

ATTACHMENT XIV.A12
CLOSURE AND POSTCLOSURE CARE COST ESTIMATES
The Dow Chemical Company
Midland Plant and Salzburg Landfill Facility

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), R 299.9702 and Title 40 of the Code of Federal Regulations (CFR), Part 264, Subpart H, establishes requirements for providing financial assurance for closure and, if necessary, postclosure care. Specifically, R 299.9702(1) requires the preparation of associated cost estimates. This license application template addresses the requirement for preparing a closure cost estimate and, if necessary, a postclosure care cost estimate. The cost estimates provided in this attachment are based on the closure and postclosure care activities detailed in Template A11. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

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A12.A CLOSURE COST ESTIMATE

The closure cost estimate covers the corresponding closure activities in the approved closure plan. These activities may include, but are not limited to, removal of waste inventory, decontamination, sampling and analysis, and closure certification. The date of closure of the hazardous waste management units has not been determined. As such, it is not possible to predict, with any high degree of certainty, actual facility conditions or regulatory requirements at time of closure. Therefore, this closure cost estimate is based on closure of the unit within the next six months and includes a contingency estimate to account for media sampling and analysis, and removal based on current conditions.

The estimate assumes closure procedures are completed by a third party. The cost estimate for disposal assumes wastes will be treated and contaminated equipment disposed rather than recovered or salvaged. The total closure cost for the closure of the Dow Michigan Operations, Midland Plant and Salzburg Landfill Facility is estimated at \$236,389,000. Postclosure costs are estimated at \$20,474,000. The closure cost estimate breakdown by unit is provided in Section A12.A.1. Unit-specific work sheets are provided, as applicable, in Tables A12.A.1 through A12.A.6.

Additional cost estimate assumptions are listed below.

1. All hazardous waste will either be managed on site as described in specific closures plans or transported off site to a licensed facility in accordance with all applicable state and federal regulations.
2. Costs are based on current year costs. All labor rates reflect commercial rates and include fringe benefits, payroll burden, and taxes.
3. Total costs include a 15 percent contingency for administrative costs and a 15 percent contingency for miscellaneous operating costs.

This closure cost estimate will be maintained at the facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted annually as required by pertinent regulations or when the types and quantity of wastes received at the facility change.

A12.A.1 Closure Cost Estimate Breakdown

Table A12.A.1 Facility Closure Cost Estimate Breakdown by Unit

1.	Container Storage Areas	\$ 6,105,000
2.	Tank Systems	\$ 698,000
3.	Surface Impoundments	\$ 210,697,000
4.	32 Incinerator	\$ 2,697,000
5.	Salzburg Landfill	\$ 15,922,000
Total Facility Closure Estimate		\$ 236,389,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate

Waste Storage Area I

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 303,000
2.	Removal of Soil	NA
3.	Backfill	\$ 232,730
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 2,852
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 2,421,083
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 2,959,665
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 443,950
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 3,408,830
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 511,325
Total Closure Cost (Add Lines 12 and 13)		\$ 3,921,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate, continued

32 Building Container Storage Area (32 Pack Room)

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 152,000
2.	Removal of Soil	NA
3.	Backfill	\$ 125,875
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 5,704
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 104,250
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 387,829
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 58,174
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 451,219
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 67,683
Total Closure Cost (Add Lines 12 and 13)		\$ 519,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate, continued

830 Building Container Storage Area (830 Building)

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 152,000
2.	Removal of Soil	NA
3.	Backfill	\$ 103,917
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 2,852
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 3,000
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 261,769
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 39,265
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 306,249
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 45,937
Total Closure Cost (Add Lines 12 and 13)		\$ 353,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate, continued

32 Incinerator Offload/Storage Spots

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 152,000
2.	Removal of Soil	NA
3.	Backfill	\$ 80,875
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 7,160
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 135,163
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 375,198
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 56,280
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 436,692
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 65,504
Total Closure Cost (Add Lines 12 and 13)		\$ 503,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate, continued

703 Tank Farm Offload/Storage Spots

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 152,000
2.	Removal of Soil	NA
3.	Backfill	\$ 116,854
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 2,852
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 3,000
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 274,706
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 41,206
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 321,127
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 48,169
Total Closure Cost (Add Lines 12 and 13)		\$ 370,000

