

January 21, 2016

Dennis Lawyer
Health Physicist
U.S. Nuclear Regulatory Commission
Division of Nuclear Materials Safety
License No. 52-25361-01MD & 52-25361-02
Control No. 588543

03038114

REC'D 1 01 25 16 PM 12:30

SUBJECT: Additional Information Concerning Application for a License Amendment.

Dear Mr. Lawyer:

For your review, find the new Decontamination and Decommissioning Cost Estimate submitted to Lantheus by Philotechnics.

If you need additional information, don't hesitate on contact me.

Regards,



Eduardo Díaz-Montes, R.Ph., BCNP, RSO
Senior Manager of Operations
Lantheus Medical Imaging
787.765.5598 ext. 2503
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588543

NMSS/RGN1 MATERIALS-002

From: Lawyer, Dennis <Dennis.Lawyer@nrc.gov>

Sent: Wednesday, November 18, 2015 12:55 PM

To: Diaz, Eduardo

Subject: Lantheus Medical Imaging, Request for Additional Information Concerning Financial Assurance, Control 588543

Dear Mr. Diaz,

This is in reference to your letter dated October 22, 2015, providing a decommissioning funding plan for Nuclear Regulatory Commission License No. 52-25361-02, Docket No. 03038114. In order to continue our review, we need the following additional information:

1. You are not required to submit financial assurance for your Nuclear Regulatory Commission License No. 52-25361-01MD. You may deduct the cost for decommissioning this license from your decommissioning funding plan. No response is needed for this item.
2. 10 CFR 30.35(e)(1)(iv) requires that each decommissioning funding plan requires a certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning. Please provide a Certification of Financial Assurance. Guidance is provided in NUREG-1757, Volume 3, Appendix A.
3. The estimates of the annual salary labor rates appears low. 10 CFR 30.35(e)(1)(i)(A) requires that the decommissioning funding plan be calculated using the cost of an independent contractor to perform all decommissioning activities. Please provide evidence that you can pay an independent contractor these rates as listed in table 3.12, Worker Unit Cost Schedule.

The labor estimates were taken directly from the latest published data from the Bureau of Labor Statistics for the worker categories shown in Puerto Rico. Previous correspondence with NRC on other projects similar to this indicated they preferred labor rates that were representative of the local area. However, I changed this to reflect nationwide averages as published by the BLS. I also changed the per diem calculation to reflect all project personnel will be from outside the local area; so all will be paid per diem in addition to their regular pay.

4. The number of containers in section 3.14 (a) packing material costs seems to be inaccurate. A B-25 box typically holds 90 cubic feet and thus you would need 11 containers for the concrete. Also, 65 cubic feet of waste would need normal sized drums, instead of 2. Please review this section, provide additional justification or make corrections.

These were errors on my part, and I corrected them accordingly.

5. The shipping costs in section 3.14(b) seems inaccurate. It appears the \$2.00 per mile was not included in the calculation for transportation. Please recalculate the table. The spreadsheet was corrected to properly account for the mileage charge. I also changed the miles to reflect the actual distance between Miami and Oak Ridge, and increased the rate from \$2 to \$3.

6. The shipping costs of ocean transport is unclear. The note states to add \$50,000 for final transport. There are two truckloads and the cost shown is \$75,000 instead of \$100,000 that would be expected. Please clarify or recalculate.

We don't know anyone who has shipped radioactive waste over ocean waters via vessel. No shipping company is willing to provide us with an estimate for a hypothetical shipment of Class 7 material. In past estimates we said \$50,000 for ocean transport, which seemed reasonable to the NRC—at least, to my knowledge they never questioned it. It seems reasonable to increase that to \$75,000.

7. The unit cost of waste is shown to be \$0.5 per pound. This is based on the material being acceptable to the US Ecology Grandview, Idaho. Please provide evidence of the cost of disposal and a discussion why your waste would be acceptable for US Ecology Grandview, Idaho location.

