

Attachment 4 – Closure and Post-Closure

SECTION 4 – CLOSURE PLAN

4.1 GENERAL

After Cell 1 has been developed and has begun operations, the potentially contaminated soil stockpiled on site in the Cell 2 area will be moved into Cell 1. Once the soils stockpiled on site have been placed in Cell 1, Cell 2 will be excavated to design grade with the excavated soils stockpiled north of the operational area. As Cell 2 is developed, Cell 1 will be filled to capacity and the first of three closure phases will begin over the eastern half of Cell 1. The second closure phase will begin once the southern part of Cell 2 has been filled to final grade. The final closure of the PCSMF will be completed when the facility has been filled to final grade over both Cell 1 and Cell 2.

4.2 IMMEDIATE CLOSURE

Although very unlikely, it may become necessary to close the PCSMF short of the final design capacity. Reasons for premature closure range from residential pressures, political pressures, alternate waste disposal options, to regulatory pressures.

Immediate closure would be closure of the facility at any point short of ultimate design capacity. If premature closure is required, waste soils would need to be deposited and sloped in a manner to create a positively sloped final cover at a lower elevation. The design, regulatory approval, and construction of a new final cover system would need to be completed over the entire waste footprint.

4.3 PHASED CLOSURE

The most probable closure scenario for the PCSMF is one of phased closure. Phased closure would consist of closing the facility under the following plan, in accordance with Rules R315-302-2 and to the general contours indicated on the Drawings in Appendix B.

4.3.1 Closure Sequencing

The total area of the lined facility will be approximately 6 acres that will be closed in three phases as presented in Appendix B. The lateral extent and predicted operational life for of each of the phases is as follows:

4.3.1.1 Landfill Area Associated with Phase I Closure

Phase I Closure will consist of the construction final cover over the eastern portions of the Cell 1 area that have been placed to final grade. The initial filling of Cell 1 will include the existing soils stockpiled on site as well as the bulk of the soils generated out of the Arts & Culture project.

Cell 1 is scheduled to begin operations in the third quarter of 2021 with the moving of the stockpiled soils and the bulk of the Arts & Culture soils being hauled to the site by the third quarter of 2022. Cell 2 is scheduled to begin operations in the third quarter of 2022 to be ready for the remaining soils generated out of the Arts & Culture project starting the summer of 2023. Phase I Closure would be designed and permitted in the last quarter of 2022 and constructed in the summer of 2023 and consist of approximately 2 acres of final cover.

4.3.1.2 Landfill Area Associated with Phase II Closure

Phase II Closure will consist of construction final cover over the southern portions of the Cell 2 area that have been placed to final grade. The initial filling of Cell 2 will include the remaining soils generated out of the Arts & Culture project and other city or residential projects that may require disposal of potentially contaminated soils.

Phase II Closure would be designed and permitted in the last quarter of 2023 and constructed in the summer of either 2024 or 2025 depending on the actual need for soil disposal. The estimated area to be closed in the second phase is approximately 2 acres.

4.3.1.3 Landfill Area Associated with Phase III Closure

Phase III Closure will consist of constructing the final cover over the remaining landfill footprint that have been placed to final grade. Phase III Closure would be designed and permitted near the end of the facility life in approximately 2031. The estimated area to be closed in the final closure phase is approximately 2 acres.

4.3.1.4 Total Capacity of the Site.

The approximate quantity of air space available at the PCSMF is 141,900 cubic yards (CY). The life of the facility is presented in Section 3.2.

4.3.2 Closure Procedures

Closure activities for each phase of the landfill will take place in accordance with the following procedures:

4.3.2.1 Submittal of Plans, Specifications, and QA/QC Plan

Four months before the intended closure of each of the aforementioned phases, a design package consisting of drawings, construction specifications, and a QA/QC plan will be submitted to the DWMRC. The DWMRC will have approximately 60 days to review and comment on the adequacy of the drawings, specifications and quality assurance/quality control measure envisioned for the construction. Comments from DWMRC will be incorporated into a final “bid” package for the cover installation.

4.3.2.2 Formal Notification

The Director of the DWMRC will be notified of the intent to implement the closure plan in whole or part, 60 days prior to the date projected for final receipt of waste.

