Exhibit A

SUPPLEMENTAL/REBUTTAL EXPERT REPORT OF P.J. ERIC STALLARD, A.S.A., M.A.A.A., F.C.A.

In re W.R. Grace & Co., *et al.*

September 25, 2007

PURPOSE

This document is my supplemental/rebuttal expert report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF).

The report has two parts. In Part I, I offer my opinions on the assumptions, methods, and procedures used by B. Thomas Florence, Ph.D., in making his estimates of the number and value of pending and future asbestos personal injury claims.

These opinions reflect my experience in data analysis, statistical estimation, modeling, and forecasting in the areas of population health and aging, with specific expertise in the epidemiology and modeling of asbestos-related diseases and claims. I approached this task with a level of scrutiny similar to what I would apply in conducting scientific peer-review for submissions to professional journals in my field. In scientific peer-review there are often one or two other reviewers with complementary areas of expertise. This is also the case with respect to the Florence rebuttal reports, with Victor L. Roggli, M.D., opining on medical criteria and Jennifer L. Biggs, F.S.A., M.A.A.A., opining on actuarial aspects, both of which complement my report.

In Part II, I present supplemental projections of the number of male claims against the Manville Trust by disease, date of first exposure, and date of claim for the period 2005–2009 through 2055–2059. I also provided these supplemental projections to Jennifer L. Biggs for use in her supplemental/rebuttal expert report dated September 25, 2007.

I was asked to prepare this report on behalf of David T. Austern, the Court-Appointed Future Claimants' Representative.

I reserve the right to modify this report as new information becomes available between now and the time of trial. I anticipate that I will review the supplemental/rebuttal expert reports of opposing experts and may offer my opinions about their analyses and conclusions in a rebuttal or supplemental report or at trial.

PART I

INFORMATION CONSIDERED

1. B. Thomas Florence. "Estimation of the Number and Value of Pending and Future Asbestos-Related Personal Injury Claims: W.R. Grace." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), June 18, 2007.
2. B. Thomas Florence. Reliance material for "Estimation of the Number and Value of Pending and Future Asbestos-Related Personal Injury Claims: W.R. Grace." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), June 18, 2007.
3. Jennifer L. Biggs. "Estimation of Asbestos Personal Injury Liabilities of W.R. Grace as of April 2, 2001." Expert Estimation Report of Jennifer L. Biggs, FCAS, MAAA, *In Re: W.R. Grace & Co., et al*., June 18, 2007.
4. Mark A. Peterson. "W.R. Grace Projected Liabilities for Asbestos Personal Injury Claims As of April 2001." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), June 2007.

5. Victor L. Roggli. "Supplemental/Rebuttal Expert Report of Victor L. Roggli, M.D." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), July 31, 2007.
6. U.S. Senate. ''Fairness in Asbestos Injury Resolution Act of 2005.'' Bill No. S. 852, April 19, 2005.
7. Thomas N. Herzog. "Introduction to Credibility Theory: Third Edition." ACTEX Publications, Winsted, CT, 1999.
8. Thomas Vasquez. "Estimation of Company Liability Personal Injury: Volume I." KPMG Peat Marwick Policy Economics Group, 1991.
9. William J. Nicholson, George Perkel, and Irving J. Selikoff. "Occupational Exposure to Asbestos: Population at Risk and Projected Mortality – 1980–2030." American Journal of Industrial Medicine 3: 259–311, 1982.
10. Elizabeth L. Anderson. "The Scientific Credibility of Personal Injury Claims Related to Alleged Exposure to W.R. Grace Asbestos-Containing Products." Supplemental Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), June 11, 2007.
11. Board of Trustees of the Social Security Trust Funds. "The 2007 Annual Report of The Board of Trustees of The Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds." U.S. GPO, Washington, DC, 2007.
12. David Weill. "Expert Report of David Weill, M.D." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), October 3, 2006.
13. Eric Stallard, Kenneth G. Manton, and Joel E. Cohen. "Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case." Springer, New York, 2005.
14. Stephen J. Carroll, Deborah Hensler, Jennifer Gross, Elizabeth M. Sloss, Matthias Schonlau, Allan Abrahamse, J. Scott Ashwood. "Asbestos Litigation." RAND, Santa Monica, CA, 2005. (The 2005 RAND Report)
15. Daniel Myer. Transcript of Testimony in the Armstrong Confirmation Hearing, May 23, 2006.
16. Lester Brickman. Transcript of Testimony in the Armstrong Confirmation Hearing, May 23, 2006.
17. Elli Leibenstein. Email to counsel for the Future Claimants' Representative, dated September 17, 2007 1:19 PM.
18. Frederick C. Dunbar. "Report of Frederick C. Dunbar." Expert Report for the W.R. Grace & Co., *et al*., Case No. 01-1139 (JKF), June 18, 2007.

STATEMENT OF OPINIONS

1. The methods and procedures used by B. Thomas Florence were inappropriate for the stated goal of making estimates of the total number and value of pending and future asbestos personal injury claims against W.R. Grace ("Grace") as of April 2, 2001 because they were designed to produce an estimated value which was not a complete estimate of Grace's liability. Florence's estimated value was fundamentally different from (a) the estimated values of Grace's liability reported by Biggs and Peterson, respectively, in their expert reports submitted in June 2007 and (b) the values reported by Florence in Sections 1.0 and 1.1 of his report describing other work he himself has performed in the area of valuing and estimating asbestos liabilities in connection with asbestos trusts and manufacturers.

This opinion is based on Florence's descriptions of the estimation task that he was asked to perform, which clearly indicate that Florence's estimates excluded large numbers of pending and future claims and associated costs:

- In the first sentence of his report (Section 1.0) he stated that his company (ARPC) "… was asked to prepare an estimate of the number and value of valid pending and future asbestos-related personal injury claims under assumptions regarding the evidence required to demonstrate the validity of the claims."
- On page 2 (Section 1.2), he stated: "These assumptions are based on the premise that only claimants whose claims met the following criteria would be able to sustain their burden of proof that their claims against Grace are valid, and therefore, their claims should be valued as part of the estimation process: …" Following a listing of seven "evidentiary criteria", he commented: "In a typical asbestos bankruptcy estimation, the information necessary for determining which claims would meet these criteria would not be available." He then cited the Court ordered requirements for pending claimants to file PIQs and POCs, and commented (on page 3): "The data gleaned from these two requirements allowed the estimation of valid Grace claims based on the above criteria."
- On page 3 (Section 2.0), he began his Opinion with: "ARPC estimated the Grace pending and future asbestos personal injury claim liability under the specified assumptions." He then referred to the criteria on page 2 as the "evidentiary criteria."
- On page 6 (Section 4.0), he began his description of the Pending Claims Estimation with: "Grace asked ARPC to assume that only the claimants whose claims met specific criteria will be able to sustain their burden of proof that the claims against Grace are valid and therefore compensable."
- On page 8 (Section 4.2.2), Florence stated: "ARPC was asked to assume that only historical pending claimants whose claims also met the following criteria would be able to sustain their burden of proof that their claims against Grace are valid, and therefore, their claims should be valued as part of the estimation process: …" after which he listed the Grace exposure criteria.
- On page 16 (Section 5.1), Florence stated: "Grace asked ARPC to assume that only the claimants whose claims met specific criteria will be able to sustain their burden of proof that the claims against Grace are valid and therefore compensable."
- On page 21 (Section 7.0), he began his Conclusion with: "ARPC was asked to estimate the Grace number and value of pending and future asbestos personal injury claims under the assumption that only claimants whose claims met the required criteria will be able to sustain their burden of proof that their claims against Grace are valid, and therefore, their claims should be valued as part of the estimation process."

Taken together, these statements indicate that Florence's methods and procedures were designed to exclude all pending and future claims and associated costs relating to claimants who would not be expected to meet the required "evidentiary criteria". Moreover, they indicate that Grace, not Florence, was responsible for the specification of the assumptions regarding the evidentiary criteria used to include or exclude these claims from the estimation procedure.

Florence's estimates are based on the unsupported assumption (page 21) that "only claimants whose claims met the required criteria will be able to sustain their burden of proof that their claims against Grace are valid, and therefore, their claims should be valued as part of the estimation process." As further explained on pages 6 and 16, these would be the only

claimants whose claims "against Grace are valid and therefore compensable." It follows logically that all excluded claims would be noncompensable with zero-dollar liability values in the tort system from April 2, 2001 onward.

Florence took no responsibility for these assumptions; he accepted Grace's assumptions without commenting on their appropriateness for the task of estimating the total value of Grace's asbestos-related personal injury liabilities.

Most importantly, Florence offered no evidence that the claims excluded from his estimates could be reasonably expected to be noncompensable with zero-dollar liability values in the tort system from April 2, 2001 onward.

Given his extensive and lengthy experience in estimating asbestos liabilities in connection with more than 20 asbestos manufacturers and trusts (page 1) and the critical role of the assumption that these claims would be noncompensable with zero-dollar liability values in the tort system from April 2, 2001 onward, I expected him to provide some evidence that these excluded claims would be noncompensable. The fact that he did not do so supports my opinion that his estimates of Grace's liability are incomplete.

Victor L. Roggli, M.D. reviewed the evidentiary criteria used by Florence and concluded that: "these criteria are not medically sound, and any estimate based on these criteria would be flawed." (Roggli, 2007, page 1). Moreover, I am unaware of any tort reform proposals that would result in limiting "valid claims" to those that meet the evidentiary criteria specified by Grace and followed by Florence.

To the extent that the claims excluded by Florence from his estimates would have a liability consistent with their historical values in the tort system, the estimates reported by Florence are significantly and materially downward-biased. Indeed, using the difference between Florence's estimated values of Grace's liability and those reported by Biggs or Peterson, one can show that the excluded costs constitute a large majority of Grace's liability as of April 2, 2001.

Because Florence's estimates excluded large numbers of claims and associated costs, these estimates are unscientific, downwardly biased, and of no assistance to the Court for the purpose of determining Grace's total liability for asbestos-related personal injuries as of April 2, 2001.

2. The methods and procedures used by Florence were inappropriate for the goal of making estimates of the value of the pending and future asbestos personal injury claims against Grace as of April 2, 2001 among claimants who could meet the evidentiary criteria specified by Grace.

This opinion is based on a fundamental inconsistency between the methods used to estimate the number of claims that would receive indemnity payments and the methods used to estimate the average values of those indemnity payments.

