Analysis of Subtitle D Financial Tests in Response to Public Comments

This report presents the findings of the updated (1996) analysis of financial test alternatives for financial assurance requirements under Subtitle D. The 1996 analysis evaluated 27 financial test alternatives that were identified as the best performing tests (i.e., providing the lowest combination of public and private costs) in prior analyses conducted for the proposed Subtitle D financial test. The prior analyses examined each of the 27 tests with a minimum net worth requirement of $10 million. The 1996 analysis examined each of these 27 tests in conjunction with minimum net worth requirements of one, five, and ten million dollars, for a total of 81 financial test alternatives. The 1996 analysis also examined the public and private costs of two variations of the "Meridian" financial test (submitted by commenters on the proposed financial test revisions), at each of the same three minimum net worth requirements, for an additional six financial test alternatives. Finally, the 1996 analysis also examined the public and private costs of the 1982 Subtitle C financial test for Subtitle D firms, and the private costs of allowing no financial test for financial assurance. Detailed information on the data, methodology, and results of the 1996 analysis are presented below in the following sections:

- **Section I: Analysis Methodology and Available Data**. Section I describes the methodology used to evaluate alternative financial tests, and describes the data used in this analysis.

- **Section II: Descriptions of Financial Tests.** Section II presents the financial ratio, bond rating, minimum net worth, and other financial requirements of alternative financial tests.

- **Section III: Quantitative Results for Tests Examined.** Section III provides complete results for each of the financial tests presented in Section II.

- **Section IV: Qualitative Discussion of Test Results.** Section IV discusses the financial requirements and comparative performance of the financial test alternatives presented in Section III.

- **Section V: Impact of Accounting for Financial Assurance Obligations.** Section V examines how financial tests might be affected by the accounting treatment of financial assurance obligations.

Detailed information on background data used in the analysis, test characteristics and results are presented in the following exhibits, appendix, and attachments:

- **Exhibit 1: Summary of Key Cost Model Variables.** Exhibit 1 presents a summary of the key parameters used to estimate the public and private costs of financial test alternatives.

- **Exhibit 2: Financial Test Data - Non-Bankrupt Subtitle D Firms.** Exhibit 2 presents the distribution, by net worth category, of firms included in the non-bankrupt firm sample.

- **Exhibit 3: Financial Test Data - Updated Bankrupt Firm Sample.** Exhibit 3 presents the distribution, by net worth category, of firms included in the updated bankrupt sample.

- **Exhibit 4: Updated Closure and Post-Closure Cost Estimates - Subtitle D Landfills.** Exhibit 4 presents a summary of the Subtitle D closure and post-closure care cost estimates used in the analysis.

- **Exhibit 5: Financial Test Requirements.** Exhibit 5 presents the various test requirements used in each of the 27 financial test alternatives.

- **Exhibit 6: Subtitle D Closure/Post-Closure Test Results.** Exhibit 6 presents the summary results for financial tests for Subtitle D closure and post-closure care costs, ranked according to their performance in minimizing total costs.

- **Exhibit 7: Accounting for FA Obligations: FA Obligations as Percentage of Accounting Liabilities.** Exhibit 7 presents data relating the amount of accounting liabilities of firms to apparent accounting practices for financial assurance obligations.

- **Exhibit 8: Accounting for FA Obligations: FA Obligations as a Percentage of Net Worth.** Exhibit 8 presents data relating firm size to apparent accounting practices for financial assurance obligations.

- **Exhibit 9: Bounding Analysis of Accounting Impact on Financial Test Performance.** Exhibit 9 presents results of how accounting rules and adjustments could affect the number of top-parent (non-subsidiary) firms that are able to pass the ratio or bond rating requirements of the proposed test.

- **Appendix: Subtitle D Test Results.** Appendix I presents detailed results for all of the Subtitle D financial tests in Exhibit 5.

- **Attachment I: Closure and Post-Closure Cost Accrual Methods.** Attachment I presents a summary of closure and post-closure cost accrual methods for Subtitle D firms.

- **Attachment II: Discounting for Closure and Post-Closure Costs.** Attachment II examines the effect of discounting on financial assurance for Subtitle D closure and post-closure costs.

- **Attachment III: Pass Rates by Test Elements for Subtitle D Firms.** Attachment III presents pass rates by financial test elements for five net worth categories of Subtitle D firms.

Section I: Analysis Methodology and Available Data

The methodology used for the 1996 Subtitle D corporate financial test analysis is consistent with the approach used to develop the proposed Subtitle D financial test. The data used in this analysis include updated financial data for the bankrupt and non-bankrupt firm samples, facility-specific data on the number and sizes of Subtitle D municipal solid waste landfills (MSWLFs), and revised cost estimates for closure and post-closure care.

Section I.1 describes the methodology used to compare the public and private costs of alternative financial tests. Section I.2 describes the facility-specific and firm-specific data used to develop the non-bankrupt firm sample for regulated firms and facilities. Section I.3 describes the methods and sources used to link financial data to regulated firms and facilities. Section I.4 discusses the data used in developing the bankrupt firm sample, and Section I.5 explains the basis for revised closure and post-closure care cost estimates.

I.1: Methodology for Comparing Public and Private Costs of Alternative Tests

Each of the 81 financial test alternatives examined in this analysis were evaluated using the cost-effectiveness criteria that the Agency considered in its development of the proposed financial tests (i.e., the Agency sought to minimize the sum of the public and private costs associated with using the financial test). In these prior analyses, the Agency calculated the public and private costs for each test using the following cost equations for closure and post-closure care:

$$\textbf{Public Costs} = [T * f * M * (1-r) * (1+o)]; \text{ and}$$
$$\textbf{Private Costs} = [T * (1-A) * s]$$

where,

- **T** is the total amount of obligations requiring financial assurance;
- **f** is the failure rate for RCRA firms;
- **M** is the misprediction rate of a financial test;
- **r** is the recovery rate for defaulted obligations covered by a test;
- **o** is the administrative cost associated with paying for defaulted obligations covered by the test;
- **A** is the availability of a financial test; and
- **s** is the cost of an alternative financial assurance mechanism.

The methodologies used to calculate T, A, and M for this analysis are discussed below. The estimated values for the remaining variables were taken directly from the Subtitle C and Subtitle D analyses conducted in support of developing the proposed tests, and are listed in Exhibit 1 below. A discussion of the analyses conducted to develop these estimates, and a detailed discussion and explanation of the public and private cost equations, are presented in the background document to the 1991 Subtitle C analysis[1] and referenced in the 1992 Subtitle D analysis[2].

[1] U.S. Environmental Protection Agency, Office of Solid Waste. Revisions to the Subtitle C Financial Tests For Closure, Post-Closure Care, and Liability Coverage: Background Document (40 CFR Parts 264 and 265). June 1991.

[2] U.S. Environmental Protection Agency, Office of Solid Waste. Background Document: Subtitle D Financial Tests for Closure, Post-Closure, and Corrective Action (40 CFR Part 258). December 15, 1992.

The total amount of financial assurance obligations (T) for this analysis was derived from the closure and post-closure care cost estimates for RCRA firms in the updated non-bankrupt firm sample (described in Section I.5, below). Thus, the value of T is the sum of the closure and post-closure care cost estimates shown in Exhibit 4 (see Section I.5 below). A dollar-based measure of availability (A$) was calculated directly for each test by summing the total financial assurance obligations of firms in the non-bankrupt sample (T), determining the amount of obligations assured by firms using a particular financial test, and calculating the percentage of obligations covered by the test. A non-bankrupt firm had to pass the minimum net worth requirement and the ratio requirements or the bond rating alternative of a financial test in order to use the test to assure any of its obligations. If a firm passed these requirements then it could use the test to assure part or all of its obligations, depending on whether it had sufficient net worth and/or net working capital to satisfy the multiple or additive requirements for part or all of its obligations. For example, if a financial test included a $10 million net worth additive requirement, then a firm with net worth of $100 million could cover up to $90 million of its financial assurance obligations with the test, regardless of its total amount of the obligations.

Exhibit 1
Summary of Key Cost Model Variables

Variable	Net Worth Category ($ millions)*			
	(1 – 10)	**(10 – 20)**	**(20 - 100)**	**(100+)**
Cost of Alternative Mechanism	2.5%	2.3%	2.1%	1.5%
Failure Rate	1.6%	1.5%	1.1%	0.7%
Recovery Rate	20%	20%	20%	20%
Overhead Rate	20%	20%	20%	20%

* Derived from data on the total number of manufacturing firms reported by the 1982 Enterprise Statistics, published by the Bureau of the Census, and based on the 1982 Census of Manufacturers, and from data on the average annual number of manufacturing failures, obtained from the Dun & Bradstreet Business Failure Record.

As explained in Section I.4 below, data were not available to develop firm-specific dollar estimates of closure and post-closure care costs for firms in the bankrupt sample. Therefore, it was not possible to directly calculate a dollar-based misprediction rate (M) -- i.e., the amount of financial assurance obligations associated with bankrupt firms that pass the test and later fail without covering these obligations. Therefore, a dollar-based misprediction rate for bankrupt firms ($M^{\$}$) was derived for each alternative financial test, using the following formula:

$$M^{\$} = A^{\$} * (M^{F} / A^{F})$$

where,

- $A^{\$}$ is the dollar-based availability (the percentage of non-bankrupt firm financial assurance obligations that can be assured by firms using the financial test);
- A^{F} is the firm-based availability (the percentage of firms in the non-bankrupt firm sample that can pass the ratio requirements of the test); and
- M^{F} is the firm-based misprediction (the percentage of firms in the bankrupt firm sample that can pass the ratio requirements of the test).

This formula assumes that the ratio of dollar-based misprediction to dollar-based availability is equal to the ratio of firm-based misprediction to firm-based availability for any given financial test. For example, if M^F = 30 percent and A^F = 60 percent (for a particular financial test), then $M^F/A^F = 0.3/0.6 = 1/2$, and $M^\$$ equals one-half of $A^\$$. The part of the formula that divides firm-based misprediction by firm-based availability (M^F/A^F) will always yield a fraction less than one if the percentage of bankrupt firms passing the test (M^F) is less than the percentage of non-bankrupt firms passing the test (A^F).

This formula cannot reflect the ability of multiple and additive requirements to discriminate between bankrupt and non-bankrupt firms, because multiple and additive requirements are a function of total financial assurance obligations, and there are no financial assurance obligations directly associated with the bankrupt firm sample. However, the prior financial test analyses found that multiples and additives, as individual candidate financial measures, performed very poorly in terms of discriminating between bankrupt and non-bankrupt firms[3] (the benefits of including these measures in a financial test are discussed further in Section II). Therefore, firm-based misprediction divided by firm-based availability (M^F/A^F) should be approximately equal to dollar-based misprediction divided by dollar-based availability ($M^\$/A^\$$). If these two ratios are identical ($M^\$/A^\$ = M^F/A^F$), then the formula used to estimate ($M^\$$) can be reduced to the following mathematical identity:

$$\mathbf{M^\$ = A^\$ * (M^F/A^F) = A^\$ * (M^\$/A^\$) = M^\$}$$

I.2: Available Data for Regulated Facilities and Firms

Data on owners and operators of MSWLFs were obtained from the Landfill Methane Database (maintained by ICF for EPA), the USEPA MSW Factbook, and from the Directory & Atlas of Solid Waste Disposal Facilities 1994 (Chartwell Information Publishers). Together, these MSWLF data sources appear to cover virtually all of the large (i.e., greater than 250 ton-per-day) MSWLFs owned or operated by private firms (i.e., entities eligible for the corporate financial test). For the 31 states covered by the Landfill Methane Database, data were also available for smaller landfills, but these data suggest that corporations operate very few of the smaller landfills that remain in operation today (i.e., MSWLFs that receive less than 250 tons-per-day are generally owned and operated by local governments). Therefore, the MSWLF database used for this analysis should include the vast majority of all corporate MSWLFs, and will account for an even higher percentage of corporate financial assurance obligations because closure and post-closure costs are higher for the largest MSWLFs that are best represented in the database.

The MSWLF database used in the analysis includes a total of 436 landfills owned or operated by 193 corporate entities controlled by 114 "top-parent" corporations. The 79 "corporate entities" that are not "top-parents" are incorporated subsidiaries of larger waste management firms or other top-parent, or non-subsidiary corporations. Of the 436 landfills in the MSWLF database, 292 were owned or operated by eight waste management firms and their subsidiaries: WMX Technologies, Browning-Ferris Industries, Laidlaw Waste Systems, Allied Waste Industries, Mid-American Waste Systems, USA Waste Services, Sanifill, and United Waste Systems. (Various mergers occurred in the industry during the performance of this analysis. This analysis used the ownership and financial data from December 31, 1995). To confirm the accuracy and completeness of the corporate MSWLF database, ICF verified that the database accounts for more than 90 percent of the total landfills reported in the annual reports of these waste management companies. The percentage of U.S. MSWLFs covered by

[3] U.S. Environmental Protection Agency, Office of Solid Waste. Revisions to the Subtitle C Financial Tests For Closure, Post-Closure Care, and Liability Coverage: Background Document (40 CFR Parts 264 and 265). June 1991.

the database should be even higher, because all of the MSWLFs in the database are in the U.S., but some of the firms that reported total number of landfills in their annual reports did not report the number of foreign landfills included in their total. The database also contains MSWLF landfills owned or operated by companies for whom waste management is not their primary business. The analysis included these operations as the regulations apply to owners or operators irrespective of the primary business focus.

I.3: Financial Data for Regulated Firms and Facilities

The facilities identified in the MSWLF database were linked to specific firms in two ways. First, an electronic search by Dun & Bradstreet (D&B) linked facilities to a specific Duns number in D&B's financial database based on the available data on owner, operator, and facility name and address. ICF then examined the facilities that were not matched by this electronic search, identified small variations in spelling for the owner name and other information missed by the electronic search, and submitted these additional data to D&B. These efforts identified the corporate owners or operators for approximately 85 percent of the corporate MSWLFs taken from the sources described above.

Some facilities were excluded from the analysis because D&B could not link any information about the facility with a specific Duns number in its database. Other facilities were excluded because the Duns number identified by D&B did not report sufficient financial data. D&B believes that firms linked to Duns numbers with little or no financial data are also likely to be smaller firms. Therefore, the facilities linked to financial data for this analysis should account for a large proportion of regulated firms that might be eligible for a financial test with any significant minimum net worth requirement.

In addition to identifying financial data on the direct owners of regulated facilities, the D&B data also identify corporate parents through top-grandparents for each direct owner. These data were used to incorporate the parent guarantee option in the financial test analysis. Exhibit 2 presents the distribution, by net worth category, for all firms that D&B identified as direct or indirect owners of Subtitle D MSWLFs (the revised non-bankrupt firm samples).

Exhibit 2
Financial Test Data - Non-Bankrupt Subtitle D Firms

	Subtitle D	
Net Worth Category ($)	**Number of Firms**	**Percent of Total**
< 1 million	56	29%
1-10 million	63	33%
10-20 million	19	10%
20-100 million	24	12%
100 million +	31	16%
Total	193	100%

Finally, bond-rating information was collected to determine which of the owners and operators of MSWLFs had investment grade bond ratings. This was necessary as the financial test allows owners and operators of MSWLFs to meet a bond rating requirement in lieu of satisfying certain financial ratios. Firms appearing in the database were cross-referenced with bond rating information obtained from Moody's[4] and

[4] Moody's Investors Service. Moody's Bond Record. July 1996.

