

A SUBSIDIARY OF UNIFIRST CORPORATION

February 18, 2008

Ms. Marie Miller U.S. Nuclear Regulatory Commission Division of Nuclear Material Safety 475 Allendale Road King of Prussia, PA 19406-1415

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RE: License No. 37-23341-01 Quarterly Report – 4<sup>th</sup> Quarter 2007

Dear Ms. Miller:

In accordance with License Condition No. 16, enclosed is the quarterly report for the referenced period for discharges made pursuant to License Condition No. 15. The resulting pathway analysis, calculated in the manner provided in UniTech's letter dated July 24, 1998, indicates a maximum potential quarterly adult Committed Effective Dose Equivalent (CEDE) of 9.64 x  $10^{-3}$  millirem and a 2007 total annual adult CEDE of 4.26 x  $10^{-2}$  millirem.

If you have questions regarding this information, please contact me at your earliest convenience. I may be reached at 610-948-9700, extension 19 or by email at <u>GRoberts@UniTech.ws</u>.

Sincerely,

UniTech Services Group, Inc.

Hh\_ Koty

Glenn Roberts Health Physicist

cc: Dan Neely, Plant Manager/RSO Michael R. Fuller, Esq., Manager, Health Physics and Engineering

> 141359 NMSS/RGN1 MATERIALS-002

2003

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Royersford Concentrations and Volumes												
2007 - ROYERSFORD WASTEWATER CONCENTRATIONS (uCi/ml)												
MONTH	JAN	FEB	MARCH		MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC
GALLONS	384,356	384,987	1,226,892	701,954	496,970	462,021	375,091	504,251	600,583	754,750	569,336	482,231
H-3	3.38E-03	9.24E-03	4.37E-04	1.23E-04	2.18E-04	2.07E-04	6.75E-05	6.75E-05	6.75E-05	9.48E-05	9.48E-05	9.48E-05
C-14	1.85E-08	1.85E-08	1.85E-08	5.82E-08	5.82E-08	5.82E-08	6.19E-09	6.19E-09	6.19E-09	9.33E-08	9.33E-08	9.33E-08
K-40	NF	NF	2.58E-07	2.51E-07	NF	NF	NF	NF	NF	NF	NF	NF
Cr-51	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Mn-54	1.74E-07	6.72E-08	3.52E-07	4.52E-08	7.36E-08	2.69E-08	4.32E-08	3.08E-08	2.40E-07	2.67E-07	2.15E-07	6.54E-08
Mn-56	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Fe-55	9.85E-08	9.85E-08	9.85E-08	9.84E-07	9.84E-07	9.84E-07	2.98E-06	2.98E-06	2.98E-06	1.74E-07	1.74E-07	1.74E-07
Fe-59	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Co-57	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Co-58	3.83E-08	1.50E-08	9.21E-08	1.24E-07	5.40E-08	4.77E-08	2.91E-08	NF	NF	8.61E-08	2.84E-07	8.52E-08
Co-60	7.37E-07	2.62E-07	1.56E-06	1.65E-07	3.08E-07	1.71E-07	2.15E-07	1.33E-07	1.27E-06	1.37E-06	1.09E-06	3.50E-07
Ni-59	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Ni-63	5.35E-07	5.35E-07	5.35E-07	<mda< td=""><td><mda< td=""><td><mda< td=""><td>3.34E-08</td><td>3.34E-08</td><td>3.34E-08</td><td>1.44E-07</td><td>1.44E-07</td><td>1.44E-07</td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td>3.34E-08</td><td>3.34E-08</td><td>3.34E-08</td><td>1.44E-07</td><td>1.44E-07</td><td>1.44E-07</td></mda<></td></mda<>	<mda< td=""><td>3.34E-08</td><td>3.34E-08</td><td>3.34E-08</td><td>1.44E-07</td><td>1.44E-07</td><td>1.44E-07</td></mda<>	3.34E-08	3.34E-08	3.34E-08	1.44E-07	1.44E-07	1.44E-07
Zn-65	4.87E-08	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sr-89	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
<u>Sr-90</u>	1.51E-08	1.51E-08	1.51E-08	2.47E-08	2.47E-08	2.47E-08	1.20E-08	1.20E-08	1.20E-08	1.25E-08	1.25E-08	1.25E-08
Zr-95	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Nb-95	NF	NF	2.51E-08	NF	NF	NF	NF	NF	NF	NF	NF	NF
