This is the 4th Affidavit
of Richard Border in this case
and was made on 11/Mar/2015

No. C965349
Vancouver Registry

In the Supreme Court of British Columbia

Between:

Anita Endean, as representative plaintiff

Plaintiff

and:

**The Canadian Red Cross Society
Her Majesty the Queen in Right of the Province of British Columbia, and The Attorney General of Canada**

Defendants

and:

Prince George Regional Hospital, Dr. William Galliford, Dr. Robert Hart Dykes, Dr. Peter Houghton, Dr. John Doe, Her Majesty the Queen in Right of Canada, and Her Majesty the Queen in Right of the Province of British Columbia

Third Parties

Proceeding under the *Class Proceedings Act*, R.S.B.C. 1996, c. 50

AFFIDAVIT

I, RICHARD BORDER, of 980-475 West Georgia Street, Vancouver, BC SWEAR (OR AFFIRM) THAT:

1. I am a Principal and Shareholder of Eckler Ltd. ("Eckler").

2. Attached hereto and marked as **Exhibit "A"** is a true copy of the Eckler Actuarial Report to the Joint Committee Assessing the Financial Sufficiency of the 1986-1990 Hepatitis C Trust as at December 31, 2013.

3. The Eckler actuarial personnel involved in the review of the data and the development of the actuarial model which provides a basis for the opinions expressed are myself, Wendy Harrison, Dong Chen and Kevin Chen. The opinions are those of Wendy Harrison and me and we are the authors of the report.

4. Attached as **Exhibits "B"**, **"C"**, **"D"** and **"E"** are the curriculum vitae of myself, Wendy Harrison, Dong Chen and Kevin Chen.

SWORN (OR AFFIRMED) BEFORE ME)
at Vancouver, British Columbia, on)
11/Mar/2015.)
)
)
)
)
A Commissioner for taking)
Affidavits for British Columbia)

RICHARD BORDER

SHARON D. MATTHEWS, QC
BARRISTER & SOLICITOR
856 Homer Street, 4th Floor
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This is Exhibit" A "referred to in the
affidavit of RICHARD BORDER
sworn before me at VANCOUVER, BC
this 11th day of MARCH 20 15

A Commissioner for taking Affidavits
for British Columbia

Actuarial Report to the

Joint Committee Assessing the Financial Sufficiency of the 1986-1990 Hepatitis C Trust

as at December 31, 2013

Prepared by:

Richard Border, FIA, FCIA Wendy Harrison, FSA, FCIA

Vancouver, B. C.
March 11, 2015

CONTENTS

1 Introduction

1. A number of class actions against the Federal and Provincial/Territorial governments were initiated at various dates in 1996 and 1998 on behalf of persons infected with the Hepatitis C Virus ("HCV") from the Canadian blood system during the period January 1, 1986 through July 1, 1990. A Settlement Agreement was subsequently reached as of June 15, 1999.

2. The Settlement Agreement (subsequently approved by the Courts) provided for the creation of a Trust and a Trust Fund from which benefits will be paid. Among other things, the Settlement Agreement set out the amounts of and manner in which funds would be paid by the Federal and Provincial/Territorial governments, investment guidelines thereon, and detail as to those eligible for the various benefits and the amounts of those benefits. The benefits differ according to whether the claimant is a hemophiliac or a non-hemophiliac transfused patient.

3. Section 10.01(1)(i) of the Settlement Agreement requires a triennial assessment of financial sufficiency. In order to do so, we consider the invested assets within the Trust Fund and the notional assets of the Trusts as well as the liabilities of the Trust. We have previously carried out such assessments as at September 30, 1999, December 31, 2001, December 31, 2004, December 31, 2007 and December 31, 2010. The Joint Committee has asked us to complete an actuarial assessment of the assets and liabilities as at December 31, 2013, and we are pleased to report thereon.

4. The intended users of this report are the Joint Committee, Health Canada, the Department of Justice of the Government of Canada, the Provincial and Territorial Governments, and the courts having jurisdiction over the Trust. This report is not intended for or necessarily suitable for users other than the intended users.

2 Approach to the Valuation

5. As has been our approach for all our previous valuations, we have assessed the sufficiency on a going-concern basis. In other words we have assumed that the Trust will continue in operation according to the terms of the Agreements.

6. For this report we have applied a seriatim approach, whereby the liability for the known population is calculated separately for each individual based on their particular circumstances.[1,2]

7. The seriatim model is based directly on the medical model developed by the Medical Model Working Group (the "MMWG", described in more detail in section 6.1) and the software platform used by the MMWG.

8. The objective of this valuation is to establish the financial sufficiency, or soundness of the settlement in light of the available funds. The Canadian Institute of Actuaries'[3] Standards of Practice[4] require that a "provision for adverse deviation" be included when carrying out a calculation that promotes the financial security of an arrangement. Such a provision is incorporated into the liability by using assumptions that are more conservative than "best estimate" assumptions, i.e. by including a "margin for adverse deviation" in the assumption. We explain these terms further in the following paragraphs.

9. A "best estimate" assumption or liability calculation means, in actuarial terms, that it is "*without bias, neither conservative nor unconservative*". In other words, there is a 50% probability that the liability is too high and a 50% probability that it is too low.

10. A "provision for adverse deviation" may be added to the best estimate liability in order to increase the probability that the liability is sufficient (under a range of adverse outcomes).

11. The Standards of Practice address uncertainty in the valuation and the resultant need for a provision for adverse deviation as follows: "*If assumptions could be made with complete confidence, if there were no statistical fluctuations, and if data had no defect, then there would be no need for a provision. But assumptions are virtually always uncertain; the exceptions, such as the assumption of the probability of getting a head when tossing a coin, are rarely encountered in practice. Some, especially*

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[1] For all valuations prior to our 2010 report we had calculated the liabilities using what can be described as an aggregate approach. Under this approach, the claimant population was grouped into age strata and an aggregate liability appropriate for that strata was calculated. This method was appropriate in particular in the context of a large unknown cohort, as it is the only way that the unknown liability could be calculated.

[2] It is not possible to assess the liability for the unknown claimants on a seriatim basis, we therefore valued the liability for unknowns on an aggregate basis whereby the unknown liability is proportional to the known liability.

[3] We are governed professionally by the Canadian Institute of Actuaries.

[4] General Standards of Practice – Part 1000 – Section 1700.

those about events long after the calculation date, may be conjectural. Even when an assumption can be made with high confidence, the result may be subject to statistical fluctuation; one may not get 5 heads when tossing a coin 10 times."

12. The "margin for adverse deviation" is the adjustment to the best estimate assumption that results in an increase in the resulting liability; this increase in the liability is the provision for adverse deviations.

13. The Standards of Practice provide further direction with respect to a provision for adverse deviation: "*The amount of that provision should take account of the effect of the uncertainty of the assumptions and data for the calculation on the financial security of those affected by the calculation, not take account of the possibility of catastrophe or other major adverse deviation which is implausible in usual operations, except when the calculation specifically addresses that possibility, and in the case of a provision in respect of uncertainty of assumptions, result from selection of assumptions that are more conservative than best estimate assumptions.*"

14. Accordingly, in setting the assumptions for this sufficiency valuation, we have included margins for adverse deviations where appropriate, but have not attempted to make provision in the sufficiency liability for catastrophic or other major adverse deviations that are not plausible under usual circumstances, as a provision in the liability for 100% security i.e. a 100% probability that the liability is sufficient, would be considered excessive.

15. We have valued the liabilities on two different bases in this report. Liabilities calculated using the best estimate assumptions are referred to as the "Best Estimate Liabilities". Liabilities calculated using best estimate liabilities and margins for adverse deviations are referred to as the "Sufficiency Liabilities" as these are the liabilities that must be considered when assessing the financial sufficiency of the trust.

16. With respect to future payments under the settlement, there is significant uncertainty that is not provided for in the liability calculation. While the volatility of the financial position arising from changes in the cohort is expected to be much smaller than it was prior to June 30, 2010, the fund is still subject to volatility arising from other factors, in particular, to changes in the medical prognosis (including very promising new treatments), and to changes in the expected benefit payments for non-scheduled benefits such as loss of income or loss of services. In addition, the future investment returns are unknown.

17. As the settlement does not provide for any additional financial resources to be paid into the Trust if the current assets prove to be insufficient, there are no additional sources of funds. The risk to the claimants is asymmetrical: if the ultimate experience of the fund is such that there is money left over, each claimant will have received the promised benefit, but if the opposite occurs, some claimants may receive far less than the Settlement Agreement specifies.

18. Given the ongoing uncertainty about future experience of the settlement, it is prudent to conclude that an excess of assets over the liabilities is required to ensure the ongoing financial soundness of the Trust. The question then arises as to how large the required excess should be.

19. We have developed a Hepatitis C specific framework to systematically assess the sources of risk not covered in the sufficiency liability and develop an appropriate "required capital" for the Hepatitis C fund, in order to protect the claimants from future major adverse experience or catastrophe. This "required capital" represents the amount of assets, over and above those needed to meet the liabilities, that is to be used for the protection, and benefit, of claimants.

3 Summary of Sufficiency Results

3.1 Key Sufficiency Results

20. The table below sets out the key results from the 2013 actuarial assessment of financial sufficiency, as well as the claimant cohort and the corresponding information from the 2010 actuarial assessment. Our methodology, assumptions and detailed results are discussed later in this report.

Key Sufficiency Results[1]		
	2013	2010
Cohort	**Count**	**Count**
Transfused - Total Known	3,924	3,840
Transfused - Total Unknown	254	384
Transfused Total	**4,178**	**4,224**
Hemophiliac Total Known	1,359	1,351
Hemophiliac Total Unknown	26	44
Hemophiliac Total	**1,385**	**1,395**
Transfused and Hemophiliac	**5,563**	**5,619**
Assets	**($,000's)**	**($,000's)**
Invested Assets	1,028,048	989,775
Provincial/Territorial Notional Assets	162,152	187,487
Total Assets	**1,190,199**	**1,177,262**
Liabilities		**Restated[2]**
Transfused	480,167	662,772
Hemophiliac	265,957	318,039
HIV Program	970	1,100
Expenses	55,552	34,986
Total Sufficiency Liabilities	**802,646**	**1,016,897**
Excess of Assets over Liabilities	387,554	160,365
Required Capital	151,213	159,500
Excess Capital	**236,341**	**865**

[1] In some cases (in this table and throughout the report), amounts may appear not to add up to the total shown. This occurs because amounts have been rounded to thousands or millions for presentation.

[2] The liabilities set out in our actuarial report assessing the financial sufficiency of the Trust as at December 31, 2010, issued July 27, 2011, totalled $925,577,000. This figure was subsequently revised, as per our Actuarial Report to the Joint Committee Responding to the Morneau Shepell Report on the Financial Sufficiency of the 1986-1990 Hepatitis C Trust as at December 31, 2010, issued November 20, 2012, to $1,016,897,000, to reflect the additional liability arising from deaths that occur at levels prior to level 6 determined to be caused by HCV. The assets in excess of liabilities were correspondingly restated from $251,700,000 to $160,365,000.

3.2 Analysis of Change in Excess Assets

21. We have analyzed the change in the excess asset position approximately as follows:

Summary of Change in Excess Assets	$ millions
Restated excess assets as at December 31, 2010	**160**
Interest on revised excess assets	14
Investment Gain	22
Three year experience gain (loss)	14
Cohort Change	17
Medical model change	370
New drug cost	(146)
Medical model 80% efficacy rate	(65)
Assumption changes	27
Change in methodology for fees and expenses	(25)
Excess assets as at December 31, 2013	**388**

22. The sufficiency of the trust is significantly improved since 2010, with the largest changes arising from the medical model change, the cost of new drugs, and implementation of a margin for adverse deviations on the assumed best estimate drug efficacy rate, as discussed below.

23. While the design of the 2013 MMWG model is essentially the same as previous versions, the expected outcomes are significantly different from the prior MMWG models. It is based on historical data, but also takes into account a number of new treatment protocols, as well as certain promising drug therapies that were "fast-tracked" through the Health Canada approval process. These new drug therapies are expected to be provided to a much larger proportion of the claimants than the therapies taken into account in the 2010 model and their efficacy is significantly higher. As a result the HCV prognosis is significantly better than that shown in previous models. A significant proportion of claimants are projected to clear the virus following treatment with these new drugs. The impact of the improved prognosis on the financial outcome is significant and resulted in a reduction of the liability of $370 million.

24. Offsetting this, the cost of the new therapies is very high and the corresponding liability for future treatment is now significant. This increased the sufficiency liability by $146 million.

25. Due to uncertainty as to the eventual true efficacy of the new treatments, we added a margin for adverse deviations to the treatment efficacy assumption by assuming that the eventual efficacy would be 80% of that assumed by the MMWG. This increased the sufficiency liability by $65 million.

3.3 Required Capital

26. In this report we have assessed the amount of capital required to ensure the soundness of the arrangement based on a first principles Hepatitis C specific approach. We calculate that $151.2 million dollars is required in order to protect the claimants from future major adverse experience or catastrophe. This "required capital" should be regarded as assets, in addition to the assets covering the liabilities, that are to be used for the protection, and benefit, of claimants.

27. The excess assets, or excess capital, i.e. the excess remaining after taking into account the "required capital", is $236.3 million.

4 Summary of Settlement

28. The Settlement Agreement set up three compensation plans: the Transfused HCV Plan ("Transfused Plan"), the Hemophiliac HCV Plan ("Hemophiliac Plan"), and the HIV Secondarily Infected Program ("HIV Program"). The following paragraphs set out the various heads of compensation.

4.1 Transfused Plan

29. The compensation amounts are set out in Articles 4, 5 and 6 of the Transfused Plan. Section 7.03 of the Transfused Plan restricted certain payments initially, subject to revision by the Courts. These restrictions have now all been removed (reduced in the case of loss of income) and are discussed in further detail in the relevant sections below.

30. The cross-references to the relevant sections of the Transfused Plan are shown in parentheses for each item.

31. Most of the prescribed compensation amounts are indexed by inflation each year. In general, we have started with the indexed amounts in effect at January 1, 2014. At January 1, 2014, the prescribed increase over the 1999 values is 34.5774%. Thus, for example, the $10,000 payment (1999 dollars) to each infected claimant under Section 4.01(1)(a) of the Transfused Plan, is increased to $13,457.74 where the payment is made in 2014. For ease of reference we continue to refer to the original 1999 amounts below rather than the actual indexed amounts used in the calculation (e.g. $10,000 instead of $13,457.74). The base 1999 amounts and the indexed 2014 values are summarized in Appendix A.

32. In some instances the dollar expenditures are based on current estimates rather than a prescribed amount, e.g. loss of income, costs of care. In these situations, we derived a compensation level by reference to the actual payouts to obtain the amount assumed payable in 2014. This is discussed further in Section 7 Assumptions.

4.2 Heads of Compensation

33. The following lump sum payments are payable:

4.2.1 $10,000 to Each HCV Infected Claimant (4.01(1)(a))

34. The payments to the known/approved claimants have already been made. All unknown HCV infected claimants who were alive at January 1, 1999 are eligible for this payment on approval as a claimant.

4.2.2 $20,000 to Each Claimant with Positive PCR Test (4.01(1)(b))

35. The $20,000 was originally restricted to $15,000 payable immediately, with $5,000 deferred until there was a favourable reassessment of the fund's assets and liabilities. Following the 2001 review, the Courts lifted the restriction in July 2002 and the full $20,000 is now taken into account. We understand that all the claimants who were originally paid $15,000 have had the additional $5,000 plus interest paid to them, and there is therefore no further liability in this regard.

4.2.3 $30,000 to Each Claimant with Non-bridging Fibrosis (4.01(1)(c))

36. The payments here are to those who have developed non-bridging fibrosis or who have satisfied certain conditions regarding HCV drug therapy.

37. A claimant is allowed to waive the $30,000 payment under this section and in lieu thereof elect compensation for loss of income (Transfused Plan section 4.02) or loss of services in the home (Transfused Plan section 4.03), provided the claimant is at least 80% disabled.

4.2.4 $65,000 to Each Claimant with Cirrhosis (4.01(1)(d))

38. A $65,000 lump sum is payable to all claimants who are at or who enter the cirrhosis stage.

4.2.5 $100,000 to Each Claimant at Decompensation/Cancer (4.01(1)(e))

39. The Transfused Plan includes some other conditions in addition to liver decompensation or cancer. We have assumed that these are all included within the decompensation/cancer probabilities derived by MMWG.

4.2.6 Bridging Fibrosis (4.01(2))

40. Claimants who have developed bridging fibrosis are to be paid the amounts under 4.2.1 $10,000 to Each HCV Infected Claimant (4.01(1)(a)), 4.2.2 $20,000 to Each Claimant with Positive PCR Test (4.01(1)(b)) and 4.2.3 $30,000 to Each Claimant with Non-bridging Fibrosis (4.01(1)(c)) above. The stages of fibrosis development and compensation levels in the Settlement do not directly correspond. As in our previous reports, we have assumed that bridging fibrosis is analogous to stage 3 fibrosis in the model.

41. A number of ongoing payments are made to claimants as follows:

4.2.7 Loss of Income/Services in lieu of $30,000 Lump Sum under 4.2.3 above (4.01(3), 4.02(1)(a) and 4.03(1)(a))

42. As noted in 4.2.3 above, claimants at stage 1 or 2 (i.e. non-bridging) fibrosis may elect to receive loss of income/services in lieu of the $30,000 lump sum.