Table A12.A.2 Container Storage Areas Closure Cost Estimate, continued

Rail Car Spots

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Demolition and Removal of Containment	\$ 101,000
2.	Removal of Soil	NA
3.	Backfill	\$ 116,854
4.	Decontamination	Covered in demo
5.	Sampling and Analysis	\$ 2,852
6.	Monitoring Well Installation	NA
7.	Transportation	Covered in demo
8.	Treatment and Disposal of Waste Inventory and Other Cleanup Wastes	\$ 106,550
9.	Subtotal of Closure Costs (Add lines 1 through 8)	\$ 327,256
10.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 49,088
11.	Certification of Closure	\$ 5,215
12.	Subtotal (Add Lines 9, 10, and 11])	\$ 381,560
13.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 57,234
Total Closure Cost (Add Lines 12 and 13)		\$ 439,000

Table A12.A.3 Tank Systems Closure Cost Estimate

1163 Building

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Waste	Covered in demo
2.	Tank System Purging (ignitable wastes <i>only</i>)	NA
3.	Flushing of Tank and Piping	NA
4.	Excavation, Disassembly, and Loading	Covered in demo
5.	Demolition and Removal of Containment System	\$ 51,000
6.	Removal of Soil	NA
7.	Backfill	\$ 31,670
8.	Decontamination	Covered in demo
9.	Sampling and Analysis	\$ 5,704
10.	Monitoring Well Installation	NA
11.	Transportation	\$ 22,140
12.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	\$ 4,360
13.	Subtotal of Closure Costs (Add Lines 1 through 12)	\$ 114,874
14.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 17,231
15.	Certification of Closure	\$ 5,215
16.	Subtotal (Add Lines 13, 14, and 15)	\$ 137,320
17.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 20,598
Total Cost of Closure (Add lines 16 and 17)		\$ 158,000

Table A12.A.3 Tank Systems Closure Cost Estimate, continued

33 Building

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Waste	Covered in demo
2.	Tank System Purging (ignitable wastes <i>only</i>)	NA
3.	Flushing of Tank and Piping	NA
4.	Excavation, Disassembly, and Loading	Covered in demo
5.	Demolition and Removal of Containment System	\$ 51,000
6.	Removal of Soil	NA
7.	Backfill	\$ 42,938
8.	Decontamination	Covered in demo
9.	Sampling and Analysis	\$ 5,704
10.	Monitoring Well Installation	NA
11.	Transportation	\$ 11,070
12.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	\$ 4,360
13.	Subtotal of Closure Costs (Add Lines 1 through 12)	\$ 115,072
14.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 17,261
15.	Certification of Closure	\$ 5,215
16.	Subtotal (Add Lines 13, 14, and 15)	\$ 137,547
17.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 20,632
Total Cost of Closure (Add lines 16, 17, and 18)		\$ 159,000

Table A12.A.3 Tank Systems Closure Cost Estimate, continued

Tank Farm – All Permitted V-Tanks Within EVO Tank Farm

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Waste	Covered in demo
2.	Tank System Purging (ignitable wastes <i>only</i>)	Covered in demo
3.	Flushing of Tank and Piping	Covered in demo
4.	Excavation, Disassembly, and Loading	Covered in demo
5.	Demolition and Removal of Containment System	\$ 152,000
6.	Removal of Soil	NA
7.	Backfill	\$ 116,854
8.	Decontamination	Covered in demo
9.	Sampling and Analysis	\$ 9,832
10.	Monitoring Well Installation	NA
11.	Transportation	Covered in demo
12.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	\$ 4,360
13.	Subtotal of Closure Costs (Add Lines 1 through 12)	\$ 283,046
14.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 42,457
15.	Certification of Closure	\$ 5,215
16.	Subtotal (Add Lines 13, 14, and 15)	\$ 330,718
17.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 49,608
Total Cost of Closure (Add lines 16 and 17)		\$ 381,000

