



Providing Insight Onsite

December 24, 2013

U.S. NRC Region 1
2100 Renaissance Blvd. Suite 100
King of Prussia, PA 19406-2713

REC R61 12 27 13 AM 10:39

Fed Ex: 7974 9980 6693

Attn: Dennis Lawyer, Health Physicist
Division of Nuclear Material Safety

07-28386-01

Re: Tracerco NRC License No. ~~07-28386-07~~ (Docket No. 030-31174)
Financial Assurance Documents, Control No. ~~582192~~

LW. 581292

Dear Mr. Lawyer:

This is in reference to your letter dated October 25, 2013 regarding the request for additional decommissioning funding plan information. Your requested items are addressed in the order presented in your letter.

1. Krypton 85 is stored in a ready-to-ship DOT Type A package. Each Type a package would contain approximately 20 Ci, or less. Transport cost is based on our typical cost to ship a container, via air cargo, cross-country. Ground freight transport would be less. Tables 11 and 16 of Tracerco's DFP have been amended to include this cost.
2. Subsequent to the submission of our previous August 30, 2010 DFP we performed a H-3 survey to demonstrate that that H-3 contamination was not present at our Newark, DE facility. A H-3 survey of our Merrillville, IN facility was not required because no H-3 had been stored at that facility. No H-3 has been stored at either facility since that submission. Notwithstanding, as requested, our DFP has been amended to include the cost to perform an H-3 survey and the associated laboratory cost involved for the survey analysis. Tables 5, 7, 9, 14 and 16 of Tracerco's DFP have been amended to include this cost.

581292

NMSS/RGN1 MATERIALS-002



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Johnson Matthey

3. The authorization for unsealed materials with atomic numbers of 3 through 83 and half-life greater than 120 days was added to our license via amendment No. 5, issued August 28, 1995. This license authorization was added to address the impurities in the Swage-Lok containers used to irradiate the tracer isotopes in. These Swage-Lok containers consist of a 5/8 inch diameter by 3 inch long aluminum tube sealed at one end with the end capped with a 5/8 inch Swage-Lok compression fitting. Referencing the attached Swage-Lok irradiation information sheet provided by Texas A&M Nuclear Science Center, of the various activation products associated with the activation of a Swage-Lok, only Manganese-54 (Mn-54) and Zinc-65 (Zn-65) have a half-life greater than 120 days. Specifically, Mn-54 has a half-life 312 days and Zn-65 has half-life of 244 days. Although atomic numbers 3-83, with than half-life greater than 120 days include many isotopes, only Mn-54 and Zn-65 are applicable to Tracerco's DFP. Subsequently, Tracerco DFP only includes Mn-54 and Zn-65. It is estimated that at the time of transfer from the reactor to Tracerco a Swedge-Lok the activated impurities are $\leq 1 \mu\text{Ci}$ of Mn-54 and $\leq 44 \mu\text{Ci}$ of Zn-75. Once the activated tracer isotope is used the empty (having once contained an activated tracer isotope with a half-life ≤ 120 days) are sealed in a container and held in storage until transferred to Tracerco North America headquarters in Pasadena, Texas, for eventual disposal through Tracerco's Texas radioactive material license. Tables 11, 12 and 16 of Tracerco's DFP have been amended to include the additional costs associated with Swage-Lok activated impurities (MN-54 & Zn-65).
4. Attached is the Certificate of Financial Assurance, which includes the applicable unsealed byproduct materials (Mn-54 & Zn-65) with atomic numbers 3 through 83 with a half-life greater than 120 days which is authorized on Tracerco's license. Please note that the attached certificate obligates Tracerco to obtain the increased amount of financial assurance once the NRC has accepted our cost estimates. Tracerco currently has financial assurance in the form of a letter of credit (LC) in place for the previous cost estimate of \$7,868. Upon The NRC's approval of our amended DFP we will initiate action to increase the amount of the current LC to \$12, 182.
5. While Tracerco does have down-hole storage at its Newark, Delaware facility for sealed sources not qualifying for financial assurance, it does not have any volume of onsite subsurface material containing residual radiation.
6. A statement on the means for adjusting estimates and funding levels has been added as a note at the bottom of Table 16 of Tracerco's DFP.



