

## INSTRUCTIONS FOR LANDFILL POST-CLOSURE COST ESTIMATE WORKSHEET

This guidance has been prepared to simplify the Permittees' task of preparing post-closure cost estimate documentation in an accurate and timely manner. Following this guidance will help to lessen KDHE's time to review and approve the estimate. This form is only completed if the facility is subject to environmental monitoring during post-closure. The landfill Permittee or his/her design consultant is to use approved Design Drawings and Construction Quality Assurance (CQA) Record Drawings from past CQA events as a basis to prepare the facility's post-closure cost estimate.

- I. Make sure that you have an updated landfill Facility Site Map and an Area, Capacity, and History TABLE(s).
- II. Download the proper Post-Closure Cost Estimate Forms from the KDHE-BWM website at [http://www.kdheks.gov/waste/forms\\_swclosurecosts.html](http://www.kdheks.gov/waste/forms_swclosurecosts.html). **Make sure you use the form for the correct fiscal year and facility type. The Kansas state fiscal year begins on July 1<sup>st</sup>, and ends on June 30<sup>th</sup>.**
- III. The unit costs on the Post-Closure Cost Estimate Forms have been updated for inflation.
- IV. From your copy of the Facility Site Map, fill out all of the information at the top of the sheet.
  - a. OWNER: \_\_\_\_\_ State the name of the Permittee.
  - b. OPERATOR: \_\_\_\_\_ This is usually the same as the Permittee.
  - c. FACILITY PERMITTED AREA: \_\_\_\_\_ ACRES. This acreage is illustrated and stated on the sealed Plat or Certificate of Survey approved by KDHE-BWM.
  - d. TOTAL PERMITTED WASTE DISPOSAL: \_\_\_\_\_ ACRES. This is the final horizontal footprint of permitted waste disposal area for this type of landfill. This area is should be stated on the most recently executed Permit for the facility. This acreage is **Not** the Facility Permitted Area (FPA) acreage.
  - e. TOTAL PERMITTED WASTE AREA CERTIFIED CLOSED: \_\_\_\_\_ ACRES. This is the area that has received final cover, and if closed after 2001, was documented closed in a CQA report approved by KDHE to certify closure.
  - f. TOTAL PERMITTED VOLUME: \_\_\_\_\_ CU YDS. This can be found using the Area, Capacity, and History Table (ACH Table). It is the total amount of volume, including capacity that has already been used.
  - g. PERMITTED VOLUME AVAILABLE: \_\_\_\_\_ CU YDS. This can also be found using the ACH Table. It is the amount of volume that has not yet received waste.
  - h. DATE: \_\_\_\_\_
  - i. PERMIT No.: \_\_\_\_\_
  - j. ESTIMATOR: \_\_\_\_\_ State your name, position, and the facility or company you represent.
  - k. PERMITTED VOLUME FILLED: \_\_\_\_\_ CU YDS. This is the volume that has been used. It can be found using the ACH Table.
  - l. An updated Facility Site Map was submitted with this estimate (Yes/No): \_\_\_\_\_
  - m. Contact your KDHE-BWM Permit Manager if you have any questions.
- V. Complete all of the Line Items in the Post-Closure Cost Estimate Worksheet. If some of the Line Items are not applicable to your facility, state "NA" (Not Applicable) in the far-right column. An explanation of each specific line item can be found in the "Post-Closure Line Items" section. If KDHE's unit costs are used, write "KDHE unit cost" in the right-hand column. If you use a different unit cost, provide your source in the right-hand column.
  - a. Provide a separate sheet attached to show your calculations and include the units. Perform all calculations in the units that are listed on the closure cost estimate.
    - i. For example, if the area open is 5 acres and you are wanting to compute the volume of low permeability soil in cubic yards,  
 $5.0 \text{ acres} \times 43,560 \text{ ft}^2/\text{acre} \times 1.5 \text{ ft} \times 1 \text{ yd}^3/27\text{ft}^3 = \underline{\hspace{2cm}}$  cubic yards.
  - b. Another example is in computing the amount of vegetative cover in cubic yards:  
 $5.0 \text{ acres} \times 43,560\text{ft}^2/\text{acre} \times 1.0 \text{ ft} \times 1\text{yd}^3/27\text{ft}^3 = \underline{\hspace{2cm}}$  cubic yards.
- VI. Print, sign, and date at the bottom of the page.

