
| TE-125M | 24. | 109.28 | 1.9207E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 27. | 57.60 | 1.5712E-05 |
| XE-127 | 49. | 202.84 | 9.9731E-09 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 23. | 695.88 | 2.1184E-07 |
| XE-129M | 46. | 196.56 | 1.8636E-07 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 43. | 123.80 | 2.9198E-08 |
| I-131 | 34. | 364.48 | 1.1866E-08 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 22. | 773.67 | 7.7876E-07 |
| XE-131M | 54. | 163.93 | 4.1972E-07 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 50. | 228.16 | 2.7420E-08 |
| BA-133 | 37. | 302.84 | 2.9041E-08 |
| BA-133M | 43. | 276.09 | 5.5397E-07 |
| I-133 | 27. | 529.87 | 1.5763E-06 |
| TE-133M | 0. | 912.58 | Half-Life too short |
| XE-133 | 29. | 81.00 | 6.5108E-08 |
| XE-133M | 52. | 233.22 | 4.8509E-07 |
| CS-134 | 27. | 604.70 | 6.0983E-09 |
| I-134 | 0. | 884.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 36. | 268.24 | 1.6511E-06 |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Minimum Detectable Activity Report (continued)

Page : 3

Sample ID : EF1-L-110020 SUM

Acquisition date : 20-MAY-2011 12:03:30

| Nuclide | Bckgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|---------------|-----------------|---------------------|
| CS-136 | 17. | 818.50 | 8.7694E-09 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 16. | 661.65 | 5.7749E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.06 | Half-Life too short |
| XE-138 | 0. | 258.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 66. | 165.85 | 7.7979E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 19. | 537.32 | 2.8284E-08 |
| LA-140 | 10. | 1596.49 | 1.3195E-07 |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 55. | 145.44 | 1.3701E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 44. | 293.26 | 4.1870E-07 |
| CE-144 | 52. | 133.54 | 5.5039E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 27. | 91.10 | 3.9426E-08 |
| PM-148M | 19. | 550.27 | 5.7490E-09 |
| EU-152 | 40. | 344.27 | 2.1175E-08 |
| EU-154 | 10. | 1004.76 | 3.2095E-08 |
| EU-155 | 33. | 105.31 | 2.9409E-08 |
| EU-156 | 11. | 646.29 | 8.0442E-08 |
| HF-181 | 28. | 482.03 | 7.3513E-09 |
| TA-182 | 17. | 1221.42 | 3.0687E-08 |
| W-187 | 16. | 685.81 | 2.1062E-06 |
| RE-188 | 43. | 155.03 | 2.7843E-05 |
| AU-199 | 50. | 150.38 | 6.5820E-08 |
| HG-203 | 41. | 279.19 | 7.5647E-09 |
| BI-207 | 25. | 569.67 | 5.7754E-09 |
| TL-208 | 0. | 593.14 | Half-Life too short |
| PB-212 | 0. | 238.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PB-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 57. | 240.98 | 5.6651E-07 |
| RA-226 | 59. | 186.21 | 1.7540E-07 |
| AC-228 | 42. | 338.32 | 4.9771E-08 |
| TH-228 | 52. | 84.37 | 9.4112E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 32. | 63.29 | 8.5849E-07 |
| U-235 | 51. | 143.76 | 5.2659E-08 |
| NP-239 | 34. | 106.13 | 2.0321E-07 |
| AM-241 | 34. | 59.54 | 1.2164E-07 |

FERMI 1 NON-OIL RELEASE CHECKLIST
LIQUID SCINTILLATION COUNT

Log Number EF1-1-710053

Task

Performed By

Date

1. Representative sample collected.

Date/Time 11-23-11 10315

C. Proffitt
Fermi 1 (signature)

11-23-11

Container Number Swamp 11

Storage Location EP1

B4016
Employee ID Number

2. Sample secured against tampering.

C. Proffitt
Fermi 1 (signature)

11-23-11

B4016
Employee ID Number

3. Tritium LLD $\leq 2 \text{ E-6 uCi/ml}$

Actual tritium LLD = 1.28 E-6 uCi/ml

No tritium activity detected. (If tritium activity detected do not sign, and explain in Remarks.)

[Signature]
Chemistry (signature)

11-24-11

50580
Employee ID Number

4. Gamma spectroscopy count completed on system suitable for MRP18 evaluations.

[Signature]
RP (signature)

11-30-11

B4016
Employee ID Number

5. Gamma spectroscopy report shows no identified peaks above critical level due to licensed radioactive material. (Note disposition of unidentified peaks on gamma spectroscopy report.

If licensed material detected, do not sign, and explain in Remarks.)

DAKES C. B.
Radiological Engineering (signature)

12-1-11

50553
Employee ID Number

Tritium Activity Calculation

Sample Information

| | |
|-------------------------|--------------|
| 1 . Sample Location | EF1-L-110053 |
| 2 . Date Sampled | 11/23/2011 |
| 3 . Time Sampled | 08:15 |
| 4 . Sample Volume, (ml) | 4 ml |

Instrument Count Data

| | | |
|--|------------|---------|
| 1 . Date Sample Counted | 11/24/2011 | |
| 2 . Time Sample Counted | 03:37 | |
| 3 . Background Inf.: | | |
| Minutes Counted | 10 | min. |
| Background Count Rate (cpm) | 9.5 | cpm |
| 4 . Efficiency Inf.: (Daily Spike Source ID # 111) | | |
| Gross Spike Count Rate (cpm) | 2550.6 | cpm |
| Net Spike Count Rate (cpm) | 2541.1 | cpm |
| H3 Spike Activity (dpm on count date) | 6359.1 | dpm |
| Counter Efficiency | 0.3996 | cpm/dpm |
| 5 . Sample Info: | | |
| Sample Gross Count Rate (cpm) | 10.7 | cpm |
| Sample Count Time (min.) | 10.0 | min. |
| Net Sample Count Rate (cpm) | 1.2 | cpm |
| 6 . Critical Level: | | |
| Critical Level Count Rate (cpm) | 2.2 | cpm |

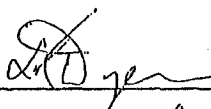
Minimum Detectable Activity

$$\text{Minimum Detectable Activity (uCi/ml)} = 3.3 \times \frac{\frac{(\text{Bkg cpm})}{(\text{Bkg min.})} + \frac{(\text{Bkg cpm})}{(\text{Smp1 min.})}}{\text{Efficiency} \times 2.22\text{E6 dpm/uCi} \times \text{Sample Volume}} = 1.28\text{E-06 uCi/ml}$$

Sample Activity

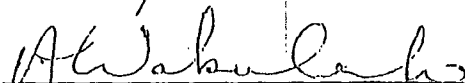
$$\text{Sample Activity (uCi/ml)} = \frac{\text{Sample Net cpm}}{\text{Efficiency} \times 2.22\text{E6 uCi/ml} \times \text{Sample Volume}} < \text{MDA}$$

Technician



Date 11-24-11

Reviewed By:



Date 11-24-11

RADIATION PROTECTION DEPARTMENT

GAMMA SPECTROSCOPY ANALYSIS REPORT

HIGH EFFICIENCY DETECTOR

Sample ID Number: CFI-L-110052 COMP #11

Sample End Time: 23-NOV-2011 09:15:00.00

REMARKS

Natural

PERFORMED BY:

Charles R. [Signature]

SIGNATURE

REVIEWED BY:

[Signature] / 12-15-11

SIGNATURE/DATE

Sample ID : ET1-L-110553 SURF #13

Acquisition date : 23-NOV-2011 08:15:00.00

Form 1 Radiation Protection Gamma Spectroscopy Report

***** Sample Parameters *****

Sample ID Number : ET1-L-110553 SURF #13
 Sample collection start date : 23-NOV-2011 08:15:00.00
 Sample collection end date : 23-NOV-2011 08:15:00.00
 Type of sample : 1 L Mar. Liquid
 Sample quantity : 1.00000E+03 cc ✓
 Sample geometry : PELL Operator: CLP

***** Acquisition Parameters *****

Detector number : DET 4 ✓ Acquire date : 20-NOV-2011 15:40:12.99
 Preset live time : 0 00:45:00.00 ✓ Elapsed live time : 0 00:45:00.00
 Elapsed real time : 0 00:45:00.63 Percent dead time : 0.03 %

***** Calibration Parameters *****

Detector number : DET 4 Yearly cal date : 14-JUN-2011 14:50:56.41 ✓
 KeV/channel : 5.40235E-01 Zero offset: -6.02154E-01
 Daily cal date : 30-NOV-2011 09:13:02.30

***** Peak Search Parameters *****

Start channel : 100 End channel : 4096
 Height sensitivity : 5.00000 Shape sensitivity : 10.00000
 Maximum number of iterations to resolve multiplets : 5

***** Nuclide Identification Parameters *****

Energy tolerance : 1.75000 ✓ Half-life ratio : 10.00000
 Abundance limit : 75.00000 Library : dcmaster.nlb
 Efficiency file : EFFD4_m211 Efficiencies at : Peak energy

| Pk | It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec | XErr | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1 | 0 | 66.54 | 33 | 90 | 1.02 | 134.23 | 129 | 10 | 1.23E-02 | 50.2 | |
| 2 | 0 | 293.78 | 56 | 70 | 1.67 | 592.40 | 585 | 14 | 2.07E-02 | 34.4 | |
| 3 | 0 | 352.14 | 67 | 51 | 1.88 | 705.15 | 700 | 9 | 2.46E-02 | 23.0 | |
| 4 | 0 | 511.40 | 160 | 40 | 2.05 | 1023.52 | 1012 | 21 | 5.94E-02 | 13.7 | |
| 5 | 0 | 610.13 | 120 | 25 | 2.11 | 1220.90 | 1211 | 21 | 4.46E-02 | 14.0 | |
| 6 | 0 | 767.62 | 24 | 31 | 7.73 | 1535.73 | 1524 | 21 | 8.98E-03 | 51.2 | |
| 7 | 0 | 1461.29 | 32 | 5 | 2.29 | 2922.46 | 2912 | 20 | 3.03E-02 | 12.9 | |

Peak Fit Peak Search Report

| It | Energy | Area | Height | FWHM | Channel | Left | Pw | SErr | Fit | Nuclides |
|----|---------|------|--------|------|---------|------|----|------|-----|------------|
| 0 | 66.54 | 33 | 99 | 1.62 | 134.23 | 129 | 10 | 56.2 | | Ge-76 |
| 0 | 295.78 | 56 | 70 | 1.67 | 592.48 | 585 | 14 | 34.4 | | Pb-214 |
| 0 | 352.14 | 67 | 51 | 1.86 | 705.15 | 700 | 9 | 23.0 | | Pb-214 |
| 0 | 511.48 | 160 | 40 | 2.05 | 1023.52 | 1012 | 21 | 13.3 | | Annul Peak |
| 0 | 610.13 | 120 | 25 | 2.11 | 1220.90 | 1211 | 21 | 14.0 | | Bi-214 |
| 0 | 767.62 | 24 | 31 | 2.73 | 1535.73 | 1524 | 21 | 61.2 | | Bi-214 |
| 0 | 1461.25 | 89 | 5 | 2.29 | 2932.46 | 2912 | 20 | 12.9 | | K-40 |

Ge-76
Pb-214
Pb-214
Annul Peak
Bi-214
Bi-214
K-40

f-12-5-11

Radionuclide Type: natural

| Radionuclide | Energy | Area | %Abn | %Eff | Uncorrected | Decay Corr | 1-Sigma |
|--------------|---------|------|--------|-----------|-------------|------------|---------|
| | | | | | uCi/cc | uCi/cc | %Error |
| K-40 | 1460.41 | 82 | 10.67% | 2.353E+00 | 3.267E-07 | 3.267E-07 | 12.92 |

Flag: "K" = Keyline

Total number of lines in spectrum: 7
 Number of unidentified lines: 0
 Number of lines tentatively identified by HLB: 7 100.00%

Nuclide Type: natural

| Nuclide | HLI/a | Decay | Uncorrected uCi/cc | Decay Corr uCi/cc | Decay Corr 1-Sigma Error | 1-Sigma %Error | Flags |
|------------------|-----------|-------|-----------------------|----------------------|-----------------------------|-------------------|-------|
| K-40 | 1.00E+05Y | 1.00 | 3.267E-07 | 3.267E-07 | 0.422E-07 | 12.92 | |
| Total Activity : | | | 3.267E-07 | 3.267E-07 | | | |

Grand Total Activity : 3.267E-07 3.267E-07

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

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

| Isotope | Half-Life | Ratio | Energy | Abund | Activity | 1-sigma | 2-sigma | 2-sigma | Rejected by |
|-----------------------------|-----------|--------|---------|--------|-----------|-----------|---------|---------|--------------|
| P-18 | 109.74M | 96.12 | 511.00 | 193.45 | 1.543E+21 | 13.31 | | | Decay |
| % Abundances Found = 100.00 | | | | | | | | | |
| SE-75 | 119.75D | 0.06 | 66.05 | 1.02 | 2.486E-06 | 58.24 | | | Abun. |
| | | | 96.73 | 3.41 | --- | Not Found | --- | | |
| | | | 121.12 | 16.70 | --- | Not Found | --- | | |
| | | | 136.00* | 59.20 | --- | Not Found | --- | | |
| | | | 198.60 | 1.45 | --- | Not Found | --- | | |
| | | | 264.65 | 59.00 | --- | Not Found | --- | | |
| | | | 279.53 | 25.20 | --- | Not Found | --- | | |
| | | | 362.91 | 1.32 | --- | Not Found | --- | | |
| | | | 400.65 | 11.40 | --- | Not Found | --- | | |
| % Abundances Found = 0.57 | | | | | | | | | |
| RU-102 | 39.35D | 0.19 | 497.00* | 89.00 | --- | Not Found | --- | | Abun. |
| | | | 616.33 | 5.60 | 5.767E-07 | 13.97 | | | |
| % Abundances Found = 5.92 | | | | | | | | | |
| I-134 | 52.60M | 200.53 | 135.40 | 3.76 | --- | Not Found | --- | | Decay, Abun. |
| | | | 235.47 | 1.90 | --- | Not Found | --- | | |
| | | | 405.45 | 7.30 | --- | Not Found | --- | | |
| | | | 548.02 | 7.90 | --- | Not Found | --- | | |
| | | | 595.36 | 11.40 | --- | Not Found | --- | | |
| | | | 621.79 | 10.60 | --- | Not Found | --- | | |
| | | | 677.34 | 9.50 | --- | Not Found | --- | | |
| | | | 766.68 | 9.10 | 1.000E+35 | 61.21 | | | |
| | | | 847.03 | 95.41 | --- | Not Found | --- | | |
| | | | 857.29 | 6.96 | --- | Not Found | --- | | |
| | | | 884.09* | 65.30 | --- | Not Found | --- | | |
| | | | 947.86 | 4.04 | --- | Not Found | --- | | |
| | | | 1072.55 | 15.30 | --- | Not Found | --- | | |
| | | | 1136.16 | 9.70 | --- | Not Found | --- | | |
| | | | 1613.00 | 4.36 | --- | Not Found | --- | | |
| | | | 1806.04 | 5.70 | --- | Not Found | --- | | |
| % Abundances Found = 1.56 | | | | | | | | | |
| TE-134 | 41.00M | 252.34 | 79.45 | 21.00 | --- | Not Found | --- | | Decay, Abun. |
| | | | 199.09 | 18.00 | --- | Not Found | --- | | |
| | | | 201.24 | 8.70 | --- | Not Found | --- | | |
| | | | 210.47* | 21.90 | --- | Not Found | --- | | |
| | | | 277.95 | 21.30 | --- | Not Found | --- | | |
| | | | 435.06 | 18.60 | --- | Not Found | --- | | |
| | | | 461.00 | 10.80 | --- | Not Found | --- | | |
| | | | 464.64 | 5.10 | --- | Not Found | --- | | |
| | | | 565.99 | 18.90 | --- | Not Found | --- | | |
| | | | 742.59 | 14.70 | --- | Not Found | --- | | |
| | | | 767.20 | 30.00 | 1.000E+35 | 61.21 | | | |
| % Abundances Found = 15.97 | | | | | | | | | |
| CS-136 | 13.16D | 0.56 | 66.91 | 12.50 | 2.868E-07 | 58.24 | | | Abun. |
| | | | 86.29 | 6.30 | --- | Not Found | --- | | |
| | | | 153.22 | 7.46 | --- | Not Found | --- | | |

| | | Half-Life | | | Activity 1-Sigma | | | |
|---------|-----------|-----------|----------------------|-------|-----------------------------|-----------|-------------|-------|
| Nuclide | Half-life | Ratio | Energy | Abund | (dpm/cc) | Error | Rejected by | |
| CS-136 | 15.160 | 0.56 | 163.89 | 4.61 | --- | Not Found | --- | Abn. |
| | | | 176.55 | 13.56 | --- | Not Found | --- | |
| | | | 273.65 | 12.66 | --- | Not Found | --- | |
| | | | 340.57 | 48.50 | --- | Not Found | --- | |
| | | | 818.50* | 99.70 | --- | Not Found | --- | |
| | | | 1048.07 | 79.60 | --- | Not Found | --- | |
| PM-148M | 41.300 | 0.18 | 1235.34 | 19.70 | --- | Not Found | --- | |
| | | | % Abundances Found = | | 4.10 | | | |
| | | | 288.11 | 12.56 | --- | Not Found | --- | Abn. |
| | | | 414.67 | 19.66 | --- | Not Found | --- | |
| | | | 432.78 | 5.35 | --- | Not Found | --- | |
| | | | 501.26 | 6.75 | --- | Not Found | --- | |
| Tb-162 | 114.740 | 0.06 | 550.27* | 94.90 | --- | Not Found | --- | |
| | | | 599.74 | 12.54 | --- | Not Found | --- | |
| | | | 611.26 | 5.48 | 5.857E-07 | 13.97 | | |
| | | | 629.97 | 89.60 | --- | Not Found | --- | |
| | | | 725.70 | 32.80 | --- | Not Found | --- | |
| | | | 915.33 | 17.17 | --- | Not Found | --- | |
| Bi-214 | 19.90M | 530.04 | 1013.81 | 20.30 | --- | Not Found | --- | |
| | | | % Abundances Found = | | 1.74 | | | |
| | | | 67.75 | 42.30 | 6.005E-05 | 50.24 | Abn. | |
| | | | 100.10 | 14.10 | --- | Not Found | --- | |
| | | | 1109.05 | 16.30 | --- | Not Found | --- | |
| | | | 1221.42* | 27.10 | --- | Not Found | --- | |
| Pb-214 | 26.80M | 393.57 | 1230.97 | 11.50 | --- | Not Found | --- | |
| | | | % Abundances Found = | | 30.01 | | | |
| | | | 689.31* | 46.30 | 1.000E+35 | 12.97 | Decay | |
| | | | 768.36 | 5.04 | 1.000E+35 | 61.21 | | |
| | | | 934.06 | 3.21 | --- | Not Found | --- | |
| | | | 1120.29 | 15.10 | --- | Not Found | --- | |
| Po-214 | 132.900 | 1.10 | 1238.11 | 5.94 | --- | Not Found | --- | |
| | | | 1377.67 | 4.11 | --- | Not Found | --- | |
| | | | 1764.49 | 15.90 | --- | Not Found | --- | |
| | | | % Abundances Found = | | 53.76 (Abn. Limit = 48.48%) | | | |
| | | | 87.30 | 4.67 | --- | Not Found | --- | Decay |
| | | | 241.98 | 7.49 | --- | Not Found | --- | |
| Ra-226 | 1600.000 | 0.0001 | 295.21 | 19.20 | 1.000E+35 | 34.40 | | |
| | | | 351.92* | 37.20 | 1.000E+35 | 23.01 | | |
| | | | 785.91 | 1.10 | --- | Not Found | --- | |
| | | | % Abundances Found = | | 90.96 (Abn. Limit = 37.20%) | | | |
| | | | | | | | | |
| | | | | | | | | |

Flag: "x" = Keyline

| Ln | Energy | Area | Count | Width | Channel | Left | Pw | Cps/Sec | %Err | %Eff | Flags |
|----|--------|------|-------|-------|---------|------|----|----------|------|----------|-----------------------------------|
| 0 | 66.54 | 33 | 90 | 1.02 | 134.23 | 129 | 10 | 1.23E-02 | 58.2 | 1.37E+00 | T $T_{1/2}$ no holder |
| 0 | 293.78 | 56 | 70 | 1.67 | 592.48 | 585 | 14 | 2.07E-02 | 34.4 | 5.82E+00 | TPb214 |
| 0 | 352.14 | 67 | 51 | 1.00 | 705.15 | 700 | 9 | 2.46E-02 | 23.0 | 5.38E+00 | TPb214 |
| 0 | 511.40 | 160 | 40 | 2.05 | 1023.52 | 1012 | 21 | 5.94E-02 | 13.3 | 4.50E+00 | T Annihilation |
| 0 | 610.13 | 120 | 25 | 2.11 | 1220.90 | 1211 | 21 | 4.46E-02 | 14.0 | 4.25E+00 | T Bi ²¹⁴ |
| 0 | 767.62 | 24 | 31 | 7.73 | 1535.73 | 1524 | 21 | 4.98E-02 | 61.2 | 3.57E+00 | T Bi ²¹⁴ $T_{1/2}$ 214 |

Flags: "T" = Tentatively associated

| Nuclide | Backgnd Sum | Energy (keV) | MDA (uCi/cc) |
|---------|----------------|-----------------|---------------------|
| DE-7 | 37. | 477.59 | 6.9062E-08 |
| F-18 | 0. | 511.00 | Half-Life too short |
| NA-22 | 10. | 1274.54 | 6.0938E-09 |
| NA-24 | 0. | 1360.53 | Half-Life too short |
| MG-27 | 0. | 1014.44 | Half-Life too short |
| CL-36 | 0. | 1642.42 | Half-Life too short |
| OR-41 | 0. | 1293.64 | Half-Life too short |
| SC-46 | 29. | 984.25 | 8.0835E-09 |
| CR-51 | 52. | 320.08 | 7.8859E-08 |
| MI-54 | 41. | 834.63 | 9.9709E-09 |
| CO-56 | 23. | 1238.25 | 1.5320E-08 |
| MM-56 | 0. | 1810.69 | Half-Life too short |
| NI-56 | 53. | 158.38 | 1.3320E-08 |
| CO-57 | 54. | 122.06 | 8.1027E-09 |
| CO-58 | 27. | 810.78 | 8.5150E-09 |
| FE-59 | 16. | 1099.22 | 1.5195E-08 |
| CO-60 | 10. | 1332.49 | 7.1040E-09 |
| CU-64 | 0. | 1345.30 | Half-Life too short |
| NI-65 | 0. | 1481.84 | Half-Life too short |
| ZN-65 | 17. | 1115.32 | 1.6162E-08 |
| ZN-69M | 0. | 438.63 | Half-Life too short |
| SE-75 | 65. | 138.00 | 1.1979E-08 |
| AS-76 | 41. | 559.10 | 1.6962E-08 |
| BR-82 | 23. | 776.49 | 2.6957E-07 |
| BR-83 | 0. | 529.64 | Half-Life too short |
| BR-84 | 0. | 801.50 | Half-Life too short |
| BR-85 | 0. | 802.41 | Half-Life too short |
| KR-85 | 53. | 513.99 | 1.9579E-08 |
| KR-85M | 0. | 151.18 | Half-Life too short |
| SR-85 | 59. | 513.99 | 9.1598E-09 |
| RB-86 | 12. | 1078.63 | 1.0123E-07 |
| KR-87 | 0. | 402.50 | Half-Life too short |
| BR-97M | 0. | 309.40 | Half-Life too short |
| KR-88 | 0. | 196.32 | Half-Life too short |
| XD-88 | 0. | 1392.39 | Half-Life too short |
| Y-88 | 0. | 1836.01 | 8.1271E-09 |
| KR-89 | 0. | 220.90 | Half-Life too short |
| RB-89 | 0. | 1031.58 | Half-Life too short |
| KR-90 | 0. | 1118.69 | Half-Life too short |
| RD-90 | 0. | 931.69 | Half-Life too short |
| CB-90M | 0. | 824.23 | Half-Life too short |
| Z-90M | 0. | 202.51 | Half-Life too short |
| SR-91 | 0. | 1024.30 | Half-Life too short |
| Z-91 | 16. | 1284.90 | 2.9746E-08 |
| Z-91M | 0. | 555.60 | Half-Life too short |
| SR-92 | 0. | 1383.94 | Half-Life too short |
| Z-92 | 0. | 924.46 | Half-Life too short |

Sample ID : EFL-4-119003 GUM

Acquisition Date : 20-09-2011 15:40:17

| Radionuclide | Signal Sum | Energy (keV) | MDA (uCi/cc) |
|--------------|---------------|-----------------|---------------------|
| SR-90 | 0. | 590.20 | Half-Life too short |
| Y-90 | 0. | 266.90 | Half-Life too short |
| NR-94 | 21. | 702.63 | 6.2434E-09 |
| NR-95 | 30. | 765.79 | 9.1292E-09 |
| NR-95M | 65. | 235.69 | 1.0834E-07 |
| ZR-95 | 12. | 756.72 | 1.0247E-08 |
| NR-97 | 0. | 657.50 | Half-Life too short |
| ZR-97 | 0. | 743.36 | Half-Life too short |
| NR-99 | 21. | 739.50 | 3.2100E-07 |
| TC-99M | 0. | 140.50 | Half-Life too short |
| TC-101 | 0. | 306.01 | Half-Life too short |
| RU-103 | 29. | 497.08 | 7.5096E-09 |
| TC-104 | 0. | 357.99 | Half-Life too short |
| RH-105 | 53. | 310.90 | 1.0617E-06 |
| RU-105 | 0. | 724.50 | Half-Life too short |
| RU-106 | 25. | 621.84 | 6.3473E-00 |
| CD-109 | 40. | 55.03 | 2.5013E-07 |
| AG-110M | 15. | 937.40 | 2.0546E-08 |
| SN-113 | 36. | 391.69 | 9.5769E-09 |
| SN-117M | 54. | 150.56 | 9.7152E-09 |
| SB-122 | 25. | 563.93 | 5.5474E-08 |
| SB-124 | 35. | 602.71 | 7.0906E-09 |
| SB-125 | 21. | 427.89 | 1.6502E-08 |
| TE-125M | 61. | 109.20 | 3.1601E-06 |
| TE-127 | 0. | 417.90 | Half-Life too short |
| TE-127M | 25. | 57.60 | 1.7266E-05 |
| XE-127 | 64. | 202.84 | 1.0664E-08 |
| TE-129 | 0. | 459.60 | Half-Life too short |
| TE-129M | 20. | 695.80 | 2.4520E-07 |
| XE-129M | 60. | 196.56 | 2.2736E-07 |
| I-130 | 0. | 536.09 | Half-Life too short |
| BA-131 | 55. | 123.80 | 3.5931E-00 |
| I-131 | 44. | 364.40 | 1.4635E-08 |
| TE-131 | 0. | 149.72 | Half-Life too short |
| TE-131M | 24. | 773.67 | 1.0992E-06 |
| XE-131M | 61. | 163.93 | 4.7730E-07 |
| I-132 | 0. | 667.69 | Half-Life too short |
| TE-132 | 45. | 220.16 | 2.9850E-00 |
| BA-133 | 41. | 302.04 | 3.1726E-08 |
| BA-133M | 49. | 276.09 | 7.5691E-07 |
| I-133 | 22. | 529.87 | 2.2084E-06 |
| TE-133M | 0. | 912.50 | Half-Life too short |
| XE-133 | 37. | 01.00 | 0.0401E-00 |
| XE-133M | 45. | 233.22 | 5.5254E-07 |
| CS-134 | 26. | 604.70 | 6.4010E-09 |
| I-134 | 0. | 984.09 | Half-Life too short |
| TE-134 | 0. | 210.47 | Half-Life too short |
| BA-135M | 53. | 268.24 | 2.6670E-06 |
| I-135 | 0. | 1260.41 | Half-Life too short |
| XE-135 | 0. | 249.79 | Half-Life too short |
| XE-135M | 0. | 526.56 | Half-Life too short |

Sample ID: IF-110655-50M

Acquisition Date: 30 NOV 2011 15:40:11

| Rad. Isot. | Background Count | Energy (keV) | MDA (uCi/cc) |
|------------|---------------------|-----------------|---------------------|
| CS-136 | 10. | 818.58 | 9.7369E-09 |
| I-136 | 0. | 1313.02 | Half-Life too short |
| CS-137 | 12. | 661.65 | 5.3276E-09 |
| XE-137 | 0. | 455.49 | Half-Life too short |
| CS-138 | 0. | 1435.86 | Half-Life too short |
| XE-138 | 0. | 250.31 | Half-Life too short |
| BA-139 | 0. | 1420.50 | Half-Life too short |
| CE-139 | 61. | 165.85 | 7.8730E-09 |
| CS-139 | 0. | 1283.23 | Half-Life too short |
| BA-140 | 20. | 537.32 | 3.7569E-08 |
| LA-140 | 10. | 1596.49 | 1.6782E-07 |
| BA-141 | 0. | 190.22 | Half-Life too short |
| CE-141 | 46. | 145.44 | 1.3404E-08 |
| LA-141 | 0. | 1354.52 | Half-Life too short |
| BA-142 | 0. | 255.12 | Half-Life too short |
| LA-142 | 0. | 641.17 | Half-Life too short |
| CE-143 | 48. | 293.26 | 5.7441E-07 |
| CE-144 | 52. | 133.54 | 5.8353E-08 |
| PR-144 | 0. | 1489.15 | Half-Life too short |
| ND-147 | 52. | 91.10 | 5.6910E-08 |
| PR-148M | 32. | 550.27 | 7.8198E-09 |
| EU-152 | 36. | 344.27 | 2.1405E-08 |
| EU-154 | 22. | 1004.76 | 4.6764E-08 |
| EU-155 | 44. | 105.31 | 3.5540E-08 |
| EU-156 | 27. | 646.29 | 1.2835E-07 |
| HF-181 | 30. | 482.03 | 8.1770E-09 |
| TA-182 | 11. | 1221.42 | 2.6590E-08 |
| W-187 | 19. | 605.61 | 3.1970E-06 |
| RE-188 | 0. | 155.03 | Half-Life too short |
| AU-199 | 53. | 150.30 | 7.8354E-08 |
| HO-200 | 53. | 279.15 | 5.9089E-09 |
| BI-207 | 25. | 569.67 | 6.1330E-09 |
| TL-208 | 0. | 583.14 | Half-Life too short |
| PE-212 | 0. | 220.63 | Half-Life too short |
| BI-214 | 0. | 609.31 | Half-Life too short |
| PE-214 | 0. | 351.92 | Half-Life too short |
| RA-224 | 71. | 240.98 | 7.1219E-07 |
| RA-226 | 56. | 186.21 | 1.7794E-07 |
| AC-228 | 45. | 338.32 | 5.4372E-08 |
| TH-228 | 35. | 84.37 | 8.2260E-07 |
| PA-234 | 0. | 131.20 | Half-Life too short |
| TH-234 | 34. | 63.29 | 9.4198E-07 |
| U-235 | 51. | 143.76 | 5.6055E-08 |
| HP-239 | 43. | 106.13 | 2.7125E-07 |
| AM-241 | 33. | 59.54 | 1.3357E-07 |

**Fermi 1 NRC Docket No. 50-16
NRC License No. DPR-9**

**Attachment 4 to
NRC-12-0012**

“Updated Fermi 1 Groundwater Monitoring Data”

Offsite Laboratory Analytical Results



February 19, 2010

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 245517

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 25, 2010. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4297.

Sincerely,



Amanda Rasco
Project Manager

Purchase Order: 4700246055
Enclosures

Table of Contents

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| Quality Control Data | 52 |

Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 245517**

February 19, 2010

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on January 25, 2010 for analysis. The sample containers received did not have collection dates and times that matched the chain of custody. Per client instruction, the time and dates on the chain of custody were used. All sample containers arrived without any visible signs of tampering or breakage. Sample EF1-4/S was not received. Some samples were not at the correct pH upon receipt. Preservative was added to these samples per client request. 245517001, 245517005, 245517008, 245517013, 245517017, 245517020.

Sample Identification The laboratory received the following samples:

| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 245517001 | GW01 |
| 245517002 | GW02 |
| 245517003 | GW04 |
| 245517004 | EF1-1/D |
| 245517005 | EF1-1/S |
| 245517006 | EF1-1/I |
| 245517007 | EF1-2/D |
| 245517009 | EF1-4/D |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 245517012 | EF1-6/D |
| 245517013 | EF1-6/S |
| 245517014 | EF1-7/S |
| 245517015 | EF1-8/S |
| 245517016 | EF1-9/S |
| 245517017 | EF1-10/S |
| 245517018 | MW393 S |
| 245517019 | MW393 D |
| 245517020 | MW388 S |
| 245517021 | MW381 D |
| 245517022 | EF1-4S-D |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.

A handwritten signature in black ink, appearing to read "Amanda Rasco".

Amanda Rasco

Project Manager

Chain of Custody

FERMI 1 NUCLEAR POWER PLANT CHAIN-OF-CUSTODY

245517

| PROJECT <i>Fermi-1</i> | | SAMPLE PREP (printed) <i>Thomas Mow</i> | | SAMPLE TYPES 1 GROUNDWATER 2 OTHER | | | | ANALYSIS TO BE PERFORMED | | | | | | CONTAINER TYPE | | REMARKS |
|---------------------------|--|--|-------|---|------|---|-------------------------|--------------------------|--------|--------|--------------------------------|-----------------|-------------------|----------------|--|-------------|
| LABORATORY ID | | SAMPLE PREP (signature) <i>Thomas Mow</i> | | | | | | Grass α/B | RA-226 | RA-228 | Uranium 233/234 235/236 238 | Strontium 89/90 | Pu 238,239 240 | | | |
| SAMPLE NUMBER | SAMPLE TYPE <small>(SEE CODE ABOVE)</small> | DATE | TIME | COMPOSITE | GRAB | STATION LOCATION OR CONTAINER NUMBER | NUMBER OF CONTAINERS | | | | | | | | | |
| GW01 | 1 | 1/14/2010 | 12:15 | | | GW01 | 1 | X | X | X | X | | | | | 3500 mL |
| GW02 | 1 | 1/14/2010 | 09:50 | | | GW02 | 1 | X | X | X | X | | | | | 3500 mL |
| GW04 | 1 | 1/13/2010 | 11:50 | | | GW04 | 1 | X | X | X | X | | | | | 3500 mL |
| EFI-2/D | 1 | 1/5/2010 | 08:30 | | | EFI-2/D | 2 | X | X | X | X | | | | | 3500 mL |
| EFI-1/S | 1 | 1/5/2010 | 10:15 | | | EFI-1/S | 1 | X | X | X | X | | | | | 3500 mL |
| EFI-1/L | 1 | 1/14/2010 | 15:30 | | | EFI-1/L | 2 | X | X | X | X | X | X | | | 5500 mL (2) |
| EFI-2/D | 1 | 1/4/2010 | 11:30 | | | EFI-2/D | 2 | X | | | | | | | | 500 mL |
| EFI-4/S | 1 | 12/29/2009 | 08:25 | | | EFI-4/S | 1 | X | | | | | | | | 500 mL |
| EFI-4/D | 1 | 12/29/2009 | 10:20 | | | EFI-4/D | 1 | X | | | | | | | | 500 mL |
| EFI-5/D | 1 | 12/29/2009 | 11:25 | | | EFI-5/D | 2 | X | X | X | X | X | X | | | 5500 mL |
| EFI-5/S | 1 | 12/29/2009 | 12:25 | | | EFI-5/S | 2 | X | X | X | X | X | X | | | 5500 mL |
| EFI-6/D | 1 | 12/29/2009 | 13:50 | | | EFI-6/D | 1 | X | | | X | | | | | 1500 mL |
| EFI-6/S | 1 | 12/29/2009 | 13:10 | | | EFI-6/S | 1 | X | | | | | | | | 500 mL |
| EFI-7/S | 1 | 1/4/10 | 10:00 | | | EFI-7/S | 1 | X | | | | | | | | 500 mL |
| EFI-8/S | 1 | 1/4/10 | 10:30 | | | EFI-8/S | 1 | X | | | | | | | | 500 mL |

Site Contacts - Lynne Goodman 1-734-588-1205 or Ken Lindsey 1-734-588-4455

| RELINQUISHED BY (printed/signed) | RECEIVED BY (printed/signed) | DATE/TIME (DD-MMM-YYYY/24HR) | REMARKS |
|-------------------------------------|---------------------------------|---------------------------------|---------|
| <i>Thomas Mow / Thomas Mow</i> | <i>Hope Taylor</i> | 1-1-2010 16:00 | |
| | | 1/25/10 16:45 | |
| | | | |
| | | | |

FERMI 1 NUCLEAR POWER PLANT
6400 N. DIXIE HWY
NEWPORT, MI 48166

Site Contacts • Lynne Goodman 1-734-586-1205 or Ken Lindsey 1-734-586-4455

FERMI 1 NUCLEAR POWER PLANT
6400 N. DIXIE HWY
NEWPORT, MI 48166



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

| | | | | | |
|--|-----|-------------------------------------|---|--|--|
| Client: <u>ROIT</u> | | | SDG/ARCO/Work Order: <u>245517</u> | | |
| Received By: <u>H. Taylor</u> | | | Date Received: <u>25 Jan 10</u> | | |
| Suspected Hazard Information | Yes | No | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation. | | |
| COC/Samples marked as radioactive? | | <input checked="" type="checkbox"/> | Maximum Counts Observed*: <u>20cpm</u> | | |
| Classified Radioactive II or III by RSO? | | <input checked="" type="checkbox"/> | | | |
| COC/Samples marked containing PCBs? | | <input checked="" type="checkbox"/> | | | |
| Shipped as a DOT Hazardous? | | <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: | | |
| Samples identified as Foreign Soil? | | <input checked="" type="checkbox"/> | | | |

| Sample Receipt Criteria | | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|-------------------------|--|-------------------------------------|-------------------------------------|-------------------------------------|---|
| 1 | Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: seals broken damaged container leaking container other (describe) |
| 2 | Samples requiring cold preservation within 0 ≤ 6 deg. C? | | <input checked="" type="checkbox"/> | | Preservation Method: ice bags blue ice dry ice <u>none</u> other (describe) <u>16</u> |
| 3 | Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | | | |
| 4 | Sample containers intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: seals broken damaged container leaking container other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | | | <input checked="" type="checkbox"/> | Sample ID's, containers affected and observed pH: <u>see continuation</u> If Preservation added, Lot#: <u>H20053</u> |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | | <input checked="" type="checkbox"/> | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | | <input checked="" type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | <input checked="" type="checkbox"/> | | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | | | <input checked="" type="checkbox"/> | Sample ID's affected: |
| 11 | Number of containers received match number indicated on COC? | | | <input checked="" type="checkbox"/> | Sample ID's affected: <u>did not receive EFI-415</u> |
| 12 | COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | | | |

Comments:

CourierADN1/26/10



SAMPLE RECEIPT & REVIEW FORM CONTINUATION FORM

Client: ROTT

Date Received: 1/25/10

Page 1 of 1

| date and time on containers | |
|---|-----------------------------------|
| GW01 | ph3 |
| GW02 | 1030 |
| GW04 | 1200 |
| EF1-1/D | 0945 |
| EF1-1/S | 1045 not preserved |
| EF1-1/I | container 1 1325 container 2 1330 |
| EF1-2/D | 1200 |
| EF1-4/D | 1030 |
| did not receive EF1-4/S | |
| EF1-5/D | container 1 1100 container 2 1140 |
| EF1-5/S | container 1 1240 container 2 1250 |
| EF1-6/D | 1600 |
| EF1-6/S | 1515 not preserved |
| EF1-7/S | 1020 date 12/30/09 not preserved |
| EF1-8/S | 1035 |
| EF1-9/S | 1500 ph 4 |
| EF1-10/S | 0940 |
| EF1-11 | |
| NW 393S | 1315 |
| NW 393D | 1415 |
| NW 388S | 1020 ph 3 |
| NW 381D | 1645 |
| EF1-45-D | no date or time |
| Client was contacted and instructed GEL to use the collection date/times listed on the COC and to preserve samples that have pH > 2. <u>APL 1/26/10</u> | |

List of current GEL Certifications as of 19 February 2010

| State | Certification |
|---------------------------|----------------------|
| Arizona | AZ0668 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | GEL |
| Connecticut | PH-0169 |
| Dept. of Navy | NFESC 413 |
| EPA Region 5 | WG-15J |
| Florida – NELAP | E87156 |
| Georgia | E87156 (FL/NELAP) |
| Georgia DW | 967 |
| Hawaii | N/A |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Nevada | SC00012 |
| New Jersey – NELAP | SC002 |
| New Mexico | FL NELAP E87156 |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-07B-TX |
| U.S. Dept. of Agriculture | S-52597 |
| Utah – NELAP | GEL |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C1641 |

RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 245517**

Method/Analysis Information

Product: Alphaspec Pu, Liquid
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number: 949025

| Sample ID | Client ID |
|------------------|---|
| 245517006 | EF1-1/I |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 1202033220 | Method Blank (MB) |
| 1202033221 | 245517006(EF1-1/I) Sample Duplicate (DUP) |
| 1202033222 | 245517006(EF1-1/I) Matrix Spike (MS) |
| 1202033223 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volumes in this batch.

