

## DEQ Guidance on Closure/Post-closure Cost Estimates and Financial Assurance

**Regulatory Reference:** OAC 252:515, Subchapter 27

**Applicability.** All solid waste disposal facilities EXCEPT:

- transfer stations, processing facilities, or composting facilities that principally manage municipal solid waste;
- yard waste composting facilities;
- land disposal facilities in post-closure on the effective date of OAC 252:515 that were not required to have financial assurance at the time of closure; and
- units of the Federal government.

**Purpose.** To provide guidance on how cost estimates are calculated and to describe approved financial assurance mechanisms.

**Technical Discussion.** The Oklahoma Solid Waste Management Act identifies several important requirements with respect to cost estimates and financial assurance. The most important are:

- disposal facility owner/operators must develop and submit estimates of the cost necessary to close a solid waste disposal facility, to perform post-closure monitoring of a closed facility if required, and to perform corrective action if required;
- cost estimates are set by the DEQ and must be for the maximum cost for closure and post-closure care;
- cost estimates must be increased when required (based on non-compliance, design changes, inflation, corrective action, etc.);
- owner/operators must provide financial assurance to ensure adequate funds are available to cover those costs; and
- most landfill owner/operators must annually provide the DEQ with updates of the remaining life of the disposal facility.

### Cost Estimates

Owner/operators will frequently calculate cost estimates based on the maximum area that may ever have waste disposed. Because it would not be necessary to perform "closure" in any areas that do not have waste disposed, it is acceptable to determine cost estimates based on the areas actually used for waste disposal at the time costs are determined. For instance, if an owner/operator has a 30-acre permitted area but only 5 acres have waste disposed, cost estimates need to be calculated only on the 5 acres. In determining cost estimates, DEQ will assume all areas of a landfill that have waste disposed will require final cover unless the owner/operator can document at least intermediate cover meeting the requirements of OAC 252:515-19-52 is in place. Documentation must be a certification by a professional engineer on a 100' x 100' grid.

Subchapter 27 identifies three methods owner/operators may use to calculate cost estimates:

- use of DEQ unit costs;
- use of actual costs (Actual Cost Method), and
- use of bids (Bid Method).

### *DEQ Unit Costs*

In December 2000, the final report of a study sponsored by DEQ was released, setting justifiable unit costs for typical closure and post-closure activities related to solid waste landfills.<sup>1, 2</sup> Appendix H and I of OAC 252:515 were derived from the Report and may be used to calculate cost estimates. Assuming owner/operators use correct assumptions when completing the tables, the cost estimates calculated will be acceptable to the DEQ.

Users of Appendix H or I must keep in mind that the unit costs are as of April 1, 2002; thus, the unit costs must be updated for inflation as of April 1st of each subsequent year.<sup>3</sup> For example, the unit cost for Task 1.a. of Appendix H (Conduct Site Evaluation) is \$2,809.00. With the inflation factor for 2003 at 1.31%, then as of April 1, 2003 a unit cost of \$2,845.80 must be used for Task 1.a. If the inflation factor for 2004 is 2%, a unit cost of \$2,902.72 ( $\$2,845.80 \times 1.02$ ) must be used as of April 1, 2004.

The Appendix H and I unit costs will be updated each year and posted on DEQ's webpage at <http://www.deq.state.ok.us/lpdnew/swindex.html>.

Subchapter 27 also acknowledges there may be certain site-specific closure/post-closure tasks in the approved closure or post-closure plans that are not identified in Appendix H or I. Furthermore, Appendix H and I are primarily geared toward those activities required at landfills. Other types of solid waste facilities (regulated medical waste and waste tire facilities for example) are not required to perform many of the tasks identified in Appendix H and I, and corrective action activities may consist of many tasks that are not identified in Appendix H and I. To arrive at acceptable cost estimates, costs for these site-specific tasks must also be included in the overall cost estimate, and calculated using one of the following additional methods.

### *Actual Cost Method*

In lieu of the Appendix H or I unit costs, or when site-specific tasks must also be considered, owner/operators may submit documentation to the DEQ showing the actual cost of work performed within the previous six months as the basis for calculation of cost estimates. For example, suppose a groundwater monitoring well had to be replaced. The unit cost for this task (Appendix H, Task 2.a.) is \$42.29 per vertical linear foot. If an owner/operator was able to have this work performed in accordance with DEQ rules for \$35.00 per vertical linear foot, he could provide this information to the DEQ for an adjustment to his cost estimate for this task.

