# Executive Summary (Heading 1)

## Purpose and Scope (Heading 2)

## Actuarial Findings

## Relevant Comments

### Heading 3

#### DONT USE Heading 4 DONT USE

##### DONT USE Heading 5 DONT USE

###### Use Heading 6 for Captions

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  + sub-bullet
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# R Packages

In developing the analysis presented in this report, we used R and packages included in the R installation (collectively referred to as Base-R).

Citations for Base-R and other packages used in our review are as follows:

[[1]] [1] “R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.”

[[2]] [1] “Bryce Chamberlain (2018). owactools: R Codebase for Oliver Wyman Actuarial Consulting.. R package version 1.5.04.”

[[3]] [1] “Hadley Wickham (2017). tidyverse: Easily Install and Load the ‘Tidyverse’. R package version 1.2.1. <https://CRAN.R-project.org/package=tidyverse>”

[[4]] [1] “Kirill Müller (2017). here: A Simpler Way to Find Your Files. R package version 0.1. <https://CRAN.R-project.org/package=here>”

[[5]] [1] “Hadley Wickham and Jennifer Bryan (2018). readxl: Read Excel Files. R package version 1.1.0. <https://CRAN.R-project.org/package=readxl>”

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# Conditions and Limitations

Our analysis is subject to the following limitations:

* **Entire Report** The conclusions are developed in the accompanying text and exhibits, which together comprise the report.
* **Data Verification** For our analysis, we relied on data and information provided by short\_client without independent audit. Though we have reviewed the data for reasonableness and consistency, we have not audited or otherwise verified this data. It should also be noted that our review of data may not always reveal imperfections. We have assumed that the data provided is both accurate and complete. The results of our analysis are dependent on this assumption. If this data or information is inaccurate or incomplete, our findings and conclusions may need to be revised.
* **Prospective Policy/Accident Period Estimates** The prospective estimates developed in this analysis are based on estimated loss costs and the projected exposures. It should be noted that prospective period claims and ACAE estimates are directly related to the projected exposures. Therefore, if actual exposures differ from the projection, prospective estimates would need to be adjusted accordingly.
* **Professional Opinion** The results contained in this report represent our professional opinion with respect to the items within the scope of the analysis and considering the limitations noted throughout this report. However, variation from these or any other estimates of unpaid expense is not only possible but probable. Actual future payments may vary significantly and in either direction from the estimates contained in this report.
* **Discounting** Additional uncertainty is introduced with discounting of unpaid claim and ACAE estimates. In addition to the risk of underestimating or overestimating the nominal unpaid claim and ACAE amount, there is the additional risk that the timing of the future claim and ACAE payments will differ from the expected payout, or that the future actual yield on the underlying supporting assets (if any) will differ from the assumed yield rate used for determining present value factors. We have not included any specific provision for this additional risk.
* We have not examined any dedicated assets supporting the liabilities, but have assumed they are supported by valid assets which have appropriate maturities and sufficient liquidity to meet payment obligations associated with the amounts that are within the scope of our review.
* Oliver Wyman expresses no opinion on the appropriateness of the interest rate used in the calculation of discounted unpaid claims and ACAE estimates.
* **Funding of Claim Payments** If there are dedicated assets supporting the recorded liabilities, we have assumed that those assets have sufficient liquidity to pay claims when due. If there are no such assets, we assume that short\_client has sufficient cash flow to meet its payment obligations.
* **Collectibility of Excess Insurance** All excess insurance is considered to be valid and fully collectible. We made no assessment and do not express any opinion concerning the collectibility of any excess insurance. We have not evaluated the financial strength, claims paying ability or any other factors with regard to short\_client’s past, current and/or prospective excess insurers.
* **Probability Levels** We have calculated estimates of the statistical uncertainty associated with the process risk inherent in our estimates. However, unless otherwise indicated, our probability level estimates do not address parameter or model risk. To the extent that the probability estimates do not address parameter risk or model risk, the true variability of results is greater than the range of outcomes presented. Therefore, our probability level estimates should be used as a guide to select risk margins and not as a rigorous statistical measure of variability. short\_client should consider this additional uncertainty in evaluating the projected and funding amounts. The selection of a specific confidence level funding target and its associated risk margin is, in our opinion, properly a management decision.
* **Rounding and Accuracy** Our models may retain more digits than those displayed. In addition, the results of certain calculations may be presented in the exhibits with more or less digits than would be considered significant. As a result, it should be recognized that:
  + There may be rounding differences between the results of calculations presented in the exhibits and replications of those calculations based on displayed underlying amounts.
  + Calculation results may not have been adjusted to reflect the precision of the calculation.
* **Actuarial Central Estimate** These caveats and limitations notwithstanding, the conclusions represent our actuarial central estimate of the items within the scope of this analysis as of the date of this report.
* **Sources of Uncertainty** While this analysis complies with applicable Actuarial Standards of Practice and Statements of Principles, users of this analysis should recognize that our projections involve estimates of future events, and are subject to economic and statistical variations from expected values. We have not anticipated any extraordinary changes to the legal, social, or economic environment that might affect the frequency or severity of claims. For these reasons, no assurance can be given that the emergence of actual losses will correspond to the projections in this analysis.
* The sources of uncertainty affecting our estimates are numerous and include factors internal and external to short\_client. Factors internal to short\_client include items such as changes in claims settlement practices. The most significant external influences include but are not limited to changes in the legal, social or regulatory environment affecting the claims process. Uncontrollable factors such as general economic conditions also contribute to the variability. Even if there are no unanticipated changes, there is an inherent uncertainty in the actuarial central estimate. This variability arises from the random nature of the claims process.
* **Exclusion of Other Program Costs** The scope of the project does not include the estimation of any costs other than those described herein. Such ancillary costs may include unallocated claim adjustment expenses; excess insurance premiums; the costs of trustee, legal, administrative, risk management and actuarial services; fees and assessments; and costs for surety bonds or letters of credit pertaining to claim liabilities.
* **Black Lung Limitation** The reserve and funding estimates are based on the year [xxxx] workers’ compensation benefit structures in place in each state and federally for Black Lung benefits. If bills were passed subsequent to this date increasing benefit levels, the funding and reserve levels may need to be increased.