Designated QC

The following sample was used for QC: 245517006 (EF1-1/I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples 1202033220 (MB), 1202033221 (EF1-1/I), 245517006 (EF1-1/I), 245517010 (EF1-5/D) and 245517011 (EF1-5/S) were recounted due to a suspected false positive.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|------------------------------------|
| Product: | Alphaspec U, Liquid |
| Analytical Method: | DOE EML HASL-300, U-02-RC Modified |
| Analytical Batch Number: | 947744 |

| Sample ID | Client ID |
|------------------|--|
| 245517001 | GW01 |
| 245517002 | GW02 |
| 245517003 | GW04 |
| 245517004 | EF1-1/D |
| 245517005 | EF1-1/S |
| 245517006 | EF1-1/I |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 245517012 | EF1-6/D |
| 245517016 | EF1-9/S |
| 245517017 | EF1-10/S |
| 245517018 | MW393 S |
| 245517019 | MW393 D |
| 245517020 | MW388 S |
| 1202030212 | Method Blank (MB) |
| 1202030213 | 245517001(GW01) Sample Duplicate (DUP) |
| 1202030214 | 245517001(GW01) Matrix Spike (MS) |
| 1202030215 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517001 (GW01).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 245517017 (EF1-10/S) was recounted due to a peak shift.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 949027

| Sample ID | Client ID |
|------------------|---|
| 245517021 | MW381 D |
| 1202033228 | Method Blank (MB) |
| 1202033229 | 245517021(MW381 D) Sample Duplicate (DUP) |
| 1202033230 | 245517021(MW381 D) Matrix Spike (MS) |
| 1202033231 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517021 (MW381 D).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Gross A/B, liquid

Analytical Method: EPA 900.0

Analytical Batch Number: 945896

| Sample ID | Client ID |
|------------------|--|
| 245517001 | GW01 |
| 245517002 | GW02 |
| 245517003 | GW04 |
| 245517004 | EF1-1/D |
| 245517005 | EF1-1/S |
| 245517006 | EF1-1/I |
| 245517009 | EF1-4/D |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 245517012 | EF1-6/D |
| 245517013 | EF1-6/S |
| 245517014 | EF1-7/S |
| 245517015 | EF1-8/S |
| 245517016 | EF1-9/S |
| 245517017 | EF1-10/S |
| 245517018 | MW393 S |
| 245517019 | MW393 D |
| 245517020 | MW388 S |
| 245517021 | MW381 D |
| 245517022 | EF1-4S-D |
| 1202026034 | Method Blank (MB) |
| 1202026035 | 245517003(GW04) Sample Duplicate (DUP) |
| 1202026036 | 245517003(GW04) Matrix Spike (MS) |
| 1202026037 | 245517003(GW04) Matrix Spike Duplicate (MSD) |
| 1202026038 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517003 (GW04).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Sample, 245517005 (EF1-1/S), did not meet the alpha and beta required detection limit due to low sample volume. No more volume could be used due to not exceeding the maximum net weight limit of the calibration curve. The sample counted for 500 minutes.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Gross A/B, liquid
Analytical Method: EPA 900.0
Analytical Batch Number: 945898

| Sample ID | Client ID |
|------------------|---|
| 245517007 | EF1-2/D |
| 1202026044 | Method Blank (MB) |
| 1202026045 | 245518001(A024-00000011) Sample Duplicate (DUP) |
| 1202026046 | 245518001(A024-00000011) Matrix Spike (MS) |
| 1202026047 | 245518001(A024-00000011) Matrix Spike Duplicate (MSD) |
| 1202026048 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 12.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245518001 (A024-00000011).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 1202026044 (MB) was recounted due to a negative result greater than three times the error. Second count being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|-------------------------------|
| Product: | GFPC, Ra228, Liquid |
| Analytical Method: | EPA 904.0/SW846 9320 Modified |
| Analytical Batch Number: | 945895 |

| Sample ID | Client ID |
|------------------|--|
| 245517001 | GW01 |
| 245517002 | GW02 |
| 245517003 | GW04 |
| 245517004 | EF1-1/D |
| 245517005 | EF1-1/S |
| 245517006 | EF1-1/I |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 245517018 | MW393 S |
| 245517019 | MW393 D |
| 245517020 | MW388 S |
| 245517021 | MW381 D |
| 1202026030 | Method Blank (MB) |
| 1202026031 | 245517001(GW01) Sample Duplicate (DUP) |
| 1202026032 | 245517001(GW01) Matrix Spike (MS) |
| 1202026033 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517001 (GW01).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set:

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr89&Sr90, Liquid

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 946221

| Sample ID | Client ID |
|------------------|---|
| 245517006 | EF1-1/I |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 1202026702 | Method Blank (MB) |
| 1202026703 | 245517006(EF1-1/I) Sample Duplicate (DUP) |
| 1202026704 | 245517006(EF1-1/I) Matrix Spike (MS) |
| 1202026705 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in

accordance with GL-RAD-A-004 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517006 (EF1-1/I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 245517006 (EF1-1/I) was recounted to verify sample result. Second count being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: DER 789326 was generated due to Sample improperly preserved. 1. Sample 245517006 was received without the correct preservation. The sample container was preserved prior to analysis. The sample was preserved with 5mL of nitric acid (Reagent Id 1249842.23) to a pH of 2. 1.Reporting results.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Lucas Cell, Ra226, liquid
Analytical Method: EPA 903.1 Modified
Analytical Batch Number: 948312

| Sample ID | Client ID |
|------------------|--|
| 245517001 | GW01 |
| 245517002 | GW02 |
| 245517003 | GW04 |
| 245517004 | EF1-1/D |
| 245517005 | EF1-1/S |
| 245517006 | EF1-1/I |
| 245517010 | EF1-5/D |
| 245517011 | EF1-5/S |
| 245517018 | MW393 S |
| 245517019 | MW393 D |
| 245517020 | MW388 S |
| 245517021 | MW381 D |
| 1202031478 | Method Blank (MB) |
| 1202031479 | 245517001(GW01) Sample Duplicate (DUP) |
| 1202031480 | 245517001(GW01) Matrix Spike (MS) |
| 1202031481 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 245517001 (GW01).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.


Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer/Date:  7/1/10

| DATA EXCEPTION REPORT | | | |
|---|---|--|-----------------------------|
| Mo.Day Yr. 10-FEB-10 | Division: Radiochemistry | Quality Criteria: Specifications | Type: Process |
| Instrument Type: GFPC | Test / Method: EPA 905.0 Modified | Matrix Type: Liquid | Client Code: ROIT |
| Batch ID: 946221 | Sample Numbers: See Below | | |
| Potentially affected work order(s)(SDG):245517 Application Issues: Sample improperly preserved | | | |
| Specification and Requirements | | DER Disposition: | |
| Exception Description: | | | |
| 1. Sample 245517006 was received without the correct preservation. The sample container was preserved prior to analysis. The sample was preserved with 5mL of nitric acid (Reagent Id 1249842.23) to a pH of 2. | | 1.Reporting results. | |

Originator's Name:
Van Culpepper 10-FEB-10

Data Validator/Group Leader:
Nat Long 10-FEB-10

SAMPLE DATA SUMMARY

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report for

ROIT001 Detroit Edison Company

Client SDG: 245517 GEL Work Order: 245517

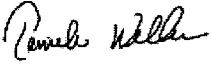
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the RL or LOQ

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the RL or LOQ.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Amanda Rasco.

Reviewed By: 

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: GW01
Sample ID: 245517001
Matrix: Ground Water
Collect Date: 14-JAN-10 12:15
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | -3.8 | | | | percent | | | | | | |
| Uranium-233/234 | U | -0.0389 | +/-0.154 | 0.366 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | -0.0453 | +/-0.196 | 0.523 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.193 | +/-0.264 | 0.423 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.75 | +/-2.78 | 4.32 | 5.00 | pCi/L | | | | | | |
| Beta | U | 1.95 | +/-1.99 | 3.28 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 0.845 | +/-0.845 | 1.38 | 3.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.832 | +/-0.317 | 0.266 | 1.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 101 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 85.6 | (15%-125%) |

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: GW02
Sample ID: 245517002
Matrix: Ground Water
Collect Date: 14-JAN-10 09:50
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | | | | | | |
| Uranium-233/234 | | 2.42 | +/-0.823 | 0.347 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.00 | +/-0.175 | 0.268 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 1.72 | +/-0.695 | 0.347 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.39 | +/-2.49 | 4.42 | 5.00 | pCi/L | | | | | | |
| Beta | | 5.74 | +/-2.36 | 3.22 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.71 | +/-1.22 | 1.85 | 3.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.460 | +/-0.300 | 0.411 | 1.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 106 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 62.2 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: GW04
Sample ID: 245517003
Matrix: Ground Water
Collect Date: 13-JAN-10 11:50
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct-Uranium-235 | U | 2.35 | | | | percent | | MXE1 | 02/09/10 | 1349 | 947744 | 1 |
| Uranium-233/234 | | 0.283 | +/-0.287 | 0.228 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0938 | +/-0.184 | 0.282 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.607 | +/-0.421 | 0.228 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.19 | +/-2.12 | 3.91 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1935 | 945896 | 2 |
| Beta | | 4.58 | +/-2.09 | 2.84 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | -0.757 | +/-0.669 | 1.58 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0723 | 945895 | 3 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 1.22 | +/-0.331 | 0.268 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1410 | 948312 | 4 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 97.6 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 79.3 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: February 17, 2010

Client Sample ID: EF1-1/D
Sample ID: 245517004
Matrix: Ground Water
Collect Date: 05-JAN-10 08:50
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 3.47 | | | | percent | | MXE1 | 02/09/10 | 1349 | 947744 | 1 |
| Uranium-233/234 | | 2.04 | +/-0.727 | 0.321 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.228 | +/-0.283 | 0.396 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.987 | +/-0.508 | 0.321 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.51 | +/-2.52 | 3.95 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1932 | 945896 | 2 |
| Beta | U | 2.44 | +/-1.87 | 2.95 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.58 | +/-1.14 | 1.76 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0723 | 945895 | 3 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.568 | +/-0.244 | 0.259 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1410 | 948312 | 4 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 108 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 79.5 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-1/S
Sample ID: 245517005
Matrix: Ground Water
Collect Date: 05-JAN-10 10:15
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | |
| Pct Uranium-235 | U | 3.79 | | | | percent | | MXE1 02/09/10 | 1349 | 947744 | 1 |
| Uranium-233/234 | | 1.55 | +/-0.685 | 0.424 | 1.00 | pCi/L | | | | | |
| Uranium-235/236 | U | 0.189 | +/-0.262 | 0.284 | 1.00 | pCi/L | | | | | |
| Uranium-238 | | 0.747 | +/-0.475 | 0.367 | 1.00 | pCi/L | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | |
| Alpha | U | 0.892 | +/-3.17 | 5.94 | 5.00 | pCi/L | | DXF3 02/11/10 | 1932 | 945896 | 2 |
| Beta | U | 0.787 | +/-2.95 | 5.15 | 5.00 | pCi/L | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | |
| Radium-228 | U | 0.223 | +/-0.993 | 1.83 | 3.00 | pCi/L | | JXC5 02/01/10 | 0723 | 945895 | 3 |
| Rad Radium-226 | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | |
| Radium-226 | | 0.948 | +/-0.348 | 0.383 | 1.00 | pCi/L | | KSD1 02/10/10 | 1440 | 948312 | 4 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 99.5 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 76.4 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-1/I
Sample ID: 245517006
Matrix: Ground Water
Collect Date: 14-JAN-10 15:30
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec Pu, Liquid "As Received"</i> | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00 | +/-0.141 | 0.216 | 1.00 | pCi/L | | JXD2 | 02/09/10 | 0923 | 949025 | 1 |
| Plutonium-239/240 | U | -0.0518 | +/-0.153 | 0.440 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.00 | +/-0.141 | 0.216 | 1.00 | pCi/L | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.377 | | | | percent | | MXE1 | 02/09/10 | 1349 | 947744 | 2 |
| Uranium-233/234 | | 3.20 | +/-0.964 | 0.361 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.093 | +/-0.182 | 0.279 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 3.82 | +/-1.05 | 0.361 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 5.77 | +/-3.52 | 4.32 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1932 | 945896 | 3 |
| Beta | U | 1.31 | +/-2.16 | 3.67 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | | 1.72 | +/-0.844 | 1.12 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0723 | 945895 | 4 |
| <i>GFPC, Sr89&Sr90, Liquid "As Received"</i> | | | | | | | | | | | | |
| Strontium-89 | U | 0.272 | +/-0.959 | 1.81 | 2.00 | pCi/L | | JXR1 | 02/03/10 | 1033 | 946221 | 5 |
| Strontium-90 | U | -0.341 | +/-0.603 | 1.96 | 2.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | U | 0.128 | +/-0.133 | 0.205 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1440 | 948312 | 6 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 900.0 | |
| 4 | EPA 904.0/SW846 9320 Modified | |
| 5 | EPA 905.0 Modified | |
| 6 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|------------------------------------|--------|---------|------------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 77.6 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-1/I
Sample ID: 245517006

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--------------------|---------------------------------------|--------|-------------|----|----|-------|------|---------|------|------|------------|--------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | | | | 99.7 | | | | (15%-125%) | |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | | | | 91.6 | | | | (15%-125%) | |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 103 | | | | (25%-125%) | |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 96.4 | | | | (25%-125%) | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-2/D
Sample ID: 245517007
Matrix: Ground Water
Collect Date: 04-JAN-10 11:30
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 3.08 | +/-3.04 | 4.45 | 5.00 | pCi/L | | DXB5 | 02/05/10 | 1436 | 945898 | 1 |
| Beta | | 5.53 | +/-2.52 | 3.27 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

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Certificate of Analysis

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Address : PO Box 44440
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Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-4/D
Sample ID: 245517009
Matrix: Ground Water
Collect Date: 29-DEC-09 10:20
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | |
| Alpha | U | 2.28 | +/-2.49 | 3.92 | 5.00 | pCi/L | | DXF3 02/11/10 | 1932 | 945896 | 1 |
| Beta | | 5.07 | +/-2.03 | 2.71 | 5.00 | pCi/L | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
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Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-5/D
Sample ID: 245517010
Matrix: Ground Water
Collect Date: 29-DEC-09 11:25
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec Pu, Liquid "As Received"</i> | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00279 | +/-0.151 | 0.459 | 1.00 | pCi/L | | JXD2 | 02/10/10 | 1301 | 949025 | 1 |
| Plutonium-239/240 | U | -0.0501 | +/-0.148 | 0.425 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | | 0.523 | +/-0.389 | 0.386 | 1.00 | pCi/L | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | -402 | | | | percent | | MXE1 | 02/09/10 | 1349 | 947744 | 2 |
| Uranium-233/234 | U | 0.0391 | +/-0.158 | 0.376 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0969 | +/-0.190 | 0.291 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | -0.0188 | +/-0.158 | 0.376 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.17 | +/-2.37 | 3.68 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1942 | 945896 | 3 |
| Beta | | 6.77 | +/-2.29 | 2.65 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | -0.0664 | +/-0.659 | 1.34 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0723 | 945895 | 4 |
| <i>GFPC, Sr89&Sr90, Liquid "As Received"</i> | | | | | | | | | | | | |
| Strontium-89 | U | 0.297 | +/-1.07 | 1.99 | 2.00 | pCi/L | | JXR1 | 02/03/10 | 1029 | 946221 | 5 |
| Strontium-90 | U | -0.0921 | +/-0.671 | 1.96 | 2.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 2.26 | +/-0.467 | 0.306 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1440 | 948312 | 6 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 900.0 | |
| 4 | EPA 904.0/SW846 9320 Modified | |
| 5 | EPA 905.0 Modified | |
| 6 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|------------------------------------|--------|---------|------------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 70.0 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi I
Address : PO Box 44440
Detroit, Michigan 48244

Report Date: February 17, 2010

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Client Sample ID: EF1-5/D
Sample ID: 245517010

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--------------------|---------------------------------------|--------|-------------|----|----|-------|------|-------------|------------|-------|--------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | | | | 97.9 | | (15%-125%) | | |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | | | | 78.9 | | (15%-125%) | | |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 104 | | (25%-125%) | | |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 102 | | (25%-125%) | | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-5/S
Sample ID: 245517011
Matrix: Ground Water
Collect Date: 29-DEC-09 12:25
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec Pu, Liquid "As Received"</i> | | | | | | | | | | | | |
| Plutonium-238 | U | 0.0361 | +/-0.144 | 0.385 | 1.00 | pCi/L | | JXD2 | 02/09/10 | 0923 | 949025 | 1 |
| Plutonium-239/240 | U | -0.0167 | +/-0.140 | 0.333 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.139 | +/-0.192 | 0.208 | 1.00 | pCi/L | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | | 1.67 | | | | percent | | MXE1 | 02/09/10 | 1349 | 947744 | 2 |
| Uranium-233/234 | | 3.62 | +/-1.08 | 0.502 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | | 0.305 | +/-0.345 | 0.305 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 2.80 | +/-0.940 | 0.247 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 3.58 | +/-2.90 | 4.13 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1942 | 945896 | 3 |
| Beta | | 3.53 | +/-2.05 | 2.97 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | | 1.51 | +/-0.847 | 1.19 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0723 | 945895 | 4 |
| <i>GFPC, Sr89&Sr90, Liquid "As Received"</i> | | | | | | | | | | | | |
| Strontium-89 | U | -1.99 | +/-0.507 | 1.98 | 2.00 | pCi/L | | JXR1 | 02/03/10 | 1029 | 946221 | 5 |
| Strontium-90 | U | 1.77 | +/-0.872 | 1.96 | 2.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.470 | +/-0.277 | 0.380 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1440 | 948312 | 6 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 900.0 | |
| 4 | EPA 904.0/SW846 9320 Modified | |
| 5 | EPA 905.0 Modified | |
| 6 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|------------------------------------|--------|---------|------------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 80.4 | (15%-125%) |

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Detroit Edison - Fermi I
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-5/S
Sample ID: 245517011

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--------------------|---------------------------------------|--------|-------------|----|----|-------|------|-------------|------------|-------|--------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | | | | 93.9 | | (15%-125%) | | |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | | | | 91.7 | | (15%-125%) | | |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 104 | | (25%-125%) | | |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | 91.9 | | (25%-125%) | | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-6/D
Sample ID: 245517012
Matrix: Ground Water
Collect Date: 29-DEC-09 15:50
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | AnalystDate | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|----|---------------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | |
| Pct Uranium-235 | U | -1.17 | | | | percent | | MXE102/09/10 | 1349 | 947744 | 1 |
| Uranium-233/234 | U | 0.131 | +/-0.195 | 0.227 | 1.00 | pCi/L | | | | | |
| Uranium-235/236 | U | -0.0225 | +/-0.189 | 0.449 | 1.00 | pCi/L | | | | | |
| Uranium-238 | | 0.303 | +/-0.297 | 0.227 | 1.00 | pCi/L | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | |
| Alpha | U | 1.00 | +/-2.18 | 4.02 | 5.00 | pCi/L | | DXF3 02/11/10 | 1942 | 945896 | 2 |
| Beta | | 3.61 | +/-1.98 | 2.83 | 5.00 | pCi/L | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 96.6 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
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Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-6/S
Sample ID: 245517013
Matrix: Ground Water
Collect Date: 29-DEC-09 15:10
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 6.22 | +/-3.33 | 3.92 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1932 | 945896 | 1 |
| Beta | U | 2.98 | +/-2.13 | 3.33 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
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Report Date: February 17, 2010

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Client Sample ID: EF1-7/S
Sample ID: 245517014
Matrix: Ground Water
Collect Date: 04-JAN-10 10:00
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.87 | +/-2.93 | 4.60 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1932 | 945896 | 1 |
| Beta | U | 1.84 | +/-2.43 | 4.10 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Report Date: February 17, 2010

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Client Sample ID: EF1-8/S
Sample ID: 245517015
Matrix: Ground Water
Collect Date: 04-JAN-10 10:30
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.55 | +/-2.53 | 4.38 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1932 | 945896 | 1 |
| Beta | | 15.5 | +/-3.27 | 3.45 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-9/S
Sample ID: 245517016
Matrix: Ground Water
Collect Date: 04-JAN-10 14:45
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.985 | | | | percent | | | | | | |
| Uranium-233/234 | | 11.2 | +/-1.80 | 0.361 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.443 | +/-0.410 | 0.446 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 6.93 | +/-1.42 | 0.226 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 12.0 | +/-4.16 | 4.76 | 5.00 | pCi/L | | | | | | |
| Beta | | 10.2 | +/-3.09 | 4.43 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 101 | (15%-125%) |

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-10/S
Sample ID: 245517017
Matrix: Ground Water
Collect Date: 30-DEC-09 09:15
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 1.11 | | | | percent | | | | | | |
| Uranium-233/234 | | 1.26 | +/-0.622 | 0.240 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0751 | +/-0.199 | 0.474 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 1.04 | +/-0.565 | 0.240 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 3.62 | +/-2.89 | 4.17 | 5.00 | pCi/L | | | | | | |
| Beta | | 5.59 | +/-2.48 | 3.47 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 94.9 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: MW393 S
Sample ID: 245517018
Matrix: Ground Water
Collect Date: 13-JAN-10 12:15
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | | 1.24 | | | | percent | | | | | | |
| Uranium-233/234 | | 15.5 | +/-2.18 | 0.240 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | | 0.989 | +/-0.613 | 0.297 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 12.2 | +/-1.94 | 0.384 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 17.4 | +/-4.94 | 4.79 | 5.00 | pCi/L | | | | | | |
| Beta | | 7.90 | +/-2.94 | 4.30 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 0.948 | +/-0.827 | 1.31 | 3.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | U | 0.125 | +/-0.163 | 0.276 | 1.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 95.4 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 82.0 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact : Mr. Tom Mow
Project : **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: MW393 D
Sample ID: 245517019
Matrix: Ground Water
Collect Date: 13-JAN-10 13:25
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.734 | | | | percent | | | | | | |
| Uranium-233/234 | | 0.673 | +/-0.387 | 0.173 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.020 | +/-0.152 | 0.437 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.421 | +/-0.324 | 0.353 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.45 | +/-2.34 | 4.18 | 5.00 | pCi/L | | | | | | |
| Beta | | 8.47 | +/-2.44 | 2.99 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.80 | +/-1.23 | 1.87 | 3.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.689 | +/-0.267 | 0.265 | 1.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 110 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 63.0 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: MW388 S
Sample ID: 245517020
Matrix: Ground Water
Collect Date: 13-JAN-10 10:20
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|------|------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | | | | | | |
| Uranium-233/234 | | 1.62 | +/-0.605 | 0.319 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.00 | +/-0.140 | 0.214 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.908 | +/-0.452 | 0.276 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 15.2 | +/-4.91 | 4.25 | 5.00 | pCi/L | | | | | | |
| Beta | | 35.8 | +/-4.45 | 3.34 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | | 1.69 | +/-1.02 | 1.50 | 3.00 | pCi/L | | | | | | |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.908 | +/-0.327 | 0.347 | 1.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 103 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 80.5 | (15%-125%) |

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: MW381 D
Sample ID: 245517021
Matrix: Ground Water
Collect Date: 13-JAN-10 16:00
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 4.58 | | | | percent | | JXD2 | 02/07/10 | 1001 | 949027 | 1 |
| Uranium-233/234 | | 0.733 | +/-0.450 | 0.336 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.173 | +/-0.240 | 0.260 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.560 | +/-0.388 | 0.210 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 4.11 | +/-2.93 | 3.97 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1934 | 945896 | 2 |
| Beta | U | 0.825 | +/-1.58 | 2.76 | 5.00 | pCi/L | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 0.785 | +/-0.984 | 1.67 | 3.00 | pCi/L | | JXC5 | 02/01/10 | 0724 | 945895 | 3 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 1.51 | +/-0.407 | 0.371 | 1.00 | pCi/L | | KSD1 | 02/10/10 | 1545 | 948312 | 4 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 900.0 | |
| 3 | EPA 904.0/SW846 9320 Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 108 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 77.0 | (15%-125%) |

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: February 17, 2010

Client Sample ID: EF1-4S-D
Sample ID: 245517022
Matrix: Ground Water
Collect Date: 29-DEC-09 08:45
Receive Date: 25-JAN-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|--------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 0.592 | +/-2.04 | 3.96 | 5.00 | pCi/L | | DXF3 | 02/11/10 | 1934 | 945896 | 1 |
| Beta | U | 2.48 | +/-1.81 | 2.79 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|-------------|------------------|
| 1 | EPA 900.0 | |

QUALITY CONTROL DATA

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 17, 2010

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Detroit Edison - Fermi 1

PO Box 44440

Detroit, Michigan

Contact: Mr. Tom Mow

Workorder: 245517

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|-----------|--------|----------|----|----------|---------|------|-----------------|----------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 947744 | | | | | | | | | | |
| QC1202030213 | 245517001 | DUP | | | | | | | | | |
| Pct Uranium-235 | | U | -3.8 | U | -2.69 | percent | | | MXE1 | 02/09/10 | 09:23 |
| Uranium-233/234 | | U | -0.0389 | U | 0.0111 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.154 | | +/-0.126 | | | | | | |
| Uranium-235/236 | | U | -0.0453 | U | -0.018 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.196 | | +/-0.152 | | | | | | |
| Uranium-238 | | U | 0.193 | U | 0.107 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.264 | | +/-0.171 | | | | | | |
| QC1202030215 | LCS | | | | | | | | | | |
| Pct Uranium-235 | | | | | 0.702 | percent | | | | 02/09/10 | 09:23 |
| Uranium-233/234 | | | | | 24.4 | pCi/L | | | | | |
| | | | | | +/-2.40 | | | | | | |
| Uranium-235/236 | | | | | 1.13 | pCi/L | | | | | |
| | | | | | +/-0.574 | | | | | | |
| Uranium-238 | 25.9 | | | | 25.0 | pCi/L | | 96.5 (75%-125%) | | | |
| | | | | | +/-2.42 | | | | | | |
| QC1202030212 | MB | | | | | | | | | | |
| Pct Uranium-235 | | | | U | 8.77 | percent | | | | 02/09/10 | 09:23 |
| Uranium-233/234 | | | | U | 0.0104 | pCi/L | | | | | |
| | | | | | +/-0.123 | | | | | | |
| Uranium-235/236 | | | | U | -0.0176 | pCi/L | | | | | |
| | | | | | +/-0.148 | | | | | | |
| Uranium-238 | | | | U | -0.0286 | pCi/L | | | | | |
| | | | | | +/-0.123 | | | | | | |
| QC1202030214 | 245517001 | MS | | | | | | | | | |
| Pct Uranium-235 | | U | -3.8 | | 0.847 | percent | | | | 02/09/10 | 09:23 |
| Uranium-233/234 | | U | -0.0389 | | 26.5 | pCi/L | | | | | |
| | | | +/-0.154 | | +/-2.71 | | | | | | |
| Uranium-235/236 | | U | -0.0453 | | 1.56 | pCi/L | | | | | |
| | | | +/-0.196 | | +/-0.744 | | | | | | |
| Uranium-238 | 25.9 | U | 0.193 | | 28.4 | pCi/L | | 110 (75%-125%) | | | |
| | | | +/-0.264 | | +/-2.82 | | | | | | |
| Batch | 949025 | | | | | | | | | | |
| QC1202033221 | 245517006 | DUP | | | | | | | | | |
| Plutonium-238 | | U | 0.00 | U | -0.0303 | pCi/L | 0.00 | | N/A JXD2 | 02/09/10 | 09:23 |
| | | | +/-0.141 | | +/-0.156 | | | | | | |
| Plutonium-239/240 | | U | -0.0518 | U | -0.066 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.153 | | +/-0.149 | | | | | | |
| Plutonium-244 | | U | 0.00 | U | 0.0357 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.141 | | +/-0.142 | | | | | | |
| QC1202033223 | LCS | | | | | | | | | | |
| Plutonium-238 | | | | U | -0.168 | pCi/L | | (75%-125%) | | 02/07/10 | 09:43 |

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QC Summary

Workorder: 245517

Page 2 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------------------|--------|--------|---------------------|----------------------|---------|------|------|-------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 949025 | | | | | | | | | | |
| Plutonium-239/240 | 22.7 | | | +/-0.227 22.0 | pCi/L | | 96.8 | (75%-125%) | JXD2 | 02/07/10 | 09:43 |
| Plutonium-244 | | | U | +/-2.36 0.182 | pCi/L | | | (75%-125%) | | | |
| QC1202033220 MB | | | | +/-0.225 | | | | | | | |
| Plutonium-238 | | | U | 0.119 | pCi/L | | | | | 02/09/10 | 09:23 |
| Plutonium-239/240 | | | U | +/-0.189 -0.0162 | pCi/L | | | | | | |
| Plutonium-244 | | | U | +/-0.136 0.0674 | pCi/L | | | | | | |
| QC1202033222 245517006 MS | | | | +/-0.132 | | | | | | | |
| Plutonium-238 | | U | 0.00 | 0.176 | pCi/L | | | (75%-125%) | | 02/07/10 | 10:03 |
| Plutonium-239/240 | 22.7 | U | +/-0.141 -0.0518 | +/-0.199 20.8 | pCi/L | | 91.8 | (75%-125%) | | | |
| Plutonium-244 | | U | +/-0.153 0.00 | +/-2.17 0.117 | pCi/L | | | (75%-125%) | | | |
| Batch | 949027 | | | +/-0.141 +/-0.163 | | | | | | | |
| QC1202033229 245517021 DUP | | | | | | | | | | | |
| Pct Uranium-235 | | U | 4.58 | 4.86 | percent | | | | JXD2 | 02/07/10 | 10:01 |
| Uranium-233/234 | | | 0.733 | 0.316 | pCi/L | 73.4 | | (0% - 100%) | | | |
| Uranium-235/236 | | U | +/-0.450 0.173 | +/-0.303 0.0875 | pCi/L | 0.00 | | N/A | | | |
| Uranium-238 | | | +/-0.240 0.560 | +/-0.171 0.266 | pCi/L | 49.1 | | (0% - 100%) | | | |
| QC1202033231 LCS | | | +/-0.388 | +/-0.279 | | | | | | | |
| Pct Uranium-235 | | | | 0.654 | percent | | | | | 02/07/10 | 10:01 |
| Uranium-233/234 | | | | 24.8 | pCi/L | | | | | | |
| Uranium-235/236 | | | | +/-2.78 1.10 | pCi/L | | | | | | |
| Uranium-238 | 25.9 | | | +/-0.653 26.1 | pCi/L | | 101 | (75%-125%) | | | |
| QC1202033228 MB | | | | +/-2.85 | | | | | | | |
| Pct Uranium-235 | | U | | 99.9 | percent | | | | | 02/07/10 | 10:01 |
| Uranium-233/234 | | U | | 0.185 | pCi/L | | | | | | |
| Uranium-235/236 | | U | | +/-0.271 0.101 | pCi/L | | | | | | |
| Uranium-238 | | U | | +/-0.198 0.00 | pCi/L | | | | | | |
| QC1202033230 245517021 MS | | | | +/-0.160 | | | | | | | |

GEL LABORATORIES LLC

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QC Summary

Workorder: 245517

Page 3 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|-----------|----------|----------|----------|---------|------|------|-------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 949027 | | | | | | | | | | |
| Pct Uranium-235 | U | 4.58 | | 0.936 | percent | | | | | 02/07/10 | 10:01 |
| Uranium-233/234 | | 0.733 | | 23.4 | pCi/L | | | | JXD2 | | |
| | | +/-0.450 | | +/-2.56 | | | | | | | |
| Uranium-235/236 | U | 0.173 | | 1.53 | pCi/L | | | | | | |
| | | +/-0.240 | | +/-0.726 | | | | | | | |
| Uranium-238 | 25.9 | 0.560 | | 25.2 | pCi/L | | 94.8 | (75%-125%) | | | |
| | | +/-0.388 | | +/-2.65 | | | | | | | |
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 945895 | | | | | | | | | | |
| QC1202026031 | 245517001 | DUP | | | | | | | | | |
| Radium-228 | U | 0.845 | U | 1.04 | pCi/L | 0.00 | | N/A | JXC5 | 02/01/10 | 07:24 |
| | | +/-0.845 | | +/-1.04 | | | | | | | |
| QC1202026033 | LCS | | | | | | | | | | |
| Radium-228 | 25.6 | | | 29.7 | pCi/L | | 116 | (75%-125%) | | 02/01/10 | 07:24 |
| | | | | +/-2.86 | | | | | | | |
| QC1202026030 | MB | | | | | | | | | | |
| Radium-228 | | | U | 0.808 | pCi/L | | | | | 02/01/10 | 07:24 |
| | | | | +/-1.06 | | | | | | | |
| QC1202026032 | 245517001 | MS | | | | | | | | | |
| Radium-228 | 77.0 | U | 0.845 | 80.1 | pCi/L | | 104 | (75%-125%) | | 02/01/10 | 07:24 |
| | | | +/-0.845 | +/-7.69 | | | | | | | |
| Batch | 945896 | | | | | | | | | | |
| QC1202026035 | 245517003 | DUP | | | | | | | | | |
| Alpha | U | 1.19 | U | 2.05 | pCi/L | 0.00 | | N/A | DXF3 | 02/11/10 | 19:31 |
| | | +/-2.12 | | +/-2.48 | | | | | | | |
| Beta | | 4.58 | U | 1.59 | pCi/L | 97.0 | | (0% - 100%) | | | |
| | | +/-2.09 | | +/-1.73 | | | | | | | |
| QC1202026038 | LCS | | | | | | | | | | |
| Alpha | 126 | | | 150 | pCi/L | | 119 | (75%-125%) | | 02/11/10 | 19:31 |
| | | | | +/-13.6 | | | | | | | |
| Beta | 385 | | | 414 | pCi/L | | 107 | (75%-125%) | | | |
| | | | | +/-16.0 | | | | | | | |
| QC1202026034 | MB | | | | | | | | | | |
| Alpha | | | U | -0.46 | pCi/L | | | | | 02/11/10 | 19:31 |
| | | | | +/-1.63 | | | | | | | |
| Beta | | | U | 0.620 | pCi/L | | | | | | |
| | | | | +/-2.08 | | | | | | | |
| QC1202026036 | 245517003 | MS | | | | | | | | | |
| Alpha | 252 | U | 1.19 | 290 | pCi/L | | 115 | (75%-125%) | | 02/11/10 | 19:35 |
| | | | +/-2.12 | +/-32.5 | | | | | | | |
| Beta | 770 | | 4.58 | 854 | pCi/L | | 110 | (75%-125%) | | | |
| | | | +/-2.09 | +/-34.0 | | | | | | | |
| QC1202026037 | 245517003 | MSD | | | | | | | | | |
| Alpha | 252 | U | 1.19 | 284 | pCi/L | 2.00 | 113 | (0%-20%) | | 02/11/10 | 19:31 |
| | | | +/-2.12 | +/-34.6 | | | | | | | |
| Beta | 770 | | 4.58 | 873 | pCi/L | 2.20 | 113 | (0%-20%) | | | |

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QC Summary

Workorder: 245517

Page 4 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|-----------|--------|----------|---------|----------|-------|-------|-------|------------|----------|-------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 945896 | | | | | | | | | | |
| | | | | +/-2.09 | | | | | | | |
| | | | | +/-34.7 | | | | | | | |
| Batch | 945898 | | | | | | | | | | |
| QC1202026045 | 245518001 | DUP | | | | | | | | | |
| Alpha | | U | 0.509 | U | 1.37 | pCi/L | 0.00 | | N/A DXB5 | 02/05/10 | 14:41 |
| | | | +/-1.03 | | +/-1.38 | | | | | | |
| Beta | | U | 1.84 | U | 1.66 | pCi/L | 0.00 | | N/A | | |
| | | | +/-1.45 | | +/-1.63 | | | | | | |
| QC1202026048 | LCS | | | | | | | | | | |
| Alpha | 84.0 | | | | 102 | pCi/L | | 121 | (75%-125%) | 02/05/10 | 14:41 |
| | | | | | +/-9.34 | | | | | | |
| Beta | 257 | | | | 260 | pCi/L | | 101 | (75%-125%) | | |
| | | | | | +/-10.5 | | | | | | |
| QC1202026044 | MB | | | | | | | | | | |
| Alpha | | | | U | 0.174 | pCi/L | | | | 02/05/10 | 19:26 |
| | | | | | +/-0.955 | | | | | | |
| Beta | | | | U | -0.914 | pCi/L | | | | | |
| | | | | | +/-0.771 | | | | | | |
| QC1202026046 | 245518001 | MS | | | | | | | | | |
| Alpha | 252 | U | 0.509 | | 290 | pCi/L | | 115 | (75%-125%) | 02/05/10 | 14:40 |
| | | | +/-1.03 | | +/-27.1 | | | | | | |
| Beta | 770 | U | 1.84 | | 837 | pCi/L | | 109 | (75%-125%) | | |
| | | | +/-1.45 | | +/-32.1 | | | | | | |
| QC1202026047 | 245518001 | MSD | | | | | | | | | |
| Alpha | 252 | U | 0.509 | | 291 | pCi/L | 0.277 | 115 | (0%-20%) | 02/05/10 | 14:40 |
| | | | +/-1.03 | | +/-27.1 | | | | | | |
| Beta | 770 | U | 1.84 | | 829 | pCi/L | 0.964 | 108 | (0%-20%) | | |
| | | | +/-1.45 | | +/-32.1 | | | | | | |
| Batch | 946221 | | | | | | | | | | |
| QC1202026703 | 245517006 | DUP | | | | | | | | | |
| Strontium-89 | | U | 0.272 | U | 0.218 | pCi/L | 0.00 | | N/A JXR1 | 02/03/10 | 10:34 |
| | | | +/-0.959 | | +/-0.930 | | | | | | |
| Strontium-90 | | U | -0.341 | U | 0.339 | pCi/L | 0.00 | | N/A | | |
| | | | +/-0.603 | | +/-0.710 | | | | | | |
| QC1202026705 | LCS | | | | | | | | | | |
| Strontium-89 | 7160 | | | | 7620 | pCi/L | | 106 | (75%-125%) | 02/03/10 | 10:34 |
| | | | | | +/-53.7 | | | | | | |
| Strontium-90 | 482 | | | | 526 | pCi/L | | 109 | (75%-125%) | | |
| | | | | | +/-12.0 | | | | | | |
| QC1202026702 | MB | | | | | | | | | | |
| Strontium-89 | | | | U | -1.71 | pCi/L | | | | 02/03/10 | 10:34 |
| | | | | | +/-0.412 | | | | | | |
| Strontium-90 | | | | U | -0.959 | pCi/L | | | | | |
| | | | | | +/-0.599 | | | | | | |
| QC1202026704 | 245517006 | MS | | | | | | | | | |
| Strontium-89 | 18200 | U | 0.272 | | 16300 | pCi/L | | 89.9 | (75%-125%) | 02/03/10 | 10:34 |
| | | | +/-0.959 | | +/-117 | | | | | | |

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QC Summary

Workorder: 245517

Page 5 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------|-----------|--------|----------|----------|-------|------|------|-------------|-------|----------|-------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 946221 | | | | | | | | | | |
| Strontium-90 | 964 | U | -0.341 | 857 | pCi/L | | 88.8 | (75%-125%) | | | |
| | | | +/-0.603 | +/-19.7 | | | | | | | |
| Rad Ra-226 | | | | | | | | | | | |
| Batch | 948312 | | | | | | | | | | |
| QC1202031479 | 245517001 | DUP | | | | | | | | | |
| Radium-226 | | | 0.832 | 1.07 | pCi/L | 24.6 | | (0% - 100%) | KSD1 | 02/10/10 | 15:45 |
| | | | +/-0.317 | +/-0.316 | | | | | | | |
| QC1202031481 | LCS | | | | | | | | | | |
| Radium-226 | 24.2 | | | 21.3 | pCi/L | | 88.1 | (75%-125%) | | 02/10/10 | 15:45 |
| | | | | +/-1.51 | | | | | | | |
| QC1202031478 | MB | | | | | | | | | | |
| Radium-226 | | U | | 0.287 | pCi/L | | | | | 02/10/10 | 15:45 |
| | | | | +/-0.220 | | | | | | | |
| QC1202031480 | 245517001 | MS | | | | | | | | | |
| Radium-226 | 121 | | 0.832 | 114 | pCi/L | | 93.5 | (75%-125%) | | 02/10/10 | 15:45 |
| | | | +/-0.317 | +/-6.94 | | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

GEL LABORATORIES LLC

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QC Summary

Workorder: 245517

Page 6 of 6

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

May 03, 2010

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 250814

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 09, 2010. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4297.