In order to use this method, the following must be provided to the DEQ for review and approval:

- a demonstration the work for which actual costs will be provided was performed within the previous six months;
- identification of the task(s) for which actual costs will be provided;
- a statement of work from the contractor, fully describing the work performed to meet the requirements of the task(s); and

---

<sup>1</sup> *Solid Waste Financial Assurance Program Report*, Cardinal Engineering, Inc., December 22, 2000.

<sup>2</sup> DEQ recognizes the unit costs should be completely reevaluated periodically. Thus, we have committed to performing a complete reevaluation of the unit costs every five years, as recommended in the Report (see OAC 252:515-27-4).

<sup>3</sup> Inflationary adjustments are discussed in the next section.

- written documentation from the contractor showing his cost to the owner/operator.<sup>4</sup>

### *Bid Method*

In lieu of Appendix H or I unit costs, or when site-specific tasks must also be considered, owner/operators may submit three bids from independent contractors showing their estimated cost for performing the work. The bids must be dated within 30 days of being submitted to the DEQ, and the average of the three bids may be used as the cost estimate.

In order to use this method, the following must be provided to the DEQ for review and approval:

- documentation the bids were obtained within 30 days of being submitted to DEQ;
- identification of the task(s) for which bids will be provided;
- a statement of work fully describing the actions necessary to complete the task(s); and
- written bids from three independent contractors not affiliated with the owner/operator. The bids must be an estimate of the contractor's cost for performing the work identified in the statement of work, on behalf of the DEQ.<sup>5</sup>

Again using the example of replacing a groundwater monitoring well, the owner/operator would submit three fully supported bids showing the estimated cost to perform the work identified in the statement of work. If three acceptable bids for replacing a monitoring well in accordance with all DEQ requirements were \$39.00, \$37.00, and \$43.00 per vertical linear foot, then the average of these is \$39.67 per vertical linear foot. This figure can be used for the cost estimate, rather than the unit cost of \$42.29.

## **Cost Estimate Adjustments**

Another important requirement related to cost estimates is that they be updated and submitted to the DEQ on the following schedule:

- April 1st of each year for all financial assurance mechanisms EXCEPT the corporate and local government test or guarantee;
- no later than 90 days after the end of the corporate fiscal year for the corporate test or guarantee;
- no later than 180 days after the end of the local government fiscal year for the local government test or guarantee; or
- any time changes to the facility design or operations, or closure, post-closure, or corrective action plans increase the costs for closure, post-closure, or corrective action.<sup>6, 7</sup>

---

<sup>4</sup> Documentation must be detailed enough to show the work performed met all DEQ requirements. For instance, it wouldn't be enough to merely say "Company X replaced monitoring well 3 for \$35.00 per vertical linear foot and here is my bill showing that this 24-foot well cost me \$840." The justification must itemize such things as personnel costs, mobilization/demobilization costs, drilling rig rental cost (from the company who rented the rig), construction details of the well, and the cost of various well components (casing, grout, bentonite, concrete pad, etc.).

<sup>5</sup> The statement of work must be detailed enough to show the proposed work will be in accordance with DEQ requirements. Using the monitoring well example again, it wouldn't be enough for a bidder to say, "I can replace a monitoring well for \$35.00 per vertical linear foot." A successful bid must itemize all activities necessary to construct a well in accordance with DEQ requirements, such as personnel costs, mobilization/demobilization costs, drilling rig rental cost (from the company who rented the rig), construction details of the well, and the estimated cost for well components (casing, grout, bentonite, concrete pad, locks, tags, etc.).

<sup>6</sup> In this instance, the revised cost estimates must be approved before the DEQ can issue the permit modification to reflect the change.

<sup>7</sup> If the revised cost estimates are approved before the figures for the annual inflationary adjustments are published, then the estimates will have to be adjusted again and submitted to the DEQ after the inflationary figures are published.

Subchapter 27 identifies two methods for adjusting cost estimates: recalculation of maximum costs or use of an inflation factor.

#### *Recalculation of Maximum Costs*

Owner/operators may update cost estimates by recalculating the estimated costs for closure, post-closure, and/or corrective action using the unit costs in Appendix H and/or I, the Actual Cost Method, or the Bid Method. When significant changes to facility design and/or closure, post-closure, or corrective action plans are required, the cost estimates **MUST** be recalculated; the inflation factor cannot be used in this instance.