Standard & Poor's[5] (S&P). An owner or operator was considered to have an investment grade bond rating if the most recent issuance of AAA, AA, A, or BBB, as issued by S&P, or Aaa, Aa, A, or Baa, as issued by Moody's, was found.

I.4: Bankrupt Firm Sample Data

The bankrupt firm sample used in the 1991 Subtitle C financial test analysis also was used for the 1992 Subtitle D financial test analysis. The sample was comprised of 31 firms that either were known to operate hazardous waste facilities or were likely to do so. The Subtitle C bankrupt firm sample was considered the best bankrupt firm data for the Subtitle D analysis for a number of reasons. First, owning and operating MSWLFs entails a capital-intensive, long-term investment in engineering and construction for industrial activity, similar to the industrial activities of many firms in the Subtitle C universe. Second, firms in the MSWLF industry, like firms in the Subtitle C universe, are subject to stringent environmental regulations and associated compliance costs. Third, there were no readily available data for a bankrupt firm sample that might be more representative of the types of firms engaged in regulated MSWLF management today.

For the current analysis, the bankrupt firm sample was expanded to include manufacturing firms identified by D&B as recent business failures for which reasonably complete financial data were available for three years prior to the year of firm failure. Manufacturing failures were used because most Subtitle C firms are manufacturing firms, as are the firms in the old bankrupt firm sample. D&B failure data were also requested for firms in the two-digit SIC code that includes MSWLF firms, but no recent failures were available with three prior years of financial data. Three years of financial data were needed because the financial test analysis assumes that a test "mispredicted" firm failure if the firm can pass the test in any of the three years prior to the year of failure. (A detailed explanation of this assumption can be found in the Subtitle C background document cited above.)

The limited amount of bankrupt firm data available from D&B did not provide any data on firms that had more than $100 million in net worth prior to firm failure, and identified only four firms that had more than $10 million in net worth prior to failure. However, D&B did identify 20 firms with less than $10 million in net worth prior to failure and three years of complete financial data. These data were needed to examine financial tests with minimum net worth of less than $10 million, because the old bankrupt firm sample included only firms that failed after reporting more than $10 million of net worth. Therefore, the new bankrupt firm data from D&B were combined with the old bankrupt firm data for this analysis. These data were not adjusted for inflation because the bankrupt firm sample is used only to measure the percentage of firms that could have passed different ratio requirements in the years prior to bankruptcy, and the ratios for different financial data would not be affected by inflation adjustments. Exhibit 3 shows the distribution, by net worth category, of firms included in the revised bankrupt firm sample.

[5] Standard & Poor's. Ratings Handbook. August 1996.

Exhibit 3
Financial Test Data - Updated Bankrupt Firm Sample

Net Worth Category	Number of Bankrupt Firms	Percent of Total
< 1 million	11	20%
1-10 million	9	16%
10-20 million	7	13%
20-100 million	10	18%
100 million +	18	33%
Total	55	100%

I.5: Updated Closure and Post-Closure Care Cost Estimates

As explained in Section I.1, the public and private costs of any financial test are functions of the total amount of obligations requiring financial assurance. In the analysis of Subtitle D tests, the financial assurance obligations for each MSWLF were derived from the size of the landfill (measured in tons per day in the MSWLF database) and the estimated costs of closure and post-closure care for landfills of similar size. Updated closure and post-closure care cost estimates for Subtitle D MSWLFs were based on inflation adjustments to the cost estimates used in the proposed Subtitle D financial test analysis. These revised cost estimates are presented in Exhibit 4.

Exhibit 4
Updated Closure and Post-Closure Cost Estimates
Subtitle D Landfills

Size Range in Tons Per Day	Closure and Post-Closure Costs used in 1991 Subtitle D Analysis	Inflation Adjusted Closure and Post-Closure Costs (1995 Dollars)
Less than 275	$5.1 million	$5.5 million
275 – 563	$8.1 million	$8.8 million
564 – 1125	$11.3 million	$12.3 million
More than 1125	$24.0 million	$26.1 million

Using the above closure and post-closure cost estimates, the total dollar value of financial assurance obligations for Subtitle D facilities in the MSWLF database was just over $7 billion.

Section II: Descriptions of Financial Tests

This section defines the individual components of different financial tests and explains how these components are combined to form specific financial test alternatives examined in the 1996 analysis. Section II.1 describes basic financial test components, and Section II.2 describes specific financial test alternatives.

Section II.1: Basic Financial Test Components

The following basic financial test components serve as the building blocks for almost all of the financial test alternatives examined in the 1996 analysis:

- Minimum Net Worth (Min NW)
- Investment Grade Bond Ratings (IGBR)
- Total Liabilities to Net Worth Ratio (TL/NW)
- Cashflow to Total Liabilities Ratio (CF/TL)
- Current Assets to Current Liabilities Ratio (CA/CL)
- Multiple and Additive Requirements

Minimum Net Worth (Min NW)

As noted above, the prior analyses of financial test alternatives incorporated a $10 million minimum net worth requirement in all of the tests considered. This means that firms with less than $10 million of net worth could not use the financial test for financial assurance. The 1996 analysis examined different financial test alternatives in conjunction with minimum net worth requirements of one, five, and ten million dollars.

It should be noted that the prior analyses of financial test alternatives were also based on bankrupt and non-bankrupt firm samples that excluded firms with less than $10 million in net worth. Therefore, these prior analyses calculated the availability, misprediction, and public and private costs only for firms with more than $10 million in net worth. For example, these prior analyses would have calculated financial test availability of 80 percent if the test covered 80 percent of the obligations of firms with net worth greater than $10 million, regardless of the amount of obligations for firms that failed the minimum net worth requirement. The private costs incurred by these smaller firms would also be excluded in the private cost calculations of prior analyses. The 1996 analysis, by contrast, is based on bankrupt and non-bankrupt firm samples that include all smaller firms (including firms with less than $1 million in net worth), with available financial data that were identified as direct or indirect owners of regulated facilities. Therefore, the 1996 analysis calculates availability, misprediction, and public and private costs in a manner that cannot be directly compared to the calculations from prior analyses, reported in background documents for the proposed Subtitle D financial test.

Investment Grade Bond Ratings (IGBR)

Almost all of the financial test alternatives require firms to either pass certain financial ratio requirements *or* to have an investment grade bond rating. Investment grade bond ratings are ratings of BBB or better from Standard & Poor's or Baa or better from Moody's.

Total Liabilities to Net Worth Ratio (TL/NW)

One of the two key ratio requirements of financial test alternatives is that total liabilities divided by net worth must be below some specified threshold, where the specific threshold may vary between financial tests. The total liabilities to net worth ratio is also commonly referred to as the debt-to-equity ratio.

Cashflow to Total Liabilities Ratio (CF/TL)

The other key ratio requirement of financial test alternatives is that cashflow divided by total liabilities must be above some specified threshold, where the specific threshold may vary between financial tests. Cashflow is defined as net income plus depreciation, depletion, and amortization (three types of non-cash accounting expenses).

The 1996 analysis, like prior analyses, has examined the cashflow to total liabilities ratio using total cashflow (CF) and three types of adjusted cashflow. The first type of adjusted cashflow is cashflow minus 66 percent of the firm's financial assurance obligations (CF - 0.66*FA). The second type of adjusted cashflow is

cashflow minus $5 million (CF - $5,000,000), and the third variation is cashflow minus $10 million (CF - $10,000,000).

Current Assets to Current Liabilities Ratio (CA/CL)

The 1982 Subtitle C financial test (referred to as the "1982 Test" in the Subtitle D analysis) also incorporates a third financial ratio, specifying that the current assets to current liabilities ratio must be greater than 1.5. This ratio, commonly called the current ratio, is not incorporated into any of the other tests examined because the prior analyses found that this ratio did not effectively discriminate between firms in the bankrupt and non-bankrupt firm samples.

Multiple and Additive Requirements

While minimum net worth, bond rating, and ratio requirements determine whether a firm can use the financial test at all, multiple and additive requirements limit the amount of financial assurance obligations that a firm can cover using the financial test. Firms that pass the other financial test requirements but not the multiple requirement can use the financial test to cover part of their obligations (up to the constraint imposed by the multiple requirement) and use a standby letter of credit or another third party mechanism to cover the rest of their obligations. Both the 1996 and prior analyses of financial test alternatives have incorporated this type of "partial coverage" in the calculation of public and private costs for alternative tests.

Prior analyses have found that the six-times multiple requirement of the 1982 Test substantially increases the private costs of the test without significantly reducing public costs.[6] The best performing tests in these analyses generally had only a one-time net worth multiple or additive requirement or no multiple requirement at all. A financial test with no multiple requirement would allow firms that pass the minimum net worth and other requirements to use the financial test to cover any amount of financial assurance obligations, even well in excess of their net worth. A one-time net worth multiple requirement states that firms must have net worth at least equal to the amount of financial assurance obligations covered by the test. A one-time net worth additive requirement states that firms must have net worth at least equal to the amount of financial assurance obligations covered by the test plus an additional specified amount of net worth (e.g., an additional one, five, or ten million dollars). None of the best performing tests from prior analyses included a net working capital multiple requirement.

Multiple and additive requirements may be desirable components of a financial test for reasons that are not reflected in the calculation of the public and private costs of alternative tests. Specifically, multiple and additive requirements may ensure that firm failure rate data, used in the calculation of public and private costs, constitutes a reasonable basis for projecting future failure rates for firms with financial assurance obligations. If financial assurance obligations guaranteed by a financial test exceed the total net worth of a firm, then an unexpected acceleration of closure and post-closure costs could trigger bankruptcy for such firms, and thereby increase the failure rate for such firms in excess of the failure rates indicated by historical data relating to firms without environmental obligations. This is a particular problem when a firm fails to account for closure and post-closure costs as liabilities. Not accounting for them as liabilities can produce higher net worth figures, understating the claims on the firm's resources, and thereby overstating the firm's ability to cover an unexpected acceleration of closure and post-closure costs.

[6] U.S. Environmental Protection Agency, Office of Solid Waste. Revisions to the Subtitle C Financial Tests For Closure, Post-Closure Care, and Liability Coverage: Background Document (40 CFR Parts 264 and 265). June 1991.

Section II.2: Specific Financial Test Alternatives

Exhibit 5 presents a list of the 81 financial test alternatives that were derived from the 27 best performing tests in prior analyses. Each of these test numbers begins with the test number assigned to these tests in the prior analysis of alternative Subtitle D financial tests. These numbers are followed by a dash and then a 1, 5, or 10 to indicate the minimum net worth requirement. An "a" is also added to the tests with additive requirements to indicate that the amount of the minimum net worth requirement is also the amount of the additive requirement. For example, Test 562-1a has a minimum net worth requirement of one million dollars, and the amount of financial assurance obligations that a firm can cover with this test is limited to one million dollars less than the firm's net worth.

All of the tests in Exhibit 5 require that firms pass the minimum net worth requirement and either have an investment grade bond rating or pass one out of two ratio requirements. The values in the columns of this exhibit indicate the specific thresholds for the ratio requirements of each test, whether the cashflow ratio is based on total or adjusted cashflow, whether there is an additive or multiple requirement, and the minimum net worth requirement.

Exhibit 5
Financial Test Requirements

Test Number	TL/NW	CF used	CF/TL	Multiple or Addit.	Min NW
5-1	2	CF	0.1	m	$1,000,000
5-5	2	CF	0.1	m	$5,000,000
5-10	2	CF	0.1	m	$10,000,000
21-1	2.5	FA * 0.66	0.05	m	$1,000,000
21-5	2.5	FA * 0.66	0.05	m	$5,000,000
21-10	2.5	FA * 0.66	0.05	m	$10,000,000
58-1	1.5	CF-10	0.1	0	$1,000,000
58-5	1.5	CF-10	0.1	0	$5,000,000
58-10	1.5	CF-10	0.1	0	$10,000,000
73-1	1.5	CF	0.05	m	$1,000,000
73-5	1.5	CF	0.05	m	$5,000,000
73-10	1.5	CF	0.05	m	$10,000,000
74-1	2	CF	0.05	m	$1,000,000
74-5	2	CF	0.05	m	$5,000,000
74-10	2	CF	0.05	m	$10,000,000
75-1	2.5	CF	0.05	m	$1,000,000
75-5	2.5	CF	0.05	m	$5,000,000
75-10	2.5	CF	0.05	m	$10,000,000
76-1	1.5	CF	0.1	m	$1,000,000
76-5	1.5	CF	0.1	m	$5,000,000
76-10	1.5	CF	0.1	m	$10,000,000
77-1	2	CF	0.1	m	$1,000,000
77-5	2	CF	0.1	m	$5,000,000
77-10	2	CF	0.1	m	$10,000,000
78-1	2.5	CF	0.1	m	$1,000,000
78-5	2.5	CF	0.1	m	$5,000,000
78-10	2.5	CF	0.1	m	$10,000,000
80-1	2	CF	0.15	m	$1,000,000
80-5	2	CF	0.15	m	$5,000,000
80-10	2	CF	0.15	m	$10,000,000

Test Number	TL/NW	CF used	CF/TL	Multiple or Addit.	Min NW
91-1	1.5	FA*0.66	0.05	m	$1,000,000
91-5	1.5	FA*0.66	0.05	m	$5,000,000
91-10	1.5	FA*0.66	0.05	m	$10,000,000
92-1	2	FA*0.66	0.05	m	$1,000,000
92-5	2	FA*0.66	0.05	m	$5,000,000
92-10	2	FA*0.66	0.05	m	$10,000,000
94-1	1.5	FA*0.66	0.1	m	$1,000,000
94-5	1.5	FA*0.66	0.1	m	$5,000,000
94-10	1.5	FA*0.66	0.1	m	$10,000,000
95-1	2	FA*0.66	0.1	m	$1,000,000
95-5	2	FA*0.66	0.1	m	$5,000,000
95-10	2	FA*0.66	0.1	m	$10,000,000
96-1	2.5	FA*0.66	0.1	m	$1,000,000
96-5	2.5	FA*0.66	0.1	m	$5,000,000
96-10	2.5	FA*0.66	0.1	m	$10,000,000
110-1	2	CF-5	0.05	m	$1,000,000
110-5	2	CF-5	0.05	m	$5,000,000
110-10	2	CF-5	0.05	m	$10,000,000
112-1	1.5	CF-5	0.1	m	$1,000,000
112-5	1.5	CF-5	0.1	m	$5,000,000
112-10	1.5	CF-5	0.1	m	$10,000,000
114-1	2.5	CF-5	0.1	m	$1,000,000
114-5	2.5	CF-5	0.1	m	$5,000,000
114-10	2.5	CF-5	0.1	m	$10,000,000
116-1	2	CF-5	0.15	m	$1,000,000
116-5	2	CF-5	0.15	m	$5,000,000
116-10	2	CF-5	0.15	m	$10,000,000
127-1	1.5	CF-10	0.05	m	$1,000,000
127-5	1.5	CF-10	0.05	m	$5,000,000
127-10	1.5	CF-10	0.05	m	$10,000,000
129-1	2.5	CF-10	0.05	m	$1,000,000
129-5	2.5	CF-10	0.05	m	$5,000,000
129-10	2.5	CF-10	0.05	m	$10,000,000
130-1	1.5	CF-10	0.1	m	$1,000,000
130-5	1.5	CF-10	0.1	m	$5,000,000
130-10	1.5	CF-10	0.1	m	$10,000,000
131-1	2	CF-10	0.1	m	$1,000,000
131-5	2	CF-10	0.1	m	$5,000,000
131-10	2	CF-10	0.1	m	$10,000,000
132-1	2.5	CF-10	0.1	m	$1,000,000
132-5	2.5	CF-10	0.1	m	$5,000,000
132-10	2.5	CF-10	0.1	m	$10,000,000
149-1	2	CF	0.1	2m	$1,000,000
149-5	2	CF	0.1	2m	$5,000,000
149-10	2	CF	0.1	2m	$10,000,000
544-1a	1.5	CF-5	0.1	a	$1,000,000
544-5a	1.5	CF-5	0.1	a	$5,000,000
544-10a	1.5	CF-5	0.1	a	$10,000,000
562-1a	1.5	CF-10	0.1	a	$1,000,000
562-5a	1.5	CF-10	0.1	a	$5,000,000
562-10a	1.5	CF-10	0.1	a	$10,000,000

Proposed Test

Test 562-10a is the test proposed by the Agency in the Subtitle D proposed rule. Tests 562-1a, 562-5a, 562-10a, 130-1, 130-5, 130-10, 58-1, 58-5, and 58-10 all have identical ratio requirements. The only differences between these tests are their minimum net worth requirements and whether they have additive, multiple, or no multiple requirements. The prior Subtitle D analysis found that Tests 58-10 and 130-10 had a lower sum of public and private costs than Test 562-10a, but the Agency preferred Test 562-10a because it ensured that a firm would have $10 million of additional net worth to prevent bankruptcy even if a firm were suddenly forced to pay all of its obligations covered by the test.