That was an error on my part; I meant to say Richland but then put in the price for Grandview. Obviously the waste would not be acceptable at Grandview, Idaho. Instead, it would be sent to a licensed low-level waste processor (Energy Solutions Oak Ridge) for eventual disposal at Clive, Utah. Estimated market rate is \$7.00/lb. This is a conservative (high) estimate, because at the time of actual decommissioning, a lower rate for such a large volume of waste could likely be negotiated. Additionally, no credit is taken for scrap, resale or salvage value.

We will continue our review upon receipt of this information. Please reply to my attention at the Region 1 Office (Address below) and refer to Mail Control No. 588543. If you have technical questions regarding this letter, please call me at (610) 337-5366.

Please note that you may not reply to this letter by return e-mail. Your reply must be in writing by letter, facsimile (610-337-5269), or signed letter attached to an email. If we do not receive a reply from you within 30 calendar days from the date of this e-mail, we will assume that you do not wish to pursue your application.

Region 1 Office Mailing Address: Licensing Assistance Team, US Nuclear Regulatory Commission Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406-2713.

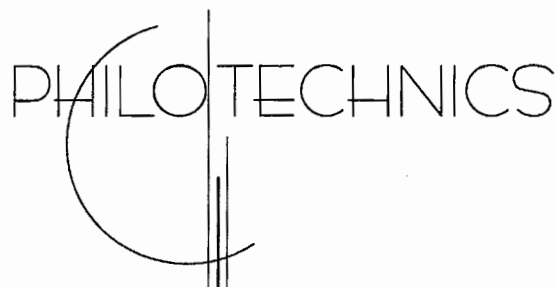
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d

**Decontamination and Decommissioning
Cost Estimate
for
Nuclear Pharmacy**

Lantheus Medical Imaging
150 Frederica Costa Street, Suite #1
San Juan, Puerto Rico

Prepared by:



Philotechnics, Ltd.
201 Renovare Boulevard
Oak Ridge, TN 37830

September 2015
(Revised December 2015)

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I. Executive Summary

Lantheus Medical Imaging (Lantheus) operates facilities in San Juan, Puerto Rico under the authority of U.S. Nuclear Regulatory Licenses 52-25361-01MD and 52-25361-02. To estimate future decommissioning costs, Lantheus contracted Philotechnics, Ltd. to develop facility decommissioning cost estimates in accordance with the guidance provided in NUREG 1757, "Consolidated NMSS Decommissioning Guidance". The facility consists of a nuclear pharmacy, 11 MeV cyclotron, and preparation and examination rooms.

Philotechnics had developed a detailed cost estimate in 2009 and updated it in 2012. Because the facility configuration and authorized uses of radioactive materials are essentially unchanged since that time, this report describes only the process of updating the cost estimate. As such, this report should be used as an addendum to the detailed report developed in March 2009.

Major cost changes result from changes in labor rates and waste disposal costs.

Cost estimates were developed using conservative assumptions regarding likely extent and duration of remediation activities. Remediation was assumed to proceed to unrestricted release. Cost estimates were prepared in accordance with and in the format of NUREG 1757 "Consolidated NMSS Decommissioning Guidance"¹ Volume 3. Per NUREG 1757 a contingency of 25% is required to be added to decommissioning estimates to address unidentified and unanticipated conditions. The overall estimate for the San Juan facility is:

Estimate	25% Contingency	TOTAL
\$1,279,491	\$319,873	\$1,599,364

II. Cost Update Process

Cost estimates for decommissioning activities were based on the methodology contained in the US Nuclear Regulatory Commission's (NRC) NUREG 1757 and 10 CFR 30.35. This methodology was modified and supplemented as necessary to account for realities associated with project field implementation at the San Juan site.

Radioactive Waste Management

Philotechnics provides waste brokerage and decontamination and decommissioning (D&D) services throughout the nation. The estimated costs for

¹ "Consolidated NMSS Decommissioning Guidance", NUREG-1757, US Nuclear Regulatory Commission, September 2006, Washington, DC.

packaging, transportation and disposal, as well as labor needs, are realistic estimates based on experience and contractual arrangements with waste processors and disposal facilities.