4.2.8 Loss of Income (4.02(1)(b))

43. In addition to the loss of income already discussed in 4.2.7, compensation is provided for loss of income to those who have developed bridging fibrosis (assumed equal to stage 3 fibrosis in the model), cirrhosis or liver decompensation/cancer.

44. Loss of Income compensation is intended to cover the claimant's net after-tax loss, taking into consideration Canada Pension Plan, Quebec Pension Plan, Unemployment Insurance and/or Employment Insurance premiums and benefits, and certain other collateral benefits.

45. The Transfused Plan initially imposed a $75,000 limit (in 1999 dollars) on the pre-claim gross income used in calculating a claimant's loss of income; this limit was increased by the Courts to $300,000 (in 1999 dollars) effective October 2004. In 2008, the limit was raised to $2.3 million, subject to approval by a court for claims where the pre-loss income exceeds $300,000. Since then four claimants (one with a loss of income of $2.3 million) have been approved. Of the four claimants approved by the courts, one died in 2010, one is now over 65 years old and thus not eligible for any further income loss payments, the third had a net income loss in 2012 of $1,497,000, and the fourth has a net income loss of less than $300,000 (this member had a pre-loss income in excess of $300,000, but has sufficient post-loss income that the income loss paid by the trust is less than $300,000).

4.2.9 Loss of Services in the Home (4.03(1)(b))

46. Compensation for loss of services is available under the same conditions set out in 4.2.8 for loss of income.

47. The compensation payable under this head is set at $12 per hour to a maximum of $240 per week (4.03(2) of the Transfused Plan). This maximum works out to $240 x 52 weeks per year = $12,480 per year (in 1999 dollars).

4.2.10 Costs of Care (4.04)

48. Compensation is available to those who have liver decompensation or cancer, to the extent such costs (other than loss of service in the home) are not recoverable under any public or private health care plan, to a maximum of $50,000 per year.

4.2.11 HCV Drug Therapy (4.05)

49. This compensation (at $1,000 per month - 1999 dollars) is available to those undergoing a regimen of drug treatment that includes ribavirin or interferon.

4.2.12 Uninsured Treatment and Medication (4.06)

50. These costs include claims related to treatments to clear the virus, as well as, for those who do not clear the virus, costs arising from any ongoing treatment related to managing their illness.

4.2.13 Out-of-Pocket Expenses (4.07)

51. Out-of-pocket expenses are expenses other than the uninsured medication costs and costs of care discussed above, and include travel costs to receive medical care and costs of obtaining medical evidence for the purposes of obtaining compensation under the Transfused Plan.

4.2.14 HIV Secondarily Infected (4.08)

52. The Transfused Plan pays compensation above $240,000 in provable claims to those persons who are also receiving compensation under the HIV Program (see Section 4.4 HIV Secondarily Infected).

4.2.15 Deaths Before January 1, 1999 (5.01)

53. The estates of HCV related deaths before January 1, 1999 may elect either $120,000 in full settlement of all claims, including uninsured funeral expenses and loss of guidance, care and companionship ($120K option), or $50,000 plus claims by the family, including uninsured funeral expenses, and loss of support or loss of services ($50K+ option).

4.2.16 Deaths after January 1, 1999

54. Funeral expenses are payable up to a maximum of $5,000 (5.02).

55. **Death Claims after January 1, 1999 - Loss of Support/Services (6.01).** Both loss of support and loss of services are payable during the remainder of the deceased's life expectancy, as if the death had not occurred, with loss of support converting to loss of services after age 65.

56. **Death Claims after January 1, 1999 - Loss of Guidance, Care and Companionship (6.02).** The lump sum amounts payable vary between $500 for each grandparent or grandchild, $5,000 for each parent, sibling, or child aged 21 or over, $15,000 for each child under age 21, and $25,000 for a spouse.

4.2.17 Secondarily Infected Persons (3.02)

57. These include spouses of the cohort members, infected via sexual transmission, and perinatal (from mother to fetus) transmission of HCV. The payments to secondarily infected persons are the same as those to primarily infected persons and are as set out above.

4.3 Hemophiliac Plan

58. The Hemophiliac Plan provides for compensation amounts and conditions that are similar in structure to the Transfused Plan, with the following exceptions:

- a claimant who is also infected with HIV may elect to be paid $50,000 in full satisfaction of all other claims including post death claims of dependents and family members (4.08(2) of the Hemophiliac Plan);
- the estates of HIV co-infected persons who died before January 1, 1999 may elect to be paid $72,000 in full satisfaction of all other claims (5.01(4) of the Hemophiliac Plan), even if HCV is not the cause of death.

4.4 HIV Secondarily Infected Program

59. The fund will pay all claims made under the HIV Program at $240,000 per claim to a maximum of 240 claims, as well as costs of administering that program to a maximum of $2 million. No interest is paid on these claims and they are not indexed for the cost of living. In addition, the Transfused Plan and the Hemophiliac Plan both allow for payments in excess of $240,000 in provable claims to those persons who are also receiving compensation under the HIV Program.

4.5 Fees and Expenses

60. Fees and expenses incurred in administering the fund are payable from the fund on judicial approval.

5 Assets at December 31, 2013

61. The costs of the settlement are shared by the Federal and Provincial/Territorial governments in the ratio 8/11 : 3/11. The Federal Government transferred assets in full settlement of its ongoing obligations, while the Provincial/Territorial governments pay their share (3/11ths) of the costs as they arise, subject to a maximum possible payout. Accordingly there are two funds:

- an invested fund containing the remaining balance of the Federal Government funds; and
- a notional Provincial fund that represents the Provincial/Territorial governments' share of the cost of the agreement; this is increased by interest at the rates on three-month treasury bills, less the Provincial/Territorial governments' share of costs to date.

62. The invested assets are invested in two different portfolios: a long term portfolio, divided further into a real return bond portfolio and a portfolio made up of equities and universe bonds, and a short term portfolio invested in short term bonds.

5.1 Asset Development to December 31, 2013

63. The asset development to December 31, 2010 was set out in our previous valuation report.

64. The development of the assets from January 1, 2011 to December 31, 2013 is summarized below. The invested assets and disbursements are taken from the Royal Trust financial statements. The Provinces and Territories' share is taken from the Royal Trust quarterly calculations of interest credits (which are reviewed by us on an ongoing basis). While the Provinces and Territories generally pay their share of the costs as they arise, some have chosen at various times to prepay in anticipation of future costs. At December 31, 2010, both Yukon and Alberta had prepaid balances to their credit which were included in the invested assets. By June 2011, Alberta's prepaid balance had been used up. As a result of further prepayments, at December 31, 2013 Yukon still had a small prepaid balance, while no other Province or Territory had a prepaid balance at the valuation date.

Asset Development from January 1, 2011 to December 31, 2013 ($,000's)			
	Invested Assets	Notional Assets	Total Assets
Initial, at January 1, 2011	**989,775**	**187,487**	**1,177,262**
Alberta/Yukon unused prepayments = credit balance	(391)	391	-
Investment income/interest credits	120,177	4,837	125,014
Interest credits allocated on prepayments	(1)		(1)
Benefit payments	(75,045)	(28,121)	(103,166)
Fees/expenses	(6,481)	(2,429)	(8,910)
Sub-total	1,028,034	162,165	1,190,199
Yukon unused prepayments = credit balance	14	(14)	-
Closing, at December 31, 2013	**1,028,048**	**162,152**	**1,190,199**

5.2 Composition of Assets

65. The composition of the total invested and notional assets is summarized below:

Asset Distribution at December 31, 2013			
	($,000's)	% of sub-total	% of total
Long Term Fund			
Real return bonds	697,549	74.5	58.6
Universe bonds	56,253	6.0	4.7
Canadian equity	82,677	8.8	6.9
US equity	49,555	5.3	4.2
International equity	49,420	5.3	4.2
Cash & short-term	475	0.1	0.0
Sub-total	935,929	100.0	78.6
Short Term Fund	92,119		7.7
Total invested assets	1,028,048		86.4
Provinces and Territories' notional assets	162,152		13.6
Total assets	**1,190,199**		**100.0**

66. The investment strategy is passive. In general, the assets in the Long Term Fund are held and not traded. The invested assets, other than the real return bonds that are held directly, are in a variety of index funds managed by TD Asset Management. We understand that the Short Term Fund is drawn down to meet current claims and expenses; it is then reimbursed for the 3/11 share due from the Provinces. We further understand that, from time to time, a portion of the Long Term Fund is re-allocated to the Short Term Fund to rebalance the overall portfolio. The Provinces' notional assets (less their 3/11 share of disbursements) are credited with interest at 3-month treasury bill rates as per the terms of the Settlement Agreement.

5.3 Duration of Fixed Income Assets

67. The duration of the fixed income assets as at December 31, 2010 and 2013 are set out below:

Duration of Fixed Income Assets		
	December 31, 2010[1]	December 31, 2013
Real return bonds	11.6 years	15.4 years
Universe bonds	6.0 years	6.7 years
Short term fund	2.6 years	2.8 years

68. Note that the duration[2] of the fixed income assets has lengthened since 2010, in particular for the real return bonds .Lengthening the asset duration was a deliberate strategy to better match the duration of the liabilities[3] as measured in the 2010 assessment. The restructuring commenced in the fourth quarter of 2013 and was completed in early 2014.

5.4 Investment Returns to December 31, 2013

69. The investment returns earned during calendar years 2011 to 2013 were:

Investment Returns By Calendar Year			
Calendar Year	On Invested Assets	On Notional Assets	Combined
2011	11.38%	0.92%	9.76%
2012	3.82%	0.90%	3.42%
2013	(2.84%)	0.98%	(2.31%)

[1] Approximate.

[2] Duration is the weighted average term of the cash flows associated with an asset or a liability and a measure of its sensitivity to changes in interest rates – the longer the duration the greater the sensitivity.

[3] When the duration of the liabilities and assets of an arrangement are equal, the effect of interest rate (real return bond yields in this case) fluctuations is broadly the same on both the assets and the liabilities, hence protecting the arrangement from investment volatility arising from interest rate changes.

70. The 3-month treasury bill rates are summarized below for each calendar quarter between January 1, 2011 and December 31, 2013. These rates were applied to the Provinces and Territories' notional assets in calculating the returns in the table above.

Quarterly 3-month Treasury Bill Rates			
	2011	2012	2013
Q1	0.98%	0.82%	0.92%
Q2	0.95%	0.93%	0.98%
Q3	0.93%	0.87%	1.03%
Q4	0.81%	0.97%	0.97%

5.5 Excess Investment Returns (Shortfall) to December 31, 2013

71. The 2010 actuarial valuation reflected the assumption that the assets (invested and notional) would earn a real rate of return (i.e. in excess of inflation) of 1.05% per year net of investment-related expenses.

72. The actual inflation increases applied to the Plans' 2010 scale of benefits were 2.84%, 1.76% and 0.91% at January 1, of 2012, 2013 and 2014 respectively.

73. If we bring forward the $1,177,262,000 asset value used at December 31, 2010, adjusted for the actual disbursements (excluding investment-related expenses), to December 31, 2013, with the assumed rates of return, we would expect a total asset value of $1,168,138,000. This compares to the actual asset value of $1,190,199,000. Thus, there was a gain of $22,061,000 (the difference between the actual and expected asset values) on the actual investment returns to December 31, 2013 compared to the long-term actuarial assumption.

5.6 Other Adjustments

74. As at December 31, 2013, there were a number of payments accrued in respect of the known (i.e. approved) claimants at that date; in addition, loss of income and loss of services payments in respect of 2013 are not payable until 2014. These total approximately $11.9 million (combined for the Transfused and Hemophiliac Plans). Provisions for these payments are included with the liabilities set out later in this report.

6 Medical Model and Related Actuarial Model

6.1 Medical Model

75. In 1998, the parties to the Settlement Agreement asked the Canadian Association for the Study of the Liver ("CASL") to construct a natural history model of hepatitis C to aid in the calculation of the various amounts of compensation to patients infected with the hepatitis C virus through blood transfusion between 1986 and 1990. The CASL study was led by Dr. Murray Krahn and was completed in April 1999; its results formed the basis of our assumptions regarding the development of the various medical outcomes for our 1999 actuarial valuation.

76. For each of the 2001, 2004, 2007, and 2010 assessments, a working group convened by Dr. Krahn was retained to review and update the medical model, taking into account the clinical and demographic data from compensation claimants to date. Each of these successive medical models incorporated refinements based on emerging information, while keeping the structure and methodology largely consistent over time. We used these models as the basis for our previous assessments.

77. For the purposes of the current assessment, Dr. Krahn was again retained to convene a working group (the "Medical Model Working Group" or "MMWG") to review the medical model and update it for the additional experience since 2010. We refer to this revised study as the "2013 MMWG"[1] report/study/model.

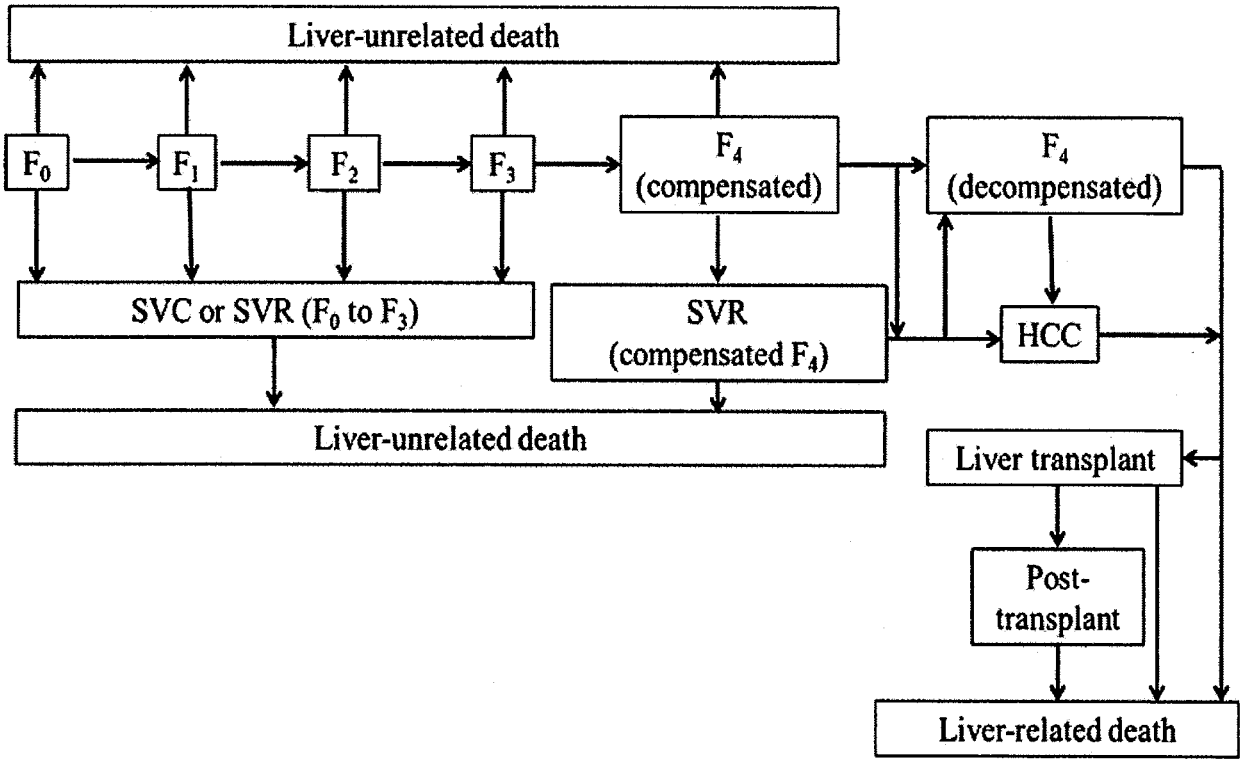
78. The MMWG model is a Markov state transition model. In this type of model, a set of relevant health states or stages is defined; these are shown in the table below. For each projection year, the model applies the appropriate probability of progressing to the next stage.

79. The table below sets out the medical model stages and associated compensation plan levels.

[1] In our previous reports, we referred to the MMWG report, study or model according to the year in which the medical report was issued. For example, the MMWG report used for the 2010 assessment was issued in 2011, so we referred to it as the 2011 MMWG report. Starting with the 2013 assessment, we have changed the naming convention to use the sufficiency review date i.e. 2013 MMWG" instead of "2014 MMWG".

MMWG Stage	MMWG Stage Description	Compensation Plan Levels	Compensation Plan Description
F0 (RNA-)	Fibrosis Stage 0 – RNA negative	1	Claimants who have cleared the virus
F0 (RNA+)	Fibrosis Stage 0 – RNA positive	2	PCR test positive
F1	Fibrosis Stage 1	3	Non---Bridging Fibrosis
F2	Fibrosis Stage 2	3	Non---Bridging Fibrosis
F3	Fibrosis Stage 3	4	Bridging Fibrosis
F4	Cirrhosis	5	Cirrhosis
HCC	Hepatocellular Cancer	6	Cancer
Decomp	Decompensated cirrhosis	6	Liver decompensation
Transplant	Liver Transplant	6	Liver transplant
Death	Liver related death		Death

80. The medical model structure as described in the 2013 MMWG report is shown below[1].



[1] Sustained Virological Response, or "SVR", is defined for this purpose as an undetectable HCV viral load test 12 weeks after completing a successful course of HCV treatment. Spontaneous Viral Clearance or "SVC" refers to undetectable HCV viral load in serum, in the absence of treatment.