My understanding of the requirements of the estimation phase of the trial is that the estimation of Grace's pending and future liabilities relating to asbestos personal injury claims

must be conducted under a "no-bankruptcy" assumption whereby the estimation procedure assumes that the Grace bankruptcy filing on April 2, 2001 did not occur and that new claims would have continued to be filed and settled, along with pending claims, through the tort system.

My understanding of the reason for the "no-bankruptcy" assumption is that it allows the total value of Grace's pending and future liabilities relating to asbestos personal injury claims to be estimated and treated as if it had become fixed immediately before the filing of the bankruptcy petition, and in a manner that would not be influenced by the fact that the bankruptcy petition was filed on April 2, 2001, or on any date thereafter, or not at all. Equivalently, my understanding is that the estimation of the total value of those liabilities should be conducted without consideration of the protections offered to Grace through bankruptcy and without regard to the resources that Grace may hold to offset those liabilities.

The generally accepted approach to constructing an estimation model under the "no-bankruptcy" assumption would be to assume that the filing and settlement process beginning at the date of the bankruptcy petition would be a continuation of the filing and settlement process in place immediately before the filing of the bankruptcy petition, with due consideration given to changes in the tort system that have occurred during the bankruptcy period from 2001 to the present as well as to changes that can be reasonably anticipated in future years. This was the approach used by Biggs and Peterson in their June 2007 expert reports.

In contrast, as noted above in Opinion 1, Florence's estimates were based on the flawed assumption – dictated to him by Grace – that the only claimants who would receive indemnity payments during the bankruptcy period from 2001 to the present, and in all future years, would be those who could meet the evidentiary criteria now specified by Grace, which are contrary to the criteria Grace actually used to settle cases pre-bankruptcy. This assumption represented a radical departure from the filing and settlement criteria in place immediately before the filing of the bankruptcy petition.

The assumption that the historical claim settlement procedures in effect prior to April 2, 2001 would be replaced by the entirely new and unprecedented claim settlement procedures based on Grace's specified evidentiary criteria was implicit in Florence's report. Florence did not discuss it and it would not be apparent that such an assumption had been made without the simultaneous recognition that the no-bankruptcy assumption was a requirement of the estimation phase of the bankruptcy proceeding.

Explicit consideration of this implicit assumption reveals a fundamental inconsistency between the methods used to estimate the number of claims that would receive indemnity payments and the methods used to estimate the average values of those indemnity payments.

Florence provided a description of how the number of compensable pending and future claims would be changed under the new claim settlement procedure but he implicitly assumed that the average value of the indemnity payments awarded to those claims *would not change* as a result of the new procedures from their inflation-adjusted historical values.

Specifically:

- "To value the estimated pending malignancy claims, ARPC analyzed Grace's historical settlement data … in the Closed Claim sample that met the criteria ..." (page 15). In this case, "malignancy" referred only to mesothelioma and lung cancer.
- To value the estimated pending malignancy claims, the historical average settlement values during April 1999 to April 2001 were adjusted for inflation at 2.5% per year and all values were converted to 2001 dollars. (page 15)
- To value the estimated pending nonmalignancy claims and other-cancer claims (i.e., other than mesothelioma and lung cancer), ARPC applied historical cost factors from four trusts to lung cancer settlement values. (page 15)
- To value the estimated future claims for all diseases, the historical average disease-specific settlement values were initially expressed in 2001 dollars and were adjusted for subsequent inflation at 2.5% per year through 2007 and 1.0% per year thereafter. (pages 18–19)

The inflation-adjusted settlement values were based on the *historical* settlement experience for a subset of claims in the tort system preceding the Grace bankruptcy filing that would have met the new evidentiary criteria specified by Grace, had those criteria been applied at the time those claims were settled. However, inflation-adjusted historical settlement values are *not* appropriate for the estimation of the future costs of similar claims under substantially different settlement conditions such as those that would have occurred had the new claim settlement procedures based on Grace's evidentiary criteria been implemented as of April 2, 2001.[1]

To the extent that the settlement conditions were substantially altered, my expectation would be that the average payments would also be substantially altered. The size and direction of the changes would depend on the changes in the settlement conditions. Given the highly restrictive form of Grace's proposed evidentiary criteria, my expectation would be that Grace would have a greater share of the total liability for claims meeting those criteria, with the average payments to those claimants increasing substantially.

The critical question is how large would the increases be?

Florence implicitly assumed that the size of the changes would be zero for mesothelioma and lung cancer claims,[2] yielding the values of $135,860 and $34,673, respectively, in his Table 4-12. To be sure, he only used historical claims that met Grace's new evidentiary criteria, but those historical claims do not reflect the higher portion of the total liability that Grace would bear on those claims.

It is informative to illustrate the potential changes that might occur if one used a more reasonable, but still conservative, set of alternative values for claimants who would meet Grace's criteria but not those of any other asbestos defendant. Such values could be derived from the 2005 Senate Bill S. 852 (pages 92–93) which listed a scheduled value of $1,100,000

[1] Inflation-adjusted historical settlement values are appropriate for the estimation of the future costs of similar claims under a continuation of the historical claim settlement procedures.

[2] The claim values for other diseases were based on the value for lung cancer (page 15).

for mesothelioma, and a set of three scheduled values – $600,000, $975,000, and $1,100,000 – for lung cancer, with the specific award dependent on smoking status.

Additional adjustments could be developed to account for claimants who met Grace's criteria and also met those of one or more other asbestos defendants, under the conservative assumption that the S. 852 values represented the total amounts that would be awarded from all defendants. This assumption is conservative because there is considerable evidence in the public domain that the settlement amounts set forth in S. 852 are far lower than what asbestos claimants actually collect in total from all defendants, particularly for mesothelioma claims.

For example, during the Armstrong confirmation hearing in May 2006, Daniel Myer, a claims settlement negotiator who was currently settling cases for Union Carbide and who has settled over 400,000 asbestos personal injury claims in his career for asbestos defendants, testified that the 'total gross value" of a typical mesothelioma case (i.e. the sum paid by all defendants to the plaintiff to settle the case) in 2006 was between $5 and $8 million, as compared to $2.5 to $3.5 million in 1999–2000 (Armstrong 5/23/06 AM Transcript, pages 26–27). At the same hearing, Lester Brickman, who is well known in the field of asbestos litigation, agreed that mesothelioma values have roughly doubled between the year 2000 and 2006 (Armstrong 5/25/06 PM Transcript, page 98). Thus, the settlement amounts set forth in S. 852 in 2005 were far below the values cited by Myer for a period five years earlier, and they took no account of an approximate doubling since that time cited by both Myer and Brickman.

The settlement amounts set forth in S. 852 in 2005 appear even more conservative when compared with jury-verdict amounts. For example, a 2005 RAND report noted that the average jury verdict in mesothelioma cases over the 1993–2001 time period was almost $4 million, rising to over $6 million in 2001 (the most recent year for which data was cited in the report) (Carroll et al., 2005, pages 53–54).[3] The same report also noted that "it is widely assumed that trends in settlement values of cases reflect trends in jury awards (perhaps with some lag)." (Carroll et al., 2005, page 49).

There is no recognition in Florence's report of the need to estimate the changes in average payments that would result from the implementation of Grace's new and much more rigorous criteria.

Using the conservative S. 852 average values as a proxy for the average settlement values under Grace's new criteria, Grace's total liability is many times higher than the value calculated by Florence:

- For mesothelioma, S. 852's scheduled value is 7.34 times larger than Florence's value, after adjusting for inflation during 2001–2005;

[3] The same source also reported that asbestosis verdicts during the same time period were $1.63 million, nearly double that of S. 852's highest scheduled value for asbestosis ($850,000). Lung cancer values were included with other non-mesothelioma malignant diseases in the combined category "other cancers", with average verdicts of $1.33 million, more than 20% above the highest of S. 852's scheduled three values ($600,000, $975,000, and $1,100,000) for lung cancer, and more than double the lowest value ($600,000) selected for illustrative purposes for this opinion.

- For lung cancer, the corresponding inflation-adjusted ratios are 15.68, 25.48, and 28.74, respectively, for the three smoking statuses. Applying the 7.34 multiplier for mesothelioma and the *smallest* of the three multipliers for lung cancer (15.68) to the median projections in Florence's Table 6-3 yields a total projection of $7.708 billion, 10.8 times larger than Florence's projection of $712 million.

An alternative set of assumptions based on Grace's actual trial history was employed by Peterson in his June 2007 expert report (pages 95–96). These calculations indicated that the total liabilities for pending and future claims could be in the range of $30–40 billion, which would be 42–56 times larger than Florence's projection of $712 million, but with the liabilities for pending claims increased by a smaller multiplier in the range of 7–8.

Peterson (pages 39–41 in his June 2007 expert report) presented a compelling case why the bottom end of the range would not be below 1.0, i.e., below 100% of the historical average settlement values. There he documented "the inseparability of payment rates and settlement values" under which the individual claim settlement amounts are positively correlated with the quality or strength of the claims in such a way that stronger claims generally have higher settlement values. Eliminating weaker claims based on criteria like those assumed by Florence would necessarily retain for payment a subset of stronger claims whose average payments would be greater than the combined average for both types of claims, which, before adjusting for inflation, is equal to 100% of the historical average settlement values.

Thus, the uncertainty of the range is effectively restricted to the upper limit, e.g., to a multiplier such as 7, 8, 10.8, 42, or 56 as indicated above.

These comparisons indicate that the location of the upper end of the relative range of uncertainty is itself highly uncertain and can vary substantially depending on the specific assumptions used in its calculation. The calculations indicate that the relative range of uncertainty is large, e.g., at least 7 to 1, but they do not allow one to quantify its size with confidence. Indeed, the relative range of uncertainty (7, 8, 10.8, 42, or 56 to 1, from high to low) is so large that it renders Florence's projections useless for purposes of informing the estimation process.

Florence's assumption that there would be no change in the size of the historic average settlement values for mesothelioma and lung cancer claims that met Grace's new criteria was equivalent to assuming that the appropriate adjustment factor was at the extreme lower limit of an extraordinarily large uncertainty range. Given the extraordinarily large size of this uncertainty range, I conclude that Florence's assumption was biased and his estimate is useless and highly misleading.