Sincerely,

A handwritten signature in black ink, appearing to read "Amanda Rasco".

Amanda Rasco
Project Manager

Purchase Order: 4700246055
Enclosures

problem solved

Table of Contents

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|-----------------------------------|-----------|
| Case Narrative..... | 1 |
| Chain of Custody | 3 |
| Radiological Analysis..... | 10 |
| Sample Data Summary | 17 |
| Quality Control Data | 25 |

Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 250814**

May 03, 2010

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on April 09, 2010 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 250814001 | MW393 (S) Duplicate |
| 250814002 | MW393 (D) |
| 250814003 | MW381 (S) |
| 250814004 | MW388 (S) |
| 250814005 | MW393 (S) |
| 250814006 | GW-4 |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Amanda Rasco

Project Manager

Chain of Custody

16 c

[illegible]

| | |
|-----------------------------------|---|
| Page: _____ of _____ | <h2 style="text-align: center;">GEL Chain of Custody and Analytical Request</h2> <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>GEL Work Order Number:</p> <p style="font-size: 1.5em; margin-top: 10px;">250814</p> </div> <div> <p>GEL Laboratories, LLC</p> <p>2040 Savage Road</p> <p>Charleston, SC 29407</p> <p>Phone: (843) 556-8171</p> <p>Fax: (843) 766-1178</p> </div> </div> |
| Project #: _____ | |
| GEL Quote #: _____ | |
| COC Number ⁽¹⁾ : _____ | |
| PO Number: _____ | |

[illegible]

| | | | |
|---|--|---|---|
| TAT Requested: Normal: <input type="checkbox"/> Rush: <input type="checkbox"/> Specify: <input type="checkbox"/> (Subject to Surcharge) | | Fax Results: Yes <input type="checkbox"/> / No <input type="checkbox"/> | Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4 |
|---|--|---|---|

| | | |
|--|-----------------------------|-------------|
| Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards | Sample Collection Time Zone | |
| | Eastern | Pacific |
| | Central | Other _____ |
| | Mountain | |

[illegible]

- 1.) Chain of Custody Number = Client Determined
2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
3.) Field Filtered: For liquid matrices, indicate with a Y - for yes the sample was field filtered or - N - for sample was not field filtered.
4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

WHITE = LABORATORY

YELLOW = FILE

PINK = CLIENT



| | |
|----------------------------|----|
| For Lab Receiving Use Only | |
| Custody Seal Intact? | |
| YES | NO |
| Cooler Temp: | |
| 16 | C |

| | |
|-----------------------------------|--|
| Page: _____ of _____ | <h2 style="text-align: center;">GEL Chain of Custody and Analytical Request</h2> <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>GEL Work Order Number:</p> <p style="font-size: 1.5em; margin-top: 10px;">250814</p> </div> <div> <p>GEL Laboratories, LLC 2040 Savage Road Charleston, SC 29407 Phone: (843) 556-8171 Fax: (843) 766-1178</p> </div> </div> |
| Project #: _____ | |
| GEL Quote #: _____ | |
| COC Number ⁽¹⁾ : _____ | |
| PO Number: _____ | |

[illegible]

| | | |
|--|-----------------------|---|
| TAT Requested: Normal: _____ Rush: _____ Specify: _____ (Subject to Surcharge) | Fax Results: Yes / No | Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4 |
|--|-----------------------|---|

| | | |
|--|-----------------------------|-------------|
| Remarks: Are there any known hazards applicable to these samples? If so, please list the hazards | Sample Collection Time Zone | |
| | Eastern | Pacific |
| | Central | Other _____ |
| | Mountain | |

| Chain of Custody Signatures | | | | | | Sample Shipping and Delivery Details | |
|---|--------|-------|---|--------|------|--------------------------------------|---------------|
| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time | | |
| 1  | 4-8-10 | 11:00 | 1  | 4/9/10 | 0830 | GEL PM: | |
| 2 | | | 2 | | | Method of Shipment: | Date Shipped: |
| 3 | | | 3 | | | Airbill #: | |

- 1.) Chain of Custody Number = Client Determined
- 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
- 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
- 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
- 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
- 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

WHITE = LABORATORY

YELLOW = FILE

PINK = CLIENT

For Lab Receiving Use Only

Custody Seal Intact?
YES NO

Cooler Temp:
16 C



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|-----|-------------------------------------|---|
| Client: <u>DOT</u> | | SDG/ARCO/Work Order: <u>250814</u> | |
| Received By: <u>SL</u> | | Date Received: <u>4/9/10</u> | |
| Suspected Hazard Information | Yes | No | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation. |
| COC/Samples marked as radioactive? | | <input checked="" type="checkbox"/> | Maximum Counts Observed*: <u>20 cpm</u> |
| Classified Radioactive II or III by RSO? | | <input checked="" type="checkbox"/> | |
| COC/Samples marked containing PCBs? | | <input checked="" type="checkbox"/> | |
| Shipped as a DOT Hazardous? | | <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | <input checked="" type="checkbox"/> | |

| Sample Receipt Criteria | | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|-------------------------|--|-------------------------------------|-------------------------------------|----|--|
| 1 | Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | Circle Applicable: seals broken damaged container leaking container other (describe) |
| 2 | Samples requiring cold preservation within 0 ≤ 6 deg. C? | | <input checked="" type="checkbox"/> | | ice bags blue ice dry ice <u>none</u> other (describe) <u>16°C</u> |
| 3 | Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | |
| 4 | Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | Circle Applicable: seals broken damaged container leaking container other (describe) |
| 5 | Samples requiring chemical preservation at proper pH? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 | VOA vials free of headspace (defined as < 6mm bubble)? | | <input checked="" type="checkbox"/> | | Sample ID's and containers affected: |
| 7 | Are Encore containers present? | | <input checked="" type="checkbox"/> | | (If yes, immediately deliver to Volatiles laboratory) |
| 8 | Samples received within holding time? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | ID's and tests affected: |
| 9 | Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | Sample ID's and containers affected: |
| 10 | Date & time on COC match date & time on bottles? | | <input checked="" type="checkbox"/> | | Sample ID's affected: <u>No date/time on containers.</u> |
| 11 | Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | Sample ID's affected: |
| 12 | COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | |

Comments:

FedEx 7957 5301 5084
 8723 1160 9228
 7957 5301 5073
 7957 5301 5062

PM (or PMA) review: Initials

AM

Date

4/9/10

List of current GEL Certifications as of 03 May 2010

| State | Certification |
|---------------------------|----------------------|
| Arizona | AZ0668 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | GEL |
| Connecticut | PH-0169 |
| Dept. of Navy | NFESC 413 |
| EPA Region 5 | WG-15J |
| Florida – NELAP | E87156 |
| Georgia | E87156 (FL/NELAP) |
| Georgia DW | 967 |
| Hawaii | N/A |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Nevada | SC00012 |
| New Jersey – NELAP | SC002 |
| New Mexico | FL NELAP E87156 |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-07B-TX |
| U.S. Dept. of Agriculture | S-52597 |
| Utah – NELAP | GEL |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C1641 |

RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 250814**

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified.
Analytical Batch Number: 973991

| Sample ID | Client ID |
|------------------|---|
| 250814001 | MW393 (S) Duplicate |
| 250814002 | MW393 (D) |
| 250814003 | MW381 (S) |
| 250814004 | MW388 (S) |
| 250814005 | MW393 (S) |
| 250814006 | GW-4 |
| 1202092556 | Method Blank (MB) |
| 1202092557 | 250814002(MW393 (D)) Sample Duplicate (DUP) |
| 1202092558 | 250814002(MW393 (D)) Matrix Spike (MS) |
| 1202092559 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 250814002 (MW393 (D)).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 250814001 (MW393 (S) Duplicate) was recounted due to a peak shift.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|--------------------------|-------------------------------|
| Product: | GFPC, Ra228, Liquid |
| Analytical Method: | EPA 904.0/SW846 9320 Modified |
| Analytical Batch Number: | 974116 |

| Sample ID | Client ID |
|------------------|--|
| 250814001 | MW393 (S) Duplicate |
| 250814002 | MW393 (D) |
| 250814003 | MW381 (S) |
| 250814004 | MW388 (S) |
| 250814005 | MW393 (S) |
| 250814006 | GW-4 |
| 1202092902 | Method Blank (MB) |
| 1202092903 | 250820001(Mallards Effluent Grab) Sample Duplicate (DUP) |
| 1202092904 | 250820001(Mallards Effluent Grab) Matrix Spike (MS) |
| 1202092905 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 250820001 (Mallards Effluent Grab).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Lucas Cell, Ra226, liquid

Analytical Method: EPA 903.1 Modified

Analytical Batch Number: 974610

| Sample ID | Client ID |
|------------------|---|
| 250814001 | MW393 (S) Duplicate |
| 250814002 | MW393 (D) |
| 250814003 | MW381 (S) |
| 250814004 | MW388 (S) |
| 250814005 | MW393 (S) |
| 250814006 | GW-4 |
| 1202094146 | Method Blank (MB) |
| 1202094147 | 250814002(MW393 (D)) Sample Duplicate (DUP) |
| 1202094148 | 250814002(MW393 (D)) Matrix Spike (MS) |
| 1202094149 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 250814002 (MW393 (D)).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

The blank result 1202094146 (MB) is greater than the MDC but less than the detection limit.

Qualifier information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer/Date: _____

 4/28/10

SAMPLE DATA SUMMARY

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report for

ROIT001 Detroit Edison Company

Client SDG: 250814 GEL Work Order: 250814

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the RL or LOQ.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Amanda Rasco.



Reviewed By: _____

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: April 27, 2010

Client Sample ID: MW393 (S) Duplicate
Sample ID: 250814001
Matrix: Ground Water
Collect Date: 01-APR-10 15:50
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | | 1.46 | | | | percent | | JXH2 | 04/17/10 | 1427 | 973991 | 1 |
| Uranium-233/234 | | 14.4 | +/-1.99 | 0.471 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | | 1.13 | +/-0.626 | 0.424 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 11.8 | +/-1.81 | 0.471 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.34 | +/-1.26 | 2.02 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0842 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | U | 0.0765 | +/-0.150 | 0.282 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 85.1 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 73.9 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: April 27, 2010

Client Sample ID: MW393 (D)
Sample ID: 250814002
Matrix: Ground Water
Collect Date: 01-APR-10 10:40
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 2.69 | | | | percent | | JXH2 | 04/15/10 | 0741 | 973991 | 1 |
| Uranium-233/234 | | 0.577 | +/-0.436 | 0.440 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0746 | +/-0.198 | 0.471 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.419 | +/-0.387 | 0.485 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.02 | +/-1.25 | 2.12 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0842 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 1.05 | +/-0.377 | 0.412 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 91.1 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 76.4 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: April 27, 2010

Client Sample ID: MW381 (S)
Sample ID: 250814003
Matrix: Ground Water
Collect Date: 06-APR-10 13:45
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.222 | | | | percent | | JXH2 | 04/15/10 | 0741 | 973991 | 1 |
| Uranium-233/234 | | 4.57 | +/-1.13 | 0.345 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0463 | +/-0.184 | 0.493 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 3.24 | +/-0.947 | 0.216 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | -0.455 | +/-1.38 | 2.77 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0842 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.377 | +/-0.236 | 0.316 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 103 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 71.5 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: April 27, 2010

Client Sample ID: MW388 (S)
Sample ID: 250814004
Matrix: Ground Water
Collect Date: 06-APR-10 11:20
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.579 | | | | percent | | JXH2 | 04/15/10 | 0741 | 973991 | 1 |
| Uranium-233/234 | | 3.76 | +/-1.04 | 0.406 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0907 | +/-0.178 | 0.272 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 2.42 | +/-0.826 | 0.220 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 1.45 | +/-1.21 | 1.90 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0842 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.422 | +/-0.240 | 0.270 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 98.8 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 80.0 | (15%-125%) |

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: April 27, 2010

Client Sample ID: MW393 (S)
Sample ID: 250814005
Matrix: Ground Water
Collect Date: 01-APR-10 15:15
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | | 1.39 | | | | percent | | JXH2 | 04/15/10 | 0741 | 973991 | 1 |
| Uranium-233/234 | | 13.8 | +/-2.12 | 0.406 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | | 1.15 | +/-0.681 | 0.314 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 12.7 | +/-2.03 | 0.254 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 0.208 | +/-1.41 | 2.69 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0843 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | U | 0.162 | +/-0.163 | 0.256 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 85.1 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 64.8 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440
Detroit, Michigan 48244

Contact: Mr. Tom Mow
Project: **Fermi 1 - PO# 4700246055**

Report Date: April 27, 2010

Client Sample ID: GW-4
Sample ID: 250814006
Matrix: Ground Water
Collect Date: 06-APR-10 09:30
Receive Date: 09-APR-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|--------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| <i>Alphaspec U, Liquid "As Received"</i> | | | | | | | | | | | | |
| Pct Uranium-235 | U | 4.77 | | | | percent | | JXH2 | 04/15/10 | 0741 | 973991 | 1 |
| Uranium-233/234 | | 0.885 | +/-0.556 | 0.477 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.187 | +/-0.299 | 0.510 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.582 | +/-0.448 | 0.413 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Ra228, Liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-228 | U | 0.808 | +/-1.21 | 2.12 | 3.00 | pCi/L | | JXC5 | 04/16/10 | 0843 | 974116 | 2 |
| Rad Radium-226 | | | | | | | | | | | | |
| <i>Lucas Cell, Ra226, liquid "As Received"</i> | | | | | | | | | | | | |
| Radium-226 | | 0.836 | +/-0.289 | 0.188 | 1.00 | pCi/L | | KSD1 | 04/26/10 | 1450 | 974610 | 3 |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | EPA 903.1 Modified | |

| Surrogate/Tracer recovery | Test | Result | Nominal | Recovery % | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|------------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 84.4 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 70.7 | (15%-125%) |

QUALITY CONTROL DATA

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: April 27, 2010

Page 1 of 3

Detroit Edison - Fermi 1

PO Box 44440

Detroit, Michigan

Contact: Mr. Tom Mow

Workorder: 250814

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|-----------|--------|------|---------|---------|------|------|-------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 973991 | | | | | | | | | | |
| QC1202092557 | 250814002 | DUP | | | | | | | | | |
| Pct Uranium-235 | U | 2.69 | U | 0.00 | percent | | | (0%-20%) | JXH2 | 04/15/10 | 07:41 |
| Uranium-233/234 | | 0.577 | | 0.532 | pCi/L | 8.12 | | (0% - 100%) | | | |
| Uranium-235/236 | U | 0.0746 | U | 0.00 | pCi/L | 0.00 | | N/A | | | |
| Uranium-238 | U | 0.419 | U | 0.393 | pCi/L | 0.00 | | N/A | | | |
| QC1202092559 | LCS | | | | | | | | | | |
| Pct Uranium-235 | | | | 1.15 | percent | | | | | 04/15/10 | 07:41 |
| Uranium-233/234 | | | | 26.5 | pCi/L | | | | | | |
| Uranium-235/236 | | | | 1.89 | pCi/L | | | | | | |
| Uranium-238 | | | | 25.9 | pCi/L | | 97.7 | (75%-125%) | | | |
| QC1202092556 | MB | | | | | | | | | | |
| Pct Uranium-235 | | | U | 0.00 | percent | | | | | 04/15/10 | 07:40 |
| Uranium-233/234 | | | U | 0.107 | pCi/L | | | | | | |
| Uranium-235/236 | | | U | 0.00 | pCi/L | | | | | | |
| Uranium-238 | | | U | -0.0202 | pCi/L | | | | | | |
| QC1202092558 | 250814002 | MS | | | | | | | | | |
| Pct Uranium-235 | U | 2.69 | | 0.793 | percent | | | | | 04/15/10 | 07:41 |
| Uranium-233/234 | | 0.577 | | 24.9 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0746 | | 1.34 | pCi/L | | | | | | |
| Uranium-238 | U | 0.419 | | 26.0 | pCi/L | | 100 | (75%-125%) | | | |
| QC1202092903 | 250820001 | DUP | | | | | | | | | |
| Radium-228 | U | 1.78 | U | 1.08 | pCi/L | 0.00 | | N/A | JXC5 | 04/16/10 | 08:43 |
| QC1202092905 | LCS | | | | | | | | | | |
| Radium-228 | | 37.4 | | 45.7 | pCi/L | | 122 | (75%-125%) | | 04/16/10 | 08:43 |
| QC1202092902 | MB | | | | | | | | | | |
| Radium-228 | | | U | -1.15 | pCi/L | | | | | 04/16/10 | 08:43 |

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QC Summary

Workorder: 250814

Page 2 of 3

| Paramname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------|-----------|--------|-------------|----------|----------|----------|-------|-------|-------------|------------|----------------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 974116 | | | | | | | | | | |
| | | | Uncertainty | | | | | | | | |
| | | | | +/-0.995 | | | | | | | |
| QC1202092904 | 250820001 | MS | | | | | | | | | |
| Radium-228 | | | 74.9 | U | 1.78 | 81.6 | pCi/L | 109 | (75%-125%) | JXC5 | 04/16/10 08:43 |
| | | | Uncertainty | | +/-1.51 | +/-8.03 | | | | | |
| Rad Ra-226 | | | | | | | | | | | |
| Batch | 974610 | | | | | | | | | | |
| QC1202094147 | 250814002 | DUP | | | | | | | | | |
| Radium-226 | | | | 1.05 | 0.735 | pCi/L | 34.9 | | (0% - 100%) | KSD1 | 04/26/10 15:20 |
| | | | Uncertainty | | +/-0.377 | +/-0.319 | | | | | |
| QC1202094149 | LCS | | | | | | | | | | |
| Radium-226 | | | 24.2 | | 19.7 | pCi/L | | 81.6 | (75%-125%) | | 04/26/10 15:20 |
| | | | Uncertainty | | +/-1.37 | | | | | | |
| QC1202094146 | MB | | | | | | | | | | |
| Radium-226 | | | | 0.424 | pCi/L | | | | | | 04/26/10 15:20 |
| | | | Uncertainty | | +/-0.277 | | | | | | |
| QC1202094148 | 250814002 | MS | | | | | | | | | |
| Radium-226 | | | 121 | | 1.05 | 106 | pCi/L | | 86.5 | (75%-125%) | 04/26/10 15:20 |
| | | | Uncertainty | | +/-0.377 | +/-6.74 | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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QC Summary

Workorder: 250814

Page 3 of 3

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| UI | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UJ | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

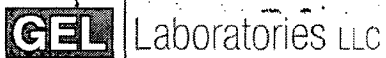
N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

December 28, 2010

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 268144

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 06, 2010. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4443.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard Albee".

Richard Albee
Project Manager

Purchase Order: 4700246055
Enclosures

problem solved

Table of Contents

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Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 268144**

December 28, 2010

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on December 06, 2010 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Samples EFT-102010-6/S, EFT-102510-1/S, and EFT-102710-5/S were received at pH 7. Samples were preserved upon receipt per client request.

Sample Identification The laboratory received the following samples:

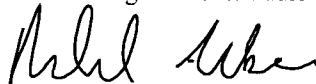
| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 268144001 | EFT-102010-6/S |
| 268144002 | EFT-102510-1/S |
| 268144003 | EFT-102710-1/D |
| 268144004 | EFT-102010-4/S |
| 268144005 | EFT-102010-5/D |
| 268144006 | EFT-102810-GW4 |
| 268144007 | EFT-102510-2/D |
| 268144008 | EFT-101310-GW3 |
| 268144009 | EFT-102710-5/S |
| 268144010 | EFT-102810-1/I |
| 268144011 | EFT-101410-9/S |
| 268144012 | EFT-102510-8SR NEW |
| 268144013 | EFT-102010-4/D |
| 268144014 | EFT-101410-6/D |
| 268144015 | EFT-101410-GW2 |
| 268144016 | EFT-11110-7/S |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Richard Albee
Project Manager

Chain of Custody

FERMI 1 NUCLEAR POWER PLANT CHAIN-OF-CUSTODY

268144

| PROJECT | | SAMPLE PREP (printed) <i>Thomas Mow</i> | | SAMPLE TYPES | | | | ANALYSIS TO BE PERFORMED | | | | | | | | |
|-------------------------------------|---------------------------------|--|-------|---------------------------------|------|--|-----------------|-----------------------------------|--|---|--|--|--|--|--------|-------------------|
| LABORATORY ID | | SAMPLE PREP (signature) <i>Thomas Mow</i> | | 1. WELL WATER 2. OTHER | | | | gross alpha/beta analysis | | | | | | | | |
| SAMPLE NUMBER | SAMPLE TYPE (SEE CODE ABOVE) | DATE | TIME | COMPOSITE | GRAB | STATION LOCATION OR CONTAINER NUMBER | NUMBER OF CG | | | | | | | | | CONTAINER TYPE |
| EFT-102010-6/S | 1 | 10/20/2010 | 16:30 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102510-1/S | 1 | 10/25/2010 | 16:05 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102710-1/D | 1 | 10/27/2010 | 8:20 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102010-4/S | 1 | 10/20/2010 | 11:50 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102010-5/D | 1 | 10/20/2010 | 14:55 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102810-GW4 | 1 | 10/28/2010 | 8:25 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102510-2/D | 1 | 10/25/2010 | 11:25 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-101310-GW3 | 1 | 10/13/2010 | 12:10 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102710-5/S | 1 | 10/27/2010 | 15:50 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102810-1/I | 1 | 10/28/2010 | 9:50 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-101410-9/S | 1 | 10/14/2010 | 11:55 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102510-8SR NEW | 1 | 10/25/2010 | 13:50 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-102010-4/D | 1 | 10/20/2010 | 12:55 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-101410-6/D | 1 | 10/14/2010 | 9:40 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-101410-GW2 | 1 | 10/14/2010 | 15:45 | | | | 1 | X | | | | | | | 500 ML | |
| EFT-11110-7/S | 1 | 11/1/2010 | 11:05 | | | | 1 | X | | | | | | | 500 ML | |
| | | | | | | | | | | | | | | | 500 ML | |
| Verify 12-1-10 16:00 p.m. | | | | | | | | | | | | | | | | |
| RELINQUISHED BY (printed/signed) | | | | RECEIVED BY (printed/signed) | | | | DATE/TIME (DD-MMM-YYYY / 24HR) | | REMARKS | | | | | | |
| <i>Thomas Mow / Thomas Mow</i> | | | | <i>Greg Tyler Shuey</i> | | | | 12/1/10 09:00 | | <i>Thomas Mow - 734-586-5334 MOWE@DTEENERGY.COM</i> | | | | | | |
| | | | | | | | | 12/5/10 11:30 | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|-----|--------------------------------------|--|
| Client: ROIT | | SDG/AR/COC/Work Order: 268144 | |
| Received By: Greg Tyler | | Date Received: 12-6-10 | |
| Suspected Hazard Information | Yes | No | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive? | | <input checked="" type="checkbox"/> | Maximum Counts Observed*: 60 cpm |
| Classified Radioactive II or III by RSO? | | <input checked="" type="checkbox"/> | |
| COC/Samples marked containing PCBs? | | <input checked="" type="checkbox"/> | |
| Shipped as a DOT Hazardous? | | <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | | <input checked="" type="checkbox"/> | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|-------------------------------------|-------------------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)? | | <input checked="" type="checkbox"/> | | Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) 12°C |
| 2a Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | | | Temperature Device Serial #: 6524646 Secondary Temperature Device Serial # (If Applicable): |
| 3 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | | | |
| 4 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | | | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 Samples requiring chemical preservation at proper pH? | | | <input checked="" type="checkbox"/> | Sample ID's, containers affected and observed pH: EFT-102610-6/5, EFT-102510-1/5 and EFT-1027-5/5 had pH of 7. If Preservation added, Lot#: 539031 |
| 6 VOA vials free of headspace (defined as < 6mm bubble)? | | <input checked="" type="checkbox"/> | | Sample ID's and containers affected: |
| 7 Are Encore containers present? | | | <input checked="" type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory) |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | | | ID's and tests affected: |
| 9 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's and containers affected: |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | | | Sample ID's affected: |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | | | Sample ID's affected: |
| 12 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | | | |
| 13 Carrier and tracking number. | | | | Circle Applicable: FedEx Air <u>FedEx Ground</u> UPS Field Services Courier Other (9612418) 4683975 15017853 |

Comments (Use Continuation Form if needed):

* Please preserve samples as needed per phone call with client. RA 12/7/10

PM (or PMA) review: Initials

RA

Date

12/6/10

Page

1 of 1

List of current GEL Certifications as of 28 December 2010

| State | Certification |
|---------------------------|----------------------|
| Arizona | AZ0668 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | GEL |
| Connecticut | PH-0169 |
| Dept. of Navy | NFESC 413 |
| EPA Region 5 | WG-15J |
| Florida – NELAP | E87156 |
| Georgia | E87156 (FL/NELAP) |
| Georgia DW | 967 |
| Hawaii | N/A |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Nevada | SC00012 |
| New Jersey – NELAP | SC002 |
| New Mexico | FL NELAP E87156 |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-07B-TX |
| U.S. Dept. of Agriculture | S-52597 |
| Utah – NELAP | GEL |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C1641 |

Radiological Analysis

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 268144**

Method/Analysis Information

Product: GFPC, Gross A/B, liquid

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1059089

| Sample ID | Client ID |
|------------------|--|
| 268144001 | EFT-102010-6/S |
| 268144002 | EFT-102510-1/S |
| 268144003 | EFT-102710-1/D |
| 268144004 | EFT-102010-4/S |
| 268144005 | EFT-102010-5/D |
| 268144006 | EFT-102810-GW4 |
| 268144007 | EFT-102510-2/D |
| 268144008 | EFT-101310-GW3 |
| 268144009 | EFT-102710-5/S |
| 268144010 | EFT-102810-1/I |
| 268144011 | EFT-101410-9/S |
| 268144012 | EFT-102510-8SR NEW |
| 268144013 | EFT-102010-4/D |
| 268144014 | EFT-101410-6/D |
| 268144015 | EFT-101410-GW2 |
| 268144016 | EFT-11110-7/S |
| 1202289947 | Method Blank (MB) |
| 1202289948 | 268144003(EFT-102710-1/D) Sample Duplicate (DUP) |
| 1202289949 | 268144003(EFT-102710-1/D) Matrix Spike (MS) |
| 1202289950 | 268144003(EFT-102710-1/D) Matrix Spike Duplicate (MSD) |
| 1202289951 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 268144003 (EFT-102710-1/D).

QC Information

Samples 1202289949 (EFT-102710-1/D) and 1202289950 (EFT-102710-1/D) did not meet the alpha recovery requirement due to the matrix of the sample. The samples are similar in results.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 1202289951 (LCS) was recounted due to high recovery. Sample 268144007 (EFT-102510-2/D) was recounted due to a detector lock out condition. Recount is being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Sample 268144002 (EFT-102510-1/S) did not meet the alpha required detection limit due to low sample volume. No more volume could be used due to not exceeding the maximum net weight limit of the calibration curve. The sample counted for 500 minutes. Samples 268144002 (EFT-102510-1/S), 268144009 (EFT-102710-5/S) and 268144011 (EFT-101410-9/S) did not meet the beta required detection limit due to low sample volume. No more volume could be used due to not exceeding the maximum net weight limit of the calibration curve. The samples counted for 500 minutes.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ROIT001 Detroit Edison Company

Client SDG: 268144 GEL Work Order: 268144

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Heather McCarty

Date: 30 DEC 2010

Title: Analyst II

Sample Data Summary

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-102010-6/S
Sample ID: 268144001
Matrix: Water
Collect Date: 20-OCT-10 16:30
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 4.08 | +/-2.62 | 3.47 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1248 | 1059089 | 1 |
| Beta | | 4.81 | +/-2.48 | 3.82 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102510-1/S
Sample ID: 268144002
Matrix: Water
Collect Date: 25-OCT-10 16:05
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 0.852 | +/-3.89 | 7.01 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1946 | 1059089 | 1 |
| Beta | U | -2.59 | +/-3.77 | 6.75 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-102710-1/D
Sample ID: 268144003
Matrix: Water
Collect Date: 27-OCT-10 08:20
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 10.1 | +/-4.18 | 3.41 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1248 | 1059089 | 1 |
| Beta | | 9.78 | +/-3.45 | 4.92 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-102010-4/S
Sample ID: 268144004
Matrix: Water
Collect Date: 20-OCT-10 11:50
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.40 | +/-1.69 | 2.78 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1248 | 1059089 | 1 |
| Beta | | 7.44 | +/-2.51 | 3.55 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102010-5/D
Sample ID: 268144005
Matrix: Water
Collect Date: 20-OCT-10 14:55
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 3.53 | +/-2.47 | 3.06 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1248 | 1059089 | 1 |
| Beta | | 9.40 | +/-2.71 | 3.67 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst | Comments |
|--------|----------------------|---------|----------|
| 1 | EPA 900.0/SW846 9310 | | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
 Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
 Mr. Tom Mow
 Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102810-GW4
 Sample ID: 268144006
 Matrix: Water
 Collect Date: 28-OCT-10 08:25
 Receive Date: 06-DEC-10
 Collector: Client

Project: ROIT00116
 Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 3.96 | +/-1.68 | 1.85 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1303 | 1059089 | 1 |
| Beta | | 5.76 | +/-1.95 | 2.89 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
 Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
 Mr. Tom Mow
 Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102510-2/D
 Sample ID: 268144007
 Matrix: Water
 Collect Date: 25-OCT-10 11:25
 Receive Date: 06-DEC-10
 Collector: Client

Project: ROIT00116
 Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 5.01 | +/-3.40 | 4.82 | 5.00 | pCi/L | | VXC2 | 12/29/10 | 1335 | 1059089 | 1 |
| Beta | | 6.85 | +/-2.24 | 2.82 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Client Sample ID: EFT-101310-GW3
Sample ID: 268144008
Matrix: Water
Collect Date: 13-OCT-10 12:10
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.20 | +/-1.56 | 2.38 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1941 | 1059089 | 1 |
| Beta | | 3.57 | +/-2.02 | 3.30 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102710-5/S
Sample ID: 268144009
Matrix: Water
Collect Date: 27-OCT-10 15:50
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 2.18 | +/-2.12 | 3.45 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1948 | 1059089 | 1 |
| Beta | U | 0.318 | +/-3.02 | 5.21 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-102810-1/I
Sample ID: 268144010
Matrix: Water
Collect Date: 28-OCT-10 09:50
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 5.19 | +/-1.73 | 1.92 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1941 | 1059089 | 1 |
| Beta | | 7.44 | +/-1.87 | 2.84 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-101410-9/S
Sample ID: 268144011
Matrix: Water
Collect Date: 14-OCT-10 11:55
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | U | 1.15 | +/-2.63 | 4.71 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1948 | 1059089 | 1 |
| Beta | U | 3.69 | +/-3.51 | 5.86 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Client Sample ID: EFT-102510-8SR NEW
Sample ID: 268144012
Matrix: Water
Collect Date: 25-OCT-10 13:50
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 3.96 | +/-2.69 | 3.46 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1939 | 1059089 | 1 |
| Beta | | 9.77 | +/-3.43 | 4.88 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Contact: Detroit, Michigan 48244
Project: Mr. Tom Mow
Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-102010-4/D
Sample ID: 268144013
Matrix: Water
Collect Date: 20-OCT-10 12:55
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 6.35 | +/-1.76 | 2.08 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1941 | 1059089 | 1 |
| Beta | | 7.69 | +/-1.75 | 2.63 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
 Address : PO Box 44440

 Contact: Detroit, Michigan 48244
 Project: Mr. Tom Mow
 Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-101410-6/D
 Sample ID: 268144014
 Matrix: Water
 Collect Date: 14-OCT-10 09:40
 Receive Date: 06-DEC-10
 Collector: Client

Project: ROIT00116
 Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 7.86 | +/-2.65 | 2.85 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1941 | 1059089 | 1 |
| Beta | | 9.54 | +/-3.24 | 5.09 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst | Comments |
|--------|----------------------|---------|----------|
| 1 | EPA 900.0/SW846 9310 | | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Report Date: December 30, 2010

Contact: Detroit, Michigan 48244
Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-101410-GW2
Sample ID: 268144015
Matrix: Water
Collect Date: 14-OCT-10 15:45
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 4.07 | +/-1.74 | 2.54 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1948 | 1059089 | 1 |
| Beta | | 2.83 | +/-1.61 | 2.64 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst Comments |
|--------|----------------------|------------------|
| 1 | EPA 900.0/SW846 9310 | |

Certificate of Analysis

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Report Date: December 30, 2010

Client Sample ID: EFT-11110-7/S
Sample ID: 268144016
Matrix: Water
Collect Date: 01-NOV-10 11:05
Receive Date: 06-DEC-10
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| <i>GFPC, Gross A/B, liquid "As Received"</i> | | | | | | | | | | | | |
| Alpha | | 2.82 | +/-2.05 | 2.56 | 5.00 | pCi/L | | VXC2 | 12/27/10 | 1939 | 1059089 | 1 |
| Beta | | 4.84 | +/-2.79 | 4.36 | 5.00 | pCi/L | | | | | | |

The following Analytical Methods were performed

| Method | Description | Analyst | Comments |
|--------|----------------------|---------|----------|
| 1 | EPA 900.0/SW846 9310 | | |

Quality Control Data

QC Summary

Report Date: December 30, 2010
Page 1 of 2

Contact: Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan
Mr. Tom Mow

Workorder: 268144

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------|-------------|---------|------|----------|-------|-------|--------|-------------|-------|----------|-------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1059089 | | | | | | | | | | |
| QC1202289948 | 268144003 | DUP | | | | | | | | | |
| Alpha | | 10.1 | | 8.38 | pCi/L | 18.3 | | (0% - 100%) | VXC2 | 12/27/10 | 13:19 |
| | Uncertainty | +/-4.18 | | +/-4.15 | | | | | | | |
| Beta | | 9.78 | | 8.34 | pCi/L | 15.8 | | (0% - 100%) | | | |
| | Uncertainty | +/-3.45 | | +/-3.08 | | | | | | | |
| QC1202289951 | LCS | | | | | | | | | | |
| Alpha | | 127 | | 158 | pCi/L | | 124 | (75%-125%) | | 12/28/10 | 07:44 |
| | Uncertainty | | | +/-14.2 | | | | | | | |
| Beta | | 497 | | 522 | pCi/L | | 105 | (75%-125%) | | | |
| | Uncertainty | | | +/-17.9 | | | | | | | |
| QC1202289947 | MB | | | | | | | | | | |
| Alpha | | | U | -0.494 | pCi/L | | | | | 12/27/10 | 13:13 |
| | Uncertainty | | | +/-0.972 | | | | | | | |
| Beta | | | U | -0.566 | pCi/L | | | | | | |
| | Uncertainty | | | +/-1.97 | | | | | | | |
| QC1202289949 | 268144003 | MS | | | | | | | | | |
| Alpha | | 254 | 10.1 | 180 | pCi/L | | 66.8 * | (75%-125%) | | 12/27/10 | 13:19 |
| | Uncertainty | +/-4.18 | | +/-26.7 | | | | | | | |
| Beta | | 993 | 9.78 | 1090 | pCi/L | | 109 | (75%-125%) | | | |
| | Uncertainty | +/-3.45 | | +/-38.6 | | | | | | | |
| QC1202289950 | 268144003 | MSD | | | | | | | | | |
| Alpha | | 254 | 10.1 | 178 | pCi/L | 0.974 | 66.1 * | (0%-20%) | | 12/27/10 | 13:20 |
| | Uncertainty | +/-4.18 | | +/-26.7 | | | | | | | |
| Beta | | 993 | 9.78 | 1010 | pCi/L | 7.45 | 101 | (0%-20%) | | | |
| | Uncertainty | +/-3.45 | | +/-37.3 | | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

QC Summary

Workorder: 268144

Page 2 of 2

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| J | Value is estimated | | | | | | | | | | |
| K | Analyte present. Reported value may be biased high. Actual value is expected to be lower. | | | | | | | | | | |
| L | Analyte present. Reported value may be biased low. Actual value is expected to be higher. | | | | | | | | | | |
| M | M if above MDC and less than LLD | | | | | | | | | | |
| M | Matrix Related Failure | | | | | | | | | | |
| N/A | RPD or %Recovery limits do not apply. | | | | | | | | | | |
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| UI | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UJ | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations:

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



Laboratories LLC

a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

June 30, 2011

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 279061

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 31, 2011. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4443.