Realistic assumptions were made concerning the likely extent and duration of necessary remedial activities. Remediation to unrestricted levels (i.e., the facility could be released for any future use without restrictions) was assumed, meaning there are no long term costs associated with site surveillance and monitoring following decommissioning.

The radioactive materials of concern at this site are primarily long-lived activation products. It is assumed decommissioning activities will begin within a few months after cyclotron operation ceases; short-lived activation products will have decayed to negligible levels. All waste resulting from the cyclotron operations and decommissioning will be shipped to Energy Solutions in Oak Ridge, Tennessee for disposal at Clive, Utah. Estimated price is \$7.00 per pound. This is equivalent to the current market rate; however, at the time of actual decommissioning a discounted rate may be available for such a large volume of waste. Therefore, this estimate is conservative.

In the past, we estimated \$50,000 for ocean transport. This was increased to \$75,000 for this estimate.

Decommissioning Labor Cost

Annual salaries reflect wages published in May 2014 by the U.S. Department of Labor, Bureau of Labor Statistics (BLS). This is the most recent data available. Specifically, the following labor categories and salaries are used:

	Value	Occupation Code, Location
Project Manager	\$94,950	11-9021, USA Average
Shipper	\$57,530	53-1031, USA Average
HP Technician	\$75,960	19-3051, USA Average
Skilled Laborer	\$42,730	47-4041, USA Average
Admin	\$34,500	43-6014, USA Average

A 100% margin is calculated into the final labor cost for the project.

Living expenses are taken from U.S. Department of Defense per diem rates published September 2015. The per diem rate is \$323 per day for San Juan. All project staff are paid the daily living allowance since they are assumed to be from outside the local area. The daily living expenses were multiplied by 7 days per week then divided by 5 workdays per week to correctly incorporate living expenses into the daily wage rate.

This decommissioning plan will be evaluated at least every 3 years or more frequently if the amounts or types of material at the facility change, facility conditions or operations change, changes occur in expected decommissioning procedures, or to account for inflation.

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
U.S. Nuclear Regulatory Licenses 52-25361-01MD and 52-25361-02
Types and quantities of materials authorized under the licenses listed above:
The facility is in operation. Therefore, activation products are present in building materials, cyclotron components – especially in the vicinity of the targets, and on surfaces. Pharmacy areas may be contaminated; however, because any contamination present is F-18 or similar short-lived positron emitting radionuclides, the amount of contaminated material at the time of decommissioning is expected to be minimal
Description of how licensed materials are used:
Fluorine-18 is used for positron emission tomography. All other activation products are waste materials. Radioactive waste is disposed of regularly and does not accumulate more than a few drums.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
The facility consists of the Cyclotron room, maintenance area (including cooling system) and the radiochemistry/pharmacy labs. Negative ventilation takes suction from the cyclotron room and discharges on the roof through a high efficiency particulate air (HEPA) filter. Total area of these rooms is approximately 3500 square feet. The cyclotron room contains the RDS Eclipse cyclotron including spent target material, laboratory benches, and accumulated waste. The radiochemistry area contains laboratory benches and three hot cells.
Quantities of materials or waste accumulated before shipping or disposal
A few drums of high-activity, short lived waste are stored for several months (up to a year) to allow decay of (primarily) Co-56 to levels at which it can be safely handled. Additionally, a drum or two of low activity waste typically accumulate before shipping. Waste storage space is limited.

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Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area: Cyclotron Vessel: Yoke and lead shielding			
Level of Contamination:		Low; some activated equipment and structures	
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)
Glove Boxes			ft3
Fume Hoods			ft3
Lab Benches			ft3
Sinks			ft3
Drains			ft3
Floors			ft2
Walls			ft2
Ceilings			ft2
Ventilation/Ductwork			ft3
Hot Cells			ft3
Equipment/Materials			22000 lb
Soil Plots			ft2
Storage Tanks			ft3
Storage Areas			ft3
Radwaste Areas			ft3
Scrap Recovery Areas			ft3
Maintenance Shop			ft3
Equipment Decon Areas			ft3
Concrete shields			lb
Concrete floor	5'x5'x1' deep for removal		25 ft3
		Feature/Equipment Mass	22000 lb
		Waste Fraction	1.00
		Waste Mass	22000 lb