4.3.2.3 Additional Closure Activities

Additional closure activities that may be required to close either the entire landfill or only one stage are as follows:

- Regrading of all side slopes where slopes are steeper than 3 horizontal to 1 vertical.
- Regrading of all the top of the landfill to 2 percent final grade.
- Finalization (including DWMRC comments) of the final cover design package. Final cover design package will include, at a minimum, plans, construction specifications, and QA/QC protocols to guide the construction of the final cover.
- Bidding and construction of final cover.
- Construction of a maintenance road over the cover.
- Construction of run-off control structures.
- Vegetation of the final cover soils.
- Preparation of As-Built drawings.
- Inspection of final cover construction by Owner (PCMC), Engineer (engineer of record) and DWMRC personnel.
- Preparation of Certificate of Closure by a Utah registered Professional Engineer.

- Submittal of required documents to the State DWMRC and to the Summit County Recorder's office.

4.4 CLOSURE COSTS

4.4.1 Planned Closure Stages

If the landfilling operations continue as proposed by this permit application, the landfill will be closed in 3 phases described in Section 4.3.1. The cost of closure for Phase I, Phase II, and Phase III are \$256,970, \$271,097, and \$301,725 respectively. Details of these estimates are provided in Appendix L – Closure / Post Closure Costs.

4.4.2 Immediate Closure

It is possible that unforeseen circumstances dictate closure of larger areas. In an attempt to prepare for the costs associated with immediate closure of a partially completed phase we have attempted to identify a "worst-case" closure scenario for the facility. The worst case situation for the PCSMF would be when Cell 1 is close to capacity but has not had final cover installed while Cell 2 has started to accept waste. The total area to be closed in this situation would be 3.8 acres (the 2.6 acre footprint of Cell 1 plus approximately 1.2 acres of Cell 2).

Details of the closure cost estimates are provided in Appendix L – Closure / Post Closure Costs.

4.4.3 Final Inspection

The DWMRC will be invited to inspect the final grading of the facility. After approval of the final grading, a schedule will be established for vegetation. Agency personnel will then be invited to return to inspect the success of the erosion control system after one year.

SECTION 5 – POST-CLOSURE PLAN

5.1 GENERAL

Post-closure financial assurance will provide for continued monitoring of ground water, surface water, and maintenance of the cover as described in the post-closure plan below. The total cost of post-closure care is estimated at \$350,000. A detailed analysis of post-closure costs is provided in Appendix L – Closure / Post Closure Costs.

5.2 POST-CLOSURE PLAN

In accordance with rules R315-302-2 and R315-303 post-closure activities at the facility will continue for 30 years, or as long as the Director or the Utah Waste Management and Radiation Control Board deems necessary for the PCSMF to be stabilized and to protect human health and the environment. The post-closure activities will include the following work:

5.2.1 Changes to Record of Title

A Plat Map and Statement of Fact concerning the location of the landfill shall be recorded with the Summit County Recorder not later than 60 days after certification of closure. The recorded document will restrict future land use.

5.2.2 Monitoring Plan

Post-closure activities will commence immediately upon closure of the total facility. The ground water and surface water structures will be monitored semi-annually.

5.2.2.1 *Ground Water*

Monitor wells (to be installed prior to the start of operations) will continue to be sampled during the 30-year post closure care period or until deemed not necessary by the Director or the WMRCB.

5.2.2.2 Surface Water

Surface water will be monitored in accordance with procedures provided in the UPDES Permit. This permit has not yet been applied for but will be obtained prior to the initiation of any work at the PCSMF.

5.2.2.3 Leachate

The only leachate management for the PCSMF will be conducted while in operation. No active leachate system or components for monitoring will be installed at this facility due to the nature of waste being managed.

5.2.2.4 Gas Monitoring

No gas collection system or components for monitoring gas will be installed at this facility due to the nature of waste being managed.

5.2.2.5 Settlement

No settlement monitoring system will be installed at this facility due to the nature of waste being managed.

5.2.3 Inspection and Maintenance

Site facilities, fences, roads, cover, and run-on and run-off systems will be inspected in accordance with the schedule presented in the post-closure cost estimate (Appendix L).

Facilities will be inspected for damage, deterioration, and impaired function with regard to the listed standards and original design. Deficiencies will be corrected promptly. Deficiencies, repairs, and restoration of function will be documented in the facility record.

SECTION 6 – POST-CLOSURE LAND USE

PCMC will design a post-closure land use plan to be implemented at the landfill 2 years prior to the end of the facilities life. PCMC will select an end use for the landfill consistent with the use of land in the vicinity of the facility. The final land use selected for the landfill will be based upon maintaining a functional cover while utilizing the land to best benefit the city. Typical end uses may range from green waste processing and composting to recreational activities, or open space. Due to the unique nature of the waste (soil) managed at the facility, post-closure land use could include vehicle parking, public work operations, or buildings.