Tc-99	2.98E-07	2.98E-07	2.98E-07	1.39E-08	1.39E-08	1.39E-08	1.05E-08	1.05E-08	1.05E-08	<mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""></mda<></td></mda<>	<mda< td=""></mda<>
Ag-110m	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sn-113	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sb-125	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
I-125	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
1-129	<mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""></mda<></td></mda<>	<mda< td=""></mda<>
<u>Cs-134</u>	6.21E-08	3.27E-08	1.08E-07	2.41E-08	2.74E-08	NF	NF	2.45E-08	NF	NF	NF	NF
<u>Cs-137</u>	4.58E-07	5.74E-07	5.72E-07	3.20E-07	3.30E-07	2.06E-07	1.43E-07	1.61E-07	2.81E-07	2.32E-07	3.52E-07	1.52E-07
Eu-152			NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
EU-154		NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
EU-155			NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
PD-212						NF	NF	NF	NF	NF	NF	NF
PD-214			NF	NF		NF	NF	NF	NF	NF	NF	NF
Ra-220		NF				NF			NF	NF	NF	NF
AU-220						NE	NF	NF	NF	NF	NF	NF
Th 220		2 04E 40	2 04E 40							2.51E-10	2.51E-10	2.51E-10
Th-230	5.94E-10	3.94E-10	3.94E-10				3.92E-10	3.92E-10	3.92E-10	2.43E-10	2.43E-10	2.43E-10
Th-237										NF		
Th-234	NE	4 16F_07	NE	3 17E_07	NE	2 28E 07	NE	101E 07	3 22E 07	1.30E-10	1.30E-10	1.505-10
11-234	3 93E-10	3 03E-10	3 03E-10	5.64E-10	5 64E-10	5.64E-10	5 195 10	5.01E-07	5.22E-07	7 105 10	7 405 40	
11-235			<md4< td=""><td><md4< td=""><td></td><td><mda< td=""><td></td><td>5.10E-10</td><td>5.10E-10</td><td>7.10E-10</td><td>7.10E-10</td><td>7.10E-10</td></mda<></td></md4<></td></md4<>	<md4< td=""><td></td><td><mda< td=""><td></td><td>5.10E-10</td><td>5.10E-10</td><td>7.10E-10</td><td>7.10E-10</td><td>7.10E-10</td></mda<></td></md4<>		<mda< td=""><td></td><td>5.10E-10</td><td>5.10E-10</td><td>7.10E-10</td><td>7.10E-10</td><td>7.10E-10</td></mda<>		5.10E-10	5.10E-10	7.10E-10	7.10E-10	7.10E-10
11-236											2.332-00	
11-238	2 90E-10	2 90E-10	2 90E-10				6 12E-10	6 12E 10	NVIDA			
Pu-238									2MDA			
Pu-239										1.94C-10	1.94E-10	1.94E-10
Pu-241										J.00E-10	3.00E-10	J.00E-10
Np-237	<mda< td=""><td><mda< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></mda<></td></mda<>	<mda< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></mda<>										
Am-241	6.95F-10	6.95F-10	6 95F-10	4 85F-10	4 85E-10	4 85F-10	5 62E-10	5.62E-10	5 62E-10	1 255 00	1 25E 00	1 25E 00
Cm-244	<mda< td=""><td><mda< td=""><td><mda< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td><mda< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<></td></mda<>	<mda< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td><mda< td=""><td><mda< td=""></mda<></td></mda<></td></mda<>								<mda< td=""><td><mda< td=""></mda<></td></mda<>	<mda< td=""></mda<>
Total	3 38F-03	9 24F-03	4 41F-04	1 25E-04	2 20E-04	2 09E-04	7 10E-05	7 125-05	7 27E-05	0.725_05	0 725 05	
						~			1.215-00	J.IZE-00	9.12C-V3	3.332-03

UniTech Table 1

NF - Not found in gamma spectra search

Notes:

<MDA - Less than minimum dection limit for analytical method.</p>
Sr-89/90 analyzed and reported as total Sr unless >50 pCi/L. Conservatively assigned to Sr-90
March K-40 result reported at MDA value. Not used in pathway dose calculation.
Nov. U-235 Gamma Spec result does not correlate with radiochemistry results but, regardless, is used in the dose calculation.

