Rejoinder Expert Report of Arlie G. Sterling

November 6, 2017

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I.   Introduction

1.   I have been retained by the Government of Canada in the damages phase of the *Bilcon et al. v. Canada* NAFTA Chapter 11 arbitration. I submitted a report dated June 9, 2017 ("First Marsoft Report") in which I addressed various issues relating to projected freight rates associated with the proposed Whites Point Quarry project. The Claimants filed a second report from Mr. Morrison dated August 18, 2017 ("Tamarack II"), a second report from Mr. Rosen dated August 23, 2017 ("FTI II"), and the SNC-Lavalin report of Jussi Jaakola with their Damages Reply. This report is a response to the comments from Mr. Morrison, Mr. Rosen and Mr. Jaakola in their reports. I have also incorporated new information, on ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮s and the actual speed of the voyages transporting aggregates from the Bay of Fundy to New York, to refine my estimates of the freight costs of the Bilcon project in light of information raised by Mr. Morrison in his report.

II.   ▮▮▮▮▮▮▮▮▮▮▮▮

2.   ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ is a key input to the freight rate calculations in the Tamarack Model.[1] ▮▮▮▮▮▮▮▮▮▮▮▮▮▮ is assumed to be ▮▮▮▮▮▮▮ Tamarack I. As I noted in the First Marsoft Report, there is no independently verifiable information on ▮▮▮▮▮▮▮▮▮▮▮▮ was calculated.   No additional evidence to substantiate ▮▮▮▮▮▮▮▮▮ is provided in Mr. Morrison's reply in the Tamarack II report.   Furthermore, Mr. Morrison fails to consider contemporary evidence which suggests that his rate estimates are too low.

A.   No Additional Evidence to Substantiate ▮▮▮▮▮▮▮▮▮

3.   In the Tamarack II Report, Mr. Morrison states that ▮▮▮[2] Beyond identifying that his source was, ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, Mr. Morrison does not provide any evidence that his source was ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

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[1] **C-1108**, Tamarack Excel model, Freight Rate Calculation.

[2] Reply Expert Report of Tamarack Resources, August 18, 2017 ("Tamarack II"), ¶ 30.

4.   The terms ███████████████████████ are generally documented in a standard contract, for example the "Gentime" form provided by the Baltic and International Maritime Council (BIMCO).[3] No such documentation is provided by Mr. Morrison.   Further, ██████████████████████ standard term in the industry and requires definition to be understood. For example, in my opinion, there could ███ ██████████

5.   Mr. Morrison expands on his ███████████████████████████████ in Tamarack II. He explains that for a new ship, ███████████████████████████████████ ██ ████████████████████████████ ████████████████████████ ██ ██ ███████████████

6.   Implicit in Mr. Morrison's observation regarding ████████████████████ ██ ██ But it would not, in my opinion, be reasonable or prudent for Bilcon of Nova Scotia ("Bilcon"), when evaluating a long-term project, to assume that there would be ██████████████████████████ ████████████████████████████ Mr. Morrison and Mr. Rosen do. A more reasonable and prudent assumption when forecasting freight costs over a period of decades (as is required for Mr. Rosen's analysis[6]) would be that t███ ████████████

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[3] BIMCO (The Baltic and International Maritime Council) provides standard forms for a wide range of shipping contracts.   See **R-833**, Baltic and International Maritime Council website excerpt, "BIMCO Contracts", available at: https://www.bimco.org/contracts-and-clauses.

[4] Tamarack II, ¶ 45.

[5] Tamarack II, ¶ 32.

[6] Expert Report of Howard Rosen, December 15, 2016 ("Rosen I"), Schedule 3.

7.   The notion that Bilcon would have relied on a quote designed by a vendor "████████████ ████ as a benchmark for their long-term transportation costs over a 50-year project is not, in my opinion, the appropriate starting point for Bilcon's project evaluation. In my experience, shipping companies ██ ████████████████████████████ Bilcon should have recognized that 50 years of transportation service required ████████████████████████████████████ ██████████ . In my opinion they should have based their plans on the assumption that ████████ ██ ████████████████████████ Neither Mr. Morrison nor Mr. Rosen recognize this in their forecast of freight rates.