1982 Subtitle C Test

In addition to the tests listed in Exhibit 5, the 1996 analysis of Subtitle D firms also examined the 1982 Subtitle C Test (1982 Test) which, for closure and post-closure care, requires the following:

- Minimum net worth of $10 million; and either
    - An investment grade bond rating and net worth of at least six times the obligations covered by the test; or
        - Net worth and net working capital of at least six times the obligations covered by the test, and two of the following three ratio requirements:
            - TL/NW < 2
            - CF/TL > 0.1
            - CA/CL > 1.5

The 1982 Test for liability coverage requires the following:

- Minimum net worth of $10 million; and either
    - An investment grade bond rating and net worth of at least six times the obligations covered by the test; or
    - Net worth and net working capital of at least six times the obligations covered by the test.

No Test

For comparison purposes, the 1996 analysis also estimates the private costs associated with not allowing a financial test for financial assurance (the "No Test" alternative). By definition, the availability, misprediction, and public costs of this alternative are all zero, because all regulated firms would have to obtain third party mechanisms to demonstrate financial assurance and the analysis assumes a zero failure rate for these mechanisms.

Meridian Test

In 1990 EPA received a rulemaking petition from the National Solid Waste Management Association (NSWMA). Along with the petition was a financial test prepared by the Meridian Corporation. The Meridian Test, which would allow firms to demonstrate financial assurance by satisfying the following financial test:

$$1.5 < [(CA + CF) / (CL + CO)] + [(10CF + CA - (CL + CO)) / TL + LO)]$$

where:

- **CA** is current assets;
- **CF** is cashflow;
- **CL** is current liabilities;
- **CO** is the value of all required financial responsibility obligations not treated by the firm as current liabilities;
- **TL** is total liabilities; and
- **LO** is the value of all required financial responsibility obligations not treated by the firm as part of its total liabilities.

The 1996 analysis examined "stringent" and "easier" interpretations of the Meridian Test with minimum net worth requirements of one, five, and ten million. Both interpretations set CO equal to zero, because firms will generally not have a significant portion of their financial assurance obligations included in current liabilities. The stringent interpretation of the Meridian Test sets LO equal to total FA obligations (i.e., assumes that no financial assurance obligations are included in the accounting liabilities reported by regulated firms), and the easier interpretation sets LO equal to zero (i.e., assumes that 100 percent of financial assurance obligations are included in the accounting liabilities reported by regulated firms). As explained below in Section V (and in Attachment II), smaller firms do not appear to include their financial assurance obligations in their reported liabilities, while larger firms appear to recognize the cost of financial assurance obligations over the life of the revenue stream associated with those obligations (e.g., over the life of the landfill). Therefore, larger firms will have some fraction of their financial assurance obligations included in their liabilities, but there are no systematic data available from D&B or other sources to determine the exact amount of such obligations included in the financial data for regulated firms. Therefore, the stringent and easier interpretations of the Meridian Test describe the likely range of performance for this financial test alternative.

Section III: Quantitative Results for Tests Examined

This section provides complete test results for each of the financial tests described in Section II. Exhibit 6 presents test results for all Exhibit 5 tests, the Meridian Test, No Test, and the 1982 Subtitle C Test for Subtitle D closure and post-closure care costs.

Exhibit 6
Subtitle D Closure/Post-Closure Test Results

Test	A($)	M($)	M(f)/ A(f)	Private Cost	Public Cost	Total Cost	Priv. Rank	Pub. Rank	Total Rank.
58-1	88.21%	48.54%	0.550	$22,041,684	$19,492,413	$41,534,096	2	26	1
58-5	84.55%	39.47%	0.467	$28,351,090	$17,151,981	$45,503,071	3	16	2
58-10	81.93%	29.63%	0.362	$32,861,224	$14,065,514	$46,926,738	5	10	3
130-1	74.99%	41.26%	0.550	$40,408,421	$13,563,158	$53,971,579	26	8	4
562-1a	74.48%	40.98%	0.550	$41,270,421	$13,180,696	$54,451,117	29	6	5
130-5	74.39%	34.73%	0.467	$41,463,712	$13,240,948	$54,704,660	42	7	6
130-10	73.43%	26.55%	0.362	$43,168,898	$12,193,282	$55,362,180	54	4	7
562-5a	73.09%	34.11%	0.467	$43,539,428	$12,351,001	$55,890,429	77	5	8
112-1	74.99%	44.87%	0.598	$40,408,421	$15,833,574	$56,241,995	26	15	9
544-1a	74.48%	44.57%	0.598	$41,270,421	$15,444,443	$56,714,864	29	13	10
112-5	74.39%	39.96%	0.537	$41,463,712	$15,511,364	$56,975,077	42	14	11
562-10a	71.67%	25.92%	0.362	$45,591,044	$11,680,791	$57,271,835	80	3	12
112-10	73.43%	32.84%	0.447	$43,168,898	$14,463,698	$57,632,596	54	11	13
544-5a	73.09%	39.26%	0.537	$43,539,428	$14,580,264	$58,119,692	77	12	14
544-10a	71.67%	32.05%	0.447	$45,591,044	$13,858,928	$59,449,972	80	9	15
MERIDIAN (EASIER) - 1	89.40%	77.74%	0.870	$19,198,086	$40,284,369	$59,482,454	1	89	16
76-1	75.27%	47.91%	0.636	$39,910,434	$19,698,794	$59,609,228	13	28	17
127-1	74.99%	47.34%	0.631	$40,408,421	$19,513,640	$59,922,061	26	27	18
76-5	74.50%	42.51%	0.571	$41,278,754	$19,174,514	$60,453,268	31	23	19
127-5	74.39%	43.45%	0.584	$41,463,712	$19,191,430	$60,655,142	42	24	20
131-1	75.02%	58.35%	0.778	$40,359,569	$20,477,601	$60,837,169	24	35	21
94-1	75.03%	48.85%	0.651	$40,185,025	$20,777,089	$60,962,114	18	36	22
131-5	74.39%	47.65%	0.641	$41,463,712	$19,701,514	$61,165,226	42	29	23
76-10	73.43%	36.35%	0.495	$43,168,898	$18,090,630	$61,259,528	54	17	24
127-10	73.43%	36.86%	0.502	$43,168,898	$18,143,763	$61,312,662	54	18	25
80-1	75.03%	59.24%	0.790	$40,185,025	$21,148,864	$61,333,889	18	37	26
80-5	74.27%	47.02%	0.633	$41,521,488	$20,151,199	$61,672,687	50	31	27

Test	A($)	M($)	M(f)/ A(f)	Private Cost	Public Cost	Total Cost	Priv. Rank	Pub. Rank	Total Rank.
94-5	74.27%	43.38%	0.584	$41,521,488	$20,241,991	$61,763,479	50	33	28
131-10	73.43%	41.83%	0.570	$43,168,898	$18,653,848	$61,822,746	54	19	29
80-10	73.20%	41.69%	0.570	$43,411,631	$19,067,315	$62,478,947	74	20	30
94-10	73.20%	37.27%	0.509	$43,411,631	$19,158,107	$62,569,739	74	22	31
MERIDIAN (EASIER) - 5	83.48%	61.69%	0.739	$29,224,559	$33,596,426	$62,820,985	4	88	32
116-1	73.35%	57.98%	0.791	$42,128,832	$21,179,553	$63,308,385	53	38	33
116-5	72.72%	47.70%	0.656	$43,232,976	$20,403,466	$63,636,442	73	34	34
116-10	71.76%	42.06%	0.586	$44,938,162	$19,355,800	$64,293,962	79	25	35
5-1	75.27%	61.85%	0.822	$39,910,434	$24,518,447	$64,428,881	13	49	36
77-1	75.27%	61.85%	0.822	$39,910,434	$24,518,447	$64,428,881	13	49	36
73-1	75.29%	60.35%	0.802	$39,875,273	$24,705,447	$64,580,720	7	53	38
91-1	75.27%	60.79%	0.808	$39,910,434	$24,715,578	$64,626,012	13	54	39
MERIDIAN (EASIER) - 10	80.48%	56.02%	0.696	$34,387,754	$30,303,137	$64,690,891	6	86	40
5-5	74.50%	51.62%	0.693	$41,278,754	$23,534,691	$64,813,446	31	44	41
77-5	74.50%	51.62%	0.693	$41,278,754	$23,534,691	$64,813,446	31	44	41
73-5	74.50%	53.68%	0.721	$41,278,754	$23,779,107	$65,057,861	31	46	43
91-5	74.50%	53.68%	0.721	$41,278,754	$23,779,107	$65,057,861	31	46	43
95-1	75.03%	62.59%	0.834	$40,185,025	$25,128,623	$65,313,648	18	59	45
5-10	73.43%	47.20%	0.643	$43,168,898	$22,450,807	$65,619,705	54	39	46
77-10	73.43%	47.20%	0.643	$43,168,898	$22,450,807	$65,619,705	54	39	46
95-5	74.27%	52.06%	0.701	$41,521,488	$24,130,959	$65,652,446	50	48	48
73-10	73.43%	49.65%	0.676	$43,168,898	$22,695,223	$65,864,121	54	41	49
91-10	73.43%	49.65%	0.676	$43,168,898	$22,695,223	$65,864,121	54	41	49
95-10	73.20%	47.72%	0.652	$43,411,631	$23,047,075	$66,458,706	74	43	51
96-1	75.28%	65.72%	0.873	$39,907,131	$26,760,878	$66,668,008	12	71	52
74-1	75.29%	66.60%	0.885	$39,875,273	$26,991,799	$66,867,072	7	74	53
92-1	75.27%	67.08%	0.891	$39,910,434	$27,003,197	$66,913,631	13	75	54
96-5	74.50%	57.48%	0.772	$41,278,754	$25,775,026	$67,053,780	31	61	55
132-1	75.04%	69.16%	0.922	$40,324,408	$26,730,073	$67,054,480	21	66	56

Test	A($)	M($)	M(f)/ A(f)	Private Cost	Public Cost	Total Cost	Priv. Rank	Pub. Rank	Total Rank.
74-5	74.50%	57.21%	0.768	$41,278,754	$25,836,988	$67,115,742	31	63	57
92-5	74.50%	57.21%	0.768	$41,278,754	$25,836,988	$67,115,742	31	63	57
132-5	74.39%	58.07%	0.781	$41,463,712	$25,738,808	$67,202,520	42	60	59
110-5	74.39%	57.79%	0.777	$41,463,712	$25,800,770	$67,264,482	42	62	60
114-1	75.04%	70.59%	0.941	$40,324,408	$26,974,488	$67,298,896	21	72	61
110-1	75.02%	71.13%	0.948	$40,359,569	$26,987,279	$67,346,848	24	73	62
114-5	74.39%	60.14%	0.808	$41,463,712	$25,983,223	$67,446,936	42	65	63
96-10	73.43%	54.18%	0.738	$43,168,898	$24,691,142	$67,860,040	54	51	64
132-10	73.43%	54.18%	0.738	$43,168,898	$24,691,142	$67,860,040	54	51	64
74-10	73.43%	53.86%	0.733	$43,168,898	$24,753,104	$67,922,002	54	55	66
92-10	73.43%	53.86%	0.733	$43,168,898	$24,753,104	$67,922,002	54	55	66
110-10	73.43%	53.86%	0.733	$43,168,898	$24,753,104	$67,922,002	54	55	66
114-10	73.43%	56.62%	0.771	$43,168,898	$24,935,557	$68,104,455	54	58	69
78-1	75.29%	67.57%	0.897	$39,875,273	$28,805,265	$68,680,538	7	83	70
21-1	75.29%	69.09%	0.918	$39,875,273	$28,987,719	$68,862,992	7	84	71
75-1	75.29%	69.09%	0.918	$39,875,273	$28,987,719	$68,862,992	7	84	71
21-5	74.50%	61.01%	0.819	$41,278,754	$27,832,907	$69,111,661	31	78	73
75-5	74.50%	61.01%	0.819	$41,278,754	$27,832,907	$69,111,661	31	78	73
78-5	74.50%	61.01%	0.819	$41,278,754	$27,832,907	$69,111,661	31	78	73
129-1	75.04%	71.61%	0.954	$40,324,408	$28,787,954	$69,112,362	21	82	76
129-5	74.39%	61.63%	0.828	$41,463,712	$27,796,689	$69,260,402	42	77	77
21-10	73.43%	58.38%	0.795	$43,168,898	$26,749,023	$69,917,921	54	67	78
75-10	73.43%	58.38%	0.795	$43,168,898	$26,749,023	$69,917,921	54	67	78
78-10	73.43%	58.38%	0.795	$43,168,898	$26,749,023	$69,917,921	54	67	78
129-10	73.43%	58.38%	0.795	$43,168,898	$26,749,023	$69,917,921	54	67	78
149-1	64.37%	52.89%	0.822	$52,720,237	$20,227,473	$72,947,710	82	32	82
149-5	63.98%	44.33%	0.693	$53,404,398	$19,731,510	$73,135,908	83	30	83
149-10	63.40%	40.76%	0.643	$54,416,318	$19,151,235	$73,567,553	84	21	84
MERIDIAN (STRINGENT) - 10	61.39%	59.30%	0.966	$56,183,958	$27,623,806	$83,807,764	87	76	85
MERIDIAN	61.55%	72.59%	1.179	$55,906,407	$28,419,600	$84,326,007	86	81	86

Test	A($)	M($)	M(f)/ A(f)	Private Cost	Public Cost	Total Cost	Priv. Rank	Pub. Rank	Total Rank.
(STRINGENT) - 5									
MERIDIAN (STRINGENT) - 1	61.63%	131.44%	2.133	$55,767,632	$32,050,285	$87,817,917	85	87	87
1982 Test - 10	24.44%	9.23%	0.380	$97,043,603	$4,302,911	$101,346,514	88	2	88
No Test	0.00%	0.00%	0.000	$123,049,180	$0	$123,049,180	89	1	89

Section IV: Qualitative Discussion of Test Results

Exhibit 6 shows that the three tests reported in the Subtitle D financial test analysis background document also rank among the lowest cost tests in the 1996 analysis. Tests 58, 130, and 562 evaluated at three different minimum net worth requirements account for 9 of the 12 lowest cost tests. Excluding Test 562-10a, the other eight tests account for all of the eight lowest cost tests. All of these tests have the same following ratio requirements:

- **Total Liabilities (TL) to Net Worth (NW) Ratio: < 1.5; or**
- **Cashflow (CF) minus Ten Million Dollars to Total Liabilities (TL): > 0.1.**

In addition, all of the tests examined in this analysis, except for the No Test alternative, have private costs that are substantially lower than the 1982 Test. Test 562-10a has the lowest public costs of any test examined, except for the No Test alternative and the 1982 Test. This low public cost for the 1982 Test results more from its low availability than from its accuracy in predicting bankruptcy. Because the test is available to cover such a small amount of obligations (24.49%) it shows a relatively low misprediction amount. However, the 1982 Test shows a higher ratio of misprediction to availability than the proposed test.

