CT-2021-002

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Secure Energy Services Inc. of all of the issued and outstanding shares of Tervita Corporation;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

SECURE ENERGY SERVICES INC.

Respondent

AFFIDAVIT OF NATHAN H. MILLER
(AFFIRMED FEBRUARY 25, 2022)

---

1. My name is Nathan H. Miller. I am the Saleh Romeih Associate Professor at the McDonough School of Business at Georgetown University in Washington, DC. I earned my B.A. in Economics and History from the University of California at Berkeley in 2008. I have served as a Visiting Professor at Toulouse School of Economics in 2019 and 2020. Prior to joining Georgetown University in 2013, I served as a Staff Economist at the U.S. Department of Justice from 2008-2013.

2. My area of expertise is in the field of Industrial Organization, which is the area of economics that addresses the behavior of firms, industries, and their markets. Within that field I have specialized in Antitrust Economics, with a recent focus on collusion and the competitive effects of mergers. I have taught graduate level courses on Microeconomics, Industrial Organization, Firm Analysis and Strategy, and Strategic Pricing. My research has been published in leading economics journals, including the American Economic Review, Econometrica, and the RAND Journal of Economics, among others. I serve on the editorial board of the Review of Industrial Organization.

3. In addition to my academic work in the area of Antitrust Economics, I have provided economic analysis for antitrust litigation matters. I served as a staff economist at the U.S. Department of Justice (DOJ), where I received an Award of Distinction for my work on a high-profile merger review. As a staff economist for the DOJ, I analyzed a number of merger matters across multiple industries, including Bazaarvoice/PowerReviews, AT&T/T-Mobile, and Ticketmaster/Live Nation.I have also analyzed the competitive effects of a merger on behalf of the merging parties, including the Express Scripts acquisition by Cigna. Finally,I have been retained by both the DOJ and Federal Trade Commission (FTC) as a testifying expert on several merger-related matters, and I worked with the Commissioner of Competition on the matter regarding Evonik Industries AG's acquisition of PeroxyChem Holding Company LLC, and Parrish & Heimbecker, Limited's acquisition of certain grain elevators from Louis Dreyfus Company Canada ULC.

4. I have been asked by the Commissioner of Competition to prepare a report examining the competitive effects and deadweight loss, if any, with respect to the acquisition of grain elevators and related assets from Louis Dreyfus Company by Parrish & Heimbecker, Limited.

5. I attach as Exhibit "A" to this affidavit my report setting out my opinion.

6. I attached as Exhibit “B” to this affidavit my curriculum vitae.

7. I attach as Exhibit “C” to this affidavit my Acknowledgement of Expert Witness.

8. I attach as Exhibit “D” to this affidavit my Documents Relied Upon.

Affirmed remotely by Nathan H. Miller at the)
)
in the City of Ottawa in the Province)
, 2022 in accordance)
)
)
)
)
)
)
)
)
)
)
)

Nathan H. Miller

A Commissioner, etc., Province of Ontario
Commissaire, etc., Province de l'Ontario
Mallory Christina Kelly
exp.: February 27, 2022
exp.: 27 février 2022
au service du gouvernement du Canada, ministère de la Justice
for the Government of Canada, Department of Justice

This is Exhibit A to the Affidavit of Nathan Miller Affirmed on February 25, 2022

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c.C-34, as amended;

AND IN THE MATTER OF the proposed acquisition of Tervita Corporation by Secure Energy Services Inc.;

AND IN THE MATTER OF an Application by the Commissioner of Competition for an order pursuant to 92 of the *Competition Act*;

AND IN THE MATTER OF an Application by the Commissioner of Competition for an interim order pursuant to section 104 of the *Competition Act*;

B E T W E E N:

COMMISSIONER OF COMPETITION

Applicant

- and -

SECURE ENERGY SERVICES INC

Respondents

EXPERT REPORT OF NATHAN H. MILLER, PH.D.

February 25, 2022

Table of contents

1. ASSIGNMENT

1. On March 2021, Secure and Tervita ("the Parties") announced a merger agreement that consummated in July 2021 ("the Transaction"). Prior to the merger, Secure and Tervita operated independent facilities that provided waste management services to oil and gas producers.

2. I have been asked by the Competition Bureau ("Bureau") to provide an independent economic assessment of the competitive implications of the proposed merger between Secure Energy Services Inc. ("Secure") and Tervita Corp. ("Tervita"), as well as the deadweight loss, if any, caused by the transaction.

2. SUMMARY OF OPINIONS

3. Based on my review of the available data and documents in this matter, I have concluded that the Transaction results in an anticompetitive effect and a deadweight loss.

4. **First,** relevant product markets are the markets for (1) the supply of waste processing and treatment services by TRDs, (2) the disposal of solid oil and gas waste into industrial landfills, and (3) the disposal of produced and waste water into water disposal wells owned by third-party waste service providers. Moreover, customer-based geographic markets consisting of groups of customers that are likely to be similarly impacted by the transaction are relevant local geographic markets.

5. **Second,** I show that the post-transaction market shares exceed the thresholds identified in the Competition Bureau Canada's Merger Enforcement Guidelines ("*Guidelines*"). Additionally, the Transaction results in Secure attaining monopoly position in many local markets. (Section 5.1)

6. **Third,** I conclude that the price of waste services in the three relevant product markets will increases for customers operating well sites located in those geographic markets. This conclusion is based on several analyses:

- Documents and industry facts indicate that Secure and Tervita competed head-to-head in many local markets. Customers leveraged one party against the other to negotiate better pricing terms. The merger eliminated this competition and weakened the customers'

ability to garner favorable terms, which in turn allows Secure to command higher prices for its services. (Section 5.2.1)

- My review of the data shows that many customers view the Parties' facilities as each other's closest substitutes. Specifically, I quantify the extent to which customers view the Parties' waste service facilities as each other's next best substitute. Estimated diversion ratios suggest that there are high levels of diversion between the Parties' facilities in many local markets. (Section 5.2.2)
- A merger simulation model indicates that the Transaction will result in an approximately 11 to 25 percent price increases, depending on the product market. (Section 5.3)

7. **Fourth,** I conclude that the transaction will create deadweight loss ("DWL"). Specifically, the closure of the 35 facilities as a result of the merger will result in a loss in consumer surplus because customers will now have fewer waste service options and will have to use less desired and inefficient options. I estimate the DWL arising from lost choice to be $78 million. Further, the increase in waste service prices will reduce the volume of waste processed at third-party facilities and result in a loss of trade and additional DWL. (Section 6)

3. INDUSTRY BACKGROUND

8. Tervita Corp. ("Tervita") and Secure Energy Services Inc. ("Secure") were the two largest waste service providers active in the Western Canadian Sedimentary Basin ("WCSB"). After their merger that was closed on July 2021, Secure became by far the largest waste service provider and attained monopoly position. Although the two companies have already merged, I will refer to them as separate entities for the purposes of this report.

9. They provide processing, treating, and disposal services, among other industry-related services, to oil and gas producers. The following section describes some of the broad industry features, including background information on the Parties (**Section 3.1**) and descriptions of waste services provided by the Parties to the oil and gas industry (**Section 3.2**). I also describe high costs to transport oilfield waste to the Parties' (and their competitors') facilities and how high transportation costs factor into the Parties' pricing practices (**Section 3.3**), as well other important competitive and market factors affecting the Parties' pricing for waste services (**Section 3.4**).

3.1. Tervita and Secure background

10. Tervita Corp. was a publicly traded Canadian company that provides "integrated waste and environmental services" to the oil and gas exploration and extraction industry,[1] and to industrial businesses, more generally.[2] Founded in 1983,[3] Tervita defines its services along two segments: energy and industrial services. Energy services include treatment, recovery, and disposal of wastes that result from oil and gas production, and industrial services comprise other types of waste, recycling, and environmental services accessed by a larger set of industries.[4] In 2020, energy services accounted for 60 percent of Tervita's revenue.[5]

11. As part of its waste service operations, Tervita operated various treatment, recovery, and disposal ("TRD") facilities, landfills, and water disposal wells.[6] These facilities are mostly located in the WCSB.

---

[1] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 11. About a quarter of revenues are derived from well drilling and completion process (early phase of well development) and three-quarters are derived from ongoing production activities. See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 12.

[2] For example, Tervita's list of top customers includes companies operating in transportation [redacted] steel manufacturing [redacted] and excavation services [redacted] as well as local governments and municipalities [redacted] See Appendix 4.3.3 to Tervita's PMN [RBBC00001_000000010].

[3] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 8 ("Legacy Tervita was originally incorporated under the ABCA on October 24, 1983 under the name 'Western Petro Pollution Control (1983) Ltd.'").

[4] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], pp. 12–13.

[5] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 13. The revenue share generated from energy services excludes any revenue earned from oil marketing and resale, which is a part of Tervita's business with low margins. See Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018 [RBBA00008_000000023], p. 20.

[6] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], pp. 12–13, 14. TRDs are also referred to as full service terminals ("FST"), particularly in Secure documents and transaction data. Secure's representative Mr. Engel explained that TRDs and FSTs provide essentially the same kind of services. Engel testimony, December 20, 2021, questions 33-34 ("Q. And they [TRDs and FSTs] are the same type of facility? A. Broadly speaking but not exactly the same. Q. Okay, but essentially the same kind; they provide essentially the same kinds of services? A. The same bucket of services, yes."). Throughout my report, I will refer to Tervita Transaction data (RBEK00004_000000084 = PROTECTED & CONFIDENTIAL Waste_Services_HMM_Sales_2018_2021; RBEK00004_000000004 = PROTECTED & CONFIDENTIAL Waste_Services_QFAIM_Sales_2019_2020; RBEK00004_000000054 = PROTECTED & CONFIDENTIAL Waste_Services_SAP_NAL_TRD_Landfill_Sales_2017_2018; RBEK00004_000000048 = PROTECTED & CONFIDENTIAL Energy_Services_QFAIM_Sales_2017_2021; RBEK00004_000000056 = PROTECTED & CONFIDENTIAL Energy_Services_SAP_NAL_TRD_Landfill_Sales_2017_2018) and Secure Transaction data (RBEJ00002_000000007 = 17 - Sales and SES Truck Tickets Data (Midstream).txt).

12. Tervita has grown its presence in waste services through de novo entry and mergers and acquisitions. These transactions include its 2018 merger with a large waste service operator at that time, Newalta Corporation ("Newalta"),[7] and its 2011 acquisition of Complete Environmental, which included the Babkirk secure landfill.[8]

13. Secure Energy Services Inc. is a publicly traded Canadian company that provides "customer solutions to upstream oil and natural gas companies" and "comprehensive environmental and fluid management for landfill disposal, onsite abandonment, remediation and reclamation, drilling, completion and production operations for oil and gas producers."[9] Secure was founded by former Tervita employees in 2007, and since then, Secure has grown by acquiring competitors and building its own facilities,[10] achieving this growth during a period of high oil exploration and development.[11]

14. Secure divides its business into two segments: midstream infrastructure and environmental and fluid management.[12] Midstream infrastructure supports the oil and gas extraction industry by treating and disposing of wastes that result from well operations, among other activities,[13] and the environmental fluid management services comprise other waste management, recycling, storage and remediation services.[14] Like Tervita, Secure also operates TRD facilities,

---

[7] The other three mergers include those with International Technologies Inc. in 1993, a merger with CCS Inc. and 987681 Alberta Ltd in 2002, and a merger with 1331826 Alberta ULC in 2007. See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 8.

[8] Federal Court of Appeal, 2013 FCA 28, at ¶¶ 6–15.

[9] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 7.

[10] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 25–27.

[11] Between 2007 and 2015, an average of over 11,000 wells were drilled in Western Canada for exploration and development. Since 2015, this number declined to an annual average of less than 4,700. The Canadian Association of Petroleum Producers (CAPP), Statistical Handbook, https://www.capp.ca/wp-content/uploads/2021/12/Frequently-Used-Stats-Nov-2021.pdf (accessed February 21, 2022).

[12] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 3.

[13] Midstream services include oil and gas related waste treatment and disposal, oil purchasing and reselling, and oil and terminalling, storage, and marketing services. SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 7-9.

[14] Environmental and fluid management services include well remediation and reclamation, landfill disposal, waste container, and fluid management, recycling, and storage services. SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 9-11.

landfills, and water disposal wells in the WCSB.[15] In 2020, the midstream infrastructure segment generated 44 percent of Secure's revenue.[16]

15. In March 2021, Secure and Tervita ("the Parties") announced a merger agreement and completed the merger in July 2021. I understand that the Parties provide similar services to midstream oil and gas industry in four categories: 1- oilfield waste processing and treatment at TRDs, 2- solid oilfield waste disposal at industrial landfills, 3- produced water and waste water disposal at deep water disposal wells, 4- oil processing and handling.[17] As I explain below, the combined entity now owns and operates a very high percentage of TRDs, industrial landfills, and water disposal wells in the WCSB.[18] In addition, the Parties indicated that both companies "provide various services that can be categorized as 'environmental solutions' in Canada."[19]

[15] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 8-9.

[16] Secure 2020 Annual Financial Statement [SESL0020098], p. 41. The share of revenue generated by midstream infrastructure services excludes oil marketing and resale.

[17] Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 10.

[18] "SECURE Energy Services Inc. and Tervita Corporation Merge to Create a Stronger Midstream Infrastructure and Environmental Solutions Business," Tervita, March 9, 2020, available at https://tervita.com/news/article/secure-energy-services-inc-and-tervita-corporation-merge-to-crea/.

[19] Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 14.

3.2. Waste Services

16. The oil and gas industry can be described in three layers: (1) exploration and extraction by oil and gas producers ("upstream producers"), (2) processing, marketing, storing, transporting, waste management, and other support services ("midstream"), (3) refining for final sale ("downstream").

17. In its exploration and extraction process, upstream producers generate a variety of waste at different stages of the drilling and production processes (see Section 3.2.1), and the Parties compete at the midstream level to provide waste treatment and disposal services to these upstream producers. A significant part of the Parties' waste service operations fall into one of three categories: waste processing and treatment services provided by TRD facilities, the disposal of solid waste from oil and gas fields at landfill facilities, and the disposal of produced and waste water in water disposal wells. As I describe in detail below and in Section 5.1, each of these waste services involves distinct types of waste that result from the exploration and extraction of oil and natural gas.

18. The Parties also provide environmental services, such as reclamation and remediation services, and energy marketing services such as oil processing, sales and "terminalling." However, these services will not be the focus of this report.[20]

3.2.1. *Oil and gas exploration and extraction processes produces a variety of wastes handled by TRDs, landfills and water wells.*

19. Oil and gas operations produce waste byproducts during the drilling, completion, and production phases of well development.[21] In addition, waste is produced during storage (sludge at the bottom of tanks), when wells are abandoned, and if there is a spill. The waste, which can come in a solid, fluid or mixed form, are byproducts of the different stages of the oil production. For example,

- The drilling phase produces drilling fluids and drill cuttings.[22] Several methods are used to drill a wellbore into the ground that

[20] See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], pp. 12-13, pp. 20-21; SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 7-10.

[21] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 15.

often bring mud and drill cuttings, or other minerals from the drilled subsurface strata, to the surface. The drill bit may also circulate water and other chemicals in the wellbore that carry the drill cuttings out of the well.[23]

- The completion phase prepares a drilled well for production, which includes setting up a steel pipe casing at the mouth of the well, pouring cement into the space between the casing and the wellbore walls, and installing other wellbore equipment necessary for production to begin.[24] The completion phase can also include the use of well stimulation techniques that increase the level of well production such as hydraulic fracturing.[25] This phase produces various waste such as fracking fluids and sand.[26] Fluids produced during this phase may be mixed with oil, which can be recovered and resold.
- The production phase creates wastes such as produced water (naturally occurring water that comes out of the ground along with oil and gas),[27] emulsion (mixture of oil, water, gas, and other substances),[28] sludges, and various solids such as sand and naturally occurring radioactive materials. Processes that separate crude oil from water, salts, and other suspended materials transform emulsion into marketable crude and waste that meets environmental and regulatory standards for safe disposal.[29]

---

[22] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 15.

[23] See Alberta Energy Regulator ("AER"), "Drilling," available at https://www.aer.ca/providing-information/by-topic/drilling.

[24] See Rigzone.com, "How does well completion work?" available at https://www.rigzone.com/training/insight.asp?insight_id=326

[25] Hydraulic fracturing is a technique that involves injecting water, sand, and other chemicals under high pressure into a bedrock formation in order to create fissures in the rock and release more oil and gas to flow to the surface. See AER, "Hydraulic Fracturing," available at https://www.aer.ca/providing-information/by-topic/hydraulic-fracturing; "Fracking Explained," Petroleum Services Association of Canada, available at https://oilandgasinfo.ca/all-about-fracking/fracking-explained/.

[26] "Fracking Explained," Petroleum Services Association of Canada, available at https://oilandgasinfo.ca/all-about-fracking/fracking-explained/ ("The frac fluid used during the fracking process consists of: A base fluid: most commonly water, but can also be liquid carbon dioxide (CO_2) or nitrogen (N_2)[.] Proppant or frac sand: commonly pure silica sand, but can also be resin-coated sand or ceramic beads[.] Additives: common additives that change the performance of the fluid throughout the fracking process and protect the reservoir and equipment[.]")

[27] "What is Produced water?" American Geosciences Institute, available at https://www.americangeosciences.org/critical-issues/faq/what-produced-water.

[28] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 15 ("Emulsion, a combination of oil and water, may also be produced and can be separated into its primary component parts through processing. …").

[29] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 8; Tervita Annual Information Form for the fiscal year ended December 31, 2020

- Waste is also produced during the "turnaround" process, which includes cleaning out the sludge and other waste collected at tank bottoms;[30] when closing abandoned wells, which requires remediation that may generate contaminated soil as waste;[31] and when cleaning up spills at the well sites.[32]

20. Federal and provincial environmental regulations dictate rules for disposing these wastes, and, by and large, oil and gas companies elicit the services of "midstream" waste management companies, such as the Parties, to meet these regulatory standards.[33] These wastes can be categorized in terms of the types of facility that can appropriately handle the waste. Specifically, the different types of waste generated throughout the phases of oil and gas development are either processed, treated, and disposed of at TRDs, landfills, or water disposal wells as I discuss in greater detail in Section 5.1 and briefly touch on in this section.