Sincerely,

Richard Albee
Project Manager

Purchase Order: 4700246055
Enclosures

problem solved

Table of Contents

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Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 279061**

June 30, 2011

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on May 31, 2011 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Sample #EFT-51811-12I, 2 samples had a ph of 7. Sample #EFT-51811-12D, 2 samples had a ph of 7. Sample #EFT-51811-13I, sample for Sr had a ph of 7. Client approved for GEL to preserve samples to ph of 2 with Nitric acid. lot# K11061 .

Sample Identification The laboratory received the following samples:

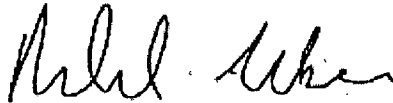
| <u>Laboratory ID</u> | <u>Client ID</u> |
|----------------------|------------------|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 279061005 | EFT-51911-13I |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Richard Albee
Project Manager

Chain of Custody

FERMI 1 NUCLEAR POWER PLANT
6400 N. DIXIE HWY



SAMPLE RECEIPT & REVIEW FORM

| | | | | | |
|--|--------------------------|-------------------------------------|--|--|--|
| Client: <u>ROTT</u> | | | SDG/AR/COC/Work Order: <u>279061</u> | | |
| Received By: <u>SE</u> | | | Date Received: <u>5-31-11 @ 0825</u> | | |
| Suspected Hazard Information | Yes | No | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. | | |
| COC/Samples marked as radioactive? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Maximum Counts Observed*: <u>40cpm</u> | | |
| Classified Radioactive II or III by RSO? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | |
| COC/Samples marked containing PCBs? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | |
| Shipped as a DOT Hazardous? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Hazard Class Shipped: _____ UN#: _____ | | |
| Samples identified as Foreign Soil? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|-------------------------------------|--------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Preservation Method: Ice bags Blue ice Dry ice <u>(None)</u> Other (describe) <u>24-26°</u> |
| 2a Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temperature Device Serial #: <u>61524649</u> Secondary Temperature Device Serial # (If Applicable): _____ |
| 3 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 Samples requiring chemical preservation at proper pH? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's, containers affected and observed pH: <u>EFT-51811-11I - 2 samples pH 3; EFT-51811-11D - 1 sample pH 4</u> If Preservation added, Lot#: <u>K11061</u> <u>see below</u> |
| 6 VOA vials free of headspace (defined as < 6mm bubble)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 7 Are Encore containers present? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory) |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | ID's and tests affected: |
| 9 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 12 Are sample containers identifiable as GEL provided? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 14 Carrier and tracking number. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: FedEx Air <u>FedEx Ground</u> UPS Field Services Courier Other <u>(9612417) 4683975 15043005 - 25°</u> <u>(9612417) 4683975 15043029 - 26°</u> <u>(9612417) 4683975 15043012 - 24°</u> |

Comments (Use Continuation Form if needed):
EFT-51811-12I - 2 samples pH 7
EFT-51811-12D - 2 samples pH 7
EFT-51811-13I - for Sr, pH 7
 *Client approved presentation to pH 2 on necessary containers. via phone call RA 5/31/11

PM (or PMA) review: Initials RA Date 5/31/11 Page 1 of 1

List of current GEL Certifications as of 30 June 2011

| State | Certification |
|---------------------------|----------------------|
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | E87156 (FL/NELAP) |
| Connecticut | PH-0169 |
| DoD ELAP – A2LA | 2567.01 |
| Florida – NELAP | E87156 |
| Foreign Soils Permit USDA | P330-09-00191 |
| Georgia | E87156 (FL/NELAP) |
| Georgia SDWA | 967 |
| Hawaii | E87156 (FL/NELAP) |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 (A133904) |
| Louisiana SDWA | LA110006 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Mississippi | E87156 (FL/NELAP) |
| Nevada | SC00012 |
| New Hampshire | 2054 |
| New Jersey – NELAP | SC002 |
| New Mexico | E87156 (FL/NELAP) |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-10-3 |
| Utah – NELAP | SC00012 |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C780 |
| Wisconsin | 999887790 |

Radiological Analysis

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 279061**

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 1108271

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202409782 | Method Blank (MB) |
| 1202409783 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202409784 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202409785 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 20.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-11I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 279061003 (EFT-51811-12I) was recounted to verify activity. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Alphaspec Pu, Liquid
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number: 1108273

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202409786 | Method Blank (MB) |
| 1202409787 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202409788 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202409789 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-111).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Sample 279061002 (EFT-51811-11D) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:

Gammasec, Gamma, Liquid (Standard List)

Analytical Method: EPA 901.1

Analytical Batch Number: 1111565

| Sample ID | Client ID |
|------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202417333 | Method Blank (MB) |
| 1202417334 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202417336 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 22.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-11I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Ra228, Liquid
Analytical Method: EPA 904.0/SW846 9320 Modified
Analytical Batch Number: 1107735

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202408506 | Method Blank (MB) |
| 1202408507 | 279061004(EFT-51811-12D) Sample Duplicate (DUP) |
| 1202408508 | 279061004(EFT-51811-12D) Matrix Spike (MS) |
| 1202408509 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 16.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061004 (EFT-51811-12D).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr89&Sr90, Liquid

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1107743

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 279061005 | EFT-51911-13I |
| 1202408527 | Method Blank (MB) |
| 1202408528 | 279061005(EFT-51911-13I) Sample Duplicate (DUP) |

1202408529 279061005(EFT-51911-13I) Matrix Spike (MS)
1202408530 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 14.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061005 (EFT-51911-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples 1202408527 (MB), 279061001 (EFT-51811-11I), 279061002 (EFT-51811-11D), 279061003 (EFT-51811-12I) and 279061004 (EFT-51811-12D) were recounted due to high MDCs. The recounts are reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG:

DER 969111 was generated due to Result is more negative than the three sigma TPU. 1. Samples 279061001, 279061004, and 279061005 have strontium 89 results that are more negative than the three sigma TPU. 1. Reporting results

Additional Comments

The matrix spike, 1202408529 (EFT-51911-13I), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Gross A/B, liquid

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1109556

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202412531 | Method Blank (MB) |
| 1202412532 | 279061003(EFT-51811-12I) Sample Duplicate (DUP) |
| 1202412533 | 279061003(EFT-51811-12I) Matrix Spike (MS) |
| 1202412534 | 279061003(EFT-51811-12I) Matrix Spike Duplicate (MSD) |
| 1202412535 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 14.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061003 (EFT-51811-12I).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Matrix Spike and Matrix Spike Duplicate, 1202412533 (EFT-51811-12I) and 1202412534 (EFT-51811-12I), do not meet the alpha recovery requirement due to the matrix of the sample. The samples are similar in results.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples 1202412533 (EFT-51811-12I), 1202412534 (EFT-51811-12I) and 1202412535 (LCS) were recounted due to low recovery. The recounts are reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|---------------------------------|---------------------------|
| Product: | GFPC, Sr90, liquid |
| Analytical Method: | EPA 905.0 Modified |
| Analytical Batch Number: | 1115396 |

| | |
|------------------|------------------|
| Sample ID | Client ID |
| 279061001 | EFT-51811-11I |

| | |
|------------|---|
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 279061005 | EFT-51911-13I |
| 1202425766 | Method Blank (MB) |
| 1202425767 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202425768 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202425769 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 14.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-11I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were re-prepped due to low recovery. The re-analysis is being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

The matrix spike, 1202425768 (EFT-51811-11I), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Liquid

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 1109586

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202412631 | Method Blank (MB) |
| 1202412632 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202412633 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202412634 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 19.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-11I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Liquid Scint Tc99, Liquid
Analytical Method: DOE EML HASL-300, Tc-02-RC Modified
Analytical Batch Number: 1110082

| Sample ID | Client ID |
|------------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202413860 | Method Blank (MB) |
| 1202413861 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202413862 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202413863 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-111).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|---------------------------------|----------------------------------|
| Product: | Lucas Cell, Ra226, liquid |
| Analytical Method: | EPA 903.1 Modified |
| Analytical Batch Number: | 1107697 |

| Sample ID | Client ID |
|------------|---|
| 279061001 | EFT-51811-11I |
| 279061002 | EFT-51811-11D |
| 279061003 | EFT-51811-12I |
| 279061004 | EFT-51811-12D |
| 1202408406 | Method Blank (MB) |
| 1202408407 | 279061001(EFT-51811-11I) Sample Duplicate (DUP) |
| 1202408408 | 279061001(EFT-51811-11I) Matrix Spike (MS) |
| 1202408409 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 279061001 (EFT-51811-11I).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1202408407 (EFT-51811-11I) and 279061001 (EFT-51811-11I), did not meet the relative percent difference requirement. However, they do meet the relative error ratio requirement with a value of 0.9539.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ROIT001 Detroit Edison Company

Client SDG: 279061 GEL Work Order: 279061

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Kate Gellatly

Date: 29 JUN 2011

Title: Analyst I

DATA EXCEPTION REPORT

| | | | |
|--|---|--|-----------------------------|
| Mo.Day Yr. 23-JUN-11 | Division: Radiochemistry | Quality Criteria: Specifications | Type: Process |
| Instrument Type: GFPC | Test / Method: EPA 905.0 Modified | Matrix Type: Liquid | Client Code: ROIT |
| Batch ID: 1107743 | Sample Numbers: See below | | |
| Potentially affected work order(s)(SDG): 279061 Application Issues: Result is more negative than the three sigma TPU | | | |
| Specification and Requirements Exception Description: | | DER Disposition: | |
| 1. Samples 279061001, 279061004, and 279061005 have strontium 89 results that are more negative than the three sigma TPU. | | 1. Reporting results | |

Originator's Name:
Kenshalla Oston 23-JUN-11

Data Validator/Group Leader:
Nat Long 23-JUN-11

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-111
Sample ID: 279061001
Matrix: Ground Water
Collect Date: 18-MAY-11 09:15
Receive Date: 31-MAY-11
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|------|----------|------|---------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec Pu, Liquid "As Received" | | | | | | | | | | | | |
| Plutonium-238 | U | 0.00204 | +/-0.111 | 0.336 | 1.00 | pCi/L | DDR1 | 06/09/11 | 0724 | 1108273 | | 1 |
| Plutonium-239/240 | U | -0.0245 | +/-0.105 | 0.282 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.0387 | +/-0.103 | 0.244 | 1.00 | pCi/L | | | | | | |
| Alphaspec U, Liquid "As Received" | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | DDR1 | 06/08/11 | 0933 | 1108271 | | 2 |
| Uranium-233/234 | U | 0.154 | +/-0.263 | 0.485 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.00 | +/-0.212 | 0.325 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.221 | +/-0.303 | 0.485 | 1.00 | pCi/L | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Actinium-228 | U | -5.0 | +/-14.2 | 21.5 | | pCi/L | KXG3 | 06/27/11 | 1233 | 1111565 | | 3 |
| Americium-241 | U | 8.92 | +/-19.1 | 31.5 | | pCi/L | | | | | | |
| Antimony-124 | U | 1.90 | +/-10.9 | 19.2 | | pCi/L | | | | | | |
| Antimony-125 | U | 0.841 | +/-10.2 | 17.2 | | pCi/L | | | | | | |
| Barium-133 | U | -0.698 | +/-4.46 | 6.39 | | pCi/L | | | | | | |
| Barium-140 | U | -75.1 | +/-113 | 158 | | pCi/L | | | | | | |
| Beryllium-7 | U | -14.7 | +/-42.3 | 65.3 | | pCi/L | | | | | | |
| Bismuth-212 | U | 19.1 | +/-54.6 | 97.5 | | pCi/L | | | | | | |
| Bismuth-214 | U | -1.51 | +/-9.69 | 16.4 | | pCi/L | | | | | | |
| Cerium-139 | U | -0.737 | +/-3.52 | 5.64 | | pCi/L | | | | | | |
| Cerium-141 | U | 5.34 | +/-11.9 | 20.6 | | pCi/L | | | | | | |
| Cerium-144 | U | -18.7 | +/-25.7 | 39.1 | | pCi/L | | | | | | |
| Cesium-134 | U | -2.71 | +/-4.02 | 5.78 | | pCi/L | | | | | | |
| Cesium-136 | U | 16.6 | +/-28.9 | 55.4 | | pCi/L | | | | | | |
| Cesium-137 | U | -0.59 | +/-4.33 | 7.54 | 10.0 | pCi/L | | | | | | |
| Chromium-51 | U | 0.337 | +/-69.6 | 118 | | pCi/L | | | | | | |
| Cobalt-56 | U | -0.581 | +/-3.88 | 6.22 | | pCi/L | | | | | | |
| Cobalt-57 | U | 0.644 | +/-3.27 | 5.56 | | pCi/L | | | | | | |
| Cobalt-58 | U | 1.24 | +/-4.72 | 8.33 | | pCi/L | | | | | | |
| Cobalt-60 | U | -2.03 | +/-3.78 | 5.39 | | pCi/L | | | | | | |
| Europium-152 | U | -7.0 | +/-9.93 | 15.1 | | pCi/L | | | | | | |
| Europium-154 | U | 3.33 | +/-8.84 | 16.5 | | pCi/L | | | | | | |
| Europium-155 | U | -8.36 | +/-11.9 | 18.7 | | pCi/L | | | | | | |
| Iridium-192 | U | -1.01 | +/-4.35 | 7.16 | | pCi/L | | | | | | |
| Iron-59 | U | 12.4 | +/-11.9 | 24.5 | | pCi/L | | | | | | |
| Lead-210 | U | -495 | +/-509 | 793 | | pCi/L | | | | | | |
| Lead-212 | U | -2.35 | +/-7.45 | 12.5 | | pCi/L | | | | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-111
Sample ID: 279061001

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|------|------|-------|------|----------|------|---------|-------|--------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Lead-214 | U | 14.7 | +/-11.7 | 15.8 | | pCi/L | | | | | | |
| Manganese-54 | U | 0.206 | +/-3.74 | 6.32 | | pCi/L | | | | | | |
| Mercury-203 | U | 2.28 | +/-5.52 | 9.88 | | pCi/L | | | | | | |
| Neodymium-147 | U | 76.5 | +/-219 | 385 | | pCi/L | | | | | | |
| Neptunium-239 | U | -3.51 | +/-30.0 | 49.8 | | pCi/L | | | | | | |
| Niobium-94 | U | 2.06 | +/-3.14 | 5.90 | | pCi/L | | | | | | |
| Niobium-95 | U | 5.58 | +/-4.53 | 9.37 | | pCi/L | | | | | | |
| Potassium-40 | U | -7.01 | +/-46.5 | 86.2 | | pCi/L | | | | | | |
| Promethium-144 | U | -0.0589 | +/-3.16 | 5.34 | | pCi/L | | | | | | |
| Promethium-146 | U | -1.98 | +/-3.93 | 5.88 | | pCi/L | | | | | | |
| Radium-228 | U | -5.0 | +/-14.2 | 21.5 | | pCi/L | | | | | | |
| Ruthenium-106 | U | -3.17 | +/-28.8 | 48.3 | | pCi/L | | | | | | |
| Silver-110m | U | -1.68 | +/-3.67 | 5.75 | | pCi/L | | | | | | |
| Sodium-22 | U | 1.09 | +/-3.13 | 5.81 | | pCi/L | | | | | | |
| Thallium-208 | U | -1.66 | +/-3.74 | 6.11 | | pCi/L | | | | | | |
| Thorium-234 | U | 47.3 | +/-176 | 322 | | pCi/L | | | | | | |
| Tin-113 | U | -0.651 | +/-5.44 | 8.96 | | pCi/L | | | | | | |
| Uranium-235 | U | 2.15 | +/-25.7 | 42.9 | | pCi/L | | | | | | |
| Uranium-238 | U | 47.3 | +/-176 | 322 | | pCi/L | | | | | | |
| Yttrium-88 | U | 0.0809 | +/-3.85 | 6.60 | | pCi/L | | | | | | |
| Zinc-65 | U | -3.83 | +/-6.74 | 9.64 | | pCi/L | | | | | | |
| Zirconium-95 | U | 3.65 | +/-8.33 | 15.3 | | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Gross A/B, liquid "As Received" | | | | | | | | | | | | |
| Alpha | U | 2.05 | +/-3.06 | 5.05 | 5.00 | pCi/L | CAS2 | 06/18/11 | 1001 | 1109556 | | 4 |
| Beta | U | 2.52 | +/-2.61 | 4.32 | 5.00 | pCi/L | | | | | | |
| GFPC, Ra228, Liquid "As Received" | | | | | | | | | | | | |
| Radium-228 | U | 1.03 | +/-1.15 | 1.93 | 3.00 | pCi/L | BXF1 | 06/09/11 | 1334 | 1107735 | | 5 |
| GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | | | | | | | |
| Strontium-89 | U | -2.16 | +/-0.369 | 1.70 | 2.00 | pCi/L | JXR1 | 06/17/11 | 1249 | 1107743 | | 6 |
| GFPC, Sr90, liquid "As Received" | | | | | | | | | | | | |
| Strontium-90 | U | 0.0884 | +/-1.07 | 1.94 | 2.00 | pCi/L | JXR1 | 06/26/11 | 0957 | 1115396 | | 7 |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| LSC, Tritium Dist, Liquid "As Received" | | | | | | | | | | | | |
| Tritium | U | 65.7 | +/-293 | 529 | 700 | pCi/L | EXK2 | 06/13/11 | 1647 | 1109586 | | 8 |
| Liquid Scint Te99, Liquid "As Received" | | | | | | | | | | | | |

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-111
Sample ID: 279061001

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|--------|-------------|-------|------|-------|----|---------|----------|------|---------|--------|
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |
| Technetium-99 | U | 7.69 | +/-16.6 | 28.5 | 50.0 | pCi/L | | MXPI | 06/14/11 | 0820 | 1110082 | 9 |
| Rad Radium-226 | | | | | | | | | | | | |
| Lucas Cell, Ra226, liquid "As Received" | | | | | | | | | | | | |
| Radium-226 | | 2.67 | +/-0.598 | 0.442 | 1.00 | pCi/L | | KSDI | 06/08/11 | 1240 | 1107697 | 10 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 901.1 | |
| 4 | EPA 900.0/SW846 9310 | |
| 5 | EPA 904.0/SW846 9320 Modified | |
| 6 | EPA 905.0 Modified | |
| 7 | EPA 905.0 Modified | |
| 8 | EPA 906.0 Modified | |
| 9 | DOE EML HASL-300, Tc-02-RC Modified | |
| 10 | EPA 903.1 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---|--------|---------|-----------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 94.2 | (15%-125%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 81.9 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 79.6 | (15%-125%) |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 123 | (25%-125%) |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 98.9 | (25%-125%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | | | 113 | (25%-125%) |
| Technetium-99m Tracer | Liquid Scint Tc99, Liquid "As Received" | | | 101 | (15%-125%) |

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-11D Project: ROIT00116
Sample ID: 279061002 Client ID: ROIT001
Matrix: Ground Water
Collect Date: 18-MAY-11 16:00
Receive Date: 31-MAY-11
Collector: Client

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------------|-------|------|---------|------|----------|------|---------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec Pu, Liquid "As Received" | | | | | | | | | | | | |
| Plutonium-238 | U | -0.0356 | +/-0.154 | 0.411 | 1.00 | pCi/L | DDR1 | 06/16/11 | 1525 | 1108273 | | 1 |
| Plutonium-239/240 | U | 0.0208 | +/-0.157 | 0.453 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.279 | +/-0.293 | 0.355 | 1.00 | pCi/L | | | | | | |
| Alphaspec U, Liquid "As Received" | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | DDR1 | 06/08/11 | 0933 | 1108271 | | 2 |
| Uranium-233/234 | U | 0.0848 | +/-0.191 | 0.414 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0555 | +/-0.221 | 0.591 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.0898 | +/-0.253 | 0.569 | 1.00 | pCi/L | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammasspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Actinium-228 | U | 1.15 | +/-12.5 | 21.1 | | pCi/L | KXG3 | 06/27/11 | 1238 | 1111565 | | 3 |
| Americium-241 | U | -22.3 | +/-22.9 | 35.6 | | pCi/L | | | | | | |
| Antimony-124 | U | 2.75 | +/-7.93 | 14.7 | | pCi/L | | | | | | |
| Antimony-125 | U | -1.24 | +/-7.96 | 13.0 | | pCi/L | | | | | | |
| Barium-133 | U | 3.18 | +/-4.40 | 7.12 | | pCi/L | | | | | | |
| Barium-140 | U | 8.00 | +/-81.7 | 135 | | pCi/L | | | | | | |
| Beryllium-7 | U | -18 | +/-37.3 | 57.0 | | pCi/L | | | | | | |
| Bismuth-212 | U | 43.4 | +/-37.4 | 73.9 | | pCi/L | | | | | | |
| Bismuth-214 | U | 6.99 | +/-7.69 | 13.6 | | pCi/L | | | | | | |
| Cerium-139 | U | -0.607 | +/-3.48 | 5.60 | | pCi/L | | | | | | |
| Cerium-141 | U | -9.91 | +/-10.5 | 15.1 | | pCi/L | | | | | | |
| Cerium-144 | U | 11.3 | +/-20.4 | 35.0 | | pCi/L | | | | | | |
| Cesium-134 | U | 0.473 | +/-3.15 | 5.43 | | pCi/L | | | | | | |
| Cesium-136 | U | -19.9 | +/-28.9 | 41.2 | | pCi/L | | | | | | |
| Cesium-137 | U | 1.03 | +/-3.67 | 6.89 | 10.0 | pCi/L | | | | | | |
| Chromium-51 | U | 45.1 | +/-58.6 | 107 | | pCi/L | | | | | | |
| Cobalt-56 | U | 2.44 | +/-3.93 | 7.23 | | pCi/L | | | | | | |
| Cobalt-57 | U | -0.015 | +/-2.89 | 4.79 | | pCi/L | | | | | | |
| Cobalt-58 | U | -0.0765 | +/-3.94 | 6.59 | | pCi/L | | | | | | |
| Cobalt-60 | U | 2.45 | +/-3.17 | 6.16 | | pCi/L | | | | | | |
| Europium-152 | U | 0.401 | +/-8.38 | 14.2 | | pCi/L | | | | | | |
| Europium-154 | U | -0.727 | +/-6.24 | 10.2 | | pCi/L | | | | | | |
| Europium-155 | U | 4.64 | +/-10.6 | 18.3 | | pCi/L | | | | | | |
| Iridium-192 | U | -0.64 | +/-4.00 | 6.47 | | pCi/L | | | | | | |
| Iron-59 | U | 0.658 | +/-10.7 | 17.8 | | pCi/L | | | | | | |
| Lead-210 | U | 221 | +/-804 | 1410 | | pCi/L | | | | | | |
| Lead-212 | U | -2.92 | +/-6.06 | 10.0 | | pCi/L | | | | | | |

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Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-11D
Sample ID: 279061002

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|------|----------|------|---------|-------|--------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Lead-214 | U | 4.44 | +/-9.67 | 13.8 | | pCi/L | | | | | | |
| Manganesec-54 | U | 0.237 | +/-2.95 | 5.00 | | pCi/L | | | | | | |
| Mercury-203 | U | 2.13 | +/-5.08 | 8.97 | | pCi/L | | | | | | |
| Neodymium-147 | U | 35.5 | +/-193 | 325 | | pCi/L | | | | | | |
| Neptunium-239 | U | -16 | +/-27.3 | 43.0 | | pCi/L | | | | | | |
| Niobium-94 | U | -0.489 | +/-2.61 | 4.30 | | pCi/L | | | | | | |
| Niobium-95 | U | 1.19 | +/-4.48 | 7.84 | | pCi/L | | | | | | |
| Potassium-40 | U | -24.3 | +/-31.7 | 46.9 | | pCi/L | | | | | | |
| Promethium-144 | U | -2.1 | +/-2.62 | 3.84 | | pCi/L | | | | | | |
| Promethium-146 | U | 1.24 | +/-3.35 | 5.83 | | pCi/L | | | | | | |
| Radium-228 | U | 1.15 | +/-12.5 | 21.1 | | pCi/L | | | | | | |
| Ruthenium-106 | U | 7.78 | +/-23.6 | 42.4 | | pCi/L | | | | | | |
| Silver-110m | U | -5.06 | +/-3.38 | 4.49 | | pCi/L | | | | | | |
| Sodium-22 | U | 0.412 | +/-2.03 | 3.65 | | pCi/L | | | | | | |
| Thallium-208 | U | 0.910 | +/-4.62 | 5.40 | | pCi/L | | | | | | |
| Thorium-234 | U | -44.9 | +/-185 | 303 | | pCi/L | | | | | | |
| Tin-113 | U | -1.41 | +/-4.10 | 6.53 | | pCi/L | | | | | | |
| Uranium-235 | U | 8.76 | +/-21.5 | 32.4 | | pCi/L | | | | | | |
| Uranium-238 | U | -44.9 | +/-185 | 303 | | pCi/L | | | | | | |
| Yttrium-88 | U | -1.27 | +/-4.74 | 7.25 | | pCi/L | | | | | | |
| Zinc-65 | U | -4.29 | +/-7.60 | 11.0 | | pCi/L | | | | | | |
| Zirconium-95 | U | -1.86 | +/-7.51 | 12.2 | | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Gross A/B, liquid "As Received" | | | | | | | | | | | | |
| Alpha | | 6.65 | +/-3.11 | 3.33 | 5.00 | pCi/L | CAS2 | 06/18/11 | 1002 | 1109556 | | 4 |
| Beta | U | 2.20 | +/-2.94 | 4.96 | 5.00 | pCi/L | | | | | | |
| GFPC, Ra228, Liquid "As Received" | | | | | | | | | | | | |
| Radium-228 | U | 1.66 | +/-1.35 | 2.17 | 3.00 | pCi/L | BXF1 | 06/09/11 | 1334 | 1107735 | | 5 |
| GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | | | | | | | |
| Strontium-89 | U | 0.688 | +/-1.08 | 1.89 | 2.00 | pCi/L | JXR1 | 06/17/11 | 1249 | 1107743 | | 6 |
| GFPC, Sr90, liquid "As Received" | | | | | | | | | | | | |
| Strontium-90 | U | -0.244 | +/-0.825 | 1.70 | 2.00 | pCi/L | JXR1 | 06/26/11 | 0958 | 1115396 | | 7 |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| LSC, Tritium Dist, Liquid "As Received" | | | | | | | | | | | | |
| Tritium | U | 49.3 | +/-295 | 536 | 700 | pCi/L | EXK2 | 06/13/11 | 1703 | 1109586 | | 8 |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |

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Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-11D
Sample ID: 279061002

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|--------|-------------|-------|------|-------|----|---------|----------|------|---------|--------|
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |
| Technetium-99 | U | -5.77 | +/-16.7 | 29.9 | 50.0 | pCi/L | | MXPI | 06/14/11 | 0836 | 1110082 | 9 |
| Rad Radium-226 | | | | | | | | | | | | |
| Lucas Cell, Ra226, liquid "As Received" | | | | | | | | | | | | |
| Radium-226 | | 2.54 | +/-0.496 | 0.289 | 1.00 | pCi/L | | KSDI | 06/08/11 | 1240 | 1107697 | 10 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 901.1 | |
| 4 | EPA 900.0/SW846 9310 | |
| 5 | EPA 904.0/SW846 9320 Modified | |
| 6 | EPA 905.0 Modified | |
| 7 | EPA 905.0 Modified | |
| 8 | EPA 906.0 Modified | |
| 9 | DOE EML HASL-300, Tc-02-RC Modified | |
| 10 | EPA 903.1 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---|--------|---------|-----------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 79.2 | (15%-125%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 84.2 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 69.6 | (15%-125%) |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 110 | (25%-125%) |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 95.6 | (25%-125%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | | | 90.7 | (25%-125%) |
| Technetium-99m Tracer | Liquid Scint Tc99, Liquid "As Received" | | | 96.1 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

| | |
|---------------------------------|--------------------|
| Client Sample ID: EFT-51811-121 | Project: ROIT00116 |
| Sample ID: 279061003 | Client ID: ROIT001 |
| Matrix: Ground Water | |
| Collect Date: 18-MAY-11 15:25 | |
| Receive Date: 31-MAY-11 | |
| Collector: Client | |

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|---------|-------------|-------|------|---------|------|----------|------|---------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec Pu, Liquid "As Received" | | | | | | | | | | | | |
| Plutonium-238 | U | -0.0386 | +/-0.114 | 0.327 | 1.00 | pCi/L | DDR1 | 06/09/11 | 0724 | 1108273 | | 1 |
| Plutonium-239/240 | U | -0.129 | +/-0.132 | 0.465 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.0279 | +/-0.111 | 0.297 | 1.00 | pCi/L | | | | | | |
| Alphaspec U, Liquid "As Received" | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | DDR1 | 06/16/11 | 1500 | 1108271 | | 2 |
| Uranium-233/234 | | 0.780 | +/-0.506 | 0.446 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0995 | +/-0.195 | 0.298 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 0.586 | +/-0.451 | 0.492 | 1.00 | pCi/L | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammasespec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Actinium-228 | U | 4.71 | +/-10.0 | 17.6 | | pCi/L | KXG3 | 06/27/11 | 1244 | 1111565 | | 3 |
| Americium-241 | U | -6.85 | +/-13.0 | 19.6 | | pCi/L | | | | | | |
| Antimony-124 | U | 3.44 | +/-7.40 | 14.0 | | pCi/L | | | | | | |
| Antimony-125 | U | 5.72 | +/-5.85 | 11.1 | | pCi/L | | | | | | |
| Barium-133 | U | -1.44 | +/-2.99 | 4.86 | | pCi/L | | | | | | |
| Barium-140 | U | -36.2 | +/-70.1 | 106 | | pCi/L | | | | | | |
| Beryllium-7 | U | 8.15 | +/-31.5 | 54.8 | | pCi/L | | | | | | |
| Bismuth-212 | U | 12.2 | +/-34.7 | 60.0 | | pCi/L | | | | | | |
| Bismuth-214 | U | -0.993 | +/-6.63 | 10.7 | | pCi/L | | | | | | |
| Cerium-139 | U | 0.209 | +/-2.64 | 4.48 | | pCi/L | | | | | | |
| Cerium-141 | U | -7.24 | +/-9.80 | 14.9 | | pCi/L | | | | | | |
| Cerium-144 | U | 10.2 | +/-17.3 | 30.6 | | pCi/L | | | | | | |
| Cesium-134 | U | 2.86 | +/-2.99 | 5.75 | | pCi/L | | | | | | |
| Cesium-136 | U | -12.8 | +/-24.3 | 36.2 | | pCi/L | | | | | | |
| Cesium-137 | U | 0.999 | +/-2.34 | 4.13 | 10.0 | pCi/L | | | | | | |
| Chromium-51 | U | -8.0 | +/-46.7 | 79.4 | | pCi/L | | | | | | |
| Cobalt-56 | U | 0.745 | +/-2.91 | 5.19 | | pCi/L | | | | | | |
| Cobalt-57 | U | -2.49 | +/-2.32 | 3.64 | | pCi/L | | | | | | |
| Cobalt-58 | U | -0.128 | +/-3.21 | 5.45 | | pCi/L | | | | | | |
| Cobalt-60 | U | -1.12 | +/-2.22 | 3.08 | | pCi/L | | | | | | |
| Europium-152 | U | 2.91 | +/-6.99 | 12.5 | | pCi/L | | | | | | |
| Europium-154 | U | -3.4 | +/-7.22 | 10.5 | | pCi/L | | | | | | |
| Europium-155 | U | -2.74 | +/-8.20 | 13.8 | | pCi/L | | | | | | |
| Iridium-192 | U | 1.05 | +/-3.42 | 5.71 | | pCi/L | | | | | | |
| Iron-59 | U | 4.19 | +/-8.24 | 15.0 | | pCi/L | | | | | | |
| Lead-210 | U | 376 | +/-447 | 437 | | pCi/L | | | | | | |
| Lead-212 | U | -0.863 | +/-5.79 | 9.39 | | pCi/L | | | | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-12I
Sample ID: 279061003

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|------|-------|------|----------|------|---------|-------|--------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Lead-214 | U | -0.242 | +/-6.21 | 10.1 | | pCi/L | | | | | | |
| Manganese-54 | U | -2.6 | +/-2.62 | 3.73 | | pCi/L | | | | | | |
| Mercury-203 | U | 4.40 | +/-4.39 | 7.82 | | pCi/L | | | | | | |
| Neodymium-147 | U | 54.3 | +/-197 | 342 | | pCi/L | | | | | | |
| Neptunium-239 | U | -7.68 | +/-22.7 | 37.9 | | pCi/L | | | | | | |
| Niobium-94 | U | 0.747 | +/-2.28 | 3.92 | | pCi/L | | | | | | |
| Niobium-95 | U | 1.13 | +/-3.19 | 5.77 | | pCi/L | | | | | | |
| Potassium-40 | U | -30.4 | +/-29.4 | 49.1 | | pCi/L | | | | | | |
| Promethium-144 | U | -0.591 | +/-2.56 | 4.03 | | pCi/L | | | | | | |
| Promethium-146 | U | -2.89 | +/-3.05 | 4.50 | | pCi/L | | | | | | |
| Radium-228 | U | 4.71 | +/-10.0 | 17.6 | | pCi/L | | | | | | |
| Ruthenium-106 | U | -4.65 | +/-23.5 | 37.7 | | pCi/L | | | | | | |
| Silver-110m | U | -1.75 | +/-2.47 | 3.55 | | pCi/L | | | | | | |
| Sodium-22 | U | -1.39 | +/-2.54 | 3.60 | | pCi/L | | | | | | |
| Thallium-208 | U | -2.04 | +/-3.17 | 4.79 | | pCi/L | | | | | | |
| Thorium-234 | U | -49.3 | +/-138 | 230 | | pCi/L | | | | | | |
| Tin-113 | U | -0.364 | +/-3.74 | 6.33 | | pCi/L | | | | | | |
| Uranium-235 | U | -4.19 | +/-19.9 | 28.9 | | pCi/L | | | | | | |
| Uranium-238 | U | -49.3 | +/-138 | 230 | | pCi/L | | | | | | |
| Yttrium-88 | U | 1.92 | +/-3.72 | 6.94 | | pCi/L | | | | | | |
| Zinc-65 | U | -3.08 | +/-5.13 | 7.34 | | pCi/L | | | | | | |
| Zirconium-95 | U | 2.27 | +/-6.28 | 11.3 | | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Gross A/B, liquid "As Received" | | | | | | | | | | | | |
| Alpha | U | -0.706 | +/-1.95 | 5.00 | 5.00 | pCi/L | CAS2 | 06/18/11 | 1002 | 1109556 | | 4 |
| Beta | U | 3.95 | +/-2.88 | 4.55 | 5.00 | pCi/L | | | | | | |
| GFPC, Ra228, Liquid "As Received" | | | | | | | | | | | | |
| Radium-228 | U | 1.34 | +/-1.03 | 1.63 | 3.00 | pCi/L | BXF1 | 06/09/11 | 1334 | 1107735 | | 5 |
| GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | | | | | | | |
| Strontium-89 | U | -1.56 | +/-0.613 | 1.91 | 2.00 | pCi/L | JXR1 | 06/17/11 | 1249 | 1107743 | | 6 |
| GFPC, Sr90, liquid "As Received" | | | | | | | | | | | | |
| Strontium-90 | U | 0.428 | +/-1.06 | 1.88 | 2.00 | pCi/L | JXR1 | 06/26/11 | 0958 | 1115396 | | 7 |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| LSC, Tritium Dist, Liquid "As Received" | | | | | | | | | | | | |
| Tritium | U | 0.00 | +/-289 | 534 | 700 | pCi/L | EXK2 | 06/13/11 | 1719 | 1109586 | | 8 |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-121
Sample ID: 279061003