The "easier" interpretation of the Meridian Test with a $1 million minimum net worth requirement has the lowest private costs of any test, but also has the highest public cost of any test . These results may be misleading, however, because the easier interpretation assumes that all of the firms in the non-bankrupt firm sample have included 100 percent of their financial assurance obligations in their reported accounting liabilities. As explained in Section V, most smaller firms do not appear to include their financial assurance obligations in their accounting liabilities, so the public and private cost estimates for the easier interpretation of the Meridian Test may be particularly misleading with low minimum net worth requirements. In general, the Meridian Test appears to perform poorly under the Subtitle D analysis.

Effect of Minimum Net Worth and Multiple and Additive Requirements

Most firms with net worth of less than $10 million were found to have estimated financial assurance obligations of $10 to $24 million (depending on the size of their landfill). This means that most of the smaller Subtitle D firms can only cover a fraction of their obligations even when they pass a lower minimum net worth requirement, because the multiple or additive requirements limit the total amount of obligations they can cover (except for Test 58 which has no multiple requirement).

One-time multiple requirements specify that the amount of obligations that a firm can cover with the financial test cannot exceed the firm's net worth. Additive requirements provide additional protection against financial obligations triggering firm failures by requiring net worth equal to financial assurance obligations covered by the test plus some additional amount of net worth. In the case of Test 562-1a, for example, this means that a firm would still have $1 million of net worth even if it were suddenly forced to pay for all of its obligations covered by the financial test (and even if none of those obligations were included in its accounting liabilities).

Although one-time additive requirements impose the same absolute requirements for net worth on all firms, they have the effect of imposing more stringent requirements on small firms in terms of the percentage of net worth that can be used to cover financial assurance obligations. In the case of 562-1a, for example, a firm with $2 million of net worth could use the test to cover $1 million of obligations, amounting to 50 percent of the firm's net worth. A firm with $10 million of net worth, however, could cover $9 million of obligations, amounting to 90 percent of its net worth, and a firm with $100 million of net worth could cover $99 million of obligations, amounting to 99 percent of its net worth.

The more stringent net worth percentage that additives effectively require for smaller firms may appropriately compensate for several other factors. First, large firms are rarely constrained by a one-time additive requirement except in the case of large Subtitle D firms with dozens of landfills, and it is unlikely that these large waste management firms would ever have to close all of their landfills at the same time for business reasons. Second, as discussed further in the next section, larger firms are more likely to include some fraction of their financial assurance obligations in their accounting liabilities by accruing the expenses for closure and post-closure care over the life of a landfill. In accounting terms, this means that reported net worth has already been reduced by the amount of obligations recognized as liabilities and accrued as expense. In principle, the payment of financial assurance obligations could have no effect on the reported net worth of these firms, because their reported net worth could fully reflect these obligations as if they had already been paid.

With respect to corrective action costs, earlier analysis of corrective action costs under Subtitle D showed that the relative performances of alternative financial tests were not affected by the higher financial assurance obligations arising from corrective action. This sensitivity analysis, therefore, was not repeated.

Total Value of FA Obligations Covered by the Financial Test and Private Costs

Subtitle D firms have total estimated financial assurance obligations of $7,055,455,642. The proposed financial test would cover 71.67 percent of these obligations, or $5,056,637,891. The remaining $1,847,674,369 of obligations not covered would result in $45,591,044 of private costs for other mechanisms (as shown in Exhibit 6). The total amount of financial assurance obligations covered by any test is simply a product of the availability of the test (A$) and the entire amount of financial assurance obligations of Subtitle D firms.

Data Limitations and Sensitivity Analysis of Financial Test Results

The estimated public and private costs of the financial tests examined in the 1996 analysis reflect the available data described in Section I. Certain limitations and inconsistencies associated with some of these data may affect the public and private cost estimates for each financial test, but sensitivity analyses discussed below indicate that data limitations do not appear to materially affect the results of this analysis.

Some of the financial data provided for this analysis reflect Dun & Bradstreet (D&B) estimates, because many firms do not report complete financial data to D&B. In order to provide complete data on these

firms, D&B estimated some financial data based on available data for the specific firms of interest and available data on other firms of similar size in the same SIC code. For example, the net income data for some firms may have been based on their own reported annual sales and the typical ratio of sales to net income for other firms in the same SIC code with similar annual sales. D&B only provided such modeled data when the estimate could be based on a sufficiently large sample of firms of similar size in the same SIC code. The data provided for a number of firms, however, included "reported" values of zero for net income. It is improbable that a significant number of regulated firms would have net income exactly equal to zero, and ICF's examination of other data sources has confirmed that some of these firms with reported net income of zero actually had positive or negative net income. In particular, we determined that Mid-American was identified as being able to pass the financial test based upon a zero reported net income from D&B and estimated depreciation. In fact, Mid American's loss in that year would not have allowed them to pass the cashflow ratio, and the corporation could not have passed the financial test in any other way either. Mid-American filed for Chapter 11 bankruptcy in January 1997.

Errors in reported net income for certain firms would only affect financial test results in those cases where the firm's ability to pass the financial test was entirely dependent on its ability to pass the cashflow ratio, because this is the only financial test requirement that incorporates net income data. As shown in Attachment III, firms with greater than $10 million in net worth that pass the cashflow ratio also tend to pass other ratio requirements and/or the bond rating requirement. Only about 10 percent of firms that pass the proposed test were only able to pass the cashflow ratio (7 out of 72 firms). If some of these firms had net income that was incorrectly reported as zero, when the firm actually recorded a net loss, then they might have failed to pass the financial test. On the other hand, Attachment III shows that only 2 out of 72 firms with net worth greater than $10 million failed to pass the proposed test. If either of these firms had net income that was incorrectly reported as zero, when their actual recorded net income was positive, then one or both might have passed the financial test. The ability of firms to pass the proposed test may therefore be slightly understated due to errors in reported net income.

To estimate the maximum potential impact of these reporting errors for net income data, the analysis identified every firm in the bankrupt firm sample with reported net income of zero and recalculated the estimated availability of the proposed test based on two extreme assumptions. At one extreme, we assumed that all firms with net income equal to zero passing only the cashflow ratio would actually fail to pass the financial test with accurate net income data. At the other extreme, we assumed that all firms with net income equal to zero and failing to pass the financial test would actually have passed the test with accurate net income data. These two extreme assumptions result in estimated availability of the proposed test between 69.4 percent and 72.1 percent, versus an analysis estimate of 71.7 percent based on the reported data. Furthermore, any small error in estimated availability for the proposed test would have resulted in a proportionate error in estimated misprediction, and these errors would be partially offsetting. Therefore, these data limitations relating to reporting errors for net income would have a minimal effect on the sum of public and private costs, and would not significantly affect the ranking of financial test alternatives with respect to minimizing the sum of public and private costs.

Section V: Impact of Accounting for Financial Assurance Obligations

As noted above, and detailed further in Attachment I, larger firms that own Subtitle D facilities tend to recognize the cost of financial assurance obligations over the life of the revenue stream associated with those obligations. For example, if a Subtitle D firm has used 50 percent of the air space capacity of a given landfill then the firm will have recognized 50 percent of the cost of closure and post-closure care for that landfill.

In accounting terms, the accrued expense recognized each year for financial assurance obligations reduces the net income reported in those years, because the annual income statement for a firm subtracts all expenses from revenues to calculate net income. The balance sheet in financial statements presents all of the firm's accumulated assets, liabilities (debts), and net worth (contributed capital plus retained earnings, where retained earnings equals the total amount of net income from prior years that was not returned to investors through dividends or stock repurchases). Therefore, the accrued expense for financial assurance reduces a firm's reported net worth over time, because recognizing these expenses reduces the amount of annual net income that is added to net worth each year on a firm's balance sheet.

A fundamental identity in financial reporting states that total assets must equal total equities, where total equity is the sum of liabilities plus net worth. Therefore, when expense is recognized each year for some portion of financial assurance obligations, and accumulated net worth is reduced by an equal amount, there must be a corresponding accounting entry that increases liabilities or reduces assets by an amount equal to the reduction in net worth. Since there is no actual reduction in cash or other assets, the accounting identity can be maintained by recognizing an accrued liability for financial assurance obligations. The increase in this accrued liability each year offsets the reduction in net worth associated with annual expense recognition for financial assurance obligations. In this case, a firm's financial assurance obligations for closure and post-closure care would be gradually recognized in accounting statements over the life of the landfill. When the firm actually pays to conduct closure and post-closure activities, the accrued liability for these obligations is reduced, and this reduction in liabilities is offset by a reduction in cash or other assets. This cash expenditure, however, would have no effect on net worth because the reduction in net worth would have already been recognized over the useful life of the landfill.

Under the 1982 Test, firms that include their financial assurance obligations in their reported liabilities can adjust their reported net worth and total liabilities when calculating their financial test ratios. Firms were initially allowed to make this adjustment under Subtitle C at a time when some waste management firms were more aggressive about recognizing the cost of future obligations while other firms in the industry did not recognize such obligations. Under these conditions, the lack of any adjustment would penalize firms that recognized such obligations relative to those that did not.

The accounting treatment of financial assurance obligations by waste management firms appears to have become much more consistent. Financial reports of firms in the solid waste management industry (see Attachment I) indicate that the larger firms generally report net worth and total liabilities that are adjusted to reflect accrued obligations for landfill closure and post-closure care.

Information on a wider range of industries, however, shows that firms do not uniformly accrue future environmental obligations. A survey by Price Waterhouse found that only 40 percent of respondents accrue future environmental costs.[7] Most of these accruals occurred in situations where the future restoration costs would occur in a fixed period. This period could be fixed by time or by a production process. Since a landfill has a set capacity, it may be relatively straightforward to accrue for closure liabilities in such a case. In fact, the Financial Accounting Standards Board (FASB) in February 1996 issued a Proposed Statement of Financial Accounting Standards entitled Accounting for Certain Liabilities Related to Closure or Removal of Long-Lived Assets. The Proposed Statement found that:

> Diverse practices have developed for recognizing obligations for closure or removal of long-lived assets in financial statements, partially because those obligations may not be satisfied for many years ... As a result of some current accounting practices, the amount actually incurred for closure or removal obligations may be different from the amount recognized in the financial statements for those obligations.[8]

Data from the non-bankrupt firm sample used in the 1996 analysis also suggest that smaller firms are less likely to accrue for closure and post-closure obligations than are larger firms. These data are presented in Exhibit 7, which shows median values for FA obligations as a percentage of total accounting liabilities for firms in different net worth categories. As explained in Section I, FA obligations in this analysis were estimated for each Subtitle D firm based on the number of MSWLFs owned or operated by each firm, and the cost estimates for facility closure and post-closure care. To calculate the median values in Exhibit 7, estimated FA obligations for each firm were divided by the firm's total accounting liabilities, as provided by D&B. If all FA obligations were included in accounting liabilities, then FA obligations could never account for more than 100 percent of total liabilities. However, the median value for this percentage is almost 2000 percent for Subtitle D firms with less than $1 million of net worth, indicating that half of the Subtitle D firms in this net worth category have FA obligations that are more than 20 times greater than their total accounting liabilities. The median values for Subtitle D firms, across all net worth categories, show that smaller firms are more likely to have FA obligations that exceed 100 percent of their total liabilities, indicating that FA obligations are not included in their accounting liabilities.

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[7] Price Waterhouse, LLP, Progress on the Environmental Challenge. A Survey of Corporate America's Environmental Accounting and Management, 1994.

[8] Proposed Statement of Financial Accounting Standards, Accounting for Certain Liabilities Related to Closure or Removal of Long-Lived Assets, p. 1, Financial Accounting Standards Board, 1996.

Exhibit 7
Accounting for FA Obligations:
Estimated FA Obligations as a Percentage of Reported/Estimated Accounting Liabilities

Net Worth ($ Million)	Median Values of Estimated FA Obligations (As Percent of Accounting Liabilities)
< 1	1,963%
1 – 10	332%
10 – 20	331%
20 – 100	87%
100+	8%

The apparent failures of most small firms to include FA obligations in their reported accounting obligations means that FA obligations would be recorded as an expense at the time of payment (e.g., when cash is paid for facility closure). This sudden recognition of FA obligations could trigger bankruptcy for firms with obligations in excess of their net worth. Exhibit 8 shows that the median values of estimated FA obligations as a percent of net worth is 2,591 percent for firms in the 1996 non-bankrupt firm sample with less than $1 million of net worth. In other words, half of these small firms have estimated FA obligations that exceed 25.91 times their total net worth.

Exhibit 8
Accounting for FA Obligations:
Estimated FA Obligations as a Percentage of Reported/Estimated Net Worth

Net Worth ($ Million)	Median Values of Estimated FA Obligations (As Percent of Net Worth)
< 1	2,591%
1 – 10	486%
10 – 20	88%
20 – 100	75%
100+	4%

FASB Proposed Accounting Standard for Liabilities Related to Long-Lived Assets

The Financial Accounting Standards Board first began work on the treatment of closure liabilities in the context of the decommissioning of nuclear power plants, but the proposed statement would also apply to closure and post-closure costs of landfills. Though the effect of a final standard will depend upon its requirements and how closely firms' current practices track with the standard, establishment of the standard would provide more uniformity in financial reporting. Generally speaking, to the extent that the FASB's final

standard resembles the proposed standard, it would have the largest effect on firms with facilities which will close shortly and which have not recognized closure liabilities on the financial statements.

The accounting standard proposed by FASB would force firms to recognize and accrue their environmental obligations in full at the time when they become unavoidable. FASB specifically rejected the alternative approach of accruing a liability according to some arbitrary schedule (e.g., over the useful life of the landfill or other related asset).