21. Liquid and solid wastes that requires processing are handled by TRDs. TRDs treat, process, recover, and dispose of oil and gas industry waste by-products such as contaminated drilling muds, completion fluids, and tank-bottom sludge.[34] Before disposal, TRDs may treat the liquid and solid wastes to

---

[RBBC00003_000000017], p. 15 ("During the oil and gas extraction (production) phase, 'produced water' is produced which must be treated, recycled and sent for disposal. Emulsion, a combination of oil and water, may also be produced and can be separated into its primary component parts through processing. … Through Tervita's stringent processes, waste is sorted into recoverable oil, wastewater, sludge, solids or fluids … The recovered, salable oil is transferred to market via Tervita's energy marketing business either via a clean oil pipeline connection at the facility or via transport trucks designed to haul oil to market.").

[30] I understand that this waste is collected during periodic cleaning up of storage tanks.

[31] AER, "Remediation," https://www.aer.ca/regulating-development/project-closure/remediation ("Contaminated soil and groundwater can be remediated in the ground (in situ) or removed and treated (ex situ). In situ remediation techniques involve managing or treating the contaminated material in place. These techniques reduce the amount of soil sent to landfills. Contaminated material treated in situ is not considered oilfield waste. Ex situ remediation techniques involve excavating or removing the material for treatment or disposal. Contaminated material that is treated or disposed of ex situ is considered oilfield waste. It must be disposed according to our waste-management directives, such as Directive 058: Oilfield Waste Management Requirements for the Upstream Petroleum Industry."); Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 10, 24-27; Witness Statement of Jeff Biegel, February 15, 2022, ¶¶ 8-10.

[32] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 9.

[33] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], pp. 3-4 for regulations. See also "Energy Services Division, Waste Processing," Tervita, June 1, 2021, TER_00001910, p. 10; Witness Statement of Tinu Odeyemi, January 8, 2022 at ¶¶ 6-10, ¶¶ 8-10, 24-25; Witness Statement of Carol Nelson, Ministry of Alberta Environment and Parks, January 25, 2022 , ¶¶ 16-18.

[34] Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018 [RBBA00008_000000023], pp. 4-5. See also Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 14 ("A TRD Facility is an above ground facility that separates waste into solids, wastewater and recovered oil through specialized waste management solutions designed to be compliant with applicable environmental laws and standards.").

meet environmental and regulatory standards, which are meant to lower the waste hazard-levels and ensure safe, non-contaminating disposal.[35] The solid components of the treated waste are then typically disposed of in landfills and the water components are injected into waste water disposal wells, which are often located near to TRDs.[36, 37] Additionally, TRDs process emulsion and other liquid wastes by separating oil and usable materials from waste water, salts, and other suspended materials that then may be disposed of in landfills or injected into waste water disposal wells.[38]

[35] Environmental standards and regulatory oversight may vary between Canadian provinces. In Alberta, the Alberta Environment and Parks ("AEP") regulates landfills under Alberta's Environmental Protection and Enhancement Act, the Waste Control Regulations and the Activities Designation Regulation. In British Columbia, the primary regulatory bodies are the British Columbia Oil and Gas Commission and the British Columbia Ministry of Environment and Climate Change Strategy, and separate bodies and law regulate the industries in Saskatchewan and Manitoba as well. See SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 33–34. See also SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 34 ("These provincial environmental regulations include requirements for oilfield waste management that deal with environmental protection, liability management, waste characterization and classification, waste manifesting and tracking, waste management facility design, application requirements and acceptable waste disposal options. These regulations strongly influence the permitting, design, construction, operation and reclamation of waste management facilities."); Witness Statement of Carol Nelson, January 25, 2022 at ¶¶ 5-9.

[36] Engel testimony, December 20, 2021, question 44 ("… most, if not all, the vast majority, of FSTs have a disposal well as part of their infrastructure…"); SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 19 ("All FSTs, with the exception of Kakwa, are connected to a Class IB Disposal Well for the disposal of produced and waste water.").

[37] [redacted]

[38] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 17 ("After processing, the resulting products are handled as follows … Residual water-based fluids are permanently injected into disposal wells associated with the facility, ensuring safe and responsible disposal. In total, SECURE deposited nearly 4.6 million m3 of produced water and waste water in 2020 via deepwell injection into the network of disposal wells associated with the Corporation's midstream processing facilities; and Solids generated by processing and treatment at facilities are stored on purpose-built solids pads for additional processing to increase hydrocarbon recovery, remove contaminants and minimize fluid content prior to transportation for disposal at an approved landfill.").

22. Landfills take in solid wastes that come directly from the well sites when the solid wastes do not require further processing, as well as post-processing wastes from TRDs.[39] Landfills may take in substances such as drill cuttings, contaminated soil, and produced sand directly from drilled wells, in addition to treated solids from the TRDs.[40] Tervita and Secure take in landfill waste from chemical producers, pulp and paper producers, and environmental remediation service providers, as well.[41]

23. Produced water and waste water, as well as other water-based liquid wastes, are often disposed of by injecting it into water disposal wells, sometimes without prior treatment.[42] As noted above, water disposal wells owned by waste service providers can be stand alone or at the location of TRDs.

24. Tervita also operated three cavern facilities that are used to dispose of both liquid and solid wastes.[43] Caverns are deep sealed salt formations that can also store liquids with high pH content, processed sludge, and other contaminants.[44] I understand that caverns can take in wastes that cannot be disposed of into the landfills or waste water wells, likening caverns to TRDs in terms of the types of wastes accepted in them.

25. Oil and gas operations sometimes produce waste streams that are contaminated with naturally occurring radioactive materials ("NORM" waste).[45] Solid waste that is contaminated with NORMs must either be

---

[39] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 17.

[40] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 17; SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 9.

[41] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 17; SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 29.

[42] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 19 ("Residual liquid waste water is injected via deep disposal wells into disposal zones between impermeable layers of rock."); Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 25 ("Tervita's network of fixed facilities includes 22 engineered landfills, eight standalone salt water disposal wells, three cavern disposal facilities, 44 TRD Facilities and a number of deep underground injection disposal wells that handle a broad variety of wastes.").

[43] The three caverns include Lindbergh, Hughenden, and Unity. See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 16.

[44] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 16 ("Tervita utilizes salt formations deep below the surface to allow for the disposal of most solid or liquid wastes, including those that are difficult to process or not appropriate for placement in TRD Facilities or engineered landfills, such as high pH fluids, chemicals, NORMs, processed sludges and other contaminants.").

[45] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 10 ("In many geographic areas, the oil and gas industry requires services providers capable of managing and disposing of NORMs, which may include production waste, impacted equipment and materials, water treatment, residuals and waste, and spills. The Corporation provides a full line of

disposed of in landfills or caverns that are permitted to accept it.[46] I understand that the only two landfills in the WCSB that can accept NORM-contaminated wastes are Secure's Pembina and Tervita's Silverberry landfill, which is now owned by Secure, as well.[47] NORM-contaminated wastes can also be disposed of in caverns, provided it is in a slurry form,[48] and the only two caverns that can accept this type of waste are the Unity salt cavern in Saskatchewan, now owned by Secure, and the Melville salt cavern owned by Plains Environmental.[49]

26. In my analysis, I do not separately analyze the potential effects of the merger on NORM disposal independent from any other wastes. I note, however, that the merger between the Parties increases the market concentration for this specialized service since, because of the merger, Secure now operates three of the four facilities that can handle NORM waste in the WCSB. As such, a separate analysis of NORM services would likely also show a price increase.

3.2.2. *The Parties own and operate multiple waste-service facilities in the Western Canadian Sedimentary Basin*

27. Tervita and Secure's waste service facilities and operations are predominantly located in Western Canada. According to Tervita's 2020 Annual Information Form, Tervita owned and operated 44 TRDs, three caverns, 22 landfills (18 of which were owned by Tervita), and eight stand-alone water disposal facilities in the WCSB.[50] According to Secure's 2020 Annual

services for managing NORMs, including site assessments, remediation, waste collection and disposal, and NORM safety training and consulting.").

[46] Engel testimony, December 20, 2021, question 62; Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 16.

[47] [RBBC00003_000000009], p. 9 ("In addition to a Class II cell, the Pembina Area Landfill has a separate Class I Landfill cell and is approved for NORM disposal allowing SECURE to provide customers with a safe, economical and environmentally responsible disposal option for NORM impacted solids."); Mr. Engel confirmed that the Silverberry landfill is also permitted to accept NORMs. See Engel testimony, December 20, 2021, p. 65, question 65 ("Q. Okay. Mr. Engel, would you agree with me that, in any BC, Silverberry is able to accept solid waste contaminated by NORMs? A. Yes, to a certain threshold.").

[48] [redacted]

[49] Engel testimony, December 20, 2021, question 71 ("Q. It is our understanding that the only ones in the western Canadian sedimentary basin are Unity and Melville. Is that your understanding, as well? A. Yes. Q. Okay, and Unity was owned by Tervita and now by Secure, while Plains Environmental owns Melville? A. Correct.").

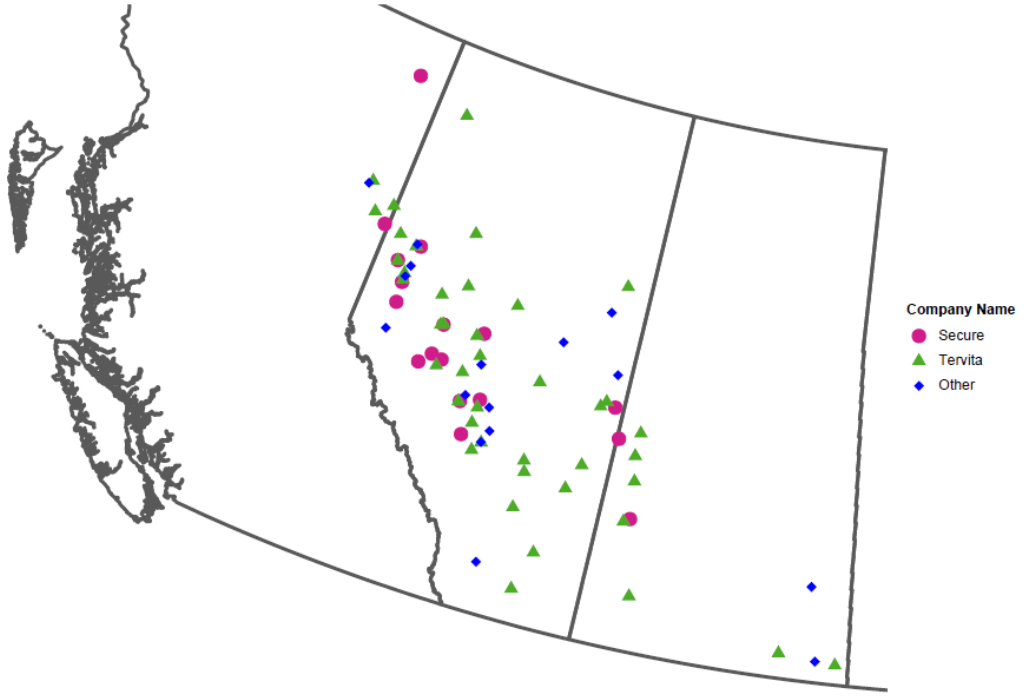
[50] Tervita's 2020 Annual Information Form refers to Western Canada as primary location for various types of assets. See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], pp. 14-17. See, e.g., Engel testimony, December 20, 2021, questions 427-428 ("Q. Okay. And those five FSTs also have water disposal wells. Is that correct? A. That is correct. Q. Okay. There are really 10 disposal wells, then? A. Yes.").

Information Form, Secure owned and operated 18 TRDs (or full-service terminals), operated seven landfills (six of which are owned by Secure), and 15 stand-alone water disposal wells in the WCSB.[51] TRD, landfill, and water disposal well locations are mapped separately in **Exhibit 1**, **Exhibit 2**, and **Exhibit 3**. Note that the map of water disposal facilities in Exhibit 3 also includes markers for TRD facilities because there are water disposal wells on the premises that can be used to dispose of produced water and waste water coming directly from the well sites. Both the maps of water disposal and landfill facilities include locations operated by oil and gas producers that take in some wastes produced by other oil and gas producers.[52]

[51] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], at p. 28 ("The majority of the Corporation's operations and customers are located in western Canada."). See also SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 20, 22-23.

[52] In particular, CNRL operated two landfills as of 2019 (Peejay and Wabasca). Since March of 2021, CNRL's Manatokan landfill has been approved to start disposing of waste from other oil and gas producers' well sites. See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 22 and Exhibit G. CNRL, Plains Midstream, Sprocket Energy, TAQA, Tourmaline, and WhiteCap operate water disposal wells that can take in produced water from other oil and gas producers. These locations are plotted on the map in Exhibit 3. See Workpaper 1.

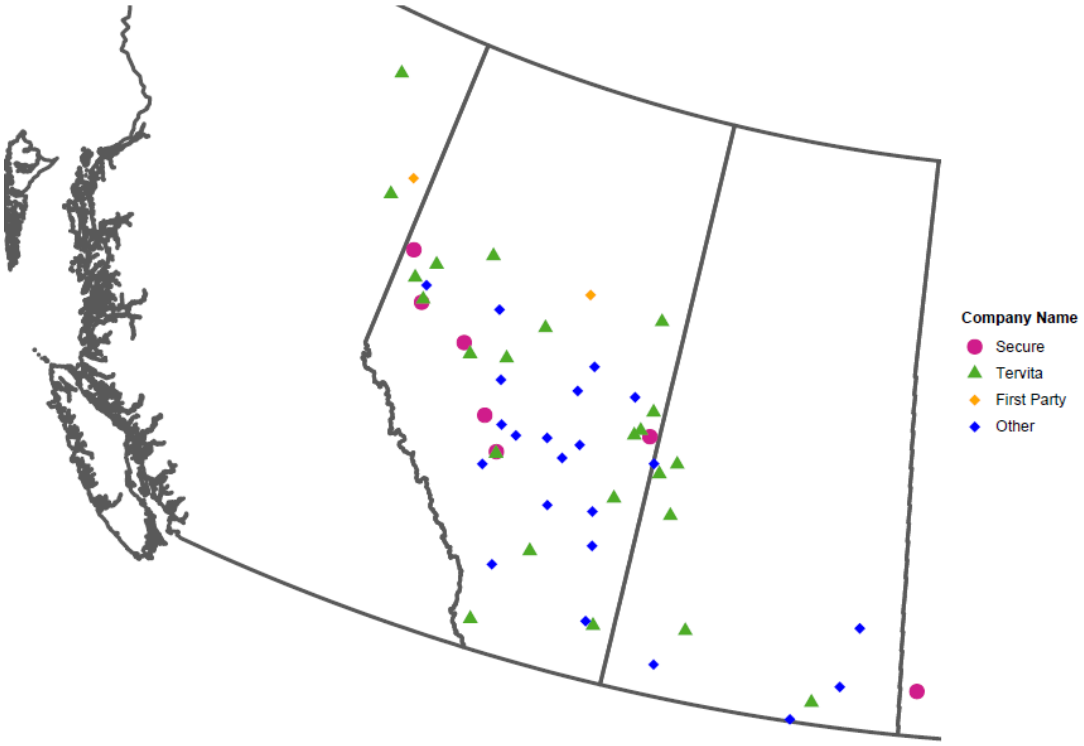
EXHIBIT 1
Map of TRD facilities operated by Tervita, Secure, and competitors in the WCSB



Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities.

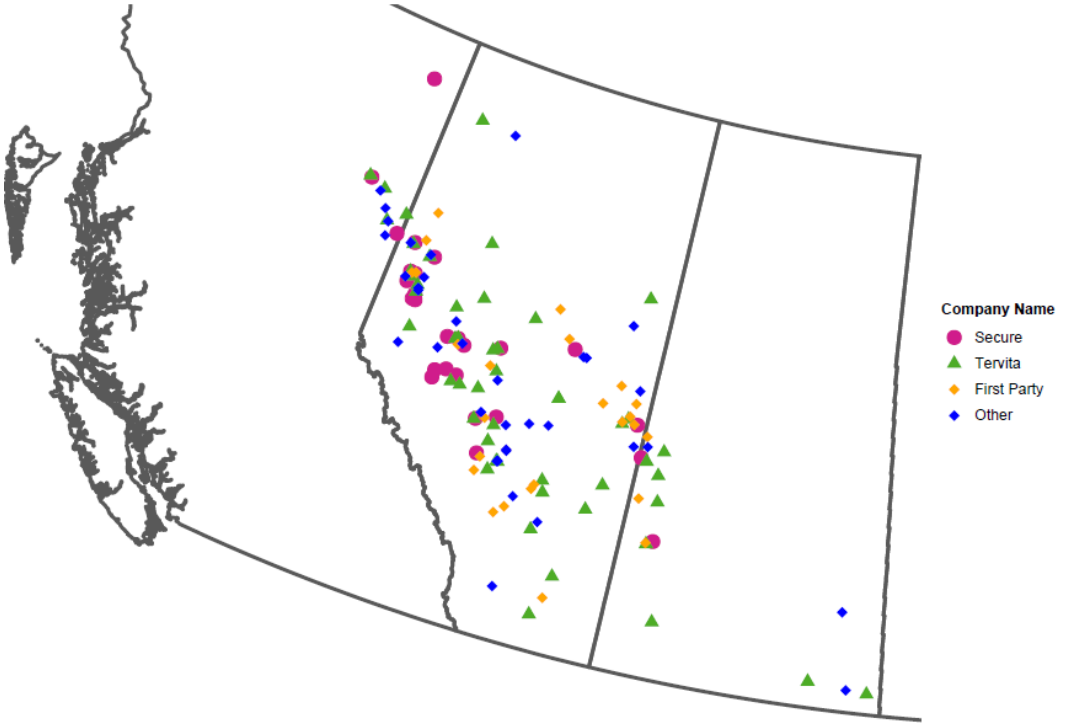
EXHIBIT 2
Map of landfill facilities operated by Tervita, Secure, and competitors in the WCSB



Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities. [redacted]

EXHIBIT 3
Map of water disposal facilities operated by Tervita, Secure, and competitors in the WCSB



Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities. The mapped facilities also include waste water disposal facilities available at TRDs, which also take in produced water and waste water. The locations indicate the water disposal wells owned by Waste Services firms. Self-supply water disposal wells are not included on the map unless the water wells can take in water from other oil and gas producers.