#### *Use of Inflation Factor*

When there has been no significant change to facility design and/or closure, post-closure, or corrective action plans, owner/operators may use an inflation factor to recalculate the costs.

Annual inflation adjustments must be derived from either the Implicit Price Deflator for Gross Domestic Product (available on January 31st of each year), or the Implicit Price Deflator for Gross National Product (available on March 31st of each year).<sup>8</sup>

The adjusted cost estimate is determined by:

$$AE = CE \times (1 + I/100) \text{ where}$$

AE is the adjusted cost estimate;

CE is the current cost estimate; and

I is the inflation factor (%) derived from the implicit price deflator.

### **Financial Assurance**

#### *Summary*

The Oklahoma Solid Waste Management Act has required financial assurance to be in place since April 9, 1997. The Act also identifies several mechanisms that can be used to provide financial assurance, and authorizes DEQ to establish additional mechanisms. With one exception,<sup>9</sup> owner/operators may choose to fund financial assurance using a combination of two or more approved mechanisms. If more than one mechanism is used, the total amount of financial assurance for all mechanisms must equal the total cost estimates for closure, post-closure, and/or corrective action.

Financial assurance mechanisms must:

- ensure the amount of funds necessary to cover the cost of closure, post-closure, and/or corrective action will be available whenever funds are needed;
- be legally valid, binding, and enforceable under State and Federal law;
- be non-negotiable;
- be in an amount approved by the DEQ;
- indicate that the purpose is to provide funds for the adequate completion of closure, post-closure, and/or corrective action if the owner/operator fails to do so;

---

<sup>8</sup> Inflation adjustment figures are available on the DEQ's webpage at <http://www.deq.state.ok.us/lpdnew/IPD.htm>.

<sup>9</sup> Mechanisms guaranteeing performance may not be combined with other mechanisms.

- provide the name, address, telephone number, contact person, and organizational information of the owner/operator and the financial assurance issuer;
- provide information on the financial responsibility and liability limits of the issuer;
- provide a clause requiring payment to the State of Oklahoma, Department of Environmental Quality Revolving Fund as the sole beneficiary upon DEQ's certification that the owner/operator has not fully or satisfactorily performed the required closure, post-closure, and/or corrective action activities;
- provide a clause addressing termination and stating that neither the owner/operator nor the issuer can revoke or cancel the mechanism without 120-day advance notice to the DEQ;
- provide a clause requiring the issuer to provide notice to the DEQ and the owner/operator prior to renewal;
- provide a clause requiring the issuer to give DEQ a 30-day notice of the owner/operator's failure to pay any renewal fees;
- specify whether coverage is for the life of the facility through certified closure, the period of post-closure care, and/or corrective action;
- include original signatures and typed names of authorized agents of the owner/operator and issuer; and
- include documentation the signatory for the issuer has the authority to commit the issuer to payment.

#### *Updates*

Just as cost estimates are required to be updated on a regular schedule, the amount of financial assurance available is to be regularly updated also. Owner/operators must submit documentation to the DEQ on an annual basis to show that financial assurance mechanisms have been updated to account for any revisions to approved cost estimates on the following schedule:

- April 9th of each year for all financial assurance mechanisms EXCEPT the corporate and local government test or guarantee;<sup>10</sup>
- no later than 90 days after the end of the corporate fiscal year for the corporate test or guarantee;<sup>11</sup>
- no later than 180 days after the end of the local government fiscal year for the local government test or guarantee;<sup>12</sup> or
- any time changes to the facility design or operations, or closure, post-closure, or corrective action plans increase the costs for closure, post-closure, or corrective action.<sup>13</sup>

#### *Cash*

To use cash as the financial assurance mechanism, the owner/operator must provide cash, a certified check, or money order for the full amount of approved cost estimates for closure, post-closure, and/or corrective action. The monies must be deposited in the State Treasury, payable to the Department of Environmental Quality Revolving Fund.

---

<sup>10</sup> For trust funds or escrow accounts, the documentation must be a statement showing the trust or escrow balance.

<sup>11</sup> Documentation must include the information identified in OAC 252:515-27-81(c) and (d).

<sup>12</sup> Documentation must include the information identified in OAC 252:515-27-82(h).

<sup>13</sup> In this instance, documentation showing the financial assurance mechanism has been updated to reflect the revised costs must be approved before the DEQ can issue the permit modification to reflect the change.