07-28386-01

Tracerco NRC License No. ~~07-28386-07~~ DFP Addendum
December 24, 2013

Pg. 3 of 3

L.W.

The above references DFP revisions required amending pages 1, 8, 10, 12, 14, 15, 17, and 19 of the DFP dated August 30, 2013. Subsequently, each of these addendums are note by an amended date od December 24, 2013.

Hopefully the above information and attachments will enable the NRC to complete its review of Tracerco's DFP. Contact Norman Lanier at 281-291-7769 if additional information or clarification is required regarding the DFP cost adjustment estimate.

Best regards,



Norman P. Lanier
Corporate Radiation Safety Officer

- Attachments:
1. Tracerco Decommissioning Funding Plan (2013-08-30, Amended: 2013-12-24)
 2. Certification of Financial Assurance (2013-12-24)
 3. Swage-Lok Irradiation Information Sheet



Decommissioning Funding Plan

August 30, 2013

(Amended December 24, 2013)

Facility Description Summary

Re: NUREG-1757, Vol. 3, Appendix A, Section A.3.4

NRC License number and type:

License No. 07-28386-01

Specific License (10 CFR Part 30)

Types and quantities of materials authorized under the license listed above.

Although Tracerco is licensed for various sealed and unsealed materials Krypton 85 gas (40 Ci), H-3 (1 mCi), Mn-54 (1 Ci), and Zn-65 (1 Ci) are the only radioactive material requiring financial assurance.

Description of how above licensed materials are used.

Kr-85 gas and H-3 are used for industrial process tracer studies at temporary job sites. Kr-85 will only be stored in a ready-to ship DOT Type A package for inventory, not used, at Tracerco's authorized permanent storage facilities. While in storage, Kr-85 will remain in the sealed ready-to-ship Type A package. H-3 will not be stored for inventory at any Tracerco authorized storage facility. H-3 will be transferred from Tracerco's North America corporate headquarters in Pasadena, Texas (TX Lic. No. L03093) to Tracerco's NRC license no. 07-28386 on an as needed (job-by job) basis. Each quantity transfer will only be as much as is required for the job at hand. The typical amount usually required for a job is ≤ 250 mCi. The H-3 will be transferred at a concentration not to exceed 1 mCi/ml. The H-3 will be provided sealed 300 cc stainless steel sample cylinders with a needle valve and sealed cap at each end. The H-3 will not be handled in an open air fashion while in possession under Tracerco's NRC license. The H-3 will remain contained in a sealed system at all times, thus eliminating potential contamination issues. Upon completion of the job at hand the residual H-3 will be returned to Tracerco's corporate headquarters (TX Lic. No. L02096) in Pasadena, Texas for storage and/or reuse. Empty (having once contained activated tracer isotopes with half-life ≤ 120 days) Swedge-lok containers with activated impurities (≤ 1 μ Ci Mn-54 & ≤ 44 μ Ci Zn-65) are stored in a sealed container for eventual transfer to Tracerco's North America headquarters in Pasadena, Texas and eventual disposal under Tracerco Texas radioactive material license.

Description of facility, including buildings, rooms, grounds, and description where particular types of materials are used.

Tracerco's facilities are used to store Kr-85 gas. Tracerco facilities are not 'for use' sites for Kr-85 gas. Each facility has a secured room or area used for Kr-85 gas storage. Kr-85 gas is stored in Type A packages at Tracerco's permanent source storage facilities when not in use at temporary job sites. The source storage area at Tracerco's Newark, DE facility is a fenced cage located in the northeast corner of a 48 ft. x 48 ft. open shop area, adjacent to a 48 ft. x 48 ft. enclosed office area. The exterior construction of the facility is cinder block and concrete. The source storage area is approximately 9 ft. x 6 ft., surrounded on three sides with concrete block walls and a front fenced wall with a locked entrance gate. The source storage area at Tracerco's Merrillville, IN facility is enclosed room located in the northeast corner of a 42 ft. x 59 ft. open shop area, adjacent to a 36 ft. x 43 ft. enclosed office area. The exterior construction of the facility is metal walls. The source storage room is approximately 13 ft. x 16 ft.. Two side walls are metal and two side walls are wood construction. The source storage room is secured with a locked entrance door.