3. The data used by Florence to estimate the average values of historical settlement amounts paid to claimants who could meet the evidentiary criteria specified by Grace were inadequate for that purpose. Specifically, the statistical sampling methods used by Florence yielded sample sizes that were inadequate for the purpose of generating reliable estimates of the

average values among the targeted population consisting of all claimants who could have met the evidentiary criteria specified by Grace.[4]

This opinion is based on my review of the data contained in the Excel workbook "Settlement averages in Sample Apr99 to Apr00.xls" provided in Florence's reliance materials.

Tabulations of those data revealed that the average values of $135,860 for mesothelioma and $34,673 for lung cancer were based on sample sizes of 21 claims and 7 claims, respectively. The average values were reported by Florence in his Table 4-12. However, the sample sizes were not reported nor was there any discussion of the fact that these sample sizes were inadequate for the purposes of generating reliable estimates of the average values.

The generally accepted standard for full credibility in actuarial practice is a sample size of 1,082 claims (Herzog, 1999, pages 59–60).[5] The 1,082-standard is designed to yield average values that are within ±5% of the true values "most of the time", where the latter condition was operationalized to mean 90% of the time. This is a technical concept that can be understood by stating that actuaries who used the 1,082-standard throughout their careers could expect that about 90% of their estimates would fall within ±5% of the true values, assuming that the true values eventually became known to them so that this assessment could be conducted.

The 1,082-standard is 51.5 times larger than Florence's mesothelioma sample size of 21 claims and 154.6 times larger than Florence's lung cancer sample size of 7. Thus, I would have expected that Florence would have provided some acknowledgement and/or assessment of the potential impact on his analysis of such small sample sizes.

The impact of the small sample size can be represented by considering how much the ±5% error tolerance in the 1,082-standard would need to be increased to match the condition in that standard that the average values must be within ±X% of the true values 90% of the time. Under the so-called "normal approximation," Florence's data indicate that X = 47.6 for mesothelioma and 58.9 for lung cancer.

In other words, Florence's data would have allowed him to state with a reasonable degree of confidence that the estimated average value of $135,860 for mesothelioma was within ±47.6% of the true value among claimants who could have met the evidentiary criteria specified by Grace; and with an equivalent level of confidence that the estimated average value of $34,673 for lung cancer was within ±58.9% of the true value among the same claimants. This is an extraordinarily large uncertainty range.

[4] Opinion 3 differs from Opinion 2 in the following way. Even if reliable estimates of the average historical values could be generated, Opinion 2 states that such estimates would be inappropriate for the goal of making estimates of the value of the pending and future asbestos personal injury claims against Grace because they would not include the changes in the historical values that would occur as a result of the assumed changes in the settlement conditions. Opinion 3 states that Florence's report failed to provide reliable estimates of the average historical values.

[5] Frequently, however, it is necessary to work with smaller sample sizes in which case the analyst would determine whether the smaller sample size materially impacted the reliability of the resulting estimates and, if so, would make appropriate adjustments to deal with the effects. Here, it was not necessary to use a sample less than 1,082 and, in any case, Florence made no appropriate adjustment.

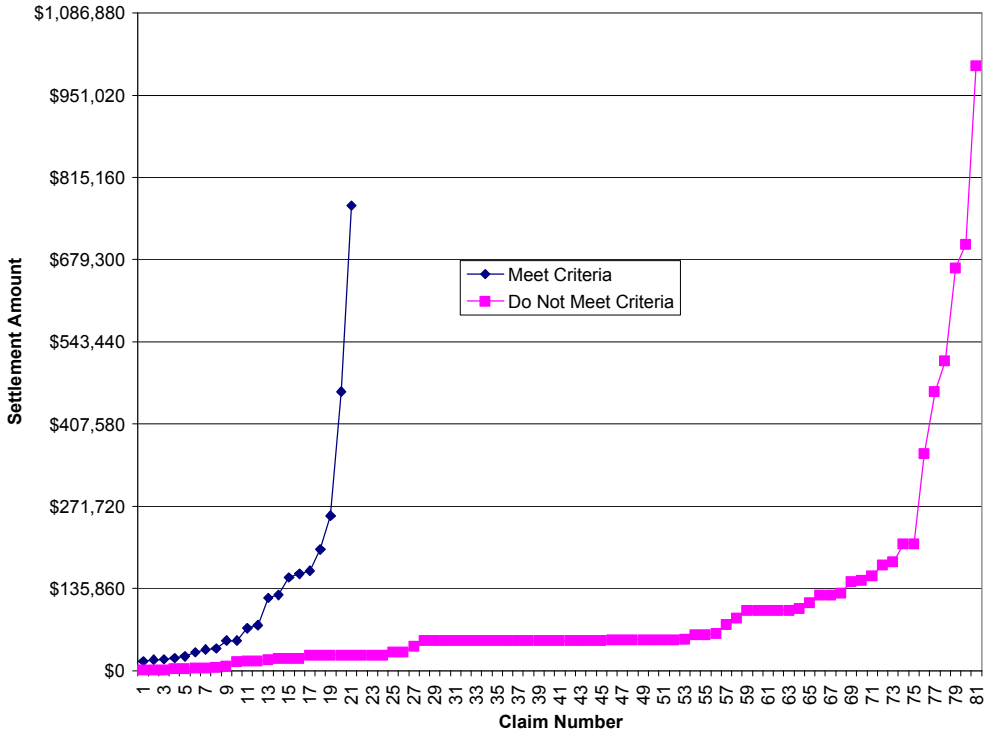
Florence's error tolerances are 9.5 and 11.8 times larger, respectively, than the standard ±5% error tolerance. These very large error tolerances reflect the fact that the sample sizes used by Florence are inadequate. They also indicate that Florence's average settlement values may be in error by factors in the range of 1.5–1.6. In other words, the actual settlement values for all such claims could be up to 50–60% higher (or lower) than estimated by Florence.

Moreover, the error tolerances for Florence's estimates may be substantially larger than indicated above. This is because the "normal approximation" assumptions I used are among the most favorable that I could have selected.

Florence attempted to gloss over this critical credibility problem by using the settlement values of only those historic settlements that met the Grace-imposed criteria. However, Florence failed here as well because there was no statistically significant difference between those settlements and the other settlements Graces paid.[6] In other words, Florence assumed that the new Grace imposed criteria would have made no difference on the historic settlements.

Figure 1 displays the settlement amounts for the 21 mesothelioma claims that met Grace's criteria along with the settlement amounts for the 81 other claims in Florence's data that did not meet Grace's criteria. Within each group the data were sorted in ascending order by settlement amount. The scaling of the vertical axis was set so that the first horizontal bar appears at the average value ($135,860) for the 21 mesothelioma claims that met Grace's criteria.

Figure 1: Settlement Amounts for Mesothelioma Claims Arrayed According to Grace Evidentiary Criteria



[6] Based on the "two-sample equal-variance *t* ratio" of 0.86 with 100 "degrees of freedom."

One can see that only 7 of the 21 claims (33%) in the first group had values above the average as did 13 of the 81 claims in the second group. The average value in the second group was $100,696, a value exceed by 18 of the 81 claims (22%).

As noted above, the differences in average values between the two groups were not statistically significant. This means that Florence had no reliable evidence that the payments to the full set of claimants who would have met Grace's evidentiary criteria for mesothelioma were actually larger on average than the payments to the claimants who would not have met those criteria. In other words, the size of the payments in the historical data has not been shown to be related to the evidentiary criteria now proposed by Grace. Florence's data fail to prove that claimants meeting those criteria benefited by receiving larger settlement amounts. Thus, the average settlement value for the 21 claimants in Figure 1 who met those criteria is not representative of the average settlement values that would have occurred had Grace actually implemented the new claim settlement procedures based on the evidentiary criteria in Florence's report.

The settlement values in the first group ranged from $15,375 to $768,750, a factor of 50. Given that all of these claims met Grace's evidentiary criteria, I would have expected that Florence's report would have provided some assessment of the conditions that led to this huge settlement differential.

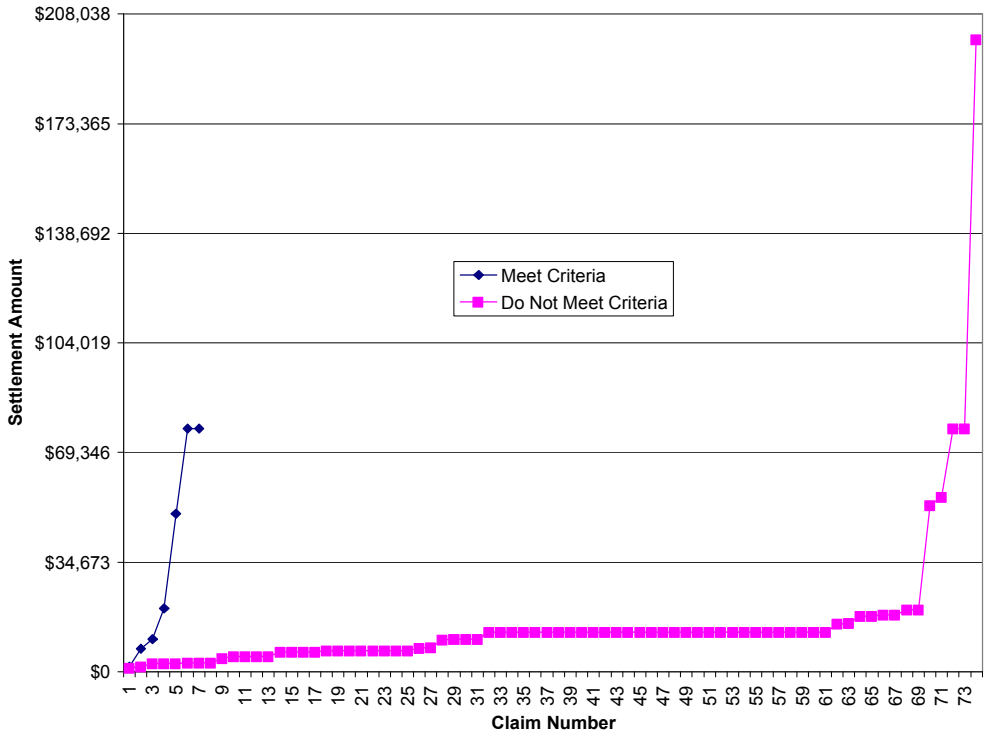
The settlement values in the second group ranged from $1,000 to $1,000,000, a factor of 1,000. Given that none of these claims met Grace's evidentiary criteria, I would also have expected that Florence's report would have provided some assessment of the conditions that led to the huge settlements for the 6 highest claim values ($358,750 and above), especially given the observation in Opinion 1 that he assigned zero-dollar values to all similar claims filed on April 2, 2001 or later. Florence provided no such assessment.