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|--------|-------------|-------|------|-------|----|---------|----------|------|---------|--------|
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |
| Technetium-99 | U | -13 | +/-15.3 | 28.1 | 50.0 | pCi/L | | MXPI | 06/14/11 | 0852 | 1110082 | 9 |
| Rad Radium-226 | | | | | | | | | | | | |
| Lucas Cell, Ra226, liquid "As Received" | | | | | | | | | | | | |
| Radium-226 | | 0.739 | +/-0.307 | 0.362 | 1.00 | pCi/L | | KSD1 | 06/08/11 | 1240 | 1107697 | 10 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 901.1 | |
| 4 | EPA 900.0/SW846 9310 | |
| 5 | EPA 904.0/SW846 9320 Modified | |
| 6 | EPA 905.0 Modified | |
| 7 | EPA 905.0 Modified | |
| 8 | EPA 906.0 Modified | |
| 9 | DOE EML HASL-300, Tc-02-RC Modified | |
| 10 | EPA 903.1 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---|--------|---------|-----------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 92.6 | (15%-125%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 88.6 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 94.2 | (15%-125%) |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 112 | (25%-125%) |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 94.7 | (25%-125%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | | | 107 | (25%-125%) |
| Technetium-99m Tracer | Liquid Scint Tc99, Liquid "As Received" | | | 102 | (15%-125%) |

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-12D Project: ROIT00116
Sample ID: 279061004 Client ID: ROIT001
Matrix: Ground Water
Collect Date: 18-MAY-11 10:50
Receive Date: 31-MAY-11
Collector: Client

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|-------|------|---------|------|----------|------|---------|-------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec Pu, Liquid "As Received" | | | | | | | | | | | | |
| Plutonium-238 | U | -0.0721 | +/-0.134 | 0.421 | 1.00 | pCi/L | DDR1 | 06/09/11 | 0724 | 1108273 | | 1 |
| Plutonium-239/240 | U | -0.187 | +/-0.156 | 0.569 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.0456 | +/-0.121 | 0.288 | 1.00 | pCi/L | | | | | | |
| Alphaspec U, Liquid "As Received" | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | DDR1 | 06/08/11 | 0933 | 1108271 | | 2 |
| Uranium-233/234 | U | 0.0924 | +/-0.168 | 0.239 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.00 | +/-0.193 | 0.296 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | U | 0.00 | +/-0.156 | 0.239 | 1.00 | pCi/L | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammasespec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Actinium-228 | U | 0.0965 | +/-10.9 | 18.3 | | pCi/L | KXG3 | 06/27/11 | 1244 | 1111565 | | 3 |
| Americium-241 | U | 6.25 | +/-5.32 | 9.29 | | pCi/L | | | | | | |
| Antimony-124 | U | 0.669 | +/-11.2 | 18.7 | | pCi/L | | | | | | |
| Antimony-125 | U | 2.83 | +/-7.70 | 13.5 | | pCi/L | | | | | | |
| Barium-133 | U | -1.67 | +/-3.42 | 5.57 | | pCi/L | | | | | | |
| Barium-140 | U | -40.8 | +/-84.2 | 147 | | pCi/L | | | | | | |
| Beryllium-7 | U | -0.86 | +/-38.7 | 64.6 | | pCi/L | | | | | | |
| Bismuth-212 | U | 19.1 | +/-49.8 | 81.5 | | pCi/L | | | | | | |
| Bismuth-214 | U | -1.21 | +/-7.42 | 11.9 | | pCi/L | | | | | | |
| Cerium-139 | U | -0.906 | +/-2.67 | 4.38 | | pCi/L | | | | | | |
| Cerium-141 | U | 2.16 | +/-9.11 | 15.7 | | pCi/L | | | | | | |
| Cerium-144 | U | 7.48 | +/-16.5 | 29.0 | | pCi/L | | | | | | |
| Cesium-134 | U | 0.495 | +/-3.31 | 5.73 | | pCi/L | | | | | | |
| Cesium-136 | U | -0.216 | +/-26.4 | 43.5 | | pCi/L | | | | | | |
| Cesium-137 | U | -4.33 | +/-4.42 | 7.94 | 10.0 | pCi/L | | | | | | |
| Chromium-51 | U | 45.5 | +/-59.3 | 109 | | pCi/L | | | | | | |
| Cobalt-56 | U | 0.466 | +/-4.27 | 7.30 | | pCi/L | | | | | | |
| Cobalt-57 | U | 0.542 | +/-2.17 | 3.79 | | pCi/L | | | | | | |
| Cobalt-58 | U | -0.695 | +/-4.04 | 6.64 | | pCi/L | | | | | | |
| Cobalt-60 | U | -0.0587 | +/-3.70 | 6.23 | | pCi/L | | | | | | |
| Europium-152 | U | 3.43 | +/-8.41 | 14.9 | | pCi/L | | | | | | |
| Europium-154 | U | 0.748 | +/-8.49 | 14.7 | | pCi/L | | | | | | |
| Europium-155 | U | -0.481 | +/-8.13 | 14.1 | | pCi/L | | | | | | |
| Iridium-192 | U | -1.88 | +/-4.09 | 6.62 | | pCi/L | | | | | | |
| Iron-59 | U | -4.39 | +/-9.76 | 14.5 | | pCi/L | | | | | | |
| Lead-210 | U | -8.28 | +/-62.8 | 114 | | pCi/L | | | | | | |
| Lead-212 | U | -1.32 | +/-6.01 | 9.64 | | pCi/L | | | | | | |

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi-1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-12D
Sample ID: 279061004

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|---------|-------------|------|------|-------|------|----------|------|---------|-------|--------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Lead-214 | U | 1.40 | +/-6.74 | 11.2 | | pCi/L | | | | | | |
| Manganese-54 | U | 0.657 | +/-3.25 | 5.63 | | pCi/L | | | | | | |
| Mercury-203 | U | -0.157 | +/-4.78 | 7.73 | | pCi/L | | | | | | |
| Neodymium-147 | U | -62.8 | +/-203 | 320 | | pCi/L | | | | | | |
| Neptunium-239 | U | -10.7 | +/-19.3 | 32.0 | | pCi/L | | | | | | |
| Niobium-94 | U | -1.33 | +/-2.39 | 3.74 | | pCi/L | | | | | | |
| Niobium-95 | U | 1.35 | +/-4.25 | 7.54 | | pCi/L | | | | | | |
| Potassium-40 | U | 15.6 | +/-38.8 | 70.3 | | pCi/L | | | | | | |
| Promethium-144 | U | 1.94 | +/-3.16 | 5.79 | | pCi/L | | | | | | |
| Promethium-146 | U | -0.365 | +/-3.40 | 5.64 | | pCi/L | | | | | | |
| Radium-228 | U | 0.0965 | +/-10.9 | 18.3 | | pCi/L | | | | | | |
| Ruthenium-106 | U | 6.88 | +/-27.6 | 46.7 | | pCi/L | | | | | | |
| Silver-110m | U | -7.87 | +/-3.55 | 4.25 | | pCi/L | | | | | | |
| Sodium-22 | U | 0.066 | +/-2.99 | 5.10 | | pCi/L | | | | | | |
| Thallium-208 | U | -2.21 | +/-3.63 | 5.61 | | pCi/L | | | | | | |
| Thorium-234 | U | -71.4 | +/-64.9 | 107 | | pCi/L | | | | | | |
| Tin-113 | U | 4.14 | +/-3.76 | 7.12 | | pCi/L | | | | | | |
| Uranium-235 | U | 0.887 | +/-18.7 | 30.5 | | pCi/L | | | | | | |
| Uranium-238 | U | -71.4 | +/-64.9 | 107 | | pCi/L | | | | | | |
| Yttrium-88 | U | -0.0697 | +/-3.59 | 6.07 | | pCi/L | | | | | | |
| Zinc-65 | U | 1.07 | +/-6.57 | 11.1 | | pCi/L | | | | | | |
| Zirconium-95 | U | -6.36 | +/-8.21 | 12.4 | | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Gross A/B, liquid "As Received" | | | | | | | | | | | | |
| Alpha | U | 2.94 | +/-2.64 | 3.48 | 5.00 | pCi/L | CAS2 | 06/18/11 | 1002 | 1109556 | | 4 |
| Beta | | 11.4 | +/-3.58 | 4.77 | 5.00 | pCi/L | | | | | | |
| GFPC, Ra228, Liquid "As Received" | | | | | | | | | | | | |
| Radium-228 | | 2.62 | +/-1.24 | 1.80 | 3.00 | pCi/L | BXF1 | 06/09/11 | 1334 | 1107735 | | 5 |
| GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | | | | | | | |
| Strontium-89 | U | -164 | +/-7.73 | 1.85 | 2.00 | pCi/L | JXR1 | 06/17/11 | 1249 | 1107743 | | 6 |
| GFPC, Sr90, liquid "As Received" | | | | | | | | | | | | |
| Strontium-90 | U | 0.254 | +/-0.669 | 1.23 | 2.00 | pCi/L | JXR1 | 06/26/11 | 0958 | 1115396 | | 7 |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| LSC, Tritium Dist, Liquid "As Received" | | | | | | | | | | | | |
| Tritium | U | -103 | +/-276 | 532 | 700 | pCi/L | EXK2 | 06/13/11 | 1735 | 1109586 | | 8 |
| Liquid Scint Te99, Liquid "As Received" | | | | | | | | | | | | |

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51811-12D
Sample ID: 279061004

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|--------|-------------|-------|------|-------|----|---------|----------|------|---------|--------|
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |
| Technetium-99 | U | -2.87 | +/-15.7 | 27.8 | 50.0 | pCi/L | | MXPI | 06/14/11 | 0908 | 1110082 | 9 |
| Rad Radium-226 | | | | | | | | | | | | |
| Lucas Cell, Ra226, liquid "As Received" | | | | | | | | | | | | |
| Radium-226 | | 3.09 | +/-0.549 | 0.335 | 1.00 | pCi/L | | KSDI | 06/08/11 | 1310 | 1107697 | 10 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | DOE EML HASL-300, U-02-RC Modified | |
| 3 | EPA 901.1 | |
| 4 | EPA 900.0/SW846 9310 | |
| 5 | EPA 904.0/SW846 9320 Modified | |
| 6 | EPA 905.0 Modified | |
| 7 | EPA 905.0 Modified | |
| 8 | EPA 906.0 Modified | |
| 9 | DOE EML HASL-300, Tc-02-RC Modified | |
| 10 | EPA 903.1 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---|--------|---------|-----------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 84.1 | (15%-125%) |
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 92.8 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 95.4 | (15%-125%) |
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 112 | (25%-125%) |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 98.5 | (25%-125%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | | | 116 | (25%-125%) |
| Technetium-99m Tracer | Liquid Scint Tc99, Liquid "As Received" | | | 103 | (15%-125%) |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 29, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-51911-131
Sample ID: 279061005
Matrix: Ground Water
Collect Date: 19-MAY-11 10:00
Receive Date: 31-MAY-11
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---------------------------------------|-----------|--------|-------------|------|------|-------|----|---------|----------|------|---------|--------|
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Sr89&Sr90, Liquid "As Received" | | | | | | | | | | | | |
| Strontium-89 | U | -81.7 | +/-5.24 | 1.87 | 2.00 | pCi/L | | JXR1 | 06/16/11 | 2236 | 1107743 | 1 |
| GFPC, Sr90, liquid "As Received" | | | | | | | | | | | | |
| Strontium-90 | U | 0.530 | +/-1.08 | 1.90 | 2.00 | pCi/L | | JXR1 | 06/26/11 | 0958 | 1115396 | 2 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|--------------------|------------------|
| 1 | EPA 905.0 Modified | |
| 2 | EPA 905.0 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---------------------------------------|--------|---------|-----------|-------------------|
| Strontium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 114 | (25%-125%) |
| Yttrium Carrier | GFPC, Sr89&Sr90, Liquid "As Received" | | | 100 | (25%-125%) |
| Strontium Carrier | GFPC, Sr90, liquid "As Received" | | | 109 | (25%-125%) |

Quality Control Data

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: June 29, 2011
Page 1 of 12

Contact: Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan
Mr. Tom Mow

Workorder: 279061

| Parname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------------------|-------------|----------|------|----------|---------|------|------|-------------|----------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch 1108271 | | | | | | | | | | | |
| QC1202409783 279061001 DUP | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | U | 0.00 | percent | 0.00 | | | N/A DDR1 | 06/08/11 | 09:33 |
| Uranium-233/234 | U | 0.154 | U | 0.245 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.263 | | +/-0.293 | | | | | | | |
| Uranium-235/236 | U | 0.00 | U | 0.0533 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.212 | | +/-0.212 | | | | | | | |
| Uranium-238 | U | 0.221 | | 0.541 | pCi/L | 10.9 | | (0% - 100%) | | | |
| | Uncertainty | +/-0.303 | | +/-0.434 | | | | | | | |
| QC1202409785 LCS | | | | | | | | | | | |
| Pct Uranium-235 | | | | 0.748 | percent | | | | | 06/08/11 | 09:33 |
| Uranium-233/234 | | | | 21.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.71 | | | | | | | |
| Uranium-235/236 | | | | 1.08 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.688 | | | | | | | |
| Uranium-238 | 25.9 | | | 22.3 | pCi/L | | 86.1 | (75%-125%) | | | |
| | Uncertainty | | | +/-2.77 | | | | | | | |
| QC1202409782 MB | | | | | | | | | | | |
| Pct Uranium-235 | | | U | 0.00 | percent | | | | | 06/08/11 | 09:33 |
| Uranium-233/234 | | | U | 0.138 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.315 | | | | | | | |
| Uranium-235/236 | | | U | -0.0298 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.250 | | | | | | | |
| Uranium-238 | | | U | 0.201 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.279 | | | | | | | |
| QC1202409784 279061001 MS | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | 0.538 | percent | | | | | 06/08/11 | 09:33 |
| Uranium-233/234 | U | 0.154 | | 24.4 | pCi/L | | | | | | |
| | Uncertainty | +/-0.263 | | +/-2.78 | | | | | | | |
| Uranium-235/236 | U | 0.00 | | 0.888 | pCi/L | | | | | | |
| | Uncertainty | +/-0.212 | | +/-0.598 | | | | | | | |
| Uranium-238 | 25.9 U | 0.221 | | 25.5 | pCi/L | | 98.5 | (75%-125%) | | | |
| | Uncertainty | +/-0.303 | | +/-2.83 | | | | | | | |
| Batch 1108273 | | | | | | | | | | | |
| QC1202409787 279061001 DUP | | | | | | | | | | | |
| Plutonium-238 | U | 0.00204 | U | -0.101 | pCi/L | 0.00 | | | N/A DDR1 | 06/09/11 | 07:24 |
| | Uncertainty | +/-0.111 | | +/-0.125 | | | | | | | |
| Plutonium-239/240 | U | -0.0245 | U | -0.0506 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.105 | | +/-0.114 | | | | | | | |
| Plutonium-244 | U | 0.0387 | U | 0.145 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.103 | | +/-0.180 | | | | | | | |
| QC1202409789 LCS | | | | | | | | | | | |
| Plutonium-238 | | | U | -0.0822 | pCi/L | | | | | 06/09/11 | 07:24 |

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QC Summary

Workorder: 279061

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------------------|-------------|----------|------|----------|-------|------|------|------------|----------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch 1108273 | | | | | | | | | | | |
| | Uncertainty | | | +/-0.186 | | | | | | | |
| Plutonium-239/240 | 20.4 | | | 20.6 | pCi/L | | 101 | (75%-125%) | DDR1 | 06/09/11 | 07:24 |
| | Uncertainty | | | +/-2.61 | | | | | | | |
| Plutonium-244 | | | U | 0.0445 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.177 | | | | | | | |
| QC1202409786 MB | | | | | | | | | | | |
| Plutonium-238 | | | U | 0.00 | pCi/L | | | | | 06/09/11 | 07:24 |
| | Uncertainty | | | +/-0.108 | | | | | | | |
| Plutonium-239/240 | | | U | 0.042 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.111 | | | | | | | |
| Plutonium-244 | | | U | 0.042 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.111 | | | | | | | |
| QC1202409788 279061001 MS | | | | | | | | | | | |
| Plutonium-238 | U | 0.00204 | U | -0.0585 | pCi/L | | | | | 06/09/11 | 07:24 |
| | Uncertainty | +/-0.111 | | +/-0.122 | | | | | | | |
| Plutonium-239/240 | 20.4 U | -0.0245 | | 20.2 | pCi/L | | 99 | (75%-125%) | | | |
| | Uncertainty | +/-0.105 | | +/-1.98 | | | | | | | |
| Plutonium-244 | U | 0.0387 | U | 0.0886 | pCi/L | | | | | | |
| | Uncertainty | +/-0.103 | | +/-0.142 | | | | | | | |
| Rad Gamma Spec | | | | | | | | | | | |
| Batch 1111565 | | | | | | | | | | | |
| QC1202417334 279061001 DUP | | | | | | | | | | | |
| Actinium-228 | U | -5.0 | U | 4.07 | pCi/L | 0.00 | | | N/A KXG3 | 06/27/11 | 13:49 |
| | Uncertainty | +/-14.2 | | +/-13.4 | | | | | | | |
| Americium-241 | U | 8.92 | U | 21.7 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-19.1 | | +/-24.5 | | | | | | | |
| Antimony-124 | U | 1.90 | U | -14.2 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-10.9 | | +/-15.6 | | | | | | | |
| Antimony-125 | U | 0.841 | U | 1.12 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-10.2 | | +/-10.2 | | | | | | | |
| Barium-133 | U | -0.698 | U | -2.12 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-4.46 | | +/-4.91 | | | | | | | |
| Barium-140 | U | -75.1 | U | -16 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-113 | | +/-98.9 | | | | | | | |
| Beryllium-7 | U | -14.7 | U | -11.3 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-42.3 | | +/-57.5 | | | | | | | |
| Bismuth-212 | U | 19.1 | U | -11.5 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-54.6 | | +/-57.3 | | | | | | | |
| Bismuth-214 | U | -1.51 | U | -1.34 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-9.69 | | +/-8.09 | | | | | | | |
| Cerium-139 | U | -0.737 | U | -1.22 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.52 | | +/-5.10 | | | | | | | |
| Cerium-141 | U | 5.34 | U | 14.0 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-11.9 | | +/-16.5 | | | | | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 279061

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|---------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch 1111565 | | | | | | | | | | | |
| Cerium-144 | U | -18.7 | U | -6.89 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-25.7 | | +/-31.6 | | | | | | | |
| Cesium-134 | U | -2.71 | U | -1.87 | pCi/L | 0.00 | | N/A | KXG3 | 06/27/11 | 13:49 |
| | Uncertainty | +/-4.02 | | +/-3.99 | | | | | | | |
| Cesium-136 | U | 16.6 | U | -12.7 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-28.9 | | +/-37.1 | | | | | | | |
| Cesium-137 | U | -0.59 | U | 2.58 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-4.33 | | +/-4.09 | | | | | | | |
| Chromium-51 | U | 0.337 | U | -3.69 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-69.6 | | +/-81.0 | | | | | | | |
| Cobalt-56 | U | -0.581 | U | -1.63 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.88 | | +/-5.72 | | | | | | | |
| Cobalt-57 | U | 0.644 | U | 1.64 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.27 | | +/-4.22 | | | | | | | |
| Cobalt-58 | U | 1.24 | U | -2.13 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-4.72 | | +/-5.56 | | | | | | | |
| Cobalt-60 | U | -2.03 | U | -0.333 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.78 | | +/-2.77 | | | | | | | |
| Europium-152 | U | -7.0 | U | 3.74 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-9.93 | | +/-11.9 | | | | | | | |
| Europium-154 | U | 3.33 | U | 3.87 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-8.84 | | +/-10.4 | | | | | | | |
| Europium-155 | U | -8.36 | U | -10.2 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-11.9 | | +/-14.0 | | | | | | | |
| Iridium-192 | U | -1.01 | U | -1.93 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-4.35 | | +/-5.29 | | | | | | | |
| Iron-59 | U | 12.4 | U | -15.2 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-11.9 | | +/-16.4 | | | | | | | |
| Lead-210 | U | -495 | U | 14.3 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-509 | | +/-956 | | | | | | | |
| Lead-212 | U | -2.35 | U | 1.33 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-7.45 | | +/-7.50 | | | | | | | |
| Lead-214 | U | 14.7 | U | 5.78 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-11.7 | | +/-9.94 | | | | | | | |
| Manganese-54 | U | 0.206 | U | -3.15 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.74 | | +/-4.08 | | | | | | | |
| Mercury-203 | U | 2.28 | U | -0.882 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-5.52 | | +/-6.88 | | | | | | | |
| Neodymium-147 | U | 76.5 | U | 7.12 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-219 | | +/-269 | | | | | | | |
| Neptunium-239 | U | -3.51 | U | -27.6 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-30.0 | | +/-37.2 | | | | | | | |
| Niobium-94 | U | 2.06 | U | 1.45 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.14 | | +/-3.89 | | | | | | | |
| Niobium-95 | U | 5.58 | U | -2.49 | pCi/L | 0.00 | | N/A | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 279061

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|---------|------|---------|-------|------|------|------------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| | Uncertainty | | | | | | | | | | |
| Potassium-40 | U | +/-4.53 | U | +/-4.43 | pCi/L | 0.00 | | N/A | KXG3 | 06/27/11 | 13:49 |
| | Uncertainty | +/-46.5 | | +/-49.3 | | | | | | | |
| Promethium-144 | U | -0.0589 | U | -2.39 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.16 | | +/-3.97 | | | | | | | |
| Promethium-146 | U | -1.98 | U | 2.74 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.93 | | +/-4.16 | | | | | | | |
| Radium-228 | U | -5.0 | U | 4.07 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-14.2 | | +/-13.4 | | | | | | | |
| Ruthenium-106 | U | -3.17 | U | -21.2 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-28.8 | | +/-34.3 | | | | | | | |
| Silver-110m | U | -1.68 | U | 2.29 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.67 | | +/-3.89 | | | | | | | |
| Sodium-22 | U | 1.09 | U | 1.36 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.13 | | +/-3.72 | | | | | | | |
| Thallium-208 | U | -1.66 | U | 2.63 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.74 | | +/-4.54 | | | | | | | |
| Thorium-234 | U | 47.3 | U | 327 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-176 | | +/-376 | | | | | | | |
| Tin-113 | U | -0.651 | U | 2.05 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-5.44 | | +/-6.15 | | | | | | | |
| Uranium-235 | U | 2.15 | U | -22.2 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-25.7 | | +/-33.0 | | | | | | | |
| Uranium-238 | U | 47.3 | U | 327 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-176 | | +/-376 | | | | | | | |
| Yttrium-88 | U | 0.0809 | U | -2.75 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-3.85 | | +/-4.44 | | | | | | | |
| Zinc-65 | U | -3.83 | U | -3.03 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-6.74 | | +/-8.45 | | | | | | | |
| Zirconium-95 | U | 3.65 | U | -6.56 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-8.33 | | +/-8.28 | | | | | | | |
| QC1202417336 | LCS | | | | | | | | | | |
| Actinium-228 | | | U | 30.5 | pCi/L | | | | | 06/27/11 | 13:35 |
| | Uncertainty | | | +/-236 | | | | | | | |
| Americium-241 | 2790 | | | 2800 | pCi/L | | 101 | (75%-125%) | | | |
| | Uncertainty | | | +/-297 | | | | | | | |
| Antimony-124 | | | U | -29 | pCi/L | | | | | | |
| | Uncertainty | | | +/-68.7 | | | | | | | |
| Antimony-125 | | | U | -25.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-120 | | | | | | | |
| Barium-133 | | | U | -27.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-48.7 | | | | | | | |
| Barium-140 | | | U | -38.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-323 | | | | | | | |

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QC Summary

Workorder: 279061

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|------------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| Beryllium-7 | | | U | -160 | pCi/L | | | | | | |
| | Uncertainty | | | +/-450 | | | | | | | |
| Bismuth-212 | | | U | 91.5 | pCi/L | | | | KXG3 | 06/27/11 | 13:35 |
| | Uncertainty | | | +/-629 | | | | | | | |
| Bismuth-214 | | | U | 23.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-88.2 | | | | | | | |
| Cerium-139 | | | | 376 | pCi/L | | | | | | |
| | Uncertainty | | | +/-67.5 | | | | | | | |
| Cerium-141 | | | U | -1.86 | pCi/L | | | | | | |
| | Uncertainty | | | +/-60.7 | | | | | | | |
| Cerium-144 | | | U | -208 | pCi/L | | | | | | |
| | Uncertainty | | | +/-226 | | | | | | | |
| Cesium-134 | | | U | 46.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-55.6 | | | | | | | |
| Cesium-136 | | | U | -168 | pCi/L | | | | | | |
| | Uncertainty | | | +/-157 | | | | | | | |
| Cesium-137 | 6290 | | | 6560 | pCi/L | | 104 | (75%-125%) | | | |
| | Uncertainty | | | +/-564 | | | | | | | |
| Chromium-51 | | | U | -27.2 | pCi/L | | | | | | |
| | Uncertainty | | | +/-412 | | | | | | | |
| Cobalt-56 | | | U | -17.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-58.0 | | | | | | | |
| Cobalt-57 | | | | 803 | pCi/L | | | | | | |
| | Uncertainty | | | +/-91.3 | | | | | | | |
| Cobalt-58 | | | U | -49.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-56.5 | | | | | | | |
| Cobalt-60 | 6810 | | | 6860 | pCi/L | | 101 | (75%-125%) | | | |
| | Uncertainty | | | +/-612 | | | | | | | |
| Europium-152 | | | U | 107 | pCi/L | | | | | | |
| | Uncertainty | | | +/-112 | | | | | | | |
| Europium-154 | | | U | -14.2 | pCi/L | | | | | | |
| | Uncertainty | | | +/-99.1 | | | | | | | |
| Europium-155 | | | U | 62.0 | pCi/L | | | | | | |
| | Uncertainty | | | +/-101 | | | | | | | |
| Iridium-192 | | | U | 22.4 | pCi/L | | | | | | |
| | Uncertainty | | | +/-38.8 | | | | | | | |
| Iron-59 | | | U | 14.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-142 | | | | | | | |
| Lead-210 | | | | 25700 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2940 | | | | | | | |
| Lead-212 | | | U | 15.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-66.5 | | | | | | | |
| Lead-214 | | | U | 51.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-84.8 | | | | | | | |
| Manganese-54 | | | U | -28.7 | pCi/L | | | | | | |

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QC Summary

Workorder: 279061

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| | Uncertainty | | | +/-52.4 | | | | | | | |
| Mercury-203 | | | | 70.9 | pCi/L | | | | KXG3 | 06/27/11 | 13:35 |
| | Uncertainty | | | +/-55.2 | | | | | | | |
| Neodymium-147 | | | U | 112 | pCi/L | | | | | | |
| | Uncertainty | | | +/-667 | | | | | | | |
| Neptunium-239 | | | U | -270 | pCi/L | | | | | | |
| | Uncertainty | | | +/-277 | | | | | | | |
| Niobium-94 | | | U | -0.335 | pCi/L | | | | | | |
| | Uncertainty | | | +/-43.0 | | | | | | | |
| Niobium-95 | | | U | 17.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-51.9 | | | | | | | |
| Potassium-40 | | | U | 176 | pCi/L | | | | | | |
| | Uncertainty | | | +/-313 | | | | | | | |
| Promethium-144 | | | U | 8.99 | pCi/L | | | | | | |
| | Uncertainty | | | +/-43.1 | | | | | | | |
| Promethium-146 | | | U | 28.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-60.1 | | | | | | | |
| Radium-228 | | | U | 30.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-236 | | | | | | | |
| Ruthenium-106 | | | U | -269 | pCi/L | | | | | | |
| | Uncertainty | | | +/-435 | | | | | | | |
| Silver-110m | | | U | 26.8 | pCi/L | | | | | | |
| | Uncertainty | | | +/-61.4 | | | | | | | |
| Sodium-22 | | | U | 5.33 | pCi/L | | | | | | |
| | Uncertainty | | | +/-34.2 | | | | | | | |
| Thallium-208 | | | U | 8.23 | pCi/L | | | | | | |
| | Uncertainty | | | +/-45.9 | | | | | | | |
| Thorium-234 | | | U | -696 | pCi/L | | | | | | |
| | Uncertainty | | | +/-742 | | | | | | | |
| Tin-113 | | | U | 12.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-54.7 | | | | | | | |
| Uranium-235 | | | U | -27 | pCi/L | | | | | | |
| | Uncertainty | | | +/-200 | | | | | | | |
| Uranium-238 | | | U | -696 | pCi/L | | | | | | |
| | Uncertainty | | | +/-742 | | | | | | | |
| Yttrium-88 | | | | 1870 | pCi/L | | | | | | |
| | Uncertainty | | | +/-205 | | | | | | | |
| Zinc-65 | | | U | 30.4 | pCi/L | | | | | | |
| | Uncertainty | | | +/-135 | | | | | | | |
| Zirconium-95 | | | U | 38.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-91.9 | | | | | | | |
| QC1202417333 | MB | | | | | | | | | | |
| Actinium-228 | | | U | 2.16 | pCi/L | | | | | 06/27/11 | 13:21 |
| | Uncertainty | | | +/-16.4 | | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| Americium-241 | | | U | 3.11 | pCi/L | | | | | | |
| | Uncertainty | | | +/-17.3 | | | | | | | |
| Antimony-124 | | | U | -0.882 | pCi/L | | | | KXG3 | 06/27/11 | 13:21 |
| | Uncertainty | | | +/-5.40 | | | | | | | |
| Antimony-125 | | | U | 11.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-8.36 | | | | | | | |
| Barium-133 | | | U | -1.86 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.47 | | | | | | | |
| Barium-140 | | | U | 16.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-21.2 | | | | | | | |
| Beryllium-7 | | | U | 27.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-28.6 | | | | | | | |
| Bismuth-212 | | | U | -71.9 | pCi/L | | | | | | |
| | Uncertainty | | | +/-45.7 | | | | | | | |
| Bismuth-214 | | | U | 1.20 | pCi/L | | | | | | |
| | Uncertainty | | | +/-7.87 | | | | | | | |
| Cerium-139 | | | U | -3.64 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.91 | | | | | | | |
| Cerium-141 | | | U | 5.02 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.19 | | | | | | | |
| Cerium-144 | | | U | 8.51 | pCi/L | | | | | | |
| | Uncertainty | | | +/-18.6 | | | | | | | |
| Cesium-134 | | | U | -1.74 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.79 | | | | | | | |
| Cesium-136 | | | U | 1.05 | pCi/L | | | | | | |
| | Uncertainty | | | +/-7.27 | | | | | | | |
| Cesium-137 | | | U | 0.720 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.91 | | | | | | | |
| Chromium-51 | | | U | -22.9 | pCi/L | | | | | | |
| | Uncertainty | | | +/-34.4 | | | | | | | |
| Cobalt-56 | | | U | 2.21 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.02 | | | | | | | |
| Cobalt-57 | | | U | -0.77 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.46 | | | | | | | |
| Cobalt-58 | | | U | 1.17 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.85 | | | | | | | |
| Cobalt-60 | | | U | -2.71 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.21 | | | | | | | |
| Europium-152 | | | U | -0.676 | pCi/L | | | | | | |
| | Uncertainty | | | +/-9.27 | | | | | | | |
| Europium-154 | | | U | -0.147 | pCi/L | | | | | | |
| | Uncertainty | | | +/-7.96 | | | | | | | |
| Europium-155 | | | U | 2.70 | pCi/L | | | | | | |
| | Uncertainty | | | +/-9.53 | | | | | | | |
| Iridium-192 | | | U | -0.298 | pCi/L | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| | Uncertainty | | | +/-3.04 | | | | | | | |
| Iron-59 | | | U | -5.37 | pCi/L | | | | KXG3 | 06/27/11 | 13:21 |
| | Uncertainty | | | +/-6.06 | | | | | | | |
| Lead-210 | | | U | -72.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-591 | | | | | | | |
| Lead-212 | | | U | -5.4 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.92 | | | | | | | |
| Lead-214 | | | U | 5.06 | pCi/L | | | | | | |
| | Uncertainty | | | +/-8.33 | | | | | | | |
| Manganese-54 | | | U | 0.312 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.98 | | | | | | | |
| Mercury-203 | | | U | -4.29 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.74 | | | | | | | |
| Neodymium-147 | | | U | -8.42 | pCi/L | | | | | | |
| | Uncertainty | | | +/-41.2 | | | | | | | |
| Neptunium-239 | | | U | 8.21 | pCi/L | | | | | | |
| | Uncertainty | | | +/-25.7 | | | | | | | |
| Niobium-94 | | | U | -1.13 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.75 | | | | | | | |
| Niobium-95 | | | U | -0.161 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.43 | | | | | | | |
| Potassium-40 | | | U | -14.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-41.6 | | | | | | | |
| Promethium-144 | | | U | 0.892 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.58 | | | | | | | |
| Promethium-146 | | | U | -4.71 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.07 | | | | | | | |
| Radium-228 | | | U | 2.16 | pCi/L | | | | | | |
| | Uncertainty | | | +/-16.4 | | | | | | | |
| Ruthenium-106 | | | U | -21.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-24.0 | | | | | | | |
| Silver-110m | | | U | 1.17 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.65 | | | | | | | |
| Sodium-22 | | | U | -0.123 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.79 | | | | | | | |
| Thallium-208 | | | U | -0.495 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.86 | | | | | | | |
| Thorium-234 | | | U | -51.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-157 | | | | | | | |
| Tin-113 | | | U | 3.55 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.26 | | | | | | | |
| Uranium-235 | | | U | 10.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-22.1 | | | | | | | |
| Uranium-238 | | | U | -51.3 | pCi/L | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|-------------|---------|-------|----------|-------|------|------|-------------|-------|----------|----------------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1111565 | | | | | | | | | | |
| | Uncertainty | | | +/-157 | | | | | | | |
| Yttrium-88 | | | U | 1.04 | pCi/L | | | | KXG3 | 06/27/11 | 13:21 |
| | Uncertainty | | | +/-3.37 | | | | | | | |
| Zinc-65 | | | U | -6.93 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.89 | | | | | | | |
| Zirconium-95 | | | U | 3.35 | pCi/L | | | | | | |
| | Uncertainty | | | +/-5.18 | | | | | | | |
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1107735 | | | | | | | | | | |
| QC1202408507 | 279061004 | DUP | | | | | | | | | |
| Radium-228 | | 2.62 | U | 1.41 | pCi/L | 60.2 | | (0% - 100%) | BOXF1 | 06/09/11 | 13:34 |
| | Uncertainty | +/-1.24 | | +/-1.17 | | | | | | | |
| QC1202408509 | LCS | | | | | | | | | | |
| Radium-228 | 59.0 | | | 58.6 | pCi/L | | 99.3 | (75%-125%) | | 06/09/11 | 13:31 |
| | Uncertainty | | | +/-3.61 | | | | | | | |
| QC1202408506 | MB | | | | | | | | | | |
| Radium-228 | | | U | 0.711 | pCi/L | | | | | 06/09/11 | 13:34 |
| | Uncertainty | | | +/-1.17 | | | | | | | |
| QC1202408508 | 279061004 | MS | | | | | | | | | |
| Radium-228 | 59.4 | 2.62 | | 61.6 | pCi/L | | 99.2 | (75%-125%) | | 06/09/11 | 13:31 |
| | Uncertainty | +/-1.24 | | +/-3.89 | | | | | | | |
| Batch | 1107743 | | | | | | | | | | |
| QC1202408528 | 279061005 | DUP | | | | | | | | | |
| Strontium-89 | U | -81.7 | U | -1.38 | pCi/L | 0.00 | | | N/A | JXR1 | 06/17/11 08:06 |
| | Uncertainty | +/-5.24 | | +/-0.554 | | | | | | | |
| QC1202408530 | LCS | | | | | | | | | | |
| Strontium-89 | 3230 | | | 3210 | pCi/L | | 99.2 | (75%-125%) | | 06/17/11 | 08:07 |
| | Uncertainty | | | +/-30.8 | | | | | | | |
| QC1202408527 | MB | | | | | | | | | | |
| Strontium-89 | | | U | 0.486 | pCi/L | | | | | 06/17/11 | 12:49 |
| | Uncertainty | | | +/-0.790 | | | | | | | |
| QC1202408529 | 279061005 | MS | | | | | | | | | |
| Strontium-89 | 9310 | U | -81.7 | 7590 | pCi/L | | 81.6 | (75%-125%) | | 06/17/11 | 08:06 |
| | Uncertainty | +/-5.24 | | +/-75.1 | | | | | | | |
| Batch | 1109556 | | | | | | | | | | |
| QC1202412532 | 279061003 | DUP | | | | | | | | | |
| Alpha | U | -0.706 | U | 0.691 | pCi/L | 0.00 | | | N/A | CAS2 | 06/18/11 10:00 |
| | Uncertainty | +/-1.95 | | +/-2.46 | | | | | | | |
| Beta | U | 3.95 | | 5.53 | pCi/L | 33.3 | | (0% - 100%) | | | |
| | Uncertainty | +/-2.88 | | +/-3.11 | | | | | | | |
| QC1202412535 | LCS | | | | | | | | | | |
| Alpha | 127 | | | 110 | pCi/L | | 86.4 | (75%-125%) | | 06/19/11 | 07:31 |
| | Uncertainty | | | +/-11.9 | | | | | | | |
| Beta | 479 | | | 457 | pCi/L | | 95.4 | (75%-125%) | | | |
| | Uncertainty | | | +/-16.7 | | | | | | | |
| QC1202412531 | MB | | | | | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------------|-------------|--------|---------|----------|--------|-------|-------|------------|-------|----------|----------------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1109556 | | | | | | | | | | |
| Alpha | | | U | 1.67 | pCi/L | | | | | 06/18/11 | 10:00 |
| | Uncertainty | | | +/-1.86 | | | | | | | |
| Beta | | | U | 2.35 | pCi/L | | | | CAS2 | | |
| | Uncertainty | | | +/-2.55 | | | | | | | |
| QC1202412533 | 279061003 | MS | | | | | | | | | |
| Alpha | 169 | U | -0.706 | 118 | pCi/L | | 69.7* | (75%-125%) | | 06/19/11 | 07:31 |
| | Uncertainty | | +/-1.95 | +/-18.2 | | | | | | | |
| Beta | 638 | U | 3.95 | 620 | pCi/L | | 97.1 | (75%-125%) | | | |
| | Uncertainty | | +/-2.88 | +/-23.5 | | | | | | | |
| QC1202412534 | 279061003 | MSD | | | | | | | | | |
| Alpha | 169 | U | -0.706 | 123 | pCi/L | 4.17 | 72.6* | (0%-20%) | | 06/19/11 | 07:31 |
| | Uncertainty | | +/-1.95 | +/-18.7 | | | | | | | |
| Beta | 638 | U | 3.95 | 673 | pCi/L | 8.28 | 105 | (0%-20%) | | | |
| | Uncertainty | | +/-2.88 | +/-24.5 | | | | | | | |
| Batch | 1115396 | | | | | | | | | | |
| QC1202425767 | 279061001 | DUP | | | | | | | | | |
| Strontium-90 | | U | 0.0884 | U | -0.913 | pCi/L | 0.00 | | N/A | JXR1 | 06/26/11 09:57 |
| | Uncertainty | | +/-1.07 | +/-0.899 | | | | | | | |
| QC1202425769 | LCS | | | | | | | | | | |
| Strontium-90 | 120 | | | 123 | pCi/L | | 103 | (75%-125%) | | 06/26/11 | 09:58 |
| | Uncertainty | | | +/-6.30 | | | | | | | |
| QC1202425766 | MB | | | | | | | | | | |
| Strontium-90 | | | U | 0.224 | pCi/L | | | | | 06/26/11 | 09:56 |
| | Uncertainty | | | +/-1.04 | | | | | | | |
| QC1202425768 | 279061001 | MS | | | | | | | | | |
| Strontium-90 | 240 | U | 0.0884 | 223 | pCi/L | | 93.1 | (75%-125%) | | 06/26/11 | 09:58 |
| | Uncertainty | | +/-1.07 | +/-11.0 | | | | | | | |
| Rad Liquid Scintillation | | | | | | | | | | | |
| Batch | 1109586 | | | | | | | | | | |
| QC1202412632 | 279061001 | DUP | | | | | | | | | |
| Tritium | | U | 65.7 | U | 83.0 | pCi/L | 0.00 | | N/A | EXK2 | 06/13/11 18:08 |
| | Uncertainty | | +/-293 | +/-296 | | | | | | | |
| QC1202412634 | LCS | | | | | | | | | | |
| Tritium | 2120 | | | 2500 | pCi/L | | 118 | (75%-125%) | | 06/13/11 | 18:40 |
| | Uncertainty | | | +/-472 | | | | | | | |
| QC1202412631 | MB | | | | | | | | | | |
| Tritium | | | U | -68.4 | pCi/L | | | | | 06/13/11 | 17:52 |
| | Uncertainty | | | +/-280 | | | | | | | |
| QC1202412633 | 279061001 | MS | | | | | | | | | |
| Tritium | 2130 | U | 65.7 | 1960 | pCi/L | | 91.7 | (75%-125%) | | 06/13/11 | 18:24 |
| | Uncertainty | | +/-293 | +/-455 | | | | | | | |
| Batch | 1110082 | | | | | | | | | | |
| QC1202413861 | 279061001 | DUP | | | | | | | | | |
| Technetium-99 | | U | 7.69 | U | -3.34 | pCi/L | 0.00 | | N/A | MPX1 | 06/14/11 09:41 |
| | Uncertainty | | +/-16.6 | +/-15.8 | | | | | | | |
| QC1202413863 | LCS | | | | | | | | | | |
| Technetium-99 | 891 | | | 772 | pCi/L | | 86.6 | (75%-125%) | | 06/14/11 | 10:13 |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|--------------------------|-----------|--------|------|--------|-------|-------|-------|------------|-------|----------|-------|
| Rad Liquid Scintillation | | | | | | | | | | | |
| Batch | 1110082 | | | | | | | | | | |
| Uncertainty | | | | | | | | | | | |
| QC1202413860 | MB | | | | | | | | | | |
| Technetium-99 | | | U | -7.62 | pCi/L | | | | MXPI | 06/14/11 | 09:25 |
| Uncertainty | | | | | | | | | | | |
| QC1202413862 | 279061001 | MS | | | | | | | | | |
| Technetium-99 | | 891 | U | 7.69 | 826 | pCi/L | 92.7 | (75%-125%) | | 06/14/11 | 09:57 |
| Uncertainty | | | | | | | | | | | |
| | | | | | | | | | | | |
| Rad Ra-226 | | | | | | | | | | | |
| Batch | 1107697 | | | | | | | | | | |
| QC1202408407 | 279061001 | DUP | | | | | | | | | |
| Radium-226 | | | | 2.67 | 2.04 | pCi/L | 26.5* | (0% - 20%) | KSD1 | 06/08/11 | 13:10 |
| Uncertainty | | | | | | | | | | | |
| QC1202408409 | LCS | | | | | | | | | | |
| Radium-226 | | 24.7 | | | 23.7 | pCi/L | 96 | (75%-125%) | | 06/08/11 | 13:10 |
| Uncertainty | | | | | | | | | | | |
| QC1202408406 | MB | | | | | | | | | | |
| Radium-226 | | | U | -0.112 | pCi/L | | | | | 06/08/11 | 13:10 |
| Uncertainty | | | | | | | | | | | |
| QC1202408408 | 279061001 | MS | | | | | | | | | |
| Radium-226 | | 24.7 | | 2.67 | 33.3 | pCi/L | 124 | (75%-125%) | | 06/08/11 | 13:10 |
| Uncertainty | | | | | | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| UI | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UJ | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