Quantities of materials or waste accumulated before shipping and disposal.

Being a gas, no Kr-85 waste will be accumulated before shipping and storage. H-3 will not be held in storage. Mn-54 and Zn-65 Swage-Lok impurities products will be held to ≤ 1 Ci ea.

Decommissioning Funding Plan

August 30, 2013

Table 1**Number of Dimensions of Facility Components**

Re: NUREG-1757, Vol. 3, Appendix A, Tabel.A.3.5

Name of room, laboratory, or area: Source storage area located at Newark, DE facility**Level of Contamination:** None to minimum

Component	Number of Components	Dimensions of Component	Total Dimensions
Glove Boxes	0	NA	NA
Fume Hoods	0	NA	NA
Lab Benches	0	NA	NA
Sinks	0	NA	NA
Drains	0	NA	NA
Floors	1	9 ft. x 6 ft.	9 ft.x 6 ft.
Walls	3	9 ft. x 8 ft., (2) 6 ft. x 8 ft..	21 ft. x 8 ft.
Ceilings	0	NA	NA
Ventalation/Ductwork	0	NA	NA
Hot Cells	0	NA	NA
Equipment/Materials	0	NA	NA
Soil Plots	0	NA	NA
Storage Tanks	0	NA	NA
Storage Areas	1	NA	NA
Radwaste Areas	1	NA	NA
Scrap Recovery Areas	0	NA	NA
Maintenance Shop	0	NA	NA
Equipment Decon Areas	0	NA	NA
Other (Specify)	0	NA	NA

NA - Not Applicable

Decommissioning Funding Plan

August 30, 2013

Table 1**Number of Dimensions of Facility Components**

Re: NUREG-1757, Vol. 3, Appendix A, Tabel.A.3.5

Name of room, laboratory, or area: Source storage room located at Merrville, IN facility**Level of Contamination:** None to minimum

Component	Number of Components	Dimensions of Component	Total Dimensions
Glove Boxes	0	NA	NA
Fume Hoods	0	NA	NA
Lab Benches	0	NA	NA
Sinks	0	NA	NA
Drains	0	NA	NA
Floors	1	13 ft. x 16 ft.	13 ft. x 16 ft.
Walls	4	(2) 16 ft. x 8 ft., (2) 13 ft. x 8 ft.	58 ft. x 8 ft.
Ceilings	0	13 ft. x 16 ft.	13 ft. x 16 ft.
Ventilation/Ductwork	0	NA	NA
Hot Cells	0	NA	NA
Equipment/Materials	0	NA	NA
Soil Plots	0	NA	NA
Storage Tanks	0	NA	NA
Storage Areas	1	NA	NA
Radwaste Areas	1	NA	NA
Scrap Recovery Areas	0	NA	NA
Maintenance Shop	0	NA	NA
Equipment Decon Areas	0	NA	NA
Other: Gang Box (SS bunker)	1	32 in. x 61 in. x 50 in.	32 in. x 61 in. x 50 in.
Other: Wood Shelving	1	40 in. x 86 in. x 96 in..	40 in. x 86 in. x 96 in..

NA - Not Applicable

Decommissioning Funding Plan
August 30, 2013

Table 2

Planning and Preparation (Work Days)
Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.6

Activity	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Preparation of Documentation for Regulatory Agencies	0	0	0
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 40.42(g)(1), 70.38(g)(1), or 72.54(g),	0	0.25	0
Development of Work Plans	0.25	0.25	0
Procurement of Special Equipment		0.5	
Staff Training	0.5	0	0
Characterization of Radiological Condition of facility (including sampling, soil and tailings analysis, if applicable)	0.25		0
Other: Venting area	0	0	1
TOTALS	1	1	1

Notes:

Health Physic services will be provided by Tracerco's Radiation Protection Advisor group from Tracerco's global headquarters in the United Kingdom

RSO services will be provide by Tracerco's Corporate RSO from Tracerco's North American headquarters

Radiation Technician and/or laborer services will be provided by Tracerco's radiation trained onsite workforce

Decommissioning Funding Plan
August 30, 2013

Table 3(a)**Decontamination or Dismantling of Radioactive Facility Components (Work Days)**

Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.7

Name of room, laboratory, or area: Source storage area located at Newark, DE facility**Level of Contamination:** None to minimum

Component	Decontamination Method	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Glove Boxes	NA	0	0	0
Fume Hoods	NA	0	0	0
Lab Benches	NA	0	0	0
Sinks	NA	0	0	0
Drains	NA	0	0	0
Floors	NA	0	0	0
Walls	Ventilate	0	0	0
Ceilings	NA	0	0	0
Ventilation/Ductwork	NA	0	0	0
Hot Cells	NA	0	0	0
Equipment/Materials	Ventilate	0	0	0
Soil Plots	NA	0	0	0
Storage Tanks	NA	0	0	0
Storage Areas	Ventilate	0	0	0
Radwaste Areas	Ventilate	0	0	0
Scrap Recovery Areas	NA	0	0	0
Maintenance Shop	Ventilate	0	0	0
Equipment Decon Areas	NA	0	0	0
Other: (specify)	NA	0	0	0
TOTALS		0	0	0

NA - Not Applicable

Decommissioning Funding Plan
August 30, 2013

Table 3(b)**Decontamination or Dismantling of Radiative Facility Components (Work Days)**

Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.7

Name of room, laboratory, or area: Source storage room located at Merrville, IN facility**Level of Contamination:** None to minimum

Component	Decontamination Method	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Glove Boxes	NA	0	0	0
Fume Hoods	NA	0	0	0
Lab Benches	NA	0	0	0
Sinks	NA	0	0	0
Drains	NA	0	0	0
Floors	Ventilate	0	0	0
Walls	Ventilate	0	0	0
Ceilings	Ventilate	0	0	0
Ventilation/Ductwork	NA	0	0	0
Hot Cells	NA	0	0	0
Equipment/Materials	Ventilate	0	0	0
Soil Plots	NA	0	0	0
Storage Tanks	NA	0	0	0
Storage Areas	Ventilate	0	0	0
Radwaste Areas	Ventilate	0	0	0
Scrap Recovery Areas	NA	0	0	0
Maintenance Shop	Ventilate	0	0	0
Equipment Decon Areas	NA	0	0	0
Other: (specify)	0	0	0	0
TOTALS		0	0	0

NA - Not Applicable

Decommissioning Funding Plan
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Table 4

Restoration of Contaminated Areas on Facility Grounds (Work Days)
Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.8

Activity	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
No restoration of contaminated areas required	0	0	0
TOTALS	0	0	0

Decommissioning Funding Plan

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(Amended: December 24, 2013)

Table 5

Final Radiation Survey (Work Days)

Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.9

Activity	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Survey of area to ensure no absorbtion or pocket accumulation of Kr-85 gas	0.5	0.5	0
H-3 area wipes	0.5	0.5	0
TOTALS	1	1	0

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Table 6

Site Stabilization and Long-term Surveillance (Work Days)
Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.10

Activity	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Site stabilization not required	0	0	0
Long-term surveillance not required	0	0	0
TOTALS	0	0	0

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Table 7**Total Work Days by Labor Category (Work Days)**

Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.11

Task	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Planning and Protection (TOTALS from Table 2)	1	1	1
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3)	0	0	1
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 4)	0	0	0
Final Radiation Survey (TOTALS from Table 5)	1	1	0
Site Stabilization and Long-Term Surveillance (Totals from Table 6)	0	0	0
TOTALS	2	2	2

Decommissioning Funding Plan
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Table 8

Work Unit Cost Schedule
(Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.12)

Labor Cost Component	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Salary & Fringe (\$/year)	NA	NA	NA
Overhead Rate (%)	NA	NA	NA
Total Cost Per Year	NA	NA	NA
Total Cost Per Work Day	\$2,142.00	\$1,071.00	\$268.00

Notes:

1. NA - Information not provided; Included in daily cost
2. Health Physicists cost includes onsite day rate, travel and expenses
3. RSO daily cost includes salary, fringe benefits, overhead, travel and expenses
4. Onsite Radiation Technician/laborer cost includes salary, fringe benefits and overhead
5. The 'Total Cost Per Work Day' represent a 7.1% *CPI increase for the August 30, 2010 DFP costs