81. While the design of the 2013 MMWG model is essentially the same as previous versions the expected outcomes are significantly different from the prior MMWG models. It is based on historical data, but also takes into account a number of new treatment protocols, as well as certain promising drug therapies that were "fast-tracked" through the Health Canada approval process. These new drug therapies are expected to be provided to a much larger proportion of the claimants than the therapies taken into account in the 2010 model and their efficacy is significantly higher. The medical model makes assumptions regarding the proportion of claimants that will be treated with new drug therapies (each claimant is assumed to receive at most one future treatment), and further assumes that these treatments will be provided in the five years from 2014 to 2018. As a result the HCV prognosis is significantly better than that shown in previous models. A significant proportion of claimants are projected to clear the virus following treatment with these new drugs. The impact of the improved prognosis on the financial outcome is significant. Offsetting this, the cost of these therapies is very high and the corresponding liability for future treatment is now significant.

82. The 2013 MMWG model uses a starting age, sex and clinical distribution of the cohort that is based on the observed claimant data, anchored at about August 2013. The MMWG adjusted the observed claimant data to allow for an expected lag in recognition of the actual disease stage of claimants.

83. The MMWG model recognizes the prevalence of HIV infection and hemophilia. While the year-by-year medical transition probabilities do not vary by age, sex or hemophilia in the MMWG model, they are assumed to vary by HIV presence; this, combined with the different age/sex/clinical-stage starting compositions and excess mortality associated with HIV infection, affects the hemophiliac prognosis and leads to different projected outcomes for the hemophiliac cohort compared to the transfused cohort.

84. The MMWG provided the estimated mean and 95% confidence intervals[1] for each of the transition parameters in their report. The 2013 medical model can use either the mean of the distribution in a deterministic[2] projection or the parameter distributions to model a given transition parameter stochastically.

6.2 Actuarial Model

85. For the 2010 valuation we moved to a seriatim approach for valuing the known population, whereby the liability for each claimant is individually calculated taking into account the claimant's specific

[1] The 95% confidence interval indicates that the MMWG is 95% confident (statistically) that the true value falls in the range.

[2] In deterministic models, the output of the model is fully defined or determined by the parameter values and the initial conditions. There is no randomness built into the model, and for a given set of inputs, the same outputs will always be produced.

details (e.g. age, sex, disease stage, actual loss of income claims, etc.). We have continued with this approach for this valuation.

86. The 2014 Markov model developed by the MMWG was analyzed by them using a software package called Treeage Pro 2014. In addition to being able to simulate the progression of individuals through the various health states, this software has the ability to generate future cash flows depending on health state, as well as discount these cash flows to the valuation date.

87. The MMWG shared with us a copy of their medical model as implemented in the Treeage software. We were able to reproduce the MMWG key results, thereby ensuring that we retained the complete medical model as developed by the MMWG; this reduced very significantly any opportunity for errors or misinterpretation arising between the medical model and the actuarial model.

88. We therefore used Treeage Pro 2014 to calculate the known liabilities using a stochastic[1] technique as follows:

- The starting stage distribution of the cohort for financial sufficiency purposes was reset to the observed claimant data, to ensure the timing of benefit payments is correctly reflected.
- We simulated the health state of each individual claimant in each future year by applying the transition probabilities set by the MMWG in their stochastic model. For each future year we calculated the payments due to the claimants based on their projected health state in that year and then discounted the payment amounts to the valuation date to obtain a present value of the future payments.
- We added up the discounted cash flows over all future years to provide an estimate of the liability for the member if they were to progress through the health states as per that simulation.
- The future health states and the associated cash flows for each known member were stochastically modelled, or simulated, 10,000 times and the average of the 10,000 liability outcomes was calculated for the total known cohort. This then represents the liability for future payments for the known population.

[1] Stochastic models use advanced modelling techniques to generate thousands of possible scenarios or outcomes. There is an element of indeterminacy, or randomness, in the potential outcomes; this indeterminacy is described by probability distributions. The model is run repeatedly (possibly thousands of times) with randomly generated inputs, and these probability distributions affect the pattern and distribution of outcomes. The probability of a certain outcome refers to the proportion of trials (or observed frequency) calculated by the model which resulted in the given outcome.

89. The liability for future payments to the unknown claimants was assumed to be proportional to the liability of the known claimants. This is effectively the same as the approach used in previous sufficiency reviews, where the disease stage distribution for the unknown claimants was assumed to be the same as that of the known claimants.

90. In addition to allowing for future payments, there is a liability for amounts payable to unknown claimants immediately upon approval. This liability is for lump sums as well as losses incurred prior to being approved. We allowed for these approximately by calculating the value of lump sum payments based on the assumed stage distribution of the unknowns and allowing for retroactive payment of recurring payments that fell due before the approval date, for example loss of income payments, out of pocket expenses, etc. Retroactive recurring payments will be proportionally less than the historic recurring payments to known claimants as people with significant losses or expenses have a greater incentive to claim, i.e. already come forward for approval. We have allowed for retroactive recurring payments by including $20,000 per unknown claimant in the liability.

91. We calculated the results assuming all unknowns come forward at the valuation date and that past payments are paid immediately and ongoing payments commence at the valuation date. Clearly there will be a delay in unknowns coming forward, but the financial impact of the delay is very small as the unknowns represent a relatively small proportion of the total claimant group and the discounting associated with the delay is small as the net discount rate is so low (see Section 7.4).

7 Assumptions

7.1 Development of Assumptions

92. A significant number of assumptions are required to calculate the liabilities of the trust. The assumptions with respect to disease progression, treatment rates and treatment efficacy were established by the MMWG and documented in their 2014 report. As review of these assumptions is outside our area of expertise, we have adopted these assumptions without modification for use as best estimates in our actuarial model. With respect to the rates of mortality, we have used different assumptions than the MMWG in certain cases, as described further in section 7.5.

93. With respect to all the other assumptions we have worked in conjunction with Morneau Shepell in establishing appropriate assumptions. In setting the assumptions we have used the cohort data provided by the administrator, guidance from, and discussion with, the Joint Committee, as well as other external sources including hepatologists and the insurance industry where necessary, to form a view as to the likely future outcomes.

94. In all cases, Eckler and Morneau Shepell agreed that the assumptions (set out below and in Appendices C to H) are appropriate.

7.2 Best Estimate Assumptions and Margins for Adverse Deviations

95. As noted earlier, a "margin for adverse deviation" is the adjustment to the best estimate assumption that results in an increase in the resulting liability; this increase in the liability is the provision for adverse deviation.

96. The provision for adverse deviation is intended to provide protection against experience that is somewhat worse than the “best estimate” assumption.

97. Use of the expected, or mean, transition probabilities and other medical model parameters would reflect a "best estimate" approach to the liability. As discussed previously in this report, a "best estimate" liability is associated with a 50% probability that it will turn out to be too low.

98. As discussed earlier, it is appropriate in this sufficiency review to incorporate some margins for adverse deviation.

7.3 Cohort Size and Development

7.3.1 Overview

99. The assumption as to the number of claimants that will eventually come forward is important to the results of our valuation. Various theoretical estimates of the number of claimants have been produced since 1998. In addition, there are now about 15 years of actual claims experience. The actual number of claimants who have come forward to date is significantly less than was predicted by the original theoretical estimates. Accordingly, adjustments have been made to the estimated numbers of claimants over the course of the five reports that we have produced.

7.3.2 2013 Cohort Revision

100. The claims deadline was June 30, 2010. Subsequent to the 2010 review, the Courts approved two late claims protocols (CAP1 and CAP2) that allow persons to make claims after this deadline. In addition, there are a number of claims that were submitted prior to the deadline that have not yet been approved. Thus, in addition to the approved or "known" cohort, there is still an "unknown" group of claimants that have yet to be approved, either because their claim has not yet been approved, or because they have not yet applied for approval. An estimate of these unknowns is required. We have arrived at this estimate by making assumptions as to the number of future CAP1 and CAP2 claims and applying assumed approval rates to these as well as the regular in-process claims.

101. The administrator has provided us with data on 3,924 approved transfused claimants as at December 31, 2013, consisting of 3,740 alive or deaths after January 1, 1999 (DA9s), and 184 who died before January 1, 1999 (DB9s). In addition the Administrator has indicated that there are a further 290 (net of 195 archived claims[1]) as yet unapproved claims in process at December 31, 2013, totaling 254 alive or DA9s, and 36 DB9s.

102. By December 31, 2013, 65 persons had claimed under CAP1 and 9 persons under CAP2. In addition, a further 30 CAP1 and 30 CAP2 claims were made in 2014.

103. The approved CAP1 and CAP 2 claims are summarized below:

[1] Old claims that were submitted for approval, but where the claimant has not continued with the approval process and it is not expected that an approved claim will result.

Number of Approved Claims Under CAP1 and CAP2		
Approval Year	**CAP1**	**CAP2**
2010	1	0
2011	0	1
2012	44	8
2013	20	0

104. Based on the table above, and information from the administrator regarding claims submitted in 2014, we have assumed 98 CAP1 and 77 CAP2 claims after 2013. The approval rate for CAP1 up to and including 2013 was 47% and the corresponding CAP2 approval rate was 78%. We have assumed that the best estimate future approval rates will be 45% and 70% respectively giving a total of CAP 1 and CAP2 unknowns of 98 (=98x45%+77x70%).

105. The approval rate for all claims up to 2013 is as follows:

Year	Submitted	Approved	Denied (including archived claims)	Pending (net of archived claims)	Approval Rate
Primarily Infected					
2000	2,912	2,051	858	3	71%
2001	1,091	655	430	6	60%
2002	609	338	268	3	56%
2003	338	192	144	2	57%
2004	249	127	120	2	51%
2005	210	107	96	7	53%
2006	170	100	62	8	62%
2007	117	52	59	6	47%
2008	102	50	44	8	53%
2009	101	52	44	5	54%
2010	471	110	148	213	43%
2011	4	1	3	0	25%
2012	53	29	22	2	57%
2013	21	6	9	6	40%
Total	**6,448**	**3,870**	**2,307**	**271**	**63%**
Secondarily Infected					
Total	**160**	**54**	**87**	**19**	**38%**

106. As can be seen from the above table, the approval rate has generally fallen over time. Further, we expect that the longer it takes to approve a claim, the less likely it will be that the claim will eventually be approved. As a result we have assumed that the best estimate approval rate for primarily infected claims (other than CAP1 and CAP2 claims after 2013) will be 55% and that secondarily infected claims will be have a best estimate 38% approval rate.

107. Applying these approval rates to the in process claims we obtain 156 regular unknowns, including 20 DB9s.

108. To show the sensitivity of the results to the number of claimants coming forward and to variation in the denial rate for the unapproved claims in process, we have calculated the cost of 10 additional approved transfused claims. This sensitivity is discussed further in Section 11.

109. The Administrator has provided us with data on 1,359 approved hemophiliac claimants as at December 31, 2013, consisting of 1,058 alive or DA9s, and 301 DB9s. In addition there are a further 19 (net of 9 archived claims) as yet unapproved claims in process at December 31, 2013, totaling 15 alive or DA9s, and 4 DB9s; and, applying an approval rate of 85% (the approval rate for hemophiliac claims since 2007, i.e. the approval rate in the more recent past), this results in a further 14 alive or DA9, plus 2 DB9s.

110. In addition, based on the rate at which hemophiliacs have claimed under CAP1 and CAP2 in 2014, we have assumed that 12 hemophiliacs will claim under CAP1 and none under CAP2 and that the approval rate will be 80%. This results in a further 10 hemophiliac unknowns, consisting of 9 alive or DA9s, plus 1 DB9s.

111. Therefore, there are 1,385 hemophiliac persons that will ultimately claim. Of these, 1,081 are alive or DA9s (23 yet to come forward), while 304 are DB9s (3 yet to claim).

112. Included in the hemophiliac totals discussed above are 8 hemophiliac secondarily infected approved claims, and we have assumed that no further secondarily infected hemophiliac claims will be approved. Of the known secondarily infected claimants, all were alive at December 31, 2013.

113. The distribution of the known alive cohort as at December 31, 2013 is shown in Appendix A. Separate tables are shown, first indicating the number of claimants and percentage allocations of the known transfused cohorts by age and clinical stage at December 31, 2013 (Appendices A-1 and A-2); next, the hemophiliac number of claimants and percentage distributions by age and clinical stage, as at December 31, 2013, are included in Appendices A-3 and A-4.

7.3.3 Further Hemophiliac Cohort Assumptions

114. At the valuation date, 62% of the known applicants who were alive at January 1, 1999 are still alive and 38% of the known applicants alive at January 1, 1999 have subsequently died. We have assumed that the 23 alive at January 1, 1999 who are yet to claim will present in the same proportion, i.e.

14 will be alive and 9 will be DA9s and their stage distribution will be the same as the stage distribution of the known claimants.

115. Currently 26% of the known alive and DA9 claimants are HIV co-infected. We have assumed that the same percentage of the unknown claimants will be co-infected and that 100% of the co-infected at level 1 will take the $50K option. This results in three $50K option claims. The rest of the alive and DA9 unknowns will claim under the regular heads of compensation, which are triggered by disease progression and other losses.

7.4 Net Discount Rate

116. The lump sum present value of future benefit and expense payments depends on two main economic parameters. The first is the gross rate of investment return that will be earned or credited on the fund's assets. The second is the rate at which the future payments may be expected to increase (most of the benefits under the plan are scheduled to increase in accordance with increases in the Consumer Price Index).

117. The foregoing two parameters affect the calculation of the lump sum present value in opposite directions. The higher the rate of investment return that is used in discounting the future payments to the present time, the lower will be the resulting lump sum present value; the higher the rate that the payments are assumed to increase in the future, the higher will be that resulting present value.

118. A precise present value calculation would require a formula incorporating the gross rate of return and the rate of inflation as separate parameters. However, virtually the same result will flow from a simpler formula where the future payments are discounted at a net rate equal to the excess of the gross rate of return over the assumed rate of inflation.

119. We developed the net discount rate for this valuation as follows. First, we established expected long term returns for each of the asset classes invested in by the fund (including the Provincial/Territorial notional assets which are effectively invested in treasury bills). Then, taking into account the standard deviation of each asset class's returns (the standard deviation is a measure of how variable returns have been historically and commonly used as an indication of investment risk) and the historical correlations between the asset class returns (the degree to which the asset class returns are related to each other), we modeled the expected return from the overall portfolio based on the target asset mix. This approach allows us to capture the effect of the diversification in the portfolio. We then subtracted an explicit inflation assumption, to derive a "best estimate" of the net rate of return.

120. As discussed in Section 7.2, it is not appropriate to use a best estimate of the net return as the discount rate. We therefore introduced a margin for adverse deviations in investment returns and accordingly reduced the best estimate net discount rate to arrive at the sufficiency valuation assumption.

121. The expected returns and standard deviations[1] assumed for each asset class are shown in the table below:

%	3-Month Treasury Bills	Universe Bonds	Short Term Bonds	Real Return Bonds	Canadian Equity	Global Equity
Expected Return	3.1	4.1	4.1	2.9	7.6	7.7
Standard Deviation	2.0	6.0	3.4	11.4	17.5	17.4

122. The asset allocation is derived by allocating $92 million of the invested assets to the Short Term Fund (as per the current allocation to the Short Term Fund) and the balance of the invested assets as at December 31, 2013 to the Long Term Fund, invested in line with the Long Term Fund benchmark asset allocation, together with the actual Provincial/Territorial Notional Assets as at December 31, 2013:

Fund	Asset Class	Asset Allocation	Fund Allocation	Total Asset Allocation
Long term Fund			**78.7%**	
	Real Return Bonds	80.0%		62.9%
	Universe Bonds	6.0%		4.7%
	Canadian Equity	7.0%		5.5%
	US Equity	3.5%		2.8%
	EAFE Equity	3.5%		2.8%
Short term Fund			**7.7%**	
	Short term bonds	100.0%		7.7%
	Cash	0.0%		0.0%
Provincial/Territorial Notional Assets	**3 Month Treasury Bills**	**100.0%**	**13.6%**	**13.6%**

[1] The mean returns and standard deviations were calculated using historical experience by asset class over a 20 year period.

123. The resulting best estimate and sufficiency valuation net discount rates are:

Component of Return	%
Best Estimate Return	3.84
Investment Expenses	(0.04)
Best Estimate Nominal Return	3.80
Best Estimate Nominal Return rounded to nearest 10th%	**3.80**
Best Estimate Inflation	2.50
Best Estimate Net Discount Rate	**1.30**
Margin for Adverse Deviation	0.25
Sufficiency Net Discount Rate	**1.05**

124. The above method also allows us to investigate the statistical distribution of returns and hence calculate, for example, the 95th percentile returns. This is important when assessing the required capital framework as discussed in Section 9.

125. The discount rate used in the 2010 valuation was derived using the same method as that described above. The best estimate net discount rate and the sufficiency valuation net discount rate are unchanged from 2010.

126. The best estimate net discount rate is used when calculating the best estimate liabilities. The sufficiency net discount rate is used in calculating the liabilities with provision for adverse deviations used in assessing the sufficiency of the fund.

127. In order to illustrate the sensitivity of the results to variations in the valuation net discount rate, we have also calculated the liability using a more conservative 0.8% per year (this increases the present value of the liabilities).

128. We have continued to ignore the effect of income tax on the investment returns since the Settlement Agreement provides that if any such taxes are paid they will be reimbursed to the fund.