8.   By anchoring freight costs with the undocumented and unspecified ████████████ ████ Mr. Morrison assumes that ████████████████████████ ████████████████████ ██ ██████████ ████████████████████████ ████████████████████████████ Mr. Rosen magnifies Mr. Morrison's unsupported ██████████ by assuming that this rate would continue all the way through a 50-year project life.[8]

B.   Failure to Consider Strong Contemporary Evidence of Higher Rates

9.   Mr. Morrison argues that the freight rates calculated in Tamarack I are reasonable because they are similar to the freight component in a 2009 quote provided from Atlantic Coast Materials ("ACM") for the purchase of delivered aggregates by New York Sand and Stone ("NYSS") from ACM's Bayside quarry.[9] However, he fails to consider strong contemporary evidence that suggests otherwise.

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[7] Expert Report of Tamarack Resources, December 9, 2016 ("Tamarack I"), page 11.

[8] Rosen I, ¶ 5.21.

[9] Tamarack II, ¶¶ 12-13.

10. In ███
██ ███████████████████████████
████████████████████████████████ Invoices for ███████████████████████████
██
██ ████████

11. Mr. Morrison makes no reference to the ████████████████████████████. In contrast, he introduces freight rate quotes from ACM to NYSS. The ACM quotes are from emails between ACM and NYSS; I have not seen documentation that the quotes were incorporated in concluded agreements.

12. Figure 1 below compares the freight rates contained in the ACM quotes that Mr. Morrison relies on in Tamarack II and those contained ██████████████████████.[12] While both the ████████████
██
██
███

███
███
███
███
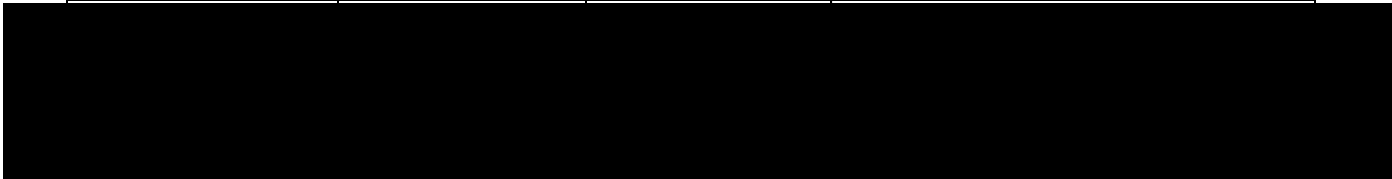
Figure 1, Freight Rate Quotes from ACM and Invoices from MMMCL[13]

13. The difference between the ACM quotes and the ███████████amounts to █████████████
██████████████████████████████████. In other words, the actual █████████████████ are nearly ████████ the rates quoted by ACM.

14. Part of the difference may be attributable to ████████████████████████████████
██████.[14] Part of the difference could also be attributable to ███████████████████████████

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[10] **C-1025**, Supply Agreement between New York Sand & Stone and Martin Marietta Materials, May 24, 2010.

[11] **R-834**, Martin Marietta, Invoices to New York Sand and Stone, 2010-2014.

[12] Tamarack II, Appendix A: Atlantic Coast Materials Quotes.

[13] Tamarack II, Appendix A: Atlantic Coast Materials Quotes; **R-834**, Martin Marietta, Invoices to New York Sand and Stone, 2010-2014.

████████████████████████████████ and the quoted ACM rates, but the emails quoting the ACM rates do not provide that detail. ████████ and the ████████████████████ may also contribute to the difference.[15] For example, the ACM quote is for ██████████████████████████████ ████████████████████████████.

15. Assuming the ████████████ was the same for both the ACM quote and ████████████ ████████████████████████████████, I estimate that ████████████████████ ██ ██████████████████████████████████████ of the ACM quote.[17]

16. Because the freight rates ████████████████ are based on ████████████████, rather than an email quote that lacks key information, the ████████ figures are, in my opinion, a more reliable basis for comparison than the ACM quotes upon which Mr. Morrison relies. Since the contemporaneous freight rates exhibited ████████████████ are ███ higher than Mr. Morrison's freight rate estimates, even after accounting for the known differences in the voyages, I disagree with Mr. Morrison assertion that "the freight rates [he] estimated in [his] December Report would have been achievable in █ ████████████████."[18]

III.   ██

19. Mr. Morrison in Tamarack II criticizes Marsoft's analysis for not using so-called ████████ ████████████████████████ t. By ████████████████ he refers to ████████████████ to made by Marsoft – ██████████████████████ – versus the assumption in Tamarack II of ████████████

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[14] Reply Witness Statement of Dan Fougere, August 18, 2017 ("Fougere II"), ¶ 38. It is about 2████████ ██ ██████████████████████████████████████.