MONTH         JAN         FEB         MARCH         APRIL         MAY         JUNE         JUNE <thjune< th="">         JUNE         JUNE         <thj< th=""><th colspan="10">2007 - ROYERSFORD WASTEWATER ACTIVITIES (mCi)</th></thj<></thjune<>	2007 - ROYERSFORD WASTEWATER ACTIVITIES (mCi)												
Gellions         384436         3844367         1226802         701954         496070         420211         37507         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550337         72750         550376         72750         550376         72750         550376         72750         550376         72750	MONTH	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT		NOV	
H-3         4.92E+03         1.35E+04         2.03E+03         1.25E+02         1.53E+02         2.71E+02         2.04E+02         1.53E+02         2.04E+02         1.53E+02         2.04E+02         1.53E+02         2.04E+02         1.53E+02         2.04E+02         1.53E+02         2.04E+02         1.73E+02         2.04E+02         1.73E+02         2.04E+02         1.73E+02         2.04E+02         1.73E+01         2.04E+02         1.73E+01         2.04E+02         1.73E+01         2.04E+01         1.70E+0         1.72E+00         2.54E+01         1.44E+01         1.75E+01         1.86E+01         1.72E+00         4.23E+00         5.68E+01         7.62E+01         4.64E+01         1.9E+01	Gallons	384356	384987	1226892	701954	496970	462021	375091	504251	600583	754750	560336	DEC
C-14       2.60E-02       2.70E-02       1.55E-01       1.00E-01       1.70E-03       1.10E-01       1.70E-02       1.70E-02       1.70E-03       1.10E-02       1.70E-02       1.70E-02       1.70E-03       1.7	H-3	4.92E+03	3 1.35E+04	4 2.03E+03	3.27E+02	4.10E+02	3.62E+02	9.58E+01	1 29E+02	1 53E+02	2715+0	2 2 045 10	402231
K-40         120E+00         6.66E-01         120E+01         170E-02         170E-01         170E-02         170E-02 <th170< th=""> <th170< th=""> <th170< th=""></th170<></th170<></th170<>	C-14	2.69E-02	2.70E-02	2 8.59E-02	1.55E-01	1.09E-01	1.02E-01	8 79E-03	1 18F-02	1 415-02	2.710	2 2.04E+0	2 1.73E+02
Cr-51       Proc. 2       Softward       Proc. 1	K-40			1.20E+00	6.68E-01			1 0 02 00	1.102-02	1.412-02	2.07E-01	2.01E-01	1.70E-01
Mn-54         2 54E-01         9.78E-02         1.64E-00         1.20E-01         1.38E-01         4.71E-02         6.14E-02         5.87E-02         5.48E-01         7.62E-01         4.64E-01         1.19E-01           Fe-55         1.43E-01         1.44E-01         4.57E-01         2.61E+00         1.85E+00         1.72E+00         4.23E+00         5.69E+00         6.77E+00         4.97E-01         3.75E-01         3.18E-01           Co-56         5.57E-02         2.18E-02         4.24E-01         1.02E-01         8.35E-02         4.14E-02         2.46E-01         6.12E-01         1.55E-01         1.55E-01         1.55E-01         1.55E-01         1.55E-01         1.55E-01         1.55E-01         2.46E-01         6.12E-01         1.55E-01         2.55E-00         2.46E-01         6.36E-01         2.55E-00	Cr-51					1							
Mn-66         minisol	Mn-54	2.54E-01	9.79E-02	2 1.64E+00	1.20E-01	1.38E-01	4.71E-02	6 14F-02	5 87E-02	5 465 01	7 605 04	4.645.04	