Laboratories LLC

a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

P 843.556.8171 F 843.766.1178

www.gel.com

September 01, 2011

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 283848

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 11, 2011. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4443.

Sincerely,

Dionne Francis for
Richard Albee
Project Manager

Purchase Order: 4700246055
Enclosures



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Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 283848**

September 01, 2011

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on August 11, 2011 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

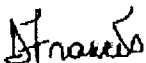
| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 283848001 | EFT-4811-13I |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.


Dionne Francis for
Richard Albee
Project Manager

Chain of Custody

Site Contacts - Lynne Goodman 1-734-586-1205 or Thomas Mow 1-734-586-5334

FERMI 1 NUCLEAR POWER PLANT
6400 N. DIXIE HWY



| | | |
|--|---|--|
| Client: <u>ROIT</u> | | SDG/AR/COC/Work Order: <u>283848</u> |
| Received By: <u>MK</u> | | Date Received: <u>8-11-11</u> |
| Suspected Hazard Information | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. |
| COC/Samples marked as radioactive? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Maximum Counts Observed*: <u>20</u> |
| Classified Radioactive II or III by RSO? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| COC/Samples marked containing PCBs? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Shipped as a DOT Hazardous? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: |
| Samples identified as Foreign Soil? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|-------------------------------------|-------------------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) |
| 2a Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Temperature Device Serial #: <u>450132</u> Secondary Temperature Device Serial # (If Applicable): |
| 3 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 4 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 Samples requiring chemical preservation at proper pH? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 VOA vials free of headspace (defined as < 6mm bubble)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 7 Are Encore containers present? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | (If yes, immediately deliver to Volatiles laboratory) |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | ID's and tests affected: |
| 9 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 12 Are sample containers identifiable as GEL provided? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| 14 Carrier and tracking number. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>8691 1149 2371</u> |

Comments (Use Continuation Form if needed):

List of current GEL Certifications as of 01 September 2011

| State | Certification |
|---------------------------|----------------------|
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | E87156 (FL/NELAP) |
| Connecticut | PH-0169 |
| DoD ELAP – A2LA | 2567.01 |
| Florida – NELAP | E87156 |
| Foreign Soils Permit USDA | P330-09-00191 |
| Georgia | E87156 (FL/NELAP) |
| Georgia SDWA | 967 |
| Hawaii | E87156 (FL/NELAP) |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 (A133904) |
| Louisiana SDWA | LA110006 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Mississippi | E87156 (FL/NELAP) |
| Nevada | SC00012 |
| New Hampshire | 2054 |
| New Jersey – NELAP | SC002 |
| New Mexico | E87156 (FL/NELAP) |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-11-4 |
| Utah – NELAP | SC00012 |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C780-11 |
| Wisconsin | 999887790 |

Radiological Analysis

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 283848**

Method/Analysis Information

Product: Alphaspec Pu, Liquid
Analytical Method: DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number: 1132061

| Sample ID | Client ID |
|------------------|--|
| 283848001 | EFT-4811-13I |
| 1202464473 | Method Blank (MB) |
| 1202464474 | 283848001(EFT-4811-13I) Sample Duplicate (DUP) |
| 1202464475 | 283848001(EFT-4811-13I) Matrix Spike (MS) |
| 1202464476 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 20.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 283848001 (EFT-4811-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Ra228, Liquid
Analytical Method: EPA 904.0/SW846 9320 Modified
Analytical Batch Number: 1132661

| Sample ID | Client ID |
|------------------|--|
| 283848001 | EFT-4811-13I |
| 1202465998 | Method Blank (MB) |
| 1202465999 | 283848001(EFT-4811-13I) Sample Duplicate (DUP) |
| 1202466000 | 283848001(EFT-4811-13I) Matrix Spike (MS) |
| 1202466001 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 16.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 283848001 (EFT-4811-131).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were reprecipitated due to high blank activity. The reprecipitated count is being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

The matrix spike, 1202466000 (EFT-4811-131), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

| | |
|---------------------------------|--|
| Product: | Liquid Scint Tc99, Liquid |
| Analytical Method: | DOE EML HASL-300, Tc-02-RC Modified |
| Analytical Batch Number: | 1132749 |

| Sample ID | Client ID |
|------------|--|
| 283848001 | EFT-4811-13I |
| 1202466266 | Method Blank (MB) |
| 1202466267 | 283848001(EFT-4811-13I) Sample Duplicate (DUP) |
| 1202466268 | 283848001(EFT-4811-13I) Matrix Spike (MS) |
| 1202466269 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-005 REV# 21.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 283848001 (EFT-4811-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Lucas Cell, Ra226, liquid

Analytical Method: EPA 903.1 Modified

Analytical Batch Number: 1131716

| Sample ID | Client ID |
|------------------|--|
| 283848001 | EFT-4811-13I |
| 1202463642 | Method Blank (MB) |
| 1202463643 | 283848001(EFT-4811-13I) Sample Duplicate (DUP) |
| 1202463644 | 283848001(EFT-4811-13I) Matrix Spike (MS) |
| 1202463645 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 13.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 283848001 (EFT-4811-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ROIT001 Detroit Edison Company

Client SDG: 283848 GEL Work Order: 283848

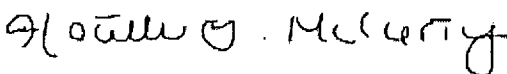
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Heather McCarty

Date: 01 SEP 2011

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 1, 2011

Company : Detroit Edison - Fermi 1
Address : PO Box 44440

Detroit, Michigan 48244
Contact: Mr. Tom Mow
Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-4811-131
Sample ID: 283848001
Matrix: Ground Water
Collect Date: 04-AUG-11 13:45
Receive Date: 11-AUG-11
Collector: Client

Project: ROIT00116
Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|---|-----------|--------|-------------|-------|------|-------|----|---------|----------|------|---------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec Pu, Liquid "As Received" | | | | | | | | | | | | |
| Plutonium-238 | U | 0.0219 | +/-0.117 | 0.324 | 1.00 | pCi/L | | JXD2 | 08/18/11 | 1007 | 1132061 | 1 |
| Plutonium-239/240 | U | 0.011 | +/-0.171 | 0.440 | 1.00 | pCi/L | | | | | | |
| Plutonium-244 | U | 0.00 | +/-0.107 | 0.164 | 1.00 | pCi/L | | | | | | |
| Rad Gas Flow Proportional Counting | | | | | | | | | | | | |
| GFPC, Ra228, Liquid "As Received" | | | | | | | | | | | | |
| Radium-228 | U | 1.16 | +/-0.880 | 1.35 | 3.00 | pCi/L | | LXE3 | 08/31/11 | 1612 | 1132661 | 2 |
| Rad Liquid Scintillation Analysis | | | | | | | | | | | | |
| Liquid Scint Tc99, Liquid "As Received" | | | | | | | | | | | | |
| Technetium-99 | U | 3.74 | +/-20.6 | 35.8 | 50.0 | pCi/L | | TYJ1 | 08/24/11 | 1641 | 1132749 | 3 |
| Rad Radium-226 | | | | | | | | | | | | |
| Lucas Cell, Ra226, liquid "As Received" | | | | | | | | | | | | |
| Radium-226 | U | 0.435 | +/-0.348 | 0.522 | 1.00 | pCi/L | | KSD1 | 08/18/11 | 1415 | 1131716 | 4 |

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|-------------------------------------|------------------|
| 1 | DOE EML HASL-300, Pu-11-RC Modified | |
| 2 | EPA 904.0/SW846 9320 Modified | |
| 3 | DOE EML HASL-300, Tc-02-RC Modified | |
| 4 | EPA 903.1 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|---|--------|---------|-----------|-------------------|
| Plutonium-242 Tracer | Alphaspec Pu, Liquid "As Received" | | | 79.2 | (15%-125%) |
| Barium-133 Tracer | GFPC, Ra228, Liquid "As Received" | | | 82.7 | (15%-125%) |
| Technetium-99m Tracer | Liquid Scint Tc99, Liquid "As Received" | | | 98.9 | (15%-125%) |

Quality Control Data

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: September 1, 2011
Page 1 of 3

Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan
Mr. Tom Mow

Contact:
Workorder: 283848

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------------|-------------|----------|------|----------|-------|------|------|------------|----------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 1132061 | | | | | | | | | | |
| QC1202464474 | 283848001 | DUP | | | | | | | | | |
| Plutonium-238 | U | 0.0219 | U | 0.0455 | pCi/L | 0.00 | | | N/A JXD2 | 08/18/11 | 10:07 |
| | Uncertainty | +/-0.117 | | +/-0.133 | | | | | | | |
| Plutonium-239/240 | U | 0.011 | U | -0.013 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.171 | | +/-0.148 | | | | | | | |
| Plutonium-244 | U | 0.00 | U | 0.0455 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-0.107 | | +/-0.133 | | | | | | | |
| QC1202464476 | LCS | | | | | | | | | | |
| Plutonium-238 | | | U | 0.0411 | pCi/L | | | | | 08/18/11 | 10:07 |
| | Uncertainty | | | +/-0.120 | | | | | | | |
| Plutonium-239/240 | 20.4 | | | 20.2 | pCi/L | | 99 | (75%-125%) | | | |
| | Uncertainty | | | +/-2.14 | | | | | | | |
| Plutonium-244 | | | U | 0.00 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.115 | | | | | | | |
| QC1202464473 | MB | | | | | | | | | | |
| Plutonium-238 | | | U | -0.017 | pCi/L | | | | | 08/18/11 | 10:07 |
| | Uncertainty | | | +/-0.116 | | | | | | | |
| Plutonium-239/240 | | | U | 0.00566 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.125 | | | | | | | |
| Plutonium-244 | | | U | 0.00 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.111 | | | | | | | |
| QC1202464475 | 283848001 | MS | | | | | | | | | |
| Plutonium-238 | U | 0.0219 | U | 0.043 | pCi/L | | | | | 08/18/11 | 10:07 |
| | Uncertainty | +/-0.117 | | +/-0.126 | | | | | | | |
| Plutonium-239/240 | 20.4 U | 0.011 | | 20.1 | pCi/L | | 98.9 | (75%-125%) | | | |
| | Uncertainty | +/-0.171 | | +/-2.18 | | | | | | | |
| Plutonium-244 | U | 0.00 | U | -0.0184 | pCi/L | | | | | | |
| | Uncertainty | +/-0.107 | | +/-0.126 | | | | | | | |
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1132661 | | | | | | | | | | |
| QC1202465999 | 283848001 | DUP | | | | | | | | | |
| Radium-228 | U | 1.16 | U | 0.752 | pCi/L | 0.00 | | | N/A LXE3 | 08/31/11 | 16:12 |
| | Uncertainty | +/-0.880 | | +/-0.747 | | | | | | | |
| QC1202466001 | LCS | | | | | | | | | | |
| Radium-228 | 60.7 | | | 64.2 | pCi/L | | 106 | (75%-125%) | | 08/31/11 | 16:11 |
| | Uncertainty | | | +/-4.52 | | | | | | | |
| QC1202465998 | MB | | | | | | | | | | |
| Radium-228 | | | U | -0.164 | pCi/L | | | | | 08/31/11 | 16:12 |
| | Uncertainty | | | +/-0.475 | | | | | | | |
| QC1202466000 | 283848001 | MS | | | | | | | | | |
| Radium-228 | 183 U | 1.16 | | 189 | pCi/L | | 103 | (75%-125%) | | 08/31/11 | 16:11 |
| | Uncertainty | +/-0.880 | | +/-12.8 | | | | | | | |

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QC Summary

Workorder: 283848

Page 2 of 3

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------------|-----------|-------------|----------|-------|----------|-------|------|------------|-------|------|----------------|
| Rad Liquid Scintillation | | | | | | | | | | | |
| Batch | 1132749 | | | | | | | | | | |
| QC1202466267 | 283848001 | DUP | | | | | | | | | |
| Technetium-99 | | U | 3.74 | U | -7.06 | pCi/L | 0.00 | | N/A | TYJ1 | 08/24/11 17:14 |
| | | Uncertainty | +/-20.6 | | +/-20.2 | | | | | | |
| QC1202466269 | LCS | | | | | | | | | | |
| Technetium-99 | | 1110 | | | 1060 | pCi/L | 95.3 | (75%-125%) | | | 08/24/11 17:46 |
| | | Uncertainty | | | +/-48.1 | | | | | | |
| QC1202466266 | MB | | | | | | | | | | |
| Technetium-99 | | | U | | -0.496 | pCi/L | | | | | 08/24/11 16:57 |
| | | Uncertainty | | | +/-20.6 | | | | | | |
| QC1202466268 | 283848001 | MS | | | | | | | | | |
| Technetium-99 | | 1110 | U | 3.74 | 1060 | pCi/L | 94.8 | (75%-125%) | | | 08/24/11 17:30 |
| | | Uncertainty | | | +/-48.7 | | | | | | |
| Rad Ra-226 | | | | | | | | | | | |
| Batch | 1131716 | | | | | | | | | | |
| QC1202463643 | 283848001 | DUP | | | | | | | | | |
| Radium-226 | | U | 0.435 | U | 0.194 | pCi/L | 0.00 | | N/A | KSD1 | 08/18/11 14:50 |
| | | Uncertainty | +/-0.348 | | +/-0.380 | | | | | | |
| QC1202463645 | LCS | | | | | | | | | | |
| Radium-226 | | 24.7 | | | 24.7 | pCi/L | 99.9 | (75%-125%) | | | 08/18/11 14:50 |
| | | Uncertainty | | | +/-1.89 | | | | | | |
| QC1202463642 | MB | | | | | | | | | | |
| Radium-226 | | | U | | 0.0822 | pCi/L | | | | | 08/18/11 14:50 |
| | | Uncertainty | | | +/-0.342 | | | | | | |
| QC1202463644 | 283848001 | MS | | | | | | | | | |
| Radium-226 | | 24.7 | U | 0.435 | 24.0 | pCi/L | 97.2 | (75%-125%) | | | 08/18/11 14:50 |
| | | Uncertainty | | | +/-1.98 | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.

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QC Summary

Workorder: 283848

Page 3 of 3

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------------------------------|------|----|-------|------|------|-------|-------|------|------|
| M | M | if above MDC and less than LLD | | | | | | | | | |
| M | Matrix Related Failure | | | | | | | | | | |
| N/A | RPD or %Recovery limits do not apply. | | | | | | | | | | |
| ND | Analyte concentration is not detected above the detection limit | | | | | | | | | | |
| NJ | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| UI | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UJ | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



Laboratories LLC

a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

September 26, 2011

Mr. Tom Mow
Detroit Edison - Fermi 1
PO Box 44440
Detroit, Michigan 48244

Re: Fermi 1 - PO# 4700246055
Work Order: 285027

Dear Mr. Mow:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 31, 2011. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4443.

Sincerely,

Dionne Francis for
Richard Albee
Project Manager

Purchase Order: 4700246055
Enclosures



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Case Narrative

**Case Narrative
for
Detroit Edison Company
SDG: 285027**

September 26, 2011

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on August 31, 2011 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:


| <u>Laboratory ID</u> | <u>Client ID</u> |
|-----------------------------|-------------------------|
| 285027001 | EFT-82211-13I |

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.


Dionne Francis for
Richard Albee
Project Manager

Chain of Custody

[illegible]

Site Contacts - Lynne Goodman 1-734-586-1205 or Thomas Mow 1-734-586-5334

| RELINQUISHED BY (printed/signed) | RECEIVED BY (printed/signed) | DATE/TIME (DD-MMM-YYYY/24HR) | REMARKS |
|-------------------------------------|---------------------------------|---------------------------------|---------------------------|
| THOMAS MOW / [Signature] | [Signature] MK 8-31-11 | 8/29/11 | Peer check CUB 28AUG2011. |
| | [Signature] MK 8-31-11 | 8-31-11 0915 | |
| | | | |
| | | | |



SAMPLE RECEIPT & REVIEW FORM

| | | | |
|--|---|--|--|
| Client: <u>ROIT</u> | | SDG/AR/COC/Work Order: <u>285027</u> | |
| Received By: <u>ME</u> | | Date Received: <u>8-31-11</u> | |
| Suspected Hazard Information | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. | |
| COC/Samples marked as radioactive? | <input checked="" type="checkbox"/> | Maximum Counts Observed*: <u>cpm 20</u> | |
| Classified Radioactive II or III by RSO? | <input checked="" type="checkbox"/> | | |
| COC/Samples marked containing PCBs? | <input checked="" type="checkbox"/> | | |
| Shipped as a DOT Hazardous? | <input checked="" type="checkbox"/> | Hazard Class Shipped: UN#: | |
| Samples identified as Foreign Soil? | <input checked="" type="checkbox"/> | | |

| Sample Receipt Criteria | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items) |
|---|-------------------------------------|-------------------------------------|--------------------------|---|
| 1 Shipping containers received intact and sealed? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 2 Samples requiring cold preservation within (0 ≤ 6 deg. C)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) <u>24°C</u> |
| 2a Daily check performed and passed on IR temperature gun? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Temperature Device Serial #: <u>4502132</u> Secondary Temperature Device Serial # (If Applicable): |
| 3 Chain of custody documents included with shipment? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4 Sample containers intact and sealed? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: Seals broken Damaged container Leaking container Other (describe) |
| 5 Samples requiring chemical preservation at proper pH? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's, containers affected and observed pH: If Preservation added, Lot#: |
| 6 VOA vials free of headspace (defined as < 6mm bubble)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 7 Are Encore containers present? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | If yes, immediately deliver to Volatiles laboratory) |
| 8 Samples received within holding time? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ID's and tests affected: |
| 9 Sample ID's on COC match ID's on bottles? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's and containers affected: |
| 10 Date & time on COC match date & time on bottles? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 11 Number of containers received match number indicated on COC? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sample ID's affected: |
| 12 Are sample containers identifiable as GEL provided? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 13 COC form is properly signed in relinquished/received sections? | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 14 Carrier and tracking number. | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>8691 1149 2408</u> |

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials ME

Date

9/1/11

Page

1

of

1

List of current GEL Certifications as of 26 September 2011

| State | Certification |
|---------------------------|----------------------|
| Arizona | AZ0766 |
| Arkansas | 88-0651 |
| CLIA | 42D0904046 |
| California – NELAP | 01151CA |
| Colorado | E87156 (FL/NELAP) |
| Connecticut | PH-0169 |
| DoD ELAP – A2LA | 2567.01 |
| Florida – NELAP | E87156 |
| Foreign Soils Permit USDA | P330-09-00191 |
| Georgia | E87156 (FL/NELAP) |
| Georgia SDWA | 967 |
| Hawaii | E87156 (FL/NELAP) |
| ISO 17025 | 2567.01 |
| Idaho | SC00012 |
| Illinois – NELAP | 200029 |
| Indiana | C-SC-01 |
| Kansas – NELAP | E-10332 |
| Kentucky | 90129 |
| Louisiana – NELAP | 03046 (A133904) |
| Louisiana SDWA | LA110006 |
| Maryland | 270 |
| Massachusetts | M-SC012 |
| Mississippi | E87156 (FL/NELAP) |
| Nevada | SC00012 |
| New Hampshire | 2054 |
| New Jersey – NELAP | SC002 |
| New Mexico | E87156 (FL/NELAP) |
| New York – NELAP | 11501 |
| North Carolina | 233 |
| North Carolina DW | 45709 |
| Oklahoma | 9904 |
| Pennsylvania – NELAP | 68-00485 |
| South Carolina | 10120001/10120002 |
| Tennessee | TN 02934 |
| Texas – NELAP | T104704235-11-4 |
| Utah – NELAP | SC00012 |
| Vermont | VT87156 |
| Virginia | 00151 |
| Washington | C780-11 |
| Wisconsin | 999887790 |

Radiological Analysis

**Radiochemistry Case Narrative
Detroit Edison Company (ROIT)
SDG 285027**

Method/Analysis Information

Product: Alphaspec U, Liquid
Analytical Method: DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number: 1137920

| Sample ID | Client ID |
|------------------|---|
| 285027001 | EFT-82211-13I |
| 1202478522 | Method Blank (MB) |
| 1202478523 | 285027001(EFT-82211-13I) Sample Duplicate (DUP) |
| 1202478524 | 285027001(EFT-82211-13I) Matrix Spike (MS) |
| 1202478525 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 21.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 285027001 (EFT-82211-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Gammaspec, Gamma, Liquid (Standard List)

Analytical Method: EPA 901.1

Analytical Batch Number: 1140793

| Sample ID | Client ID |
|------------|---|
| 285027001 | EFT-82211-13I |
| 1202485450 | Method Blank (MB) |
| 1202485451 | 285027001(EFT-82211-13I) Sample Duplicate (DUP) |
| 1202485453 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 22.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 285027001 (EFT-82211-13I).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Gross A/B, liquid
Analytical Method: EPA 900.0/SW846 9310
Analytical Batch Number: 1139478

| Sample ID | Client ID |
|------------|---|
| 285027001 | EFT-82211-13I |
| 1202482196 | Method Blank (MB) |
| 1202482197 | 285027001(EFT-82211-13I) Sample Duplicate (DUP) |

1202482198 285027001(EFT-82211-13I) Matrix Spike (MS)
1202482199 285027001(EFT-82211-13I) Matrix Spike Duplicate (MSD)
1202482200 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 14.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 285027001 (EFT-82211-13I).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER). The sample and the duplicate, 1202482197 (EFT-82211-13I) and 285027001 (EFT-82211-13I), did not meet the beta relative percent difference requirement; however, they do meet the relative error ratio requirement with value of 2.0773. The matrix spike and matrix spike duplicate, 1202482198 (EFT-82211-13I) and 1202482199 (EFT-82211-13I), did not meet the alpha relative percent difference requirement; The relative error ratio between the matrix spike and matrix spike duplicate is 1.6819

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper

alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG:
DER 1000757 was generated due to RDL less than MDA and Failed Recovery for MSD/PSD. 1. Sample 285014001 does not meet the beta required detection limit. The sample aliquot was reduced to the matrix of the sample. The sample was counted for 500 minutes. 2. The matrix spike duplicate 1202482199 does not meet the alpha recovery requirement. The matrix spike 1202482198 meets at 100.7%. The relative error ratio between the matrix spike and matrix spike duplicate is 1.6819. 1. Reporting results 2. Reporting results

Additional Comments

The matrix spike and matrix spike duplicate, 1202482198 (EFT-82211-13I) and 1202482199 (EFT-82211-13I), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Liquid
Analytical Method: EPA 906.0 Modified
Analytical Batch Number: 1140357

| Sample ID | Client ID |
|------------------|---|
| 285027001 | EFT-82211-13I |
| 1202484335 | Method Blank (MB) |
| 1202484336 | 284658001(VY DOWNSTREAM) Sample Duplicate (DUP) |
| 1202484337 | 284658001(VY DOWNSTREAM) Matrix Spike (MS) |
| 1202484338 | Laboratory Control Sample (LCS) |

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 284658001 (VY DOWNSTREAM).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

The matrix spike, 1202484337 (VY DOWNSTREAM), was reduced due to limited sample volume.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ROIT001 Detroit Edison Company

Client SDG: 285027 GEL Work Order: 285027

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Kate Gellatly

Date: 27 SEP 2011

Title: Analyst I

| | | | |
|---------------------------|-----------|-------------------------------------|-----------|
| Originator's Name: | | Data Validator/Group Leader: | |
| Kenshalla Oston | 26-SEP-11 | Nat Long | 26-SEP-11 |

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 26, 2011

Company : Detroit Edison - Fermi 1
 Address : PO Box 44440

 Detroit, Michigan 48244
 Contact: Mr. Tom Mow
 Project: Fermi 1 - PO# 4700246055

Client Sample ID: EFT-82211-13I Project: ROIT00116
 Sample ID: 285027001 Client ID: ROIT001
 Matrix: Ground Water
 Collect Date: 22-AUG-11 14:40
 Receive Date: 31-AUG-11
 Collector: Client

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|-------|------|---------|----|---------|----------|------|---------|--------|
| Rad Alpha Spec Analysis | | | | | | | | | | | | |
| Alphaspec U, Liquid "As Received" | | | | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | | | percent | | JXH2 | 09/06/11 | 1315 | 1137920 | 1 |
| Uranium-233/234 | | 3.34 | +/-1.14 | 0.483 | 1.00 | pCi/L | | | | | | |
| Uranium-235/236 | U | 0.0947 | +/-0.251 | 0.597 | 1.00 | pCi/L | | | | | | |
| Uranium-238 | | 2.75 | +/-1.05 | 0.616 | 1.00 | pCi/L | | | | | | |
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammascpec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Actinium-228 | U | -8.7 | +/-13.5 | 20.7 | | pCi/L | | KXG3 | 09/16/11 | 1002 | 1140793 | 2 |
| Americium-241 | U | -17.1 | +/-30.0 | 47.3 | | pCi/L | | | | | | |
| Antimony-124 | U | -3.15 | +/-10.2 | 15.5 | | pCi/L | | | | | | |
| Antimony-125 | U | 8.06 | +/-7.72 | 14.2 | | pCi/L | | | | | | |
| Barium-133 | U | -1.84 | +/-4.05 | 6.33 | | pCi/L | | | | | | |
| Barium-140 | U | -8.0 | +/-13.2 | 18.3 | | pCi/L | | | | | | |
| Beryllium-7 | U | 14.7 | +/-32.3 | 58.0 | | pCi/L | | | | | | |
| Bismuth-212 | U | 28.0 | +/-40.1 | 73.5 | | pCi/L | | | | | | |
| Bismuth-214 | U | -0.591 | +/-7.03 | 11.8 | | pCi/L | | | | | | |
| Cerium-139 | U | -2.2 | +/-3.04 | 4.91 | | pCi/L | | | | | | |
| Cerium-141 | U | 2.66 | +/-7.37 | 13.0 | | pCi/L | | | | | | |
| Cerium-144 | U | 1.71 | +/-19.1 | 33.1 | | pCi/L | | | | | | |
| Cesium-134 | U | 2.77 | +/-2.92 | 5.60 | | pCi/L | | | | | | |
| Cesium-136 | U | 1.14 | +/-13.6 | 23.6 | | pCi/L | | | | | | |
| Cesium-137 | U | -1.44 | +/-2.97 | 4.62 | 10.0 | pCi/L | | | | | | |
| Chromium-51 | U | -5.33 | +/-48.8 | 80.0 | | pCi/L | | | | | | |
| Cobalt-56 | U | -0.701 | +/-3.82 | 6.13 | | pCi/L | | | | | | |
| Cobalt-57 | U | 1.13 | +/-2.65 | 4.70 | | pCi/L | | | | | | |
| Cobalt-58 | U | 1.45 | +/-3.00 | 5.41 | | pCi/L | | | | | | |
| Cobalt-60 | U | -0.615 | +/-2.99 | 4.78 | | pCi/L | | | | | | |
| Europium-152 | U | -2.98 | +/-9.10 | 14.5 | | pCi/L | | | | | | |
| Europium-154 | U | -3.63 | +/-6.79 | 9.67 | | pCi/L | | | | | | |
| Europium-155 | U | 4.80 | +/-11.3 | 18.9 | | pCi/L | | | | | | |
| Iridium-192 | U | 0.489 | +/-3.73 | 6.26 | | pCi/L | | | | | | |
| Iron-59 | U | 2.67 | +/-8.65 | 15.4 | | pCi/L | | | | | | |
| Lead-210 | U | 119 | +/-1090 | 1820 | | pCi/L | | | | | | |
| Lead-212 | U | 2.59 | +/-11.8 | 12.3 | | pCi/L | | | | | | |
| Lead-214 | U | 2.59 | +/-7.70 | 12.8 | | pCi/L | | | | | | |
| Manganesec-54 | U | 0.182 | +/-2.90 | 4.85 | | pCi/L | | | | | | |
| Mercury-203 | U | 0.538 | +/-4.21 | 7.11 | | pCi/L | | | | | | |
| Neodymium-147 | U | 26.5 | +/-80.7 | 143 | | pCi/L | | | | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 26, 2011

Company : Detroit Edison - Fermi 1
 Address : PO Box 44440

 Contact: Detroit, Michigan 48244
 Project: Mr. Tom Mow
 Fermi 1 - PO# 4700246055

Client Sample ID: EFT-82211-13I
 Sample ID: 285027001

Project: ROIT00116
 Client ID: ROIT001

| Parameter | Qualifier | Result | Uncertainty | DL | RL | Units | DF | Analyst | Date | Time | Batch | Method |
|--|-----------|--------|-------------|------|----|-------|----|---------|------|------|-------|--------|
| Rad Gamma Spec Analysis | | | | | | | | | | | | |
| Gammaspec, Gamma, Liquid (Standard List) "As Received" | | | | | | | | | | | | |
| Neptunium-239 | U | -7.54 | +/-28.0 | 47.6 | | pCi/L | | | | | | |
| Niobium-94 | U | 0.969 | +/-3.18 | 5.52 | | pCi/L | | | | | | |
| Niobium-95 | U | 1.28 | +/-3.23 | 5.50 | | pCi/L | | | | | | |
| Potassium-40 | | 101 | +/-57.0 | 46.7 | | pCi/L | | | | | | |
| Promethium-144 | U | 0.229 | +/-2.95 | 4.99 | | pCi/L | | | | | | |
| Promethium-146 | U | -1.59 | +/-3.43 | 5.56 | | pCi/L | | | | | | |
| Radium-228 | U | -8.7 | +/-13.5 | 20.7 | | pCi/L | | | | | | |
| Ruthenium-106 | U | 5.55 | +/-26.1 | 45.3 | | pCi/L | | | | | | |
| Silver-110m | U | -0.562 | +/-2.78 | 4.53 | | pCi/L | | | | | | |
| Sodium-22 | U | -1.33 | +/-2.40 | 3.39 | | pCi/L | | | | | | |
| Thallium-208 | U | 0.316 | +/-3.62 | 6.10 | | pCi/L | | | | | | |
| Thorium-234 | U | -103 | +/-276 | 441 | | pCi/L | | | | | | |
| Tin-113 | U | -1.45 | +/-4.83 | 7.65 | | pCi/L | | | | | | |
| Uranium-235 | U | -6.0 | +/-21.7 | 35.7 | | pCi/L | | | | | | |
| Uranium-238 | U | -103 | +/-276 | 441 | | pCi/L | | | | | | |
| Yttrium-88 | U | 0.464 | +/-3.32 | 5.85 | | pCi/L | | | | | | |
| Zinc-65 | U | -6.1 | +/-6.94 | 9.89 | | pCi/L | | | | | | |
| Zirconium-95 | U | -1.5 | +/-6.69 | 10.8 | | pCi/L | | | | | | |

Rad Gas Flow Proportional Counting

GFPC, Gross A/B, liquid "As Received"

| | | | | | | | | | | |
|-------|------|---------|------|------|-------|------|----------|------|---------|---|
| Alpha | 6.97 | +/-4.12 | 4.79 | 5.00 | pCi/L | DXF3 | 09/24/11 | 1424 | 1139478 | 3 |
| Beta | 75.5 | +/-6.98 | 4.31 | 5.00 | pCi/L | | | | | |

Rad Liquid Scintillation Analysis

LSC, Tritium Dist, Liquid "As Received"

| | | | | | | | | | | | |
|---------|---|-----|--------|-----|-----|-------|------|----------|------|---------|---|
| Tritium | U | 113 | +/-182 | 291 | 700 | pCi/L | EXK2 | 09/13/11 | 1714 | 1140357 | 4 |
|---------|---|-----|--------|-----|-----|-------|------|----------|------|---------|---|

The following Analytical Methods were performed:

| Method | Description | Analyst Comments |
|--------|------------------------------------|------------------|
| 1 | DOE EML HASL-300, U-02-RC Modified | |
| 2 | EPA 901.1 | |
| 3 | EPA 900.0/SW846 9310 | |
| 4 | EPA 906.0 Modified | |

| Surrogate/Tracer Recovery | Test | Result | Nominal | Recovery% | Acceptable Limits |
|---------------------------|-----------------------------------|--------|---------|-----------|-------------------|
| Uranium-232 Tracer | Alphaspec U, Liquid "As Received" | | | 74.1 | (15%-125%) |