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## POST-CLOSURE LINE ITEMS:

### **1.0.0 Final Cover Routine Maintenance**

- 1.0.1 Inspect soil cover, vents, flares, drainage letdowns and outfalls, etc...: Cost includes the inspection of soil cover, vents, flares, drainage letdowns, outfalls and all other structures remaining at the closed landfill.
- 1.0.2 Mowing/Trimming total acres twice per year: Cost includes mowing and trimming the final landfill cover or cap in order to prevent the growth of woody brush and trees.
- 1.0.3 Clean Drain/Vent Openings: Cost includes the cleaning of drains and vents.
- 1.0.4 Final Cover Routine Maintenance Annual Subtotal: Total of 1.0.1, 1.0.2 and 1.0.3.

### **2.0.0 FINAL COVER REPAIRS**

- 2.0.1 Remove/incorporate unacceptable materials (e.g. dead vegetation, solid waste): Cost includes the removal and/or disposal of unacceptable material that is exposed at the surface of the landfill cover.
- 2.0.2 Scarify and prepare surface: Cost includes scarifying and preparing the surface to receive additional soil to repair the cover.
- 2.0.3 Soil, on-site (excavate, transport, place, compact): Cost includes the excavation, transportation, placement and compaction of on-site soil.
- 2.0.4 Soil, off-site (purchase, transport, place, compact): Cost includes the purchase, transportation, placement and compaction of off-site soil. *Do not include this item if soil is available on-site.*
- 2.0.5 Seeding and mulching: Cost includes the purchase and application of grass seed and of 1" of straw mulch.
- 2.0.6 Fertilizer: Cost includes the purchase and application of appropriate, grass fertilizer.
- 2.0.7 **Final Cover Repairs Annual Subtotal:** Total of 2.0.1, 2.0.2, 2.0.3, 2.0.4, 2.0.5 and 2.0.6.

### **3.0.0 ACCESS ROAD REPAIRS**

- 3.0.1 Reshape/regrade subgrade: Cost includes the reshaping and regrading of access road subgrade prior to placement of gravel surface.
- 3.0.2 Gravel (purchase, transport, place): Cost includes the purchase, transportation and placement of the gravel on the road surface.
- 3.0.3 Drainage Structures (e.g. culverts): Cost includes the replacement and/or the addition of new drainage structures needed to complete access road repairs.
- 3.0.4 Riprap ditching/channels: Cost includes the purchase, transportation and placement of riprap in the ditches and channels.
- 3.0.5 **Access Road Repairs Annual Subtotal:** Total of 3.0.1, 3.0.2, 3.0.3 and 3.0.4.

### **4.0.0 SURFACE WATER MANAGEMENT O&M**

- 4.0.1 Collection system operation and maintenance (ditches, piping conveyances, outfalls, sampling points repair/replace): Cost includes everything required to operate and maintain the surface water collection system including but not limited to ditches, piping conveyances, outfalls and sampling points.
- 4.0.2 Stormwater storage (sediment pond) operation/repairs: Cost includes everything required to operate and repair sediment pond(s) for stormwater storage.

4.0.3 Sample collection ( \_\_\_events per year): Cost includes the transportation of personnel and equipment to the site and the sampling of surface water from sediment pond(s). Costs also include decontamination of the sampling. Costs are based on the number of sampling events per year multiplied by the number of sediment ponds sampled.

4.0.4 Sample analysis and reporting ( \_\_\_events per year): Cost includes analysis of sediment pond water samples. Costs are based on the number of sampling events per year multiplied by the number of sediment ponds sampled.