[15] Tamarack I, page 5 and page 7: $██.

[16] **R-834**, ██, 2010-2014. Similarly, the Dec 2009 ACM quote says that ████████████████████████████████████: Tamarack II, Appendix A: Atlantic Coast Materials Quotes, Invoice dated December 11, 2009, p. 2.

[17] **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Input MMM ACM".

[18] Tamarack II, ¶ 14.

████ [19] By ████████████ he refers to an assumption in Marsoft's analysis that the ████████ ██. Each point is addressed below.

20. With regard to the ██████████████████████), Mr. Morrison argues that ████████ ██ ██ ██ ██ ██ ████████████████████████████████

21. Indeed, while Bilcon stated in the project description of its EIS that it intended to use Panamax-size vessels (i.e. the size of the ██████████████,[20] they also stated that the discharge ports were restricted due to water depth.[21] The Buxton Reply Statement confirms that ████████████████ ██.[22] Thus, because Mr. Morrison ████████ ██ ████████[23] as he stated, he failed to consider any other factors that might impact ████████████ ████████████

22. In any case, the impact of ██████████████████ on the Marsoft analysis is small. The weighted average project cost of shipping, calculated using ████████████████████████████████ ██████████████████████████ conclusion I reached in my June 9th report, all else equal:

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[19] Tamarack II, section II. Cargo quantities are quoted in short tons throughout this report and my June 9th report for consistency with the EIS.

[20] **R-581**, Whites Point Quarry & Marine Terminal, Revised Project Description, November 2006 ("Revised Project Description"), page 137.

[21] **R-581**, Revised Project Description, page 137.

[22] Reply Witness Statement of Paul Buxton, August 18, 2017 ("Buxton II"), ¶ 41.

[23] Tamarack II, ¶ 19.

■ ██ ■

■ ██ ■

23.   With regard to ████████████████ Mr. Morrison did not use ██████████████████████████

██ He used ██ Further, he did

not ██ in Tamarack II. In

contrast, ██ . At the heart of Mr. Morrison's

concern regarding██ that are

required to transport Bilcon's cargo from Nova Scotia to New York.[26] Figure 2, Shipment Volume and

Voyage, summarizes the different assumptions used by the Tamarack I and II reports, as well as the

assumptions I used based on the 2007 EIS.
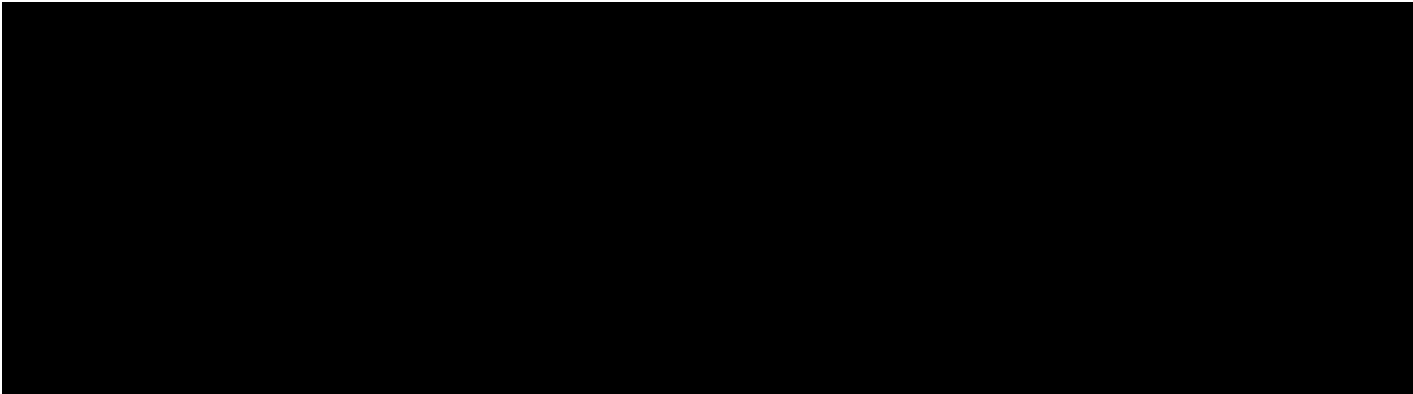
Figure 2, Shipment Volume and Voyage[27]