Figure 2 displays the corresponding data for lung cancer. The differences in average values between the two groups, though relatively larger ($34,673 vs. $15,570), were also not statistically significant.[7] Again, this means that Florence had no reliable evidence that the claim payments to the full set of claimants who would have met Grace's evidentiary criteria for lung cancer were actually larger on average than the payments to the claimants who would not have met those criteria.

The settlement values in the first group ranged from $1,538 to $76,875, a factor of 50; and in the second group, from $1,025 to $200,000, a factor of 195. The settlement amounts for the three largest claims in the second group were greater than or equal to the largest settlement amounts for the claims in the first group. As noted above, Florence's estimation procedures assigned zero-dollar values to all similar claims filed on April 2, 2001 or later.

[7] Based on the "two-sample equal-variance *t* ratio" of 1.84 with 79 "degrees of freedom."

Figure 2: Settlement Amounts for Lung Cancer Claims Arrayed According to Grace Evidentiary Criteria



4. The median forecasted liability of $712 million reported by Florence was based on a set of 32 individual forecasts with liabilities ranging from $385 million to $1,314 million. The 32 individual forecasts were formed by combinations of:
    - 4 overlapping calibration periods (1996–2000, 1997–2000, 1998–2000, and 1999–2000),
    - 2 methods for handling missing data on the evidentiary criteria (default failure vs. random allocation),
    - 2 methods for mesothelioma and lung cancer forecasts (Nicholson vs. Peto), and
    - 2 methods for other cancer and nonmalignancy forecasts (ratio vs. regression).

    Florence implicitly assumed that the median forecast would be the best summarization of his calculations. This is not correct. The best summarization would be near the high end of his range or possibly above the high end.

    Any modification to Florence's results based on the issues raised in Opinion 4 would be distinct from the modifications that would be required to respond to the inadequacies identified in Opinions 1–3.

    This opinion is based on my review of Sections 5.0–6.0 of his report, and related material in his Appendices, and in references contained therein.

Calibration Periods

Florence stated (page 18):

> "A calibration period is selected to be that historical period that is expected to be most reflective of future events. The range of calibration periods: 1996–2000, 1997–2000, 1998–2000, and 1999–2000, was selected so as to include sufficient years such that the influence of any single anomalous year would be mitigated."

None of the four selected calibration periods were "reflective of future events." Examination of Florence's Tables 5-1 and 5-2 shows that there was a significant increase in claims between 1999 and 2000, an increase that continued into 2001. Bigg's expert report (June 18, 2007, pp. 44–49) documents her analysis showing that the number of claims against Grace would have continued to increase through 2002–2003, after which mesothelioma claims would continue at the higher rate, lung cancer and other cancer would have declined to earlier levels, and nonmalignancies would have declined sharply below the earlier levels.

Florence implicitly treated 2000 as if it were an "anomalous year." This would have been a reasonable assumption if he were conducting his analysis in 2001, but is not a reasonable assumption for an analysis conducted in 2007. At this time the claim filing patterns for major defendants and trusts were known for the years 2001–2006, and it was not reasonable for Florence to ignore such information in making his current estimates. Moreover, given the broad range of asbestos defendants and trusts listed on page 1 of his report, it is difficult to imagine that Florence did not have access to such information.

Given the sharp increases in mesothelioma claim filings during 2000–2002 and the fact that mesothelioma represents 52–63% of the liabilities in his Table 6-3, it is likely that an adequate treatment of the changes that occurred during 2001–2006 would yield substantially higher liability estimates.

Missing Data on the Evidentiary Criteria

At three points in his report (pages 9, 11, 12), when dealing with pending claims, Florence stated: "…ARPC had no data to calculate how many, if any, of the claimants who did not respond had claims that met the criteria." Florence dealt with this "missing data" problem in two ways:

- Method 1 (default failure) assumed that all claimants who did not respond would have failed to meet the evidentiary criteria.
- Method 2 (random allocation) assumed that all claimants who did not respond would have met the evidentiary criteria in the same proportion as those who provided the data.

In the absence of evidence to the contrary, Method 2 is the preferred method because it is neutral with respect to the assumptions concerning the relative success/failure rates of the respondents vs. non-respondents.

Method 1 involves the very strong assumption that the absence of data is equivalent to failure to meet the evidentiary criteria. The problem in using Method 1 is that it requires the use of evidence that does not exist. Florence clearly stated that "ARPC had no data" on the non-respondents, which means that he had no evidence to support the default failure assumption. Florence could have collected additional data on the non-respondents in order to test the default failure assumption, but he did not. In the absence of such data, there is simply no

basis for validating the assumption and no basis for using the assumption in the current estimation.

Table 6-3 indicates that the median liabilities for Method 2 are $1,043 million, substantially higher than the median liabilities of $493 for Method 1, or the median liabilities of $712 for the combination of the methods, and much closer to the high end of the range of the 32 projections ($1,314 million).

Florence's application of Method 2 to "all claimants" included 84,476 but excluded 29,172 claimants listed in his Table 4.1 for which "there was no possible POC match" (page 5). This exclusion was equivalent to assuming that these claims were invalid at the time they were filed, and was done without presenting any supporting evidence (as in other applications of Method 1). Accounting for this excluded group could raise the liability estimates for pending claims by 34.5% ($44 million) if they were assumed to be statistically identical to the included claimants (as in other applications of Method 2).

Florence's approach of combining Methods 1 and 2 for pending claims appears to be inconsistent with his unmodified use of Method 2 (random allocation) when he deals with the estimation of the fraction of closed claims that would meet the evidentiary criteria. On page 16–17 he uses a random allocation assumption "that the historical closed claims would meet the criteria in the same proportion as the historical pending claims."

In this case, however, it is not clear why he did not use the Closed Claim sample to make these estimates. Moreover, to the extent that the closed claims represented stronger claims than the claims that were pending at the time of bankruptcy, one would expect that the fraction of closed claims that would meet the evidentiary criteria would be higher than the corresponding fraction of pending claims, implying that the random allocation method is downwardly biased.

Mesothelioma and Lung Cancer Forecasts

The mesothelioma and lung cancer forecasts form the core of Florence's estimation procedures. As detailed in his Appendix I, he used two different methods to conduct these forecasts.

The first method was a 1991 modification of the Nicholson's 1982 method (see Nicholson et al. 1982) prepared by Vasquez in cooperation with Nicholson, termed the "Nicholson/KPMG Method". The second was a procedure termed the "Peto/ARPC Model" or "Peto/ARPC Method."

The methods can be distinguished by their approach to the estimation of the size of the population that was exposed to asbestos in the past. The Nicholson/KPMG Method is based on historical data on occupations with asbestos exposure; the Peto/ARPC Method is based on estimates from the OSHA dose-response models of the implied size of the population that was exposed to asbestos, given that the number of cases of asbestos-related lung cancer or mesothelioma was known.

With estimates of the size of the population, one can generate valid forecasts of future lung cancer or mesothelioma diagnoses or deaths using a variety of methods. Unfortunately, the methods chosen by Florence do not lead to valid forecasts; instead they produce forecasts that are downwardly biased and are based on inconsistent or contradictory assumptions. I document these points below.

Nicholson/KPMG Method

The Nicholson/KPMG Method was based on Vasquez's 1991 work. As noted by Vasquez (1991, page 66), this method produced its peak mesothelioma incidence in 1995. This deviated sharply from the later peak mesothelioma incidence in 2002 in the original Nicholson model (Vasquez 1991, page 67) and it is now known to be inconsistent with the increasing incidence in U.S. Vital Statistics through at least 2004 (see Biggs, June 18, 2007, page 45). A reasonable conclusion is that the changes made by Vasquez were in the wrong direction. The fact that Florence took Vasquez's version of the Nicholson/KPMG Method meant that he started with an inherently inferior model.

As noted on his page I-2, Florence was aware of these problems with Vasquez's version of the Nicholson/KPMG Method and he attempted to make ad hoc adjustments to that model to match the number of claims filed against Grace within industry group and disease during his calibration period 1996–2000. One problem with this adjustment was that it merely rescaled Vasquez's forecasts without resolving the inconsistency between the timing of the peaks and, derivatively, of the rate of decline following the peaks. A second problem was that the chosen calibration period 1996–2000 was not "reflective of future events," as noted above in the section entitled "Calibration Periods."

The Nicholson/KPMG Method was based on exposures to asbestos that began during the period 1930–1979. Exposures beginning in 1980 and later are not represented. This omission is inconsistent with the results in Table 2 of Anderson's June 11, 2007 expert report which indicates that Grace exposures continued up to 1993. The omission of persons with exposures initiating during the period 1980–1993 could have a significant impact on the forecasted liabilities because these persons would be substantially younger than the other exposed persons which would put them at risk for one to two decades longer. This implies that the projections in Florence's Table J-1 would be too low for all years, and especially for the years after 2020 when the elapsed time since first exposure would put these persons at the highest risks of mesothelioma and lung cancer.

Both the original Nicholson Method and Vasquez's version of the Nicholson/KPMG Method used total mortality rates for males from U.S. national vital statistics for the period 1975–1979 and assumed that these held constant throughout the period 1980–2030 (Nicholson et al. 1982, p. 296). The constancy assumption was incorrect. The actual mortality rates declined at an average rate near 1% per year from 1979 to 2003 and are projected to continue to decline through 2030 and beyond. The impact of these declines can be seen by the increase of male life expectancy at age 65 from 14.0 years in 1980 to 18.0 years in 2030 (see Board of Trustees of the Social Security Trust Funds, 2007, p. 81). These extra 4 years of survival at the end of life mean that there is significant additional time for the emergence of asbestos-related diseases to become manifest. The Nicholson mortality assumptions are

unrealistically conservative and the resulting projections are downwardly biased, with increasingly larger errors for the later years of the projections.

In an email to counsel for the Future Claimants' Representative dated September 17, 2007, Grace's counsel, Elli Leibenstein (of Kirkland & Ellis), stated:

> "Attached is a table with ARPC's KPMG incidence numbers that ARPC has been using since 2001. In 2001, ARPC updated the KPMG model by updating the average ages for entrants into the workforce (to better fit the SEER age distribution) and the mortality tables."