3.3. High transportation costs and the implications

28. Third-party trucking companies typically transport waste from a well site to a waste disposal facility or landfill,[53, 54] and I understand that transportation costs are one of the single-largest components of waste disposal costs for a producer. Secure, in a 2018 submission to the Bureau explained, "transportation is a significant cost incurred by the customer."[55]

29. Transportation costs tend to be proportional to the driving distance, driving time, and weight transported.[56] Oil and gas producers describe how transportations costs are large and a significant consideration when selecting a waste service facility.[57] Tervita's internal analyses show that transportation costs are a significant part of overall waste disposal costs. For example, an internal Tervita estimate suggests a range of [redacted] percent of the total

---

[53] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 16 ("Producers generally hire third-party trucks to remove waste, water, emulsion and oil from their sites to deliver it to Tervita's TRD Facilities and cavern facilities."). Newalta Responses to Request for Information (March 23 2018) [RBBA00011_000000028], p. 3 ("The Company does not typically provide or arrange transportation services from a customer's site to the Company's Site. As customers typically get preferred rates with transporters, Company provided or arranged transportation would not add value for most customer. However, in a very small number of cases a customer requests a 'turn-key' service, which includes transportation. In that case, the Company will arrange for the provision of transportation services on behalf of the customer."). I understand that in some circumstances, pipelines connecting the well site to the waste service facility may transport waste such as produced water instead of trucks. SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 5, 13 ("In the fourth quarter of 2019, new produced water pipelines connecting producer facilities/gas plants to SECURE's midstream infrastructure were added to the Tony Creek and the Gold Creek water disposal facilities. … To achieve this, SECURE is focused on growing and expanding production-focused infrastructure. The strategies the Corporation has developed to achieve this priority include: … Building and connecting produced water pipelines and disposal facilities to reduce customers' transportation costs and reduce their environmental footprint…"). Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 31 ("Tervita's TRD Facilities contain pipeline networks to transport wastewater for disposal.").

[54] Some Waste Service suppliers also provide trucking services, including Wolverine. Wolverine Energy + Infrastructure Inc., "Trailer Rentals," available at https://wnrgi.com/rentals/transportation/ ("We pride ourselves on fast, quality transport services. Wolverine Energy & Infrastructure provides a 24 hour hauling service to the oil and gas industry as well as various trucking services for construction, agriculture & residential."). See also Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 16.

[55] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 5.

[56] Trucking differential analyses, also described in Section 3.4, include estimated trucking prices per hour, which accounts for driving distance, driving speed, hourly rental rates, and tonnage to haul. See Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: [redacted]" October 15, 2020, TEV00223412, attachment "Trucking Differential – [redacted] xlsx" [TEV00223413]. See an internal Secure document that summarizes the average truck capacities to transport different types of waste. d. 05-26-2021 SES Transport Efficiencies InterCo.xlsx [RBBC00003_000000008].

[57] Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 30-31; Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶ 9; Witness Statement of Paul Dziuba (Chevron Canada Resources), February 24, 2022, ¶¶ 13, 16; Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, ¶¶ 16-17; Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶¶ 15, 21; Witness Statement of LB Energy Services Ltd., February 9, 2022 at ¶ 13; Witness Statement of Nigel Wiebe (TAQA), January 27, 2022 at ¶¶ 11-13.

disposal costs, including the per-unit disposal fees paid for waste services.[58] Secure's analysis submitted to the Bureau in 2018 confirm the high cost of transportation services. For example, Secure's analysis of Gordondale area estimated [redacted] per cubic meter in trucking costs compared to disposal fees of [redacted] per tonne for landfills, [redacted] per cubic-meter for water disposal services, and [redacted] per cubic-meter for waste processing services.[59] Consequently, to attract customers and mitigate the high costs of transportation, waste service providers try to locate their facilities near to well sites.[60]

30. As I also discuss in Section 3.4, company documents show that transportation costs are often a significant factor considered by the Parties when quoting disposal fees to customers. [redacted]

[58] The trucking differential analysis attached to the email quoted per hour trucking costs of between [redacted] per tonne and hour, while the disposal fees ranged from [redacted] per tonne. Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: [redacted]" October 15, 2020, [TEV00223412], attachment "Trucking Differential [redacted] xlsx," [TEV00223413].

[59] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 11.

[60] Secure Presentation, "Secure + [redacted]" September 2018, SES0086266, pp. 1-13 at p. 13 ("SECURE consistently lowers customers' All-In Disposal Cost[.] We strategically locate facilities in locations that lower transportation costs[.] We provide options to pipeline connect water volumes that entirely reduces trucking costs"); Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018 [RBBA00008_000000023], p. 14. ("Generally speaking, given the costs to transport waste to treatment facilities and to dispose of it, providers of these services strive to be located in close proximity to those who produce the waste."). I understand that "tipping fee" is a term used to describe per-unit landfill disposal prices.

[61] [redacted]

[62] [redacted]

[63] [redacted]

[redacted][64]

31. Due to the high transportation costs, waste service operations are local in nature. Based on my analysis of Tervita and Secure's transaction data, the average driving distance between waste service customers and Tervita landfill facilities is 95 kilometers, and that distance is 104 kilometers for Secure's landfill customers.[65] For TRDs, the average travel distances for Tervita and Secure TRD customers are 74 and 71 kilometers, respectively. For water disposal wells, the average travel distances of Tervita and Secure customers are 74 and 66 kilometers, respectively. **Exhibit 4** summarizes these distances between waste service customers and Tervita and Secure facility locations for TRDs, landfills, and water disposal wells.[66]

[redacted]

[64] [redacted]

[65] Throughout my report, I use the transaction-level and facilities data from the parties and focus my analyses on transactions that occurred in 2019. The Secure sales data describes the transactions for the midstream segment of the business and includes information about the customer identity, customer location, the types of waste, and the pricing (17 - Sales and SES Truck Tickets Data (Midstream).txt [RBEJ00002_000000007]). The Secure facilities data describes the facility name, location, operational status, and a code for facility type, e.g., whether it is a full-service terminal or landfill (Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306). The Tervita sales data also describes similar information, and I focus on transaction specific to the energy services (energy_services_qfaim_sales_2017_2021.txt [RBEK00004_000000048]) and waste services (waste_services_qfaim_sales_2019_2020.txt [RBEK00004_000000004]). Similarly, the Tervita facilities data describes the facility name, location, type, and operational status (facilities_list.xlsx [RBEK00004_000000068]). I use the customer and facility locations to calculate the driving distances between them with the GridAtlas and ArcGIS software. See Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; SES0030460.html; SES0030461.docx; PROTECTED & CONFIDENTIAL Waste_Services_HMM_Sales_2018_2021.txt: RBEK00004_000000084.

[66] Note that TRD facilities include deep well disposal facilities, so the distances between TRD customers and facilities are also summarized in the distances between well water customers and facilities (similarly Secure's FST and customer distances are also included in the well water customers). See, e.g., Engel testimony, December 20, 2021, p. 153, questions 427-428 ("Q. Okay. And those five FSTs also have water disposal wells. Is that correct? A. That is correct. Q. Okay. There are really 10 disposal wells, then? A. Yes.").

EXHIBIT 4
Distribution of travel distance between customers and Secure and Tervita facilities

	Company	Product Market[1]	Number of Transactions[2]	Number of Associated Customer Wells	Average Travel Distance (km)	Median Travel Distance (km)	90th Percentile Travel Distance (km)
1.	Secure	Landfill	38,074	[redacted]			
2.	Secure	TRD	211,928				
3.	Secure	Water, TRD	157,780				
4.	Tervita	Landfill	71,413				
5.	Tervita	TRD	292,312				
6.	Tervita	Water, TRD	134,188				

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Tervita transactions were excluded from this analysis if the customer was Tervita; if they had blank, most add-on services, or terminalling service types; if they are associated with a TCC, Hydrovac, or fractionation plant; or indicated credits (i.e. negative revenue). Secure transactions were excluded from this analysis if the customer was Secure; if they had blank, industrial landfill, terminalling, or "Other Revenue" general ledger names; or indicated credits (i.e. negative revenue). Moreover, this sample does not include transactions missing travel data due to unconvertable UWI or undefined travel routes (e.g. off-road terrain).
[1] TRDs are listed with the water disposal wells since TRDs often have water disposal wells on site that can dispose of waste and produced water directly without any processing or treatment services. The summary statistics for the "water, TRD" product market only include TRD transactions for direct water disposal services akin to the services provided by standalone water disposal wells.
[2] Statistics are weighted by the number of transactions.

32. Moreover, my findings are consistent with the information Tervita and Newalta provided to the Bureau during their 2018 transaction. According to Tervita and Newalta, "treatment of oilfield waste and its disposal is regional in nature… Typically, the majority of customers will be located within [redacted] km of a treatment facility…"[67]

3.4. Industry pricing practices

33. Waste service providers, such as the Parties, charge customers disposal fees for their services. The presence and proximity of other competitors, distance between customers and the facility, master service agreements, and volume commitments, among other factors, determine how disposal fees are set. In other words, the Parties can and do price discriminate between customers (i.e., charge different customers different prices) depending on locations and local

[67] Tervita and Newalta further explained that "distance between customers and facilities "varies considerably depending on the local topography and infrastructure (e.g., rivers, mountains, roads, density of production activity), and whether the customer has solid waste or waste water to process. Customers are generally more willing to transport solids farther than water, in part because there are more options available to dispose of waste water. In more remote locations, customers are more willing to transport waste upwards of [redacted] km if necessary to receive service." Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018 [RBBA00008_000000023], p. 14.

competitive conditions. The Parties' practice of price discrimination is reflected in the Parties' internal documents and their transaction-level sales data.

34. Tervita's internal documents show that its pricing varies across its facilities and local competition is a consideration in pricing decisions. For example, an internal pricing discussion document indicates that Tervita considers "market rate and strategy" at each facility separately.[68] Other pricing strategy documents include facility-level pricing information, including average rates quoted for different service types and the win/loss records for them.[69]

35. Regarding local market conditions, a Tervita presentation about market rates shows that "competition" and "competitive dynamics" are factors that Tervita considers when deciding to adjust its rates,[70] and a Tervita competition analysis tracks proximity to competitor facilities and estimated competitor pricing information.[71] Oil and gas producers also note that prices are negotiated based on local market conditions.[72] Other documents suggest that prices tended

[68] Email chain from Shane Nelson to Curtis Benson, "FW: Deliverable due Wednesday- Pricing Strategy Documents," January 11, 2017, TER_00057979 [redacted]

[69] Email chain from mhavens@tervita.com to wscholze@tervita.com et al., "FW: Market Rates Review/PBR Review," July 22, 2019, TEV00242986, attachment "Market Rate Review – AREA SUMMARY 07-2019.xlsx," TEV00242988 [redacted] See also Tervita "Facilities metrics breakdown-Lindbergh," [TEV00107405]; Tervita, "Facilities metrics breakdown-Fox Creek Landfill [TEV00060814]; Tervita, "Facilities metrics breakdown-Spirit River Landfill [TEV00046126]; Tervita, "Facilities metrics breakdown-La Glace TRD [TEV00046073]; Tervita, "Facilities metrics breakdown-Fort McMurray [TEV00044566].

[70] Email chain from Shane Nelson to Curtis Benson, "FW: Deliverable due Wednesday- Pricing Strategy Documents," January 11, 2017, TER_00057979, attachment "WP 2017 Market Rate – Internal Information," TER_0005781, p. 4 [redacted]

[71] A Tervita competition analysis describes the distances to the next nearest competitors for each facility, along with estimated competitor prices and market shares for different Waste Service types. See TER_00023052. Email chain from Keith Blundel to Jesse Rausch, "Market Studies," January 24, 2018, [SES0004680] [redacted] See also Dawson Creek FST study [SES0004681].

[72] Witness Statement of Paul Dziuba (Chevron Canada Resources), February 24, 2022, ¶ 14 ("Chevron negotiates prices in a service contract. The price is made up of a tipping fee and disposal fee. Each facility will have varying tipping fees that are priced according to market dynamics and the levels of surrounding competition."); Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, p. 5 ("Pricing and business terms are established through negotiation. Tipping fees and trucking rates (in cases when they offer trucking) are usually negotiated annually. As with most services, supply and market demand pressures will impact the fees that Obsidian is required to pay."); Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 44 ("In PECL's experience, companies offering waste disposal services are aware of their customers' transportation costs and offer specific customers prices that are comparable with the next-closest option, taking into account those transportation costs") Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 21 ("Companies like Secure know where third party owned facilities (including

to be lower in regions where competitors could potentially attract Tervita's customers away by offering lower prices.[73]

36. Tervita's transaction data confirms that pricing for the same service varies across different facilities. For example, according to Tervita's 2019 transaction data, Tervita's per ton "Plant based rate" for "drilling waste advanced gel chemical" was [redacted] at the Fox Creek landfill, [redacted] at the East Peace landfill, and [redacted] at the Judy Creek landfill.[74] The transaction data also shows that prices vary across customers who deliver their waste to the same facility. For example, Tervita's 2019 "ticket rates," (i.e., prices after discounts to the "Plant based rate") at the East Peace landfill varied between [redacted] and [redacted] and, at the Judy Creek landfill, they varied between [redacted] and [redacted] [75] Mr. Engel, a senior vice president at Secure, testified that Secure's prices also change by facility.[76]

37. Proximity to competitors' waste service facilities and the oil and gas producers' well site locations are additional factors in pricing decisions. Secure's Mr. Engel testified that Secure takes into account customers' locations and competitive conditions.[77] Tervita often conducts a differential analysis that

---

CNRL-owned facilities) are located relative to their own facilities and the estimated trucking costs, and may price their services based on this knowledge."); Witness Statement of the Orphan Well Association, February 22, 2022 at ¶ 38 ("Pricing for the disposal of oil and gas waste is transparent. Waste disposal companies like Secure and the former Tervita must track where the waste being disposed of in their facilities is coming from (i.e., the generating site). As a result, they are able to determine how much it would cost to truck waste to the next closest facility. This allows them to adjust their tipping fees so that the total cost of disposal is still cheaper than going to the next closest facility").

[73] [redacted]

[74] See my workpaper. The analysis is based on Tervita's 2019 sales data. See Workpaper 2.

[75] See my workpaper. For example, at the Judy Creek landfill, Tervita charged [redacted] See Workpaper 3.

[76] [redacted]

[77] Engel testimony, December 20, 2021, questions 121-122 ("Q. Does Secure agree that it can and does adjust the tipping fees it may charge a customer based on the location the waste is coming from? A. That is the one of the things that is considered, among many. Q. Okay. Does Secure agree that it can and does adjust the tipping fees it

compares distances between the well locations and Tervita facilities, as well as competitor facilities.[78] The disposal prices offered may be lower or higher depending on how far a customer would need to transport the waste or how close competitor facilities are.[79] With regard to the Tervita-Newalta transaction, Secure explained that, "Customers consider the total cost of the Service fees, plus the transportation expense. Therefore, a service provider may consider the next nearest facility location in determining the price for Services."[80] A Tervita employee email chain references a negotiation with a [redacted] representative, who noted the relative proximity to Tervita and competitor facilities as a pertinent factor when asking Tervita to quote lower fees to handle his company's waste.[81] Another internal email discusses pricing for [redacted] and an attachment spreadsheet compares the travel distances, times, and

---

may charge a customer based on the competitive options it believes the customer has? A. That is one consideration among many.").

[78] I understand that Tervita uses the differential analyses to assess the transportation costs of nearby competing facilities in order to determine a per-unit price to offer to the customer. Email chain from bbowes@tervita.com to mjohnson@tervita et al., "RE: [redacted] / Mile 103 Pricing Follow Up," October 13, 2020, TEV00114394, attachment "Trucking Differentials [redacted] Mile 103.xlsx," TEV00045140 ("Please see attached. [trucking differential analysis] You can play around with the variables to see the impact. The trucking differentials will help determine where we should be at."); Email chain from tnickled@tervita.com to drollings@tervita.com , "FW: [redacted] Differential," October 5, 2020, TEV00155420 ([redacted] See also Email chain from tnickel@tervita.com to cmacmullin@tervita.com, "Re: [redacted] volumes," October 15, 2020 [TEV00223412], attachment [TEV00223413] [redacted]

[79] [redacted]

[80] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 5. See also Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 44 ("In PECL's experience, companies offering waste disposal services are aware of their customers' transportation costs and offer specific customers prices that are comparable with the next-closest option, taking into account those transportation costs"); Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 21 ("Companies like Secure know where third party owned facilities (including CNRL-owned facilities) are located relative to their own facilities and the estimated trucking costs, and may price their services based on this knowledge.").

[81] [redacted]

trucking cost differentials per tonne of shipment in order to assess the rates that Tervita needs to match to compete for their business.[82]

38. Documents and testimony also indicate that waste service providers may consider customers' volume commitments specific to third-party waste service at facilities in pricing decisions.[83] In one example of negotiations with an active customer, a Tervita employee agreed not to increase prices at the Buck Creek facility in exchange for commitment, stating that Tervita could "[p]otentially go even lower with discounted rates to entice them to sign for a longer period under commitments."[84] In the [redacted] negotiation noted above, the correspondence recommends offering rates that are based on an agreement to deliver 100% of waste streams to Tervita.[85] Mr. Engel testified that arrangements with customers may allow for discounted rates when volumes exceed a specified threshold.[86]

---

[82] In particular, the trucking differential spreadsheet summarizes the estimated competitor rates to dispose of waste, distances to the waste sites, travel speed, travel time roundtrip, differential per truck, trucking differential per tonne, and the "Tervita Rate to Match" compared to nearby facilities belonging to competitors. See Email chain from bbowes@tervita.com to mjohnson@tervita et al., "RE: [redacted] / Mile 103 Pricing Follow Up," October 13, 2020, TEV00114394, attachment "Trucking Differentials [redacted] Mile 103.xlsx," TEV00045140 ("… with more volume our cost/m3 is reduced. If we can get understanding of committed volume Mike would also agree we can reduce rate."). See also Email chain from tnickel@tervita.com to drollings@tervita.com, "FW: [redacted] Differential," October 5, 2020, TEV00155420 [redacted]

[83] Email chain from jmcneil@tervita.com to amorgan@tervita.com et al., "RE: [redacted] Cuttings Discussion," September 16, 2020, TEV00137398 ([redacted] Email chain from Ryan Richardson to Daniel Schwarz, "Re: [redacted] Cost Reduction Initiative," March 17, 2020, SES0043674 [redacted] . Engel testimony, December 20, 2021, questions 503-505 ("Q. Okay. So then why would Secure agree to charge a price other than the base rate? A. It could be volume based. Q. Can you elaborate on that? A. Well, if you show up with 10 units of something versus a hundred versus a thousand, you can expect a lower price for larger volumes. Q. Okay. And is there anything that you do with respect to this that is typically done, routinely done, to figure out whether Secure will charge a price other than the base rate? A. Primarily, it is volume driven."). See also examples in SES0045741; SESL0005839; SESL0017504; SES0018395.

