

Financial Assurance Workshop

KDHE



Garden City, Kansas – May 7th, 2013

Emporia, Kansas - May 14th, 2013

By

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Closure/Post Closure Cost Estimates

- **40 CFR 258.71 Financial assurance for closure.**
- **(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of all MSWLF units ever requiring a final cover as required under § 258.60 at any time during the active life in accordance with the closure plan. The owner or operator must notify the State Director that the estimate has been placed in the operating record.**
- **(1) The cost estimate must equal the cost of closing the largest area of all MSWLF unit ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see § 258.60(c)(2) of this part).**
- **(2) During the active life of the MSWLF unit, the owner or operator must annually adjust the closure cost estimate for inflation.**

Closure/Post Closure Cost Estimates

- K.S.A. 65-3407(h) authorizes and requires financial assurance before issuance or renewal of permits
- K.A.R. 28-29-2101(c)(1)...
 - (B) For each solid waste disposal area, the amount of closure financial assurance shall be calculated as the cost to complete final closure of the largest area to lack final cover at any one time before the next annual permit renewal. The calculated cost shall include the cost to complete all closure activities in a manner consistent with the approved facility closure plan.

Closure Cost Estimate

- What would it take to close the landfill on any day within the next year by a **third party** – the annual renewal period?
 - Preparing the site for construction of final cover.
 - Construct the final cover.
 - How much leachate/contact water is **currently** managed, and in case of closure, how would it be managed by a **third party**.
 - Surface water management structures and equipment.
 - Landfill gas monitoring and management systems that are **currently** in place.
 - Groundwater monitoring systems that are **currently** in place.
 - Security and safety issues at closed site.

Preparing the site for final cover

- **Is backfilling required to make sure that storm water can be managed as surface flows that will safely flow by gravity off the area to be closed?**
- **Structural backfill to be laid in lifts to ensure that the final cover does not require intensive post-closure care.**

Preparing the site for final cover

- If backfilling is impractical –
 - Excavation to create a drainage way to drain storm water off site possible? Gravity drain.
 - Design of a sump and pump system required? **Perpetual** pumping?
 - Remove the waste to create a clean close pit?
 - Other options appropriate for the site?



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Constructing the final cover

- **Site-specific design finalized and approved by KDHE?**
 - **Regulatory prescriptive cover?**
 - **Alternate cover suitable for the site approved by KDHE?**
- **Areas closed but not certified closed?**
- **Areas in intermediate cover - >12” of soil cover?**
- **Areas in daily cover.**
- **Any special features that the final cover has to include in the design?**
 - **Landfill gas wells**
 - **Leachate/Contact water dewatering wells**
 - **Post-closure use areas requiring special final covers**

Constructing the final cover

- **Some final covers may have recurring replacement costs that can have significant impacts on the length of post-closure care required and the associated post-closure costs.**
- **Alternately, site-specific alternate covers may be self-sustaining and require minimal post-closure care.**

Leachate/contact water management

- How much is currently generated?
- How is it currently managed?
 - On-site?
 - Pumped?
 - Gravity drained?
 - Evaporation ponds?
 - Recirculated into active areas?
 - Off-site?
 - Pumped and trucked?
 - Pumped into forcemain?

Leachate/contact water management

- Leachate generation trends in the past on closed areas?
- Options for management once the landfill is closed?
- Maintenance of structures such as evaporations ponds
 - How much annually after closure?
 - How long after closure?

Leachate/contact water monitoring

- **Leachate quality monitoring?**
- **Leachate levels monitoring?**
 - **Manual?**
 - **Automated?**
- **How long after closure?**
- **Used to assess termination of post-closure care associated with post-closure use of the site?**

Surface water management

- **Managed as sheet flow with terraces and released off-site?**
- **Any monitoring requirements – structural integrity(pipes, dry dams, let down pipes) and water quality?**
- **Post-closure maintenance items?**

Surface water management

- **Managed as releases from detention ponds?**
- **Any monitoring requirements – structural integrity(pipes, dams, let down pipes) and water quality?**
- **Post-closure maintenance items?**

Other sources of Water

- How much, if any, under liner drainage needs to be managed?
- In perpetuity?