7.5 Mortality Assumptions

129. In their previous reports, the MMWG used standard Canada life table mortality for non-liver related deaths on the basis that any extra mortality related to the health problems that had required blood transfusions was no longer present due to the passage of time. For their 2014 report, the MMWG analyzed cohort mortality experience and used mortality rates derived from the data for most ten year age bands (see pages 32 - 34 of the MMWG report). The data used to derive these rates is extremely sparse:

19 male hemophiliac deaths, 5 female hemophiliac deaths[1], 124 male transfused deaths and 61 female transfused deaths). In our opinion, this data is insufficient to derive mortality rates that can be considered to be calculated in accordance with accepted actuarial practice and therefore we are unable to use the mortality rates derived by the MMWG in our financial assessment. Instead we assumed non-liver related mortality rates would be as per the Canada Life Tables 2009 – 2011. The effect of this modification of the MMWG assumption is immaterial. The limited evidence from the MMWG analysis suggests that actual mortality for both the hemophiliac and transfused groups could be somewhat higher than the Canada Life tables' mortality, but no allowance was made for future mortality improvements (general population mortality is expected to improve over time), which compensates for this to some degree. Because the results of the assessment are not particularly sensitive to this mortality assumption, no margin for adverse deviation was applied.

130. Life insurance underwriting manuals indicate that hemophiliacs have higher mortality rates than non-hemophiliacs. In previous reports, the MMWG discussed this issue and pointed out that other than increased mortality due to HIV infection and liver disease, the underlying mortality of hemophiliacs was the same as non-hemophiliacs (Page 51 of the 2010 MMWG Report). As the mortality associated with HIV co-infection and end stage liver disease is explicitly allowed for in the medical model, no additional mortality adjustment is required for hemophiliac's mortality and the Canada Life Tables 2009-2011 mortality rates are used for non-liver related mortality for hemophiliacs without HIV co-infection.

131. For HIV co-infected, we have concerns regarding developing mortality rates from the cohort data as was done in the MMWG report (page 36) due to the paucity of data. Accordingly, we have assumed mortality rates at 624% of the Canada Life 2009-2011. The 624% adjustment was calculated by the MMWG in their 2010 report based on a meta-analysis of four studies with significantly more data than available from the cohort (the cohort based rates were based on 11 deaths over a ten year period, which in our opinion is insufficient to develop meaningful mortality rates). Because this assumption affects a relatively small portion of the liability, no margin for adverse deviation has been applied.

132. For mortality associated with liver-related diseases, we based our assumption on the rates derived by the MMWG, with one adjustment. For HIV co-infected claimants, at older ages it is possible for the 624% of the Canada Life Table 2009-2011 mortality rates to exceed the liver-related mortality rates derived by the MMWG. As a result, we have assumed that mortality for HIV co-infected claimants will be the greater of the MMWG derived rate and 624% of the Canada Life Table 2009-2011 rates. The data that the MMWG relied on to derive the liver-related mortality rates is somewhat sparse, but we understand that this mortality is significantly higher than general population mortality, and we have no better source for this assumption.

[1] Hemophilia is a genetic disorder that rarely affects females. However, persons who qualify under the hemophiliac plan have medical conditions broader than hemophilia, hence the presence of female deaths in the hemophiliac data.

133. The medical model makes explicit allowance for HCV liver-related deaths only at stage 6. In practice, some deaths at earlier stages are determined to be HCV related and claimants compensated as such. Based on an analysis of the proportion of deaths being compensated as HCV deaths at each stage we derived appropriate assumptions to reflect this. No margin for adverse deviation was applied to this modified assumption; rather, an allowance for additional HCV related deaths was made in the required capital calculation.

7.6 Treatment to Clear the Virus

134. The medical model assumes there are three[1] categories of treatment drugs that will be offered to claimants: PEG-IFN/RBC-based triple therapy; Sofosbuvir-based doublets; and 3D regimen plus RBV.

135. After the 2013 MMWG report was completed, and while we were developing this report, other drug regimens have been introduced, for example, 3D regimen without RBV. We have not attempted to modify the medical model to reflect these new regimens.

136. The medical model also makes assumptions as to the percentage of claimants who will receive each of these three categories of treatment drugs. These percentages vary depending on whether the claimant was previously treated, and whether the claimant is co-infected with HIV, resulting in four classes of treatment prevalence. We have adopted these assumptions, which are set out in Appendix E.

137. The Joint Committee provided us with medical evidence summarizing the current HCV treatment protocols in Canada, including the 2015 CASL guidelines and medical information from Dr Bain (a hepatologist called on by the Joint Committee to provide guidance on HCV treatment protocols). These protocols specify the typical treatment comprising choice of drug, whether additional drugs are included, and treatment duration. Treatment durations generally vary from 8 weeks to 24 weeks, with 12 weeks being by far the most common. The protocols may vary depending on a number of factors, including whether the individual has been previously treated, the disease stage of the individual (for example, whether the claimant is cirrhotic) and the genotype of the virus.

138. We developed a distribution of treatment drug and duration for known alive claimants, by applying these protocols according to claimant data (which indicated whether previously treated, whether co-infected, and disease stage) and an assumed distribution of genotype for the claimant cohort.

139. From this distribution of treatment drug and duration, we calculated the weighted average treatment duration for each of the three categories of HCV treatment drugs.

[1] Four different treatment categories were initially considered by the MMWG, but the results of a survey of physicians specializing in HCV (upon which the MMWG based their treatment assumptions) indicated that no doctors would prescribe the oldest drug, and it was effectively dropped from the medical model.

140. The Joint Committee provided us with information on costs of these HCV treatment drugs, reflecting input from the administrator and the medical evidence from Dr. Bain, based on a standard treatment duration of 12 weeks. One of the HCV treatment drugs was only approved for use in Canada in December 2014 and as such actual costs are not yet available; we assumed that the cost of this drug would be the same as that of the most recently approved drug for which we have actual costs available.

141. We adjusted these drug costs to reflect the average treatment durations described in paragraph 139; this formed the basis for our best estimate of drug treatment costs assuming 100% of the cost is reimbursed by the HCV Trust: $60,000 for PEG-IFN/RBC-based triple therapy, and $85,000 for each of Sofosbuvir-based doublets and 3D regimen plus RBV.

142. Taking into account the uncertainty associated with the assumptions regarding these very new HCV treatment drugs, uncertainty which could arise from drug costs per treatment or dose higher than expected and/or treatment durations longer than expected, we applied margins for adverse deviations to these best estimate assumptions, resulting in a sufficiency assumption of $110,000 per course of HCV drug treatment for each of the three categories. We believe the margin for adverse deviation with respect to HCV drug treatment cost, which is proportionately larger than the margins applied in most other normal situations, is appropriate in these circumstances.

143. Of the three categories of drug treatments that were assumed in the medical model, one (PEG-IFN/RBC-based triple therapy) is no longer included in the HCV drug treatment protocol in Canada. This drug has a lower average best estimate cost than the other two drugs, but a lower treatment efficacy. It is our understanding, based on the 2015 CASL guidelines and medical evidence from Dr. Bain, that newer drug options would likely be prescribed instead. The proportion of claimants assumed to be treated with this older drug was lower than the other two options. We did not modify the medical model to eliminate this older drug as a treatment option, as assumptions regarding treatment protocols are beyond the scope of our expertise. We believe the impact of retaining this older drug in the model results in liabilities which are slightly higher than they would otherwise have been.

144. The HCV trust pays only that portion of the HCV treatment drugs that is not reimbursed by either a provincial or private health plan.

145. The medical model assumes that all claimants who are eligible for treatment will be treated over a five year period starting in 2014. We assumed that over this period, none of the drug treatments would be eligible for reimbursement from a provincial drug plan (in other words, by the time these drugs are generally covered under provincial health plans, the claimants have already been treated and reimbursed by the HCV Trust).

146. We assumed that, on average, 50% of the claimants under age 65 would be covered under a private health insurance plan, and that the private health insurance plan would reimburse 80% of the costs; this leaves 60% (the balance after 50% of 80%, or 40%, is reimbursed by the private plan) to be paid by the HCV Trust. These assumptions were derived from data from the administrator showing historical rates of private insurer drug coverage for HCV claimants combined with our understanding of private insurance coverage in the Canadian population, and data from private insurers showing average reimbursement rates for newer HCV treatment drugs.

147. Using the same weightings as were used to derive the treatment durations for each of the three categories of HCV treatment drugs (which were based on the medical evidence provided by the Joint Committee), we developed weighted overall average treatment duration of 13.2 weeks; this was used as our best estimate assumption for duration of drug therapy. We applied a margin to this assumption to obtain the sufficiency assumption of 14.5 weeks.

148. The HCV treatment drugs have evolved dramatically and rapidly in recent years. Drug treatments contemplated in medical model have changed dramatically from the 2010 to 2013 medical models, and, as noted in paragraph 143, certain drug treatments taken into account in the 2014 model, developed in 2013 and 2014, are no longer offered. The field is changing quickly, and other new drugs may emerge, either replacing the current drugs, or enabling more effective treatment of individuals who are currently hard to treat.

7.7 Other Assumptions

149. The 2013 valuation required a number of other assumptions, e.g. proportion of claimants claiming loss of income/services/support at various disease levels, their average percentage of disability, income/support levels, costs of care, drug costs, other expenses, death benefits and so on. We, together with Morneau Shepell, derived appropriate assumptions based on analysis of the claims experience to the valuation date, consideration of the assumptions used in previous valuations, as well as expert medical and other advice.

150. These assumptions differ in some instances between the transfused and hemophiliac plans. We show the assumptions in detail in Appendix F.

151. As discussed in Section 7.2, we start with best estimate assumptions, but for the sufficiency valuation we require assumptions which include margins for adverse deviations. We have not taken margins on all assumptions, only those where there is either a large degree of uncertainty as to the eventual outcome and/or where the overall liability is a large component of the total.

152. This section describes the approach and considerations taken into account in setting the assumptions. The assumptions used are set out in detail in Appendix F.

7.7.1 Lump Sum Payments

153. Lump sum payments are made when a claimant reaches specific stages of the disease. For known claimants, allowance is made for future payments based on their projected progression through the disease per the MMWG model. For unknown claimants, all stage related payments based on their assumed disease stage at the time of approval as a claimant are allowed for, together with future payments based on their projected progression through the disease.

7.7.2 Loss of Income and Loss of Services

154. The assumptions regarding loss of income and loss of services claims may vary depending on the claimant's disease stage, whether the claimant is already claiming one of the benefits, and whether the claimant is projected to clear the virus on treatment or not.

155. For claimants already receiving loss of income or loss of service payments, the actual loss at the valuation date is taken into account. In stochastic projections where the claimant does not clear the virus on treatment, the actual loss is assumed to continue until age 65 or earlier death for loss of income, and for life for loss of services.

156. For claimants not yet receiving loss of income benefits, future loss of income or loss of services benefits are assumed to be paid at an annual rate derived from the average loss of income/loss of services amounts currently in pay.

157. We analyzed the proportion of claimants receiving loss of income/loss of services at each disease stage to derive probabilities of claiming at each disease stage. These probabilities are set such that the proportion of claimants who have not yet cleared the virus receiving such payments in the future is the same as the proportion of those who have not yet cleared the virus currently receiving such payments. In other words, as current claimants who have not yet cleared the virus move on, or are projected to die, new claimants are projected to replace them at a rate such that the total percentage of claimants who have not yet cleared the virus receiving payments remains constant.

158. For claimants who are projected to clear the virus before going on loss of income or loss of services we assume that they will not receive loss of income or loss of services payments.

159. For claimants who are projected to clear the virus on treatment, allowance needs to be made for recovery and return to work, or return to household duties. The amount of data on cured claimants who were receiving loss of income or loss of service benefits is quite limited. It did show, however, that a

significant proportion of claimants have continued to receive loss of income/loss of service payments after clearing the virus, especially in cases where the loss has been in payment for a long time.

160. There are no studies that we are aware of that investigate the return to work outcomes for HCV infected people on clearing the virus, so we were unable to identify external data that was directly applicable in this regard. The Joint Committee consulted Dr Bain and Morneau Shepell consulted Dr Wong (a hepatologist) for further insight on likely recovery rates,

161. We considered disability tables developed by actuaries for use in life insurance as a further source of information on disability recovery rates. These tables, and associated studies, do not provide any specifically useful data on recovery rates as the disabilities covered are broader than HCV. They do show, however, that recovery rates decline the longer the claimant has been on disability. This is consistent with the recovery data (limited as it is) of the fund, and so we established recovery rates that are duration dependent. In other words, the longer the person has been receiving loss of income or loss of service payments the less likely that these payments will stop on successfully clearing the virus. The rates assumed are shown in Appendix F.

162. The Loss of Income and Loss of Services benefits comprise a significant portion of the liability, and there is considerable uncertainty about the probability of recovery following a cure as a result of HCV treatment. We therefore applied a margin for adverse deviation to the recovery assumption.

163. We developed assumptions regarding the benefit amounts for future Loss of Income and Loss of Services claims based on the experience of the Trust, taking into account differences between transfused and hemophiliac claimants, and trends in the data.

164. A review of the annual loss of income payments to individuals shows considerable variation in benefit amounts; we therefore applied a margin for adverse deviation to this assumption.

165. The Transfused Plan initially imposed a $75,000 limit (in 1999 dollars) on the pre-claim gross income used in calculating a claimant's loss of income; this limit was increased by the Courts to $300,000 (in 1999 dollars) effective October 2004. In 2008, the limit was raised to $2.3 million, subject to approval by a court for claims where the pre-loss income exceeds $300,000. Since then four claimants (one with a loss of income of $2.3 million) have been approved. Of the four claimants approved by the courts, one died in 2010, one is now over 65 years old and thus not eligible for any further income loss payments, the third had a net income loss in 2012 of $1,497,000, and the fourth has a net income loss of less than $300,000 (this member had a pre-loss income in excess of $300,000, but has sufficient post-loss income that the income loss paid by the trust is less than $300,000).

7.7.3 Cost of Care

166. Analysis of the cohort data shows that average claim amounts are approximately $30,000 and that about 40% of those at Stage 6 will claim for cost of care.

167. A review of the cost of care payments to individuals shows considerable variation in benefit amounts; we therefore applied a margin for adverse deviation to this assumption.

7.7.4 HCV Drug Therapy

168. HCV Drug Therapy payments are made to claimants receiving a drug treatment regimen that includes ribavirin or interferon. Prior to the emergence of the recent HCV treatment drugs, all HCV treatments incorporated one or both of these drugs. While we recognize that the most recent drug regimens, which were approved after development of the medical model, may not include these drugs, we have assumed that Drug Therapy payments will be made to all claimants receiving treatment to clear the virus for the same length of time that we have assumed treatment will take. See section 7.6 for a discussion on assumed treatment length. To provide insight into the effect of overstatement in this assumption as a result of changes in treatment regimens in the future, we have included a sensitivity result showing the impact of reducing the number of claimants for HCV drug therapy payments by 50%.

7.7.5 Uninsured Treatment and Medication

169. For claimants who do not clear the virus, we have allowed for ongoing uninsured treatment and medication. The amount per year was set equal to the average (rounded up to the nearest $500) uninsured treatment and medication costs after removing expenses related to treatment aimed at clearing the virus. Likewise the percentage of claimants receiving such payments is derived from the administrator data. The analysis has been done separately for Transfused and Hemophiliacs.

170. For uninsured costs related to treatment to clear the virus we have used the assumptions discussed in Section 7.6 Treatment to Clear the Virus above.

7.7.6 Out-of-Pocket Expenses

171. Out-of-pocket expenses are expenses other than the uninsured medication costs and costs of care discussed above, and include travel costs to receive medical care and costs of obtaining medical evidence for the purposes of obtaining compensation under the Transfused Plan.

172. For claimants who do not clear the virus, we based our out-of-pocket expense assumption on the experience of the trust. We did not apply a margin for adverse deviation to this assumption, which has remained relatively stable over the last few assessments.

173. For claimants who clear the virus, we expect that the out-of-pocket expenses will reduce significantly, but the cohort data is too sparse to be useful in setting an appropriate assumption. We reviewed "Patient time costs and out-of-pocket costs in hepatitis C", a study of out of pocket expense claims (and other ongoing costs) in BC published in Liver International, 2011, to see if it provided any insights. The study showed that out-of-pocket expenses continue to be incurred after successful treatment, but given the generally short period between successful treatment and the study date, it was not conclusive that out-of-pocket expenses will continue in the long term. Accordingly, we have set an assumption (expressed as a single present value payment, payable on successful treatment) that takes into account our expectation that out-of-pocket expenses will reduce considerably on clearing the virus. Since there is considerable uncertainty surrounding this assumption, we applied a margin for adverse deviation.

7.7.7 Funeral Costs

174. Funeral costs are payable up to $5,000 for both HCV related deaths before January 1, 1999 and HCV related deaths after January 1, 1999. Analysis of the average funeral costs paid by the fund show that average amount paid per death is not at this maximum rate. We have set an assumption based on the average claim amount and assumed that 100% of deaths will result in a funeral claim. We did not apply a margin for adverse deviation to this assumption.

7.7.8 Deaths Before January 1, 1999

175. The estates of HCV related deaths before January 1, 1999 may elect either $120,000 in full settlement of all claims ($120K option), or $50,000 plus claims by the family, including loss of support or loss of services ($50K+ option).

176. We have analyzed the cohort data to obtain the percentage choosing each option, the average payments to the family under the $50K+ option and percentage receiving loss of support and loss of services. Loss of services are assumed to be paid the same rate as loss of services to alive claimants, while the loss of support is assumed to be paid at the average rate in the cohort data.