Post-Closure Contact:

Park City Municipal Corporation
445 Marsac Avenue
Park City, Ut 84060
(435) 615-5000

APPENDIX L

Closure / Post-Closure Costs

CLOSURE COSTS (PHASE I & PHASE II)

Section 1.0 - Engineering

PHASE I

ESTIMATED DATE OF CLOSURE = 2022
APPROXIMATE CLOSURE AREA = 87,120

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	Topographic Survey	LS	\$7,500	1	\$7,500
1.2	Boundary Survey for Closure	NA			
1.3	Site Evaluation	LS	\$2,500	1	\$2,500
1.4	Development of Plans	LS	\$25,000	1	\$25,000
1.5	Contract Administration - (Bidding and Award)	LA		1	\$0
1.6	Administrative Costs - (Certification of Final Cover and Closure Notice)	LS	\$5,000	1	\$5,000
1.7	Project Management - (Construction Observation and Testing)	LS	\$5,000	1	\$5,000
1.8	Monitor Well Consultant Cost	NA			\$0
1.9	Other Environmental Permit Costs	NA			\$0
Engineering Subtotal					\$45,000

PHASE II

ESTIMATED DATE OF CLOSURE = 2025
APPROXIMATE CLOSURE AREA = 87,120

Unit Measure	Cost/Unit	No. Units	Total Cost
LS	\$7,500	1	\$7,500
NA			
LS	\$2,500	1	\$2,500
LS	\$25,000	1	\$25,000
LA		1	\$0
LS	\$5,000	1	\$5,000
LS	\$5,000	1	\$5,000
NA			\$0
NA			\$0
Engineering Subtotal			45000

Section 2.0 - Construction

PHASE I

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	Final Cover System				
2.1.1	Site Preparation/Site Grading	ACRE	\$1,500	2.0	\$3,000
2.1.2	Gas Collection Layer/Pipes	NA			\$0
2.1.3	Low permeability Layer (Soil - If Applicable)				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY			\$0
c	Soil Transportation	CY			\$0
d	Soil Placement	CY			\$0
e	Soil Amendment (compact)	CY			\$0
2.1.4	Low permeability Layer (Synthetic - If Applicable)				
a	Geotextile	NA	\$0.2	87,120	\$17,424
b	GCL	NA	\$0.6	87,120	\$52,272
c	Geomembrane (HDPE,PVC,LLDPE,etc...)	NA	\$0.6	87,120	\$52,272
2.1.5	Drainage Layer (Soil - If Applicable)				
a	Geotextile	NA			\$0
b	Sand/Gravel	NA			\$0
2.1.6	Drainage Layer (Synthetic - If Applicable)				
a	Geotextile	NA			\$0
b	Geonet/Geocomposite	NA			\$0
2.1.7	Erosion Protection Soil Layer				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY	\$1.50	4,840	\$7,260
c	Soil Transportation	CY	\$2.00	4,840	\$9,680
d	Soil Placement	CY	\$1.50	4,840	\$7,260
e	Soil Amendment (compact)	CY			\$0
2.1.8	Topsoil Layer				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY	\$1.50	1,613	\$2,420
c	Soil Transportation	CY	\$2.00	1,613	\$3,227
d	Soil Placement	CY	\$1.50	1,613	\$2,420
e	Soil Amendment	NA			\$0
2.1.9	Revegetation				
a	Seeding	ACRE	\$1,200	2.0	\$2,400
b	Fertilizing	ACRE	\$500	2.0	\$1,000
c	Mulch	ACRE	\$200	2.0	\$400
d	Tacifier	ACRE	\$200	2.0	\$400
2.2	Stormwater Protection Structures				
a	Culverts	EA			\$0
b	Pipes	NA			\$0
c	Ditches/Berms	FT			\$0
d	Detention Basins	NA			\$0
2.3	Gas Collection System				
a	Design	NA			\$0
b	Additional Equipment / Installation	NA			\$0
2.4	Leachate Collection System				
a	Design	NA			\$0
b	Additional Equipment / Installation	NA			\$0
2.5	Groundwater Monitoring System				
a	Monitor Well Installation	NA			\$0
b	Monitor Well Abandonment	NA			\$0
2.6	Site Security				
a	Lighting, signs, etc...	NA			\$0
b	Fencing and Gates	NA			\$0
2.7	Miscellaneous				
a	Performance Bonds	LS	\$10,000	1	\$10,000
b	Contract/Legal fees	LS	\$5,000	1	\$5,000
Construction Subtotal					\$176,435