However, the attachment to that email showed that the peak mesothelioma incidence still occurred in 1995 so that ARPC's 2001 update did not resolve the problems with the peak incidence identified in the prior paragraph.

In describing the OSHA models on page I-1, Florence stated:

> "… no peer reviewer challenged the mathematical equations devised by OSHA in its models to predict risk of lung cancer and mesothelioma from asbestos exposure. The consensus was that the data behind their assumptions were correct and that the models were appropriate and acceptable means of risk assessment. The dose-response models presented in the 1986 [OSHA] report have never been revised and have been adopted by several other regulatory and scientific bodies for use in risk assessments."

Apparently he failed to notice that evidentiary criterion 3 on page 2 of his report constituted a complete rejection of the OSHA model. This criterion states that a diagnosis of asbestosis is necessary for the causation of lung cancer to be validly attributed to asbestos exposure. Roggli explained on pages 3–4 of his report why this criterion is wrong. On page I-3 of his report, Florence listed the four components of the OSHA model. It is clear from this listing that none of the four components included any requirement or even mention of a role for asbestosis to generate increased risk of lung cancer.

Florence failed to notice that if criterion 3 on page 2 were correct, then it would necessarily follow that the OSHA model would be wrong, and that any forecast based on the OSHA model would be wrong. His assumption that criterion 3 on page 2 is correct is inconsistent with his assumption that the OSHA model in also correct. Logically, one of these two assumptions must be wrong.

This inconsistency leads to the conclusion that Florence's lung cancer projections are wrong, regardless of whether asbestosis is or is not "a necessary precursor in order to attribute lung cancer to asbestos exposure" (as asserted by David Weill, October 3, 2006, p. 20).

Peto/ARPC Method

Florence's report contains very few details concerning his implementation of the Peto/ARPC Method. Given that it is basically an alternative method of estimating the size of the population that was exposed to asbestos in the past, and that it employs the OSHA model

with constant mortality, all of the problems with the Nicholson/KPMG Method would also be problems with this alternative method, except the problem relating to the shift of the peak mesothelioma year from 2002 to 1995.

Other Cancer and Nonmalignancy Forecasts

Florence used two methods for his forecasts of claims for other cancers and for nonmalignant diseases. The first method was a "ratio method" based on the use of the projected number of lung cancer claims as an "index series" for the claims due to other cancers, with the method repeated separately for claims due to nonmalignant diseases. For each type of claim, the ratio was presumably held constant throughout the projection period. The second method was a "regression method" that used the natural logarithm of the number of lung cancer claims to predict the natural logarithm of the number of claims due to other cancers, with the method repeated separately for claims due to nonmalignant diseases.

The ratio method is wrong for nonmalignancies, for two reasons:

- The assumption that the ratio would be constant over even a short time is proven false by Bigg's expert report (June 18, 2007, pp. 44–49) which documents her analysis showing that the number of claims against Grace would have continued to increase through 2002–2003, after which lung cancer and other cancer would have declined to earlier levels while nonmalignancies would have declined sharply below the earlier levels.
- The assumption that the ratio would be constant over a longer time is proven false by the finding in my analysis that the rate of increase in claim filings as a function of time since first exposure is faster for malignancies than for nonmalignancies (Stallard et al. 2005, p. 228).

The ratio method is wrong both for other cancers and nonmalignancies for the additional reason that the underlying forecast of lung cancer which serves as the "index series" is wrong.

The "regression method" is a generalization of the ratio method in which the number of claims due to other cancers (or separately due to nonmalignant diseases) is proportional, not to the number of lung cancer claims, but to a power of the number of lung cancer claims. If the power were exactly 1.0, the two methods would yield identical results. This method is subject to the same three problems identified above for the ratio method, and hence fails to produce valid forecasts for the same reasons.

In addition to the problems noted above in forecasting the number of future claims for lung cancer, other cancers, and nonmalignant diseases, it is worth emphasizing that the estimated costs for 58,241 pending and future claims for these three disease categories were based on just 7 closed claims with settlement values that ranged from $1,538 to $76,875 (Figure 2). The estimated costs for the 4,284 pending and future claims for mesothelioma were based on just 21 closed claims with settlement values that ranged from $15,375 to $768,750 (Figure 1).

In this particular analysis, the uncertainty in the forecasted numbers of valid claims combines multiplicatively with the uncertainty in the settlement values assumed to apply to those claims to produce a set of estimates that are so highly uncertain that they cannot be considered to have any valid role in the context of generating unbiased and reliable estimates of Grace's asbestos-related liabilities in the case currently before the Court.

5. Florence's report makes numerous assumptions, many of which have an unquantified or unquantifiable degree of uncertainty. Since each assumption builds upon other assumptions, the cumulative degree of uncertainty quickly reaches the point where the report's estimate is unreliable, and indeed, surpasses that point when consideration is given to the issues raised in Opinions 1–4.

   In addition, the basis and reasons for these numerous assumptions are not completely stated in the report, making it difficult both to assess their validity and to determine whether there are additional issues that would have been raised by me in this rebuttal report had a more forthright statement been provided. Moreover, statements such as those on page 10 – "Final numbers will be included after the additional review is completed" – led me to conclude that the June 18, 2007 version of the report was not intended to be the final version, and that additional revisions could be expected.

   In the following, I discuss several of these problematic assumptions.

   On page 7, Florence excluded 5,063 claims from the CMS database because they had diagnosis dates or date-filed dates after the bankruptcy petition date of April 2, 2001. He provided no details concerning how many of these claims filed a POC, nor did he indicate the number of claims with rejections based on each type of date. It is incorrect to exclude a claim with a valid POC that was filed prior to the petition date regardless of the recorded diagnosis date. Alternatively, even if some portion of the claims were filed after the bankruptcy, they still could provide valuable information about the characteristics of future claims early in the period between the bankruptcy and the present and hence should not have been ignored in the analysis.

   On page 7, Florence excluded 29,172 of 113,648 claims from the CMS database, after excluding the 5,063 claims indicated above, because he could not obtain a match between their CMS record and the POC records. His analytic workfile therefore was based on 84,476 claims. Had he matched the 29,172 claims, his analytic workfile would have been 34.5% larger, and had he retained all of the 5,063 claims in addition, his analytic workfile would have been 40.5% larger.

   The exclusion of such large fractions of pending claims can substantially downwardly bias the estimates in two ways. First, the historical claim filing counts used in calibrating the projections will appear to be substantially smaller than they actually were. Second, the total settlement value assigned to the pending claims will appear to be substantially smaller than it should be. Florence's report provides insufficient justification for these exclusions and insufficient detail to assess the size of the impact on the estimates. Florence's report does provide enough information to state qualitatively that the impact could be large, i.e., up to 34.5–40.5% as indicated in the prior paragraph.

On page 8, Florence excluded 10,322 POCs because he could not match them to the PIQ database. This meant that the PIQ database contained only 74,154 of the 113,648 claims from the CMS database, after excluding the 5,063 claims indicated above. Had he matched both the 29,172 and the 10,322 claims, his analytic workfile would have been 53.3% larger, and had he retained all of the 5,063 claims in addition, his analytic workfile would have been 60.1% larger. Alternatively, the PIQ database represents only 62.5% of the claims he identified as being in the CMS database. It is completely unknown how the characteristics of the excluded 37.5% of the claims would compare to the retained 62.5% of the claims with respect to the information on the PIQ. This lack of knowledge generates a potentially large source of uncertainty that is not quantifiable based on the information in Florence's report.

On page 10, Florence appeared to have assumed that x-ray evidence not available for lung cancer claimants in his study would not be available at time of trial. This assumption was confusing because he stated that he assumed that "such evidence would not be available for the **estimation** trial" (boldface mine, not his), rather than for the trial in the tort system. The unavailability of evidence at the time of the PIQ submission is not the same thing as unavailability of evidence at the time of trial. Florence's improper assumption excluded over half (51%) of the otherwise valid claims. Moreover, the impact of this assumption on the liability estimate is compounded because the lung cancer settlement values for diseases other than mesothelioma were assumed to be multiplicatively related to the lung cancer settlement values.

Throughout his report, Florence assumed that only individuals that personally mixed or installed asbestos products will acquire an asbestos related disease even though, as Roggli observed in his July 2007 expert report, people exposed to asbestos have developed asbestos-related diseases who did not mix or install asbestos. Florence's criteria thus excluded potentially valid claims. The impact of this exclusion is exceedingly complex, as discussed above in Opinions 1 and 2, but it is reasonable to conclude that the impact is very large, even if it is difficult to precisely quantify how large it actually is.

The lung cancer causation criteria are too strict because an asbestosis diagnosis is not a necessary precursor to asbestos induced lung cancer (see Roggli's July 2007 expert report). Thus Florence's criteria eliminated still other potentially valid claims.

Although Florence uses valuations drawn from a historical sample that actually meets his screening criteria, he failed to make any adjustment for the fact that Grace's share of the total liability would have been higher because many plaintiffs would not have been able to establish liability against some or all of the other defendants. Additional discussion of this issue is provided above in Opinion 2 where it is shown that the numerical impact of this effect is potentially very large.

In addition to the other problems with the applications of the Nicholson/KPMG and Peto/ARPC models noted above, the Nicholson/KPMG and Peto/ARPC run-offs that Florence used were based on different exposure criteria than Florence used, but these differences were not taken into account in his estimation procedure, nor did he provide any results that would allow one to quantify the impact of these differences.

Florence's assumptions regarding the use of four "calibration periods" indicate that his estimates are subject to great uncertainty. However, the fact that it is now known that both the claim filing counts and the settlement values were increasing after the period 1999–2000 means that none of his calibration periods were "reflective of future events," as he assumed on page 18. Thus the actual uncertainty of his estimates must be substantially larger than the amount he indicated in his report.

On page 3, Florence reported that the low end of his 32 estimates indicated a total liability of $385 million. Compared to the actual indemnity payments of $151 million for 2000 (see page 26 of Dunbar's June 18, 2007 expert report), this amount barely allows for 2.5 years of payments at a flat annual rate. Given that both the claim filing counts and the settlement values were increasing after the period 1999–2000, the provision of funds for only 2.5 years of payments would appear with great certainty to be woefully and shockingly inadequate to handle all claims expected to arise over the next 40–50 years.