[84] Email chain from Miguel Juat to Kayla Nagorski and Rob Menzies, "RE: Level 2 DOA – [redacted] – Jan 7, 2016," January 27, 2016, TER_00042320 ("1. Proceed with the below but include the commitments, even if it's for a shorter period, where the rates and volume gets locked in for say six months to align with June one rates this year and we can review again then. 2. Potentially go even lower with discounted rates to entice them to sign for a longer period under commitments given they're a reasonably large unmanaged account.").

[85] Email chain from Vince Lisch to Duane Burkard, "FW: [redacted] DOA Request," February 9, 2016, TER_00024414 ("However, because of the level of competitiveness that is currently occurring in that region especially with literally no-one drilling…I feel it may be advisable to take this one step further and reduce by an additional [redacted] in the line of obtaining a signed, minimum 1yr, exclusivity agreement with 'make whole' on at a minimum both of these waste streams from [redacted] .

[86] Engel testimony, December 22, 2021, question 1490 [redacted]

39. I understand that some customers may sign master service agreements, or "MSAs," that specify waste service prices to be paid for disposing specific wastes across a fixed time frame—a year or longer.[87] However, several examples in the documents suggest that, even when an MSA is in place, customers may negotiate lower waste service prices with the Parties.

- [redacted] had an MSE with Secure dated from September 2019 to September 2020 for FST pricing at the Fox Creek and Kaybob facilities.[88] [redacted] requested project-specific rates in March 2020, and Secure offered it lower rates than specified in the MSA for Shell's produced water and flowback water volumes.[89]
- [redacted] requested lower rates than what was specified on its MSA with Secure based on quotes it was receiving from a nearby Tervita facility.[90]
- The **Orphan Well Association ("OWA")**, tasked with remediating abandoned wells from producers that have gone bankrupt,[91] signed a "supplier of choice" agreement with Secure and Tervita in place from June 2020 to June 2021.[92] The OWA explained that this agreement sets the ceiling price but OWA can negotiate lower prices.[93]

[redacted]

[87] Engel testimony, December 20, 2021, questions 340-342.

[88] Amending Agreement #3 between [redacted] and Secure Energy Services, Inc., September 1, 2017 [SES0020531].

[89] Email to Pat Coffey, "Re: Fox Creek Produced Water Capacity," April 9, 2020 [SES0084905] [redacted]

[90] Secure Energy Services, "MSA Rates – Updated Jan 24, 2018," [SES0089949]; Email chain from David Mattinson to Corey Higham, "Re: [redacted] October 20, 2018, [SES0064462].

[91] Witness Statement of the Orphan Well Association, February, 22, 2022, ¶ 10.

[92] "Supplier of Choice Agreement between Alberta Oil Orphan Abandonment and Reclamation Association and Secure Energy Services, June 23, 2020 [SES0017850].

[93] Indeed both Secure and Tervita offered rates lower than specified by the MSA as early as October 2020. Witness Statement of the Orphan Well Association, February, 22, 2022, ¶ 32 ("The Secure Agreement effectively sets the ceiling price for tipping fees and disposal fees that the OWA pays to Secure as the OWA will seek lower rates. When the OWA seeks to dispose of oil and gas waste, our Prime Contractors typically request quotes for disposal of that waste into landfills or TRDs depending on the composition of the waste. … For example, in October 2020, the OWA was cleaning up a site near Debolt, Alberta. The OWA contractor in charge of that job was Sharp. Sharp sought a quote from Secure for disposal of this waste into Secure's Fox Creek landfill and also from Tervita's Fox Creek Landfill. Secure agreed to take the waste for $14.50 a tonne which is lower than the rate provided for in the Secure Agreement."); SES0018395; TEV00119499. See also Email chain from mbongfeldt@tervita.com to tfittes@tervita.com, "Re: [redacted] Drill Waste Update," February 12, 2018 [TER_00069850] ("Note that their MSA rates are a ceiling essentially, as most of these are higher than what we have negotiated down over the years and what [redacted] is currently receiving as rates in QFAIM.").

40. Together, the evidence suggests that, while some customers negotiate rates under MSA agreements, they are situationally able to obtain lower rates, including in response to competing rates from competitors or rates that are project-specific.

41. Mr. Engel also testified that other factors, such as "[r]elationships, historical pricing for different customers in different areas," as well as prices paid for bundles of services, may lead to discounted pricing.[94] He explained that oil and gas producers' field supervisors move around to different well sites, and they may try to negotiate lower prices for one field site based on prices paid at other locations where they have worked.[95] He also described how Secure would consider discounting the prices paid for particular service when considered together with all of the waste services purchased from Secure.[96]

42. I understand that arbitrage in waste services is not possible.[97] In economics, arbitrage is the practice of profiting from price differences between two or more markets. In the case of waste services, customer A, who is facing higher disposal fees, can theoretically take advantage of lower disposal fees quoted to customer B by sending its waste to customer B and customer B then sending the waste to Waste Service providers at the lower disposal fee. However, due to waste manifesting and tracking requirements, waste services providers always know the original customer and the location where the waste is generated and thus can prevent arbitrage.[98] Further, high transportation costs would likely

---

[94] Engel testimony, December 20, 2021, questions 508-512.

[95] Engel testimony, December 20, 2021, questions 508-512.

[96] Engel testimony, December 22, 2021, questions 1475-1476 ("A. I think we would consider what we are doing with other services such as oil before we would make a change to a different service so as not to impact the relationship. Q. Right. So you may offer discounts to customers based on other products that they may be purchasing from Secure? A. Yes.").

[97] In their submissions to the Bureau, the Parties did not mention the possibility or practice of arbitrage. Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002].

[98] See Engel testimony, December 20, 2021, Qs. 526-529: UWI stands for unique well identifier? A. Correct. Q. And the UWI tells Secure where the waste is coming from. Correct? A. Yes. Q. Okay. You agree that Secure knows where the waste going into landfills, its FSTs and disposal wells, is coming from? A. Yes. Q. Okay. So you would agree all waste that is coming into a landfill TRD and disposal well, Secure knows where all that waste is coming from? A. Yes."); Witness Statement of Carol Nelson, January 25, 2022, ¶ 26 ("In addition to issuing approvals for certain waste-receiving facilities in Alberta, the AEP also mandates certain reporting requirements for hazardous waste. To track hazardous waste from its point of generation, the AEP issues an identification number to each hazardous waste-generating facility."). For chain of custody requirements see Tervita, "AER Directive 58 Reference," available at https://tervita.com/files/public-files/aer-directiven-58-reference.pdf (Alberta), BC Environment Industry Association, "General Information Fact Sheet Hazardous Waste Management in BC" https://bceia.com/wp-content/uploads/2018/05/bceia_001_Hazardous_Waste_Management_in_BC_General_Information_2013.pdf (British Columbia), SRC Environmental Analytical Laboratories, "Chain of Custody / Analysis Form," https://www.src.sk.ca/sites/default/files/files/resource/EAL%20COC%20and%20TC%20FILLABLE%20CSM-132A_May2021.pdf (Saskatchewan).

eliminate any arbitrage opportunities if the waste is physically transported between customer facilities.

4. **MARKET DEFINITION**

43. A common theme in antitrust analysis is that mergers or acquisitions may harm customers if they "are likely to create, maintain or enhance the ability of the merged entity, unilaterally or in coordination with other firms, to exercise market power… Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time."[99] A useful analytical tool in assessing how a merger changes the industry participants' abilities to exercise market power is market definition.[100] Market definition specifies the line(s) of commerce and geographic area(s) in which competitive concerns arise. It "identif[ies] the set of products that customers consider to be substitutes for those produced by the merging firms."[101] The customers (in our context, oil and gas producers) that might be harmed by the transaction are those that might reasonably purchase any of the identified services.

44. Defining a market involves identifying both a product market (**Section 4.1**) and a geographic market (**Section 4.2**), which is detailed below.[102]

4.1. Product markets

45. The relevant market comprises the products and services of the merging firms and those products that customers consider to be reasonable substitutes. Not every substitutable product needs to be considered in the relevant market. The *Guidelines* specify that a relevant product market consists of "the smallest group of products, including at least one product of the merging parties, and the smallest geographic area, in which a sole profit-maximizing seller (a

[99] "Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time." Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 2.1, 2.3.

[100] "Market definition is not necessarily the initial step, or a required step, but generally is undertaken." Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 3.1.

[101] High market shares and concentration inform the analysis of competitive effects even though they are not conclusive on their own regarding the effects of the merger. See Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 3.2.

[102] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.1.

"hypothetical monopolist") would impose and sustain a small but significant and non-transitory increase in price ("SSNIP")."[103]

46. I consider the following three product markets for waste services:

> (i) supply of waste processing and treatment services by TRDs;
> (ii) disposal of solid oil and gas waste into industrial landfills; and
> (iii) disposal of produced and waste water into water disposal wells owned by third-party waste service providers.

47. These three defined product markets are distinct for several reasons, and they largely do not overlap with one another. Due to federal and provincial regulations, as well as the technical capabilities of different facilities, customers have to dispose different types of waste at specific types of facilities.[104] Secure's representative Mr. Engel agreed that landfills, TRDs, and disposal wells handle different types of waste and are not generally substitutes for each other.[105] Therefore, TRD, landfill, and waste water disposal facilities are not functionally substitutable across all different types of waste. Water disposal wells are not able to accept solid waste and, conversely, industrial landfills cannot accept waste water. Neither of these types of facilities are substitutes for the services offered by TRDs, which handle wastes that require treatment to separate resalable oil from water or other fluids, and other types of waste processing that reduce the fluid's hazard level before it can be safely disposed.[106]

48. Company documents and transaction data confirm that each facility handles different and largely non-overlapping types of waste. For example, a Tervita document presented in **Exhibit 5** lists the types of wastes accepted by different facility types and shows that there is little overlap between TRD and

---

[103] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.3.

[104] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], pp. 3-4 for regulations. See also "Energy Services Division, Waste Processing," Tervita, June 1, 2021, TER_00001910, p. 10.

[105] Engel testimony, December 20, 2021, questions 37, 43, 45 ("Q. Okay, and so you can't dispose of produced waste water in a landfill, and you can't send contaminated soil down a disposal well. Right? A. Correct. In most cases, there are some disposal wells, or have been historically, that have disposed of solids, but, in general, they are not interchangable. … Q. Mr. Engel, would you agree with me that services provided by FSTs or TRDs are not a functional substitute for services provided by landfills? A. Yes. … Q … But would you agree with me that the treatment services that an FST and TRD provide are not a functional substitute for services provided by disposal wells? A. The majority of treatment services, yes.").

[106] See Section 3.2.

landfill facilities,[107] and **Exhibit 6** uses the Parties' transaction data to demonstrate minimal overlap across all three product markets.[108]

EXHIBIT 5
Wastes accepted by different types of facilities

	TRDs (Fluids)	Caverns (Fluids and Solids)	Landfills (Dry Solids)
Drilling	• Dirty Water from Rig Tanks • Spent Drill Mud	• Drill Mud • Cuttings	• Cuttings • Solids from Drill Mud
Completions	• Water Flowback • Acid Water Flowback • Hydrocarbon Flowback • Frac Sand Returns	• Frac Sand • Cement	• Frac Sand Returns • Cement
Production	• Emulsion • Produced Water • Sludges • Dry Oil / Condensate	• Oil Field Sludges • Waste Water • Produced Water • NORMs	• Produced Sand • Lime Waste • NORMs
Turnarounds	• Tank Bottoms • Treater Bottoms	• Tank Bottoms • Sludges	
Spills	• Oily Water	• Spill Material	• Contaminated Soil • Contaminated Wood
Abandonments			• Contaminated Soil from Pits • Contaminated Soil from Facilities

Water Oil Solids

Source: "Tervita at [redacted]" Tervita, August 19, 2019 [TEV00143218], p. 24

49. The Parties' transaction data confirm that each type of facility accepts different types of waste and there is minimal overlap between types of facilities. **Exhibit 6** lists the largest categories of waste types delivered to Tervita facilities by the facility types. In particular, it describes the types of wastes delivered to Tervita landfills, TRDs, and water disposal facilities according to

[107] There are no common waste categories in this chart that are accepted by both TRDs and landfills, with the exception of "frac sand returns" generated by the well-completion process. Note, however, that there is overlap in wastes accepted at TRDs and caverns or between caverns and landfills. For example, both TRDs and caverns accept produced water and sludge generated during production, as well as tank bottom wastes generated during turnaround. Both caverns and landfills accept cuttings generated during drilling, cement generated during completions, and NORM waste generated during production.

[108] Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 5 ("Caverns are used primarily for difficult to treat solid and liquid wastes that are not suitable for Waste Management Facilities or Landfills. These types of waste include but are not limited to; high pH fluids, tight emulsions, NORMs, chemicals, and sludges."); Engel testimony, December 22, 2021 at p. 565, questions 1569-70. I understand that Tervita operates all but two caverns in the WCSB (White Swan and Plains Environmental own Atmore West and Melville caverns, respectively). The two competitor owned caverns are in rural locations. The competitor owned caverns are respectively 169 kilometers and 215 kilometers away from the nearest landfill owned by the Parties and respectively 33 kilometers and 214 kilometers away from the nearest waste water disposal facility owned by the Parties. See my workpapers. I understand that caverns are facilities that dispose of liquid and solid wastes that can be handled by landfills and waste water wells (see Section 3.2). In my analysis, caverns are considered to be potential sources of competition in all three product markets. See Workpaper 4.

the 2019 transaction data. Notably, most of the different types of waste can only be handled by one facility type, e.g., "waste-drill cuttings" and "waste-contaminated soil" is always handled by landfills, whereas "waste-drill fluids" and "waste-processing" is always handled by TRDs. Most TRDs have water disposal wells on site and are able to take in produced water and waste water.[109]

EXHIBIT 6
Waste services rendered by different types of facilities

	Service Group	Service Share of Total Revenue	Share of Revenue going to a... Landfill	TRD	Water Disposal Facility
1.	Waste - Contaminated Soil	[redacted]			
2.	Waste - Drill Cuttings				
3.	Waste - Lime Sludge				
4.	Treating - Emulsion				
5.	Treating - Water				
6.	Waste - Bitumen Waste Unit				
7.	Waste - Drill Fluids				
8.	Waste - Drilling Fluids				
9.	Waste - Ebd Water < 12.5 Ph				
10.	Waste - Hydrovac Waste				
11.	Waste - Processing				
12.	Waste - Solid Component				
13.	Waste - Solids				
14.	Waste - Water Component				
15.	Waste - Ho Processing				
16.	Waste - Sludge				
17.	Water - Waste Water				
18.	Waste - Frac Water				
19.	Water - Produced Water				
20.	Other Services				
	Total / Average[1]				

Source: Tervita Transaction Data; Secure Transaction data; Appendix; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: Transactions were excluded from this analysis if the customer was Tervita; if they had blank, add-on service, or terminalling service types; if they are associated with a TCC, Hydrovac, or fractionation plant; or indicated credits (i.e. negative revenue). Moreover, this sample does not include transactions missing travel data due to unconvertable UWI or undefined travel routes (e.g. off-road terrain). One transaction was removed from "Waste - Drill Cuttings" due to misassigned units. In this table, the Water Disposal Facility category includes stand-alone facilities only, and do not include the TRDs with water disposal wells on site, which also dispose of produced water and waste water.
[1] Service type groups are generated based on specific service types.
[2] TRD includes cavern facilities.

[109] I include produced and waste water disposal services rendered at TRDs as part of the product market that includes standalone water disposal facilities. Tervita, in particular, operates fewer standalone waste water disposal wells, but the TRD facilities dispose of large quantities of produced and waste water that could otherwise be sent to standalone water disposal wells (i.e., tickets in the Tervita transaction data that do not include processing or treatment services).

50. Parties' documents also suggest that the companies view and analyze TRDs, landfills, and water disposal wells separately. For example, the Tervita's profit-loss statements separately summarize landfills, water services, and TRD facilities,[110] and in "facilities metric breakdown" reports, Tervita analyzes the competitive conditions of TRDs separate from landfills.[111]

51. Parties' submission to the Bureau in this matter identify and discuss these three markets separately as overlapping business operations between Secure and Tervita. The Parties refer to the separate services as "(i) produced water and waste water disposal; (ii) oil processing and handling; (iii) liquid oilfield waste processing; and (iv) solid oilfield waste disposal."[112] Note that in this report, I do not analyze "oil processing and handling" services.

52. The *Guidelines* describe a "hypothetical monopolist" analysis to verify that a candidate market indeed constitutes a relevant antitrust market.

> [T]he analysis proceeds by determining whether a hypothetical monopolist controlling the group of products in that candidate market would profitably impose a SSNIP [significant and non-transitory increase in price], assuming the terms of sale of all other products remained constant.[113]

53. Each of these three types of waste service constitutes a relevant product market because oil and gas producers are obligated to manage their waste and there are no viable alternatives to TRDs, landfills, and water disposal wells as I discuss in detail below. Documentary evidence demonstrating that the Parties compete head-to-head and analyses demonstrating that the merger will lead to fewer viable substitutes presented throughout my report suggest that a

---

[110] Tervita's PROTECTED & CONFIDENTIAL Water Services 2017-2021 P&Ls.xlsx [RBEK00004_000000011], PROTECTED & CONFIDENTIAL LF-Financial Summary_no link.xlsx [RBEK00004_000000085], and PROTECTED & CONFIDENTIAL TRD-Financial Summary with EM Final_no link 05-27-2021.xlsx [RBEK00004_000000057].

[111] For example, Tervita, "Facility Metrics Breakdown – TRDs and Disposal Wells," 2016/2017, TER_00085702; SESL0009217 ("The Secure Elk Point location (03-15-055-06 W4) operates a Full Service Terminal (FST) for waste processing of oilfield waste at the same location as a class 2 landfill. The facilities have separate approvals and are regulated differently but work together to manage waste efficiently."). See also examples in TEV00248947; TEV00061715.