24.   As can be seen in the bottom row of Figure 2, in the 2007 EIS, Bilcon's shipments ramped up

quickly from 1.4 mm short tons to 2.0 mm short tons over two years and maintained that pace until the

final year of the project. In the Claimants' projections, used by Mr. Morrison, Bilcon's shipments ████

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[24] See **RE-7**, Expert Report of Arlie G. Sterling, June 9, 2017 ("Marsoft I"), ¶¶ 70-72 for details about the
Capital Cost model ██
██████

[25] Refer to **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Output FC EIS 49500".

[26] The ████████████████ in the Tamarack I report is also referred to as the "Claimants" case in my June 9th
report. The ████████ in the Tamarack II report is also referred to as the ████████████████ in the Tamarack II
report and the SNC-Lavalin report of Jussi Jaakola.

[27] Tamarack I, page 11. Tamarack I only provided estimates of ████████████████████████████████
████████████

██

████ despite the fact that Bilcon stated in the Revised EIS Project Description that it "… does not anticipate a future demand in excess of 2 million tons at this time".[28]

25.   ██

██.[29] However in the Claimants' case,████████████

██

████████████████████████████████████. Tamarack's assumption of the ████████████████████

██

26.   Mr. Morrison claims that ██

██ and that when Bilcon

██

████████   ██

██

27.   Mr. Morrison presents no analysis or evidence to show that ██████████████████████

██ █ ████████████████████████

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28.   Given the number of shipments presented in the EIS, it is appropriate in my opinion to assume

that ██

████████████████████

[28] **R-581**, Revised Project Description, page 137.

[29] I regard Bilcon's requirement for ██

████████████████████████

IV. ██

29.   Bilcon could have ██

██████████████████████████████ Mr. Morrison, Mr. Buxton, and Mr. Fougere all suggest that it

██. [30] Bilcon however ████████████

██

██

███■

30.   Bilcon effectively ██

████████████████████████████████ In my opinion, both in my June 9th report and in this

response, ██

██

████████████████████████   ████████████████████████████████████

██   ████

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███████████████████

31.   The appropriateness of using the ████████████████ to estimate freight rates over the long

term is implicit in Mr. Morrison's own statement. The Tamarack II report recognizes that ██████████

██[32] ████████████████████

██

██

████████████████████   ██

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██

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[30] Tamarack II, ¶¶ 47, 51-54; Buxton II, ¶ 39; Fougere II, ¶¶ 35-37.

[31] **R-581**, Revised Project Description, page 137. ████████████████████████████

██

████████████████

[32] Tamarack II, ¶ 64.

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███

V.   ████████████

32.   In my June 9th report, I noted that Mr. Morrison chose ███████████████████████

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███[33]

33.   Mr. Morrison in Tamarack II claims that ██████████████████████████

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█████████████████████████████████

34.   In particular, the Tamarack II report states that: ████████████████████

██

████████████[34]   ██

██

██

██

███

███   ██

██[35]

██████████████████████████████████████[36]███████████████████

██

[33] **RE-7**, Marsoft I, ¶ 21.

[34] Tamarack II, ¶ 33.

[35] **C-1025**, Supply Agreement between New York Sand & Stone and Martin Marietta Materials, May 24, 2010, clause 8 at pp. 7-8.

[36] Rosen II, ¶ 5.27; Witness Statement of Tom Dooley, ¶ 97 and Exhibit 1 (**C-1025**).

███
██

36.   In light of the above, I do not have any adjustments to make to Figure 5 of my June 9th report, which shows██given the Claimants' latest filing. The table is derived exactly from the shipping cost model produced by Tamarack.

VI.   Comparison of Mr. Rosen's Freight Rates to Marsoft's

37.   The Tamarack I Report provides rates only from 2010 to 2020, assuming ████████████████ ███████████████[38] It does not provide any basis for projections for charter rates beyond 2020. ██ ███ ███ ██. In the FTI II Report, Mr. Rosen now██ ██.[40] While Mr. Rosen explains that he has done this to ███ ██ █████████ █████████

38.   "Corrected Fig. 10" in the Jaakola Report ██ ██ ████████████████████ I do not disagree with the Jaakola Report in its methodology.