PART II

INFORMATION CONSIDERED

1. Eric Stallard and Kenneth G. Manton. *Estimates and projections of asbestos-related diseases and exposures among Manville Personal Injury Settlement Trust claimants, 1990-2049*. Presented to U.S. District Court, Eastern District of New York, Judge Jack B. Weinstein presiding, September 7, 1993, and entered into testimony March 15, 1994.
2. Eric Stallard and Kenneth G. Manton. *Projections of asbestos-related personal injury claims against the Manville Personal Injury Settlement Trust, males 1990-2049, by occupation, date of first exposure, and type of claim*. Submitted to U.S. District Court, Eastern District of New York, as sworn testimony, Judge Jack B. Weinstein presiding, March 15, 1994.
3. Eric Stallard. "Product liability forecasting for asbestos-related personal injury claims: A multidisciplinary approach." Chapter 13 in *Population Health and Aging: Strengthening the Dialogue Between Epidemiology and Demography – Annals of the New York Academy of Sciences*, (M. Weinstein, A.I. Hermalin, and M.A. Stoto, Eds.), Volume 954, December 2001, pp. 223–244. ISBN 1-57331-372-6.
4. Eric Stallard, Kenneth G. Manton, and Joel E. Cohen. *Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case*. Springer Verlag, New York, 2005.
5. Data files from the Manville Personal Injury Settlement Trust claims database provided by the Trust for the purposes of conducting the analyses reported in items 1–4 above.
6. Eric Stallard. "Expert Report of P.J. Eric Stallard, A.S.A., M.A.A.A., F.C.A." Expert Estimation Report of P.J. Eric Stallard, A.S.A., M.A.A.A., F.C.A, *In Re: W.R. Grace & Co., et al*., June 18, 2007.
7. Data tabulations of files from the Surveillance, Epidemiology, and End Results (SEER) Program. Public-Use Data (1973–1999). National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2002, based on the November 2001 submission, used for the purposes of conducting the analyses reported in item 4 above.
8. Data files from the Manville Personal Injury Settlement Trust claims database, as of December 31, 2006, provided by the Trust for the purposes of conducting the analysis reported herein.

9. Claims Resolution Management Corporation (CRMC). "Manville Trust Related Documents." Available at http://www.claimsres.com/DocumentsMT.html, website visited May 4, 2007.
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11. Social Security Actuaries. "Statistical Tables: Period Life Table, 2002, Updated June 27, 2006." Obtained from http://www.ssa.gov/OACT/STATS/table4c6.html.
12. Congressional Budget Office. "CBO-Mortality Improvement Rates." Unpublished estimates consistent with the mortality rates used by the Social Security Actuaries, June 7, 2007.
13. Bertram Price and Adam Ware. "Mesothelioma: Risk Apportionment Among Asbestos Exposure Sources." Risk Analysis 25(4): 937–943, 2005.
14. National Center for Health Statistics. "Health, United States, 2006: With Chartbook on Trends in the Health of Americans." Hyattsville, MD, 2006.

STATEMENT OF OPINIONS

1. Forecasts of the number, timing, and type of future asbestos-related personal injury claims should be updated periodically. Such updating can eliminate or reduce three types of errors: observed errors, unobserved errors, and errors of omission.

   - Observed errors are due to differences between the actual and forecasted values that develop over time and generally become increasing larger as the interval between the base year of the forecast and each targeted future year increases. Updating can eliminate observed errors occurring in the period between the base year of the original forecast and the base year of the updated forecast and reset the base level of the claims in the updated forecast to match the latest observed levels.
   - Unobserved errors occur in the period after the base year of a forecast and represent the differences between the yet-to-be-observed actual values and the forecasted values. Unobserved errors occurring after the base year of an updated forecast will generally be smaller than the corresponding errors in the original forecast because the size of the errors is correlated with the size of the interval between the base year of the forecast and any targeted future year, and this interval will be smaller after the updating is done. In other words, updating can reduce the uncertainty of all forecasted future values to a level below that of the original forecast.
   - Errors of omission are due to the inability of the original forecast to account for exposures to asbestos beginning in the period after the base year of the original forecast. These errors can be eliminated by including such exposures in the updated forecast.[8]

   The basis of this opinion is documented in Stallard (2001) and Stallard et al. (2005). The treatment of observed and unobserved errors in this opinion is generally accepted among professional forecasters and is not controversial. Biases due to errors of omission for later exposures are frequently ignored, e.g., as noted above in Part I in my critique of Florence's application of the Nicholson/KPMG Method which was based on exposures to asbestos that began during the period 1930–1979, with exposures beginning in 1980 and

[8] These errors will disappear in all updates performed after the exposures have ceased.

later not represented. My opinion is that such errors should be explicitly considered and appropriate adjustments made to correct for them.

2. There are two general types of updating that are responsive to Opinion 1: partial updating and global re-estimation of the entire model.

   - Partial updating, described in Stallard (2001), removes the observed errors that occur due to differences between the actual and forecasted values during the updating interval, resets the base level of the claims to match the latest observed levels, while retaining the shape (relative timing) of the claim runoff process. The resetting of the base levels reduces the unobserved errors occurring in the period after the base year of the updated forecast as long as the original estimates of the claim runoff process remain valid. Partial updating does not address errors of omission for later exposures. The accuracy of the resulting updated forecast will depend on the size of such errors.
   - Global re-estimation of the entire model was recommended in Stallard (2001) as an alternative to partial updating that would be performed relatively infrequently due to the greater effort involved. Global re-estimation allows one to address all three types of errors, and can be conducted using methods similar to those described in Stallard et al. (2005).

   The basis of this opinion is also documented in Stallard (2001) and Stallard et al. (2005).

UPDATED PROJECTIONS

Table 1 of my June 18 report (reference 6 in the first section) presented claim runoffs from my 1994 analysis of the Manville Trust data. These data were provided to Jennifer L. Biggs for use in generating her projected claims. My understanding was that her use of these data was restricted to reliance on the shapes (relative timing) of the claim runoffs, without reliance on the base levels (absolute numbers of claims in any selected base year), but with adjustments for errors of omission for later exposures.

Given this application, and the possibility that global re-estimation of the entire model might produce different shapes (relative timing) of the claim runoffs or different adjustments for errors of omission for later exposures, I recommended that she consider using updated claim runoffs based on a global re-estimation of the entire model using the latest Manville Trust data (for the 5-year period 2002–2006; see reference 8 in the first section).

I generated updated projections of the number of male claims against the Manville Trust by disease, date of first exposure, and date of claim for the period 2005–2009 through 2055–2059, after which all claims terminated, and I provided these supplemental projections to Jennifer L. Biggs for use in her supplemental/rebuttal expert report dated September 25, 2007.

The updated claim runoffs are summarized separately by disease and groupings of disease below in Tables 1–6. All of the tables have the same format.

Table 1 presents the projections for all asbestos-related personal injury claims. These consist of claims for malignancies and nonmaligancies. The total projected number of claims is 355,556 with 130,155 claims projected for the period 2005–2009. The ratio of these two numbers is

called the "development factor" and has the value 2.73. The total number of claims is thus equal to 2.73 times the number projected for 2005–2009. The development factor is a convenient summarization of the shape of the claim runoff curve. A large development factor implies that claims will be filed for relatively many years; conversely, a small development factor implies that claims will terminate relatively early.

Corresponding development factors are presented for each date of first exposure, and range from 1.00 for 1925–1929 exposure starts to 8.96 for 1980–1984 exposure starts. The development factor increases by a factor of 3.03 (from 2.96 to 8.96) between exposure starts during 1970–1974 and 1980–1984. Overall, 18.3% of projected claims are projected to arise from exposure starts during 1975–1984.

Table 1: Updated Projections of the Number of All Asbestos-Related Personal Injury Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	14	0	0	0	0	0	0	0	0	0	0	14	1.00
1930-1934	142	12	0	0	0	0	0	0	0	0	0	154	1.08
1935-1939	1,051	230	19	0	0	0	0	0	0	0	0	1,300	1.24
1940-1944	8,257	3,629	782	74	0	0	0	0	0	0	0	12,742	1.54
1945-1949	10,247	5,272	2,191	432	24	0	0	0	0	0	0	18,165	1.77
1950-1954	16,663	9,550	4,951	1,993	442	36	0	0	0	0	0	33,635	2.02
1955-1959	18,274	12,544	7,597	4,242	1,916	406	22	0	0	0	0	45,001	2.46
1960-1964	19,694	14,720	10,548	6,733	3,807	2,000	398	22	0	0	0	57,922	2.94
1965-1969	23,237	14,027	10,593	7,857	5,286	3,191	1,484	259	14	0	0	65,948	2.84
1970-1974	18,735	11,480	7,468	6,079	4,827	3,242	2,314	1,095	205	11	0	55,457	2.96
1975-1979	11,748	12,202	7,099	4,904	3,543	3,009	2,171	1,180	514	73	12	46,454	3.95
1980-1984	2,093	3,677	4,523	2,618	1,752	1,387	1,425	689	414	148	35	18,762	8.96
Total	130,155	87,344	55,772	34,933	21,597	13,271	7,814	3,246	1,147	231	47	355,556	2.73
Updated 1915-1974	116,314	71,464	44,150	27,412	16,302	8,874	4,218	1,377	218	11	0	290,340	2.50
Original 1915-1974	40,994	30,503	20,813	13,046	7,197	3,918	2,105	510	14	0	0	119,027	2.90
Ratio of Updated/Original	2.84	2.34	2.12	2.10	2.27	2.27	2.00	2.70	15.59	---	---	2.44	0.86

The bottom three rows of Table 1 present, respectively:

- The updated projected total for exposure starts during 1915–1974.
- The corresponding original projected total for exposure starts during 1915–1974 from my 1994 analysis (obtained from the asbestos-related disease categories 1–7 in my June 18 report).
- The ratios of the updated to the original projected totals, for exposure starts during 1915–1974.

The results in Table 1 show that the projected number of claims increases by a factor of 2.44 from 119,027 to 290,340 claims. This increase is consistent with increases for Grace and other asbestos defendants noted in Part I and in the other expert reports and with the increases noted in Stallard (2001) and Stallard et al. (2005).

The results in Table 1 also show a 14% decline in the 1915–1974 development factor, from 2.90 to 2.50. This means that the updated projection starts at a higher level but declines more rapidly.

Table 2 presents the corresponding results for claims for malignant disease injuries.