**4.0.5 Surface Water Management O&M Annual Subtotal:** Total of 4.0.1, 4.0.2, 4.0.3 and 4.0.4.

### **5.0.0 LEACHATE COLLECTION SYSTEM O&M**

5.0.1 Generation Rate = \_\_\_\_\_ gal./ac./yr.

5.0.2 Clean Leachate Line: Cost includes cleaning the residue from the inside of the leachate line and disposing of the material removed from the line.

5.0.3 Collection operation/maintenance (pump, piping, storage...operation/repair/replace): Cost includes the operation, the repairing and /or the replacement of leachate pumps, piping and storage systems.

5.0.4 Leachate loading, off-loading and off-site transportation: Cost includes the loading, offloading and transportation of the leachate to an off-site disposal or treatment facility.

5.0.5 Leachate Treatment/Disposal: Cost includes required treatment and/or disposal of leachate.

5.0.6 Additional/upgrades for piping, pumps and storage: Cost includes adding new or upgrading existing leachate pumps, piping and storage systems.

5.0.7 Leachate sample collection: Cost includes drawing leachate samples for analysis. The cost should also include mobilization and mileage to bring personnel on-site.

5.0.8 Leachate sample analysis and reporting: Cost includes annual leachate analysis for each unit for parameters listed in K.A.R. 28-29-107 (i)(6)(B).

**5.0.9 Leachate Collection System Annual O&M Subtotal:** Total of 5.0.1, 5.0.2, 5.0.3, 5.0.4, 5.0.5, 5.0.6 and 5.0.7.

### **6.0.0 GROUNDWATER MONITORING SYSTEM O&M**

6.0.1 Number of Wells in Approved System = \_\_\_\_\_

6.0.2 Well maintenance (e.g. protective casing (locks & hinges) repair/replacement, well pad repair/replace, etc...): Cost includes repair or replacement of well pads, repair of protective casing and padlocks. Cost includes labor and materials and should assume a minimum of 4 hours of labor per well, prorated over 30 years.

6.0.3 Abandon and plug wells: Cost includes removal and disposal of the concrete pad, the steel protective casing and a minimum of the top 10' of the well casing. It also includes plugging the well with bentonite and with completing and submitting the WWC5 well forms.

6.0.4 Rehabilitate/redevelop existing well: Cost includes labor and materials to rehabilitate or redevelop the existing well. The cost should also include mobilization and mileage to bring personnel and equipment on-site.

6.0.5 Well replacement: Cost includes replacement of 50% of the groundwater wells over the 30-year post-closure period, or 1.67% of the groundwater wells per year, and includes the complete well installation and completing