### *Certificate of Deposit (CD)*

A CD used for financial assurance must be payable to the Department of Environmental Quality Revolving Fund and issued in an amount equal to the approved cost estimates for closure, post-closure, and/or corrective action. The issuing bank must be a state or federally chartered bank that is regulated and examined by a state or federal agency.

### *Trust Fund*

To use a trust fund for financial assurance, the trustee must be an entity with the authority to act as a trustee, and whose trust operations are regulated and examined by a state or federal agency. The trust must also contain an irrevocable assignment of funds to the DEQ. A trust agreement with original signatures, and a copy of the agreement must be submitted to the DEQ.

The trust fund for an existing disposal facility must be funded for the full amount of the approved cost estimates for closure and post-closure no later than April 9, 2011 or by the end of the facility's economic life,<sup>14</sup> whichever is less. In other words, existing disposal facilities with an economic life extending beyond April 9, 2011 must have their trust funds funded for the full amount of closure and post-closure costs no later than April 9, 2011 and the trust must remain fully funded after that time. Those with an economic life that will end prior to April 9, 2011 must have their trusts fully funded at the end of the economic life.

For new disposal facilities, trust funds must be fully funded within 15 years of the initial receipt of waste.

Trust funds for corrective action must be fully funded for the approved corrective action cost estimates within 15 years of when the corrective action remedy is selected, or one-half of the estimated length of the corrective action program, whichever is shorter.

Because cost estimates must be adjusted annually, owner/operators will need to also annually calculate the payment required for the trust. For a closure and post-closure trust fund, the payment each year is determined by:

$$NP = (CE - CV) \div Y, \text{ where}$$

NP is the next payment required;

CE is the currently approved cost estimates (adjusted as required);

CV is the amount of money currently in the trust<sup>15</sup>; and

Y is the remaining economic life.

When a trust is used for corrective action financial assurance, the payment each year is determined by:

$$NP = (RB - CV) \div Y, \text{ where}$$

NP is the next payment required;

RB is the most recent estimate of the cost of corrective action (adjusted as required);

---

<sup>14</sup> Calculation of economic life for landfills is discussed in the next section. For non-landfills, the economic life is the expected operational life of the facility.

<sup>15</sup> The initial payment into a new trust fund can be calculated by setting CV = 0.

CV is the amount of money currently in the trust; and  
Y is the remaining years in the corrective action pay-in period.

#### *Escrow Account*

To use an escrow account for financial assurance, the escrow bank must be a state or national bank located in Oklahoma and authorized to receive and hold State funds. The escrow agreement must also contain an irrevocable assignment of funds to the DEQ, and the funds placed in escrow must be fully insured and/or collateralized by the Bank's pledge of government securities. An escrow agreement with original signatures and a copy of the agreement must be submitted to the DEQ.

The escrow account for an existing disposal facility must be funded for the full amount of the approved cost estimates for closure and post-closure no later than April 9, 2011 or by the end of the facility's economic life,<sup>16</sup> whichever is less. In other words, existing disposal facilities with an economic life extending beyond April 9, 2011 must have their escrow accounts funded for the full amount of closure and post-closure costs no later than April 9, 2011, and the escrow must remain fully funded after that time. Those with an economic life that will end prior to April 9, 2011 must have their escrow fully funded at the end of the economic life.

For new disposal facilities, escrow accounts must be fully funded within 15 years of the initial receipt of waste.

Escrow accounts for corrective action must be fully funded for the approved corrective action cost estimates within 15 years of when the corrective action remedy is selected, or one-half of the estimated length of the corrective action program, whichever is shorter.

Because cost estimates must be adjusted annually, owner/operators will need to also annually calculate the payment required for the escrow. For a closure and post-closure escrow account, the payment each year is determined by:

$$NP = (CE - CV) \div Y, \text{ where}$$

NP is the next payment required;  
CE is the currently approved cost estimates (adjusted as required);  
CV is the amount of money currently in escrow<sup>17</sup>; and  
Y is the remaining economic life.

When an escrow is used for corrective action financial assurance, the payment each year is determined by:

$$NP = (RB - CV) \div Y, \text{ where}$$

NP is the next payment required;  
RB is the most recent estimate of the cost of corrective action (adjusted as required);  
CV is the amount of money currently in escrow; and  
Y is the remaining years in the corrective action pay-in period.