NONNEGOTIABLE

Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area: Cyclotron Concrete shield blocks			
Level of Contamination:		Low	
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)
Glove Boxes			ft3
Fume Hoods			ft3
Lab Benches			ft3
Sinks			ft3
Drains			ft3
Floors			ft2
Walls			ft2
Ceilings			ft2
Ventilation/Ductwork			ft3
Hot Cells			ft3
Equipment/Materials			ft3
Soil Plots			ft2
Storage Tanks			ft3
Storage Areas			ft3
Radwaste Areas			ft3
Scrap Recovery Areas			ft3
Maintenance Shop			ft3
Equipment Decon Areas			ft3
Composite shielding			84620 lb
Lead Shielding			19380 lb
		Feature/Equipment Volume	104000 lb
		Waste Fraction	1.00
		Waste Volume	104000 lb

Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area: Balance of facility, minus cyclotron and shielding				
Level of Contamination: Low				
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	2		48	ft3
Fume Hoods	4		600	ft3
Lab Benches/tables/casework	1		750	ft3
Sinks	2		6	ft3
Drains	1		3	ft3
Floors	0		3425	ft2
Walls	0		7250	ft2
Ceilings	0		3425	ft2
Ventilation/Ductwork	1		232	ft3
Hot Cells	3		244	ft3
Equipment/Materials			1000	ft3
Soil Plots	0		0	ft2
Storage Tanks			0	ft3
Storage Areas			0	ft3
Radwaste Areas			75	ft3
Scrap Recovery Areas			0	ft3
Maintenance Shop			0	ft3
Equipment Decon Areas			0	ft3
Concrete shields			0	lb
Concrete floor				ft3
		Feature/Equipment Volume	2883	ft3
		Waste Fraction	0.05	
		Waste Volume	144.15	ft3
		Density (lb/ft3)	15	
		Waste Mass	2162.25	lb

3.6 PLANNING AND PREPARATION

(Work Days)

Estimate the number of workdays, by specific labor category, that will be required to complete planning and preparation activities. Include all labor categories, including Supervisor, Foreman, Craftsman, Technician, Health Physicist, Laborer, Clerical, and others as needed.

Activity	Project Mgr/Health Physicist	Shipper	HP Technician	Radiation Workers	Clerical
Preparation of Documentation for Regulatory Agencies	2	5			1
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 40.42(g)(1), or 70.38(g)(1)	2				0.5
Development of Work Plans	5		2		5
Procurement of Special Equipment	5				1
Staff Training	2	1	2	6	2
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	2		4		
Other (specify) Mobilization	1	1	2		
TOTALS	19	7	10	6	9.5

**3.7 DECONTAMINATION OR DISMANTLING OF RADIOACTIVE FACILITY COMPONENTS
(Work Days)**

Estimate the number of workdays, by specific labor category, that will be required to complete decontamination and/or dismantling activities for each facility component. Copy and complete this table as necessary for each room, laboratory, or area. Rooms, laboratories, or areas with similar levels of contamination may be consolidated in one table.

Name of room, laboratory, or area:							
Level of Contamination:		Low					
Component	Decon Method	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Glove Boxes	Remove/Disp						
Fume Hoods	Remove/Disp	1		1	2	4	1
Lab Benches	Remove/Disp				2	4	0.1
Sinks	Remove/Disp	0.25			0.25	0.25	0.1
Drains	Remove/Disp				0.25	0.25	0.1
Floors	Scabble				1	2	0.1
Walls	Remove/Disp				1		0.1
Ceilings	Vac/Wipe				1		0.1
Ventilation/Ductwork	Remove/Disp	2		1	2	4	2
Hot Cells	Remove/Disp	3		2	6	12	3
Equipment/Materials	Sur/Rem/Disp	4		2	8	24	0.1
Soil Plots	Sample						
Storage Tanks	N/A						
Storage Areas	Remove/Disp						
Radwaste Areas	Remove/Disp	0.25		0.5	0.5	1	0.25
Scrap Recovery Areas	N/A						
Maintenance Shop	Remove/Disp						
Equipment Decontamination	Remove/Disp						
Shield blocks	Remove/Disp	2		5	4	8	2
Cyclotron	Remove/Disp	2		5	4	8	2
TOTALS		14.5		16.5	32	67.5	10.95