Fe-55         1.43E-01         1.45E-01         2.61E+00         1.26E+00         4.23E+00         6.69E+00         6.77E+00         4.97E-01         3.76E-01         3.18E-01           Co-57         5         -	Mn-56				1			0.142-02	0.072-02	J.40E-01	1.02E-01	4.04E-01	1.19E-01
Fe-59         The of         Hours of <thhours of<="" th=""> <thhours of<="" th=""> <thhou< td=""><td>Fe-55</td><td>1.43E-01</td><td>1.44E-01</td><td>4.57E-01</td><td>2.61E+00</td><td>1.85E+00</td><td>1 72E+00</td><td>4 23E+00</td><td>5 60E+00</td><td>6 77E+00</td><td>4.075.04</td><td>0.755.04</td><td></td></thhou<></thhours></thhours>	Fe-55	1.43E-01	1.44E-01	4.57E-01	2.61E+00	1.85E+00	1 72E+00	4 23E+00	5 60E+00	6 77E+00	4.075.04	0.755.04	
Co-57         S.FE-02         2.18E-02         4.28E-01         3.29E-01         8.35E-02         4.14E-02         2.46E-01         6.12E-01         1.56E-01           Co-60         1.07E+00         3.82E-01         7.22E+00         4.38E-01         2.99E-01         3.08E-02         2.48E+01         2.88E+00         3.30E+00         2.38E+00         3.30E+00         2.38E+00         3.30E+00         2.38E+00         2.88E+00         3.08E-01         2.88E+00         3.08E-01         2.88E+00         3.08E-01         2.88E+00         2.88E+01         3.10E-01         2.88E+01         2.88E+01         2.88E+02         2.88E+02         2.98E+02         2.78E+02         2.88E+02         2.88E+02<	Fe-59							4.202.00	0.03E+00	0.77E+00	4.9/E-01	3.75E-01	3.18E-01
$ \begin{array}{c} \begin{array}{c} \begin{array}{c} 0.686 \\ \hline 0.57E-02 \\ \hline 0.660 \\ \hline 1.07E+00 \\ \hline 0.83E-01 \\ \hline 0.78E-01 \\ \hline 0.78E-02 \\ \hline 0.78E-01 \\ \hline 0.78E-02 \\ \hline 0.78E-$	Co-57												
Co-60       1.07E+00       3.82E-01       7.22E+00       4.39E-01       5.78E-01       2.98E-01       3.08E-01       2.84E+01       2.88E+00       5.86E-00       5.	Co-58	5.57E-02	2.18E-02	4.28E-01	3.29E-01	1.02E-01	8.35E-02	4 14E-02	<u> </u>	ł	2 465 04	6 405 04	1 505 01
Ni-59         Production         Production </td <td>Co-60</td> <td>1.07E+00</td> <td>3.82E-01</td> <td>7.22E+00</td> <td>4.39E-01</td> <td>5.79E-01</td> <td>2,99E-01</td> <td>3.06E-01</td> <td>2 54E-01</td> <td>2 885+00</td> <td>2.402-01</td> <td>0.12E-01</td> <td>1.56E-01</td>	Co-60	1.07E+00	3.82E-01	7.22E+00	4.39E-01	5.79E-01	2,99E-01	3.06E-01	2 54E-01	2 885+00	2.402-01	0.12E-01	1.56E-01
IN-63         7.78E-01         7.80E-01         2.40E+00         4.74E-02         8.37E-02         7.59E-02         4.11E-01         3.10E-01         2.63E-01           Sr-80         2.20E-02         2.20E-02         7.01E-02         6.56E-02         4.55E-02         4.32E-02         1.70E-02         2.29E-02         2.73E-02         3.57E-02         2.56E-02         2.26E-02         2.20E-02         2.26E-02         2.26E-01         2.77E-01         2.77E-01         2.77E-01         2.77E-01	Ni-59		T					0.002-01	2.046-01	2.00E+00	3.90E+00	2.35E+00	6.38E-01