PHASE II

Unit Measure	Cost/Unit	No. Units	Total Cost
ACRE	\$1,500	2.0	\$3,000
NA			\$0
NA			\$0
CY			\$0
CY			\$0
CY			\$0
CY			\$0
CY			\$0
NA	\$0.2	87,120	\$17,424
NA	\$0.6	87,120	\$52,272
NA	\$0.6	87,120	\$52,272
NA			\$0
NA			\$0
NA			\$0
NA			\$0
CY	\$1.50	4,840	\$7,260
CY	\$2.00	4,840	\$9,680
CY	\$1.50	4,840	\$7,260
CY			\$0
NA			\$0
CY	\$1.50	1,613	\$2,420
CY	\$2.00	1,613	\$3,227
CY	\$1.50	1,613	\$2,420
NA			\$0
ACRE	\$1,200	2.0	\$2,400
ACRE	\$500	2.0	\$1,000
ACRE	\$200	2.0	\$400
ACRE	\$200	2.0	\$400
EA			\$0
NA			\$0
FT			\$0
NA			\$0
NA			\$0
NA			\$0
NA			\$0
LS	\$10,000	1	\$10,000
LS	\$5,000	1	\$5,000
Construction Subtotal			\$176,435

LS - LUMP SUM
NA - NOT APPLICABLE
EA - EACH
CY - CUBIC YARD
FT - FEET

Total \$221,435
10% Contingency \$22,143
Subtotal Closure Cost \$243,578
 Inflation Factor 1.0550
Inflated Closure Cost (2% inflation) \$256,970

Total \$221,435
10% Contingency \$22,143
Subtotal Closure Cost \$243,578
 Inflation Factor 1.1130
Inflated Closure Cost (2% inflation) \$271,097

CLOSURE COSTS (PHASE III)

Section 1.0 - Engineering

PHASE III

ESTIMATED DATE OF CLOSURE = 2031
 APPROXIMATE CLOSURE AREA = 87,120

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	Topographic Survey	LS	\$7,500	1	\$7,500
1.2	Boundary Survey for Closure	NA			
1.3	Site Evaluation	LS	\$2,500	1	\$2,500
1.4	Development of Plans	LS	\$25,000	1	\$25,000
1.5	Contract Administration - (Bidding and Award)	LA		1	\$0
1.6	Administrative Costs - (Certification of Final Cover and Closure Notice)	LS	\$5,000	1	\$5,000
1.7	Project Management - (Construction Observation and Testing)	LS	\$5,000	1	\$5,000
1.8	Monitor Well Consultant Cost	NA			\$0
1.9	Other Environmental Permit Costs	NA			\$0
Engineering Subtotal					\$45,000