Quality Control Data

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: September 26, 2011

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Detroit Edison - Fermi 1

PO Box 44440

Detroit, Michigan

Contact: Mr. Tom Mow

Workorder: 285027

| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------|-------------|----------|------|----------|---------|------|------|------------|-------|----------|-------|
| Rad Alpha Spec | | | | | | | | | | | |
| Batch | 1137920 | | | | | | | | | | |
| QC1202478523 | 285027001 | DUP | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | U | 0.00 | percent | 0.00 | | N/A | JXH2 | 09/06/11 | 13:15 |
| Uranium-233/234 | | 3.34 | | 3.66 | pCi/L | 9.18 | | (0% - 20%) | | | |
| | Uncertainty | +/-1.14 | | +/-1.08 | | | | | | | |
| Uranium-235/236 | U | 0.0947 | U | 0.276 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-0.251 | | +/-0.343 | | | | | | | |
| Uranium-238 | | 2.75 | | 2.59 | pCi/L | 6.05 | | (0% - 20%) | | | |
| | Uncertainty | +/-1.05 | | +/-0.897 | | | | | | | |
| QC1202478525 | LCS | | | | | | | | | | |
| Pct Uranium-235 | | | | 0.436 | percent | | | | | 09/06/11 | 13:15 |
| Uranium-233/234 | | | | 27.3 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.07 | | | | | | | |
| Uranium-235/236 | | | | 0.778 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.576 | | | | | | | |
| Uranium-238 | 25.9 | | | 27.6 | pCi/L | | 107 | (75%-125%) | | | |
| | Uncertainty | | | +/-3.09 | | | | | | | |
| QC1202478522 | MB | | | | | | | | | | |
| Pct Uranium-235 | | | U | 0.00 | percent | | | | | 09/06/11 | 13:15 |
| Uranium-233/234 | | | U | -0.149 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.185 | | | | | | | |
| Uranium-235/236 | | | U | -0.0252 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.212 | | | | | | | |
| Uranium-238 | | | U | 0.150 | pCi/L | | | | | | |
| | Uncertainty | | | +/-0.239 | | | | | | | |
| QC1202478524 | 285027001 | MS | | | | | | | | | |
| Pct Uranium-235 | U | 0.00 | | 1.08 | percent | | | | | 09/06/11 | 13:15 |
| Uranium-233/234 | | 3.34 | | 25.6 | pCi/L | | | | | | |
| | Uncertainty | +/-1.14 | | +/-2.86 | | | | | | | |
| Uranium-235/236 | U | 0.0947 | | 1.74 | pCi/L | | | | | | |
| | Uncertainty | +/-0.251 | | +/-0.829 | | | | | | | |
| Uranium-238 | 25.9 | 2.75 | | 24.7 | pCi/L | | 84.9 | (75%-125%) | | | |
| | Uncertainty | +/-1.05 | | +/-2.81 | | | | | | | |
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| QC1202485451 | 285027001 | DUP | | | | | | | | | |
| Actinium-228 | U | -8.7 | U | 3.31 | pCi/L | 0.00 | | N/A | KXG3 | 09/16/11 | 14:57 |
| | Uncertainty | +/-13.5 | | +/-10.1 | | | | | | | |
| Americium-241 | U | -17.1 | U | -17.1 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-30.0 | | +/-22.7 | | | | | | | |
| Antimony-124 | U | -3.15 | U | 5.84 | pCi/L | 0.00 | | N/A | | | |
| | Uncertainty | +/-10.2 | | +/-7.80 | | | | | | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 285027

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|---------|------|---------|-------|------|------|-------------|----------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch 1140793 | | | | | | | | | | | |
| Antimony-125 | U | 8.06 | U | -2.61 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-7.72 | | +/-7.58 | | | | | | | |
| Barium-133 | U | -1.84 | U | -5.64 | pCi/L | 0.00 | | | N/A KXG3 | 09/16/11 | 14:57 |
| | Uncertainty | +/-4.05 | | +/-4.08 | | | | | | | |
| Barium-140 | U | -8.0 | U | 4.52 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-13.2 | | +/-11.8 | | | | | | | |
| Beryllium-7 | U | 14.7 | U | 4.83 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-32.3 | | +/-33.2 | | | | | | | |
| Bismuth-212 | U | 28.0 | U | -35.1 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-40.1 | | +/-42.4 | | | | | | | |
| Bismuth-214 | U | -0.591 | | 17.1 | pCi/L | 36.2 | | (0% - 100%) | | | |
| | Uncertainty | +/-7.03 | | +/-9.69 | | | | | | | |
| Cerium-139 | U | -2.2 | U | 0.509 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.04 | | +/-2.94 | | | | | | | |
| Cerium-141 | U | 2.66 | U | 7.24 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-7.37 | | +/-8.10 | | | | | | | |
| Cerium-144 | U | 1.71 | U | -3.7 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-19.1 | | +/-20.5 | | | | | | | |
| Cesium-134 | U | 2.77 | U | 2.93 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.92 | | +/-2.89 | | | | | | | |
| Cesium-136 | U | 1.14 | U | -0.648 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-13.6 | | +/-14.1 | | | | | | | |
| Cesium-137 | U | -1.44 | U | -2.33 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.97 | | +/-3.60 | | | | | | | |
| Chromium-51 | U | -5.33 | U | 5.23 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-48.8 | | +/-42.7 | | | | | | | |
| Cobalt-56 | U | -0.701 | U | -0.774 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.82 | | +/-3.46 | | | | | | | |
| Cobalt-57 | U | 1.13 | U | 2.13 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.65 | | +/-2.60 | | | | | | | |
| Cobalt-58 | U | 1.45 | U | 0.829 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.00 | | +/-3.14 | | | | | | | |
| Cobalt-60 | U | -0.615 | U | -1.19 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.99 | | +/-3.12 | | | | | | | |
| Europium-152 | U | -2.98 | U | -9.17 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-9.10 | | +/-8.30 | | | | | | | |
| Europium-154 | U | -3.63 | U | 0.511 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-6.79 | | +/-9.21 | | | | | | | |
| Europium-155 | U | 4.80 | U | 6.08 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-11.3 | | +/-11.0 | | | | | | | |
| Iridium-192 | U | 0.489 | U | -0.0668 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.73 | | +/-3.45 | | | | | | | |
| Iron-59 | U | 2.67 | U | 6.94 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-8.65 | | +/-5.69 | | | | | | | |
| Lead-210 | U | 119 | U | 811 | pCi/L | 0.00 | | | N/A | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 285027

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|---------|------|---------|-------|------|------|-------------|-------|------|----------------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch 1140793 | | | | | | | | | | | |
| | Uncertainty | | | | | | | | | | |
| Lead-212 | U | 2.59 | U | 1.38 | pCi/L | 0.00 | | | N/A | KXG3 | 09/16/11 14:57 |
| | Uncertainty | +/-11.8 | | +/-6.08 | | | | | | | |
| Lead-214 | U | 2.59 | U | 5.51 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-7.70 | | +/-7.80 | | | | | | | |
| Manganese-54 | U | 0.182 | U | 1.34 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.90 | | +/-3.04 | | | | | | | |
| Mercury-203 | U | 0.538 | U | -6.14 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-4.21 | | +/-4.34 | | | | | | | |
| Neodymium-147 | U | 26.5 | U | 34.6 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-80.7 | | +/-104 | | | | | | | |
| Neptunium-239 | U | -7.54 | U | 11.5 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-28.0 | | +/-25.6 | | | | | | | |
| Niobium-94 | U | 0.969 | U | 0.458 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.18 | | +/-2.75 | | | | | | | |
| Niobium-95 | U | 1.28 | U | 0.276 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.23 | | +/-3.71 | | | | | | | |
| Potassium-40 | | 101 | | 153 | pCi/L | 41.3 | | (0% - 100%) | | | |
| | Uncertainty | +/-57.0 | | +/-60.5 | | | | | | | |
| Promethium-144 | U | 0.229 | U | 0.102 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.95 | | +/-2.88 | | | | | | | |
| Promethium-146 | U | -1.59 | U | 0.731 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.43 | | +/-3.26 | | | | | | | |
| Radium-228 | U | -8.7 | U | 3.31 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-13.5 | | +/-10.1 | | | | | | | |
| Ruthenium-106 | U | 5.55 | U | 10.4 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-26.1 | | +/-24.6 | | | | | | | |
| Silver-110m | U | -0.562 | U | -3.39 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.78 | | +/-2.85 | | | | | | | |
| Sodium-22 | U | -1.33 | U | 0.131 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-2.40 | | +/-3.26 | | | | | | | |
| Thallium-208 | U | 0.316 | U | -3.2 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.62 | | +/-3.71 | | | | | | | |
| Thorium-234 | U | -103 | U | -18.5 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-276 | | +/-173 | | | | | | | |
| Tin-113 | U | -1.45 | U | 2.90 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-4.83 | | +/-3.96 | | | | | | | |
| Uranium-235 | U | -6.0 | U | -5.44 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-21.7 | | +/-22.0 | | | | | | | |
| Uranium-238 | U | -103 | U | -18.5 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-276 | | +/-173 | | | | | | | |
| Yttrium-88 | U | 0.464 | U | 0.782 | pCi/L | 0.00 | | | N/A | | |
| | Uncertainty | +/-3.32 | | +/-3.93 | | | | | | | |
| Zinc-65 | U | -6.1 | U | 2.48 | pCi/L | 0.00 | | | N/A | | |

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 285027

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|---------|-------------|------|---------|-------|------|------|------------|----------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| | | Uncertainty | | | | | | | | | |
| Zirconium-95 | U | +/-6.94 | | +/-6.93 | | | | | | | |
| | | -1.5 | U | 1.56 | pCi/L | 0.00 | | | N/A KXG3 | 09/16/11 | 14:57 |
| | | Uncertainty | | +/-6.24 | | | | | | | |
| QC1202485453 | LCS | | | | | | | | | | |
| Actinium-228 | | | U | 76.5 | pCi/L | | | | | 09/16/11 | 14:12 |
| | | Uncertainty | | +/-116 | | | | | | | |
| Americium-241 | 2790 | | | 3060 | pCi/L | | 110 | (75%-125%) | | | |
| | | Uncertainty | | +/-297 | | | | | | | |
| Antimony-124 | | | U | -8.64 | pCi/L | | | | | | |
| | | Uncertainty | | +/-26.8 | | | | | | | |
| Antimony-125 | | | U | 9.70 | pCi/L | | | | | | |
| | | Uncertainty | | +/-67.3 | | | | | | | |
| Barium-133 | | | U | 1.66 | pCi/L | | | | | | |
| | | Uncertainty | | +/-29.9 | | | | | | | |
| Barium-140 | | | U | 1.46 | pCi/L | | | | | | |
| | | Uncertainty | | +/-18.7 | | | | | | | |
| Beryllium-7 | | | U | 22.4 | pCi/L | | | | | | |
| | | Uncertainty | | +/-211 | | | | | | | |
| Bismuth-212 | | | U | 24.9 | pCi/L | | | | | | |
| | | Uncertainty | | +/-330 | | | | | | | |
| Bismuth-214 | | | U | 52.7 | pCi/L | | | | | | |
| | | Uncertainty | | +/-46.4 | | | | | | | |
| Cerium-139 | | | | 240 | pCi/L | | | | | | |
| | | Uncertainty | | +/-36.6 | | | | | | | |
| Cerium-141 | | | U | -27.3 | pCi/L | | | | | | |
| | | Uncertainty | | +/-31.7 | | | | | | | |
| Cerium-144 | | | U | 10.8 | pCi/L | | | | | | |
| | | Uncertainty | | +/-146 | | | | | | | |
| Cesium-134 | | | U | 2.27 | pCi/L | | | | | | |
| | | Uncertainty | | +/-28.7 | | | | | | | |
| Cesium-136 | | | U | -24.2 | pCi/L | | | | | | |
| | | Uncertainty | | +/-42.1 | | | | | | | |
| Cesium-137 | 6260 | | | 6710 | pCi/L | | 107 | (75%-125%) | | | |
| | | Uncertainty | | +/-577 | | | | | | | |
| Chromium-51 | | | U | -66.7 | pCi/L | | | | | | |
| | | Uncertainty | | +/-192 | | | | | | | |
| Cobalt-56 | | | U | 4.85 | pCi/L | | | | | | |
| | | Uncertainty | | +/-25.5 | | | | | | | |
| Cobalt-57 | | | | 635 | pCi/L | | | | | | |
| | | Uncertainty | | +/-61.7 | | | | | | | |
| Cobalt-58 | | | U | -9.07 | pCi/L | | | | | | |
| | | Uncertainty | | +/-26.5 | | | | | | | |
| Cobalt-60 | 6590 | | | 6890 | pCi/L | | 105 | (75%-125%) | | | |
| | | Uncertainty | | +/-616 | | | | | | | |

GEL LABORATORIES LLC

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QC Summary

Workorder: 285027

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| Europium-152 | | | U | -65.8 | pCi/L | | | | | | |
| | Uncertainty | | | +/-69.8 | | | | | | | |
| Europium-154 | | | U | -0.742 | pCi/L | | | | KXG3 | 09/16/11 | 14:12 |
| | Uncertainty | | | +/-46.2 | | | | | | | |
| Europium-155 | | | U | 3.63 | pCi/L | | | | | | |
| | Uncertainty | | | +/-73.0 | | | | | | | |
| Iridium-192 | | | U | 17.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-21.9 | | | | | | | |
| Iron-59 | | | U | -3.52 | pCi/L | | | | | | |
| | Uncertainty | | | +/-57.7 | | | | | | | |
| Lead-210 | | | | 29200 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4100 | | | | | | | |
| Lead-212 | | | U | -10.2 | pCi/L | | | | | | |
| | Uncertainty | | | +/-40.8 | | | | | | | |
| Lead-214 | | | U | -38 | pCi/L | | | | | | |
| | Uncertainty | | | +/-52.2 | | | | | | | |
| Manganese-54 | | | U | 27.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-25.0 | | | | | | | |
| Mercury-203 | | | U | 12.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-22.4 | | | | | | | |
| Neodymium-147 | | | U | -49 | pCi/L | | | | | | |
| | Uncertainty | | | +/-178 | | | | | | | |
| Neptunium-239 | | | U | 112 | pCi/L | | | | | | |
| | Uncertainty | | | +/-223 | | | | | | | |
| Niobium-94 | | | U | 4.60 | pCi/L | | | | | | |
| | Uncertainty | | | +/-21.0 | | | | | | | |
| Niobium-95 | | | U | -4.67 | pCi/L | | | | | | |
| | Uncertainty | | | +/-23.7 | | | | | | | |
| Potassium-40 | | | U | -51.2 | pCi/L | | | | | | |
| | Uncertainty | | | +/-134 | | | | | | | |
| Promethium-144 | | | U | -20.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-21.8 | | | | | | | |
| Promethium-146 | | | U | -4.99 | pCi/L | | | | | | |
| | Uncertainty | | | +/-33.3 | | | | | | | |
| Radium-228 | | | U | 76.5 | pCi/L | | | | | | |
| | Uncertainty | | | +/-116 | | | | | | | |
| Ruthenium-106 | | | U | 120 | pCi/L | | | | | | |
| | Uncertainty | | | +/-209 | | | | | | | |
| Silver-110m | | | | 329 | pCi/L | | | | | | |
| | Uncertainty | | | +/-44.7 | | | | | | | |
| Sodium-22 | | | U | -0.0675 | pCi/L | | | | | | |
| | Uncertainty | | | +/-16.2 | | | | | | | |
| Thallium-208 | | | U | 25.2 | pCi/L | | | | | | |
| | Uncertainty | | | +/-24.4 | | | | | | | |
| Thorium-234 | | | U | -1190 | pCi/L | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|-----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| | Uncertainty | | | +/-871 | | | | | | | |
| Tin-113 | | | U | -17.4 | pCi/L | | | | KXG3 | 09/16/11 | 14:12 |
| | Uncertainty | | | +/-29.3 | | | | | | | |
| Uranium-235 | | | U | -147 | pCi/L | | | | | | |
| | Uncertainty | | | +/-136 | | | | | | | |
| Uranium-238 | | | U | -1190 | pCi/L | | | | | | |
| | Uncertainty | | | +/-871 | | | | | | | |
| Yttrium-88 | | | | 1090 | pCi/L | | | | | | |
| | Uncertainty | | | +/-103 | | | | | | | |
| Zinc-65 | | | U | 27.0 | pCi/L | | | | | | |
| | Uncertainty | | | +/-59.6 | | | | | | | |
| Zirconium-95 | | | U | 1.84 | pCi/L | | | | | | |
| | Uncertainty | | | +/-43.4 | | | | | | | |
| QC1202485450 MB | | | | | | | | | | | |
| Actinium-228 | | | U | -3.3 | pCi/L | | | | | 09/16/11 | 14:13 |
| | Uncertainty | | | +/-10.5 | | | | | | | |
| Americium-241 | | | U | -11 | pCi/L | | | | | | |
| | Uncertainty | | | +/-12.8 | | | | | | | |
| Antimony-124 | | | U | -3.22 | pCi/L | | | | | | |
| | Uncertainty | | | +/-5.84 | | | | | | | |
| Antimony-125 | | | U | -1.1 | pCi/L | | | | | | |
| | Uncertainty | | | +/-5.62 | | | | | | | |
| Barium-133 | | | U | -2.38 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.46 | | | | | | | |
| Barium-140 | | | U | -3.24 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.52 | | | | | | | |
| Beryllium-7 | | | U | -7.37 | pCi/L | | | | | | |
| | Uncertainty | | | +/-20.4 | | | | | | | |
| Bismuth-212 | | | U | 22.6 | pCi/L | | | | | | |
| | Uncertainty | | | +/-35.6 | | | | | | | |
| Bismuth-214 | | | U | -3.03 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.10 | | | | | | | |
| Cerium-139 | | | U | 0.357 | pCi/L | | | | | | |
| | Uncertainty | | | +/-1.87 | | | | | | | |
| Cerium-141 | | | U | 1.34 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.32 | | | | | | | |
| Cerium-144 | | | U | -2.81 | pCi/L | | | | | | |
| | Uncertainty | | | +/-13.0 | | | | | | | |
| Cesium-134 | | | U | 1.68 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.53 | | | | | | | |
| Cesium-136 | | | U | -0.76 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.30 | | | | | | | |
| Cesium-137 | | | U | -0.0296 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.42 | | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|--------|------|---------|-------|------|------|-------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| Chromium-51 | | | U | -2.45 | pCi/L | | | | | | |
| | Uncertainty | | | +/-22.4 | | | | | | | |
| Cobalt-56 | | | U | -1.77 | pCi/L | | | | KXG3 | 09/16/11 | 14:13 |
| | Uncertainty | | | +/-2.59 | | | | | | | |
| Cobalt-57 | | | U | -0.851 | pCi/L | | | | | | |
| | Uncertainty | | | +/-1.79 | | | | | | | |
| Cobalt-58 | | | U | -1.0 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.54 | | | | | | | |
| Cobalt-60 | | | U | 1.43 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.08 | | | | | | | |
| Europium-152 | | | U | -4.56 | pCi/L | | | | | | |
| | Uncertainty | | | +/-7.75 | | | | | | | |
| Europium-154 | | | U | 4.59 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.80 | | | | | | | |
| Europium-155 | | | U | 5.96 | pCi/L | | | | | | |
| | Uncertainty | | | +/-7.10 | | | | | | | |
| Iridium-192 | | | U | 0.776 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.41 | | | | | | | |
| Iron-59 | | | U | -2.64 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.76 | | | | | | | |
| Lead-210 | | | U | 106 | pCi/L | | | | | | |
| | Uncertainty | | | +/-318 | | | | | | | |
| Lead-212 | | | U | -1.52 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.83 | | | | | | | |
| Lead-214 | | | U | 6.62 | pCi/L | | | | | | |
| | Uncertainty | | | +/-6.59 | | | | | | | |
| Manganese-54 | | | U | 1.79 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.39 | | | | | | | |
| Mercury-203 | | | U | 0.00849 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.29 | | | | | | | |
| Neodymium-147 | | | U | 11.7 | pCi/L | | | | | | |
| | Uncertainty | | | +/-20.1 | | | | | | | |
| Neptunium-239 | | | U | 9.60 | pCi/L | | | | | | |
| | Uncertainty | | | +/-19.6 | | | | | | | |
| Niobium-94 | | | U | 1.53 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.60 | | | | | | | |
| Niobium-95 | | | U | 0.00839 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.11 | | | | | | | |
| Potassium-40 | | | U | 7.90 | pCi/L | | | | | | |
| | Uncertainty | | | +/-32.6 | | | | | | | |
| Promethium-144 | | | U | 0.182 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.47 | | | | | | | |
| Promethium-146 | | | U | -0.704 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.13 | | | | | | | |
| Radium-228 | | | U | -3.3 | pCi/L | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------------|-------------|---------|------|----------|-------|-------|------|-------------|-------|----------|-------|
| Rad Gamma Spec | | | | | | | | | | | |
| Batch | 1140793 | | | | | | | | | | |
| | Uncertainty | | | +/-10.5 | | | | | | | |
| Ruthenium-106 | | | U | -10.4 | pCi/L | | | | KXG3 | 09/16/11 | 14:13 |
| | Uncertainty | | | +/-22.4 | | | | | | | |
| Silver-110m | | | U | -0.52 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.31 | | | | | | | |
| Sodium-22 | | | U | 1.50 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.36 | | | | | | | |
| Thallium-208 | | | U | 0.0626 | pCi/L | | | | | | |
| | Uncertainty | | | +/-2.82 | | | | | | | |
| Thorium-234 | | | U | -29.9 | pCi/L | | | | | | |
| | Uncertainty | | | +/-122 | | | | | | | |
| Tin-113 | | | U | 0.685 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.12 | | | | | | | |
| Uranium-235 | | | U | -9.15 | pCi/L | | | | | | |
| | Uncertainty | | | +/-15.4 | | | | | | | |
| Uranium-238 | | | U | -29.9 | pCi/L | | | | | | |
| | Uncertainty | | | +/-122 | | | | | | | |
| Yttrium-88 | | | U | -2.86 | pCi/L | | | | | | |
| | Uncertainty | | | +/-3.17 | | | | | | | |
| Zinc-65 | | | U | 2.96 | pCi/L | | | | | | |
| | Uncertainty | | | +/-5.76 | | | | | | | |
| Zirconium-95 | | | U | -0.564 | pCi/L | | | | | | |
| | Uncertainty | | | +/-4.21 | | | | | | | |
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1139478 | | | | | | | | | | |
| QC1202482197 | 285027001 | DUP | | | | | | | | | |
| Alpha | | 6.97 | U | 2.76 | pCi/L | 86.6 | | (0% - 100%) | DXF3 | 09/24/11 | 14:36 |
| | Uncertainty | +/-4.12 | | +/-2.83 | | | | | | | |
| Beta | | 75.5 | | 56.6 | pCi/L | 28.6* | | (0% - 20%) | | | |
| | Uncertainty | +/-6.98 | | +/-5.93 | | | | | | | |
| QC1202482200 | LCS | | | | | | | | | | |
| Alpha | | 80.2 | | 72.5 | pCi/L | | 90.4 | (75%-125%) | | 09/24/11 | 14:58 |
| | Uncertainty | | | +/-7.89 | | | | | | | |
| Beta | | 331 | | 330 | pCi/L | | 99.6 | (75%-125%) | | | |
| | Uncertainty | | | +/-11.8 | | | | | | | |
| QC1202482196 | MB | | | | | | | | | | |
| Alpha | | | U | -0.457 | pCi/L | | | | | 09/24/11 | 14:36 |
| | Uncertainty | | | +/-0.549 | | | | | | | |
| Beta | | | U | 0.113 | pCi/L | | | | | | |
| | Uncertainty | | | +/-1.66 | | | | | | | |
| QC1202482198 | 285027001 | MS | | | | | | | | | |
| Alpha | | 241 | 6.97 | 249 | pCi/L | | 101 | (75%-125%) | | 09/24/11 | 14:36 |
| | Uncertainty | +/-4.12 | | +/-30.5 | | | | | | | |
| Beta | | 994 | 75.5 | 1170 | pCi/L | | 110 | (75%-125%) | | | |
| | Uncertainty | +/-6.98 | | +/-40.2 | | | | | | | |

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|---------------------------------|-------------|---------|------|---------|-------|-------|-------|------------|----------|----------|-------|
| Rad Gas Flow | | | | | | | | | | | |
| Batch | 1139478 | | | | | | | | | | |
| QC1202482199 | 285027001 | MSD | | | | | | | | | |
| Alpha | 241 | 6.97 | | 185 | pCi/L | 29.8* | 73.9* | (0%-20%) | DXF3 | 09/24/11 | 14:36 |
| | Uncertainty | +/-4.12 | | +/-25.8 | | | | | | | |
| Beta | 994 | 75.5 | | 1220 | pCi/L | 4.18 | 115 | (0%-20%) | | | |
| | Uncertainty | +/-6.98 | | +/-40.7 | | | | | | | |
| Rad Liquid Scintillation | | | | | | | | | | | |
| Batch | 1140357 | | | | | | | | | | |
| QC1202484336 | 284658001 | DUP | | | | | | | | | |
| Tritium | U | 94.9 | U | 103 | pCi/L | 0.00 | | | N/A EXK2 | 09/13/11 | 18:07 |
| | Uncertainty | +/-188 | | +/-190 | | | | | | | |
| QC1202484338 | LCS | | | | | | | | | | |
| Tritium | 2090 | | | 2190 | pCi/L | | 105 | (75%-125%) | | 09/13/11 | 18:59 |
| | Uncertainty | | | +/-308 | | | | | | | |
| QC1202484335 | MB | | | | | | | | | | |
| Tritium | | | U | 108 | pCi/L | | | | | 09/13/11 | 17:40 |
| | Uncertainty | | | +/-187 | | | | | | | |
| QC1202484337 | 284658001 | MS | | | | | | | | | |
| Tritium | 5340 | U | 94.9 | 5470 | pCi/L | | 102 | (75%-125%) | | 09/13/11 | 18:33 |
| | Uncertainty | +/-188 | | +/-668 | | | | | | | |

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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| Parmname | NOM | Sample | Qual | QC | Units | RPD% | REC% | Range | Anlst | Date | Time |
|----------|--|--------|------|----|-------|------|------|-------|-------|------|------|
| Q | One or more quality control criteria have not been met. Refer to the applicable narrative or DER. | | | | | | | | | | |
| R | Sample results are rejected | | | | | | | | | | |
| U | Analyte was analyzed for, but not detected above the MDL, MDA, or LOD. | | | | | | | | | | |
| UI | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UJ | Gamma Spectroscopy--Uncertain identification | | | | | | | | | | |
| UL | Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias. | | | | | | | | | | |
| X | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier | | | | | | | | | | |
| Y | QC Samples were not spiked with this compound | | | | | | | | | | |
| ^ | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry. | | | | | | | | | | |
| h | Preparation or preservation holding time was exceeded | | | | | | | | | | |

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

**Fermi 1 NRC Docket No. 50-16
NRC License No. DPR-9**

**Attachment 5 to
NRC-12-0012**

“Updated Fermi 1 Groundwater Monitoring Data”

Site Conceptual Model Recommendations and Actions

Site Conceptual Model Recommendations and Actions

The recommendations were contained in the text of Section 8 of the Conestoga-Rovers & Associates (CRA) report. For ease of addressing each recommendation, this letter lists each of the recommendations and actions taken.

Recommendation 1:

CRA recommends the installation of additional monitoring wells at the Station. The purpose of the monitoring wells is to provide Intermediate and Deep monitoring points to the southeast and southwest and to provide additional control points for groundwater contouring.

Action:

Five new wells were installed in spring 2011. Three of the wells were of intermediate depth and two wells were deep wells. Two wells were installed to the southeast and two wells were installed to the southwest of the facility. The other well, EFT-13I as discussed in Recommendation 9, was installed near the Health Physics Building pad.

Recommendation 2:

After installation, CRA recommends additional rounds of groundwater samples and synoptic water level measurements be collected from all station monitoring wells.

Action:

Additional rounds of sampling from Fermi 1 monitoring wells were conducted in June and October 2011. Samples were taken from all Fermi 1 monitoring wells, except where insufficient water was obtainable. The sample results are included in the updated table. At the beginning of each monitoring round, groundwater level measurements were taken at each well, however, the new wells were monitored in May 2011 and the existing wells were monitored in June 2011. The groundwater elevation was measured for all monitoring wells on October 3-4, 2011 prior to the October monitoring round. On January 4, 2012, groundwater elevation was measured at the monitoring wells to obtain additional data. The groundwater elevation measurements and contour maps are provided in Attachment 6.

Recommendation 3:

Groundwater samples should be analyzed for the groundwater radioactive isotopes presented in Section 4 of the CRA report.

Action:

This report contains data for samples taken through November 2011. At least four samples were taken from each of the new wells. Offsite analysis was performed for a sample from each well, with the other analyses being performed at the onsite laboratory. The offsite analysis included all of the following isotopes identified in Section 4 of the CRA report as being the radionuclides of concern for groundwater monitoring plus gross alpha:

- Tritium (3H)
- 22Na
- 60Co
- 90Sr
- 99Tc
- 137Cs
- 226Ra
- 228Ra
- Uranium Isotopes

The onsite laboratory can detect tritium, Na-22, Co-60, Cs-137, Ra-226 and U-235 of the isotopes listed above. Offsite analysis had previously been performed on at least one round of samples from the older monitoring wells and since the activity detected in onsite analysis continued to be less than Minimum Detectable Activity, samples from the older wells were not sent offsite for analysis in 2011.

Recommendation 4:

Statistical analysis should be updated.

Action:

Attachment 2 contains the updated Table of Comparison of Analytical Results to Background, which is the table that provides the statistical analysis of the background well data for uranium and radium, and well sample data for uranium and radium isotopes, gross alpha and gross beta activity. Since the additional data is for monitoring wells, the calculations were unaffected. One sample of the additional data (Well EFT-12D) is marked as exceeding the upper tolerance limit (UTL) for the 90th percentile, 95% confidence level for total radium activity; however the sample analysis result of 5.71 pCi/L is very close to the calculated background UTL of 5.65 pCi/L. The sample shown from Well EFT-9S as slightly exceeding the UTL for Uranium was previously addressed in Reference 2.

Recommendation 5:

Figure 13 of the CRA report provided recommended locations for the new wells. Locations shown are approximate since underground structures and other interferences need to be considered when siting the wells.

Action:

The five new wells were installed near the locations shown on figure 13 of Reference 2. Locations had to be moved slightly to avoid underground interferences.

Recommendation 6:

Fermi 1 should consider the placement of two separate clusters (EFT-11 I/D and EFT-12 I/D) of wells in the southern portion of the Station to further define both bedrock flow in the Deep zone and evaluate the potential for groundwater flow in the Intermediate zone. The wells should be positioned in the southwest and southeast corners of the Station.

Action:

Wells EFT-11I/D were installed to the southwest of the facility and Wells EFT-12I/D were installed in the southeastern portion of the facility.

Groundwater flow direction in the bedrock is similar to previous results reported (References 2 and 4), though the January 4, 2012 bedrock potentiometric surface map (contour map) indicates a more southeasterly flow direction. This may be due to natural variability or due to an anomolous reading of groundwater elevation at EFT-11D, possibly due to malfunction of the water level guage due to a weak battery. Some of the earlier potentiometric surface maps in Reference 4 show flow to the south-southeast. The majority of contour maps show that flow in the bedrock is to the south-southeast to the south-southwest quadrant. See attachment 6 for bedrock groundwater elevation contour maps. Maps are also included for the intermediate well elevations, however, there is not a continuous saturated permeable strata in the glacial clay between the intermediate wells. Wells EFT-11I and EFT-13I are monitoring the glacial clay. Wells EFT-11I and EFT-12I were placed deeper in the intermediate zone, such that they are monitoring the more permeable zone of weathered rock at the base of the glacial till, as well as the clay.

Recommendation 7:

The screen interval for wells EFT-11I and EFT-12I should include the one-foot zone at the base of the glacial till (on top of bedrock), which is presumably more permeable than the overlying Glacial Lake Clays and Clay Fill. A final determination of the Intermediate screened interval will be made based on field observations (e.g., if only the bottom one-foot zone yields water, then the well screen will be restricted to this interval).

Action:

As shown in Reference 2, Attachment 4, the bottom of the screened interval for wells EFT-11I and EFT-12I includes the approximately two foot zone of weathered rock at the base of the glacial till.

Recommendation 8:

The completion interval for wells EFT-11D and EFT-12D should be deep enough to extend below the invert depths of the Station structures.

Action:

The bottom depth of wells EFT-11D and EFT-12D is at approximately 529 feet and 528 feet elevation, respectively, as shown in Reference 2, Attachment 4. The invert depth of the Reactor Building is at 539 feet (Reference 2, Attachment 1).

Recommendation 9:

Fermi 1 will also install an additional monitoring well (EFT-13I) in the intermediate zone near the Health Physics Building and associate sump. The well screen will be placed below the invert depth of the sump and extend to the top of bedrock.

Action:

The bottom of the Health Physics Building sump is at approximately 575 feet elevation. This well (EFT-13I) is one of the five new wells described above. The screen for well EFT-13I was placed from approximately 566 feet to 571 feet elevation, which is below the invert of the sump. The screen was not able to be placed at the top of the bedrock, since difficulty was experienced in advancing the hole prior to reaching the top of the bedrock. The goal of monitoring below the invert of the sump and in the Intermediate Zone was achieved.