Landfill gas monitoring

- **Perimeter**
 - **Probes**
 - **Bar holes**
 - **Distressed vegetation assessment**
- **On-site structures**
 - **Continuous monitors**
 - **Remote data with alarm notification**

Landfill gas monitoring

- Landfill gas collection wellheads
- Landfill disposal area Surface Emissions Monitoring
- Regulatorily required start date and end date?

Landfill gas management systems

- **Blowers**
- **Compressors**
- **Flares**
- **Incinerators**
- **Boilers**
- **Infra-red heaters**
- **Generators**
- **Processing Plants**
 - **High BTU**
 - **CNG**

Landfill gas management systems

- **Installation**
- **Maintenance**
- **Upgrades**
- **Decommissioning**
- **Length of time that such systems would be required after closure?**

Groundwater monitoring systems

- **Key during operational life of landfill**
- **Key during closure**
- **Assess length of time this is required after closure based on leachate quality within the closed landfill?**

Groundwater Clean up systems

- For sites that may require corrective action

Professional Services

- **What professions will be involved in closure and post-closure for design/construction/maintenance/monitoring – Geologists, Surveyors, Accountants, Plumbers, Heavy equipment operators, Laboratories, Security, Engineers, etc.?**
- **Costs of professional services?**

Worksheets

- **Closure Cost Estimate Worksheet**
- **Post-Closure Cost Estimate Worksheet**
- **Estimated Life Worksheet – only MSWLFs**

Landfill Closure Cost Estimate Worksheet

| | |
|---|---|
| OWNER: _____ | PERMIT No.: _____ |
| OPERATOR: _____ | ESTIMATOR: _____ DATE: _____ |
| TOTAL PERMITTED WASTE DISPOSAL _____ ACRES | Closure Plan Title: _____ Last Revision Date: _____ |
| TOTAL PERMITTED AREA CERTIFIED CLOSED: _____ ACRES | ACRES CURRENTLY OPEN: _____ (i.e., "open" means areas subject to regulation and have not been certified closed) |
| LARGEST ACREAGE REQUIRING FINAL COVER DURING THE RENEWAL PERIOD: _____ | |
| LANDFILL TYPE: _____ SUBTITLE D MUNICIPAL SOLID WASTE _____ SMALL ARID MUNICIPAL SOLID WASTE _____ INDUSTRIAL WASTE _____ CONSTRUCTION & DEMOLITION WASTE _____ WASTE TIRE MONOFILL _____ | |

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Preparing the site for construction of final cover

| | | | |
|--------------|--|---|----------|
| 1.0.0 | PREPARING SITE FOR CONSTRUCTION OF FINAL COVER | | |
| 1.0.1 | Backfill below grade areas with structural backfill | | CU. YD. |
| 1.0.2 | Construct sump and install pump(s) for perpetual pumping | 1 | Lump Sum |
| 1.0.3 | Other: Provide design and itemize | | Acre |
| 1.0.4 | Preparing Site for Construction of Final Cover Subtotal | | |