> Some current accounting practices for recognizing the costs of closure or removal activities for long-lived assets emphasize the allocation of those costs over the period of the assets' operations. Using those practices, the amount recognized in the statement of financial position for the costs of closure removal activities may be different from the amount of the obligation that an entity has actually incurred. The Board concluded that closure or removal liabilities should be recognized when they are incurred, in accordance with existing accounting concepts.
>
> FASB Concepts Statement No. 6, Elements of Financial Statements, defines liabilities as "probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events" (paragraph 35; footnote references omitted). The Board believes that those closure or removal obligations that meet the definition of a liability should be accounted for as a liability as the obligations are incurred. Allocation of the costs of closure or removal to the periods of operation of the long-lived asset is an issue that is separate from the recognition of the liability. Because one of the objectives of this Statement is the recognition of a liability, the method of allocating the costs of closure or removal may differ from current practices that recognize both the liability and the expense ratably over the life of any related long-lived assets.[9]

Under this proposed standard, the present value of the liability for closure and post-closure care would be recognized as the liability is actually incurred. The proposed standard would also "capitalize" the closure and post-closure care costs (i.e., add the cost of the closure and post-closure liabilities to the asset value recorded for the landfill, along with costs of landfill construction, permitting, and other related costs), thereby maintaining the assets equal equities identity.

> The Board decided that the cost of closure or removal of a long-lived asset should be capitalized as part of the cost of that asset. Current accounting practice includes all costs that are necessary to get an asset ready for its intended use in the historical cost basis of that asset. The Board also concluded that capitalized closure or removal costs are not a separate asset, just as other costs that may be capitalized in the historical cost of a long-lived asset are not separate assets. That is, there is no specific and separate future economic benefit that results

[9] Proposed Statement of Financial Accounting Standards, Accounting for Certain Liabilities Related to Closure or Removal of Long-Lived Assets, p. 15, Financial Accounting Standards Board, 1996.

from those costs. The future economic benefit of those costs lies in the productive asset that is used in the entity's operations.[10]

As the landfill depreciates each year, depreciation expense is recognized corresponding to some portion of the capitalized closure and post-closure obligations. In this way, the depreciation of the landfill asset over its useful life would, under FASB's proposed statement, amortize the landfill's closure and post-closure costs. The depreciation of the landfill asset each year (including the capitalized closure and post-closure costs) would also reduce net worth annually via the recognition of depreciation expense in income. Depreciation thus reduces both the value of the landfill asset and the firm's accumulated net worth. Net worth will not be affected further when closure and post-closure activities are actually conducted, however, because payments (using cash or other assets) for closure and post-closure expenses will be entirely offset by a reduction in the closure and post-closure liability.

Accounting Impact on Financial Test Performance

Accounting adjustments and new accounting standards could impact the performance of the financial test in two ways. First, the reduction in net worth that is recognized over the useful life of the MSWLF would tighten the financial assurance capacity constraint that is imposed by any net worth additive or multiple requirement. Second, the immediate recognition of environmental liabilities, as required by the proposed FASB standard, combined with the gradual reduction in net worth over the facility's useful life, would affect both the cashflow ratio and the liabilities to net worth ratio, and could thereby reduce the number of firms that pass the test. Exhibit 9 presents a bounding analysis of how accounting rules and adjustments could affect the number of top-parent (non-subsidiary) firms that are able to pass the ratio or bond rating requirements of the proposed test (i.e., investment grade bond rating, or total liabilities to net worth less than 1.5, or cashflow minus $10 million divided by total liabilities greater than 1.0, which are the ratio and bond rating requirements for Tests 58-1, 58-5, 58-10, 130-1, 130-5, 130-10, 562-1a, 562-5a, 562-10a).

Exhibit 9
Bounding Analysis of Accounting Impact on Financial Test Performance:
Number of Top-Parents Passing Proposed Test Ratio and/or Bond Rating Requirements

	Subtitle D Top-Parents		
Net Worth ($ Million)	**Lower Bound**	**1996 Analysis**	**Upper Bound**
< 1	1	26	33
1 - 10	0	30	39
10 - 20	1	6	6
20 - 100	4	8	8
100+	23	24	24

[10] Ibid., p. 26, Financial Accounting Standards Board, Norwalk, CT, 1996.

Lower Bound: Minimum number of top-parents that pass under FASB proposed standard, based on estimated FA obligations added to accounting liabilities and subtracted from net worth.
Upper Bound: Maximum number of top-parents that pass with accounting adjustment allowed under Subtitle C, based on FA obligations subtracted from accounting liabilities and added to net worth.

The columns labeled "1996 Analysis" in Exhibit 9 show the number of top-parents that pass the bond rating and/or ratio requirements of the proposed test, by net worth category, based on the financial data provided by D&B. The lower bound columns show the minimum number of top-parent firms that would still pass under FASB's proposed standard, based on estimated FA obligations added to accounting liabilities and subtracted from net worth. This lower bound assumes that no financial assurance obligations are included in reported accounting liabilities, and all of the MSWLFs are so close to closure that the FASB rule would require a reduction in net worth, as well as an increase in liabilities, equal to the total amount of each firm's financial assurance obligations. The upper bound columns show the maximum number of Subtitle D top-parent firms that could pass with the accounting adjustment allowed under Subtitle C, based on estimated FA obligations subtracted from accounting liabilities and added to net worth. This upper bound assumes that all financial assurance obligations are included in reported accounting liabilities and deducted from net worth.

Firms that could have negative net worth after the adjustment for FASB's proposed standard are excluded from the lower bound estimates in Exhibit 9, because it is impossible that some firms would report negative net worth after making this accounting change. In the case of the upper bound, however, the numbers in Exhibit 9 include firms that would have negative liabilities after subtracting FA obligations from reported liabilities, because these firms obviously have not included all their FA obligations in their reported liabilities and thus would not be eligible for the accounting adjustments that are presently allowed under Subtitle C. This upper bound is shown for Subtitle D firms for comparison with Subtitle C, but it should be noted that the proposed rule for the Subtitle D financial test does not include any equivalent allowance for accounting adjustments. The number of top-parents passing the ratio requirements with less than $1 million of net worth is shown for comparison with other net worth categories, even though all of the financial tests included in the 1996 analysis have minimum net worth requirements of at least $1 million.

The upper bound data in Exhibit 9 show that the accounting adjustment allowed under Subtitle C has very little effect on the number of Subtitle D top-parents that can pass the Proposed Test. In fact, no Subtitle D firms with over $10 million in net worth would have their ability to pass the requirements of the Proposed Test affected by this accounting adjustment. In fact, the effect of this accounting adjustment is even less because the smaller firms (with $10 to $20 million in net worth) are less likely to reflect financial assurance obligations in their accounting statements, and larger firms appear to accrue these obligations over the useful life of the related facility, so the adjustments to their financial statements could be substantially less than the total amount of FA obligations used to calculate this upper bound. Of course, accounting adjustments allowed under Subtitle C would also affect the amount of net worth available to satisfy the Proposed Test's $10 million additive requirement, as evidenced by the pass rates presented in Attachment III.

The lower bound data in Exhibit 9 also show that the proposed FASB standard would have little impact on the number of larger top-parents that can pass the Proposed Test. Among top-parents with over

$100 million in net worth, the proposed FASB standard might affect just one Subtitle D firm. For firms with $10 to $100 million of net worth, the proposed standard might affect nine Subtitle D firms. Of course, the actual number of firms affected would be much lower, because many Subtitle D firms with over $10 million of net worth already appear to accrue their financial assurance obligations over the useful life of their landfills. Also, the FASB standard would not actually require an immediate charge against net worth for all financial assurance obligations, as assumed in this lower bound estimate. This may be particularly important to Subtitle D firms that are constrained by the net worth additive requirement, because the FASB proposed standard would capitalize closure and post-closure costs as part of the landfill asset, and this would not affect reported net worth for firms that already accrue closure and post-closure expenses over the life of the landfill.

Exhibit 9 indicates that the biggest impact of the FASB proposed standard would be among firms with less than $10 million of net worth. Of course, the impact on these smaller firms would not affect the performance of financial tests with a minimum net worth requirement of $10 million. For tests requiring minimum net worth of just $1 million, however, Exhibit 9 indicates that the proposed FASB standard could result in a 100 percent reduction in the number of Subtitle D top-parents that passed the ratio requirements in the 1996 analysis with $1 - $10 million of net worth. The actual number of firms affected would be somewhat lower because the FASB standard would not actually require an immediate charge against net worth for all financial assurance obligations, as assumed in this lower bound estimate.

Attachment I
Closure and Post-Closure Cost Accrual Methods

EPA regulations require facility owners and operators to provide an up-front demonstration of financial assurance for all closure/post-closure costs. The Financial Accounting Standards Board, however, allows firms to accrue these liabilities in their financial records over the life of the landfill. SEC Staff Accounting Bulletin No. 92, Accounting and Disclosures Relating to Contingencies, provides a precedent for such accounting practices. Many firms choose to accrue these costs in percentages that relate to the amount of landfill capacity used. Exhibit I-1 presents summaries of cost accrual methods for Subtitle D firms.

Exhibit I-1
Cost Accrual Methods
Subtitle D Firms

Company	C/P-C Cost Accrual Method
Allied Waste Industries, Inc.	"Estimated costs are accrued based on accepted tonnage as landfill airspace is consumed."
American Waste Services, Inc.	"Accrued over the estimated life of the related disposal site as disposal capacity is utilized based on engineering estimates of remaining available airspace."
Browning-Ferris Industries, Inc./Attwoods	"The Company typically provides accruals for these costs as the remaining permitted airspace of such facilities is consumed."
Eastern Environmental Services, Inc.	"The Company recognizes these costs either on the unit-of-production method based on consumed airspace or as a function of time, depending on the circumstances under which the landfill is currently permitted to operate."
Laidlaw Inc.	"The Company accrues for closure and post-closure costs over the life of the landfill site as airspace is consumed... Where the Company believes that both the amount of a particular environmental liability and the timing of the payments are readily determinable, the cost in current dollars is discounted to present value at 5%."
Mid-American Waste Systems, Inc.	"The Company records an accrual (other liabilities) and a charge to operating expense for estimated post-closure costs over the operating life of the landfills as the airspace is filled... Estimated aggregate closure and post-closure costs are fully accrued for the landfill sites at the time the landfills

	cease to accept waste and are closed."
Republic Waste Industries, Inc.	"These costs are accrued based on consumed airspace."
Sanifill, Inc.	"The Company accrues remaining estimated closure and post-closure costs on a unit-of-production basis over the facility's estimated remaining airspace... Such funds are invested in closure trust funds which are included in `goodwill and other assets' on the firm's balance sheet."
USA Waste Services, Inc./Chambers	"The difference between the closure and post-closure costs accrued ... and the total estimated closure and post-closure costs to be incurred will be accrued and charged to expense as airspace is consumed."
Western Waste Industries	"The Company accounts for closure and post-closure accruals by comparing the total estimated closure and post-closure cost with the existing reserve. The difference is accrued and charged to cost of operations as airspace is consumed."
WMX Technologies, Inc.	"The Company provides for estimated closure and post-closure monitoring costs over the operating life of disposal sites as airspace is consumed."

Attachment II
Discounting for Closure and Post-Closure Costs

This attachment analyzes the effects of discounting on the costs of financial assurance. At present, financial assurance obligations must reflect the current cost of closure and the sum of annual post-closure costs in current dollars. Discounting would allow firms to demonstrate financial assurance for the present value of closure and post-closure care. Present value calculations recognize that funds invested today will earn compound interest over time, which means that the amount that must be set aside for future obligations is less than the total expected cost of those obligations in future dollars. The specific amount that needs to be set aside today is determined by the interest rate earned and the length of time before the obligation must be paid.

This attachment examines the impact of two discounting options for Subtitle D closure and post-closure care obligations.

1. The first option would allow discounting for post-closure care only, over a 30 year time period. This option recognizes that post-closure care would be performed over a 30 year period even if closure were suddenly and unexpectedly accelerated to the current period.

2. The second option would allow discounting for closure over a ten year period, and discounting for post-closure over a 30 year period. This option assumes that landfill owners and operators can estimate the year of closure with some accuracy, and that the average term to closure is 10 years.

Both of these discounting options use a real discount rate (implicit interest rate) of five percent for illustrative purposes. This rate reflects the average long-term Applicable Federal Rate (AFR) adjusted for inflation (using the GDP deflator). The long-term AFR is used to reflect a risk-free rate over 10 to 30 years, and this rate is adjusted for inflation because current cost estimates to be discounted have not been adjusted for future inflation. Exhibit II-1 shows the private costs of financial assurance for six financial test alternatives, without discounting, with discounting for post-closure only (PC), and with discounting for closure and post-closure care (C/PC).

Exhibit II-1
Private Costs of Financial Assurance
Subtitle D MSWLFs

Test	No Discounting	Discounting PC	Discounting C/PC
Meridian 10 (Easier)	$34,387,754	$32,500,787	$20,695,154
Meridian 1 (Easier)	$19,198,086	$18,167,203	$11,559,583
Meridian 10 (Stringent)	$56,183,958	$53,180,823	$27,109,981
Meridian 1 (Stringent)	$55,767,632	$52,801,248	$26,076,682
562 - 10a	$45,591,044	$42,544,009	$24,596,143
562 - 1a	$41,270,421	$38,449,688	$21,636,238

Exhibit II-1 shows the effect of universal discounting on Subtitle D private costs. (EPA's MSWLF regulations at 40 CFR 258.75 provide that States may allow discounting under certain circumstances.) Specifically, Exhibit II-1 shows that universal discounting of post-closure costs reduces total private costs by about five to seven percent, while universal discounting of closure and post-closure costs reduces total private costs by 40 to 53 percent. Discounting post-closure obligations has a relatively small effect on total private costs because post-closure care accounts for only about 10 percent of total Subtitle D financial assurance obligations. All Subtitle D MSWLFs have post-closure obligations, but post-closure accounts for a much smaller percentage of total obligations at the larger Subtitle D landfills (i.e., there are greater economies of scale in post-closure care than in closure). The net effect is that post-closure accounts for a little over 10 percent of total financial assurance obligations under Subtitle D.

The results in Exhibit II-1 could have been approximated (and similar results estimated for other tests) as a simple function of the discount factors used in this analysis. The discount factor for post-closure costs is 15.37 times annual post-closure costs, where 15.37 is the present value of $1 per year for 30 years discounted at five percent. Current financial assurance requirements are based on the sum of annual post-closure costs, or 30 times annual costs. Therefore, discounting reduces the post-closure amounts requiring financial assurance by about 50 percent (15.37/30 = 0.5). A 50 percent reduction in post-closure financial assurance obligations results in a five percent reduction in total private costs because post-closure care accounts for about 10 percent of total financial assurance obligations (i.e., 0.50 times 10 percent equals 5 percent). Similarly, the discount factor used for closure costs was 0.614 times current closure costs, where 0.614 is the present value of $1 received after 10 years discounted at five percent. This means that discounting reduces closure financial assurance obligations by 38.6 percent (1 - 0.614). If post-closure care accounts for 10 percent of total financial assurance obligations and closure accounts for 90 percent, then a 38.6 percent reduction in closure obligations plus a 50 percent reduction in post-closure obligations results in a weighted average reduction of 40 percent in total private costs (.386 x 90 percent, plus 0.5 x 10 percent equals 40 percent).

