

15.0 FINANCIAL ASSURANCE

The original Decommissioning Funding Plan (DFP) (MDNR 1997) was based on the assumption that complete removal of the licensed radioactive material might be required. While that assumption has proven to be overly pessimistic, the cost estimate provided in the original DFP serves as an upper bound and the basis for the financial assurance vehicle issued by the MDNR. In April 2003, a revised cost estimate for decommissioning the site was submitted to the NRC in a revision to the DFP (MDNR 2003).

The original cost estimate projected that the cost of site characterization would be approximately \$2.5 million and that the cost of complete removal and disposal of the thorium-bearing slag materials would be approximately \$10 million. Actual costs for the subsurface characterization sampling and survey work were approximately \$3.5 million, and it is estimated that the cost to complete the remaining open items under the preferred decommissioning alternative will be less than \$1 million in 2004 dollars.

On February 3, 1997, the MDNR issued a Statement of Intent in which it committed to seek a total of \$12.5 million from the Michigan Legislature through the appropriate process. That Statement of Intent is still in effect and in excess of the projected funds needed to complete the decommissioning process for the site.

The following sections summarize the information presented in the latest revision of the DFP, with four main modifications: the funding estimates have been increased for the unlikely possibility that all materials demolished on the site will be disposed of as radioactive waste; the projected costs of a final status survey of the surface soils of the site have been added; labor categories have been revised from those in the DFP to match the decommissioning organization as described in Section 9 of this DP; and unit labor rates have been updated to be stated in 2004 dollars.

15.1 COST ESTIMATE

Decommissioning activities that remain to be completed involve:

- Removing the LCTS building and separate concrete slab.
- Cutting and capping the LCTS piping below the ground surface.
- Making local repairs to the clay cover as a result of removing the building and piping.
- Performing a final status survey to verify that no licensed materials have been brought to the surface.
- Performing a post-closure gamma radiation survey over the site.
- Preparing the documentation describing the final radiological status of the site and requesting license termination.

The following general assumptions were used to prepare the cost estimate:

- Transportation and disposal services for any radioactive wastes will be obtained through a licensed waste broker;
- The preferred “no action” alternative is approved;
- Work inside radiologically controlled areas will be performed using existing, approved radiation work procedures;
- Radiation Safety Personnel will be onsite during decommissioning activities involving the handling of unencapsulated radioactive materials;
- All wastes generated during decommissioning will be disposed of as low-level radioactive wastes (LLW).

15.1.1 Cost Estimation Methodology

The proposed decommissioning option does not require the removal of subsurface soils and debris having residual thorium radioactivity. Waste volumes are those associated with small amounts of existing sample-derived wastes, piping from the LCTS, debris associated with the removal of the LCTS building, and debris from the demolished concrete slab. All of these wastes will be characterized, and it is possible, even likely, that none or only a small amount will contain radioactivity in excess of the surface release limits. As presented in Section 12, the types and quantities of potential radioactive waste are as follows:

- Approximately 8 cubic feet of sample-derived waste (one 55-gallon drum)
- Approximately 24 cubic feet of piping and equipment from the LCTS (approximately three 55-gallon drums)
- Approximately 108 cubic feet of concrete from the structure
- Approximately 54 cubic feet of concrete from the separate slab

The cost estimates include characterization, packaging, and disposal of all wastes as LLW to account for uncertainty. Estimates are shown in 2004 dollars.

15.1.2 Decontamination Methodology

This section outlines the major procedural aspects involved in the decontamination and decommissioning of the leachate collection system, building, and concrete slab used for decontamination.

The LCTS consists of six leachate-extraction wells, associated piping, and a building, which was designed to house equipment for the treatment of leachate. The building is discussed separately below.

LCTS components (piping, valves, extraction wells, etc.) will be terminated below the ground surface and rendered inaccessible. The removed piping and components will be surveyed to identify the presence and extent of residual surface radioactivity levels.

LCTS equipment identified as containing residual surface radioactivity in excess of the release limits will either be decontaminated on site or (if decontamination is ineffective or impracticable) will be sized and packaged for disposal at an approved radioactive waste disposal facility. No extraordinary or reagent-facilitated decontamination is anticipated as the volume of waste having residual radioactivity in excess of approved limits is expected to be minimal.

It is assumed that only minor, if any, residual surface radioactivity will be encountered on floors, walls, ceilings, and other surfaces of the building and the decontamination pad. Building and decontamination pad surfaces identified as having residual surface radioactivity in excess of the release limits will either be decontaminated on site or (if decontamination is ineffective or impracticable) will be sized and packaged for disposal at an approved radioactive waste disposal facility. No extraordinary or reagent facilitated decontamination is anticipated as the volume of waste having residual radioactivity in excess of approved limits is expected to be minimal.

15.1.3 Restoration

After the building, decontamination pad, and the LCTS system piping is removed, the MDNR will restore the disturbed surface of the clay cover over the disposal cell in accordance with design specifications developed for that task. After the surface of the clay cover has been restored, a post-closure gamma radiation survey will be performed on a systematic grid over the entire cover to demonstrate that the cover is attenuating radiation as expected. Upon determination that cover is performing as expected, the disturbed areas of the cover will be provided with appropriate seeding to minimize erosion.