Table A12.A.4 Surface Impoundments Closure Cost Estimate

Tertiary Pond System

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Free Liquid	\$ 168,000
2.	Removal of Sludge	\$ 4,471,200
3.	Stabilization of Waste	\$ 1,500,000
4.	Removal of Containment System Components	\$ 6,250,000
5.	Removal of Concrete Structures	NA
6.	Removal of Soil	\$ 709,868
7.	Backfill	\$ 2,700,000
8.	Decontamination	\$ 1,680
9.	Sampling and Analysis	\$ 55,840
10.	Monitoring Well Installation	NA
11.	Transportation	NA
12.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	\$ 73,026,480
13.	Subtotal of Closure Costs (Add Lines 1 through 12)	\$ 88,883,068
14.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 13,332,460
15.	Certification of Closure	\$ 5,215
16.	Subtotal (Add Lines 13, 14, and 15)	\$ 102,220,743
17.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 15,333,111
18.	Landfill Closure	\$ 93,412,800
Total Cost of Closure (Add lines 16, 17, and 18)		\$ 210,967,000

Table A12.A.5 Incinerators Closure Cost Estimate

32 Incinerator

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Waste and Residue	Covered in demo
2.	Decontamination of the Unit	Covered in demo
3.	Disassembly of Ancillary Piping	Covered in demo
4.	Demolition and Loading	\$ 1,768,000
5.	Removal of Soil	NA
6.	Backfill	\$ 254,688
8.	Sampling and Analysis	\$ 8,556
9.	Monitoring Well Installation	NA
10.	Transportation	Covered in demo
11.	Treatment and Disposal of Waste Inventory and Cleanup Wastes	\$ 3,000
12.	Subtotal of Closure Costs (Add Lines 1 through 11)	\$ 2,034,244
13.	Engineering Expenses (15% of closure costs, excluding certification of closure.)	\$ 305,137
14.	Certification of Closure	\$ 5,215
15.	Subtotal (Add Lines 12, 13, and 14)	\$ 2,344,596
16.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 351,689
Total Cost of Closure (Add lines 15 and 16)		\$ 2,697,000

Table A12.A.6 Landfills Closure Cost Estimate

Dow Salzburg Landfill

Activity		Estimated Cost
1.	Installation of Compaction of 12" Base Soil for GCL	\$ 869,806
2.	Installation of base soil for Geocomposite Clay Liner	\$ 2,120,152
3.	Installation of Geomembrane	\$ 1,406,640
4.	Installation of Geocomposite Drainage Membrane (GMB)	\$ 1,174,238
5.	Installation of Cover Soil	\$ 2,319,483
6.	Installation of Topsoil	\$ 805,376
7.	Establishment of Vegetative Cover	\$ 82,253
8.	Miscellaneous site work, including installation of perimeter drainage, gas vents, storm water runoff downspouts, shaping and grading final cover.	\$ 600,000
9.	Clean cover soil for inter-cell notch areas (between cells 20-22 to 23-28 phase 1)	\$ 2,560,000
10.	Sampling and Analysis	\$ 1,456
11.	Demolition of 3600 and 3601 Buildings	\$ 95,000
12.	Subtotal of Closure Costs	\$ 12,034,404
13.	Engineering Expenses	\$ 1,805,161
14.	Certification of Closure	\$ 5,215
15.	Subtotal	\$ 13,844,779
16.	Contingency Allowance (15% of closure costs, engineering expenses, and cost of certification of closure.)	\$ 2,076,717
Total Cost of Closure		\$ 15,922,000

A12.B POSTCLOSURE COST ESTIMATE
 [R 299.9702(1) and 40 CFR §264.144]

The postclosure care cost estimate covers activities that will be performed after closure of the landfill unit or any unit with waste left in place. These activities include maintaining the integrity of the containment system and the monitoring system and performing postclosure monitoring. The postclosure care activities are presented in Section A11.B.4 of Attachment XIV.A11. Postclosure care estimates are prepared assuming a 30-year time period for postclosure care. The associated postclosure care cost estimates for all units, active and previously closed (i.e., Container Storage Areas, Tank Systems, 32 Building Incinerator, WSA IIA & IIB, Closed Diversion Basin, Open Waste Water Conduits A, B, C-1, C-2, & C-3, and 703 & 830 Incinerators), located within the footprint of the closed 1925 Landfill will be included in the Corrective Action cost estimate section of this license reapplication. Postclosure monitoring and maintenance for all units located within the footprint of the 1925 Landfill are consistent with the approved 1925 Landfill Corrective Action Monitoring and Maintenance Plan.