Table 2: Updated Projections of the Number of Malignancy Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	5	0	0	0	0	0	0	0	0	0	0	5	1.00
1930-1934	50	5	0	0	0	0	0	0	0	0	0	55	1.10
1935-1939	342	92	9	0	0	0	0	0	0	0	0	442	1.29
1940-1944	2,563	1,371	357	41	0	0	0	0	0	0	0	4,332	1.69
1945-1949	2,738	1,847	910	212	15	0	0	0	0	0	0	5,720	2.09
1950-1954	3,966	2,945	1,966	946	244	21	0	0	0	0	0	10,088	2.54
1955-1959	3,769	3,492	2,629	1,795	916	222	14	0	0	0	0	12,838	3.41
1960-1964	3,138	3,478	3,265	2,509	1,737	986	232	15	0	0	0	15,361	4.89
1965-1969	2,647	2,847	3,057	2,798	2,097	1,468	761	148	10	0	0	15,831	5.98
1970-1974	1,452	1,700	1,780	1,857	1,760	1,331	1,027	533	127	8	0	11,575	7.97
1975-1979	671	1,133	1,199	1,286	1,220	1,153	932	598	307	46	7	8,551	12.75
1980-1984	122	315	480	469	443	417	438	280	203	78	19	3,265	26.66
Total	21,463	19,224	15,652	11,911	8,432	5,598	3,404	1,574	648	132	26	88,063	4.10
Updated 1915-1974	20,669	17,777	13,972	10,157	6,769	4,028	2,034	696	138	8	0	76,248	3.69
Original 1915-1974	10,949	9,372	7,368	5,396	3,422	1,969	1,217	295	14	0	0	39,930	3.65
Ratio of Updated/Original	1.89	1.90	1.90	1.88	1.98	2.05	1.67	2.36	9.97	---	---	1.91	1.01

Compared with Table 1, the results in Table 2 for malignancies indicate a very significant but smaller increase in the total number of claims, increasing by a factor of 1.91 compared to 2.44 in Table 1, and a 1% increase in the 1915–1974 development factor (from 3.65 to 3.69) compared to a 14% decrease in Table 1.

Most significant is the finding that the overall development factor for malignancies is significantly higher than for all claims, increasing from 2.73 to 4.10. Table 6 below shows that the reason for this difference is that the development factor for nonmalignancies is substantially lower, at 2.46. These results provide additional support for the opinion stated in Part I that the number of claims for nonmalignancies cannot be validly expressed as a simple ratio of the number of claims for malignancies.

Table 3 presents the corresponding results for mesothelioma claims.

Compared with Table 2, the results in Table 3 for mesothelioma indicate a larger increase in the total number of claims, increasing by a factor of 2.31 compared to 1.91 in Table 2, and a 7% increase in the 1915–1974 development factor (from 3.71 to 3.97) compared to a 1% increase in Table 2.

The 7% increase in the mesothelioma development factor is consistent with results reported by the National Center for Health Statistics in *Health, United States 2006* (Table 48; reference 14 in the first section) showing that mesothelioma deaths continued to increase at least to 2004. This differs from earlier results reported in Stallard (2001) based on SEER data (reference 7 in the first section) which indicated that mesothelioma incidence appeared to have peaked by the mid-1990s. This also differs from the Nicholson/KPMG Method used by Florence which produced its peak mesothelioma incidence in 1995. The 7% increase in the mesothelioma development factor translates directly into a 7% downward bias in all projections that fail to take these updates into account.

Table 3: Updated Projections of the Number of Mesothelioma Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	3	0	0	0	0	0	0	0	0	0	0	3	1.00
1930-1934	24	3	0	0	0	0	0	0	0	0	0	26	1.11
1935-1939	153	43	4	0	0	0	0	0	0	0	0	201	1.31
1940-1944	1,207	648	173	20	0	0	0	0	0	0	0	2,048	1.70
1945-1949	1,149	867	429	109	7	0	0	0	0	0	0	2,561	2.23
1950-1954	1,525	1,252	931	459	120	12	0	0	0	0	0	4,300	2.82
1955-1959	1,431	1,352	1,113	879	461	121	7	0	0	0	0	5,365	3.75
1960-1964	1,182	1,325	1,261	1,054	831	463	119	8	0	0	0	6,244	5.28
1965-1969	915	1,101	1,210	1,134	919	728	388	83	6	0	0	6,484	7.09
1970-1974	467	623	726	777	717	585	504	263	67	5	0	4,734	10.13
1975-1979	221	333	437	509	533	497	420	311	155	29	5	3,450	15.62
1980-1984	53	94	130	178	184	200	169	131	113	47	11	1,312	24.57
Total	8,330	7,642	6,415	5,119	3,773	2,605	1,607	796	341	81	17	36,726	4.41
Updated 1915-1974	8,056	7,215	5,848	4,432	3,056	1,909	1,018	354	73	5	0	31,964	3.97
Original 1915-1974	3,730	3,201	2,506	1,858	1,238	719	440	128	2	0	0	13,823	3.71
Ratio of Updated/Original	2.16	2.25	2.33	2.38	2.47	2.65	2.31	2.77	40.33	---	---	2.31	1.07

Table 3 shows that 13.0% of mesothelioma claims are projected to arise from exposure starts during 1975–1984, another source of downward bias in projections such as Florence's that fail to fully take these later exposure starts into account.

Table 4 presents the corresponding results for lung cancer claims.

Table 4: Updated Projections of the Number of Lung Cancer Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	2	0	0	0	0	0	0	0	0	0	0	2	1.00
1930-1934	22	2	0	0	0	0	0	0	0	0	0	23	1.08
1935-1939	144	39	3	0	0	0	0	0	0	0	0	187	1.30
1940-1944	1,028	535	148	14	0	0	0	0	0	0	0	1,725	1.68
1945-1949	1,246	736	367	82	5	0	0	0	0	0	0	2,435	1.95
1950-1954	1,943	1,322	774	376	96	7	0	0	0	0	0	4,518	2.33
1955-1959	1,893	1,720	1,184	698	345	80	5	0	0	0	0	5,924	3.13
1960-1964	1,557	1,744	1,597	1,140	698	405	90	5	0	0	0	7,236	4.65
1965-1969	1,366	1,383	1,491	1,328	903	555	266	53	3	0	0	7,347	5.38
1970-1974	769	851	828	877	815	568	387	202	53	3	0	5,354	6.96
1975-1979	359	626	605	622	559	504	402	220	122	11	1	4,032	11.25
1980-1984	58	174	259	224	209	175	212	115	74	23	8	1,529	26.35
Total	10,386	9,131	7,255	5,360	3,628	2,295	1,362	595	253	37	9	40,312	3.88
Updated 1915-1974	9,969	8,332	6,392	4,514	2,861	1,615	749	260	56	3	0	34,750	3.49
Original 1915-1974	5,630	4,824	3,825	2,791	1,729	1,025	667	129	0	0	0	20,621	3.66
Ratio of Updated/Original	1.77	1.73	1.67	1.62	1.65	1.58	1.12	2.01	---	---	---	1.69	0.95

Compared with Table 2, the results in Table 4 for lung cancer indicate a smaller increase in the total number of claims, increasing by a factor of 1.69 compared to 1.91 in Table 2, and a 5% decrease in the 1915–1974 development factor (from 3.66 to 3.49) compared to a 1% increase in Table 2.

Table 4 shows that 13.8% of lung cancer claims are projected to arise from exposure starts during 1975–1984.

Table 5 presents the corresponding results for claims for other cancer injuries.

Compared with the results in Table 2, the results in Table 5 for other cancer also indicate a smaller increase in the total number of claims, increasing by a factor of 1.74 compared to 1.91 in Table 2, and a 4% increase in the 1915–1974 development factor (from 3.45 to 3.61) compared to a 1% increase in Table 2.

Table 5 shows that 13.5% of other cancer claims are projected to arise from exposure starts during 1975–1984.

Table 5: Updated Projections of the Number of Other Cancer Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	1	0	0	0	0	0	0	0	0	0	0	1	1.00
1930-1934	5	1	0	0	0	0	0	0	0	0	0	6	1.16
1935-1939	44	9	1	0	0	0	0	0	0	0	0	54	1.24
1940-1944	328	188	36	7	0	0	0	0	0	0	0	559	1.70
1945-1949	343	244	114	21	2	0	0	0	0	0	0	724	2.11
1950-1954	498	370	260	111	28	2	0	0	0	0	0	1,270	2.55
1955-1959	445	420	332	218	110	22	2	0	0	0	0	1,549	3.48
1960-1964	399	409	407	314	209	118	23	2	0	0	0	1,881	4.71
1965-1969	366	363	356	336	275	184	107	12	1	0	0	2,001	5.47
1970-1974	215	226	225	203	228	178	136	68	7	1	0	1,487	6.91
1975-1979	91	174	157	155	129	151	110	67	30	5	0	1,069	11.70
1980-1984	11	47	92	67	50	42	57	34	16	8	0	424	38.35
Total	2,746	2,451	1,981	1,432	1,031	698	434	184	54	14	0	11,026	4.01
Updated 1915-1974	2,644	2,230	1,732	1,210	852	505	268	82	9	1	0	9,533	3.61
Original 1915-1974	1,588	1,348	1,036	747	455	225	109	39	12	0	0	5,487	3.45
Ratio of Updated/Original	1.66	1.65	1.67	1.62	1.87	2.24	2.45	2.13	0.72	---	---	1.74	1.04

Table 6 presents the corresponding results for nonmalignant disease claims.

Compared with Table 1, the results in Table 6 for nonmalignancies indicate a substantially larger increase in the total number of claims, increasing by a factor of 2.71 compared to 2.44 in Table 1, and a 15% decrease in the 1915–1974 development factor (from 2.63 to 2.44) compared to a 14% decrease in Table 1.

Table 6 shows that 20.0% of nonmaligancy claims are projected to arise from exposure starts during 1975–1984.

The 15% decline in the 1915–1974 nonmalignancy development factor in Table 6 contrasts with the 1% increase in the 1915–1974 malignancy development factor in Table 2, and the 7% increase in the 1915–1974 mesothelioma development factor in Table 3. These differences indicate that cancer claims, especially mesothelioma, will continue to be filed at a runoff rate that is at least as high as estimated in my 1994 analysis.