177. For five claimants who chose the $50K+ option the total payments to date are less than $120,000 we have anticipated that further claims will be forthcoming (i.e. their claim will be worth more than the $120K option) and allowed for an additional liability in this regard.

7.7.9 Deaths After January 1, 1999

178. Both loss of support and loss of services are payable during the remainder of the deceased's life expectancy, as if the death had not occurred, with loss of support converting to loss of services after age 65.

179. For simplicity we have assumed a life expectancy of 85 for both males and females, and allowed for payments from the age at death to this age. Strictly speaking, life expectancy increases the older the attained age, for example the life expectancy of a 60 year old is higher than the life expectancy of a 40 year old, but our simplified approach will result in a liability that is not materially different to the liability that would be calculated using the slightly more accurate attained age life expectancies.

180. Where loss of income or loss of services were being paid prior to death, it is assumed that corresponding claims will be made for loss of support or loss of services after death. The loss of support will be at 70% of the loss of income amount and loss of services will continue at the pre death level.

181. Where loss of income or services were not being paid prior to death we have assumed payments will be made at the average rate in the cohort data and the percentage claiming each type of payment will be as per the cohort data to date.

182. Death Claims after January 1, 1999 - Loss of Guidance, Care and Companionship. The lump sum amounts payable vary between $500 for each grandparent or grandchild, $5,000 for each parent, sibling, or child aged 21 or over, $15,000 for each child under age 21, and $25,000 for a spouse. Care and guidance is assumed to be paid at the average rate in the cohort data.

7.7.10 HIV Secondarily Infected Payments in Excess of HIV Program Payments

183. The Plans pay compensation above $240,000 only in provable claims to those persons who are also receiving compensation under the HIV Program (see Section 4.4). The Joint Committee expects this group to be extraordinarily small or non-existent and therefore, as in previous valuations, we have not performed any calculations pertaining to this limit. There have been no such claims to date.

7.7.11 Secondarily Infected Persons

184. These include spouses of the cohort members, infected via sexual transmission, and perinatal (from mother to fetus) transmission of HCV.

185. We have combined the secondarily infected persons with the primarily infected persons when calculating the liability for each head of compensation, therefore, no liability has been separately identified for those secondarily infected persons.

7.7.12 Outstanding 2013 Payments for Known Claimants

186. As noted in Section 5.6, there were a number of payments relating to calendar 2013 that were outstanding in respect of the known/approved claimants as at December 31, 2013. These total approximately $6,390,000 in respect of the Transfused Plan claimants and $5,521,000 for hemophiliacs.

7.7.13 Delay in Commencement of Payments to Unknown Claimants

187. As noted in Section 6.2, the above liability amounts assume that all unknowns come forward at the valuation date and that all due amounts are paid immediately. In reality there will be a delay before the payments to the unknowns commence, however, given the small size of the unknown cohort and the low discount rate we have not made allowance for this.

7.7.14 Claimants with Cryoglobulinemia and Glomerulonephritis

188. There are 25 claimants at Level 6 who have either Cryoglobulinemia or Glomerulonephritis who were excluded from the MMWG modelled outcomes on the basis that they are good candidates for treatment and that their prognosis would improve significantly on successfully clearing the virus.

189. Based on the guidance of the MMWG and medical experts retained by the Joint Committee, we have assumed that all of these members will be treated and have included a liability for the cost of this treatment. We have valued the liability for other claim payments as if they remained at Level 6 after successful treatment. We assumed there would be no recovery from loss of income or loss of services. We considered 2/3 of the deaths to be HCV-related and 1/3 as not HCV-related.

7.8 HIV Program

190. The Joint Committee has instructed us to assume there will be five additional HIV program claims, occurring every three years starting in 2014, with no additional administration expenses. Each claim will be for $240,000. No interest is paid on these claims and they are not indexed for the cost of living.

7.9 Fees and Expenses

191. We set the assumptions for fees and expenses in consultation with the Joint Committee, taking into account the actual fees and expenses incurred by the Trust, and the budgeted expenses in the near future and the anticipated expenses in subsequent years.

192. In previous valuations the fees and expenses were assumed to continue in the near and medium term, increasing with inflation and then reduce to zero in the long term. For this valuation we have allowed for maturing of the fund by reducing annual costs in proportion to projected number of claimants alive after 2025.

7.10 Effect of Emerging Experience

193. When setting the assumptions for this sufficiency review, we used our best efforts based on our understanding of the Trust. We have also made a number of simplifying assumptions or approximations

in calculating some of the smaller components of the liabilities; in these cases, we have tried to err on the conservative side, i.e. increasing costs and liabilities. There is, however, significant uncertainty with respect to future experience of the fund, especially arising from changes in the medical model and changes in the benefit payments for non-scheduled benefits such as loss of income or loss of services. Differences from our assumptions will continue to emerge over time. These differences and the related actuarial assumptions will continue to be re-examined at each periodic assessment of the Trust.

8 Detailed Results

8.1 Cohort

194. The following table sets out the known cohort, and best estimate and sufficiency assumptions for the unknown cohort, for transfused and hemophiliac claimants:

Summary of Cohort				
	Best Estimate		Sufficiency	
Cohort	Transfused	Hemophiliac	Transfused	Hemophiliac
Known cohort	3,924	1,359	3,924	1,359
Unknown cohort	254	26	254	26
Total claimants	4,178	1,385	4,178	1,385
Total Transfused and Hemophiliac	5,563		5,563	

8.2 Total Liabilities for Transfused and Hemophiliac Claimants

195. The following table sets out the best estimate and sufficiency liabilities for the total (known and unknown) cohort, split between transfused and hemophiliac claimants:

Summary of Total Liabilities for Transfused and Hemophiliac Claimants					
		Best Estimate		Sufficiency	
	Liability - $000s	Transfused	Hemophiliac	Transfused	Hemophiliac
	Co-infected taking $50,000 option		202		202
1.	$10,000 to those alive at 1.1.99	3,082	269	3,082	269
2.	$20,000 if PCR positive at 1.1.99	5,033	538	5,033	538
3.	$30,000 if non-bridging fibrosis	9,726	1,701	12,191	2,169
4.	$65,000 if cirrhosis	12,816	5,510	20,086	8,148
5.	$100,000 if decompensation/cancer	25,210	13,737	33,710	17,115
6.	Loss of income/services in lieu of $30,000 lump sum in 9.1.4	18,103	3,790	19,474	4,148
7.	Loss of income for bridging fibrosis, cirrhosis and decompensation/cancer	17,964	24,491	24,798	28,788
8.	Loss of services for bridging fibrosis, cirrhosis and decompensation/cancer	46,698	28,115	59,387	32,228
9.	Costs of care	17,562	10,362	33,183	18,431
10.	HCV drug therapy	6,606	1,640	7,201	1,790
11.	HCV drug cost	91,183	19,998	123,024	26,841
12.	Uninsured treatment & medication	2,868	3,613	2,948	3,703
13.	Out-of-pocket expenses	4,737	3,237	6,538	4,682
14.	Excess HIV secondarily infected				
15.	Pre-1999 deaths	16,042	27,495	16,207	28,180
16.	Deaths after 1.1.99 - funeral	1,559	762	2,044	918
17.	Deaths after 1.1.99 - loss of support /services	63,698	61,365	73,024	67,310
18.	Loss of guidance, care and companionship	18,318	10,656	23,959	12,827
19.	Claimants with Cryoglobulinemia/Glomerulonephritis	7,889	2,149	7,889	2,149
20.	Known outstanding 2013 payments	6,390	5,521	6,390	5,521
21.	**Total**	**375,482**	**225,153**	**480,167**	**265,957**

8.3 Liability for Expenses

196. The present value of the assumed expenses, as set out in Appendix G, is $ 53,455,000 on the best estimate basis and $ 55,552,000 including the provision for adverse deviation.

8.4 Liability for HIV Program

197. The present value of the assumed claim costs for the HIV program, as set out in section 4.4, is $950,000 on the best estimate basis and $970,000 including the provision for adverse deviation.

8.5 Assets and Liabilities

198. The assets are taken from Section 5.1.

199. The present values of the various compensation amounts set out in Section 4.2 for Transfused and Hemophiliac claimants, as well as the liabilities for the HIV program and Expenses (above) make up the total liabilities.

Assets	**2013**		**2010**
	Best Estimate	**Sufficiency**	**Sufficiency**
Invested Assets	1,028,048	1,028,048	989,775
Provincial/Territorial notional asset	162,152	162,152	187,487
Total Assets	**1,190,199**	**1,190,199**	**1,177,262**
Liabilities			
Transfused	375,482	480,167	662,772
Hemophiliac	225,153	265,957	318,039
HIV Program	950	970	1,100
Expenses	53,455	55,552	34,986
Total Liabilities	**655,040**	**802,646**	**1,016,897**
Excess of Assets over Liabilities	**535,160**	**387,554**	**160,365**

200. The foregoing table indicates that, as at December 31, 2013, the total assets exceed the total sufficiency liabilities by about $387,554.

8.6 Provisions for Adverse Deviations

Provision for Adverse Deviation Included in Sufficiency Liability ($ millions)					
	Total	**Transfused**	**Hemo**	**HIV Program**	**Expenses**
Best Estimate Liability	**655**	**375**	**225**	**1**	**54**
Reduce discount rate to 1.05%	16	8	6	0	2
Reduce treatment efficacy to 80%	65	47	18	0	0
Increase treatment costs to $110,000	39	32	7	0	0
Increase drug therapy to 14.5 weeks	1	1	0	0	0
Lower LOI/LOS recovery rates on clearing virus	4	3	1	0	0
Cost of Care	17	11	6	0	0
Out of pocket expenses after clearing virus	3	1	2	0	0
Margins on LOI/LOS/SRV	3	2	1	0	0
Sufficiency Liability	**803**	**480**	**266**	**1**	**56**
Total Provision	**148**	**105**	**41**	**0**	**2**
Provision %	**23%**	**28%**	**18%**	**2%**	**4%**

201. The foregoing table indicates that the total provision for adverse deviation is $148 million, or about 23% of the best estimate liability. In our opinion, this is appropriate for assessing the sufficiency of the HCV Trust.

8.7 Analysis of Change in Excess Assets

202. We have analyzed the change in the excess asset position approximately as follows:

Summary of Change in Excess Assets	$ millions
Restated excess assets as at December 31, 2010	**160**
Interest on revised excess assets	14
Investment Gain	22
Three year experience gain (loss)	14
Cohort Change	17
Medical model change	370
New drug cost	(146)
Medical model 80% efficacy rate	(65)
Assumption changes	27
Change in methodology for fees and expenses	(25)
Excess assets as at December 31, 2013	**388**

203. The sufficiency of the trust is significantly improved since 2010.

204. The excess assets would have been expected to grow with the assumed investment return, hence the $14 million increase shown above.

205. The actual investment returns, net of inflation, over the three years since the 2010 assessment exceeded the assumed return of 1.05% per year. This resulted in the financial position improving by $22 million.

206. The actual experience over the three years since the 2010 assessment was different to that assumed in 2010. We estimate the net impact of this to be a saving of $14 million.

207. The cohort size is smaller than that assumed in 2010 and as a result the liability is $17 million lower.

208. While the design of the 2013 MMWG model is essentially the same as previous versions, the expected outcomes are significantly different from the prior MMWG models. It is based on historical data, but also takes into account a number of new treatment protocols, as well as certain promising drug therapies that were "fast-tracked" through the Health Canada approval process. These new drug therapies are expected to be provided to a much larger proportion of the claimants than the therapies taken into account in the 2010 model and their efficacy is significantly higher. As a result the HCV prognosis is significantly better than that shown in previous models. A significant proportion of claimants are projected to clear the virus following treatment with these new drugs. The impact of the improved prognosis on the financial outcome is significant and resulted in a reduction of the liability of $370 million.

209. Offsetting this, the cost of the new therapies is very high and the corresponding liability for future treatment is now significant. This increased the liability by $146 million.

210. Due to uncertainty as to the eventual true efficacy of the new treatments, we added a margin for adverse deviations to the treatment efficacy assumption by assuming that the eventual efficacy would be 80% of that assumed by the MMWG. This increased the sufficiency liability by $65 million.

211. The net impact of the improved treatment outcomes, after allowing for the increased treatment cost and some conservatism regarding to the eventual treatment efficacy is still significant, a net reduction in liability of $159 million.

212. In previous valuations the fees and expenses were assumed to continue in the near to medium term, increasing with inflation and then reduce to zero in the long term. For this valuation we have allowed for maturing of the fund by reducing annual costs in proportion to projected number of claimants alive after 2025. This change in methodology resulted in a decrease in excess assets of about $25 million.

213. Finally, the net effect of the remaining assumption changes is a $27 million increase in excess assets.

9 Required Capital

214. The liabilities include some margin for adverse deviation, as discussed earlier in this report. There is, however, significant uncertainty with respect to future experience of the fund that is not provided for in the liability calculation. While the volatility of the financial position arising from changes in the cohort is expected to be much smaller than it was prior to June 30, 2010, the fund is still subject to volatility arising from other factors, in particular, to changes in the medical model (including the impact of the promising new treatments), to investment experience, and to changes in the expected benefit payments for non-scheduled benefits such as loss of income or loss of services.

215. In the event that the fund assets are not sufficient to fund the promised benefits, there are no additional sources of funds. Claimants cannot turn to capital markets to raise additional funds. The risk to the claimants is asymmetrical: if the ultimate experience of the fund is such that there is money left over, each claimant will have received the promised benefit, but if the opposite occurs, later claimants may receive far less than the Agreements specify.

216. In our view, these are compelling reasons for developing a framework, specific to the Hepatitis C fund, to methodically assess what additional buffer (in excess of the sufficiency liability) would be appropriate. We refer to this additional buffer as "required capital" representing the amount of assets, over and above those required to meet the liabilities, that is to be used for the protection, and benefit, of claimants. Our methodology is consistent with the approach we took in the 2010 assessment, when we first implemented a Hepatitis C specific required capital framework by borrowing concepts from the regulation of life insurance companies in Canada, and adapting them as appropriate for the Trust.

217. To develop a Hepatitis C specific framework for the fund, we have examined each significant risk factor, using statistical analysis where possible i.e. we assess the amount of additional assets are needed to ensure the fund can withstand adverse experience with a probability of "x", where "x" is an acceptably high probability, but less than 100%.

218. While a high probability threshold, such as 99%, clearly indicates more security for the fund, there are some practical difficulties in developing a complete and fully integrated statistical model. We have therefore assessed the sensitivity of the fund to each material risk separately and added the results to obtain the total risk amount. This approach effectively assumes that the risk parameters are co-related and that all experience is adverse simultaneously; the probability of this occurring is extremely low. To mitigate the potential overstatement of risk exposure, we have used a 95% probability threshold in our analysis.

219. In summary, we seek to calculate the amount of assets that, taking into account the variability and uncertainty of the future benefit payments and investment returns, are associated with a 95% probability of being sufficient – this is referred to in actuarial literature as the "95% quantile" liability. The difference between this 95% quantile liability and the actual liability reported in the balance sheet becomes the required capital risk amount. Therefore, to the extent there are margins for adverse deviation in the actual liability calculation, the impact is to reduce the additional required capital. Conversely, if there is no margin in the actual liability (i.e. it is a "best estimate" liability), the required capital would be higher. This approach prevents inappropriate duplication (between the actual liability and the required capital) in providing for uncertainty.

220. The ideal way to calculate the assets needed to attain the 95% quantile liability is to use stochastic modeling. In the context of the Hepatitis C fund, stochastic models are available and appropriate for some risks, such as asset default and market risk, and disease progression, but not for all risks i.e. drug efficacy risk, the risk that the amounts claimed for benefits such as loss of income or out-of-pocket expenses will be higher than expected, or that the cohort of approved claimants is larger than anticipated. In these types of risk, we have looked at the variability of actual experience to develop the risk requirement; the logic being that, if we have observed a given level of volatility or uncertainty in the past, it could plausibly occur again.

9.1 Investment Risk

221. Most benefits are indexed to changes in the Consumer Price Index, and so the fund is sensitive to the real rate of investment earnings.

222. Taking into account the asset mix of the Hepatitis C fund, and combined with long term assumptions regarding asset class mean returns, standard deviations, and correlations, we have stochastically produced a distribution of nominal fund returns. As described elsewhere in this report, we used the mean of this distribution (expected return) to develop the best estimate and sufficiency discount rates. The nominal interest rate at the 95th quantile at the low end of the distribution is 2.30% (after rounding to the nearest 5 bps); we select the low end of the distribution because in general, this is more detrimental to the fund's financial position. The corresponding inflation rate was assumed to be 2.00%, giving a real rate of return of about 0.30%.

223. If the fund earned a real rate of return of only 0.30% p.a. for three years, the investment loss (measured relative to the liability discount rate) would be about $25.4 million.

9.2 Interest Mismatch

224. In our report on the 2010 sufficiency, we reported that the duration of the liabilities[1] was about 14.1 years (using a 1.05% net discount rate), while the duration of the assets was shorter. The larger the duration, the greater the sensitivity to interest rate shifts. This means that, at the time of the 2010 assessment, the fund was sensitive to a drop in interest rates, as the resulting increase in liabilities would be more than the increase in asset value.

225. With the significant impact of the new HCV treatments, and the associated drug costs in the five years following the valuation date, the duration of the liabilities as measured in the 2013 assessment has shortened considerably, to about 9.5 years (using a 1.05% net discount rate). At the same time, the duration of the interest-sensitive assets (in particular, the real return bonds) has lengthened, with average duration now about 13.4 years. This means that the fund is now sensitive to an increase in interest rates, as the resulting decrease in liabilities would be less than the decrease in asset value.