[112] "The parties' business operations overlap in respect of four services: (i) produced water and waste water disposal; (ii) oil processing and handling; (iii) liquid oilfield waste processing; and (iv) solid oilfield waste disposal." Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 10. The submission discusses each of these services separately on pages 10-14.

[113] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.4.

hypothetical monopolist could raise prices in these markets without incurring much lost waste volume.[114] In other words, a SNNIP would likely be profitable given the evidence on this matter.

4.1.1. *The supply of waste processing and treatment services by TRDs is a relevant product market*

54. As discussed above, waste that requires processing or treatment before it can be disposed of is typically shipped to and processed by third-party TRDs. Provincial regulations require oil and gas producers to treat certain wastes before it can be disposed of in a water disposal well or landfill.[115] TRDs treat these type of wastes, which can be comprised of liquid, solid, or some combination of liquid and solid wastes, to meet the regulatory standards. Rows 4 through 15 of **Exhibit 6**, for example, list the types of waste/services uniquely handled by Tervita TRDs. These services include emulsion and water treating, high-solids sludge processing, and other types of waste processing services.[116]

55. Waste that has been treated or processed ultimately results in liquid and/or solid waste byproduct that meets regulatory standards for safe disposal. For example, in **Exhibit 6**, I understand that the service category "Waste – Solid Component" (row 12) and "Waste – Water Component" (row 14) are wastes that have undergone some form of treatment or processing in order to meet the environmental standards for disposal at a landfill and water disposal well, respectively.[117]

---

[114] See Section 5.2.1. While I did not perform a formal hypothetical monopolist test, analysis of proximity between customers' well sites and waste service facilities suggest that Secure customers are often located nearer to a Tervita facility than another third-party competitor, and similarly Tervita customers are often located nearer to a Secure facilities (Section 5.2.2). Moreover, as I will describe in Section 5.2.2, measure of diversion between the two Parties is often high, suggesting that the Parties' customers are more likely to switch between the Parities facilities if one of them where to increase prices.

[115] See Section 3.2.1.

[116] I understand that most oil and gas producers cannot handle TRD-types services as part of their operation. However, testimony from Murphy Oil suggests that they have the capacity to handle their emulsion process, but they are unable to process other TRD-specific wastes such as sludges and tank bottoms. For the latter, Murphy Oil requires services from third-party waste service providers such as Tervita and Secure. Witness Statement of Jarred Anstett (Murphy Oil Company Ltd.), February 21, 2022, ¶¶ 11-15. Another witness testified that they have not considered building a TRD (cavern or landfill) because it would be cost prohibitive to do so. [redacted] Witness Statement of Gibson Energy Inc., February 24, 2022, ¶ 10.

[117] Caverns, of which there are four operated across the WCSB by Tervita, White Swan, and Plains Environmental, can be used to dispose of liquids and types of slurried solids that cannot necessarily be disposed of in a landfill or water disposal well. See Engel testimony, December 20, 2021, p. 29, question 76 (A. Yes, the solid waste or soils that could go to a landfill could also go to caverns if they can be slurried and pumped down the well."); Engel

56. **Exhibit 7** summarizes the share of TRD transactions that comprise bundles of waste services provided by TRDs, including treatment or processing, water disposal, and solid disposal. The majority of TRD revenue for Secure and Tervita comes from bundles of services. Emulsion treatment and water disposal services comprise the largest share of bundled revenue (i.e., percent of Secure's TRD revenue and [redacted] percent of Tervita's TRD revenue), and the lower panel reports the mean per-unit price and volume for those treating and water disposal services at Secure and Tervita facilities.[118] Tank bottoms and wash fluids are other common substances that require a bundle of services, including processing, solids disposal, and water disposal. Because TRDs render these services together, water wells and landfills cannot be used as substitutes to dispose of them.

testimony, December 22, 2021, p. 565, questions 1569-1570 ("It says: 'Caverns are used primarily for difficult to treat solid and liquid wastes that are not suitable for waste management facilities or landfills.' That was accurate when Secure made its submissions on May 17th 2018? A. Yes. Q. And that is still accurate today? A. Yes, primarily."). Because caverns can be used to dispose of wastes sent to all three facility types, I conservatively include them as potential sources of competition in all three product markets. However, the services observed in the Tervita transaction data appear to most align first with services provided at TRDs and, second, at water disposal wells.

[118] Many transactions also include some type of truck flushing or H2S Scavenger service as part of the services rendered for each emulsion delivery. See Workpaper 5.

EXHIBIT 7
Multi-step services offered by TRDs

	Secure TRD		Tervita TRD	
	Revenue Share		**Revenue Share**	
Bundled Services	[redacted]			
Emulsion				
Tank bottoms				
Wash Fluids Water				
	Mean per-unit price	**Mean volume (m3)**	**Mean per-unit price**	**Mean volume (m3)**
Emulsion	[redacted]			
Treating				
Water Disposal				
Tank bottoms				
Processing				
Solids Disposal				
Water Disposal				
Wash Fluids Water				
Processing				
Solids Disposal				
Water Disposal				

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: Bundled of services are identified in the Secure transaction data by observations that share the same "transaction ID," and in the Tervita transaction data, by observations that share the same "ticket ID."

57. Most TRDs can also take in produced and waste water that do not require further treatment. TRDs dispose of this waste at water wells located on site.[119] I treat these wastes and the disposal services as part of the water disposal market since these wastes delivered to TRDs are directly injected into the water disposal wells on location (i.e., I treat certain TRD services as substitutes for services rendered at water disposal wells).[120] However, water disposal wells are not, in general, substitutes for TRDs because they cannot handle waste that

[119] For example, I understand that the service categories "Waste – Water Waste" and "Waste – Produced Waste" summarized in in Exhibit 6 are shipments of waste from an oil and gas producer to a TRD for disposal at an on-site water well. See, e.g., Engel testimony, December 20, 2021, p. 153, questions 427-428 ("Q. Okay. And those five FSTs also have water disposal wells. Is that correct? A. That is correct. Q. Okay. There are really 10 disposal wells, then? A. Yes.").

[120] In particular, I classify "produced water" and "waste water" deliveries to TRDs as part of the water disposal market since those volumes did not require any treating or processing services prior to disposal according to the Parties' transaction datasets.

requires further processing and treatment before disposal into a water disposal well.[121, 122]

58. As oil and gas production results in certain types of waste that needs to be managed and requires treatment and processing before it can be stored in a landfill or water disposal well, a hypothetical monopolist that owns all TRD facilities likely would find it profitable to impose a SSNIP on the prices for TRD waste services.

4.1.2. *The disposal of solid oil and gas waste at third-party landfills is a relevant product market*

59. Environmental regulations also require that oil and gas producers appropriately dispose of solid wastes in landfills certified to handle specified levels of waste toxicity.[123] This type of solid waste does not require processing or treatment services provided by TRDs. Solid wastes falling into this category and generated by the oil and gas industry include drill cuttings, types of contaminated soil, cement, and sand, among others.[124] Landfills operated by third-party waste service providers and used to dispose of this solid waste comprise a second product market.

60. In addition to landfills, I am aware of other potential methods of handling solid waste disposal, but I understand that none of them are viable alternatives to third-party landfills like those operated by the Parties. These include bioremediation, waste storage at the well site, disposal at municipal landfills, disposal at producer-operated landfills, and "self-supply." Below I describe

---

[121] Engel testimony, December 20, 2021, p. 19, question 44 ("Q. Okay, and you would agree with me that services provided by FSTs or TRDs are not a functional substitute for services provided by disposal wells? A. It depends because… most, if not all, the vast majority, of FSTs have a disposal well as part of their infrastructure… so they would be able to be interchangable for an SWD, but an SWD would not in most cases be able to substitute for an FST, with the exception that some disposal wells can handle small volumes of emulsion or oil-water mixes and be able to provide some services that are provided by an FST. So there is some overlap between the two. It is not a perfect line between them.").

[122] I understand there are some instances when water disposal wells can provide emulsion-treating services for small volumes and oil and gas producers may operate small-scale batteries that allow them to treat smaller volumes of emulsion on site. These alternatives, however, do not appear to be viable alternatives for the vast majority of waste services offered by TRDs. Engel testimony, December 20, 2021, p. 19, question 44 ("…with the exception that some disposal wells can handle small volumes of emulsion or oil-water mixes and be able to provide some services that are provided by an FST. So there is some overlap between the two. It is not a perfect line between them.").

[123] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], pp. 8-10, 17-23; Witness statement of Carol Nelson, January 25, 2022, ¶¶ 10-15; Witness Statement of Tinu Odeyemi, January 8, 2022, ¶¶ 5-10; Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 28-29.

[124] See Exhibit 6; Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017] p. 17.

reasons why each of these alternatives are not viable large-scale substitutes to third-party landfills.[125]

61. First, bioremediation techniques, or methods using natural or plant-based decomposers,[126] can be used to dispose of some types of solid waste and bypass landfills. However, the techniques are restricted to specific types of solid wastes—they cannot be used to dispose of solids that contain metals or salts, for example.[127] These techniques are limited in their use, are relatively expensive and, therefore, are not likely be a viable large-scale substitute to landfills. Mr. Engel's testimony indicates that bioremediation is not a large-scale substitute to landfills. [redacted][128] Oil and gas producers stated that they do not consider bioremediation to be a viable substitute as it can be used to dispose of a limited number of substances.[129]

[125] Note that not all substitutes need be included in the market. Each of the examples described in this section, while potential substitutes, generally comprise a small volume of total landfill waste compared to Secure and Tervita facilities, limiting their ability prevent the Parties from increasing prices post-merger.

[126] Science World, "Bioremediation of oil spills," available at https://www.scienceworld.ca/resource/bioremediation-oil-spills/ ("Bioremediation is any process that uses decomposers and green plants, or their enzymes, to improve the condition of contaminated environments."). See also Witness Statement of RemedX Remediation Services Inc., February 7, 2022, ¶ 9.

[127] Mr. Engel explained that bioremediation cannot be used to treat soil contaminated with heavy metals or heavy end hydrocarbons. Engel deposition, December 20, 2021, pp. 39, 40, questions 95-97 ("Q. Now, if we can turn to bioremediation, Mr. Engel, can bioremediation be used to effectively treat solid waste contaminated with heavy metals? A. Not normally. … Q. Can bioremediation be used to effectively treat solids contaminated with heavy end hydrocarbons? A. Not from a standpoint of -- not normally from a standpoint of breaking down the heavy end hydrocarbons, but what also happens at bioremediation sites is that amendments are added to fluff up the solids and sometimes through the addition of those amendments and other soils the concentration of the -- say, a heavy end that can't be broken down might be reduced to a level that it now meets environmental standards.").

[128] [redacted]

[129] Witness Statement of Nigel Wiebe, January 27, 2022, ¶ 21 ("TAQA North bioremediates less than [redacted] of our waste instead of transporting the material to landfill. This material is primarily light end hydrocarbons. Bioremediation is a only viable alternative to disposal depending on the level and type of contamination. For example, waste containing heavy hydrocarbons will take longer to break down, and is therefore unlikely to be considered for bioremediation."); Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, ¶¶ 29-30 ("Given the typical contents of contaminated soil generated by Obsidian, bioremediation is not a replacement for disposing at a landfill."); Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 72-74 ("… Of note, only a portion of PECL's overall solid oilfield waste may be treated via bioremediation methods. Only contaminated soils are eligible for bioremediation. Waste recovered from the subsurface environment including drilling cuttings and spent drilling muds are, at times, contaminated with salts and heavy end, long chain hydrocarbons which cannot be remediated through biologic processes. Given these collective challenges PECL does not consider bioremediation to be a legitimate substitute for landfill disposal."); See also Witness Statement of RemedX Remediation Services Inc., February 7, 2022, ¶¶ 9-10 ("The bioremediation at RemedX's Breton Facility is not effective for soils contaminated with heavier hydrocarbons. Bioremediation is also expensive relative to disposal of the same material at a landfill (approximately double the cost). In RemedX's experience, customers for solid waste disposal are cost-sensitive and generally prefer the cheapest option; they typically choose to use landfills instead of bioremediating solid waste.").

Moreover, I understand that in past matters, the Competition Tribunal found that bioremediation was not a close substitute,[130] and, in the Parties' submission to the Bureau, they did not identify bioremediation as an alternative to landfills.[131]

62. Second, oil and gas producers may store some solid waste generated by drilling and production activity at the well site instead of delivering it to a third-party landfill. However, onsite storage and/or disposal is often inadequately small to handle the volume of waste produced by drilled wells,[132] particularly during the early stages of well development.[133] Moreover, these producers may be trading off the costs of third-party disposal with risks of incurring a fine levied by the provincial regulator from violating rules around how wastes should be disposed of, or "risk management,"[134] which eventually require disposal at some point in the future regardless.[135] Furthermore, I understand that the Competition Tribunal found that risk management through onsite storage was not a viable large-scale substitute for landfills in a past matter.[136]

---

[130] The Commissioner of Competition v. CCS Corporation et al., 2012 Comp. Trib. 14, ¶¶ 63, 88 ("Bioremediation has been described above and the evidence is clear that it is not an acceptable substitute for generators of Hazardous Waste if soil is contaminated with salts or metals. The Tribunal also accepts that, if heavy-end hydrocarbons are present, bioremediation is not cost effective or successful in a reasonable timeframe."); Witness Statement of Nigel Wiebe, January 27, 2022, pp. 5-6 ("TAQA North bioremediates less than [redacted] of our waste instead of transporting the material to landfill. This material is primarily light end hydrocarbons. Bioremediation is a only viable alternative to disposal depending on the level and type of contamination. For example, waste containing heavy hydrocarbons will take longer to break down, and is therefore unlikely to be considered for bioremediation.").

[131] Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], pp. 12-14.

[132] Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, p. 8 ("Waste fluids, such as completions flowback and drilling fluids, cannot be economically stored for the long term, as tanks are typically rented as part of these operations. Soil remediation may include temporary storage atop impermeable membranes, but this is not a viable long term disposal method. Solid waste that must be disposed of due to a recent event must be moved with minimal delay."); Witness Statement of Jarred Anstett, Murphy Oil Company Ltd., February 21, 2022, at ¶ 32 ("In general, longer-term storage of waste to wait for better waste disposal pricing is not an option, particularly for high volumes like those produced during completion of a well.").

[133] Kelly Smith-Business Development at Secure Energy, "Wonowon Landfill Economics, May 29, 2019 [SES0048120] P. 7 ("Spud activity along with well depths have increased since 2016 based on 2017 numbers, resulting in more drill cuttings and waste to be disposed of. … Total area cuttings have almost doubled in the last year reaching 61,118 mT in 2017 and well depth average also continues to grow and has now surpassed 4,000m in 2017"); Witness Statement of ConocoPhillips, February 23, 2022, ¶ 15 ("Access to disposal capacity is also a factor in ConocoPhillips' choice of waste disposal facility. For example, in the Montney region many producers drill new wells at the same time of year, which collectively results in the production of a large volume of flowback water. ConocoPhillips choice of waste disposal facility during these busy times of year is often constrained by this increased demand for waste disposal capacity").

[134] The Commissioner of Competition v. CCS Corporation et al., 2012 Comp. Trib. 14, Reasons for order and order, May 29, 2021, pp. 19-20.

[135] See Section 3.2.1 regarding wastes generated during well site remediation.

[136] The Commissioner of Competition v. CCS Corporation et al., 2012 Comp. Trib. 14, ¶¶ 88, 90 ("This evidence leads the Tribunal to conclude that risk management is seldom used and is not considered to be an acceptable substitute for disposing of Hazardous Waste in a Secure Landfill… With regard to storage and risk management,

For these reasons, onsite storage is unlikely to be a viable large scale alternative to third-party landfills for most oil and gas producers.

63. Third, oil and gas producers can potentially dispose of solid waste in municipal landfills. However, municipal landfills are not likely to be close substitutes to third-party landfills because they do not typically handle the significant volumes of contaminated soil and other solid waste produced during oil and gas operations.[137] Consequently, they are not likely to be part of my relevant product market. Nonetheless, I include municipal landfills as part of the landfill product market in my competitive effects and welfare analyses, and the conclusions of my analysis hold.

64. Large oil and gas producers, such as Canadian National Resources (CNRL), may own a number of landfills and can "self-supply" solid waste disposal services.[138] However, landfills owned by producers are not close substitutes to third-party facilities.[139] They are often operated for the exclusive use of their owners and are not permitted to take in waste from other oil and gas producers,[140, 141] and other oil and gas producers noted that they would not consider building their own landfills.[142] [redacted]

---

there was no evidence about the volumes stored in NEBC and no evidence to suggest that the tenure payments or the cost to obtain a certificate of restoration have any impact on Tipping Fees at Silverberry.").

[137] Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 36 ("Municipal landfills are not an option for PECL as they are neither licensed for nor designed to accept the type of solid oilfield waste which PECL generates."); Witness Statement of RemedX Remediation Services Inc., Barrie Flood, February 7, 2022, ¶ 13 ("Municipal landfills near the Breton Facility will, at times, accept industrial waste. While municipal landfills sometimes have lower waste disposal costs, in general these municipal landfills cannot accept all of the waste types that can be disposed of at a Class II landfill and there may be greater environmental risk in disposal at a municipal landfill. In RemedX's experience, Class II industrial landfills are generally constructed and regulated to a higher standard."). See Witness Statement of Carol Nelson, January 26, 2022 at Exhibit F (RBED00003_000000002). See Section 7.1.1 for a comparison of volume taken in by municipal landfills versus Secure or Tervita landfill facilities.

[138] Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶¶ 20-24

[139] I am not aware of any full service TRDs owned by oil and gas producers. Witness Statement of Tinu Odeyemi, January 8, 2022 at Exhibit B.

[140] Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 13 ("…producers such as CNRL, Cenovus/Husky, Shell and ConocoPhillips operate landfills for their own exclusive use…"). See also Alberta Energy Regulator, "Approved Oilfield Waste Management Facilities," available at http://www1.aer.ca/ProductCatalogue/41.html.

[141] [redacted]

[142] Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 58-59 ("While the ability to dispose of solid oilfield waste is an essential service for PECL, the company does not produce sufficient volumes of internally produced solid oilfield waste to justify establishing its own licenced landfill facility. In addition to possessing insufficient volumes, PECL does not regard solid waste disposal as part of its' core business.") [redacted] Witness Statement of Paul Dziuba (Chevron Canada Resources), February 24,

[redacted] [143] For these reasons, self-supply facilities are unlikely to be viable alternatives to third-party operated landfills for all customers. Nonetheless, I include wastes delivered by other oil and gas producers to CNRL's self-supply landfills as part of the relevant product market, and the conclusions of my analysis hold.