2n-66       7.08E-02       1.11E-01       1.11E-01       2.83E-01         Sr-89       2.20E-02       2.20E-02       7.01E-02       6.66E-02       4.32E-02       1.70E-02       2.28E-02       2.73E-02       3.57E-02       2.69E-02       2.26E-02         Zr-95       1.16E-01       2       2       2       2.00E-02       2.39E-02       2.73E-02       3.57E-02       2.69E-02       2.26E-02       2.26E-02       2.69E-02       2.26E-02       2.26E-02       2.69E-02       2.26E-02       2.69E-02       2.69E-01       2.77E-01       2.77E-01	Ni-63	7.78E-01	7.80E-01	2.48E+00				4 74E-02	6 37E-02	7 505 02	4 115 01	2 405 04	
Sr-89         2 <td>Zn-65</td> <td>7.08E-02</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4.142-02</td> <td>0.07 2-02</td> <td>1.392-02</td> <td>4.11E-01</td> <td>3.10E-01</td> <td>2.63E-01</td>	Zn-65	7.08E-02						4.142-02	0.07 2-02	1.392-02	4.11E-01	3.10E-01	2.63E-01
Si-90       2.20E-02       2.20E-02       7.01E-02       6.66E-02       4.32E-02       1.70E-02       2.29E-02       2.73E-02       3.57E-02       2.69E-02       2.28E-02         Di-96       1.16E-01       1       1.38E+00       3.69E-02       2.43E-02       1.49E-02       2.00E-02       2.39E-02       2.39E-02       1.57E-02       2.69E-02       2.28E-02         Ag-110m       1.38E+00       3.69E-02       2.61E-02       2.43E-02       1.49E-02       2.00E-02       2.39E-02       1.57E-02       2.69E-02       1.57E-02       1.57E-01       1.57E-04       1.58E-01       1.57E-04       1.57E-04       1.57E-04 <td< td=""><td>Sr-89</td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>l</td></td<>	Sr-89						1						l
Zr.96         Mb-95         1.16E-01         Mb-95         2.39E-02         2.39E-03         2.39E-03         2.39E-03         2.39	Sr-90	2.20E-02	2.20E-02	7.01E-02	6.56E-02	4.65E-02	4.32E-02	1 70F-02	2 29E-02	2 735-02	3 575 00	2.005.00	0.005.00
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Zr-95						1.022.02	1.702-02	2.232-02	2.732-02	3.57E-02	2.09E-02	2.28E-02
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Nb-95			1.16E-01			1					<u> </u>	<u> </u>
Ag-110m       Image of the set of the	Tc-99	4.34E-01	4.34E-01	1.38E+00	3.69E-02	2.61E-02	2.43E-02	1 49E-02	2 00E-02	2 30E-02			<u> </u>
Sh-113       Image: state of the state of t	Ag-110m							1.102 02	2.002-02	2.392-02			<b>↓</b> ]
Sb-125         Image: Constraint of the state of th	Sn-113												<u> </u>
I-125       Image: Constraint of the constra	Sb-125			1									łl
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	I-125											1	I
Cs-134       9.04E-02       4.76E-02       5.00E-01       6.41E-02       5.16E-02       4.68E-02       5.307E-01       6.64E-01       7.58E-01       2.77E-01         Eu-152       -	I-129						-					<u> </u>	<u> </u>
Cs-137       6.66E-01       8.36E-01       2.66E+00       8.49E-01       6.21E-01       3.61E-01       2.02E-01       3.07E-01       6.39E-01       6.64E-01       7.58E-01       2.77E-01         Eu-152	Cs-134	9.04E-02	4.76E-02	5.00E-01	6.41E-02	5.16E-02			4 68F-02				╀─────┦
Eu-152	Cs-137	6.66E-01	8.36E-01	2.66E+00	8.49E-01	6.21E-01	3.61E-01	2.02E-01	3 07E-01	6 39E-01	6 64E 01	7 595 01	2775 04
Eu-154       Image: state of the state of t	Eu-152								0.07 2 01	0.032-01	0.042-01	7.50E-01	2.77E-01
Eu-155       Image: constraint of the constr	Eu-154												<u> </u>
Pb-212       Image: constraint of the system o	Eu-155												
Pb-214       Image: constraint of the second s	Pb-212												