226. We have calculated that, if medium to long-term interest rates increased by 0.5%, the market value of the assets would decrease by about $56.8 million, while the liabilities would decrease by about $38.2 million, for a reduction in excess assets of $18.6 million. The 0.5% shift was the same as was used in the 2010 assessment; the current low interest environment suggests that there may be limited downside potential and so the upward shift seems appropriate. We believe this is a reasonable provision for interest mismatch risk as measured in this sufficiency assessment.

227. To the extent that the actual benefits and expenses payable under the HCV arrangement differ from those assumed in the valuation, interest mismatch may exist even if the duration of the assets is set equal to the duration of the liabilities, but it is not possible to quantify this in any meaningful way.

9.3 Efficacy Rate of New HCV Treatments

228. In the interval since the 2010 sufficiency review, there have been dramatic developments in the drugs available to treat HCV. More claimants can be treated by these new drugs, they are tolerated far more easily, and clinical trials indicate cure rates as high as 95%.

229. The impact of incorporating these new drug treatment options into the medical model (and our valuation) resulted in a net reduction of liability. As discussed earlier in this report, because the drugs are so new, we believe there is the potential for variability in their effectiveness: this variability could arise from a number of sources: fewer claimants than expected able to be treated, unexpected drug toxicity

[1] As noted earlier, duration is the weighted average term of the cash flows associated with an asset or a liability. Since it is the average term, some cash flows will occur earlier, and some later, than the duration.

results in drugs being pulled from market, and/or the actual efficacy (cure) rate is lower than anticipated based on the clinical trials.

230. We have included a provision for adverse deviation for drug efficacy in our sufficiency liability by multiplying the best estimate drug efficacy rate by a factor of 80%. Given the newness of these drugs, and the sensitivity of the liability to this assumption, we have calculated an additional buffer for drug efficacy, equal to the increase in liabilities if we substituted a factor of 67% for the 80% factor in the liability calculation. The resulting additional buffer for drug efficacy is $32.6 million for transfused claimants and $12.2 million for hemophiliac claimants, for a total of $44.8 million.

231. Calculating the additional buffer in this way ensures that there is no double counting, since the provision for adverse deviation for drug efficacy in the actuarial liability is excluded from the additional buffer.

9.4 Transition Probability Parameter Uncertainty

232. As noted earlier, the MMWG cannot know with certainty what the actual transition probabilities are, and have provided the estimated mean, associated distribution, and 95% confidence intervals for each one. The estimated mean represents the best estimate of the true value of the transition probability, and the 95% confidence interval indicates that the MMWG are 95% confident (statistically) that the true value falls in the range.

233. We modified our liability calculation to use the distribution specified by the MMWG, rather than the mean of the distribution, for seven[1] key disease transition parameters. Using these distributions in the Tree-age software, we carried out stochastic analysis of the impact of medical parameter uncertainty.

234. Based on the results of 1,000 stochastic scenarios, we determined the distribution of liability results, and selected the liability at the 95% quantile threshold. The difference between the 95% quantile liability and the mean liability (which formed the basis for the sufficiency liability) represents the required capital for this risk exposure.

235. The difference between the 95% quantile liability for parameter uncertainty and the mean liability is $17.3 million for transfused claimants and $11.1 million for hemophiliac claimants, for a total of $28.4 million in additional buffer.

[1] The stochastic analysis was restricted to seven parameters to limit the changes needed to Tree-age. The seven specific parameters chosen were those that we understand will have the most significant impact on the results.

9.5 Statistical Variation in Each Claimant's Progression Through the Disease

236. In our 2010 report, we incorporated a specific buffer for statistical variation in each claimant's progression through disease stages. The rationale for this buffer was the statement by the MMWG that there are slow, medium and fast progressors through the disease.

237. With the passage of time, it is reasonable to believe that at least some of the fast progressors are no longer alive, and that the alive cohort is more heavily weighted to the slow and medium progressors.

238. Furthermore, with the advent of the new drug treatments, and the high cure rates (even after applying the 80% factor to the MMWG best estimates), we believe the significance statistical variation in each claimant's progression through the disease is reduced.

239. We have therefore dropped this component from the buffer; it is effectively replaced by the drug efficacy rate component.

9.6 Uncertainty Regarding Other Benefit and Claim Amounts

240. For benefits other than the lump sums, the dollar amount of benefits that will be paid in the future is not known.

241. Ignoring for the moment the four claimants who exceeded the $300,000 cap, the average loss of income payment in each year has remained reasonably stable, despite the individual variation. There have, however, been four claimants whose pre-claim income exceeded the $300,000 cap on loss of income benefits (one claimant's pre-claim income was about $2 million annually); initially three had their benefits limited by the cap, but this cap was lifted and these claimants received (or are receiving) the full benefit defined in the Agreements, with no limit. It is statistically unlikely that another very large loss of income claim will be submitted, but in the event that one does, our understanding is that the full amount would be paid if that would not impair the overall fund sufficiency. It seems reasonable to earmark some amount for this potential future claim; a $1 million annual loss of income claim payable for 12 years would require about $11.3 million in assets.

242. Other benefits also have significant variation in individual payments, in particular the costs of care, uninsured treatment and medication, drug therapy, and out-of-pocket expenses. For example, based on a review of the 2013 data, the average out-of-pocket claim was just under $2000, but the actual payments ranged from about $2 to over $34,000. There is also wide variation in claim amounts for costs of care. We have incorporated a specific provision for adverse deviation in the sufficiency liability for costs of care, and out-of-pocket expense claims for those claimants who clear the virus, and therefore believe an additional buffer for these benefits is not warranted. Similarly, we have incorporated a specific

provision for adverse deviation for the drug therapy duration and the cost of HCV treatment drugs, and so no additional buffer is required.

243. Our valuation incorporates an assumption regarding the proportion of deaths (other than deaths at level 6) that are deemed to be HCV related (with the ensuing additional benefits). There is considerable uncertainty around this outcome, as it depends on a number of factors, including the co-morbidities and the interpretation of "death materially contributed to by HCV". If the assumed proportion of deaths at levels 2 through 5 that are deemed to be caused by HCV were increased by adding 10% at each level, the liability would increase by $17.4 million.

244. Considering only this subset (one additional large loss of income claim and additional deaths attributed to HCV) of the possible variation in benefit and claim amounts, and calculating the impact of a plausible change in average benefit amount or claim rate for each gives a total increase in liability of $28.7 million. We believe this is a reasonable risk amount in respect of benefit uncertainty.

9.7 Actual Size of Unknown Cohort

245. Although the official cut-off date for claimants coming forward was 30 June 2010, there is still some uncertainty regarding the size (and profile) of the unknown cohort: additional claimants may be approved due to unusual circumstances and/or the assumed denial rate could prove to be too high. If 25 additional unknown alive transfused claimants were approved, the liability would increase by about $5.3 million. The 25 additional unknowns represents two types of uncertainty: the possibility that the number for claimants coming forward in the future is higher than anticipated (we assumed there were 10 unanticipated claimants) and the risk that the assumed denial rate applied to the claims in process and/or CAP1 and CAP2 claims higher than actual (in which case we assumed an additional 15 claimants would be approved).

9.8 Results of Hepatitis C Specific Approach to Required Capital

246. The results of the Hepatitis C specific approach to calculating required capital are set out in the following table:

Estimated Required Capital on Hepatitis C Specific Approach		
Risk Component		**Hepatitis C Specific Risk Amount ($ millions)**
Investment Risk		$25.4
Mismatch Risk		18.6
Claimant Risk	Drug Treatment Efficacy	44.8
	Parameter Uncertainty	28.4
	Benefit Amount Uncertainty	28.7
	Cohort Uncertainty	5.3
Total Required Capital		151.2
Required Capital as a percentage of the Sufficiency Liability		18.8%

10 Financial Position

247. The following table summarizes the financial position of the Trust as at December 31, 2013 and 2010.

Assets	2013		2010
	Best Estimate	Sufficiency	Sufficiency
Invested Assets	1,028,048	1,028,048	989,775
Provincial/Territorial notional asset	162,152	162,152	187,487
Total Assets	**1,190,199**	**1,190,199**	**1,177,262**
Liabilities			
Transfused	375,482	480,167	662,772
Hemophiliac	225,153	265,957	318,039
HIV Program	950	970	1,100
Expenses	53,455	55,552	34,986
Total Liabilities	**655,040**	**802,646**	**1,016,897**
Excess of Assets over Liabilities	535,160	387,554	160,365
Required Capital	n/a	151,213	159,500
Excess Capital	**n/a**	**236,341**	**865**

248. The foregoing table indicates that, as at December 31, 2013 the assets exceed the sufficiency liabilities by about $387,554,000.

249. After allowing for the required capital buffer of $151,213,000 as discussed in Section 9, the excess capital is $236,341,000.

11 Sensitivity Tests

11.1 Net Discount Rate

250. The sufficiency liability calculations are based on a sufficiency net discount rate of 1.05% per annum. In order to illustrate the sensitivity of the results to variations in the investment experience, and hence in the valuation net discount rate, calculations have also been done at net discount rates of 1.30% per annum (this reduces the present value of the liabilities) and 0.80% per annum (this increases the present value of the liabilities).

251. The impact on the total sufficiency liabilities is as follows:

	($ millions)		
	Liabilities	Impact on Liabilities	
	@ 1.05% p.a.	@ 1.30% p.a.	@ 0.80% p.a.
Transfused Plan	480.2	- 10.3	+ 11.0
Hemophiliac Plan	265.9	- 6.3	+ 6.7
HIV Program	1.0	- 0.0	+ 0.0
Total benefits	747.1	- 16.6	+ 17.7
Expenses	55.5	- 2.1	+ 2.3
Total sufficiency liabilities	802.6	- 18.7	+ 20.0

11.2 Cohort Size

252. The table below shows the liability for the unknown cohort alive at January 1, 1999, and for an additional 10 approved alive claimants, separately for transfused and hemophiliac.

Unknown cohort Alive at January 1, 1999	Transfused Plan Liability ($ millions)	Hemophiliac Plan Liability ($ millions)
Sufficiency liability for unknowns alive at January 1, 1999	48.8	7.9
+/- each 10 persons	+/-2.1	+/-3.4

11.3 CAP 3

253. We were asked to calculate the liability for CAP3 and report it as a sensitivity, not included in the sufficiency liability amount. We have assumed that 120 transfused and 10 hemophiliac claims will be made and approved under CAP3 and that none of these claims will be DB9s. Taking into account the unknown alive and DA9 sensitivity results report above, we calculate the resulting CAP3 liability to be $29.0 million, $25.6 million for transfused and $3.4 million for hemophiliac.

11.4 HCV Drug Therapy

254. HCV Drug Therapy payments are made to claimants receiving a drug treatment regimen that includes ribavirin or interferon. Prior to the emergence of the recent HCV treatment drugs, all HCV treatments incorporated one or both of these drugs. The most recent drug regimens, which were approved after development of the medical model, may not include these drugs; however, in the calculation of our sufficiency liability, we have assumed that Drug Therapy payments will be made to all claimants receiving HCV drug treatment for the duration of their treatment.

255. To provide insight into the effect of potential overstatement of the liability as a result of this assumption, the following table shows the impact of reducing the number of claimants for future HCV drug therapy payments by 50%. The assumption regarding past payments for Drug Therapy claims incurred before December 31, 2013 (under the older drug regimens) is held constant:

Sensitivity to HCV Drug Therapy Assumption for Transfused and Hemophiliac Claimants $000s		
	Transfused	Hemophiliac
Sufficiency Liability	7,201	1,790
Liability if future HCV Drug Therapy payments are reduced by 50%	3,737	906

256. As shown above, reducing the number of claimants receiving Drug Therapy would reduce the liability by $3,464,000 (= $7,201,000 - $3,737,000) for Transfused and $884,000 (=$1,790,000 - $906,000). This is not material in the context of the total liabilities of the Trust.

12 Comparison with the Morneau Shepell Calculations

257. The assumptions for the best estimate valuation and the sufficiency valuation have been developed in conjunction with Morneau Shepell. As a result, no differences in the financial results arise as a result of assumption differences.

258. The actuarial models employed by Morneau Shepell and Eckler are quite different. As discussed previously, the Eckler model is a stochastic model that has been developed by adding financial overlay to the MMWG Treeage Pro medical model. The Morneau Shepell model is a deterministic model (i.e. it doesn't incorporate statistical variability into the liability calculation) that Morneau Shepell independently developed to reflect the disease progression described in the MMWG medical model. Eckler and Morneau Shepell spent a considerable amount of time reconciling the results of the two different financial models. Refinements were made to both models to ensure consistency of results.

259. The two models produce substantially the same results, both on a Best Estimate and on a Sufficiency basis. Not surprisingly there is a small residual difference between the two models, but the difference of about $10 million or 1.24%, is well within an acceptable range.

260. Both Eckler and Morneau Shepell agree that it is appropriate to hold assets in excess of the liabilities (referred to by Eckler as required capital). Our views on what is an acceptable additional buffer are slightly different, but both are within the range of acceptable outcomes. When the total financial result is computed, the net difference in the excess assets is small (Morneau Shepell has a slightly higher liability and slightly lower buffer, compared to Eckler with a slightly lower liability and slightly higher buffer).

13 Opinion

In our opinion,

(a) the Trust funds are sufficient to meet the liabilities of the Trust,

(b) the claimant data on which the valuation is based are sufficient and reliable for the purposes of the valuation,

(c) the assumptions are appropriate for the purposes of the valuation, and

(d) the methods employed in the valuation are appropriate for the purposes of the valuation.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. Pursuant to the requirements of the settlement agreement, the next valuation should be completed no later than as of December 31, 2016.

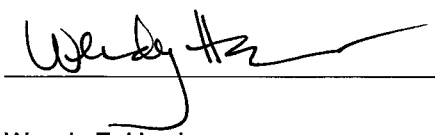
To the best of our knowledge, there are no material subsequent events that would affect the results and recommendations of this valuation. Any investment experience occurring between the valuation date and the report date, which differs from the assumption made, is not reflected in this report and will be reported on in future valuations.

On behalf of the Eckler actuarial personnel who worked on this report, we certify that we are aware that our duties are:

(a) to provide opinion evidence that is fair, objective and non-partisan and related only to matters within our area of expertise; and

(b) to assist the court and provide such additional assistance as the court may reasonably require to determine a matter in issue.

We are aware that the foregoing duties prevail over any obligation they may owe to any party on whose behalf we are engaged and we are aware that we are not to be an advocate for any party. We confirm that the report conforms with the above-noted duties. We further confirm that if called upon to give oral or written testimony, we will give such testimony in conformity with these duties.



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Appendix A – Data

Source of Data

261. The seriatim information with respect to claimants as at December 31, 2013 was provided by the administrator through the Joint Committee. For each known claimant, the data included dozens of data fields, including unique claimant identifier, whether transfused or hemophiliac, gender, date of birth, date of death if applicable, disease level, etc. Additional files including a history of all benefit payments (by benefit type e.g. out-of-pocket or loss if income) made from the trust, details on previous drug treatments, and information on claims submitted but not approved were provided by the administrator through the Joint Committee.

Data Checks

262. We reviewed the data and subjected it to a number of tests of reasonableness and consistency, including reconciliation of claimant count to the 2010 data; consistency between data fields (such as previous drug therapy claim and previous treatment flag); and consistency of the approved and denied cohort between different data files. In cases of apparent inconsistency, we asked for and received clarification from the administrator, through the Joint Committee. We also make cohort adjustments according to the response from the administrator.

A-1 Transfused Known Claimants by Count[1]

Distribution of those alive by stage at December 31, 2013								
Age at Dec-31-13	Number alive at Dec-31-13	Level 1 Cleared virus	Level 2 PCR positive	Level 3 Non-bridging fibrosis	Level 4 Bridging fibrosis	Level 5 Cirrhosis	Level 6 Decomp/ cancer/ transplant/ lymphoma	Level 6 Glom/ Cryo
0-19	3	0	3	0	0	0	0	0
20-29	188	30	66	76	7	4	2	3
30-39	118	27	34	45	6	5	1	0
40-49	372	65	92	178	16	13	5	3
50-59	685	129	184	260	56	32	20	4
60-69	492	81	131	172	39	42	19	8
70-79	403	74	148	98	32	36	13	2
80-89	329	64	174	46	18	21	6	0
90+	231	40	161	23	1	5	1	0
Total	**2,821**	**510**	**993**	**898**	**175**	**158**	**67**	**20**

Average age at December 31, 2013: 61.8

A-2 Transfused Known Claimants Distribution

	Distribution of those alive by stage at December 31, 2013							
Age at Dec-31-13	Number alive at Dec-31-13	Level 1 Cleared virus	Level 2 PCR positive	Level 3 Non-bridging fibrosis	Level 4 Bridging fibrosis	Level 5 Cirrhosis	Level 6 Decomp/ cancer/ transplant/ lymphoma	Level 6 Glom/ Cryo
0-19	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
20-29	6.6%	1.1%	2.3%	2.7%	0.2%	0.1%	0.1%	0.1%
30-39	4.2%	1.0%	1.2%	1.6%	0.2%	0.2%	0.0%	0.0%
40-49	13.3%	2.3%	3.3%	6.3%	0.6%	0.5%	0.2%	0.1%
50-59	24.2%	4.6%	6.5%	9.2%	2.0%	1.1%	0.7%	0.1%
60-69	17.5%	2.9%	4.6%	6.1%	1.4%	1.5%	0.7%	0.3%
70-79	14.4%	2.6%	5.3%	3.5%	1.1%	1.3%	0.5%	0.1%
80-89	11.6%	2.3%	6.2%	1.6%	0.6%	0.7%	0.2%	0.0%
90+	8.1%	1.4%	5.7%	0.8%	0.0%	0.2%	0.0%	0.0%
Total	**100.0%**	**18.2%**	**35.2%**	**31.8%**	**6.1%**	**5.6%**	**2.4%**	**0.7%**

[1] Includes secondarily infected claimants.