4.1.3. *The disposal of produced water and waste water into water disposal wells owned by third-party waste service providers is a relevant product market*

65. Large amounts of produced and waste water are generated during the drilling and producing phases. This water does not often require treatment or processing before it is injected into a water disposal well. Water disposal wells may be owned by third parties such as Secure and Tervita or by the oil and gas producers.[144] In their submission, the Parties claim that self-supply is a significant source of competition for Secure and Tervita.[145] However, water disposal wells operated by waste service companies, such as Secure and Tervita, are distinct from those operated by oil and gas producers.

66. In particular, I understand that many water disposal wells used for self-supply are operated for the company's own use and that they cannot necessarily handle the total volume of produced water generated by a well, especially during the early phases of well development.[146, 147] Therefore, even oil and gas

2022, ¶ 25 ("Currently, Chevron does not operate any of its own TRDs or landfills. Chevron's primary business is oil and gas exploration and it does not have plans to build any such facilities. There are many factors that make it difficult to internalize this type of business. For example, receiving the necessary permits to begin creation of a landfill can take between 24-36 months, even just finding a geologically suitable location can be very difficult, and the capital expenditures required to build a TRD/FST or landfill have not been evaluated by Chevron as they are not economically feasible.").

143 [redacted]

144 Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 11.

145 Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021 [RBBB00001_000000002], p. 2.

146 [redacted]

147 Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 25, 60-61; Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶ 15; Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, ¶¶ 25-26.

producers who have self-supply capabilities use third-party services for "overflow" water.[148] Further, third-party water disposal wells serve oil and gas producers that do not have any self-supply capabilities and cannot use water disposal wells owned by other oil and gas producers. For example, oil and gas producers in certain regions of the WCSB do not have opportunities to drill water disposal wells and self-supply due to geological factors,[149] and witness testimony suggests that it can be costly to fully self-supply water disposal.[150] These oil and gas producers need to use third-party facilities.

67. Generally, oil and gas producers do not have access to the disposal wells owned by other oil and gas producers, but even when they do, it is on a limited basis.[151] Among oil and gas producers that do dispose of other producers' waste water, the volumes are typically small,[152] particularly compared to the amounts of waste water disposed by Secure, Tervita, and other third-party competitors.

---

[148] Secure, "Dawson Creek Area Market Study," February 2020, SES0004800, p. 6 ("Many producers in the area have their own disposal capacity [redacted] – water coming into DCFST is generally overflow from these large producers."). See also Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, p. 6; Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶¶ 13-18; Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, ¶ 25.

[149] Secure, Project Name: Pipestone SWD, April 4, 2019, SES0041155, p. 3 ("Due to the limited disposal geology in the area producers have not been pursuing inhouse disposal options."); Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶ 17 ("To begin the process of building a disposal well, Crew Energy evaluates subsurface geological targets for potential disposal zones. In depth geophysical, geological and engineering analyses occur to identify the geological horizon and the location of the well. Further, a drilling permit is acquired and then, a well is drilled, completed or converted to disposal services."); Engel testimony, December 22, 2021, questions 1509-1510 ("Q. Underneath the heading it says: 'There are limited areas within Alberta with the appropriate geology to construct disposal wells.' Mr. Engel, that was correct when Secure made its submissions on May 17, 2018. Correct? A. Yes. Q. You would agree with me that is still accurate today? A. Yes."); Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 24 ("There are limited areas within Alberta with the appropriate geology to construct disposal wells"). See also Tervita, "Energy Services, Facility Sales Plans Q3 2020: Action Plan Summary," July 15, 2020, TEV00247518.docx.

[150] [redacted]

[151] Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibits A and B; Alberta Energy Regulator, "Approved Oilfield Waste Management Facilities," available at http://www1.aer.ca/ProductCatalogue/41.html ("The AER [Alberta Energy Regulator] maintains lists of approved first and third-party oilfield waste management facilities. First-party receivers can only accept upstream oilfield waste generated by one oil and gas company, but can come from various sites. Third-party receivers can accept upstream oilfield waste from various sites and various generators."); [redacted]

[152] See, e.g., Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022, ¶ 28 ("Waste fluids, such as completions flowback and drilling fluids, cannot be economically stored for the long term, as tanks are typically rented as part of these operations. Soil remediation may include temporary storage atop impermeable

68. In particular, water disposal wells and landfills owned by oil and gas producers are not a significant option for other oil and gas producers. For landfills, I understand that CNRL was the only oil and gas company that took in solid waste from other oil and gas companies. [redacted] [54] Similarly, in 2020, oil and gas companies that accepted waste water from other oil and gas companies earned around [redacted] total compared to [redacted] of Secure and Tervita revenues.[155] [redacted] [56]

69. Nonetheless, I include facilities operated by oil and gas producers that take in waste from other oil and gas producers in my competitive effects analysis even though they are not likely to be part of the relevant market, and my conclusions hold.[157]

4.2. Customer-based geographic markets

70. A relevant market is also characterized by the geographic boundaries of competition. These boundaries can be defined around supplier facilities or around sets of customers, depending on the pricing practices in the industry. Customer-based geographic market definition may better illuminate the competitive effects of the merger when sellers can effectively price discriminate (i.e., charge different prices) among buyers. This is because, with price discrimination, competitive effects of the merger may vary for different customers—i.e., the merging parties may raise prices to certain targeted

membranes, but this is not a viable long term disposal method. Solid waste that must be disposed of due to a recent event must be moved with minimal delay.").

[153] See Workpaper 6.

[154] See Workpaper 6.

[155] See my Workpaper 6.

[156] [redacted]

[157] See also the Appendix (Section 7.7) for more details about which facilities are included and excluded from my analyses.

customers but not to others, or raise prices to some customers by more than for others. The *Guidelines* explain:

> [W]hen price discrimination is feasible, it may be appropriate to define relevant markets with reference to the characteristics of the buyers who purchase the product (assuming they can be delineated) or to the particular locations of the targeted buyers.[158]

71. Price discrimination is feasible when sellers can identify targeted customers based on their observable characteristics (e.g., location) and targeted customers cannot switch easily to other suppliers in response (e.g., due to transportation costs) and cannot engage in arbitrage.[159] As I described in Section 3.4, these conditions are met in the relevant product markets here and, as reflected in their transaction data, the Parties are able to and do charge different prices to customers depending on customers' locations and proximity to competing facilities. Therefore, I use the customer-based approach to geographic market definition.[160]

72. I define a customer-based geographic market around a set of customers that are likely to be similarly impacted by the transaction, and I then calculate the Parties' market shares based on these.[161] In particular, for each product market, I define customer-based relevant geographic markets comprised of regions from which both Parties' facilities draw waste services revenues (i.e., "overlapping draw areas").[162] Customers in this region may have distinct preferences for the facilities but roughly share the same competitive conditions. The process of defining a customer-based geographic market starts by

---

[158] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.8.

[159] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 4.8.

[160] This approach was used and analyzed in academic literature. See, for example, Coate, Malcolm, and Jeffrey H. Fischer, "A Practical Guide to the Hypothetical Monopolist Test for Market Definition," *Journal of Competition Law & Economics,* Vol. 4 no.4 (April 2008): pp. 1031–1063, at pp. 1036, 1057; Bailey, DeeVon, B. Wade Brorsen, and Michael R. Thomsen, "Identifying Buyer Market Areas and the Impact of Buyer Concentration in Feeder Cattle Markets Using Mapping and Spatial Statistics," *American Journal of Agricultural Economics*, Vol. 77 (1995): pp.309–318.

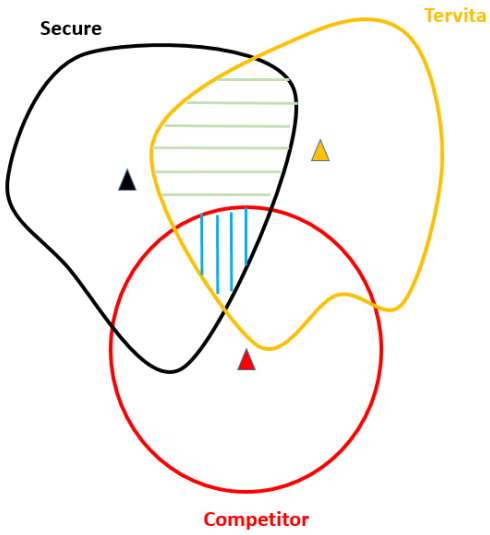
[161] As characterized by my model of customers' preferences presented in Section 5.3 and detailed in the Appendix (Section 7.4), underlying the market share calculations are individualized preferences based on how an oil and gas producer that operates a specific well site values a facility different than another nearby operator might. Customers' values for facilities that are part of the same customer-defined market include a common component that is shared across all customers in the same market and an idiosyncratic component that explains why one customer chooses a particular facility for a transaction and another customer does not. My market share analysis assumes that these customers, while acting based on individual preferences, behave similarly in aggregate because they face similar competitive conditions for waste services and would incur similar levels of transportation costs to any given facility located in the relevant market.

[162] In my Initial Affidavit, I confirmed that a facility-based market definition results in similar conclusions to those reached using a customer-based approach. See Miller June Expert Report, RCFC00001_000000015 p. 2716 at section 5.2, p. 2748.

identifying customers, or well sites, that currently benefit from competition between Secure and Tervita facilities. **Exhibit 8** illustrates the approach. In this simplified illustration, there is a Secure facility (denoted by the black triangle) and a Tervita facility (denoted by the yellow-orange triangle) that are located nearby. The black shape represents the Secure facility's draw area, and the yellow-orange shape represents the Tervita facility's draw area.

73. A "draw area" is comprise of the locations from which a waste service facility expects to acquire most of its revenues. I use the Parties' transaction data to identify the draw areas as locations of the closest well site from which a facility receives at least 90 percent of its waste service revenue. In this illustrative example, Secure's and Tervita's draw areas overlap. Customers' well sites that fall in the overlapping draw areas benefit from competition between the Parties and, thus, they may be impacted by the merger.

EXHIBIT 8
Illustration of customer-based geographic market definition



74. I then identify any third-party facilities (i.e., those owned by competing waste service providers) that may also provide a competitive option to Secure's and Tervita's waste service customers. These are the facilities that are within a viable travel distance to customers in Secure's and Tervita's overlapping draw area. In this illustrative example, there is one competing facility denoted by the red triangle in Exhibit 8. I determine the competing facility's draw area (denoted by the red circle) using a fixed travel distance from the facility. I choose the distance by calculating the distance from Secure and Tervita

facilities to the edge of their respective 90-percent draw areas and taking the maximum of the two distances.[163, 164]

75. In this example, there are two groups of "targeted" well sites that would be affected by the merger between Secure and Tervita.[165] The first group comprises customers' well sites that benefitted from the competition between Secure and Tervita before the merger, but that will lose this competition and face only one supplier after the merger. For these well sites, the transaction represents a "merger-to-monopoly," and they are represented by the green-shaded area. The second group comprises customers' well sites that benefitted from the competition between Secure, Tervita, and another third-party facility before the merger. After the merger, these well sites will face only two competitors (the merged entity and the remaining third-party facility). For these customers, the

[163] Mechanically, I sort the customers who have used the Secure facility according to their travel distance from the Secure facility. I then add the revenues from these customers starting with the closest customer until I capture 90 percent of the facility's revenues. The farthest travel distance among the customers that comprise 90 percent of the facility's revenues is the distance from the Secure facility to the edge of the draw area. I repeat this calculation for the Tervita facility. Then I take the larger of the results for the Secure and Tervita facilities and use this distance to define the draw area of the competing facility. I assume that the third-party facility provides an alternative to Secure and Tervita customers if the customers are within the facility's draw area.

[164] The 90th percentile customer travel distances shown in Exhibit 4 for each type of Secure and Tervita facility are indicative of the travel distances I use to determine competitor facility draw areas. The 90th percentile travel distances in Exhibit 4 are the averages of the 90th percentile travel distances for each Secure or Tervita facility. The 90th percentile travel distances for a particular facility can be higher or lower than the average figure reported in the exhibit. The distances I use for the competitor facilities are conservatively large. First, I use the 90th percentile (as opposed to, for example, the average or the median travel distance), which means that the large majority of customers drive a shorter distance to Tervita and Secure facilities. Second, the distances I use to define the competitor-facility draw areas are much larger than the distances the Parties used to define the boundaries of local competition. The locally-defined geographic market proposed by Tervita (CCS Corporation) for its acquisition of the Babkirk landfill facility was roughly the size of circle with a 60 km radius. See "The Commissioner of Competition v. CCS Corporation et al.," 2012 Comp. Trib. 14 File No.: CT-2011-002., May 29, 2012, pp. 1-84 at p. 21. Similarly, the Tervita-Newalta submission to the Competition Bureau Submission assessed the level of competitive overlap for the Parties' facilities using a [redacted] km radius around TRD, landfill, cavern, and disposal well facilities. The Parties also stated that that the "majority of customers will be located within [redacted] km of a treatment facility," though they claimed that the radius can vary with other physical features of the environment. See "Proposed Combination of Tervita Corporation and Newalta Corporation by way of plan of arrangement under the Business Corporations Act (Alberta) the Proposed Transaction," March 1, 2018 [RBBA00008_000000023], pp. 1-25 at p. 14 ("Typically, the majority of customers will be located within [redacted] km of a treatment facility, but this varies considerably depending on the local topography and infrastructure (e.g., rivers, mountains, roads, density of production activity), and whether the customer has solid waste or waste water to process."). I then impose a minimum draw area threshold of [redacted] for facilities in the data that draw 90 percent of revenue from distances that are less than [redacted] There are only a few, small facilities with draw areas shorter than 40 kilometers in the Parties transaction data. See Workpaper 8. This threshold follows Secure's proposal in the Tervita-Newalta matter. See Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018 [RBBA00011_000000002], p. 6 ("[b]ased on [their] operating experience [redacted] can be used as an initial rule of thumb to define the competitive area around a facility.").

[165] Note that customers located in the overlapping draw areas of Secure and the competitor, but not Tervita, and those located in the overlapping draw areas of Tervita and the competitor, but not Secure, as also part of customer-defined markets. However, these markets would not experience a reduction in competition from the merger because one or the other party is not part of their markets.

transaction represents “three-to-two merger,” and they are represented by the blue-shaded area.

76. Both groups of well sites can be identified based on their locations, and the customers cannot engage in arbitrage or turn to other reasonable means (such as shipping their waste to far away facilities) to handle their waste in response to a small price increase.[166] Therefore, the hypothetical monopolist comprised of these three facilities can profitably increase prices to them by a SSNIP.

77. For each product market, my relevant geographic markets are comprised of sets of customers’ well sites located within the Parties’ overlapping draw areas. Specifically, draw areas are defined based on the locations of the nearest well sites from which a facility receives 90 percent of its waste service revenue.[167] In the example above, the black and the yellow boundaries encircling the black and yellow triangles that mark Secure and Tervita facility locations define Secure and Tervita’s draw areas, respectively. Consequently, the relevant geographic markets consist of the green and blue shaded regions where Secure and Tervita’s draw areas overlap with one another.[168]

78. Using the method described above to locate the sets of relevant, customer-defined markets, I identify 16 TRD markets that are 2-to-1 23 that are 3-to-2, and 56 that are 4-to-3 (or higher).[169] Among landfills, I identify 3 customer-defined markets that are 3-to-2, 25 that are 4-to-3 (or higher), and among water disposal wells, I identify 3 that are 2-to-1, 14 that are 3-to-2, and 131 that are 4-to-3 (or higher). In my Appendix (Section 7.1.2), I provide maps that capture the location of these markets and table that enumerate the each of the customer defined markets.

---

[166] As I discuss below, Secure and Tervita transaction data indicate that customers in relevant geographical areas send only a small share of their waste to Secure and Tervita facilities outside of the market.

[167] Tervita, Secure, and competitor facility locations are identified by precise geo-coordinates (longitudes and latitudes). Customers, or well sites, are also identified by geo-coordinates, or UWIs (universal well identifiers) that have been converted to geo-coordinates. I use the facility and customer geo-coordinates to calculate the driving distances and driving times to all nearby facilities using ArcGIS. The draw area calculation described in fn. [163, 164] uses the driving distances between facilities and the customers, or well sites, from which it draws 90 percent of its revenue. Customers, or wells sites, are then categorized into customer-defined markets based on the proximity to the Secure, Tervita, and competitor facilities. See additional details in my backup materials.

[168] Competitors’ draw areas as assumed to be the maximum draw area of the measured draw areas for the Secure and Tervita facilities located nearest to the competitors’ facility locations. See also fn. [164, 165].

[169] Conservatively, I impose that both of the Parties must generate at least five percent of the total Party revenue in each relevant customer-defined market for inclusion in the set of relevant markets. There are well sites in the Parties’ overlapping draw region that are not counted among the relevant customer-defined markets, but that are also likely affected by reduced waste facility choices because of the merger.

5. COMPETITIVE EFFECTS

79. In the preceding section, I discussed the relevant antitrust markets. In this section, I turn to assessing the competitive impact of the merger on competition in the relevant antitrust market.

80. First, I show that the merger substantially increased the Parties' combined market shares, which suggests that the merger is likely to be anticompetitive. In particular, the post-merger market shares within the relevant antitrust markets far exceed the Guidelines' "safe harbour" threshold. (**Section 5.1)**

81. Second, I show that there was robust competition between Secure and Tervita. Documents show that the Parties are each other's closest competitor and, prior to the transaction, actively competed to provide waste services to oil and gas companies in relevant markets (**Section 5.2.1**). Customers view Secure and Tervita facilities as close substitutes, and, as such, they are better able to negotiate discounted rates by leveraging a nearby Party facility against the other facility (**Section 5.2.2**). The merger will hinder customers' ability to negotiate better rates (**Section 5.2.3**). These findings suggest that the merger will likely lead to higher levels of concentration and allow the merged entity to raise prices.

82. Third, I quantify the price impact of the merger using a merger simulation that accounts for the industry's salient characteristics such as pricing practices (**Section 5.3**). The simulation suggests that prices on average could increase by approximately 11 to 25 percent, depending on the product market.