15.1.4 Final Status Survey (FSS)

A final radiological status survey (FSS) of the surface soils of the cover will be performed to verify that the approved post-decommissioning radiological criteria have been achieved. The FSS involves the collection of a thin veneer of soils from selected locations of the surface of the cover. The soil samples will be submitted to an independent analytical laboratory for radiological analysis. The basic design of the FSS has already been developed and is reported in Section 14.0 of this DP. The sample design calls for sampling of a single surface soil-survey unit that has been subdivided into two strata. Considering the worst case, it is safe to assume that no more than 60 surface-soil samples (including a 20-percent buffer for QA samples) will be required to achieve the data quality objectives for the sampling event.

15.1.5 Decommissioning Cost Estimate

The estimated remaining cost to complete the decommissioning of the site is approximately \$500,000 including 25-percent contingency. MDNR estimates that it has spent approximately \$3.5 million to date. Considering that the cost estimate for the remaining work is estimated to be less than \$1.0 million, the revised cost estimate is well within the original estimate of \$12.5 million and the revised cost estimate projected in the April 2003 revision of the DFP.

The remaining decommissioning tasks to be completed are itemized in Table 15–1. Table 15–2 provides unit labor rates from which the cost estimates are derived. Table 15–3 through Table 15–8 provide estimates of the costs broken down by task. Table 15–9 provides a cumulative summary of the estimated costs for the remaining decontamination and decommissioning activities at the Tobico Marsh SGA site.

The unit labor costs shown in the tables contain contractor overhead and profit. Equipment, supplies, and miscellaneous expenses are included in the tables as “other direct costs” (ODCs) and (aside from contracted analytical laboratory services) are not itemized separately due to their small dollar value. To be conservative, the cost estimates assume that characterization of waste will involve sampling and analysis. In reality, wastes may be characterized using process knowledge.

Table 15–1 Major Activities Associated with Decommissioning and License Termination

Description	Cost Estimated in Table
Planning and Preparation	Table 15–3
Radioactive Waste Characterization and Disposal	Table 15–4
Specifications and Procurement Assistance	Table 15–5
MDNR/NRC Correspondence and Meetings	Table 15–6
Site Radiological Training & Surveys	Table 15–7
Final Status Radiological Survey & Report	Table 15–8

Table 15–2 Unit Labor Rates

Classification	Unit Labor Rates (per Hour)
Project Manager	\$125
Field Superintendent	\$95
Radiological Engineer	\$125
Health and Safety Officer	\$125
Field Technician	\$60
Quality Assurance Specialist	\$125
Waste Management Officer	\$120
Contracts Administration	\$80
Clerical Support	\$55

Table 15–3 Planning and Preparation

Staff	Hours	Rate	Cost
Project Manager	24	\$125	\$3,000
Field Superintendent	60	\$95	\$5,700
Radiological Engineer	60	\$125	\$7,500
Quality Assurance	20	\$125	\$2,500
Waste Management	20	\$120	\$2,400
Health and Safety	20	\$125	\$2,500
Clerical Support	13	\$55	\$715
Other Direct Costs (ODCs)	NA	NA	\$500
Total			\$24,815

Table 15-4 Radioactive Waste Characterization & Disposal

Table 15-4-A Procurement of Laboratory Services

Staff	Hours	Rate	Cost
Project Manager	1	\$125	\$125
Field Superintendent	8	\$95	\$760
Radiological Engineer	2	\$125	\$250
Waste Management	2	\$120	\$240
Contracts Administration	4	\$80	\$320
ODCs	NA	NA	\$100
Total			\$1,795

Table 15-4-B Sample and Analysis of Radioactive Waste

Staff	Hours	Rate	Cost
Project Manager	6	\$125	\$750
Field Superintendent	24	\$95	\$2,280
Radiological Engineer	24	\$125	\$3,000
Field Technician	12	\$60	\$720
Quality Assurance	8	\$125	\$1,000
Health and Safety	12	\$125	\$1,500
Waste Management	12	\$120	\$1,440
ODCs	NA	NA	\$12,000
Total			\$22,690

Table 15-4-C Procurement and Oversight of Radioactive Waste Removal

Staff	Hours	Rate	Cost
Project Manager	2	\$125	\$230
Field Superintendent	16	\$95	\$1,520
Radiological Engineer	8	\$125	\$1,000
Field Technician	16	\$60	\$960
Waste Management	12	\$120	\$1,440
Health and Safety	12	\$125	\$1,500
Quality Assurance	6	\$125	\$750
Contracts Administration	4	\$80	\$320
Clerical Support	2	\$55	\$110
ODCs	NA	NA	\$1,000
Waste Broker Services	NA	NA	\$40,300
Total			\$49,130

Table 15-5 Specifications and Procurement Assistance

Table 15-5-A Specifications for Removal/Termination of the Building, Slab, and LCTS Piping