**Fermi 1 NRC Docket No. 50-16
NRC License No. DPR-9**

**Attachment 6 to
NRC-12-0012**

“Updated Fermi 1 Groundwater Monitoring Data”

Monitoring Well Groundwater Elevations and Maps

Monitoring Well Depth to Groundwater Table

| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|----------------------|-------------------------|-----------------------|-----------|-------|
| EFT-1S | | 584.87 | | | |
| EFT-1I | | 584.86 | | | |
| EFT-1D | | 584.86 | | | |
| EFT-2S | | 583.33 | | | |
| EFT-2D | | 583.12 | | | |
| EFT-4S | | 587.16 | | | |
| EFT-4D | | 587.34 | | | |
| EFT-5S | | 586.64 | | | |
| EFT-5D | | 586.89 | | | |
| EFT-6S | | 585.63 | | | |
| EFT-6D | | 585.71 | | | |
| EFT-7S | | 584.94 | | | |
| EFT-8SOld | | 582.86 | | | |
| EFT-8SNew | | 582.95 | | | |
| EFT-9S | | 583.01 | | | |
| EFT-10S | | 591.56 | | | |
| EFT-11I | 15.4 | 585.38 | 569.98 | 5/17/2011 | 13:00 |
| EFT-11D | 15.7 | 585.45 | 569.75 | 5/17/2011 | 13:10 |
| EFT-12I | 14.99 | 584.94 | 569.95 | 5/17/2011 | 13:25 |
| EFT-12D | 15.2 | 584.99 | 569.79 | 5/17/2011 | 13:20 |
| EFT-13I | 6.5 | 582.13 | 575.63 | 5/17/2011 | 13:45 |

Monitoring Well Depth to Groundwater Table

| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|-----------------------|-------------------------|-----------------------|----------|-------|
| EFT-1S | 5.69 | 584.87 | 579.18 | 6/5/2011 | 13:20 |
| EFT-1I | Mud, couldn't measure | 584.86 | | | |
| EFT-1D | 6.25 | 584.86 | 578.61 | 6/5/2011 | 13:25 |
| EFT-2S | 7.51 | 583.33 | 575.82 | 6/5/2011 | 10:00 |
| EFT-2D | 9.90 | 583.12 | 573.22 | 6/5/2011 | 10:05 |
| EFT-4S | 5.50 | 587.16 | 581.66 | 6/5/2011 | 10:15 |
| EFT-4D | 13.36 | 587.34 | 573.98 | 6/5/2011 | 10:20 |
| EFT-5S | 5.70 | 586.64 | 580.94 | 6/5/2011 | 10:45 |
| EFT-5D | 14.53 | 586.89 | 572.36 | 6/5/2011 | 10:50 |
| EFT-6S | 6.90 | 585.63 | 578.73 | 6/5/2011 | 10:55 |
| EFT-6D | 13.20 | 585.71 | 572.51 | 6/5/2011 | 11:05 |
| EFT-7S | 2.80 | 584.94 | 582.14 | 6/5/2011 | 11:15 |
| EFT-8SOld | 9.00 | 582.86 | 573.86 | 6/5/2011 | 12:00 |
| EFT-8SNew | 5.50 | 582.95 | 577.45 | 6/5/2011 | 12:05 |
| EFT-9S | 4.20 | 583.01 | 578.81 | 6/5/2011 | 13:40 |
| EFT-10S | 11.45 | 591.56 | 580.11 | 6/5/2011 | 14:00 |
| EFT-11I | | 585.38 | | | |
| EFT-11D | | 585.45 | | | |
| EFT-12I | | 584.94 | | | |
| EFT-12D | | 584.99 | | | |
| EFT-13I | | 582.13 | | | |

Monitoring Well Depth to Groundwater Table

| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|----------------------|-------------------------|-----------------------|----------|------|
| EFT-1S | | 584.87 | | | |
| EFT-1I | | 584.86 | | | |
| EFT-1D | | 584.86 | | | |
| EFT-2S | | 583.33 | | | |
| EFT-2D | | 583.12 | | | |
| EFT-4S | | 587.16 | | | |
| EFT-4D | | 587.34 | | | |
| EFT-5S | | 586.64 | | | |
| EFT-5D | | 586.89 | | | |
| EFT-6S | | 585.63 | | | |
| EFT-6D | | 585.71 | | | |
| EFT-7S | | 584.94 | | | |
| EFT-8SOld | | 582.86 | | | |
| EFT-8SNew | | 582.95 | | | |
| EFT-9S | | 583.01 | | | |
| EFT-10S | | 591.56 | | | |
| EFT-11I | 16.6 | 585.38 | 568.78 | 8/4/2011 | 9:20 |
| EFT-11D | 16.9 | 585.45 | 568.55 | 8/4/2011 | 9:10 |
| EFT-12I | 15.7 | 584.94 | 569.24 | 8/4/2011 | 9:05 |
| EFT-12D | 16.9 | 584.99 | 568.09 | 8/4/2011 | 9:00 |
| EFT-13I | 0.1 | 582.13 | 582.03 | 8/4/2011 | 9:30 |

Monitoring Well Depth to Groundwater Table

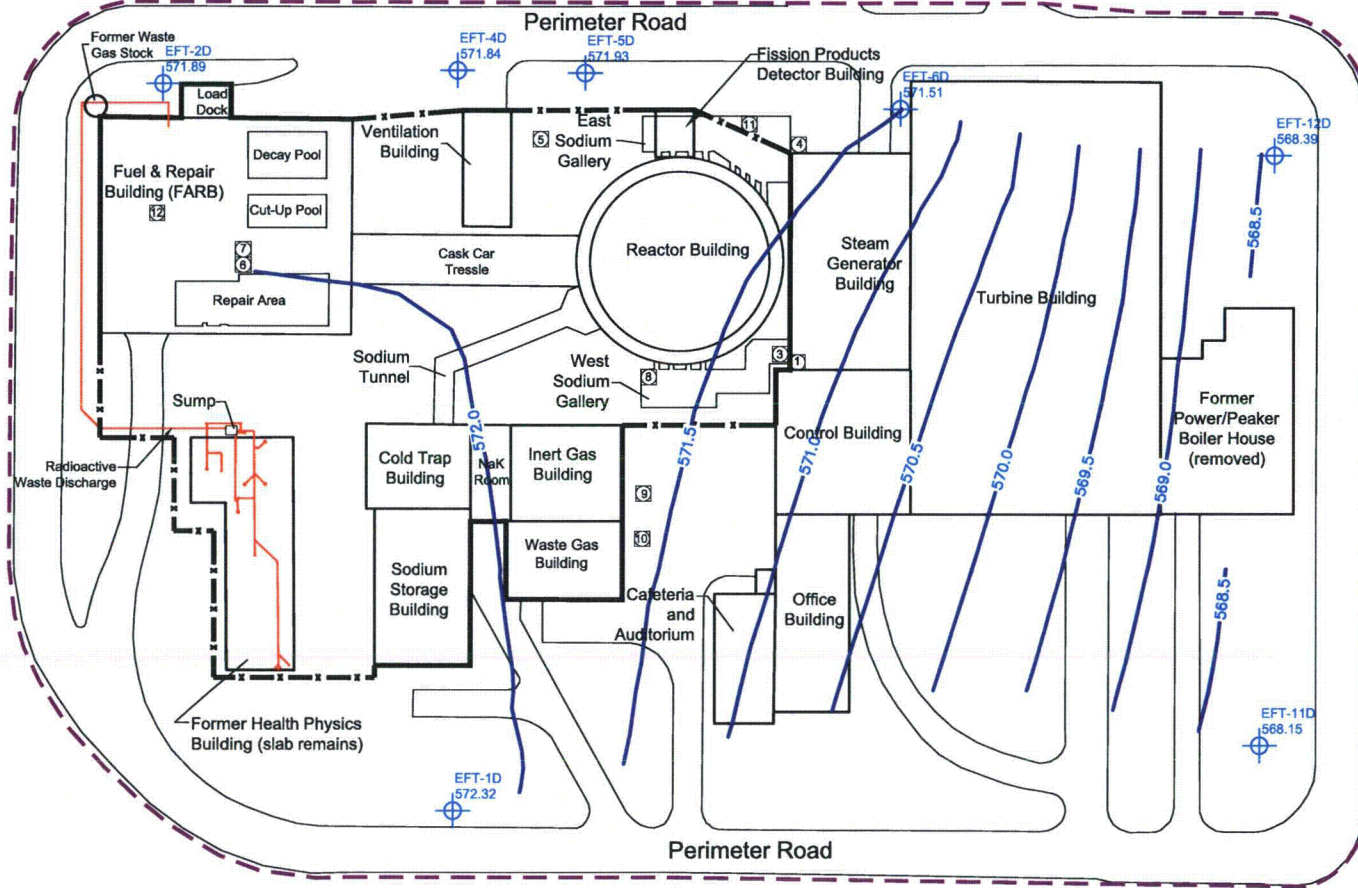
| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|----------------------|-------------------------|-----------------------|-----------|-------|
| EFT-1S | 6.50 | 584.87 | 578.37 | 10/3/2011 | 8:45 |
| EFT-1I | 8.82 | 584.86 | 576.04 | 10/3/2011 | 8:55 |
| EFT-1D | 12.54 | 584.86 | 572.32 | 10/3/2011 | 9:10 |
| EFT-2S | 3.50 | 583.33 | 579.83 | 10/3/2011 | 9:20 |
| EFT-2D | 11.23 | 583.12 | 571.89 | 10/3/2011 | 9:30 |
| EFT-4S | 6.93 | 587.16 | 580.23 | 10/3/2011 | 9:50 |
| EFT-4D | 15.50 | 587.34 | 571.84 | 10/3/2011 | 11:10 |
| EFT-5S | 6.10 | 586.64 | 580.54 | 10/3/2011 | 11:20 |
| EFT-5D | 14.96 | 586.89 | 571.93 | 10/3/2011 | 13:15 |
| EFT-6S | 6.25 | 585.63 | 579.38 | 10/3/2011 | 13:25 |
| EFT-6D | 14.20 | 585.71 | 571.51 | 10/3/2011 | 13:55 |
| EFT-7S | 4.70 | 584.94 | 580.24 | 10/3/2011 | 16:20 |
| EFT-8SOld | 9.00 | 582.86 | 573.86 | 10/3/2011 | 16:30 |
| EFT-8SNew | 3.70 | 582.95 | 579.25 | 10/3/2011 | 17:00 |
| EFT-9S | 2.20 | 583.01 | 580.81 | 10/4/2011 | 9:15 |
| EFT-10S | 22.00 | 591.56 | 569.56 | 10/4/2011 | 9:45 |
| EFT-11I | 14.5 | 585.38 | 570.88 | 10/4/2011 | 11:10 |
| EFT-11D | 17.3 | 585.45 | 568.15 | 10/4/2011 | 11:15 |
| EFT-12I | 15.3 | 584.94 | 569.64 | 10/4/2011 | 11:25 |
| EFT-12D | 16.6 | 584.99 | 568.39 | 10/4/2011 | 11:30 |
| EFT-13I | 2.2 | 582.13 | 579.93 | 10/4/2011 | 8:45 |

Monitoring Well Depth to Groundwater Table

| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|----------------------|-------------------------|-----------------------|-----------|------|
| EFT-1S | | 584.87 | | | |
| EFT-1I | | 584.86 | | | |
| EFT-1D | | 584.86 | | | |
| EFT-2S | | 583.33 | | | |
| EFT-2D | | 583.12 | | | |
| EFT-4S | | 587.16 | | | |
| EFT-4D | | 587.34 | | | |
| EFT-5S | | 586.64 | | | |
| EFT-5D | | 586.89 | | | |
| EFT-6S | | 585.63 | | | |
| EFT-6D | | 585.71 | | | |
| EFT-7S | | 584.94 | | | |
| EFT-8Sold | | 582.86 | | | |
| EFT-8SNew | | 582.95 | | | |
| EFT-9S | | 583.01 | | | |
| EFT-10S | 10.20 | 591.56 | 581.36 | 12/5/2011 | 8:45 |
| EFT-11I | 16.2 | 585.38 | 569.18 | 12/5/2011 | 9:22 |
| EFT-11D | 14.8 | 585.45 | 570.65 | 12/5/2011 | 9:33 |
| EFT-12I | 14.99 | 584.94 | 569.95 | 12/5/2011 | 9:39 |
| EFT-12D | 15.2 | 584.99 | 569.79 | 12/5/2011 | 9:47 |
| EFT-13I | 2.5 | 582.13 | 579.63 | 12/5/2011 | 9:12 |

Monitoring Well Depth to Groundwater Table

| Well ID | Depth to Groundwater | Top of casing Elevation | Groundwater Elevation | Date | Time |
|-----------|----------------------|-------------------------|-----------------------|----------|-------|
| EFT-1S | 8.92 | 584.87 | 575.95 | 1/4/2012 | 13:59 |
| EFT-1I | 10.60 | 584.86 | 574.26 | 1/4/2012 | 13:56 |
| EFT-1D | 11.80 | 584.86 | 573.06 | 1/4/2012 | 13:51 |
| EFT-2S | 3.40 | 583.33 | 579.93 | 1/4/2012 | 10:44 |
| EFT-2D | 10.98 | 583.12 | 572.14 | 1/4/2012 | 10:55 |
| EFT-4S | 7.26 | 587.16 | 579.9 | 1/4/2012 | 11:01 |
| EFT-4D | 16.31 | 587.34 | 571.03 | 1/4/2012 | 11:09 |
| EFT-5S | 5.92 | 586.64 | 580.72 | 1/4/2012 | 11:15 |
| EFT-5D | 15.62 | 586.89 | 571.27 | 1/4/2012 | 11:23 |
| EFT-6S | 5.63 | 585.63 | 580 | 1/4/2012 | 11:38 |
| EFT-6D | 15.31 | 585.71 | 570.4 | 1/4/2012 | 11:50 |
| EFT-7S | 4.66 | 584.94 | 580.28 | 1/4/2012 | 14:10 |
| EFT-8SOld | INACCESSIBLE | 582.86 | N/A | 1/4/2012 | |
| EFT-8SNew | 4.26 | 582.95 | 578.69 | 1/4/2012 | 10:35 |
| EFT-9S | 3.74 | 583.01 | 579.27 | 1/4/2012 | 10:22 |
| EFT-10S | 16.81 | 591.56 | 574.75 | 1/4/2012 | 14:15 |
| EFT-11I | 17.1 | 585.38 | 568.28 | 1/4/2012 | 13:10 |
| EFT-11D | 14.2 | 585.45 | 571.25 | 1/4/2012 | 13:15 |
| EFT-12I | 16.12 | 584.94 | 568.82 | 1/4/2012 | 13:26 |
| EFT-12D | 15.95 | 584.99 | 569.04 | 1/4/2012 | 13:40 |
| EFT-13I | FROZEN | 582.13 | N/A | 1/4/2012 | |




LEGEND

- x — x — x — FENCE
- — — — — PROTECTED AREA BOUNDARY
- ⊕ SUMP
- ⊕ EFT-1S/I/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
- - - - - TERMINATION BOUNDARY
- 558.0 — GROUNDWATER ELEVATION CONTOUR

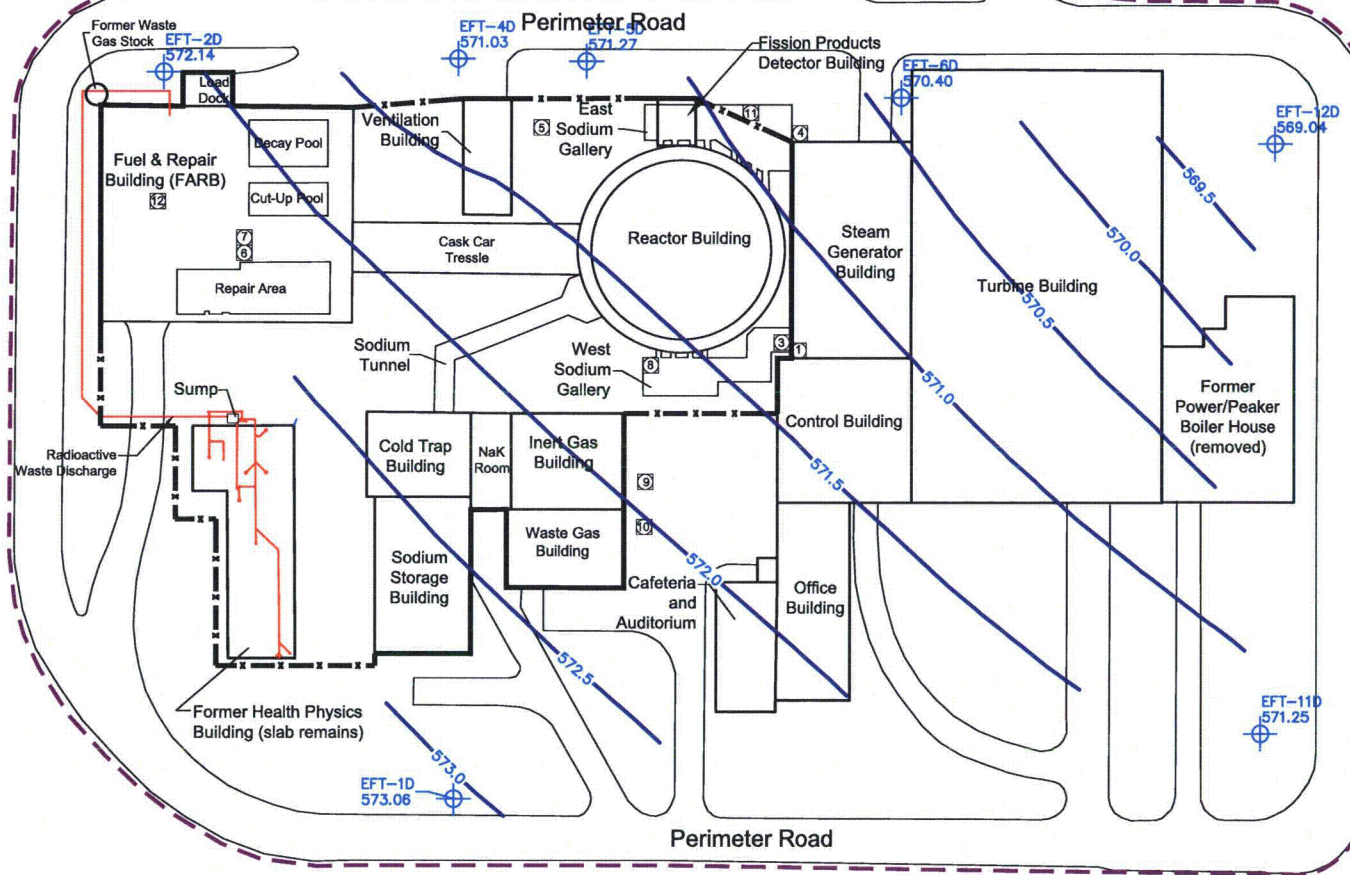
NOTES

1. Drawing is adapted from the following Detroit Edison Company drawings:
 - 6E721-56 (Perimeter road and general building layout)
 - 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
 - 6P721-1074-1 (Sodium tunnel)
 - 6C721-1640-1 (FARB interior)
 - 6E721-57-4 (East sodium gallery)
 - 6E721-57-5 (West sodium gallery)
 - 6P721-1117-1 (Health physics building and drains)
 - 6P721-1118-1 (Radioactive waste discharge line)
 - 6P721-1836-20 (Fission products detector building)



| | | | | | | |
|---|--|--|--------|----------|----------------|---|
|  Golder Associates Great Lakes | | | SCALE | AS SHOWN | TITLE | GROUNDWATER ELEVATION MAP DEEP ZONE OCTOBER 3-4, 2011 |
| | | | DATE | 02/07/12 | | |
| | | | DESIGN | DPR | | |
| | | | CADD | MGG | | |
| FILE No. 0238793B001 | | | CHECK | BST | DTE\FERMI 1\MI | FIGURE 4 |
| PROJECT No. 023-8793 REV. 0 | | | REVIEW | DK | | |
| | | | | | | |

File: K:\Projects\023-8793_DTE EFT Bedrock Water Levels\B-2011-12 Groundwater\REV 0\DWG\0238793B001.dwg Layout: DW JAN 12 User: Moosnell Feb 07, 2012 - 4:54pm

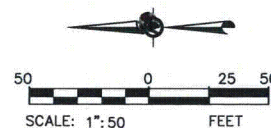



LEGEND

- FENCE
- PROTECTED AREA BOUNDARY
- ⊕ SUMP
- ⊕ EFT-1S/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
- - - - - TERMINATION BOUNDARY
- 558 GROUNDWATER ELEVATION CONTOUR

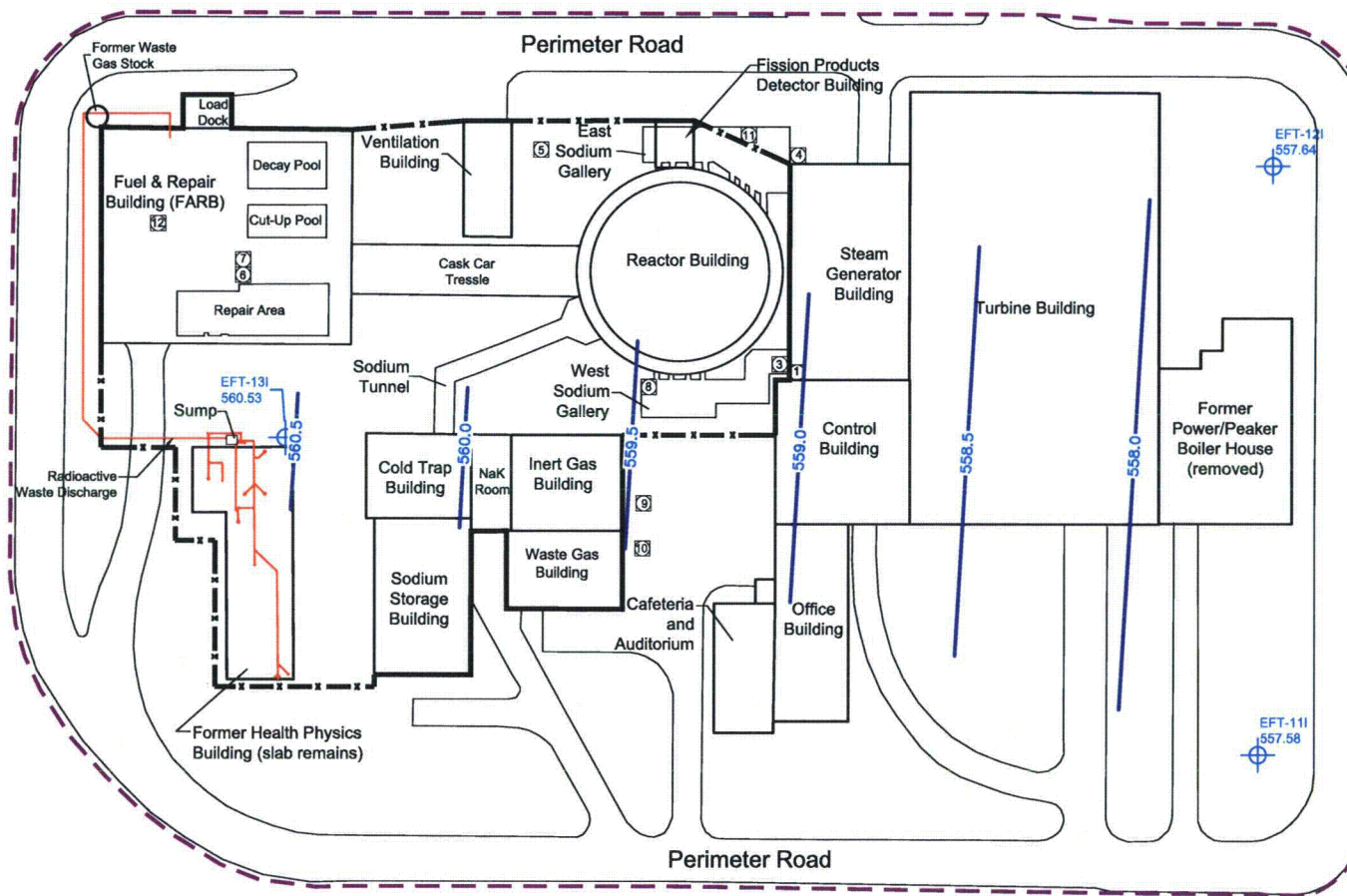
NOTES

1. Drawing is adapted from the following Detroit Edison Company drawings:
 - 6E721-56 (Perimeter road and general building layout)
 - 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
 - 6P721-1074-1 (Sodium tunnel)
 - 6C721-1640-1 (FARB interior)
 - 6E721-57-4 (East sodium gallery)
 - 6E721-57-5 (West sodium gallery)
 - 6P721-1117-1 (Health physics building and drains)
 - 6P721-1118-1 (Radioactive waste discharge line)
 - 6P721-1836-20 (Fission products detector building)



| | | | | | | | |
|---|-------------|------|--------|----------|----------------|--|----|
|  Golder Associates Great Lakes | | | SCALE | AS SHOWN | TITLE | GROUNDWATER ELEVATION MAP DEEP ZONE JANUARY 4, 2012 | |
| | | | DATE | 02/07/12 | | | |
| | | | DESIGN | DPR | | | |
| | | | CADD | MGG | | | |
| FILE No. | 0238793B001 | | CHECK | BST | DTE\FERMI 1\MI | FIGURE 7 | |
| PROJECT No. | 023-8793 | REV. | 0 | REVIEW | | | DK |

File: K:\Projects\023-8793-DTE F1 Bedrock Water Levels\B-2011-12 Groundwater\REV 0\DWG\0238793B001.dwg Layout: IW MAY 11 User: MGoanell Feb 07, 2012 - 4:57pm

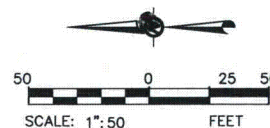



LEGEND

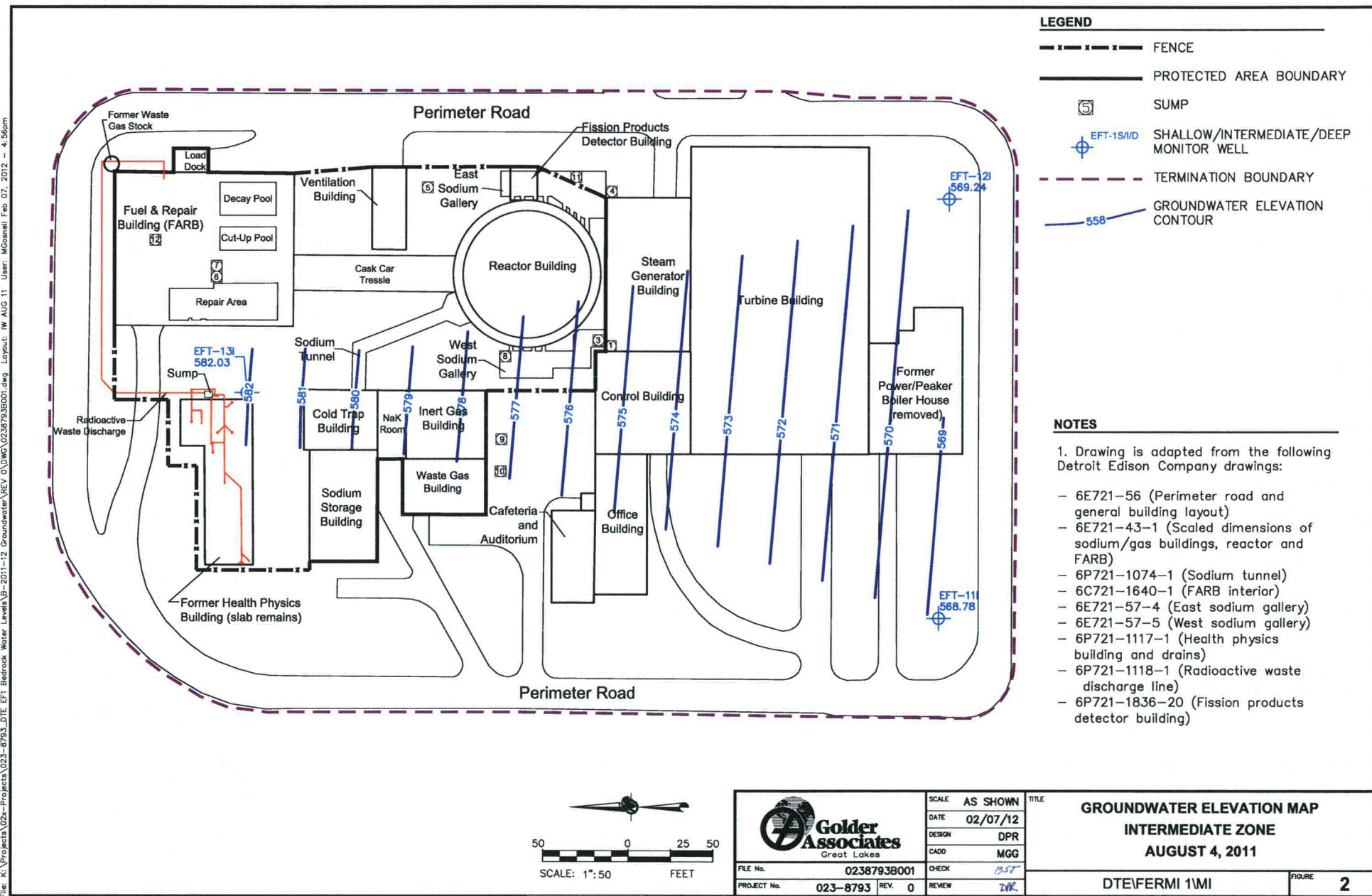
- FENCE
- PROTECTED AREA BOUNDARY
- ⊕ SUMP
- ⊕ EFT-1S/I/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
- - - - - TERMINATION BOUNDARY
- 558 GROUNDWATER ELEVATION CONTOUR

NOTES







1. Drawing is adapted from the following Detroit Edison Company drawings:
 - 6E721-56 (Perimeter road and general building layout)
 - 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
 - 6P721-1074-1 (Sodium tunnel)
 - 6C721-1640-1 (FARB interior)
 - 6E721-57-4 (East sodium gallery)
 - 6E721-57-5 (West sodium gallery)
 - 6P721-1117-1 (Health physics building and drains)
 - 6P721-1118-1 (Radioactive waste discharge line)
 - 6P721-1836-20 (Fission products detector building)



| | | | | | |
|---|-------------------------|--------|----------|----------|--|
|  Golder Associates Great Lakes | | SCALE | AS SHOWN | TITLE | GROUNDWATER ELEVATION MAP INTERMEDIATE ZONE MAY 17, 2011 |
| | | DATE | 02/07/12 | | |
| FILE No. PROJECT No. | 0238793B001 023-8793 | DESIGN | DPR | CHECK | DTE\FERMI 1\MI |
| | | CADD | MGG | | |
| | | REV. | 0 | | |
| | | REVIEW | DPR | FIGURE 1 | |

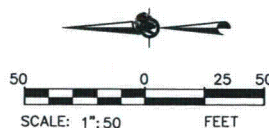


LEGEND

-  FENCE
 PROTECTED AREA BOUNDARY
 SUMP
 EFT-1S/I/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
 TERMINATION BOUNDARY
 558 GROUNDWATER ELEVATION CONTOUR

NOTES

- 1. Drawing is adapted from the following Detroit Edison Company drawings:
- 6E721-56 (Perimeter road and general building layout)
- 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
- 6P721-1074-1 (Sodium tunnel)
- 6C721-1640-1 (FARB interior)
- 6E721-57-4 (East sodium gallery)
- 6E721-57-5 (West sodium gallery)
- 6P721-1117-1 (Health physics building and drains)
- 6P721-1118-1 (Radioactive waste discharge line)
- 6P721-1836-20 (Fission products detector building)




| | | | |
|-------------|-------------|------|---|
| FILE No. | 0238793B001 | | |
| PROJECT No. | 023-8793 | REV. | 0 |

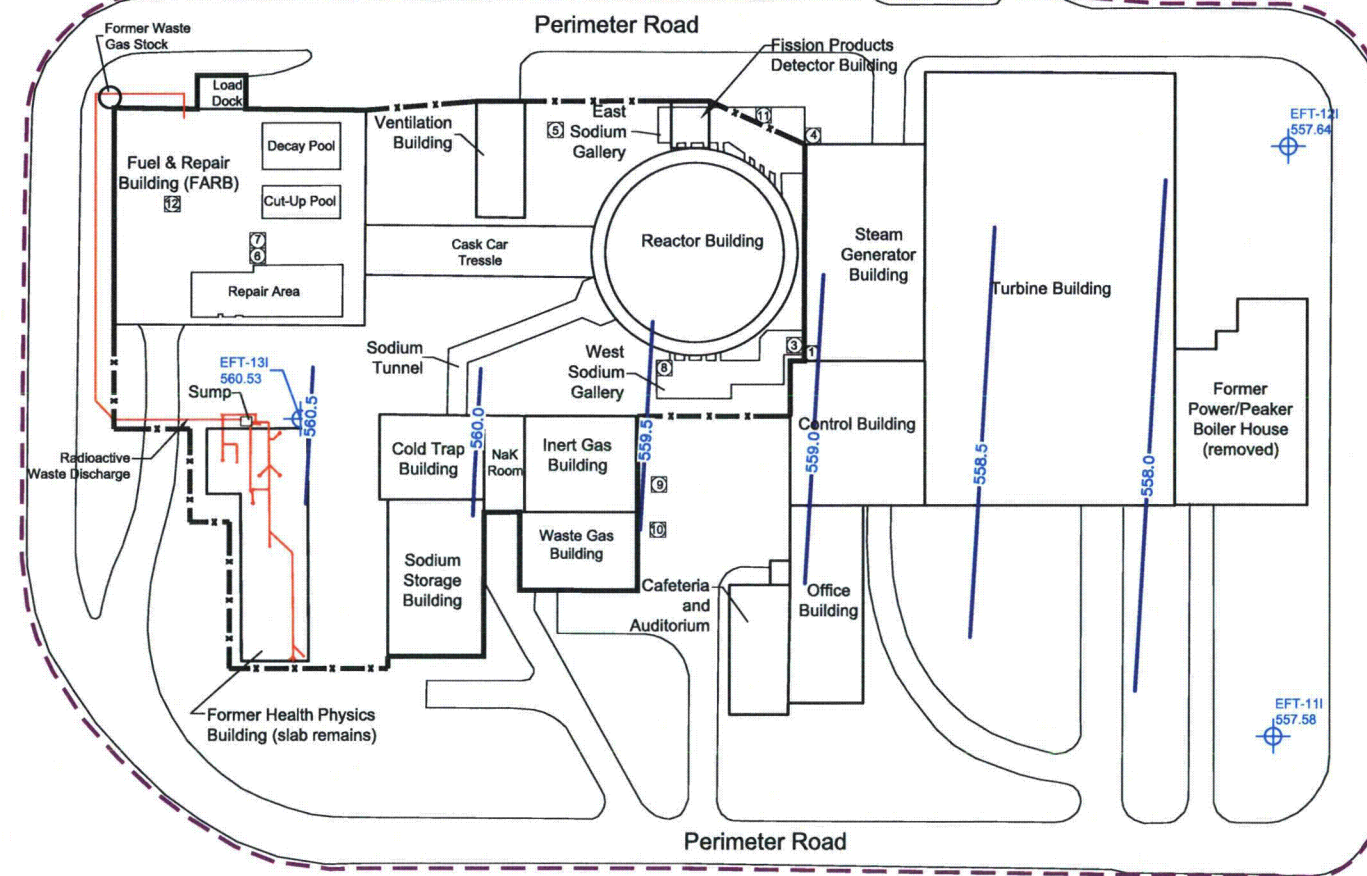
| | |
|--------|------------|
| SCALE | AS SHOWN |
| DATE | 02/07/12 |
| DESIGN | DPR |
| CADD | MGG |
| CHECK | <i>BST</i> |
| REVIEW | <i>DJR</i> |

**GROUNDWATER ELEVATION MAP
INTERMEDIATE ZONE
AUGUST 4, 2011**

DTE\FERMI 1\MI

FIGURE 2

| | | | | |
|---|-------------|----------|---|---------------------------------------|
|  Golder Associates Great Lakes | SCALE | AS SHOWN | TITLE GROUNDWATER ELEVATION MAP INTERMEDIATE ZONE OCTOBER 3-4, 2011 | |
| | DATE | 02/07/12 | | |
| | DESIGN | DPR | | |
| | CADD | MGJ | | |
| FILE No. | 02387938001 | | CHECK | DTE/VERMI 1\MI FIGURE 3 |
| PROJECT No. | 023-8793 | REV. 0 | REVIEW | |

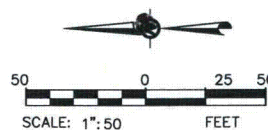



LEGEND

- FENCE
- PROTECTED AREA BOUNDARY
- ⊕ SUMP
- ⊕ EFT-131/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
- - - - - TERMINATION BOUNDARY
- 558 GROUNDWATER ELEVATION CONTOUR

NOTES

1. Drawing is adapted from the following Detroit Edison Company drawings:
 - 6E721-56 (Perimeter road and general building layout)
 - 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
 - 6P721-1074-1 (Sodium tunnel)
 - 6C721-1640-1 (FARB interior)
 - 6E721-57-4 (East sodium gallery)
 - 6E721-57-5 (West sodium gallery)
 - 6P721-1117-1 (Health physics building and drains)
 - 6P721-1118-1 (Radioactive waste discharge line)
 - 6P721-1836-20 (Fission products detector building)



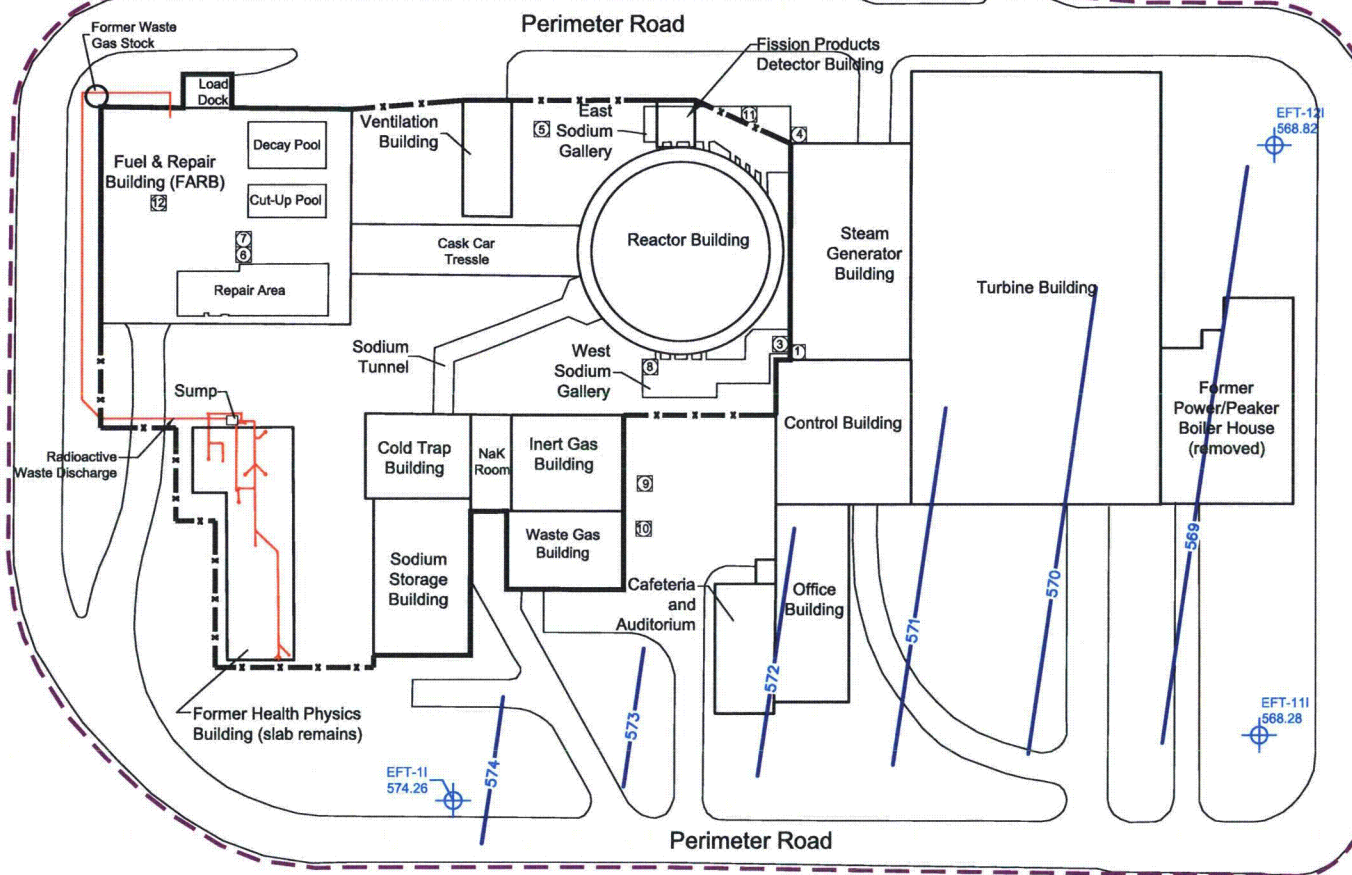
| | | | |
|--|-------------|----------|-------|
|  Golder Associates Great Lakes | SCALE | AS SHOWN | TITLE |
| | DATE | 02/07/12 | |
| | DESIGN | DPR | |
| | CADD | MGG | |
| | CHECK | BST | |
| FILE No. | 0238793B001 | | |
| PROJECT No. | 023-8793 | REV. | 0 |
| | | REVIEW | DK |

GROUNDWATER ELEVATION MAP INTERMEDIATE ZONE DECEMBER 5, 2011

DTE\FERMI 1\MI

FIGURE 5

File: K:\Projects\02--Projects\02--8793_DTE E1 Bedrock Water Levels\B-2011-12 Groundwater\REV 0\DWG\0238793B001.dwg Layout: IW JAN 12 User: MGoanell Feb 07, 2012 -- 4:55pm



LEGEND

- FENCE
- PROTECTED AREA BOUNDARY
- ☐ SUMP
- ⊕ EFT-1S/I/D SHALLOW/INTERMEDIATE/DEEP MONITOR WELL
- - - - - TERMINATION BOUNDARY
- 558 GROUNDWATER ELEVATION CONTOUR

NOTES

1. Drawing is adapted from the following Detroit Edison Company drawings:
 - 6E721-56 (Perimeter road and general building layout)
 - 6E721-43-1 (Scaled dimensions of sodium/gas buildings, reactor and FARB)
 - 6P721-1074-1 (Sodium tunnel)
 - 6C721-1640-1 (FARB interior)
 - 6E721-57-4 (East sodium gallery)
 - 6E721-57-5 (West sodium gallery)
 - 6P721-1117-1 (Health physics building and drains)
 - 6P721-1118-1 (Radioactive waste discharge line)
 - 6P721-1836-20 (Fission products detector building)



| | | | | |
|-------------|-------------|--------|----------|---|
| | | SCALE | AS SHOWN | TITLE GROUNDWATER ELEVATION MAP INTERMEDIATE ZONE JANUARY 4, 2012 |
| | | DATE | 02/07/12 | |
| | | DESIGN | DPR | |
| | | CADD | MGG | |
| FILE No. | 0238793B001 | CHECK | BST | DTE/FERMI 1/MI |
| PROJECT No. | 023-8793 | REV. | 0 | |
| | | REVIEW | DAK | FIGURE |
| | | | | 6 |