Discounting of financial assurance obligations is allowed but not required by 40 CFR 258.75. To the extent that MSWLFs do not qualify for discounting, these estimates of closure and post closure costs are

understated. Also, the actual time horizon and discount rate will also affect costs. For example, use of a lower percentage rate such as three percent would result in a much lower factor (19.60).

There is a small additional reduction in private costs because discounting reduces the amount of financial assurance obligations that are not covered by a financial test due to additive or multiple requirements. This accounts for the small variations in the percentage reduction in private costs from discounting with different financial test alternatives, and has been reflected in Exhibit II-1.

Allowing discounting for closure and post-closure care reduces the private costs of Test 562-1a by almost 48 percent, and reduces the private costs for the Meridian 1 (Stringent) Test by more than 53 percent. These percentage reductions are substantial because discounting is available for firms that both pass or fail the financial test. The majority of potential savings would accrue to firms that do not qualify for the financial test. The other potential savings would accrue to Subtitle D firms passing the ratio or bond rating requirements for Subtitle D financial test alternatives that are not able to cover 100 percent of their undiscounted financial assurance obligations.

The effect of discounting on public costs is more uncertain than the effect on private costs. Also the implications of "discounted public costs" are different for closure versus post-closure costs.

In the case of post-closure costs, discounting could provide a more accurate measure of public costs but would not actually change future public costs. The methodology used to calculate public costs for the 1996 analysis reflects the total amount of obligations covered by financial tests, but one could argue that the true public costs associated with the post-closure portion of these obligations should reflect discounted post-closure costs, because the discounted amount could be placed in an interest-bearing trust at the beginning of the post-closure period in order to pay for all 30 years of post-closure care.

Discounting would also provide a more accurate measure of public costs for closure if there were real certainty about the timing of closure costs. However, if financial assurance is provided for discounted closure costs and closure is accelerated unexpectedly, then the current cost of closure will exceed the discounted cost covered by financial assurance. This may increase the risk of financial assurance obligations triggering firm failures, and thereby increasing public costs.

Attachment III
Pass Rates by Test Elements for Subtitle D Firms

Attachment III presents information on the number of firms passing the proposed and 1982 Subtitle C (1982 Test) financial tests in the Subtitle D financial test analysis. Specifically, Exhibits III-1 and III-2 show the methods by which Subtitle D firms pass the financial test components of the proposed test and the 1982 Test, respectively. Detailed information on both tests is presented in Section II of the report " Analysis of Subtitle D Financial Tests in Response to Public Comments".

Exhibit III-1 presents the pass methods by test components for the proposed test. The proposed test for closure and post-closure coverage requires the following:

- Minimum net worth of $10 million; and either
  - An investment grade bond rating; or
  - One of the following two ratio requirements:
    - TL / NW < 1.5
    - CF - $10 million / TL > 0.1.

Exhibit III-1
Pass Rates by Proposed Test Elements
Subtitle D Firms

Firm Size ($Million) (By Net Worth Category)	Number of Firms Passing Financial Test Combinations *									
	A	B	C	A&B	A&C	B&C	A&B&C	Any	None	Test Totals
<1	0	0	0	0	0	0	0	0	56	56
1 - 10	0	0	0	0	0	0	0	0	63	63
10 - 20	0	17	0	0	0	1	0	18	1	19
20 - 100	0	14	1	1	0	7	0	23	1	24
100+	1	3	6	2	2	13	4	31	0	31
Total	1	34	7	3	2	21	4	72	121	193

* Financial test components for the proposed test are represented by the following letters in Exhibit III-1: A (Investment Grade Bond Rating); B (Total Liabilities to Net Worth < 1.5); and C (Cashflow - $10 million to Total Liabilities > 0.1).

Exhibit III-2 presents the pass methods by test components for the 1982 Test. The 1982 Test for closure and post-closure coverage requires the following:

- Minimum net worth of $10 million; and either
    - An investment grade bond rating and net worth of at least six times the obligations covered by the test; or
    - Net worth and net working capital of at least six times the obligations covered by the test, and two of the following three ratio requirements:
        - TL/NW < 2
        - CF/TL > 0.1
        - CA/CL > 1.5.

Exhibit III-2
Pass Rates by 1982 Test Elements
Subtitle D Firms

Firm Size ($Million) (By Net Worth Category)	Number of Firms Passing Financial Test Combinations *											
	A	B&C	C&D	B&D	A&B&C	A&B&D	A&C&D	B&C&D	All	Any	None	Test Totals
<1	0	0	0	0	0	0	0	0	0	0	56	56
1 - 10	0	0	0	0	0	0	0	0	0	0	63	63
10 - 20	0	14	0	0	0	0	0	3	0	17	2	19
20 - 100	0	14	0	1	0	0	0	7	1	23	1	24
100+	1	11	1	0	7	0	1	7	0	28	3	31
Total	1	39	1	1	7	0	1	17	1	68	125	193

* Financial test components for the 1982 Test are represented by the following letters in Exhibit III-2: A (Investment Grade Bond Rating); B (Total Liabilities to Net Worth < 2); C (Cashflow to Total Liabilities >0.1); and D Current Assets to Current Liabilities > 1.5).

Although the proposed test substantially reduces private costs relative to the 1982 Test, comparing Exhibits III-1 and III-2 indicates that the 1982 Test only allows slightly fewer firms to use the test to cover some portion of their obligations. The private costs of the 1982 Test are high, however, because of the six-times multiple requirements for net worth and net working capital (Exhibits III-1 and III-2 do not reflect multiple and additive requirements).

Subtitle D Closure/Post-Closure Test Results

Test	110-1	110-5	110-10	112-1	112-5	112-10
Rqrmnts						
TL/NW	2	2	2	1.5	1.5	1.5
CF used	CF-5	CF-5	CF-5	CF-5	CF-5	CF-5
CF/TL	0.05	0.05	0.05	0.1	0.1	0.1
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	18.82%	11.43%	0.00%	18.50%	11.43%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	75.02%	74.39%	73.43%	74.99%	74.39%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.38%	11.43%	0.00%	14.94%	11.43%	0.00%
10-20	22.60%	16.95%	16.95%	16.95%	16.95%	16.95%
20-100	95.82%	95.82%	95.82%	47.91%	47.91%	47.91%
100+	60.81%	60.81%	60.81%	35.47%	35.47%	35.47%
Overall	71.13%	57.79%	53.86%	44.87%	39.96%	32.84%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,051,722	$1,047,666	$0	$1,369,876	$1,047,666	$0
10-20	$729,814	$547,361	$547,361	$547,361	$547,361	$547,361
20-100	$2,444,153	$2,444,153	$2,444,153	$1,222,076	$1,222,076	$1,222,076
100+	$21,761,590	$21,761,590	$21,761,590	$12,694,261	$12,694,261	$12,694,261
Overall	$26,987,279	$25,800,770	$24,753,104	$15,833,574	$15,511,364	$14,463,698
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$12,115,075	$13,219,219	$14,924,405	$12,163,928	$13,219,219	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$40,359,569	$41,463,712	$43,168,898	$40,408,421	$41,463,712	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$14,166,798	$14,266,885	$14,924,405	$13,533,804	$14,266,885	$14,924,405
10-20	$4,063,306	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853
20-100	$2,656,417	$2,656,417	$2,656,417	$1,434,341	$1,434,341	$1,434,341
100+	$28,783,330	$28,783,330	$28,783,330	$19,716,000	$19,716,000	$19,716,000
Overall	$67,346,848	$67,264,482	$67,922,002	$56,241,995	$56,975,077	$57,632,596
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.19	1.00	0.00	0.81	1.00	0.00
10-20	0.64	0.48	0.48	0.48	0.48	0.48
20-100	1.00	1.00	1.00	0.50	0.50	0.50
100+	0.67	0.67	0.67	0.39	0.39	0.39
Overall	0.95	0.78	0.73	0.60	0.54	0.45

Subtitle D Closure/Post-Closure Test Results

Test	114-1	114-5	114-10	116-1	116-5	116-10
Rqrmnts						
TL/NW	2.5	2.5	2.5	2	2	2
CF used	CF-5	CF-5	CF-5	CF-5	CF-5	CF-5
CF/TL	0.1	0.1	0.1	0.15	0.15	0.15
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	19.06%	11.43%	0.00%	18.82%	11.43%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	89.00%	89.00%	89.00%
Overall	75.04%	74.39%	73.43%	73.35%	72.72%	71.76%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.24%	11.43%	0.00%	19.89%	11.43%	0.00%
10-20	22.60%	22.60%	22.60%	16.95%	16.95%	16.95%
20-100	95.82%	95.82%	95.82%	69.99%	69.99%	69.99%
100+	60.81%	60.81%	60.81%	47.57%	47.57%	47.57%
Overall	70.59%	60.14%	56.62%	57.98%	47.70%	42.06%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,038,931	$1,047,666	$0	$1,823,753	$1,047,666	$0
10-20	$729,814	$729,814	$729,814	$547,361	$547,361	$547,361
20-100	$2,444,153	$2,444,153	$2,444,153	$1,785,294	$1,785,294	$1,785,294
100+	$21,761,590	$21,761,590	$21,761,590	$17,023,145	$17,023,145	$17,023,145
Overall	$26,974,488	$25,983,223	$24,935,557	$21,179,553	$20,403,466	$19,355,800
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$12,079,914	$13,219,219	$14,924,405	$12,115,075	$13,219,219	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$8,791,003	$8,791,003	$8,791,003
Overall	$40,324,408	$41,463,712	$43,168,898	$42,128,832	$43,232,976	$44,938,162
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$14,118,845	$14,266,885	$14,924,405	$13,938,828	$14,266,885	$14,924,405
10-20	$4,063,306	$4,063,306	$4,063,306	$3,880,853	$3,880,853	$3,880,853
20-100	$2,656,417	$2,656,417	$2,656,417	$1,997,559	$1,997,559	$1,997,559
100+	$28,783,330	$28,783,330	$28,783,330	$25,814,148	$25,814,148	$25,814,148
Overall	$67,298,896	$67,446,936	$68,104,455	$63,308,385	$63,636,442	$64,293,962
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.17	1.00	0.00	1.06	1.00	0.00
10-20	0.64	0.64	0.64	0.48	0.48	0.48
20-100	1.00	1.00	1.00	0.73	0.73	0.73
100+	0.67	0.67	0.67	0.53	0.53	0.53
Overall	0.94	0.81	0.77	0.79	0.66	0.59

Subtitle D Closure/Post-Closure Test Results

Test	127-1	127-5	127-10	129-1	129-5	129-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	2.5	2.5	2.5
CF used	CF-10	CF-10	CF-10	CF-10	CF-10	CF-10
CF/TL	0.05	0.05	0.05	0.05	0.05	0.05
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	18.50%	11.43%	0.00%	19.06%	11.43%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	74.99%	74.39%	73.43%	75.04%	74.39%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	14.94%	11.43%	0.00%	22.24%	11.43%	0.00%
10-20	16.95%	16.95%	16.95%	22.60%	22.60%	22.60%
20-100	49.99%	49.99%	49.99%	95.82%	95.82%	95.82%
100+	45.61%	45.61%	45.61%	65.87%	65.87%	65.87%
Overall	47.34%	43.45%	36.86%	71.61%	61.63%	58.38%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$1,369,876	$1,047,666	$0	$2,038,931	$1,047,666	$0
10-20	$547,361	$547,361	$547,361	$729,814	$729,814	$729,814
20-100	$1,275,210	$1,275,210	$1,275,210	$2,444,153	$2,444,153	$2,444,153
100+	$16,321,193	$16,321,193	$16,321,193	$23,575,056	$23,575,056	$23,575,056
Overall	$19,513,640	$19,191,430	$18,143,763	$28,787,954	$27,796,689	$26,749,023
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$12,163,928	$13,219,219	$14,924,405	$12,079,914	$13,219,219	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$40,408,421	$41,463,712	$43,168,898	$40,324,408	$41,463,712	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,533,804	$14,266,885	$14,924,405	$14,118,845	$14,266,885	$14,924,405
10-20	$3,880,853	$3,880,853	$3,880,853	$4,063,306	$4,063,306	$4,063,306
20-100	$1,487,475	$1,487,475	$1,487,475	$2,656,417	$2,656,417	$2,656,417
100+	$23,342,932	$23,342,932	$23,342,932	$30,596,795	$30,596,795	$30,596,795
Overall	$59,922,061	$60,655,142	$61,312,662	$69,112,362	$69,260,402	$69,917,921
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.81	1.00	0.00	1.17	1.00	0.00
10-20	0.48	0.48	0.48	0.64	0.64	0.64
20-100	0.52	0.52	0.52	1.00	1.00	1.00
100+	0.50	0.50	0.50	0.72	0.72	0.72
Overall	0.63	0.58	0.50	0.95	0.83	0.80

Subtitle D Closure/Post-Closure Test Results

Test	130-1	130-5	130-10	131-1	131-5	131-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	2	2	2
CF used	CF-10	CF-10	CF-10	CF-10	CF-10	CF-10
CF/TL	0.1	0.1	0.1	0.1	0.1	0.1
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	18.50%	11.43%	0.00%	18.82%	11.43%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	74.99%	74.39%	73.43%	75.02%	74.39%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	14.94%	11.43%	0.00%	19.89%	11.43%	0.00%
10-20	16.95%	16.95%	16.95%	16.95%	16.95%	16.95%
20-100	29.99%	29.99%	29.99%	69.99%	69.99%	69.99%
100+	30.40%	30.40%	30.40%	45.61%	45.61%	45.61%
Overall	41.26%	34.73%	26.55%	58.35%	47.65%	41.83%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$1,369,876	$1,047,666	$0	$1,823,753	$1,047,666	$0
10-20	$547,361	$547,361	$547,361	$547,361	$547,361	$547,361
20-100	$765,126	$765,126	$765,126	$1,785,294	$1,785,294	$1,785,294
100+	$10,880,795	$10,880,795	$10,880,795	$16,321,193	$16,321,193	$16,321,193
Overall	$13,563,158	$13,240,948	$12,193,282	$20,477,601	$19,701,514	$18,653,848
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$12,163,928	$13,219,219	$14,924,405	$12,115,075	$13,219,219	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$40,408,421	$41,463,712	$43,168,898	$40,359,569	$41,463,712	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,533,804	$14,266,885	$14,924,405	$13,938,828	$14,266,885	$14,924,405
10-20	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853
20-100	$977,391	$977,391	$977,391	$1,997,559	$1,997,559	$1,997,559
100+	$17,902,534	$17,902,534	$17,902,534	$23,342,932	$23,342,932	$23,342,932
Overall	$53,971,579	$54,704,660	$55,362,180	$60,837,169	$61,165,226	$61,822,746
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.81	1.00	0.00	1.06	1.00	0.00
10-20	0.48	0.48	0.48	0.48	0.48	0.48
20-100	0.31	0.31	0.31	0.73	0.73	0.73
100+	0.33	0.33	0.33	0.50	0.50	0.50
Overall	0.55	0.47	0.36	0.78	0.64	0.57