5.1. High post-merger market shares indicate a likely anticompetitive impact

83. My analysis indicates that, in many local markets, the market shares of the merging firms exceed the threshold of 35 percent mentioned in the *Guidelines* as a safe harbour metric. Specifically, the *Guidelines* state that a merger is unlikely to have anti-competitive consequences due to unilateral exercise of market power if the post-merger market share of the merged firm would be less than 35 percent.[170]

[170] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.9.

84. Based on the market shares I calculate, the merger between Secure and Tervita leads to increased market concentration for TRD, landfill, and water disposal services in many locally-defined geographic markets spread across the WCSB. **Exhibit 9** summarizes the Parties' combined shares within the relevant markets.

85. In particular, Exhibit 9 reports the Parties' combined revenue, number of affected customers, and weighted-average market shares across all customer-based markets that experience a reduction in competition from the merger separately for each product market. My analysis includes third-party waste service providers, and, conservatively, also includes municipal landfills and facilities operated by oil and gas producers that take in waste from other producers, even though these facilities are not viable alternatives for third-party facilities and thus not in defined product markets.[171] The summaries are reported separately for markets that will experience a 2-to-1 reduction in waste service providers (i.e., merger to monopoly), 3-to-2, 4-to-3, and 5-to-4 (or higher-level changes in competition), and then for the total across all market types.[172]

86. Customers with well sites in a geographic market may send a small share of their waste to facilities that are outside of the geographic market (i.e., facilities that do not comprise the set of overlapping draw areas). In my calculation, I assume that customers in the relevant market spend 10 percent of the waste service revenue at facilities that do not have a draw area that overlaps with a local geographic market.[173] For example, while Secure and Tervita are the only two facilities that have overlapping draw areas in 2-to-1 markets, I assume that Secure and Tervita only capture a 90 percent of revenue share in these markets. As I discuss in the Appendix (Section 7.3), this assumption conservatively underestimates the Parties' market shares, rendering the analyses in my report conservative.[174]

---

[171] See Section 7.7 for details about the data I received from third-party waste service providers, oil and gas producers, and the AEP, which provided volumes taken in by municipal landfills.

[172] The estimated market shares are all based on the revenue-weighted average shares across all affected customer-based markets that are of a specific market type, as are the total combined share for each of the TRD, landfill, water well markets.

[173] Note that the expenditures that occur outside of the defined geographic market can be captured by Secure, Tervita, or other competitors' third-party waste service facilities that are outside of the geographic market.

[174] For example, based on the Parties' transaction data, assuming that 10 percent of waste service expenditures are outside of relevant geographic markets results in outside-market revenue that is, on average, between 50 and 80 percent higher (depending on the product market) than the amount of expenditure that is actually spent at Secure and Tervita facilities outside of the market. My calculation includes markets in which one of the Parties

87. As reported in Exhibit 9, in 3-to-2 markets, the combined market shares are at least 78 percent. Across all market types, the combined market shares are greater than 64 percent for each of the product markets. The TRD and landfill markets are the most concentrated by the Parties, and the weighted average combined market shares are 81 and 75 percent, respectively. The water disposal market's weighted average market share across all market types is 64 percent. See my Appendix (Section 7.1.2) and backup materials for the market-level results.

EXHIBIT 9
Weighted average of Parties' market shares for the TRD, landfill, and water disposal markets

Market Type	Total Secure and Tervita Market Revenue	No. of Secure and Tervita Well Sites in the Market	Estimated Market Share of Merged Entity
TRDs			
1. 2-to-1			90.0%
2. 3-to-2			88.5%
3. 4-to-3 (or higher)			73.3%
5. Total			*80.5%*
Landfills			
1. 2-to-1			-
2. 3-to-2			87.7%
3. 4-to-3 (or higher)			66.8%
5. Total			*74.8%*
Water disposal (+TRDs)			
1. 2-to-1			90.0%
2. 3-to-2			78.3%
3. 4-to-3 (or higher)			63.2%
5. Total			*64.4%*

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: Revenue, customers (or well sites), and shares are reported for customer-defined markets in which there is a change in concentration due to the merger between Secure and Tervita, which accounts for around 63 percent of all waste service revenue generated at Secure and Tervita waste service facilitie across the WCSB. See Workpaper 10. Thirty-seven percent of revenue is generated in markets comprised of overlapping draw area(s) of only one or the Parties, some of which are already Secure or Tervita monopolies, or in customer-defined markets where both of the parties do not take in at least 5 percent of revenue. The category 5-to-4 (or higher) refers to markets that will experience a reduction in competition from 5 to 4, 6 to 5, or any other higher-level reduction. [redacted] The market share results exclude markets in which customers' wells sites do not generate at least 50 percent of revenue at facilities that comprise the overlapping draw area of the relevant market. These small and fragmented markets tend to arise in regions where there are many waste service facilities, and applies to less than 1 percent of the Parties' revenue. See Workpaper 11.

does not generate at least 5 percent of revenue in the relevant market, and when I exclude those markets, the percentages increase. See Workpaper 9.

88. While market shares and concentration are not on their own sufficient to determine the competitive effects of a merger, the *Guidelines* specify that

> … information about market share and concentration can inform the analysis of competitive effects when it reflects the market position of the merged firm relative to that of its rivals. In the absence of high post-merger market share and concentration, effective competition in the relevant market is generally likely to constrain the creation, maintenance or enhancement of market power by reason of the merger.[175]

89. Around [redacted] percent of the Parties' revenue is generated by customers' well sites that are within the relevant antitrust markets (i.e., within Parties' overlapping draw areas), depending on the specific product market, and will face higher concentration due to the merger.[176] Of the customers located in the relevant markets, between 29 and 36 percent of landfill and TRD customers, respectively have at most one viable option other than the Parties' facilities—i.e., the merger will result in customers facing a monopoly or a duopoly.[177] 10.7 percent of Parties' customer well locations already only have access to either a Secure or a Tervita facility (i.e., they were already facing a monopoly before the merger).[178]

5.2. The merger eliminates competition between Secure and Tervita

90. In this subsection, I explain my findings supporting that Secure and Tervita compete with each other to win customers in the relevant market—competition that would be eliminated by the merger. Specifically,

- My review of the Parties' documents and industry facts support that Secure and Tervita compete head-to-head in many local markets (**Section 5.2.1**).
- I use data on well and facility locations, as well as waste service transactions, to demonstrate that many customers view the Parties' facilities as each other's closest substitutes (**Section 5.2.2**).

---

[175] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 5.8.

[176] See Workpaper 10.

[177] See Workpaper 12.

[178] Even before the merger, these customers are located in markets where a Secure or Tervita facility was the only option, i.e., there are no other competitor facilities that are located within the maximum distance between Secure or Tervita's facility (or facilities) and customers in the draw area. See Workpaper 12.

- I then discuss how customers leverage one party against the other to negotiate better pricing terms (**Section 5.2.3**). The merger eliminates this leverage, which in turn allows the Parties to command higher prices for its services.

5.2.1. *Documents indicate that Secure and Tervita compete head-to-head in many local markets*

91. When competition between merging parties is stronger, the likelihood that the merger will result in anticompetitive effects is higher. Thus, it is useful to assess whether and the extent to which Secure and Tervita view each other as head-to-head competitors and competitive constraints on each other's prices and sales. Such evidence can come from documents created in the normal course of business, documents parties may have submitted to government agencies, documents describing industry conditions, and prior business decisions taken by parties. My review of these types of documents indicates that the Parties view each other as direct close competitors. Moreover, industry reports confirm that Secure and Tervita are each other's closest competitors.

92. The Parties identify each other as their primary competitors in Annual Information Forms (AIF), including the Secure AIF from 2020:

> SECURE is one of the leading providers in the third-party oilfield treatment and disposal market with 42 locations in the WCSB and five in the U.S. Tervita Corporation ("Tervita") has approximately 50 treating, recovery and disposal facilities located primarily in western Canada. Several smaller competitors also exist, operating independent facilities, most of which offer limited services.[179]

93. Tervita's 2020 AIF similarly identify Secure as Tervita's competitor:

> Treating, Recovery and Disposal and Landfills – Tervita's large competitors include Secure Energy Services Inc., plus a number of smaller, predominantly privately owned, regional operators, as well as producers that handle their own waste processing.[180]

[179] SECURE ENERGY Annual Information Form for the year ended December 31, 2020 [RBBC00003_000000009], p. 30.

[180] Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 21.

94. Internal individual facility analysis documents also indicate that Tervita and Secure compete head-to-head in local markets. For example, a Tervita document analyzing the competitive conditions in local markets identifies Secure facilities as competitors to its facilities:[181]

- "Competition [at the Silverberry landfill] is moderate in the area. Secure Saddle Hills Landfill and CNRL's Peejay landfill, which is not operational as they have recently been acquired by CNRL"
- "Judy Creek TRD is in a highly competitive market area with Secure being 15km away."
- "Secure Fox Creek Landfill 25km North on the Highway and has an average disposal rate of [redacted] on soil & cuttings and is selling clean clay from their site at [redacted]"
- "High competition in area with Secure & Pembina across the road from the [La Glace TRD] facility."

95. A Tervita "facility metrics breakdown" presents a list of competing facilities and their market shares for 26 Tervita facilities. According to this document, 17 of the 26 Tervita facilities face competition from a Secure facility.[182]

96. In another example, when discussing the pricing at their facilities, a Tervita employee identifies Secure as their "main competition" for these sites and quotes Secure's pricing for consideration.[183]

97. Other documents show Tervita and Secure personnel request discounts to be competitive with each other's prices. For example, a 2016 Tervita email identifies Secure Dawson Creek and Newalta Valleyview (now part of Tervita) as closest competitors and requests lower prices to compete against Secure.[184] Another Tervita email from 2018 requests a discount to win [redacted]

[181] RCFC00001_000000002 - Supplementary Record - July 23, 2021 v2.pdf, pp. 349, 361, 368, 378.

[182] Tervita, "Facility Metrics Breakdown – TRDs and Disposal Wells," 2016/2017, TER_00085702. See also examples in SESL0004441; SES0037940; SES0052305; SES0050636.

[183] Email chain from Shane Nelson to Curtis Benson, "FW: Deliverable due Wednesday- Pricing Strategy Documents," January 11, 2017, TER_00057979 ("Our current main competition is Secure Energy at Mile 100. They are commonly offering produced and waste water at anywhere from [redacted] they don't differentiate costs between the two streams… There are a few other sites in the region run by companies for their own injection needs that occasionally received third party water.").

[184] See TEV00000285 ("I have spoke to the field sales rep in the Willesden Green and he is aware that Secure is offering customers in the area [redacted] Tonne. He recommended matching or going to [redacted] to make sure that we receive the soil."); TEV00000460 ("We recently lost to Secure for [redacted] on a similar job at [redacted] so trying [redacted] as per discussions with Jesse, Tim Link and Shaun Tuck."); TEV00000673 ("In order to win this work we will need to be aggressive. Secure has offered as low as [redacted] I have contacted Brent and he is good with this price.").

drill cuttings business away from Secure's Pembina facility.[185] A 2018 Secure email compares Tervita's and Secure's rates and requests discounted rates to key clients to win business back from Tervita.[186] A Secure email from 2020 requests a discount for a customer to match an offer from Tervita. In the email discussion, a Secure employee indicated that "we would be at risk of losing it if we didn't match it."[187] A Secure analysis recommended not raising rates at South Grande Prairie landfill because of Tervita's and Newalta's pricing pressures.[188] Tervita employees also refer to "price battles" with Secure and Newalta.[189]

98. In 2018, Tervita described Secure in its submissions to the Bureau in the context of its Newalta acquisition as "one of the most prominent remaining competitors," stating:

> Both parties [Tervita and Newalta] identify Secure as their principal third-party competitor, suggesting that they lose business more often to Secure than to each other. From Tervita's perspective, Secure is viewed as the stronger competitor because of its stronger financial position, in that Newalta's recent financial strains have limited its ability to compete on price, whereas Secure tends to be more aggressive on pricing.[190]

99. In their submission, Tervita identified "competing facilities in numerous local markets." In their analysis, Tervita identified 39 third-party TRD facilities

---

[185] Email from Lori Lambert, "EXTERNAL - DOA Level- [redacted] - Drill Program 18/19," August 24, 2018, TEV00219518. ("I went out to see Shane last week in Edson to discuss drill cuttings as he is taking them to Secure Pembina facility near Cynthia. Shane told me that if we can match the price of [redacted] which is where Secure is in Cynthia, he will take his last hole to Judy Creek LF as well as the 8 holes he will be drilling in Fox instead of going to our Fox Creek LF which is at [redacted]).

[186] Email from Ryley Pierson, "RE: South GP Discounted Vac Waste Rates," June 16, 2020, SES0024264. ("We'd like to offer a few key clients discounted vac waste rates at South GP for about 3 months in order to get more waste in. Yesterday Tanner was able get the exact pricing Tervita is charging [redacted] and we are a decent amount higher now which is contributing to a lot lower waste volumes…").

[187] Email chain from Ed Guenther, "RE: Discount approval at 101," March 24, 2020, SES0026223. ("As we discussed yesterday as a group, Hayden mentioned that we would be at risk of losing it if we didn't match it. So as a one off I would be comfortable with matching for the three months, providing we keep all their work. I am worried long term that Tervita will keep undercutting us on pricing though…").

[188] See SES0026580, p. 8. ("Tipping Fee at South GP LF – NOT Rising due to Tervita and Newalta continually dropping their rates…").

[189] Email chain from Michael Bongfeldt to Troy Waltz and Lynsey Price, "RE: Lindbergh Sludge Campaign," October 6, 2016, TER_00091578 ("As this is not dis-similar to what we went through at the beginning of the year when we jockeyed with Newalta and Secure trying to regain some volumes and as of late there has been some degree of normality in a way. In going to [redacted] m for any client……contractual, volume driven, or not…..we are going to re-ignite the price battle unequivocally, but still fall well short of what we are trying to achieve by year end. And wind up losing margin with all other clients we [sic] currently as we move forward.").

[190] Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018 [RBBA00008_000000023], p. 22.

within 110 kilometers. 21 of the competing TRD facilities (54%) were Secure facilities. Tervita's counsel includes a section where competitive overlap between TRD facilities is identified by indicating Tervita TRDs and third-party TRDs within 110 kilometers of Newalta TRDs. There are 39 third-party TRDs identified as competitive alternatives to Tervita and Newalta: 21 were Secure TRDs.

5.2.2. *Customers in the relevant markets view Secure and Tervita facilities as each other's closest substitutes relative to other facilities*

100. The locations of Secure, Tervita, and competitor facilities, confirms that Secure and Tervita are each other's closest competitors for many waste service customers. As discussed in Section 3.3, transportation costs are high in this industry and are a key consideration for customers when choosing a waste-service facility. Thus, the location of Secure and Tervita facilities lends insight into the extent to which customers view the Parties' facilities as substitutes.

101. Indeed, the proximity of Tervita's facilities to Secure's facilities indicate that Tervita is Secure's nearest competitor. **Exhibit 10** summarizes the count of Secure customers with Tervita as the next nearest facility and the average distances to those Tervita facilities compared to other third-party facilities. Between 63 and 84 percent of Secure customers are located in regions where Tervita operates the next nearest facility to them. These customers are located within 76 kilometers of the Tervita landfill facility, on average, while their average distance to a competitor facility is 140 kilometers.

EXHIBIT 10
Secure customers' next nearest facility is often operated by Tervita

	Market participant	Count of transactions	Count of customer wells	Transactions for whom the nearest non-Secure facility is Tervita...		If the nearest non-Secure facility is Tervita, mean distance to...	
				Count	Percentage	Tervita facility (km)	Nearest third party facility (km)
1.	Landfill	38,074	1,306	[redacted]		[redacted]	
2.	TRD	211,928	10,539				
3.	Water, TRD	157,780	6,178				

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Secure transactions were excluded from this analysis if the customer was Secure; if they had blank, industrial landfill, terminalling, or "Other Revenue" general ledger names; or indicated credits (i.e. negative revenue). Moreover, this sample does not include transactions missing travel data due to unconvertable UWI or undefined travel routes (e.g. off-road terrain). Statistics are weighted by the number of transactions associated with each facility type.

102. Similarly, **Exhibit 11** describes the count of Tervita customers with Secure as the next nearest facility for landfill, TRD, and water treatment facilities, as well as the average distances to those sites. For example, between 17 and 48 percent of Tervita customers' next-nearest (non-Tervita) site is operated by Secure. These customers are located within 61 kilometers of the Tervita landfill facility, on average, while their average distance to a competitor facility is 105 kilometers.

EXHIBIT 11
Tervita customers' next nearest facilities are often operated by Secure

	Market participant	Count of transactions	Count of customer wells	Transactions for whom the nearest non-Tervita facility is Secure...		If the nearest non-Tervita facility is Secure, mean distance to...	
				Count	Percentage	Secure facility (km)	Nearest third party facility (km)
1.	Landfill	71,357	2,479	[redacted]			
2.	TRD	292,304	22,397				
3.	Water, TRD	134,185	11,855				

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Tervita transactions were excluded from this analysis if the customer was Tervita; if they had blank, add-on service, or terminalling service types; if they are associated with a TCC, Hydrovac, or fractionation plant; or indicated credits (i.e. negative revenue). Moreover, this sample does not include transactions missing travel data due to unconvertable UWI or undefined travel routes (e.g. off-road terrain). Landills include the Standard industrial facility and TRDs include caverns. Statistics are weighted by the number of transactions associated with each facility type.

103. Market shares can be indicative of diversion patterns. Market share-based diversion can be a reasonable measure of diversion, depending on the market, and it is a technique employed in antitrust analysis, including multiple prior merger matters.[191] In this case, share-based diversion ratios imply that customers generally view Secure and Tervita's facilities as the next-best substitute for each other. Diversion ratios measure the substitutability of two products or sellers. As the Guidelines explain,

> The closeness of competition between the merging firms' products may be measured by the diversion ratio between them … The greater the value of the diverted sales, the greater the incentive the merged firm has to raise prices.[192]

[191] See, e.g., Economic Analysis of the merger between ATT and T-Mobile, Attachment A, p. 77-78, available at https://appliedantitrust.com/14_merger_litigation/cases_doj/att/fcc/sprint/sprint_petition_deny5_31_2011attach.pdf (accessed Febrary 25, 2022).

[192] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, ¶ 6.15.