Staff	Hours	Rate	Cost
Project Manager	16	\$125	\$2,000
Field Superintendent	70	\$95	\$6,650
Radiological Engineer	30	\$125	\$3,750
Quality Assurance	8	\$125	\$1,000
Clerical Support	37	\$55	\$2,035
ODCs	NA	NA	\$1,000
Total			\$16,435

Table 15-5-B Procurement Assistance

Staff	Hours	Rate	Cost
Project Manager	40	\$125	\$5,000
Field Superintendent	80	\$95	\$7,600
Radiological Engineer	16	\$125	\$2,000
Health and Safety	10	\$125	\$1,250
Clerical Support	9	\$55	\$495
Contracts Administration	8	\$80	\$640
ODCs	NA	NA	\$1,500
Total			\$18,485

Table 15-5-C Removal/Termination of Building, Slab, and Piping

Staff	Hours	Rate	Cost
Project Manager	32	\$125	\$4,000
Field Superintendent	80	\$95	\$7,600
Radiological Engineer	80	\$125	\$10,000
Field Technician	80	\$60	\$4,800
Quality Assurance	10	\$125	\$1,250
Clerical Support	7	\$55	\$385
Health and Safety	80	\$125	\$10,000
Demolition Activities	NA	NA	\$40,000
ODCs	NA	NA	\$3,000
Total			\$81,035

Table 15-6 MDNR/NRC Correspondence and Meetings

Staff	Hours	Rate	Cost
Project Manager	120	\$125	\$15,000
Field Superintendent	40	\$95	\$3,800
Radiological Engineer	40	\$125	\$5,000
Health and Safety	40	\$125	\$5,000
Clerical Support	18	\$55	\$990
Contracts Administration	20	\$80	\$1,600
ODCs	NA	NA	\$5,000
		Total	\$36,390

Table 15-7 Site Radiological Training & Surveys

Table 15-7-A Radiological Training

Staff	Hours	Rate	Cost
Project Manager	16	\$125	\$2,000
Field Superintendent	16	\$95	\$1,520
Field Technician	32	\$60	\$1,920
Radiological Engineer	40	\$125	\$5,000
ODCs	NA	NA	\$2,500
Total			\$12,940

Table 15-7-B Site Radiological Surveys

Staff	Hours	Rate	Cost
Project Manager	28	\$125	\$3,500
Field Superintendent	36	\$95	\$3,420
Field Technician	144	\$60	\$8,640
Radiological Engineer	100	\$125	\$12,500
Clerical Support	14	\$55	\$770
ODCs	NA	NA	\$5,000
Total			\$33,830

Table 15-7-C Quarterly Smears

Staff	Hours	Rate	Cost
Project Manager	4	\$125	\$500
Field Superintendent	4	\$95	\$380
Field Technician	40	\$60	\$2,400
Radiological Engineer	6	\$125	\$750
ODCs	NA	NA	\$500
Total			\$4,530

Table 15–8 Radiological Final Status Survey

Staff	Hours	Rate	Cost
Project Manager	40	\$125	\$5,000
Field Superintendent	40	\$95	\$3,800
Field Technician	80	\$60	\$4,800
Radiological Engineer	50	\$125	\$6,250
Analytical Laboratory Services	60 Samples	\$250/Sample	\$15,000
Other ODCs	NA	NA	\$3,000
Total			\$37,850

Staff	Hours	Rate	Cost
Project Manager	60	\$125	\$7,500
Field Superintendent	150	\$95	\$14,250
Radiological Engineer	200	\$125	\$25,000
Quality Assurance	40	\$125	\$5,000
Clerical Support	80	\$55	\$4,400
ODCs	NA	NA	\$2,000
Total			\$58,150

Table 15–9 Summary of Cost Estimates

Description	Table	Cost Estimate Summary
Unit Cost for Workers	2	NA
Planning and Preparation	3	\$24,815
Radioactive Waste Characterization and Disposal	4	\$73,615
Specifications and Procurement Assistance	5	\$115,955
MDNR/NRC Correspondence and Meetings	6	\$36,390
Site Radiological Training & Surveys	7	\$51,300
Final Radiological Status Survey & Report	8	\$96,000
	Subtotal	\$398,075
Contingency	25%	\$99,520
	Grand Total	\$497,595

15.2 CERTIFICATION STATEMENT

A certification statement is not included with the DP because the MDNR has chosen to use a financial assurance mechanism that is not one or more of the three certifications prescribed in 10 CFR 30, 40, and 70.

15.3 FINANCIAL MECHANISM

On February 3, 1997, the MDNR issued, a “Statement of Intent” as the financial assurance vehicle in accordance with the requirements of 10 CFR 40.36. In the Statement of Intent, the MDNR committed to seek a total of \$12.5 million from the Michigan Legislature through the appropriate process. That Statement of Intent is still in effect and in excess of the projected funds needed to complete the decommissioning process for the Tobico Marsh site, thus ensuring that sufficient funding will be sought. A copy of the Statement is included in Appendix N.