Subtitle D Closure/Post-Closure Test Results

Test	132-1	132-5	132-10	149-1	149-5	149-10
Rqrmnts						
TL/NW	2.5	2.5	2.5	2	2	2
CF used	CF-10	CF-10	CF-10	CF	CF	CF
CF/TL	0.1	0.1	0.1	0.1	0.1	0.1
Multiple or Addit.	m	m	m	2m	2m	2m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	19.06%	11.43%	0.00%	11.36%	6.78%	0.00%
10-20	35.38%	35.38%	35.38%	25.37%	25.37%	25.37%
20-100	95.82%	95.82%	95.82%	64.09%	64.09%	64.09%
100+	91.21%	91.21%	91.21%	79.79%	79.79%	79.79%
Overall	75.04%	74.39%	73.43%	64.37%	63.98%	63.40%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.24%	11.43%	0.00%	11.74%	6.33%	0.00%
10-20	22.60%	22.60%	22.60%	12.15%	12.15%	12.15%
20-100	86.23%	86.23%	86.23%	51.27%	51.27%	51.27%
100+	60.81%	60.81%	60.81%	48.76%	48.76%	48.76%
Overall	69.16%	58.07%	54.18%	52.89%	44.33%	40.76%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,038,931	$1,047,666	$0	$1,076,238	$580,276	$0
10-20	$729,814	$729,814	$729,814	$392,539	$392,539	$392,539
20-100	$2,199,738	$2,199,738	$2,199,738	$1,307,955	$1,307,955	$1,307,955
100+	$21,761,590	$21,761,590	$21,761,590	$17,450,741	$17,450,741	$17,450,741
Overall	$26,730,073	$25,738,808	$24,691,142	$20,227,473	$19,731,510	$19,151,235
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$12,079,914	$13,219,219	$14,924,405	$13,228,324	$13,912,484	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,849,752	$3,849,752	$3,849,752
20-100	$212,265	$212,265	$212,265	$1,821,488	$1,821,488	$1,821,488
100+	$7,021,739	$7,021,739	$7,021,739	$16,143,677	$16,143,677	$16,143,677
Overall	$40,324,408	$41,463,712	$43,168,898	$52,720,237	$53,404,398	$54,416,318
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$14,118,845	$14,266,885	$14,924,405	$14,304,562	$14,492,760	$14,924,405
10-20	$4,063,306	$4,063,306	$4,063,306	$4,242,291	$4,242,291	$4,242,291
20-100	$2,412,002	$2,412,002	$2,412,002	$3,129,443	$3,129,443	$3,129,443
100+	$28,783,330	$28,783,330	$28,783,330	$33,594,417	$33,594,417	$33,594,417
Overall	$67,054,480	$67,202,520	$67,860,040	$72,947,710	$73,135,908	$73,567,553
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.17	1.00	0.00	1.03	0.93	0.00
10-20	0.64	0.64	0.64	0.48	0.48	0.48
20-100	0.90	0.90	0.90	0.80	0.80	0.80
100+	0.67	0.67	0.67	0.61	0.61	0.61
Overall	0.92	0.78	0.74	0.82	0.69	0.64

Subtitle D Closure/Post-Closure Test Results

Test	21-1	21-5	21-10	5-1	5-5	5-10
Rqrmnts						
TL/NW	2.5	2.5	2.5	2	2	2
CF used	FA * 0.66	FA * 0.66	FA * 0.66	CF	CF	CF
CF/TL	0.05	0.05	0.05	0.1	0.1	0.1
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	22.07%	12.66%	0.00%	21.83%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	75.29%	74.50%	73.43%	75.27%	74.50%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.42%	11.82%	0.00%	22.55%	11.82%	0.00%
10-20	28.25%	22.60%	22.60%	16.95%	16.95%	16.95%
20-100	95.82%	95.82%	95.82%	76.65%	76.65%	76.65%
100+	65.87%	65.87%	65.87%	55.74%	55.74%	55.74%
Overall	69.09%	61.01%	58.38%	61.85%	51.62%	47.20%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,056,242	$1,083,884	$0	$2,067,640	$1,083,884	$0
10-20	$912,268	$729,814	$729,814	$547,361	$547,361	$547,361
20-100	$2,444,153	$2,444,153	$2,444,153	$1,955,322	$1,955,322	$1,955,322
100+	$23,575,056	$23,575,056	$23,575,056	$19,948,124	$19,948,124	$19,948,124
Overall	$28,987,719	$27,832,907	$26,749,023	$24,518,447	$23,534,691	$22,450,807
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,630,779	$13,034,261	$14,924,405	$11,665,940	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$39,875,273	$41,278,754	$43,168,898	$39,910,434	$41,278,754	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,687,022	$14,118,145	$14,924,405	$13,733,580	$14,118,145	$14,924,405
10-20	$4,245,760	$4,063,306	$4,063,306	$3,880,853	$3,880,853	$3,880,853
20-100	$2,656,417	$2,656,417	$2,656,417	$2,167,587	$2,167,587	$2,167,587
100+	$30,596,795	$30,596,795	$30,596,795	$26,969,864	$26,969,864	$26,969,864
Overall	$68,862,992	$69,111,661	$69,917,921	$64,428,881	$64,813,446	$65,619,705
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.02	0.93	0.00	1.03	0.93	0.00
10-20	0.80	0.64	0.64	0.48	0.48	0.48
20-100	1.00	1.00	1.00	0.80	0.80	0.80
100+	0.72	0.72	0.72	0.61	0.61	0.61
Overall	0.92	0.82	0.80	0.82	0.69	0.64

Subtitle D Closure/Post-Closure Test Results

Test	58-1	58-5	58-10	73-1	73-5	73-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	1.5	1.5	1.5
CF used	CF-10	CF-10	CF-10	CF	CF	CF
CF/TL	0.1	0.1	0.1	0.05	0.05	0.05
Multiple or Addit.	0	0	0	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	3.17%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	72.41%	33.36%	4.38%	22.07%	12.66%	0.00%
10-20	90.59%	90.59%	90.59%	35.38%	35.38%	35.38%
20-100	100.00%	100.00%	100.00%	95.82%	95.82%	95.82%
100+	100.00%	99.70%	99.47%	91.21%	91.21%	91.21%
Overall	88.21%	84.55%	81.93%	75.29%	74.50%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	58.49%	33.36%	0.00%	19.93%	11.82%	0.00%
10-20	43.39%	43.39%	43.39%	22.60%	16.95%	16.95%
20-100	31.30%	31.30%	31.30%	86.23%	86.23%	86.23%
100+	33.33%	33.23%	33.16%	55.74%	55.74%	55.74%
Overall	48.54%	39.47%	29.63%	60.35%	53.68%	49.65%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$5,363,100	$3,058,916	$0	$1,827,771	$1,083,884	$0
10-20	$1,401,398	$1,401,398	$1,401,398	$729,814	$547,361	$547,361
20-100	$798,540	$798,540	$798,540	$2,199,738	$2,199,738	$2,199,738
100+	$11,929,375	$11,893,127	$11,865,576	$19,948,124	$19,948,124	$19,948,124
Overall	$19,492,413	$17,151,981	$14,065,514	$24,705,447	$23,779,107	$22,695,223
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,438,956	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$4,117,068	$9,945,700	$14,271,344	$11,630,779	$13,034,261	$14,924,405
10-20	$485,660	$485,660	$485,660	$3,333,492	$3,333,492	$3,333,492
20-100	$0	$0	$0	$212,265	$212,265	$212,265
100+	$0	$242,733	$427,223	$7,021,739	$7,021,739	$7,021,739
Overall	$22,041,684	$28,351,090	$32,861,224	$39,875,273	$41,278,754	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,438,956	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$9,480,167	$13,004,616	$14,271,344	$13,458,550	$14,118,145	$14,924,405
10-20	$1,887,058	$1,887,058	$1,887,058	$4,063,306	$3,880,853	$3,880,853
20-100	$798,540	$798,540	$798,540	$2,412,002	$2,412,002	$2,412,002
100+	$11,929,375	$12,135,860	$12,292,799	$26,969,864	$26,969,864	$26,969,864
Overall	$41,534,096	$45,503,071	$46,926,738	$64,580,720	$65,057,861	$65,864,121
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.81	1.00	0.00	0.90	0.93	0.00
10-20	0.48	0.48	0.48	0.64	0.48	0.48
20-100	0.31	0.31	0.31	0.90	0.90	0.90
100+	0.33	0.33	0.33	0.61	0.61	0.61
Overall	0.55	0.47	0.36	0.80	0.72	0.68

Subtitle D Closure/Post-Closure Test Results

Test	74-1	74-5	74-10	75-1	75-5	75-10
Rqrmnts						
TL/NW	2	2	2	2.5	2.5	2.5
CF used	CF	CF	CF	CF	CF	CF
CF/TL	0.05	0.05	0.05	0.05	0.05	0.05
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	22.07%	12.66%	0.00%	22.07%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	75.29%	74.50%	73.43%	75.29%	74.50%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.42%	11.82%	0.00%	22.42%	11.82%	0.00%
10-20	22.60%	16.95%	16.95%	28.25%	22.60%	22.60%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	60.81%	60.81%	60.81%	65.87%	65.87%	65.87%
Overall	66.60%	57.21%	53.86%	69.09%	61.01%	58.38%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,056,242	$1,083,884	$0	$2,056,242	$1,083,884	$0
10-20	$729,814	$547,361	$547,361	$912,268	$729,814	$729,814
20-100	$2,444,153	$2,444,153	$2,444,153	$2,444,153	$2,444,153	$2,444,153
100+	$21,761,590	$21,761,590	$21,761,590	$23,575,056	$23,575,056	$23,575,056
Overall	$26,991,799	$25,836,988	$24,753,104	$28,987,719	$27,832,907	$26,749,023
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,630,779	$13,034,261	$14,924,405	$11,630,779	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$39,875,273	$41,278,754	$43,168,898	$39,875,273	$41,278,754	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,687,022	$14,118,145	$14,924,405	$13,687,022	$14,118,145	$14,924,405
10-20	$4,063,306	$3,880,853	$3,880,853	$4,245,760	$4,063,306	$4,063,306
20-100	$2,656,417	$2,656,417	$2,656,417	$2,656,417	$2,656,417	$2,656,417
100+	$28,783,330	$28,783,330	$28,783,330	$30,596,795	$30,596,795	$30,596,795
Overall	$66,867,072	$67,115,742	$67,922,002	$68,862,992	$69,111,661	$69,917,921
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.02	0.93	0.00	1.02	0.93	0.00
10-20	0.64	0.48	0.48	0.80	0.64	0.64
20-100	1.00	1.00	1.00	1.00	1.00	1.00
100+	0.67	0.67	0.67	0.72	0.72	0.72
Overall	0.88	0.77	0.73	0.92	0.82	0.80

Subtitle D Closure/Post-Closure Test Results

Test	76-1	76-5	76-10	77-1	77-5	77-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	2	2	2
CF used	CF	CF	CF	CF	CF	CF
CF/TL	0.1	0.1	0.1	0.1	0.1	0.1
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	21.83%	12.66%	0.00%	21.83%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	75.27%	74.50%	73.43%	75.27%	74.50%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	17.54%	11.82%	0.00%	22.55%	11.82%	0.00%
10-20	16.95%	16.95%	16.95%	16.95%	16.95%	16.95%
20-100	47.91%	47.91%	47.91%	76.65%	76.65%	76.65%
100+	45.61%	45.61%	45.61%	55.74%	55.74%	55.74%
Overall	47.91%	42.51%	36.35%	61.85%	51.62%	47.20%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$1,608,164	$1,083,884	$0	$2,067,640	$1,083,884	$0
10-20	$547,361	$547,361	$547,361	$547,361	$547,361	$547,361
20-100	$1,222,076	$1,222,076	$1,222,076	$1,955,322	$1,955,322	$1,955,322
100+	$16,321,193	$16,321,193	$16,321,193	$19,948,124	$19,948,124	$19,948,124
Overall	$19,698,794	$19,174,514	$18,090,630	$24,518,447	$23,534,691	$22,450,807
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,665,940	$13,034,261	$14,924,405	$11,665,940	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$39,910,434	$41,278,754	$43,168,898	$39,910,434	$41,278,754	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,274,105	$14,118,145	$14,924,405	$13,733,580	$14,118,145	$14,924,405
10-20	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853
20-100	$1,434,341	$1,434,341	$1,434,341	$2,167,587	$2,167,587	$2,167,587
100+	$23,342,932	$23,342,932	$23,342,932	$26,969,864	$26,969,864	$26,969,864
Overall	$59,609,228	$60,453,268	$61,259,528	$64,428,881	$64,813,446	$65,619,705
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.80	0.93	0.00	1.03	0.93	0.00
10-20	0.48	0.48	0.48	0.48	0.48	0.48
20-100	0.50	0.50	0.50	0.80	0.80	0.80
100+	0.50	0.50	0.50	0.61	0.61	0.61
Overall	0.64	0.57	0.50	0.82	0.69	0.64

Subtitle D Closure/Post-Closure Test Results

Test	78-1	78-5	78-10	80-1	80-5	80-10
Rqrmnts						
TL/NW	2.5	2.5	2.5	2	2	2
CF used	CF	CF	CF	CF	CF	CF
CF/TL	0.1	0.1	0.1	0.15	0.15	0.15
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	22.07%	12.66%	0.00%	21.62%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	90.91%	90.91%	90.91%
Overall	75.29%	74.50%	73.43%	75.03%	74.27%	73.20%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.42%	11.82%	0.00%	22.70%	11.82%	0.00%
10-20	22.60%	22.60%	22.60%	16.95%	16.95%	16.95%
20-100	95.82%	95.82%	95.82%	67.07%	67.07%	67.07%
100+	65.87%	65.87%	65.87%	46.97%	46.97%	46.97%
Overall	67.57%	61.01%	58.38%	59.24%	47.02%	41.69%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,056,242	$1,083,884	$0	$2,081,548	$1,083,884	$0
10-20	$729,814	$729,814	$729,814	$547,361	$547,361	$547,361
20-100	$2,444,153	$2,444,153	$2,444,153	$1,710,907	$1,710,907	$1,710,907
100+	$23,575,056	$23,575,056	$23,575,056	$16,809,048	$16,809,048	$16,809,048
Overall	$28,805,265	$27,832,907	$26,749,023	$21,148,864	$20,151,199	$19,067,315
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,630,779	$13,034,261	$14,924,405	$11,697,798	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,264,473	$7,264,473	$7,264,473
Overall	$39,875,273	$41,278,754	$43,168,898	$40,185,025	$41,521,488	$43,411,631
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,687,022	$14,118,145	$14,924,405	$13,779,347	$14,118,145	$14,924,405
10-20	$4,063,306	$4,063,306	$4,063,306	$3,880,853	$3,880,853	$3,880,853
20-100	$2,656,417	$2,656,417	$2,656,417	$1,923,172	$1,923,172	$1,923,172
100+	$30,596,795	$30,596,795	$30,596,795	$24,073,520	$24,073,520	$24,073,520
Overall	$68,680,538	$69,111,661	$69,917,921	$61,333,889	$61,672,687	$62,478,947
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.02	0.93	0.00	1.05	0.93	0.00
10-20	0.64	0.64	0.64	0.48	0.48	0.48
20-100	1.00	1.00	1.00	0.70	0.70	0.70
100+	0.72	0.72	0.72	0.52	0.52	0.52
Overall	0.90	0.82	0.80	0.79	0.63	0.57