Ra-226       Image: constraint of the second s	Pb-214												
Ac-228       Image: constraint of the state	Ra-226												
Th-228       Image: Constraint of the constr	Ac-228												
Th-230       5.73E-04       5.74E-04       1.83E-03       5.57E-04       7.48E-04       8.91E-04       6.94E-04       5.24E-04       4.44E-04         Th-231	Th-228										7.17E-04	541E-04	4 58E-04
Th-231       Control       Contro       Control       Control	Th-230	5.73E-04	5.74E-04	1.83E-03				5.57E-04	7.48E-04	8.91E-04	6.94E-04	5 24E-04	4.44E-04
Th-232       Image: Constraint of the constr	Th-231										0.012.01	0.242-04	7.772-07
Th-234       6.06E-01       8.43E-01       3.99E-01       5.74E-01       7.32E-01       0       2.03E-03       1.30E-03         U-234       5.72E-04       5.73E-04       1.83E-03       1.50E-03       1.06E-03       9.86E-04       7.35E-04       9.89E-04       1.18E-03       2.03E-03       1.53E-03       1.30E-03         U-236       Image: Constraint of the second s	Th-232										4.46E-04	3 36E-04	2 85E-04
U-234       5.72E-04       5.73E-04       1.83E-03       1.50E-03       1.06E-03       9.86E-04       7.35E-04       9.89E-04       1.18E-03       2.03E-03       1.53E-03       1.30E-03         U-235       Image: constraint of the state of the sta	Th-234		6.06E-01		8.43E-01		3.99E-01		5.74E-01	7.32E-01		5.002-04	2.002-04
U-235       Image: Constraint of the constra	U-234	5.72E-04	5.73E-04	1.83E-03	1.50E-03	1.06E-03	9.86E-04	7.35E-04	9.89E-04	1.18E-03	2.03E-03	1.53E-03	1 30E-02
U-236       Image: constraint of the second se	U-235											5.02E-02	1.502-03
U-238       4.22E-04       4.23E-04       1.35E-03       8.69E-04       1.17E-03       1.39E-03	U-236											0.022-02	
Pu-238       Image: Constraint of the constr	U-238	4.22E-04	4.23E-04	1.35E-03				8.69E-04	1.17E-03	1.39E-03			
Pu-239       O.S.T. 07       4.10E-04       3.34E-04         Pu-241       1.11E-03       8.36E-04       7.08E-04         Np-237	Pu-238										5.54F-04	4 18F-04	3.54E-04
Pu-241       Image: Constraint of the second s	Pu-239										1.11E-03	8.36F_04	7.085-04
Np-237         Am-241         1.01E-03         1.01E-03         3.23E-03         1.29E-03         9.12E-04         8.48E-04         7.98E-04         1.07E-03         1.28E-03         3.57E-03         2.69E-03         2.28E-03           Cm-244         TOTAL         4.02E+03         1.29E-04         0.00E-03         0.00E-03 <td>Pu-241</td> <td></td> <td>0.002-04</td> <td>7.002-04</td>	Pu-241											0.002-04	7.002-04
Am-241         1.01E-03         1.01E-03         3.23E-03         1.29E-03         9.12E-04         8.48E-04         7.98E-04         1.07E-03         1.28E-03         3.57E-03         2.69E-03         2.28E-03           Cm-244	Np-237												
	Am-241	1.01E-03	1.01E-03	3.23E-03	1.29E-03	9.12E-04	8.48E-04	7.98E-04	1.07E-03	1.28E-03	3.57E-03	2.69E-03	2 28E-03
	Cm-244											2.00L-00	2.202-03
101AL JL4.32E+03 1.35E+04 2.05E+03 3.33E+02 4.14E+02 3.65E+02 1.01E+02 1.36E+02 1.65E+02 2.78E+02 2.00E+02 1.75E+02	TOTAL	4.92E+03	1.35E+04	2.05E+03	3.33E+02 4	.14E+02	3.65E+02	.01E+02	1.36E+02 1	.65E+02 2	78E+02	2 09E+02	1755+02

UniTech Table 2 Royersford Activities for Pathway Input