A-3 Hemophiliac Known Claimants by Count[1]

Distribution of those alive by stage at December 31, 2013									
Age at Dec-31-13	Number alive at Dec-31-13	Level 1 Cleared virus	Level 2 PCR positive	Level 3 Non-bridging fibrosis	Level 4 Bridging fibrosis	Level 5 Cirrhosis	Level 6 Decomp/ cancer/ transplant/ lymphoma	Level 6 Glom/ Cryo	HIV Co-infected
0-19	1	0	1	0	0	0	0	0	0
20-29	16	5	3	7	1	0	0	0	1
30-39	186	52	38	67	12	14	3	0	35
40-49	265	40	55	107	26	23	12	2	71
50-59	216	23	45	83	24	28	11	2	56
60-69	114	14	15	48	11	13	12	1	15
70-79	47	8	12	12	5	4	6	0	2
80-89	24	4	16	1	2	0	1	0	1
90+	8	0	7	1	0	0	0	0	0
Total	**877**	**146**	**192**	**326**	**81**	**82**	**45**	**5**	**181**

Average age at December 31, 2013: 50.2

Included above are 50 HIV co-infected claimants who elected to take the $50K options for whom no further liability remains and who were therefore removed from our model.

A-4 Hemophiliac Known Claimants Distribution

Distribution of those alive by stage at December 31, 2013									
Age at Dec-31-13	Number alive at Dec-31-13	Level 1 Cleared virus	Level 2 PCR positive	Level 3 Non-bridging fibrosis	Level 4 Bridging fibrosis	Level 5 Cirrhosis	Level 6 Decomp/ cancer/ transplant/ lymphoma	Level 6 Glom/ Cryo	HIV Co-infected
0-19	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20-29	1.8%	0.6%	0.3%	0.8%	0.1%	0.0%	0.0%	0.0%	0.1%
30-39	21.1%	5.9%	4.3%	7.6%	1.4%	1.6%	0.3%	0.0%	4.0%
40-49	30.3%	4.6%	6.3%	12.2%	3.0%	2.6%	1.4%	0.2%	8.1%
50-59	24.6%	2.6%	5.1%	9.5%	2.7%	3.2%	1.3%	0.2%	6.4%
60-69	13.0%	1.6%	1.7%	5.5%	1.2%	1.5%	1.4%	0.1%	1.7%
70-79	5.5%	0.9%	1.4%	1.4%	0.6%	0.5%	0.7%	0.0%	0.2%
80-89	2.7%	0.5%	1.8%	0.1%	0.2%	0.0%	0.1%	0.0%	0.1%
90+	0.9%	0.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	**100.0%**	**16.7%**	**21.8%**	**37.2%**	**9.2%**	**9.4%**	**5.2%**	**0.5%**	**20.6%**

[1] Includes secondarily infected claimants.

Appendix B – Disease Progression

Summary of Transition Probabilities used in the 2013 HCV Markov Prediction Model

Type of Transition Probability	Mean (best estimate)	Standard deviation
F0 to HCV RNA-	0.017	0.0028
F0 to F1	0.054	0.0041
F1 to F2	0.120	0.0163
F2 to F3	0.135	0.0255
F3 to F4 (Cirrhosis)	0.138	0.0316
F4 (Cirrhosis) to Decompensated Cirrhosis	0.078	0.0026
Decompensated cirrhosis or HCC to Liver transplantation	0.004	0.0001
HCC to death	0.182	0.0074
Liver transplantation to Death (first year)	0.086	0.0380
Liver transplantation to Death (after first year)	0.039	0.0018
Decompensation to liver-related death	0.152	0.0031
F1 to HCC	0.0001	0.0002
F2 to HCC	0.0001	0.0002
F3 to HCC	0.001	0.0022
F4 (Cirrhosis) to HCC	0.025	0.0008
Decompensation to HCC	0.02	0.0008
HCC to transplant	0.004	0.0001

Appendix C – Mortality Assumptions

Mortality Rates

Mortality	Best Estimate	Sufficiency
All causes except HCV	Canada Life Table 2009-2011	Same
All causes except HCV co-infected with HIV	624% of Canada Life Table 2009-2011	Same
Decompensated Cirrhosis	Greater of 15.2% and all cause mortality	Same
HCC	Greater of 18.2% and all cause mortality	Same
Liver transplant – first year	Greater of 8.6% and all cause mortality	Same
Liver transplant – after first year	Greater of 3.9% and all cause mortality	Same
Male / female mix	Actual	Same

HCV Deaths: Percentage of total deaths assumed to be deemed to be HCV related

	Claimants who did not clear virus	Claimants who cleared the virus
Stage 1	0%	0%
Stage 2	10%	0%
Stage 3	35%	0%
Stage 4	45%	25%
Stage 5	80%	60%
Stage 6	100%	100%

The best estimate and sufficiency assumptions are the same for percentage of deaths assumed to be deemed to be HCV related.

Appendix D – Economic Assumptions

2013 Economic Assumptions

Fund	Asset Class	Asset Allocation	Fund Allocation	Total Asset Allocation	Expected Return
Long term Fund			**78.7%**		
	Real Return Bonds	80.0%		62.9%	2.9%
	Universe Bonds	6.0%		4.7%	4.1%
	Canadian Equity	7.0%		5.5%	7.6%
	US Equity	3.5%		2.8%	7.7%
	EAFE Equity	3.5%		2.8%	
Short term Fund			**7.7%**		
	Short term bonds	100.0%		7.7%	4.1%
	Cash	0.0%		0.0%	3.1%
Provincial/territorial Notional Assets	**3 Month Treasury Bills**	**100.0%**	**13.6%**	**13.6%**	**3.1%**

Component of Return	%
Weighted Average Return	3.60
Diversification and rebalancing	0.24
Best Estimate Return Gross of investment expenses	3.84
Investment Expenses	(0.04)
Best Estimate Nominal Return	3.80
Best Estimate Nominal Return rounded to nearest 10th%	**3.80**
Best Estimate Inflation	2.50
Best Estimate Net Discount Rate	**1.30**
Margin for Adverse Deviation	0.25
Sufficiency Valuation Net Discount Rate	**1.05**

2010 Economic Assumptions

Best Estimate Nominal Return rounded to nearest 10th%	**3.80%**
Best Estimate Inflation	2.50
Best Estimate Net Discount Rate	**1.30**
Margin for Adverse Deviation	0.25
Sufficiency Valuation Net Discount Rate	**1.05**

Appendix E – Treatment Probabilities and Costs

Treatment and Treatment Efficacies - 2013

	Treatment Naïve without HIV	Treatment Naïve with HIV	Previously Treated without HIV	Previously Treated with HIV
Annual treatment rate first five years	34.0%	19.3%	38.2%	17.5%
Annual treatment rate after five years	0.0%	0.0%	0.0%	0.0%
Cumulative treatment	87.5%	65.8%	91.0%	61.7%
Percentage of treatments using:				
PEG-IFN/RBV	0.0%	0.0%	0.0%	0.0%
PEG-IFN/RBN based triple therapy	14.3%	8.3%	7.1%	8.3%
Sofosbuvir-based doublet	50.0%	25.0%	35.7%	8.3%
3D regimen plus RBV	35.7%	66.7%	57.1%	83.4%
Treatment Efficacy – Best Estimate:				
PEG-IFN/RBV	45.5%	37.1%	37.4%	30.5%
PEG-IFN/RBN based triple therapy	70.0%	73.5%	53.8%	53.8%
Sofosbuvir-based doublet	94.6%	80.2%	95.4%	80.9%
3D regimen plus RBV	96.2%	81.6%	96.3%	81.7%
Treatment Efficacy – Sufficiency	All efficacy rates are 80% of the corresponding Best Estimate			

Treatment Costs

	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Treatment Costs			
PEG-INF/RBC-based triple therapy	Included in uninsured treatment cost assumption	60,000	110,000
Sofosbuvir – based doublets		85,000	110,000
3D regimen plus RBC		85,000	110,000
Percentage of treatment cost met by Fund			
Below age 65		100%	100%
Above age 65		60%	60%

2010 Assumptions

Type of Transition Probability	Best estimate	Valuation (60^{th} percentile)
Effect of HCV treatment		
Annual treatment rate < 65: F0: 0%	0.0000	0.0000
Annual treatment rate < 65: F1-F3: 10% Treatment efficacy (SVR): 49%	0.0490	0.0439
Annual treatment rate < 65: F4: 10% Treatment efficacy (SVR): 31%	0.0310	0.0278
Annual treatment rate > 65: F0: 0%	0.0000	0.0000
Annual treatment rate > 65: F1-F3: 3.3% Treatment efficacy (SVR): 49%	0.0163	0.0145
Annual treatment rate < 65: F4: 3.3% Treatment efficacy (SVR): 31%	0.0103	0.0092
Effect of HIV status on fibrosis progression rates	2.1220	2.2710
Excess mortality associated with HIV infection	624%	658%

Appendix F – Compensation Assumptions

The following tables shows the 1999 base amounts of compensation together with the 2014 indexed figures for amounts specified in the Plan, as well as the assumed payments where the dollar amounts are not specified, as well as other payment related assumptions in cases where not all claimants will receive a payment. All amounts taken into account in the 2013 valuation are in 2014 dollars. We also show in the comparative amounts and assumptions used in the 2010 valuation in 2011 dollars.

Type of Benefits	1999 Original Amount	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Lump sum payments				
Stage 1	$10,000	$12,744	$13,458	Same
Stage 2	20,000	25,488	26,915	Same
Stage 3	30,000	38,233	40,373	Same
Stage 5	65,000	82,838	87,475	Same
Stage 6	100,000	127,442	134,577	Same

Type of Benefits	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Loss of income amounts			
Already in payment	Actual claim	Actual claim	Same
Commencing in the future			
Transfused	35,000	39,000	43,000
Hemophiliac	38,000	48,000	53,000
Percentage claiming Loss of Income (below age 65)			
Already in payment and not cleared virus	100%	100%	Same
Not cleared the virus and commencing in the future			
Stage 3	3%	3%	Same
Stage 4 and 5			
- not yet at stage 4 or 5	18%	21%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	9.8%	5.8%	Same
- hemophiliac	1.6%	3.2%	Same
Stage 6			
- not yet at stage 4, 5 or 6	17%	25%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	13.4%	5.1%	Same
- hemophiliac	9.8%	5.1%	Same
- already stage 6, but not yet claiming			
- transfused	10.5%	0.0%	Same
- hemophiliac	0.0%	0.0%	Same
Cleared the virus and not currently claiming[1]	Same as not cleared virus	0.0%	Same
Cleared virus and currently claiming[1]	Same as not cleared virus	Per recovery rates	

[1] Also applies to loss of services.

Loss of income and loss of services recovery rates	2013 Best Estimate			2013 Sufficiency		
Stage when clearing the virus	3 + 4	5	6	3 + 4	5	6
Duration since claim commenced						
One year	50%	25%	0%	25%	13%	0%
Two years	30%	15%	0%	15%	8%	0%
Three years	25%	13%	0%	13%	7%	0%
Four years	25%	13%	0%	13%	7%	0%
Five years	15%	8%	0%	8%	4%	0%
Six years	10%	5%	0%	5%	3%	0%
Seven years	5%	3%	0%	3%	2%	0%
Eight years	5%	3%	0%	3%	1%	0%
Nine or more years	0%	0%	0%	0%	0%	0%

Type of Benefits	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Loss of services amounts			
Transfused and Hemophiliacs	15,000	16,000	Same
Percentage claiming Loss of Services (below age 65)			
Stage 3	2%	2%	Same
Stage 4 and 5			
- not yet at stage 4 or 5	39%	30%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	21.2%	6.7%	Same
- hemophiliac	3.5%	0.0%	Same
Stage 6			
- not yet at stage 4, 5 or 6	57%	40%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	44.9%	14.3%	Same
- hemophiliac	32.9%	14.3%	Same
- already stage 6, but not yet claiming			
- transfused	35.2%	5.3%	Same
- hemophiliac	0.0%	0.0%	Same
Percentage claiming Loss of Services (above age 64)			
Stage 3	5%	7%	Same
Stage 4 and 5			
- not yet at stage 4 or 5	57%	51%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	30.9%	27.3%	Same
- hemophiliac	5.2%	0.0%	Same
Stage 6			
- not yet at stage 4, 5 or 6	74%	65%	Same
- already stage 4 or 5, but not yet claiming			
- transfused	58.2%	28.6%	Same
- hemophiliac	42.7%	28.6%	Same
- already stage 6, but not yet claiming			
- transfused	45.6%	40.9%	Same
- hemophiliac	0.0%	0.0%	Same

Type of Benefits	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Costs of care – Stage 6 only			
Average amount	$21,000	30,000	45,000
Percentage claiming	15%	40%	Same
HCV drug therapy			
Compensation per month	$1,274	$1,346	Same
Treatment month	11	3.3	3.6
Percentage claiming	65% at stage 2 or worse	100% of claimants being treated	Same
Uninsured treatment and medication for those who have not cleared the virus			
Transfused	$3,000	$1,500	Same
Hemo	$4,000	$3,000	Same
Stage 2 or worse - Transfused	4%	4.5%	Same
Stage 2 or worse - Hemo	7%	7.5%	Same
Uninsured treatment and medication for treatment to clear the virus	Included above	Appendix E	Appendix E
Out of pocket expenses – not cleared virus			
Transfused	$1,700	$1,800	Same
Hemo	$2,500	$2,600	Same
Percentage of people will claim	12%	8%	Same
Out of pocket expenses – present value of all payments to those who have cleared the virus			
Transfused		1,200	2,400
Hemo		5,000	10,000
Percentage of people will claim		All, at date assumed cleared	Same
HIV Program	6 additional claims at $240,000 per claim	5 additional claims at $240,000 per claim	Same

Type of Benefits	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Payments related to all deaths			
Assumed funeral costs	$5,000	$4,300	Same
Deaths before January 1, 1999			
$50K option	$63,721	$67,289	Same
Five knowns who chose $50K option, but whose payments to date are less than $120K		Total extra liability = $500,000	Same
$120K option	$152,931	$161,493	Same
Co-infected taking $72K option - Hemo	$91,759	$96,896	Same
Payment to family - Transfused	$70,000	$75,000	Same
Payment to family - Hemo	$80,000	$85,000	Same
Loss of services	$15,000	$16,000	Same
Loss of support - Transfused	$30,000	$30,000	$34,000
Loss of support - Hemo	$32,000	$34,000	$36,000
Percentage electing $50K option	52%	52%	Same
Percentage electing $120K option	48%	48%	Same
Of those electing the $50K option (%)			Same
Loss of support - Transfused	20%	20%	Same
Loss of services - Transfused	80%	80%	Same
Loss of support - Hemo	50%	50%	Same
Loss of services - Hemo	50%	50%	Same

Type of Benefits	2010 Valuation	2013 Best Estimate	2013 Sufficiency
Deaths after January 1, 1999			
Loss of support where loss of income was being paid	Same as below	70% of loss of income	Same
Loss of support where income loss was not being paid - Transfused	$30,000	$31,000	$34,000
Loss of support where income loss was not being paid – Hemo	$32,000	$33,000	$36,000
Loss of services	$15,000	$16,000	Same
Of those DA9 deaths caused by HCV			
Percent claiming where loss of income or loss of service is already being paid	Same as below	100%	Same
Percent claiming where loss of income or loss of service is not being paid			
Loss of support (younger than age 65)	10%	45%	Same
Loss of service (younger than age 65)	40%	5%	Same
Loss of service (older than age 65)	50%	40%	Same
Total care/guidance - Transfused	$55,000	$50,000	Same
Total care/guidance - Hemo	$55,000	$60,000	Same

Appendix G – Expense Assumptions and Liability

263. In prior years, the Joint Committee provided the assumptions regarding fees and expenses payable by the fund. For the 2013 Financial Sufficiency Review, we developed the expense assumptions, with reference to:

- Discussion with the Joint Committee
- Actual expenses incurred in the recent past;
- Budgeted expenses for the near future, if applicable.

264. Some expenses are on a three year cycle to reflect the extra costs associated with triennial sufficiency reviews.

265. In prior years, the expenses were assumed to be payable to a specific point in the future; for the 2010 review, that was 18 years following the review date. For the 2013 Financial Sufficiency Review, the methodology was modified to project the expenses over a longer period of time, reflecting the projected run-off of the program. With the new drug treatments, which have much higher cure rates than the older treatments, claimants are projected to live longer; this has been reflected in the expense assumptions as follows.