Subtitle D Closure/Post-Closure Test Results

Test	91-1	91-5	91-10	92-1	92-5	92-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	2	2	2
CF used	FA*0.66	FA*0.66	FA*0.66	FA*0.66	FA*0.66	FA*0.66
CF/TL	0.05	0.05	0.05	0.05	0.05	0.05
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	21.83%	12.66%	0.00%	21.83%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	91.21%	91.21%	91.21%	91.21%	91.21%	91.21%
Overall	75.27%	74.50%	73.43%	75.27%	74.50%	73.43%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	20.04%	11.82%	0.00%	22.55%	11.82%	0.00%
10-20	22.60%	16.95%	16.95%	22.60%	16.95%	16.95%
20-100	86.23%	86.23%	86.23%	95.82%	95.82%	95.82%
100+	55.74%	55.74%	55.74%	60.81%	60.81%	60.81%
Overall	60.79%	53.68%	49.65%	67.08%	57.21%	53.86%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$1,837,902	$1,083,884	$0	$2,067,640	$1,083,884	$0
10-20	$729,814	$547,361	$547,361	$729,814	$547,361	$547,361
20-100	$2,199,738	$2,199,738	$2,199,738	$2,444,153	$2,444,153	$2,444,153
100+	$19,948,124	$19,948,124	$19,948,124	$21,761,590	$21,761,590	$21,761,590
Overall	$24,715,578	$23,779,107	$22,695,223	$27,003,197	$25,836,988	$24,753,104
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,665,940	$13,034,261	$14,924,405	$11,665,940	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739	$7,021,739
Overall	$39,910,434	$41,278,754	$43,168,898	$39,910,434	$41,278,754	$43,168,898
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,503,842	$14,118,145	$14,924,405	$13,733,580	$14,118,145	$14,924,405
10-20	$4,063,306	$3,880,853	$3,880,853	$4,063,306	$3,880,853	$3,880,853
20-100	$2,412,002	$2,412,002	$2,412,002	$2,656,417	$2,656,417	$2,656,417
100+	$26,969,864	$26,969,864	$26,969,864	$28,783,330	$28,783,330	$28,783,330
Overall	$64,626,012	$65,057,861	$65,864,121	$66,913,631	$67,115,742	$67,922,002
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.92	0.93	0.00	1.03	0.93	0.00
10-20	0.64	0.48	0.48	0.64	0.48	0.48
20-100	0.90	0.90	0.90	1.00	1.00	1.00
100+	0.61	0.61	0.61	0.67	0.67	0.67
Overall	0.81	0.72	0.68	0.89	0.77	0.73

Subtitle D Closure/Post-Closure Test Results

Test	94-1	94-5	94-10	95-1	95-5	95-10
Rqrmnts						
TL/NW	1.5	1.5	1.5	2	2	2
CF used	FA*0.66	FA*0.66	FA*0.66	FA*0.66	FA*0.66	FA*0.66
CF/TL	0.1	0.1	0.1	0.1	0.1	0.1
Multiple or Addit.	m	m	m	m	m	m
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	21.62%	12.66%	0.00%	21.62%	12.66%	0.00%
10-20	35.38%	35.38%	35.38%	35.38%	35.38%	35.38%
20-100	95.82%	95.82%	95.82%	95.82%	95.82%	95.82%
100+	90.91%	90.91%	90.91%	90.91%	90.91%	90.91%
Overall	75.03%	74.27%	73.20%	75.03%	74.27%	73.20%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	17.66%	11.82%	0.00%	22.70%	11.82%	0.00%
10-20	16.95%	16.95%	16.95%	16.95%	16.95%	16.95%
20-100	47.91%	47.91%	47.91%	76.65%	76.65%	76.65%
100+	48.59%	48.59%	48.59%	57.41%	57.41%	57.41%
Overall	48.85%	43.38%	37.27%	62.59%	52.06%	47.72%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$1,618,982	$1,083,884	$0	$2,081,548	$1,083,884	$0
10-20	$547,361	$547,361	$547,361	$547,361	$547,361	$547,361
20-100	$1,222,076	$1,222,076	$1,222,076	$1,955,322	$1,955,322	$1,955,322
100+	$17,388,670	$17,388,670	$17,388,670	$20,544,392	$20,544,392	$20,544,392
Overall	$20,777,089	$20,241,991	$19,158,107	$25,128,623	$24,130,959	$23,047,075
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,697,798	$13,034,261	$14,924,405	$11,697,798	$13,034,261	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492	$3,333,492
20-100	$212,265	$212,265	$212,265	$212,265	$212,265	$212,265
100+	$7,264,473	$7,264,473	$7,264,473	$7,264,473	$7,264,473	$7,264,473
Overall	$40,185,025	$41,521,488	$43,411,631	$40,185,025	$41,521,488	$43,411,631
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,316,780	$14,118,145	$14,924,405	$13,779,347	$14,118,145	$14,924,405
10-20	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853	$3,880,853
20-100	$1,434,341	$1,434,341	$1,434,341	$2,167,587	$2,167,587	$2,167,587
100+	$24,653,143	$24,653,143	$24,653,143	$27,808,864	$27,808,864	$27,808,864
Overall	$60,962,114	$61,763,479	$62,569,739	$65,313,648	$65,652,446	$66,458,706
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.82	0.93	0.00	1.05	0.93	0.00
10-20	0.48	0.48	0.48	0.48	0.48	0.48
20-100	0.50	0.50	0.50	0.80	0.80	0.80
100+	0.53	0.53	0.53	0.63	0.63	0.63
Overall	0.65	0.58	0.51	0.83	0.70	0.65

Subtitle D Closure/Post-Closure Test Results

Test	96-1	96-5	96-10	544-1a	544-5a	544-10a
Rqrmnts						
TL/NW	2.5	2.5	2.5	1.5	1.5	1.5
CF used	FA*0.66	FA*0.66	FA*0.66	CF-5	CF-5	CF-5
CF/TL	0.1	0.1	0.1	0.1	0.1	0.1
Multiple or Addit.	m	m	m	a = $1,000,000	a = $5,000,000	a = $10,000,000
Min NW	$1,000,000	$5,000,000	$10,000,000	$1,000,000	$5,000,000	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	1.84%	1.84%	1.84%
1-10	21.86%	12.66%	0.00%	13.81%	3.95%	0.00%
10-20	35.38%	35.38%	35.38%	34.04%	27.95%	16.81%
20-100	95.82%	95.82%	95.82%	94.57%	88.17%	79.89%
100+	91.21%	91.21%	91.21%	91.17%	90.97%	90.39%
Overall	75.28%	74.50%	73.43%	74.48%	73.09%	71.67%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	22.57%	11.82%	0.00%	11.15%	3.95%	0.00%
10-20	22.60%	22.60%	22.60%	16.31%	13.39%	8.05%
20-100	86.23%	86.23%	86.23%	47.29%	44.08%	39.95%
100+	60.81%	60.81%	60.81%	35.46%	35.38%	35.15%
Overall	65.72%	57.48%	54.18%	44.57%	39.26%	32.05%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$2,069,736	$1,083,884	$0	$1,022,504	$361,810	$0
10-20	$729,814	$729,814	$729,814	$526,668	$432,463	$260,026
20-100	$2,199,738	$2,199,738	$2,199,738	$1,206,236	$1,124,559	$1,018,959
100+	$21,761,590	$21,761,590	$21,761,590	$12,689,034	$12,661,433	$12,579,943
Overall	$26,760,878	$25,775,026	$24,691,142	$15,444,443	$14,580,264	$13,858,928
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$11,662,637	$13,034,261	$14,924,405	$12,863,928	$14,335,522	$14,924,405
10-20	$3,333,492	$3,333,492	$3,333,492	$3,402,492	$3,716,626	$4,291,626
20-100	$212,265	$212,265	$212,265	$275,265	$600,118	$1,020,118
100+	$7,021,739	$7,021,739	$7,021,739	$7,051,739	$7,210,165	$7,677,898
Overall	$39,907,131	$41,278,754	$43,168,898	$41,270,421	$43,539,428	$45,591,044
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997	$17,676,997
1-10	$13,732,373	$14,118,145	$14,924,405	$13,886,431	$14,697,332	$14,924,405
10-20	$4,063,306	$4,063,306	$4,063,306	$3,929,160	$4,149,088	$4,551,651
20-100	$2,412,002	$2,412,002	$2,412,002	$1,481,501	$1,724,677	$2,039,077
100+	$28,783,330	$28,783,330	$28,783,330	$19,740,774	$19,871,598	$20,257,842
Overall	$66,668,008	$67,053,780	$67,860,040	$56,714,864	$58,119,692	$59,449,972
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	1.03	0.93	0.00	0.81	1.00	0.00
10-20	0.64	0.64	0.64	0.48	0.48	0.48
20-100	0.90	0.90	0.90	0.50	0.50	0.50
100+	0.67	0.67	0.67	0.39	0.39	0.39
Overall	0.87	0.77	0.74	0.60	0.54	0.45

Subtitle D Closure/Post-Closure Test Results

Test	562-1a	562-5a	562-10a	NO TEST	1982 TEST
Rqrmnts					CA/CL >= 1.5
TL/NW	1.5	1.5	1.5	-	2
CF used	CF-10	CF-10	CF-10	-	CF
CF/TL	0.1	0.1	0.1	-	0.1
Multiple or Addit.	a = $1,000,000	a = $5,000,000	a = $10,000,000	-	6*NW, 6*NWC
Min NW	$1,000,000	$5,000,000	$10,000,000	-	$10,000,000
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	1.84%	0.00%	0.00%
1-10	13.81%	3.95%	0.00%	0.00%	0.00%
10-20	34.04%	27.95%	16.81%	0.00%	0.98%
20-100	94.57%	88.17%	79.89%	0.00%	8.61%
100+	91.17%	90.97%	90.39%	0.00%	31.94%
Overall	74.48%	73.09%	71.67%	0.00%	24.44%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	11.15%	3.95%	0.00%	0.00%	0.00%
10-20	16.31%	13.39%	8.05%	0.00%	0.47%
20-100	29.61%	27.60%	25.01%	0.00%	2.70%
100+	30.39%	30.32%	30.13%	0.00%	11.79%
Overall	40.98%	34.11%	25.92%	0.00%	9.23%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0
1-10	$1,022,504	$361,810	$0	$0	$0
10-20	$526,668	$432,463	$260,026	$0	$15,113
20-100	$755,209	$704,072	$637,957	$0	$68,773
100+	$10,876,315	$10,852,657	$10,782,809	$0	$4,219,025
Overall	$13,180,696	$12,351,001	$11,680,791	$0	$4,302,911
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$18,009,079	$18,009,079
1-10	$12,863,928	$14,335,522	$14,924,405	$14,924,405	$14,924,405
10-20	$3,402,492	$3,716,626	$4,291,626	$5,158,694	$5,108,300
20-100	$275,265	$600,118	$1,020,118	$5,072,796	$4,635,911
100+	$7,051,739	$7,210,165	$7,677,898	$79,884,206	$54,365,909
Overall	$41,270,421	$43,539,428	$45,591,044	$123,049,180	$97,043,603
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,676,997	$18,009,079	$18,009,079
1-10	$13,886,431	$14,697,332	$14,924,405	$14,924,405	$14,924,405
10-20	$3,929,160	$4,149,088	$4,551,651	$5,158,694	$5,123,413
20-100	$1,030,473	$1,304,190	$1,658,075	$5,072,796	$4,704,683
100+	$17,928,054	$18,062,822	$18,460,707	$79,884,206	$58,584,934
Overall	$54,451,117	$55,890,429	$57,271,835	$123,049,180	$101,346,514
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00
1-10	0.81	1.00	0.00	0.00	0.00
10-20	0.48	0.48	0.48	0.00	0.48
20-100	0.31	0.31	0.31	0.00	0.31
100+	0.33	0.33	0.33	0.00	0.37
Overall	0.55	0.47	0.36	0.00	0.38

Subtitle D Closure/Post-Closure Test Results

	Less Stringent			More Stringent		
Test	**Meridian Test**			**Meridian Test**		
Test	**10**	**5**	**1**	**10**	**5**	**1**
NW Category	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**	**A($)**
<1	1.84%	1.84%	3.17%	1.84%	1.84%	1.84%
1-10	4.38%	37.74%	99.07%	0.00%	1.86%	2.79%
10-20	90.59%	90.59%	90.59%	27.22%	27.22%	27.22%
20-100	100.00%	100.00%	100.00%	86.89%	86.89%	86.89%
100+	97.55%	97.79%	98.58%	76.01%	76.01%	76.01%
Overall	80.48%	83.48%	89.40%	61.39%	61.55%	61.63%
NW Category	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**	**M($)**
<1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1-10	0.00%	35.22%	100.67%	0.00%	8.68%	43.94%
10-20	43.39%	43.39%	57.85%	36.95%	36.95%	49.26%
20-100	76.36%	76.36%	76.36%	81.10%	81.10%	81.10%
100+	75.31%	75.49%	76.11%	68.07%	68.07%	68.07%
Overall	56.02%	61.69%	77.74%	59.30%	72.59%	131.44%
NW Category	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**	**Public Cost**
<1	$0	$0	$0	$0	$0	$0
1-10	$0	$3,229,480	$9,230,811	$0	$795,794	$4,028,709
10-20	$1,401,398	$1,401,398	$1,868,531	$1,193,311	$1,193,311	$1,591,081
20-100	$1,947,954	$1,947,954	$1,947,954	$2,068,659	$2,068,659	$2,068,659
100+	$26,953,785	$27,017,594	$27,237,073	$24,361,837	$24,361,837	$24,361,837
Overall	$30,303,137	$33,596,426	$40,284,369	$27,623,806	$28,419,600	$32,050,285
NW Category	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**	**Private Cost**
<1	$17,676,997	$17,676,997	$17,438,956	$17,676,997	$17,676,997	$17,676,997
1-10	$14,271,344	$9,292,639	$138,776	$14,924,405	$14,646,854	$14,508,078
10-20	$485,660	$485,660	$485,660	$3,754,286	$3,754,286	$3,754,286
20-100	$0	$0	$0	$665,143	$665,143	$665,143
100+	$1,953,754	$1,769,264	$1,134,694	$19,163,127	$19,163,127	$19,163,127
Overall	$34,387,754	$29,224,559	$19,198,086	$56,183,958	$55,906,407	$55,767,632
NW Category	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**	**Total Cost**
<1	$17,676,997	$17,676,997	$17,438,956	$17,676,997	$17,676,997	$17,676,997
1-10	$14,271,344	$12,522,119	$9,369,587	$14,924,405	$15,442,648	$18,536,787
10-20	$1,887,058	$1,887,058	$2,354,191	$4,947,597	$4,947,597	$5,345,367
20-100	$1,947,954	$1,947,954	$1,947,954	$2,733,802	$2,733,802	$2,733,802
100+	$28,907,539	$28,786,858	$28,371,767	$43,524,964	$43,524,964	$43,524,964
Overall	$64,690,891	$62,820,985	$59,482,455	$83,807,764	$84,326,007	$87,817,917
NW Category	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**	**m(f)/a(f)**
<1	0.00	0.00	0.00	0.00	0.00	0.00
1-10	0.00	0.93	1.02	0.00	4.67	15.75
10-20	0.48	0.48	0.64	1.36	1.36	1.81
20-100	0.76	0.76	0.76	0.93	0.93	0.93
100+	0.77	0.77	0.77	0.90	0.90	0.90
Overall	0.70	0.74	0.87	0.97	1.18	2.13