Table 6: Updated Projections of the Number of Nonmalignancy Claims Against the Manville Trust, Males, U.S. and Canada

	Date of Claim												
Date of First Exposure	2005-2009	2010-2014	2015-2019	2020-2024	2025-2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-2054	2055-2059	Total	Development Factor
1915-1919	0	0	0	0	0	0	0	0	0	0	0	0	
1920-1924	0	0	0	0	0	0	0	0	0	0	0	0	
1925-1929	9	0	0	0	0	0	0	0	0	0	0	9	1.00
1930-1934	92	6	0	0	0	0	0	0	0	0	0	99	1.07
1935-1939	710	138	10	0	0	0	0	0	0	0	0	858	1.21
1940-1944	5,693	2,259	426	33	0	0	0	0	0	0	0	8,411	1.48
1945-1949	7,509	3,425	1,281	220	9	0	0	0	0	0	0	12,445	1.66
1950-1954	12,697	6,605	2,985	1,047	198	15	0	0	0	0	0	23,548	1.85
1955-1959	14,505	9,052	4,968	2,447	1,000	184	7	0	0	0	0	32,163	2.22
1960-1964	16,556	11,242	7,283	4,224	2,070	1,014	166	7	0	0	0	42,562	2.57
1965-1969	20,590	11,180	7,536	5,060	3,190	1,723	723	111	3	0	0	50,116	2.43
1970-1974	17,283	9,780	5,688	4,223	3,067	1,911	1,287	562	77	3	0	43,881	2.54
1975-1979	11,077	11,070	5,900	3,618	2,323	1,856	1,239	582	207	27	5	37,904	3.42
1980-1984	1,971	3,362	4,043	2,149	1,309	970	987	409	211	70	16	15,497	7.86
Total	108,692	68,119	40,120	23,022	13,165	7,673	4,411	1,672	499	100	21	267,493	2.46
Updated 1915-1974	95,645	53,688	30,177	17,255	9,533	4,846	2,184	681	81	3	0	214,092	2.24
Original 1915-1974	30,050	21,135	13,451	7,656	3,783	1,958	898	225	12	0	0	79,097	2.63
Ratio of Updated/Original	3.18	2.54	2.24	2.25	2.52	2.48	2.43	3.02	6.61	---	---	2.71	0.85

The results in this section underscore the need to periodically perform a global re-estimation of the entire model in order to eliminate or reduce the three types of errors discussed above: observed errors, unobserved errors, and errors of omission for later exposures.

PROJECTION METHODS

The methods used in generating the updated projections were designed to be consistent with the methods described in Stallard et al. (2005, Chapter 8), while dealing with the reality there had been substantial changes in the Manville Trust database in the coding and classification of occupation and industry categories, and while attempting to exploit the additional detail now available with respect to the timing and duration of exposures, which make it possible to more accurately implement the OSHA model using the parameters estimated by Stallard et al. (2005, page 283, Table 8.7, Model 4).

One way of gauging this consistency is to consider the finding reported above that the 1915–1974 malignancy development factor in Table 2 changed by only 1%. There was nothing in my calculations that forced this very high degree of agreement. It was the result solely of my attempt to be consistent with the previous methods while dealing with a database and claim filing process that had changed significantly over the past 14 years.

The details of the projection model are available for complete review in the reliance materials provided along with this report. In the remainder of this section, I describe the most important differences between the updated and prior implementations of the model.

Mode

The prior projections were based on computer programs written in Fortran 77 and C. The updated projections were based on standard applications of Microsoft Excel and Access.

Time Units

The prior projections employed quinquennial age groups, calendar periods, and time-since-first-exposure categories. The updated projections were based on single-year of age groups, calendar periods, and time-since-first-exposure categories.

The prior projections did not use individual-specific measures of duration of exposure. The updated projections used individual-specific measures of duration of exposure at two points in the model:

- The calculation of the exposed population associated with each mesothelioma claim used two measures of duration to code the expected duration for individuals to fractional parts of each year, in effect approximating a continuous measure of duration. One measure provided the total duration rounded to the nearest year; the other measure provided the total duration according to the elapsed number of calendar years. Consideration of both measures jointly produced fractional measures that clustered near multiples of one-third, two-thirds, and three-thirds (one) years, thereby increasing the precision of the combined measure over either individual measure.
- The calculation of the disease-, age-, and time-specific claim hazard rates used five relatively homogeneous duration groupings defined for 0–4 years, 5–9 years, 10–14 years, 15–24 years, and 25 years and longer.

Credibility

The calculations of the exposed population associated with each mesothelioma claim in the prior projections were based on a total of 1,958 male mesothelioma claims filed during 1990–1992. The corresponding calculations in the updated projection were based on a total of 8,641 male mesothelioma claims filed during 2002–2006, an increase by a factor of 4.4.

While both sets of projections were based on claim counts that substantially exceeded the 1,082-standard discussed in Part I, the updated projections exceeded the standard by nearly a factor of 8. This allowed some simplification of the modeling of the claim hazard rates because it was not necessary to perform the ad hoc smoothing described by Stallard et al. (2005, page 293).

This simplification was further motivated by the use of two rather than eight occupational categories ("high risk" vs. "low risk" groupings based on the relative risks associated with specific combinations of industry and occupation codes; see below) in the claim hazard modeling which was done to permit the use of the five duration groupings described above. Thus, the updated projections employed a total of ten groupings based on combinations of two occupational and five duration categories.

Stallard et al. (2005, page 283, Table 8.8) used occupational groupings with four distinct values of relative risks and duration values that formed three distinct clusters. However, these were not used in combination. All individuals in a given occupation group were assumed to have the same duration. The updated projections classify individuals in each occupation group into five homogeneous risk categories.

Relative Risks by Industry-Occupation

Stallard et al. (2005) reviewed the combinations of industry and occupation codes used by the Manville Trust in 1992 (displayed in Table 8.1 on pages 258–265) and developed a set of "recodes" that could be used to collapse these categories into a smaller set of eight occupation codes (displayed in Table 8.8 on page 283) used in the prior projections.

The updated projections had to deal with substantial changes and additions to the coding of industry and occupation over the past 14 years, effectively adding 13 new industry codes and 13 new occupation codes.

Relative risk values were assigned to industry codes based on the mapping of Table 8.1 to Table 8.8 in Stallard et al. (2005). Relative risk values were assigned to occupation codes based on the harmonic means of the relative risks for the subset of industry codes with known relative risks. Relative risk values were then assigned to the industry codes with unknown relative risks based on the harmonic means of the relative risks for the occupation codes within each of these industry groups. Modifications to these relative risks were then made to ensure consistency with the charts prepared by the Claims Resolution Management Corporation (reference 9 in the first section) showing the combinations of occupation and industry with significant occupational exposures to asbestos, and with the relative risk values that I had previously assigned in my prior projections.

Stratification of industry-occupation combinations into "high risk" vs. "low risk" groupings was based on the rank order of relative risks by industry-occupation combinations with cut points set to yield approximately equal numbers of mesothelioma claims above and below the cut points.

Exposed Population

The calculations of the exposed population associated with each mesothelioma claim in the prior projection were implemented as described on page 288 of Stallard et al. (2005), using the inverse of the mesothelioma incidence function for homogeneous groups of mesothelioma claimants. In the updated projection the exposed population associated with each mesothelioma claim was set equal to the inverse of the mesothelioma incidence function for individual claimants.

Because each individual was allowed to have his own duration of exposure, which could be as short as one-third year, as well as his own time since first exposure, which could be less than the 10-year minimum for the OSHA model to produce a non-zero incidence rate, it was necessary to add a small background incidence component that reflected an age-dependent level of risk equivalent to that of the general female population. This component was estimated using the 1973–1999 SEER data (reference 7 in the first section) and, on average, accounted for about 1.3% of the total mesothelioma risk. The use of such a background component is consistent with Price and Ware (2005), and in the cases where the OSHA model produced a zero or near-zero incidence rate it was the only reasonable way to proceed.

Even with this adjustment, about 0.5% of the mesothelioma claims generated very small incidence rates, and hence, extraordinarily high exposed population estimates. To deal with this problem, I introduced a shrinkage function whereby all exposed population estimates above 20,000 persons were reduced by subtracting two-thirds of the excess above 20,000 persons. For

example, one mesothelioma claim produced the largest estimated exposed population of 109,201 persons; after shrinkage, the estimate was reduced to 49,734 persons. This adjustment had the effect of shrinking the final location of the extreme 99.5–100.0 percentile of the exposed population distribution to match the original location of the 99.5–99.9 percentile. In other words, the effect was minimal but the impact of a small number of highly leveraged claims was moderated.

Age Groups

The calculations in the prior projection were based on quinquennial age groups with the youngest ages at first exposure being ages 15–19 and with the oldest claims occurring at ages 90–94. The updated projections were based on single-years of age with the youngest ages at first exposure being age 16 and the oldest claims occurring at age 94. In other words, the only difference was that claims with exposures at age 15 were eliminated from the updated projections. This was because the claim counts at age 15 were small and the exposed population estimates were more volatile than at the older ages.

Claims with ages at first exposure below age 15 or with unknown ages at first exposure were also eliminated from the updated projections. This was similar to the prior projections.

Females

Claims for females were not included in the prior projections. For consistency they were also excluded from the updated projections.

Diseases

The number of asbestos-related diseases in the updated projections was reduced from seven to four, as shown in the prior section. Other cancer now includes colon/rectal cancer; nonmalignancies now includes asbestosis, disputed asbestosis, and pleural diseases.

General Population Mortality

Mortality improvements based on linear extrapolation of historical trends were included in the prior projections. Mortality improvements based on extrapolation of historical trends were also included in the updated projections but the extrapolations which were nonlinear were obtained from the Social Security Administration and the Congressional Budget Office (references 10–12 in the first section).

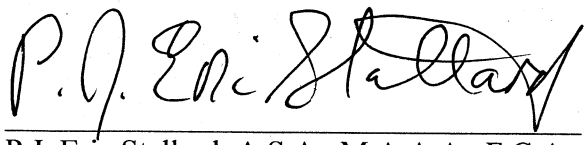
U.S. and Canadian Claims

Documentation provided by the Claims Resolution Management Corporation (reference 9 in the first section) indicated that claims with exposures in the U.S. and Canada are treated similarly. Hence, the updated projections were restricted to claims from those two countries. Location of exposure was not considered in the prior projections.

EXHIBITS TO BE USED

I have not determined whether I will employ additional tables and figures, or other material, as exhibits in connection with any testimony I might give in this matter. In the event that I decide to do so, they will be disclosed in accordance with any applicable rules, court orders, or stipulations among the parties.

Signed this 25th day of September, 2007,



P.J. Eric Stallard, A.S.A., M.A.A.A., F.C.A.