[37] **C-1025**, Supply Agreement between New York Sand & Stone and Martin Marietta Materials, May 24, 2010, page 7.

[38] Tamarack I, pp. 11-13.

[39] Rosen I, ¶ 5.23.

[40] Rosen II, ¶¶ 5.36-5.41.

[41] Rosen II, ¶ 5.38.

[42] *See, e.g.,* Rosen I, Fig. 5.4; Rosen II, Fig. 5.1.

39.   However, the observation in the Jaakola Report that ███████████████████████████████

███

███████████████████████   ███

███

███████████████████████████████████████   █████████████████████████████████

███████████████████████████████████

40.   Consider ███████████████████████████████ if the Tamarack/FTI scenario came about.
In all likelihood, they would ███

███ In other words, Bilcon would

███

41.   The explanation provided by the Tamarack and FTI Reports for████████████████████

███

As I explained in my June 9th report, ██

VII.   Capital Cost Methodology

42.   The Tamarack II Report also levelled critiques at my ████████████████████. In particular, it
asserted that ███

███████████████ that I used to benchmark ███

███████████████████████████████. I have ████████████ to provide further data points to refine my
analysis   and   confirm   that ███████████████████████████████ are   appropriate,   comparable
benchmarks to include in my analysis.

43.   ███

███ is shown in the Reply Witness Statement of Dan
Fougere.[44] ██

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[43] For a detailed analysis, refer to **RE-7**, Marsoft I, section III, D. Long-Term Freight Costs Used in the Rosen
Report.

[44] Fougere II, Exhibit 2.

███ ████████

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█████████████████████████████████

44.   Tamarack II states that ██

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██ ■ ████████████████

██

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██████████

45.   Tamarack II also asserts that ██████████████████████████████████████

██

██

████████████████████████████████████[47] It is thus reasonable, in my opinion,

to include ████████████

46.   I have also updated the Marsoft ██████████████████████████████████████

██

██

███████████████

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[45] **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Input Self-unloader".

[46] **R-836**, Port Technology International, The transhipment solution: overcoming constraints in port logistics in developing countries, p. 2.

[47] **R-837**, CSL Americas, Vessel Design Information of the CSL Tacoma and Sheila Ann; **R-838**, Algoma Central Corporation, Vessel Design Information of the Weser Stahl.
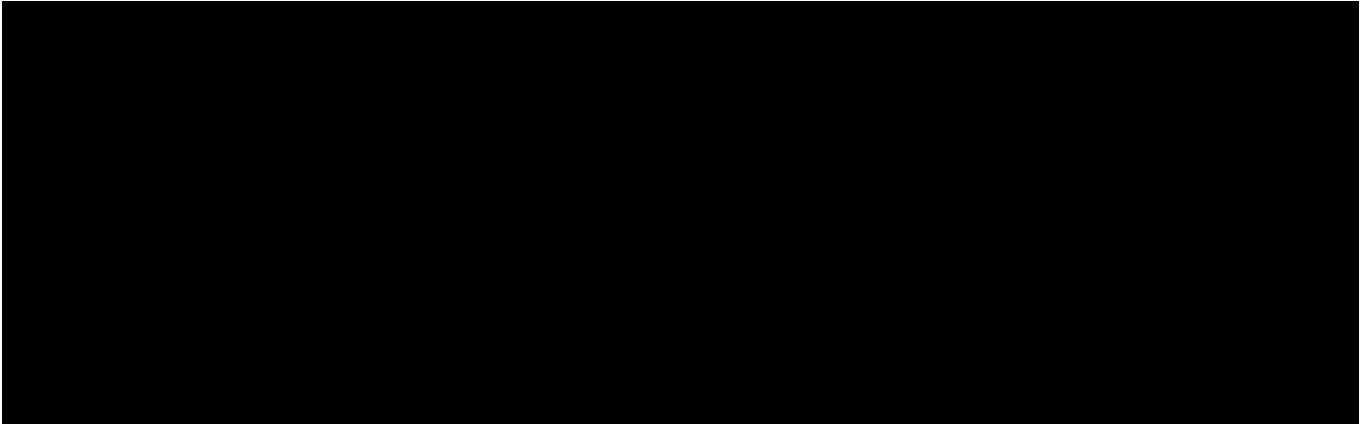
Figure 3, Self-unloader Newbuilding Price Premium