---

<sup>16</sup> Calculation of economic life for landfills is discussed in the next section. For non-landfills, the economic life is the expected operational life of the facility.

<sup>17</sup> The initial payment into a new escrow can be calculated by setting  $CV = 0$ .

### *Surety Bond*

For closure and post-closure costs, owner/operators may use a payment or performance surety bond for financial assurance. If a surety bond is used for corrective action costs, it must be a performance bond; payment bonds are not an authorized mechanism for corrective action financial assurance. An original and a copy of the bond must be submitted to the DEQ for approval to demonstrate it meets the following criteria:

- only those bonds issued by companies listed in Circular 570 of the U. S. Department of the Treasury may be used for financial assurance;<sup>18</sup>
- the penal sum of the bond must be at least the currently approved closure, post-closure, and/or corrective action costs (unless the bond is used in conjunction with another mechanism);
- the surety must be liable for the bond obligation in the event the owner/operator defaults; and
- a standby trust fund must be established to receive payments from a payment bond.

### *Letter of Credit (LOC)*

Owner/operators may satisfy financial assurance for closure, post-closure, and/or corrective action by obtaining an irrevocable standby LOC. An original and a copy of the LOC must be submitted to the DEQ for approval to demonstrate it meets the following requirements:

- the issuing institution must be an entity with the authority to issue letters of credit and whose letter of credit operations are regulated and examined by a federal or state agency.
- the owner/operator must provide a letter referring to the LOC by number and containing the following information:
  - (1) the name of the issuing institution;
  - (2) the date the letter of credit was issued;
  - (3) the disposal facility name and address; and
  - (4) the amount of funds assured.
- the letter of credit must:
  - (1) be irrevocable;
  - (2) be issued for a period of at least one year in an amount at least equal to the current cost estimate for closure, post-closure care and/or corrective action (unless used in conjunction with another mechanism); and
  - (3) provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution cancels the LOC.

### *Insurance*

Financial assurance for closure and/or post-closure care may be satisfied by obtaining insurance. Insurance is not authorized as a financial assurance mechanism for corrective action. An original and a copy of the insurance policy must be submitted to the DEQ for approval. Certificates of insurance are not acceptable to demonstrate financial assurance.

To qualify as a financial assurance mechanism, the insurance policy must:

- have been issued by an insurer licensed to transact the business of insurance in the State of Oklahoma, or be eligible to provide insurance as an excess or surplus lines insurer, in one or more states;

---

<sup>18</sup> Circular 570 may be found online at <http://www.fms.treas.gov/c570/c570.html>.

- be issued for a face amount at least equal to the current cost estimate for closure or post-closure care (unless used in conjunction with another mechanism);
- guarantee that funds will be available to close the facility whenever final closure occurs or to provide post-closure care for the facility whenever the post-closure care period begins, whichever is applicable;
- guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner/operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy;
- contain a provision allowing assignment of the policy to a successor owner/operator;
- include a provision that the insurer may not cancel, terminate or fail to renew the policy except for failure to pay the premium; and
- provide the insured with the option of automatic renewal of the policy at the face amount of the expiring policy.

#### *Corporate Financial Test*

Provided the corporation is financially sound, the corporate owner of a disposal facility can use its company's financial strength to assure financial assurance obligations. To qualify for this mechanism, an independent certified public accountant (CPA) must review the corporate financial records related to assets, debts, and other environmental obligations, then issue its opinion based on that review. If the CPA issues an adverse opinion, disclaimer of opinion, or other qualified opinion, the corporate financial test cannot be used for financial assurance.

Within 90 days of the close of each corporate fiscal year, the owner/operator must submit the documentation identified in OAC 252:515-27-81(b) and (c) to show the corporation can guarantee the DEQ-approved costs. If the corporation no longer meets the requirements of the financial test, then a DEQ-approved alternative financial assurance mechanism must be established within 120 days of the end of the corporate fiscal year.

#### *Local Government Test*

Provided the local government is financially sound, the local government owner of a disposal facility can use its financial strength to assure financial assurance obligations. To qualify for this mechanism, an independent certified public accountant (CPA) must review the local government's financial records related to general obligation bonds, securities, expenditures, debt service, and other environmental obligations, then issue its opinion based on that review. If the CPA issues a qualified opinion, the local government test cannot be used for financial assurance.