Final Cover

| | | | | | | |
|--------------|--|--|---------|--|--------|--------|
| 2.0.1 | Low Permeability Soil Layer | | | | | |
| 2.0.2 | Complete soil contouring and grading for final cover | | ACRE | | \$0.00 | |
| 2.0.3 | Clay, On-Site (excavate, transport, place, compact) (Quantity must match earthwork balance and must be guaranteed for future availability) | | CU. YD. | | \$0.00 | |
| 2.0.4 | Clay, Off-site (excavate, transport, place, compact) (Quantity must match earthwork balance) | | CU. YD. | | \$0.00 | |
| 2.0.5 | Low Permeability Soil Layer Subtotal | | | | | \$0.00 |
| 3.0.0 | Geomembrane and Drainage Layer | | | | | |
| 3.0.1 | Drainage material--sand | | CU. YD. | | \$0.00 | |
| 3.0.2 | Drainage material--geogrid | | SQ. YD. | | \$0.00 | |
| 3.0.3 | Geomembrane | | SQ. YD. | | \$0.00 | |
| 3.0.4 | Geomembrane and Drainage Layer Subtotal | | | | | \$0.00 |
| 4.0.0 | Protective Soil and Vegetative Layer | | | | | |
| 4.0.1 | Protective Soil, On-site (excavate, transport, place, compact) (Quantity must match earthwork balance and must be guaranteed for future availability) | | CU. YD. | | \$0.00 | |
| 4.0.2 | Protective Soil, Off-site (excavate, transport, place, compact) (Quantity must match earthwork balance) | | CU. YD. | | \$0.00 | |
| 4.0.3 | Vegetative Soil (Topsoil), On-site (excavate, transport, place) (Quantity must match earthwork balance and must be guaranteed for future availability) | | CU. YD. | | \$0.00 | |
| 4.0.4 | Vegetative Soil (Topsoil), Off-site (excavate, transport, place) (Quantity must match earthwork balance) | | CU. YD. | | \$0.00 | |
| 4.0.5 | Seeding and mulching | | ACRE | | \$0.00 | |
| 4.0.6 | Fertilizer | | ACRE | | \$0.00 | |
| 4.0.7 | Protective Soil and Vegetative Layer Subtotal | | | | | \$0.00 |

Some other items

| | | | | | | | |
|---------------|---|---|----------|--|--------|--|--------|
| 10.0.0 | DEMOLITION/REMOVAL SITE IMPROVEMENTS | | | | | | |
| 10.0.1 | Office/shop/maintenance and other ancillary buildings | 1 | Lump Sum | | \$0.00 | | |
| 10.0.2 | Equipment to be decommissioned (e.g., weigh scales, bulking/solidification pits, collection pits/sumps, piping, etc...) | 1 | Lump Sum | | \$0.00 | | |
| 10.0.3 | Site Utilities | 1 | Lump Sum | | \$0.00 | | |
| 10.0.4 | Demolition/Removal Site Improvements Subtotal | | | | | | \$0.00 |
| 11.0.0 | REPLACE/REBUILD SITE ACCESS CONTROLS | | | | | | |
| 11.0.1 | Fencing | | Lin. FT. | | \$0.00 | | |
| 11.0.2 | Gates | | EACH | | \$0.00 | | |
| 11.0.3 | Access barriers | | EACH | | \$0.00 | | |
| 11.0.4 | Other security equipment | 1 | Lump Sum | | \$0.00 | | |
| 11.0.5 | Replace/Rebuild Site Access Controls Subtotal | | | | | | \$0.00 |
| 12.0.0 | BORROW AREA RECLAMATION | | | | | | |
| 12.0.1 | Grading and site preparation | | ACRE | | \$0.00 | | |
| 12.0.2 | Soil, On-site (excavate, transport, place, compact) | | CU.YD. | | \$0.00 | | |
| 12.0.3 | Soil, Off-site (excavate, transport, place, compact) | | CU. YD. | | \$0.00 | | |
| 12.0.4 | Seeding and mulching | | ACRE | | \$0.00 | | |
| 12.0.5 | Fertilizer | | ACRE | | \$0.00 | | |
| 12.0.6 | Borrow Area Reclamation Subtotal | | | | | | \$0.00 |

Other issues

- **KDHE used to require cost estimates to be based on the entire permitted footprint. Since 2006, estimates are only required to cover the actual environmental exposure. This can be a significant.**
- **Updating the permit drawings has helped identify areas that need to be addressed.**
- **If permittee does not own the land, or if it is a municipal solid waste landfill, certain statutory requirements apply.**
- **Landfill gas collection and control systems may need to be installed at significant cost.**
- **Corrective action measures may need to be reassessed.**
- **Updating regulations to allow for site-specific final cover designs is now in process.**



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