The postclosure cost estimate breakdown by unit is provided in Section A12.B.1. Unit-specific work sheets are provided, as applicable, in Tables A12.B.2 through A12.B.4. Total costs include a 15 percent contingency.

This postclosure cost estimate will be maintained at the facility. It will be revised whenever a change in the closure/postclosure plan affects the cost of closure and postclosure.

A12.B.1 Postclosure Care Cost Estimate Breakdown

Table A.12.B.1 Facility Postclosure Cost Estimate Breakdown By Unit

1.	Tertiary Pond System	\$ 9,511,000
2.	Sludge Dewatering Facility	\$ 1,758,000
3.	Dow Salzburg Landfill	\$ 9,205,000
Total Facility Postclosure Estimate		\$ 20,474,000

Table A.12.B.2 Annual Postclosure Care Cost Estimate

Tertiary Pond (T-Pond) System

Activity		Estimated Cost
"NA" listed as the Estimated Cost for activities not expected to be performed.		
1.	Removal of Leachate	Corrective action
2.	Site Security	Corrective action
3.	Maintenance of Vegetative Cover	\$ 182,700
4.	Maintenance and Inspection	Corrective action
5.	Groundwater Monitoring	\$ 57,000
6.	Deed Notation	Covered in closure
7.	Subtotal of Postclosure Costs (Add lines 1 through 7)	\$ 239,700
8.	Engineering Expenses (15% of postclosure costs, excluding certification of postclosure.)	\$ 35,955
9.	Certification of Postclosure	Covered in closure
10.	Subtotal (Add lines 8, 9, and 10)	\$ 275,655
11.	Contingency Allowance (15% of postclosure care costs, engineering expenses, and cost of certification of postclosure.)	\$ 41,348
Total Annual Cost of Postclosure Care (Add lines 10 and 11)		\$ 317,003
Annualized costs are multiplied over 30 years		\$ 9,511,000

Table A.12.B.3 Annual Postclosure Care Cost Estimate

Sludge Dewatering Facility

Activity		Estimated Cost
If certain activities are not expected to be performed, enter "NA" as the Estimated Cost.		
1.	Removal of Leachate	Corrective action
2.	Site Security	Corrective action
3.	Maintenance of Vegetative Cover	\$ 33,300
4.	Maintenance and Inspection	Corrective action
5.	Groundwater Monitoring	\$ 11,000
6.	Deed Notation	NA
7.	Subtotal of Postclosure Costs (Add lines 1 through 7)	\$ 44,300
8.	Engineering Expenses (15% of postclosure costs, excluding certification of postclosure.)	\$ 6,645
9.	Certification of Postclosure	Covered in closure
10.	Subtotal (Add lines 7, 8, and 9)	\$ 50,945
11.	Contingency Allowance (15% of postclosure care costs, engineering expenses, and cost of certification of postclosure.)	\$ 7,642
Total Annual Cost of Postclosure Care (Add lines 10 and 11)		\$ 58,587
Annualized costs are multiplied over 30 years		\$1,758,000

Table A.12.B.4 Annual Postclosure Care Cost Estimate

Dow Salzburg Landfill

Activity		Estimated Cost
1.	Removal of Leachate	Corrective action
2.	Site Security	Corrective action
4.	Maintenance and Inspection	\$ 112,000
5.	Environmental Monitoring and Reporting	\$ 120,000
6.	Deed Notation	Covered in closure
8.	Subtotal of Postclosure Costs	\$ 232,000
9.	Engineering Expenses	\$ 34,800
10.	Certification of Postclosure	Covered in closure
11.	Subtotal (Add lines 8, 9 and 10)	\$ 266,800
12.	Contingency Allowance (15% of postclosure care costs, engineering expenses, and cost of certification of postclosure.)	\$ 40,020
Total Annual Cost of Postclosure Care (Add lines 11 and 12)		\$ 306,820
Annualized costs are multiplied over 30 years		\$ 9,205,000