3.8 RESTORATION OF CONTAMINATED AREAS ON FACILITY GROUNDS
(Work Days)

Estimate the number of work days, by specific labor category, that will be required to restore contaminated areas on the facility grounds.

Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Restore Floors	2		1	5	10	1
Restore Walls						
Restore Roof						
Restore Utilites						
TOTALS	2		1	5	10	1

3.9 FINAL RADIATION SURVEY

(Work Days)

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.

Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
FSS Setup	2					1
Survey Packages	1					1
Class 1	5			10		1
Class 2	2.5			5		0.5
Class 3	2.5			5		0.5
TOTALS	13		0	20	0	4

3.10 SITE STABILIZATION AND LONG-TERM SURVEILLANCE
(Work Days)

Estimate the number of work days, by specific labor category, that will be required to complete site stabilization and long-term surveillance activities.

Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
TOTALS	0		0	0	0	0

3.11 TOTAL WORK DAYS BY LABOR CATEGORY

Enter the total work days for each specific labor category from the applicable table above (i.e., from the bottom rows of Tables 3.6 through 3.10).

Task	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Planning and Preparation (TOTALS from Table 3.6)	19		7	10	6	9.5
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	14.5		16.5	32	67.5	10.95
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	2		1	5	10	1
Final Radiation Survey (TOTALS from Table 3.9)	13		0	20	0	4
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0		0	0	0	0

3.12 WORKER UNIT COST SCHEDULE

Estimate labor costs (including salary, fringe benefits, and corporate overhead). Include all appropriate labor categories, including Supervisor, Foreman, Craftsman, Technician, Health Physicist, Laborer, Clerical, and other personnel.						
Labor Cost Component	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Salary (\$/year)	\$94,950		\$57,530	\$75,960	\$42,730	\$34,500
Overhead Rate (%)	100%		100%	100%	100%	100%
Total Cost Per Year	\$189,900		\$115,060	\$151,920	\$85,460	\$69,000
Living Expenses (PD*7/5) ¹	\$452		\$452	\$452	\$452	\$452
Total Cost Per Work Day ²	\$1,183		\$895	\$1,037	\$781	\$718

¹ Per Diem Rate: \$323 per day.

² Based on 260 work days per year (e.g., 260).

3.13 TOTAL LABOR COSTS BY MAJOR DECOMMISSIONING TASK

Multiply the estimated work days for each specific labor category (from Table 3.11) by the total cost per work day for the corresponding labor category (from Table 3.12), and enter the results in the table below. Then, add across all labor categories to determine the total labor costs for each major decommissioning task.

Labor Cost Component	Project Mgr/Health Physicist	0	Shipper	HP Technician	Radiation Workers	Clerical	Total Labor Cost
Planning and Preparation	\$22,469	\$0	\$6,263	\$10,365	\$4,685	\$6,817	\$50,600
Decontamination and/or Dismantling of Radioactive Facility Components	\$17,147	\$0	\$14,763	\$33,168	\$52,710	\$7,858	\$125,647
Restoration of Contaminated Areas on Facility Grounds	\$2,365	\$0	\$895	\$5,183	\$7,809	\$718	\$16,969
Final Radiation Survey	\$15,374	\$0	\$0	\$20,730	\$0	\$2,870	\$38,974
Site Stabilization and Long-Term Surveillance	\$0	\$0	\$0	\$0	\$0	\$0	\$0

**3.14 PACKAGING, SHIPPING, AND DISPOSAL OF RADIOACTIVE WASTES
(Excluding Labor Costs)**

(a) Packing Material Costs

Estimate the types and volumes of waste expected to be generated, along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.					
Waste Type	Volume (ft3)	Number of Containers	Type of Containers	Unit Cost of Container	Total Packaging Costs
DAW	75	1	B-25	\$2,200	\$2,200
Concrete	965	2	20' Sealand	\$2,000	\$4,000
Contaminated Lead	65	2	B-25	\$2,200	\$4,400
Metal	242	1	20' Sealand	\$2,000	\$2,000
TOTAL					\$12,600

(b) Shipping Costs

Estimate the types and volumes of waste expected to be generated, along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.