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- and submitting the WWC5 well forms.
- 6.0.6 Sample collection (2 events per year): Cost includes the transportation of personnel and equipment to the site and the sampling of the groundwater wells according to the approved Sampling and Analysis Plan. Costs also include decontamination of the sampling and depth sounding equipment. Costs are based on 2 sampling events per year multiplied by the number of wells sampled.
- 6.0.7 Sampling analysis and reporting (2 events per year): Cost includes analysis of groundwater samples from all monitoring wells within the approved system twice a year for all constituents listed in Appendix I of K.A.R. 28-29-113 for landfills and submittal of the groundwater sampling event report as defined in the Sampling and Analysis Plan.
- 6.0.8 Groundwater Monitoring System O&M Annual Subtotal:** Total of 6.0.1, 6.0.2, 6.0.3, 6.0.4, 6.0.5 and 6.0.6.
- 7.0.0 GAS MONITORING SYSTEM O&M**
- 7.0.1 Number of Gas Monitoring Probes/Wells = \_\_\_\_\_
- 7.0.2 Methane Monitoring of Probes/Wells (4 per year): Cost includes labor and equipment to monitor probes and transportation of personnel and equipment to the site. Costs are based on 4 monitoring events per year multiplied by the number of probes monitored.
- 7.0.3 Methane Monitoring at Site Boundaries and Structures (4 per year): Cost includes labor and equipment to monitor probes at the site boundaries and structures as well as the transportation of personnel and equipment to the site. Costs are based on 4 monitoring events per year multiplied by the number of probes monitored.
- 7.0.4 Sampling analysis and reporting: Cost includes submittal of a written report detailing the analysis of the gases detected during the monitoring of each of the gas probes.
- 7.0.5 **Gas Monitoring System O&M Annual Subtotal:** Total of 7.0.1, 7.0.2, 7.0.3 and 7.0.4
- 8.0.0 GAS EXTRACTION SYSTEM O&M**
- 8.0.1 Gas vents, \_\_\_\_\_ # of vents, \_\_\_\_\_ average depth
- 8.0.2 Passive System**
- 8.0.3 Passive well head turbine maintenance: Cost includes repair and replacement of turbines.
- 8.0.4 Active System**
- 8.0.5 Flare, \_\_\_\_\_ BTU/hour
- 8.0.6 Additional well installation/rehabilitate: Cost includes the labor and materials to install new gas wells, the cost to transport personnel, materials and equipment to the site and the fees to design number and location of new gas wells. Cost also includes the labor and materials to rehabilitate the gas well and the cost to transport personnel and materials to the site.
- 8.0.7 Ancillary gas equipment repair/replacement (piping, blowers, condensate collection): Cost includes the labor and materials needed to repair or replace piping, blowers and condensate collection system and the cost to transport personnel and material to the site.
- 8.0.8 Gas Extraction System O&M Subtotal:** Total of 8.0.3, 8.0.6 and 8.0.7.
- 9.0.0 CORRECTIVE ACTION EVALUATION AND IMPLEMENTATION**
- 9.0.1 Resurvey monitoring well reference points and site benchmarks (prorate for annual expenses): Cost includes resurveying the monitoring well reference points and site benchmarks. Cost should be prorated over the post-closure time period.
- 9.0.2 Remove sediments from stormwater basin(s) (prorate for annual expenses): Cost includes the labor and equipment (including the transportation of personnel and equipment) require for the removal of sediments from the stormwater basin(s) and the disposal of those sediments. Cost should be prorated over the post-closure time period.
- 9.0.3 Groundwater exceedances statistical evaluation: Cost includes the labor of a groundwater expert to evaluate exceedances of the statistical analysis of the groundwater sample analysis.
- 9.0.4 Groundwater alternate source determination: Cost includes consultant fees for performing the alternate source determination. Cost should be prorated over the post-closure time period.
- 9.0.5 Other \_\_\_\_\_  
Fill in the blank with a list of items that are deemed necessary.
- 9.0.6 Corrective Action Evaluation and Implementation Annual Subtotal:** Total of 9.0.1, 9.0.2, 9.0.3, 9.0.4 and 9.0.5.
- 10.0.0 POST-CLOSURE CARE ANNUAL COST SUBTOTAL:** Total of 1.0.4, 2.0.7, 3.0.5, 4.0.5, 5.0.9, 6.0.8, 7.0.5, 8.0.6 and 9.0.6.
- 11.0.0 Administrative Services (Post-Closure Cost Subtotal [10.0.0] X 5%): Cost = 5% of the Post-Closure Care Annual Cost Subtotal
- 12.0.0 Contingency (Post-Closure Cost Subtotal [10.0.0] X 10%): Cost = 10% of the Post-Closure Care Annual Cost Subtotal
- 13.0.0 PROFESSIONAL SERVICES (Post-Closure Cost Subtotal [10.0.0] X 5%) or Enter costs provided by third party with sources listed in line items below: Cost = 5% of the Post-Closure Care Annual Cost Subtotal or as provided by third party source.
- 13.0.1 Engineering (annual inspection and reporting, corrective action design and bid, contract management): Cost include engineering for annual inspection and reporting, corrective action design and bid, contract management.
- 13.0.2 Topographic and Boundary Survey: Cost includes labor, transportation and drafting for topographic and boundary survey.
- 13.0.3 Corrective Action Engineering Services (construction oversight, testing, reporting, certification): Cost includes engineering services for construction oversight, testing, reporting and certification.
- 14.0.0 Subtotal of Line Items 11.0.0 through 13.0.3:** Total of 11.0.0, 12.0.0, 13.0.0, 13.0.1, 13.0.2, and 13.0.3.