Within 180 days of the close of each fiscal year, the owner/operator must submit the documentation identified in OAC 252:515-27-82(h) to show the local government can guarantee the DEQ-approved costs. If the local government no longer meets the requirements of the financial test, then a DEQ-approved alternative financial assurance mechanism must be established within 210 days of the end of the local government fiscal year.

#### *Corporate Guarantee*

An owner/operator may satisfy his financial assurance requirements by obtaining a written guarantee from a corporate sponsor. To qualify, the corporate sponsor must be the direct or higher-tier parent corporation of the owner/operator, a firm whose parent corporation is also the parent corporation of the owner/operator, or a firm with a substantial business relationship with the owner/operator. If this requirement is met and the corporate sponsor otherwise meets the requirements of the corporate financial

test, then the corporate guarantee can be used. In addition, the terms of the guarantee between the corporation and the owner/operator must provide for the following:

- if the owner/operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will either perform (or pay a third party to perform) closure, post-closure care, and/or corrective action as required, or establish a fully funded trust fund in the name of the owner/operator;
- the guarantee is to remain in force unless the guarantor sends notice of cancellation by certified mail to the owner/operator and to the DEQ;
- if a guarantee is canceled by the corporation, the owner/operator must, within 90 days following receipt of the cancellation notice, obtain DEQ approved alternate financial assurance; and
- if the owner/operator fails to provide alternate financial assurance within the 90-day period, the guarantor must establish an approved alternate assurance within 120 days of receipt of the cancellation notice.

Documentation that the proposed corporate sponsor is authorized to make the guarantee as well as documentation that the corporate sponsor meets the requirements for the corporate test must be submitted to the DEQ for approval.

#### *Local Government Guarantee*

An owner/operator may satisfy his financial assurance requirements by obtaining a written guarantee from a local government sponsor. To qualify, the local government must meet the requirements of the local government test. In addition, there must be a written guarantee between the owner/operator and the local government providing for the following:

- if the owner/operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will either perform (or pay a third party to perform) closure, post-closure care, and/or corrective action as required, or establish a fully funded trust fund in the name of the owner/operator;
- the guarantee is to remain in force unless the local government sends notice of cancellation by certified mail to the owner/operator and to the DEQ;
- if a guarantee is canceled by the local government, the owner/operator must, within 90 days following receipt of the cancellation notice, obtain DEQ approved alternate financial assurance; and
- if the owner/operator fails to provide alternate financial assurance within the 90-day period, the local government must establish an approved alternate assurance within 120 days of receipt of the cancellation notice by the owner/operator.

A copy of the written guarantee as well as documentation the local government sponsor meets the requirements for the local government test must be submitted to the DEQ for approval.

#### *State Approved Mechanism*

Owner/operators may satisfy financial assurance obligations by obtaining an alternative mechanism that meets the criteria of OAC 252:515-27-71 and is approved by the DEQ.

### **Landfill Life of Site**

To ensure adequate financial assurance is available, the Oklahoma Solid Waste Management Act requires landfill owner/operators to submit information annually on the remaining landfill life. This

information and supporting documentation must be submitted no later than April 1st of each year, and represent the actual remaining life as of December 31st of the previous year. Revised life-of-site calculations must also be submitted as part of any permit modification to increase disposal capacity, as part of an out-of-state waste disposal plan, or any other facility changes that affect disposal capacity or life of the facility.

Subchapter 27 identifies the following formula to calculate the life of the facility:

$$L = \frac{[V - (P \times V)] \times D}{W} \text{ where}$$

L is the life of the facility in years;

V is the total volume of air space, in cubic yards, that is actually permitted for waste disposal;<sup>19</sup>

P is the approximate percentage of V taken up by daily cover;<sup>20</sup>

D is the approximate density, in pounds per cubic yard, of compacted waste;<sup>21</sup> and

W is the amount of waste, in pounds, received per year.<sup>22</sup>

---

<sup>19</sup> V is not based on total permitted area, but is the volume of those disposal cells that have been constructed and DEQ has authorized waste disposal activities to begin. Areas that have certified final cover should not be included in V.

<sup>20</sup> P must be 0.20 (20%) unless an alternative value can be documented.

<sup>21</sup> D must be 1000 lbs/yd<sup>3</sup> unless an alternative value can be documented.

<sup>22</sup> W must be based on scale records. For new facilities, W must be calculated by 4.4 x 365 x population served until a history of waste receipts is established.