Waste Type	Number of Truckloads	Unit Cost (\$/mile/truckload)	Ocean Transport*	Overweight Charges(\$/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	0.25	\$3.00	1		900	\$675
Concrete	1.5	\$3.00	1		900	\$4,050
Contaminated Lead	0.25	\$3.00	1		900	\$675
Metal	1	\$3.00	1		900	\$2,700
Ocean Transport						\$75,000
TOTAL	3					\$83,100

* Add \$75,000 to final transportation cost to account for ocean transport

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unit disposal cost (including any volume based surcharges). Add any surcharges that are based on the number of containers of waste along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.

Waste Type	Disposal Volume (ft3)	Density (lb/ft3)	Disposal Mass (lbs)	Unit Cost	Surcharges (\$/ft3 or \$/container)	Total Disposal Costs
DAW	75	15	1125	7.00	1	\$7,875
Concrete	965	90	86870	7.00	1	\$608,090
Contaminated Lead	64.6	300	19380	7.00	1	\$135,660
Metal	242	100	24162.25	7.00	1	\$169,136
TOTAL	1346					\$920,761

3.15 EQUIPMENT/SUPPLY COSTS (Excluding Containers)

Estimate the quantity of equipment and supplies required for decommissioning and multiply that quantity by the appropriate unit costs.			
Equipment/Supplies	Quantity	Unit Cost	Total Equipment/Supply Cost
Protective Clothing	200	\$4	\$800
Respirators	10	\$50	\$500
Instrumentation	5	\$100	\$500
Air Fare (round trip)	5	\$700	\$3,500
Crane and Crew (days)	2	\$3,000	\$6,000
TOTAL			\$11,300

3.16 LABORATORY COSTS

If applicable, estimate the costs for analyses to be performed by an independent third party laboratory.			
Activity	Quantity	Unit Cost	Total Item Cost
Sampling & Analysis	20	\$250	\$5,000
Transport of Samples	20	\$10	\$200
Testing and Analysis			\$0
Other (specify)			
TOTAL			\$5,200

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees (Reciprocity)	\$1,900
Insurance	\$8,795
Taxes	\$1,697
Other (specify): Security	\$1,949
TOTAL	\$14,341

3.18 TOTAL DECOMMISSIONING COSTS

Enter the total costs reported in Tables 3.13, 3.14(a)-(c), 3.15, 3.16, and 3.17 into the appropriate cells below, and add them to obtain a subtotal. Add to the subtotal a contingency allowance in the amount of 25 percent of the total decommissioning cost estimate. Also, calculate for each task/component the percentage it represents of the total.		
Task/Component	Cost	Percentage
Planning and Preparation (from Table 3.13)	\$50,600	4.0%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	\$125,647	9.8%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	\$16,969	1.3%
Final Radiation Survey (From Table 3.13)	\$38,974	3.0%
Packing Material Costs (TOTAL from Table 3.14(a))	\$12,600	1.0%
Shipping Costs (TOTAL from Table 3.14(b))	\$83,100	6.5%
Waste Disposal Costs (TOTAL from Table 3.14(c))	\$920,761	72.0%
Equipment/Supply Costs (TOTAL from Table 3.15)	\$11,300	0.9%
Laboratory Costs (TOTAL from Table 3.16)	\$5,200	0.4%
Miscellaneous Costs (TOTAL from Table 3.17)	\$14,341	1.1%
SUBTOTAL	\$1,279,491	100.0%
25% Contingency	\$319,873	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	\$1,599,364	125.0%