Section 2.0 - Construction

PHASE I

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	Final Cover System				
2.1.1	Site Preparation/ Site Regrading	ACRE	\$1,500	2.0	\$3,000
2.1.2	Gas Collection Layer/Pipes	NA			\$0
2.1.3	Low permeability Layer (Soil - If Applicable)				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY			\$0
c	Soil Transportation	CY			\$0
d	Soil Placement	CY			\$0
e	Soil Amendment (compact)	CY			\$0
2.1.4	Low permeability Layer (Synthetic - If Applicable)				
a	Geotextile	NA	\$0.2	87,120	\$17,424
b	GCL	NA	\$0.6	87,120	\$52,272
c	Geomembrane (HDPE,PVC,LLDPE,etc...)	NA	\$0.6	87,120	\$52,272
2.1.5	Drainage Layer (Soil - If Applicable)				
a	Geotextile	NA			\$0
b	Sand/Gravel	NA			\$0
2.1.6	Drainage Layer (Synthetic - If Applicable)				
a	Geotextile	NA			\$0
b	Geonet/Geocomposite	NA			\$0
2.1.7	Erosion Protection Soil Layer				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY	\$1.50	4,840	\$7,260
c	Soil Transportation	CY	\$2.00	4,840	\$9,680
d	Soil Placement	CY	\$1.50	4,840	\$7,260
e	Soil Amendment (compact)	CY			\$0
2.1.8	Topsial Layer				
a	Soil Purchase	NA			\$0
b	Soil Processing (load)	CY	\$1.50	1,613	\$2,420
c	Soil Transportation	CY	\$2.00	1,613	\$3,227
d	Soil Placement	CY	\$1.50	1,613	\$2,420
e	Soil Amendment	NA			\$0
2.1.9	Revegetation				
a	Seeding	ACRE	\$1,200	2.0	\$2,400
b	Fertilizing	ACRE	\$500	2.0	\$1,000
c	Mulch	ACRE	\$200	2.0	\$400
d	Tacifier	ACRE	\$200	2.0	\$400
2.2	Stormwater Protection Structures				
a	Culverts	EA			\$0
b	Pipes	NA			\$0
c	Ditches/Berms	FT			\$0
d	Detention Basins	NA			\$0
2.3	Gas Collection System				
a	Design	NA			
b	Additional Equipment / Installation	NA			
2.4	Leachate Collection System				
a	Design	NA			\$0
b	Additional Equipment / Installation	NA			\$0
2.5	Groundwater Monitoring System				
a	Monitor Well Installation	NA			\$0
b	Monitor Well Abandonment	NA			\$0
2.6	Site Security				
a	Lighting, signs, etc...	NA			\$0
b	Fencing and Gates	NA			\$0
2.7	Miscellaneous				
a	Performance Bonds	LS	\$10,000	1	\$10,000
b	Contract/Legal fees	LS	\$5,000	1	\$5,000
Construction Subtotal					\$176,435

LS - LUMP SUM
 NA - NOT APPLICABLE
 EA - EACH
 CY - CUBIC YARD
 FT - FEET

Total \$221,435
10% Contingency \$22,143
Subtotal Closure Cost \$243,578
 Inflation Factor 1.2387
Inflated Closure Cost (2% inflation) \$301,725

POST-CLOSURE COSTS (30 YEARS)

Section 1.0 - Engineering

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
1.1	Post-Closure Plan	LS	\$5,000	1	\$5,000
1.2	Annual Report (including results from gas, leachate, and ground water sampling - details of maintenance performed)	LS	\$1,000	30	\$30,000
a	Semiannual Site Inspections	LS	\$400	60	\$24,000
b	Plan Update	LS	\$200	30	\$6,000
Engineering Subtotal					\$65,000

Section 2.0 - Gas Collection System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	Sample Collection	LS	\$0	60	\$0
2.2	Sample Analysis	LS	\$0	60	\$0
2.3	Report (Part of Annual Report)				
Gas Collection System - Sampling Subtotal					\$0

Section 3.0 - Leachate Collection System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
2.1	Sample Collection	NA			\$0
2.2	Sample Analysis	NA			\$0
2.3	Report (Part of Annual Report)				
Leachate Collection System - Sampling Subtotal					\$0

Section 4.0 - Ground Water Monitoring System - Sampling

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
3.1	Sample Collection	LS	\$1,600	60	\$96,000
3.2	Sample Analysis	LS	\$2,400	60	\$144,000
3.3	Report (Part of Annual Report)				
Ground Water Collection System - Sampling Subtotal					\$240,000

Section 5.0 - Facility Operations and Maintenance

Item	Description	Unit Measure	Cost/Unit	No. Units	Total Cost
4.1	Cover				
a	Soil Replacement	LS	\$100	30	\$3,000
b	Vegetation/Reseeding	LS	\$50	30	\$1,500
4.2	Storm Water Protection Structures				
a	Ditch and Culvert Maintenance	LS	\$50	30	\$1,500
b	Berm and Basin Maintenance	LS	\$50	30	\$1,500
4.3	Gas Collection System				
a	System Operation	NA		30	\$0
b	System Repair	LS		30	\$0
4.4	Leachate Collection System				
a	System Operation	NA		30	\$0
b	System Repair	NA		30	\$0
4.5	Ground Water Monitoring System				
a	System Operation	NA		30	\$0
b	System Repair	LS		30	\$0
4.6	Site Security				
a	Lighting, signs, etc...	LS	\$100	30	\$3,000
b	Fencing and Gates	LS	\$100	30	\$3,000
4.7	Miscellaneous				
a					
b					
Facility Operations and Maintenance Subtotal					\$13,500

Total	\$318,500
10% Contingency	\$31,850
Total Post-Closure Cost	\$350,350