266. We have allowed for the maturing of the fund, by reducing annual costs in proportion to projected number of claimants alive after 2026 as per the MMWG report. Specifically, the expenses are projected by major category based on budgeted amounts, direction from the Joint Committee, and in some cases, trend, from 2014 to 2025. Starting in 2026, the amounts that would otherwise be projected are reduced in proportion to the year by year change in the proportion of claimants that are "known alive" at the review projected by the medical model to still be alive at the future year, e.g., of the known alive claimants at the review date, 77.1% are projected to be alive in 2025 and 74.9% are projected to be alive in 2026, a reduction of about 3% (.749/.771 - 1). The 2026 expenses are therefore projected to be 3% lower than 2025. For claims that occur on a three year cycle (related to sufficiency reviews), the proportions are adjusted accordingly.

267. The proportion of alive claimants was set out in table 13.1 of the 2013 MMWG report, dated September 2014. These proportions are projected and reported at 10 year intervals. We interpolated linearly for the intermediate years. After 50 years, about 10% of the claimants are still alive. We truncated the projection at 50 years, since the present value of expenses beyond that date would not be material to the results of the valuation.

268. If we had truncated the projection of expenses after 40 years instead of 50, the liability for expenses would be $52.9 million, or $2.6 million lower than the liability that we calculated.

269. While some expenses are expected to trend down in proportion to the number of alive claimants, other expenses (e.g. those associated with the sufficiency reviews) are not necessarily proportionate to the remaining alive cohort. By 2025, however, we expect that much of the uncertainty and variability around the medical model and the expected disease progression of the claimants will be reduced, and that the cost of carrying out a triennial sufficiency review could decrease. It is difficult to be precise with the projection of these expenses decades into the future, but we believe that the approach we have taken is reasonable.

270. This methodology is based on the premise that the HCV program continues on a going concern basis until all benefits due to claimants have been paid. If the fund were to be wound up at some point prior to that point, significant windup expenses would be incurred; these wind-up expenses could be considered as an acceleration of the expenses projected under the going concern scenario. In this way, the methodology adopted for the 2013 review also encompasses the alternate scenario of wind up.

271. Goods and services tax/harmonized sales tax (GST/HST) are applied to each expense category based on a weighted average across the applicable provinces.

272. The dollar references are in 2014 dollars. We have allowed for inflation by discounting at the net discount rate of 1.3% for best estimate and 1.05% for sufficiency liabilities.

273. The only difference between the best estimate and the sufficiency liability is the effect of the different discount rates for these two liabilities.

274. The specific expenses are set out below:

275. Actuarial Financial Sufficiency Review (5% HST for BC)

(a) $407,000 in 2014 for financial sufficiency; $490,000 in 2015 for financial sufficiency report preparation and response; $50,000 in 2016; then start three year cycle of $500,000 following review date, $200,000 the following year, and $50,000 in the third year; this three year cycle continues to 2025; grading off thereafter as described above.

276. Actuarial Regular (5% HST for BC)

(b) $29,000 in 2014 based on actual, $50,000 per year for actuarial and investment advice to 2025; plus $25,000 for special projects every third year, starting in 2016, to 2025; grading off thereafter as described above.

277. Accounting Expert Testimony and Assistance (13% HST for Ontario)

(c) $20,000 per year until 2020; $15,000 per year from 2021 to 2025; grading off thereafter as described above.

278. Administration (13% HST for Ontario)

(d) $740,000 for 2014; $639,000 in 2015; $623,000 in 2016; $600,000 from 2017 to 2025; grading off thereafter as described above.

279. Class Member Communication (13% HST for Ontario)

(e) $50,000 every third year, starting in 2014, to 2025; grading off thereafter as described above.

280. Arbitrators/Referees (11.49% blended HST/GST and QST for BC, Ontario and Quebec)

(f) $20,000 per year through 2017; $15,000 in 2018; $10,000 per year from 2019 to 2025; grading off thereafter as described above.

281. Audit (13% HST for Ontario)

(g) $92,000 per year for audit activities and preparation of financial statements from 2014 to 2025; plus $25,000 for special projects every third year, starting in 2016, to 2025; grading off thereafter as described above.

282. Canadian Blood Services (No HST or GST)

(h) $10,000 per year to 2025; grading off thereafter as described above.

283. Fund Counsel (11.49% blended HST/GST and QST for BC, Ontario and Quebec)

(j) $90,000 per year until 2017, declining thereafter $9,000 per year until it reaches $45,000; $45,000 per year until 2025; grading off thereafter as described above.

284. Héma-Québec (No HST or GST)

(k) $3,000 per year to 2025; grading off thereafter as described above.

285. Independent Counsel (13% HST for Ontario)

(l) $10,000 per year to 2025; grading off thereafter as described above.

286. Joint Committee Financial Sufficiency Review (10.39% blended HST/GST and QST for BC, Ontario and Quebec)

(m) $330,000 for financial sufficiency in 2014; $800,000 in 2015; $100,000 in 2016; then start three year cycle $300,000 following review date, $200,000 the following year, and $100,000 in the third year; this three year cycle continues to 2025; grading off thereafter as described above.

287. Joint Committee Financial Administration (10.39% blended HST/GST and QST for BC, Ontario and Quebec)

(n) $580,000 for general oversight of the ongoing administration in 2014 based on actual; $650,000 in 2015 based on budget; declining after 2015 by $50,000 per year until it reaches $400,000; $400,000 per year until 2025; grading off thereafter as described above.

288. Medical Modelling (No HST or GST)

(o) $220,000 in 2014, and every third year thereafter until 2025; grading off thereafter as described above.

289. Monitor (13% HST for Ontario)

(p) $60,000 per year until 2017; declining thereafter $6,000 per year until it reaches $30,000; $30,000 per year until 2025, grading off thereafter as described above.

290. Software Development (13% HST for Ontario)

(q) $10,000 per year until 2025, grading off thereafter as described above.

291. Investment expenses, including fees for investment counsel, custody of assets, and other related items are not included in this section as they have already been implicitly recognized in our calculation of the valuation net discount rate (see Section 7.4).

292. The present values of the expenses are calculated as at the December 31, 2013 valuation date. For simplicity, we have assumed that the annual expenses thereafter are payable at the middle of each year, measured from December 31, 2013.

Item of expense	Present value at December 31, 2013 ($,000's)	
	Best Estimate	Sufficiency
Actuarial Financial Sufficiency	6,602	6,862
Actuarial Regular	1,424	1,483
Administration services	15,219	15,839
Arbitors/ Referees	294	305
Auditors	2,503	2,606
Class Member Communications	434	451
CBS	250	261
Independent Counsel	250	261
Monitor	924	956
Fund Counsel	1,386	1,434
Hema Quebec	75	78
Joint Committee Administration	10,915	11,333
Joint Committee Financial Sufficiency	5,693	5,902
Medical Modelling	1,909	1,984
Accounting Expert Testimony	409	425
Software development	250	261
Taxes (Federal GST/HST, Provincial QST)	4,918	5,111
Total	**53,455**	**55,552**

Appendix H – Payments and Amounts Specified in the Plan

293. As provided for in Section 7.02 of Schedule A - Transfused HCV Plan, the payment amounts and limits identified in Articles Four, Five and Six of the Plan are adjusted each year to reflect the increase in the CPI. The original 1999, and 2014, amounts are summarized below.

Section	1999 amount ($)	2014 amount ($)
4.01(1)(a)	10,000	13,457.74
(b)	20,000	26,915.48
(c)	30,000	40,373.22
(d)	65,000	87,475.30
(e)	100,000	134,577.39
4.02(2)(b)(i)[1]	2,300,000	3,095,279.91
4.03(2)	12	16.15
	240	322.99
4.04(a)	50,000	67,288.69
4.05	1,000	1,345.77
4.08	240,000	322,985.73
5.01(1)	5,000	6,728.87
	50,000	67,288.69
(2)	120,000	161,492.87
(3)	240,000	322,985.73
5.02(1)	5,000	6,728.87
(2)	240,000	322,985.73
6.01(2)	12	16.15
	240	322.99
6.02(a)	25,000	33,644.35
(b)	15,000	20,186.61
(c), (d), (e)	5,000	6,728.87
(f), (g)	500	672.89

[1] This amount was previously limited to $300,000 in 1999 dollars.

294. The Hemophiliac HCV Plan (i.e. Schedule B) provides for similar payments and amounts, with the following two additional items:

Section	1999 amount ($)	2014 amount ($)
4.08(2)	50,000	67,288.69
5.01(4)	72,000	96,895.72

Appendix I – Glossary of Abbreviations and Terminology

The following summarizes some of the abbreviations and terminology used in the report.

CASL: the Canadian Association for the Study of the Liver; developed the 1999 CASL report/study/model on the progression of hepatitis C, led by Dr. Murray Krahn; used by us in our 1999 actuarial assessment of the fund's assets and liabilities; published the special article *An update on the management of chronic hepatitis c: 2015 Consensus guidelines from the Canadian Association for the Study of the Liver* which sets out current treatment protocols in Canada.

DA9: deaths after January 1, 1999

DB9: deaths before January 1, 1999 due to HCV related causes

Fibrosis Stages 0, 1, 2, 3, 4: indicating the disease development in the MMWG models, from infection (stage 0) through cirrhosis (stage 4); these stages do not correspond directly to the disease-based compensation Levels in the Plans

HCV: hepatitis C virus

Hemophiliac Plan: the Hemophiliac HCV Plan provided for in the Settlement Agreement

HIV Coinfection: the situation where a claimant is infected with both HCV and HIV. Additional benefits may be payable to coinfected claimants.

HIV Program: the HIV Secondarily Infected Program provided for in the Settlement Agreement

Known(s) or Known Claimant(s): those claimants who are known and approved before the actuarial assessment date

Level: a disease-based compensation level as defined under the Plans. Disease levels for the purpose of the Settlement Agreement do not correspond directly to the Fibrosis Stages, in the MMWG models.

MMWG: Medical Model Working Group; led by Dr. Krahn; convened to review and update the medical model for the 2001, 2004, 2007, 2010 and the 2013 assessments

Plans: Comprises the Hemophiliac and Transfused Plans

Previously **T**reated: refers to treatment with HCV treatment drugs prior to the actuarial assessment date.

Settlement Agreement: the agreement made as of June 15, 1999 between the governments and the counsel for the class action plaintiffs

SVC, short for Spontaneous Viral Clearance, refers to undetectable HCV viral load in serum, in the absence of treatment

SVR, short for Sustained Virological Response, refers to an undetectable HCV viral load test 12 weeks after completing a successful course of HCV treatment.

Transfused Plan: the Transfused HCV Plan provided for in the Settlement Agreement

Unknown(s) or Unknown Claimant(s): those claimants included in the actuarial assessment who are yet to be approved as claimants, and who are presumed to be approved after the actuarial assessment date. Unknowns consist of those who are known to the Administrator, but not yet approved as claimants, as well as those who have not yet lodged a claim

$50K+ option: for deaths before January 1, 1999, the option of choosing $50,000 plus claims by the family, including loss of support or loss of services

$120K option: for deaths before January 1, 1999, the option of choosing $120,000 in full settlement of all claims

Appendix J – Source Material

Document	Date	Author/Source
Copy of the data regarding the approved claimant cohort as at August 31, 2013, provided to the MMWG by the administrator, including claimant details such as disease state, drug therapy history, and results of claimant survey, including a question whether the claimant had cleared the virus	September 27, 2013 cover letter	Crawford Class Action Settlements
Copy of the data regarding the approved claimant cohort as at December 31, 2013, prepared at the request of the Joint Committee, including cohort details and payment history and a "worksheet references" document setting out field name definitions for claimant data	February 6, 2014 cover letter	Crawford Class Action Settlements
2013 MMWG report: Estimating the Prognosis of Canadians Infected With the Hepatitis C Virus through the Blood Supply, 1986-1990 The Fifth Revision of Hepatitis C Prognostic Model Based on the Post-Transfusion Hepatitis C Compensation Claimant Cohort	September 2014	MMWG
2013 medical model in Tree-age software, corresponding to the 2013 MMWG report	September 2014	MMWG
Claim payment history updated to October 2014	November 2014	Crawford Class Action Settlements
Information on claims submitted under CAP 1 and CAP2	January 2015	Crawford Class Action Settlements
2013 Financial Sufficiency Review - Medical Evidence	February 13, 2015	Dr. Bain
An update on the management of chronic hepatitis C*: 2015 Consensus guidelines from the Canadian Association for the Study of the Liver*	February 2015	CASL
Distribution of hepatitis C virus genotypes in Canada: Results from the LCDC Sentinel Health Unit Surveillance System	February 2010	Chaudhary et al
Patient time costs and out-of-pocket costs in hepatitis C	November 2011	Dr. Krahn et al, Liver International
Annual reports for the HCV Trust from inception to 2013, including the audited financial statements	various	Joint Committee
Custodial statements for the **T**rust for 2011 through 2013 inclusive	various	RBC Investor Services
Copy of the original Settlement Agreement	June 1999	Joint Committee
Correspondence between Joint Committee and Eckler providing input from medical experts and the administrator regarding assumptions and the operations of the Trust	various	various
Correspondence between Morneau Shepell and Eckler regarding development of assumptions and methods	various	Morneau Shepell

Richard Border, FIA, FCIA,

Richard is a Principal and Shareholder based in the Vancouver office. He has over 25 years of actuarial experience in pension consulting, valuation of long-term liabilities (such as Workers' Compensation plans), investment consulting, technical design of investment and insurance products for pension plans, management information, and financial modeling.

Since joining Eckler in early 2002, Richard has specialized in pensions and workers compensation actuarial consulting. He is the lead actuary to public sector pension plans in British Columbia (specifically, the BC Public Service, Municipal, College, and Teachers' pension plans). His responsibilities for these clients include acting as lead consultant, providing technical actuarial analysis, as well as consulting advice and guidance on plan design issues. He is the external actuary for WorkSafeBC and is responsible for the actuarial opinion on the adequacy of the liabilities in the WorkSafeBC annual report. He has similar responsibilities for the Workers Compensation Board of Manitoba.

Richard has worked on the 2001, 2004, 2007 and 2010 HCV sufficiency reviews and has co-signed each of the associated reports.

Prior to joining Eckler, Richard's early career was with a large South African life insurer, both in South Africa and the UK. Subsequently he joined the investment consulting division of a large consulting firm before moving to Canada in 2001. He became a Canadian citizen in 2007.

Richard graduated from the University of Cape Town in 1986 with a BSc statistics. He is a Fellow of both the Institute and Faculty of Actuaries (UK) and the Canadian Institute of Actuaries.

This is Exhibit " B **" referred to in the**
affidavit of RICHARD BORDER
sworn before me at VANCOUVER
this 11 **day of** MARCH **20** 15

A Commissioner for taking Affidavits
for British Columbia

Wendy Harrison

FSA, FCIA, is a Principal and Shareholder of Eckler based in the Vancouver office, with 14 years of experience as a consulting actuary with Eckler Ltd., and more than 28 years of actuarial experience, including the provision of actuarial services for pension plans; financial reporting and risk management for life insurers (including the valuation of long-term liabilities such as life and disability insurance and annuities); and Workers' Compensation plans. During her career, she has worked on a wide range of actuarial and business projects, such as mergers and acquisitions, determining appraisal values for financial institutions and valuing the liabilities related to class-action awards.

Wendy provides actuarial consulting services to a range of clients, including pension plans and financial institutions. She has primary responsibility for the WorkSafeBC defined benefit pension plan, as well as a number of other defined benefit pension plans ranging from university to multi-employer union plans. She is also the Appointed Actuary for Pacific Blue Cross, a B.C.-based provider of group life and health benefits.

Wendy has worked on and co-signed the 2004, 2007 and 2010 HCV sufficiency reports.

Before joining Eckler, Wendy was Vice President and Appointed Actuary for the Seaboard Life Insurance Company, based in Vancouver. As the Appointed Actuary for Seaboard, Wendy was responsible for the valuation of more than $1.5-billion in liabilities for insurance products sold throughout Canada and the United States, and for compliance with all relevant standards of practice and regulatory project requirements.

Wendy graduated from the University of Waterloo in 1985 with a joint honours degree in actuarial science and statistics. She is a Fellow of both the Society of Actuaries and the Canadian Institute of Actuaries, and is a Member of the American Academy of Actuaries.

This is Exhibit " C " **referred to in the affidavit of** RICHARD BORDER
sworn before me at VANCOUVER
this 11 **day of** MARCH, **20** 15

.....
A Commissioner for taking Affidavits for British Columbia

Dong Chen, FSA, FCIA

Dong is a consulting actuary who joined Eckler Ltd. in 2003, working part time while finishing his university studies. Since graduating from Simon Fraser University in 2004, he has been with Eckler on a full-time basis. Dong specializes in the valuation of private and public sector pension plans. He has worked on the 2004, 2007 and 2010 HCV fund sufficiency reviews.

He is a Fellow of both the Society of Actuaries and the Canadian Institute of Actuaries.

This is Exhibit" D "referred to in the
affidavit of RICHARD BORDER
sworn before me at VANCOUVER
this 11 day of MARCH, 2015

A Commissioner for taking Affidavits
for British Columbia

Kevin Chen

Kevin Chen joined Eckler Ltd. in 2009 as a summer student, and then commenced permanent employment in January 2010. He has an undergraduate degree in actuarial science from Simon Fraser University, and completed a Master's degree in actuarial science from the University of Waterloo in 2010. He is making good progress with his Society of Actuaries exams and focuses on technical actuarial work, mainly in the pensions area. He has worked on the 2010 and 2013 HCV fund sufficiency reviews.

This is Exhibit" E "referred to in the
affidavit of RICHARD BORDER
sworn before me at VANCOUVER
this 11 **day of** MARCH, **20** 15

.....
A Commissioner for taking Affidavits
for British Columbia