*CPI - Consumer Price Index increase from August 2010 to August 2013, compiled the Bureau of Labor Statistics

Decommissioning Funding Plan

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Table 9**Total Labor Costs by Major Decommissioning Task**

(Re: NUREG-1757, Vol. 3, Appendix A, Table A.3.13)

Task	Labor Category		
	Health Physicist	Radiation Safety Officer	Radiation Technician and/or Laborer
Planning and Protection	\$2,142.00	\$1,071.00	\$268.00
Decontamination and/or Dismantling of Radioactive Facility Components	\$0.00	\$0.00	\$268.00
Restoration of Contaminated Areas on Facility Grounds	\$0.00	\$0.00	\$0.00
Final Radiation Survey	\$2,142.00	\$1,071.00	\$0.00
Site Stabilization and Long-Term Surveillance	\$0.00	\$0.00	\$0.00
TOTALS	\$4,284.00	\$2,142.00	\$536.00

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Table 10

Packing Materials Cost (Excluding Labor Costs)
Re: NUREG -1757, Vol.3, Apendix A, Table A.3.14(a)

Waste Type	Volume (m³)	Number of Containers	Type of Container	Unit Cost of Container	Total Packing Costs
None					
TOTAL	0	0	0	\$0.00	\$0.00

Decommissioning Funding Plan
 August 30, 2013
 (Amended: December 24, 2013)

Table 11

Shipping Costs

Re: NUREG -1757, Vol.3, Apendix A, Table A.3.14(b)

Waste Type	Number of Truckloads	Unit Cost (\$/mile/truck-load)	Surcharges (\$/mile)	Overweight Charges (\$/mile)	Unit Cost of Container	Total Packing Costs
Kr-85	2 x Type A				\$500.00	\$1,000.00
Swage-Loc					\$300.00	\$300.00
TOTAL	0	0	0	0	\$800.00	\$1,300.00

Decommissioning Funding Plan
 August 30, 2013
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Table 12

Waste Disposal Costs

Re: NUREG -1757, Vol.3, Apendix A, Table A.3.14(c)

Waste Type	Disposal Volume (m³)	Unit Cost (\$/m³)	Surcharges (\$/m³ or \$/container)	Total Disposal Costs
Swage-Loks				\$1,000.00
TOTAL	0	\$0.00	\$0.00	\$1,000.00

Decommissioning Funding Plan
August 30, 2013

Table 13

Equipment/Supply Costs (Excluding Containers)
Re: NUREG -1757, Vol.3, Apendix A, Table A.3.15

Equipment/Suplies	Quantity	Unit Cost	Total Equipment/Supply Costs
High volume ventilation fan	1	\$268.00	\$268.00
Ventalation hose/duct	100 ft.	\$2.15	\$215.00
TOTAL			\$483.00

Note:

The 'Total Equipment/Supply Costs' represent a 7.1% *CPI increase for the August 30, 2010 DFP costs

*CPI - Consumer Price Index increase from August 2010 to August 2013, compiled the Bureau of Labor Statistics

Decommissioning Funding Plan

Table 14

August 30, 2013

(Amended: December 24, 2013)

Laboratory Costs

Re: NUREG -1757, Vol.3, Apendix A, Table A.3.16

Activity	Total Cost
Sampling	\$0.00
Transport of Sampling	\$0.00
Testing and Analysis	\$175.00
Other (specify)	\$0.00
TOTAL	\$0.00

Note:

Sampling, testing and analysis is not applicable to Kr-85 gas decommissioning. Sampling cost for H-3 wipes are included in HP labor cost referenced in Table 5. H-3 sample analysis cost are based on actual costs incurred for previous H-3 sampling analysis.