47.   Adjusting my freight rates ████████████████████████, the project's average cost of shipping, is (all else equal):

    a)   ███
    █   ██

VIII.   Vessel Speed Issues

48.   The speed at which a vessel ████████████████ travels is assumed to be ████████ by Mr. Morrison in Tamarack I and II.[49] I made the same assumption in my June Report. For this reply, however, I was able to analyze the actual speed at which ████████████████ traded between the Nova Scotia from Auld's Cove and New York, using data provided by the Canadian Coast Guard.[50] We believe this voyage is representative of the voyage from Whites Point Quarry to New York and back.

49.   The vessel tracking data provided by the Coast Guard covers the period 2012 through 2017 (no information was available for prior years). The Coast Guard collected the data from several sources including the Department of National Defence Global Positioning Warehouse and processed it to provide estimates of average speed by voyage from origin to destination.[51] I further screened the data

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[48] Refer to **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Output FC EIS 56". Both rates presented here are calculated using Marsoft's Capital Cost model based on 2011Q1 project start.

[49] **C-1108**, Tamarack Excel Model, Freight Rate Calculation, Tab "2010", Line 28.

[50] **R-839**, Canadian Coast Guard, Vessel Speed Data ████████████████, 2012-2017, pp. 3-8.

[51] For a full description of the process followed by the Coast Guard, refer to **R-839**, Canadian Coast Guard, Vessel Speed Data ████████████████, 2012-2017, p. 2.

to collect the average speed of the vessel on voyages from the Bay of Fundy to New York (thereby excluding voyages to other destinations).[52] A total of 63 voyages were included in the speed database.

50.   The average speed of ▮▮▮▮▮▮▮▮▮▮▮ over this period, on voyages between New York and the Bay of Fundy, was ▮▮▮▮▮▮ Based on this observation I concluded that a more realistic estimate of the cost to transport aggregates from the Whites Point Quarry to New York should be based on an average speed of ▮▮▮▮▮ instead of the ▮▮▮▮▮ assumed earlier.

51.   By adjusting the speed input to the Marsoft ▮▮▮▮▮▮▮▮▮▮ to reflect the speed of the ship to ▮▮▮▮▮▮ throughout its voyage from Nova Scotia to New York, the impact on the voyage days would be ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
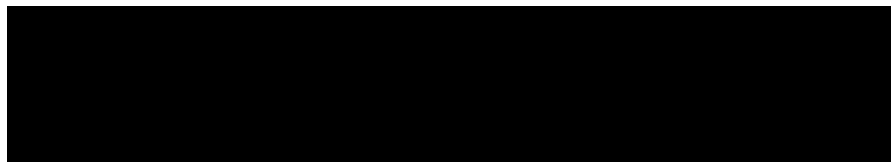
Figure 4, Voyage Days by Speed

52.   The average cost of shipping increases as a result of the slower speed, since the vessel consumes more bunkers per voyage.[53] The average cost per ton increases ▮▮▮▮▮▮▮▮▮▮▮

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

a)   ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
▮   ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

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[52] **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Input Speed".

[53] There may be savings in fuel consumption at 10.7 knot vs. 13 knots. Speed/consumption curves for the ▮▮▮▮▮▮▮ are not available to me. The ship still has the capacity to transport the maximum annual demand of 2 million short tons assumed in the 2007 EIS - the total number of voyage days required to transport 2 million tons per year at 10.7 knots is 347 days per year.

[54] Refer to **R-835**, Marsoft Updated Capital Cost Model - Bilcon Ship Freight Costs, tab "Output FC EIS 10.7". For comparison purposes, this correction is shown here to the base rate calculated in my first report, without the adjustment discussed in section VII above.