Decommissioning Funding Plan

Table 15
August 30, 2013

Miscellaneous Costs
Re: NUREG -1757, Vol.3, Apendix A, Table A.3.17

Cost Item	Total Cost
License Fees	\$0.00
Insurance	\$0.00
Taxes	\$0.00
Other (specify)	\$0.00
TOTAL	\$0.00

Decommissioning Funding Plan
August 30, 2013
(Amended: December 24, 2013)

Table 16

Total Decommissioning Costs
Re: NUREG -1757, Vol.3, Apendix A, Table A.3.18

Task/ Component	Cost	Percentage
Planning and Preparation (From Table 9)	\$3,481.00	3500%
Decontamination and/or Dismantling of Radioactive Facility Components (From Table 9)	\$268.00	3%
Restoration of Contaminated Areas on Facility Grounds (From Table 9)	\$0.00	0%
Final Radiation Survey (From Table 9)	\$3,213.00	32%
Site Stabilization and Long-Term Surveillance (From Table 9)	\$0.00	0%
Packing Material Costs (TOTAL from Table10)	\$0.00	0%
Shipping Costs (TOTAL from Table 11)	\$1,300.00	14%
Waste Disposal Costs (TOTAL from Table 12)	\$1,000.00	11%
Equipment/Supply Costs (TOTAL from Table 13)	\$483.00	5%
Laboratory Costs (TOTAL from Table 14)	\$0.00	0%
Miscellaneous Costs (TOTAL from Table 15)	\$0.00	0%
SUBTOTAL	\$9,745.00	100%
25% Contingency	\$2,437.00	
TOTAL DECOMMISSIONING COST ESTIMATE	\$12,182.00	

Note:

The 'Total Decommissioning Cost Estamate' represent a 7.1% *CPI increase for the August 30, 2010 DFP costs, plus additional costs associated with the inclusion of waste shipping & disposal, plus added suvey cost for H3, plus the 25% contingency cost

*CPI - Consumer Price Index increase from August 2010 to August 2013, compiled the Bureau of Labor Statistics

Tracerco's DFP will be reviewed every three years and whenever there is a significant change to its facility operation or license possession limits for byproduct materail covered under the Plan. The review will include any cost estimate increase exceeding 10%. The Consumer Price Index (CPI) will be used as a means to adujust the cost estimate.



Providing Insight Onsite

CERTIFICATION OF FINANCIAL ASSURANCE

Principle: Tracerco, a business unit of Johnson Matthey, Inc.
4106 New West drive, Pasadena, TX 77507


NRC License No. 07-28386-01
Tracerco, a business unit of Johnson Matthey, Inc
31 Albe Drive, Suite 5, Newark DE 19702
3320 E. 84th Place, Suite A/B. Merrillville, IN 46410

Issue to: U.S. Nuclear Regulatory Commission

I certify that Tracerco is licensed to possess the following types of unsealed by-product material with a half-life greater than 120 days licensed under 10 CFR Part 30 in the following amounts:

<u>Type of Material</u>	<u>Amount of Material</u>
Krypton-85	40 Curies
Hydrogen-3	1 Curie
Manganese-54	1 Curie
Zinc-65	1 Curie

I also certify that financial assurance in the amount of \$12,182 will be obtained upon the NRC's approval of Tracerco's Decommissioning Funding Plan cost estimates, as described by 10 CFR Part 30.


Norman P. Lanier
Corporate Radiation Safety Officer

12-24-13
Date



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Texas A&M University
Nuclear Science Center
Irradiation Information Sheet

Run Information

Run Time: 14.366 hours
14 + 21
Decay Time: 18 hours
Desired Activity: 0 mCi
Core Position: A4
Thermal Flux: 8.192E+12
Flux: peak flux

Material Information

Material: Swagelok
Isotope of Interest: Al-28
Mass: 33 g

Isotope	End of Irradiation Activity	End of Decay Activity
Al-28	32.916 Ci	0 mCi
Na-24A	15.946 mCi	6.922 mCi
Cu-64	1.141 Ci	427.056 mCi
Cu-66	449.708 mCi	0 μCi
Mg-27	4.228 mCi	0 μCi
Mn-56	1.339 Ci	10.589 mCi
Mn-54N	0.441 μCi	0 μCi
Fe-59	5.022 μCi	5 μCi
Si-31	711.641 μCi	6 μCi
Zn-65	43.88 μCi	44 μCi
Zn-69m	507.595 μCi	205 μCi
Ti-51	476.616 μCi	0 μCi
Cr-51	305.461 μCi	300 μCi
Cr-55	259.608 μCi	0 μCi

Thank you, and Gig 'Em.