IX.   Conclusion and Summary of Changes to Marsoft's Freight Rates

53.   I have reviewed the Tamarack II report and concluded that no adjustment is necessary except for two factors.

54.   I have revised my estimates of the freight cost for the White' Point project to account for ██ ██████

55.   ███ ███

56.   The average vessel speed is reduced ████████████████████████ on the basis of new information available on actual trading records for █████████████

57.   Accordingly, the project average cost of shipping, given these two changes (all else equal), is ████████████████████████████ ██████ █████████████████████████ ██████
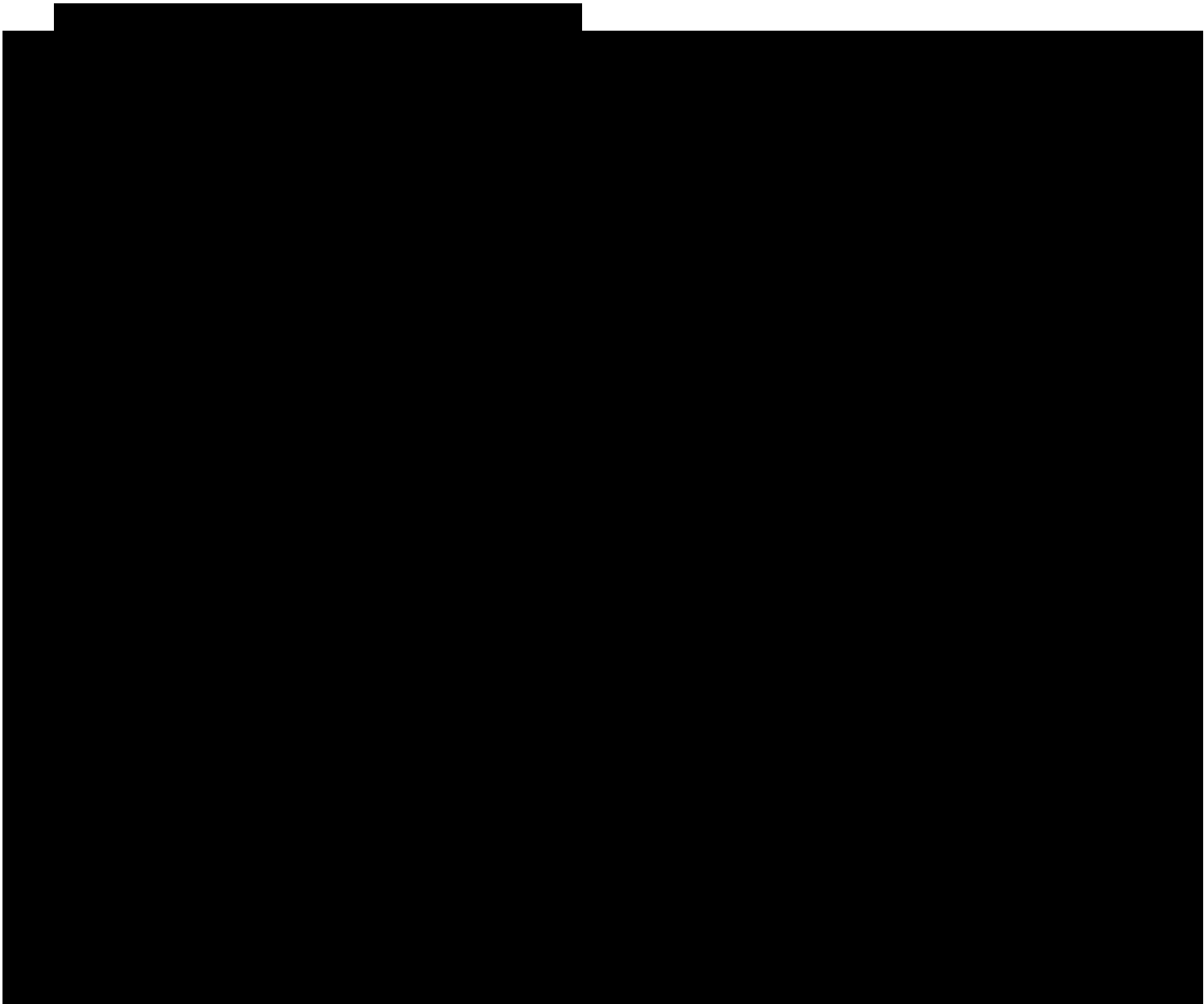
Dr. Arlie G. Sterling

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[55] Refer to

Figure 5, Freight Costs under the Capital Cost Methodology, Self-unloader Premium at 56%, Speed at 10.7 Knots for details.

[56] Refer to Figure 6, Freight Costs under the Capital Cost Methodology, Self-unloader Premium at 56%, Speed at 10.7 Knots, 1st ship Operational Time 2015Q1 for details.

Freight Costs (USD/Ton),

Freight Costs (USD/Ton)