104. The diversion from Secure to Tervita measures how many of Secure's customers would switch to the Tervita facility if the Secure facility were not an option. Higher levels of diversion imply that more customers view the facilities as close substitutes.

105. I estimate diversion ratios based on facilities' market shares. These diversion ratios account for how oil and gas producers may value different waste service facilities depending on the location of their well sites relative to them as well as other factors. In this estimation, the diversion ratios are proportional to the facility shares, and they leverage the relative intensity with which different facilities provide waste services to customers in a given market. As an illustrative example, suppose that there are 30 of a given customer type, and…

- a Secure facility receives waste from 15 customers,
- a Tervita facility receives waste from 10 customers, and
- a third-party competitor receives waste from the remaining 5 customers.

106. Share-based diversion predicts that if Tervita were to increase its prices, of the customers that leave the Tervita facility, 75 percent [=15/(15+5)] would divert to the Secure facility and deliver their waste there. Put differently, share-based diversion utilizes the observed frequency with which customers sought the services of a non-Tervita facility to inform where Tervita customers would go for waste services in response to a Tervita price increase.

107. As discussed in Section 3.3, transportation costs comprise a significant portion of the customer's overall waste service costs, so the facility locations are an important driver of customers' choices. For this reason, and using the same method described in Section 4.2, I group customers by their location and consider a "customer type" as characterizing the sets of customers located in the same overlapping draw areas (i.e., customers in the same relevant geographic markets).[193]

108. For each of these overlapping draw areas, I calculate the share-based diversions. **Exhibit 12** through **Exhibit 17** summarize the diversion ratios based on the shares of waste service revenue earned by Secure, Tervita, and

[193] See Section 4.2 for a description of overlapping draw areas.

other nearby competitors in customer-based markets.[194] Each map dot represents the location of a customer. The exhibit does not show customers in markets where there is likely to be no diversion (e.g., markets where Secure and Tervita already have a monopoly position).

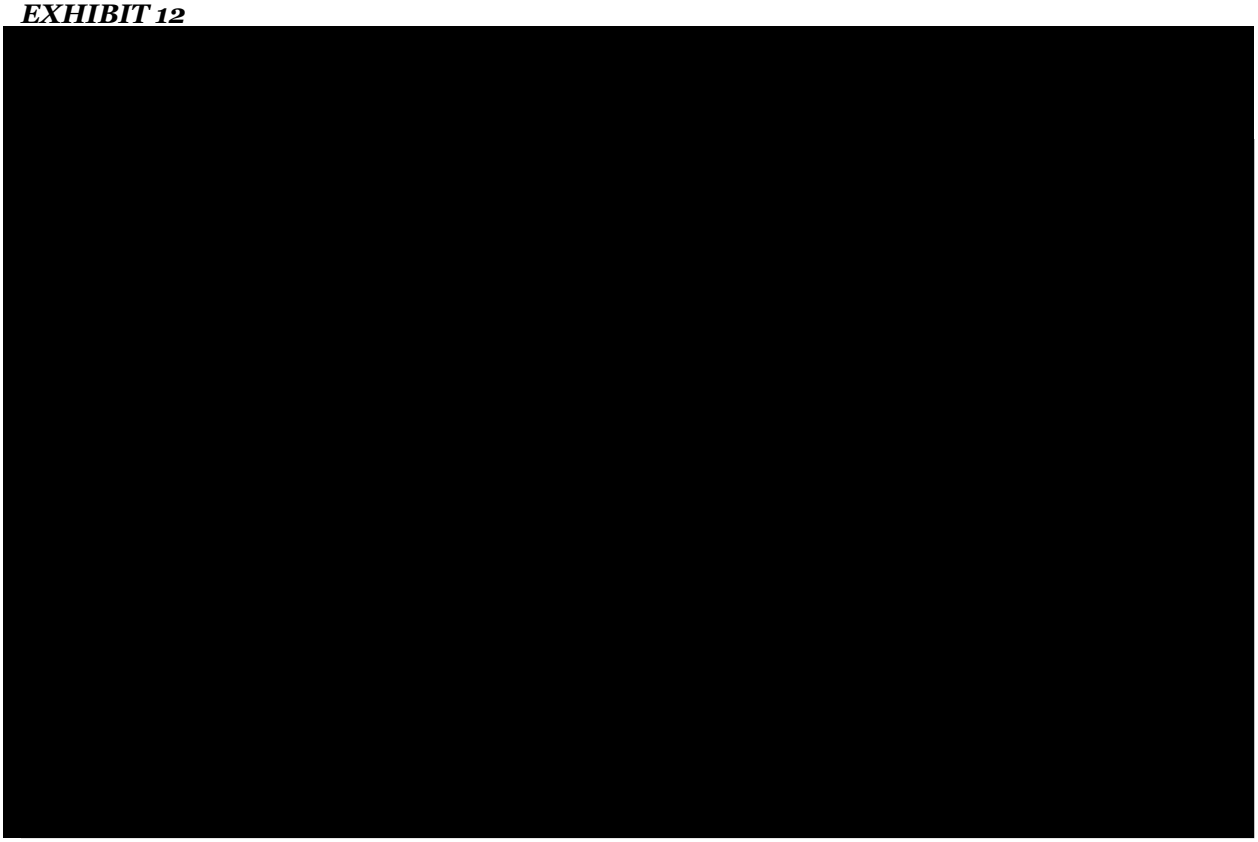
109. **Exhibit 12**, for example, describes the diversion ratios for Secure TRD customers from facilities operated by Secure to Tervita. Higher levels of diversion between the two Parties' facilities are captured by warmer colors. The majority of the map is colored orange, suggesting that, if a Secure TRD facility closed, Secure's customers would most often go to a Tervita TRD instead of one operated by another competitor. Similarly, **Exhibit 13** maps the diversion of Tervita TRD customers to Secure facilities. The regions in central and western Alberta suggest high levels of diversion for these customers; however, regions along the Alberta and Saskatchewan border suggest lower levels.

110. **Exhibit 14** and **Exhibit 15** map the diversion between Tervita and Secure landfills, and **Exhibit 16** and **Exhibit 17** map diversion between Tervita and Secure water disposal wells. These exhibits indicate that many Secure customers would most often divert to nearby Tervita facilities, and vice versa. For waste water wells, diversion ratios are similarly high. Among waste service customers, [redacted] percent of Tervita TRD customers and [redacted] percent of Secure customers would divert to the other merging Parties' facility with more than [redacted] percent probability. Similarly [redacted] percent of Tervita landfill customers [redacted] percent of Secure landfill customers, [redacted] percent of Tervita water well customers, and [redacted] percent of Secure water disposal customers have more than [redacted] percent probability of diverting to the other merging Parties' facilities.[195]

[194] Note that the diversion ratio maps do not include customers in markets where there is not diversion between Secure and Tervita, e.g., there are no customers displayed in markets in which there is only a Secure or Tervita facility. These markets also exclude customers' well locations in customer-defined markets where one of the Parties does not generate at least 5 percent of revenue.

[195] See Workpaper 13. These averages apply to customers for whom there is some diversion. It excludes customers who are already facing a Secure or Tervita monopoly.

EXHIBIT 12



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

EXHIBIT 13

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

EXHIBIT 14

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

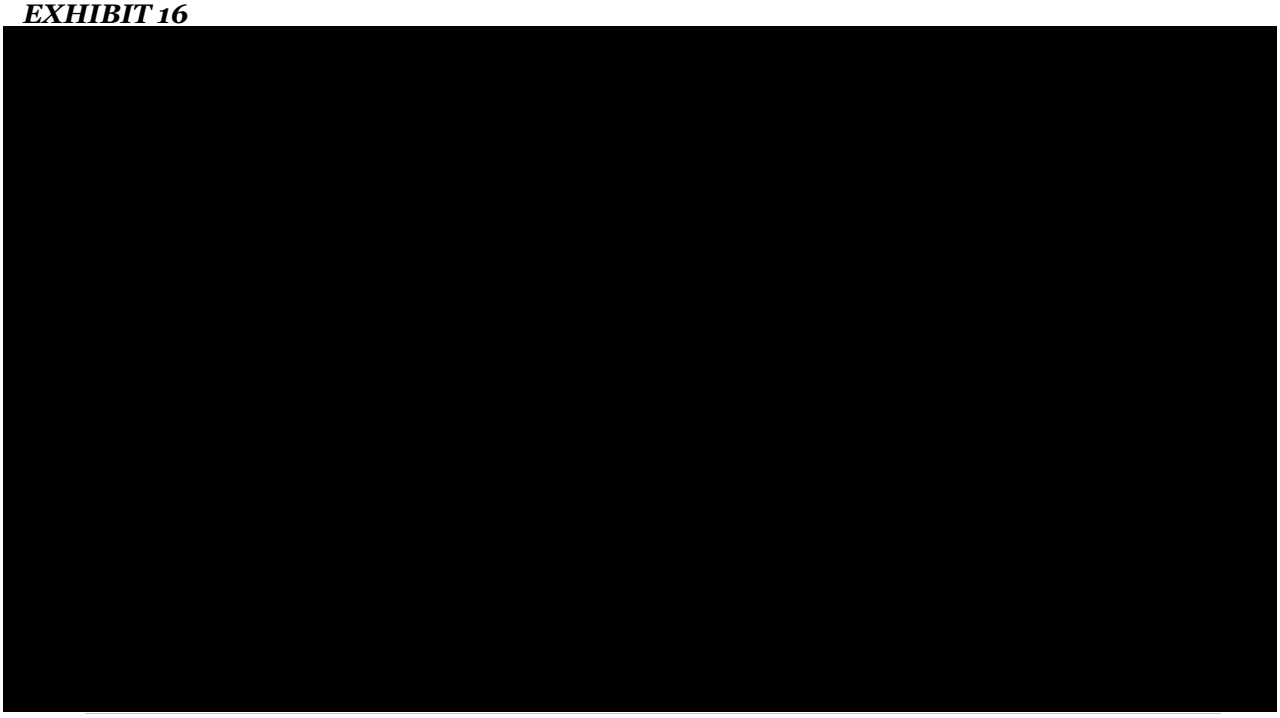
Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

EXHIBIT 15

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

EXHIBIT 16



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

EXHIBIT 17

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot on the map describe the location of a specific customer, or well site, and the color of the dot describes the weighted average diversion ratio for that customer betweeen Secure and Tervita facilities based on the customer-defined markets. Dots that are warmer colors represent higher levels of diversion, where deeper orange-red describes diversions between 75 and 100 percent. See Section 7.5.1 for more details about the diversion formula.

5.2.3. *Merger eliminates the ability of customers to leverage a party against the other to negotiate better rates*

111. A merger harms customers if it results in higher prices or lower quality, and economic theory indicates that mergers between close competitors likely result in higher prices to consumers.[196] The economic mechanism underlying this result is particularly salient in industries where prices are negotiated, as is the case in this matter. Specifically, a merger enables the merging party to increase

[196] The Merger Enforcement Guidelines explains the incentive as follows: "By placing pricing and supply decisions under common control, a merger can create an incentive to increase price and restrict supply or limit other dimensions of competition. … When buyers can choose from among many sellers offering comparable products, a firm's ability to profitably increase its price is limited by buyers diverting their purchases to substitute products in response to the price increase. When two firms in a market merge and the price of one firm's product(s) rises, some demand may be diverted to product(s) of the firm's merger partner, thereby increasing the overall profitability of the price increase and providing the impetus to raise the price. As such, the elimination of competition between firms as a result of a merger may lessen competition substantially." The Competition Bureau, "Merger Enforcement Guidelines," October 6, 2011, ¶¶ 6.10-11. See also Farrell, Joseph, and Carl Shapiro, "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *The BE Journal of Theoretical Economics* 10(1), 2010, pp. 1–39.

its leverage when negotiating waste service prices with oil and gas producers (i.e., the customers) for wastes delivered from specific well locations.[197]

112. To understand this point, consider a customer's decision to ship its waste to various third-party facilities, including the facilities operated by the merging Parties. Prior to merger, that customer had the option of contracting with either of the Parties' facilities and can potentially use its ability to choose among the Parties' offers as leverage in negotiations. For example, when a customer negotiates with Secure it could use the availability of a Tervita facility as a threat point in negotiations. The existence of a Tervita facility as a viable substitute should the negotiation fail effectively constrains Secure's prices. This leverage and constraint cease to exist as a result of the merger, and the merged entity's ability to charge the customer higher prices increases.

113. Indeed, the Parties' business documents demonstrate that the Parties are aware of the leverage each other's facilities provide to customers and consider the existence and proximity of nearby facilities in their pricing. For example, as described in Section 3.3, one Tervita document compared the differential costs of two Secure and four Tervita facilities for a future job.[198] In a second example, a Tervita employee notes that Tervita can submit a higher rate because the competing Secure facility is farther from the customer's drilling sites.[199]

[197] E.g., Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 41 ("The merger may also impact CNRL's ability Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 44, 77 ("In PECL's experience, companies offering waste disposal services are aware of their customers' transportation costs and offer specific customers prices that are comparable with the next-closest option, taking into account those transportation costs.... Secure's acquisition of the Tervita Silverberry landfill has reduced the number of independent landfills available to PECL for disposal of its solid oilfield waste. PECL will no longer have the benefit of competition for disposal volumes between the Tervita Silverberry and Secure Saddle Hills landfills."); Witness Statement of the Orphan Well Association, February 22, 2022 at ¶¶ 34-40; Witness Statement of Jeffrey Biegel, February 15, 2022 at ¶¶ 13-17.

[198] Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: Volumes," October 15, 2020, TEV00223412, attachment "Trucking Differential – lsx," TEV00223413.

[199] Email chain from tnickled@tervita.com to drollings@tervita.com , "FW: Differential," October 5, 2020, TEV00155420. (.

[redacted][200] Secure has explained to the Bureau that waste service providers consider the nearest competitors in their pricing decisions, and lack of nearby facilities can create pricing power in these geographic areas.[201]

114. Many of the Parties' customers benefit from this type of competition in many local markets. For example, **Exhibit 18** shows the locations of Secure's Fox Creek landfill (dark pink circle) and Tervita's Fox Creek landfill (dark green triangle). These landfills are located within about 31 kilometers of each other.[202] Pink and green dots show the locations of customers, who have used Secure's and Tervita's facilities, respectively.[203] The circular, thin pink and green lines indicate the 90 percent draw areas of each of the Parties.[204] A 90 percent draw area comprises the locations of the closest customers from which a facility expects to acquire 90 percent of its waste service revenues.[205] The closest competing facility owned by a third-party is the High Prairie facility operated by Ridgeline, which is located 185 kilometers to northeast of the Secure's Fox Creek facility.

---

[200] [redacted]

[201] Secure's Response to Request for Information by the Competition Bureau for the Tervita and Newalta transaction, May 17, 2018 [RBBA00011_000000002], p. 5. See also evidence that waste service providers consider the nearest competitors when setting prices from witness statements. Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 21 ("Companies like Secure know where third party owned facilities (including CNRL-owned facilities) are located relative to their own facilities and the estimated trucking costs, and may price their services based on this knowledge."); Witness Statement of the Orphan Well Association, February 22, 2022 at ¶ 38 ("Pricing for the disposal of oil and gas waste is transparent. Waste disposal companies like Secure and the former Tervita must track where the waste being disposed of in their facilities is coming from (i.e., the generating site). As a result, they are able to determine how much it would cost to truck waste to the next closest facility. This allows them to adjust their tipping fees so that the total cost of disposal is still cheaper than going to the next closest facility"); Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 44 ("In PECL's experience, companies offering waste disposal services are aware of their customers' transportation costs and offer specific customers prices that are comparable with the next-closest option, taking into account those transportation costs").

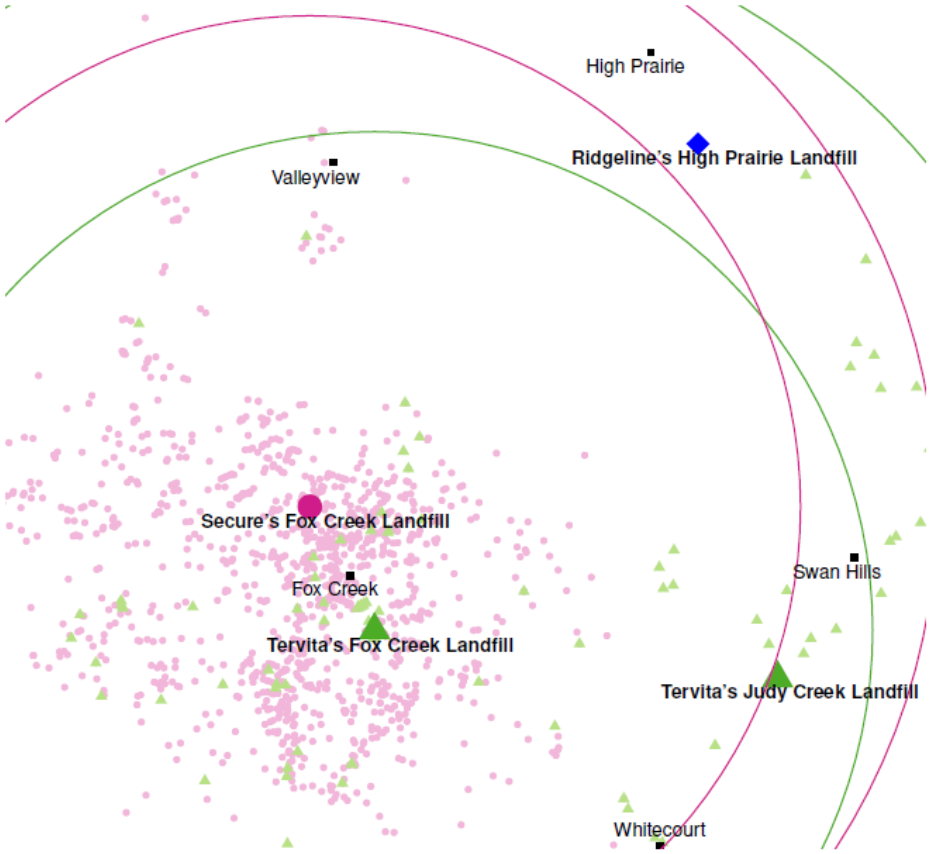
[202] For comparison, the distance from town of Valleyview to town of Whitecourt is 144 kilometers.

[203] Some of Tervita's customer locations may not be visible because green dots may be overlaid by pink dots.

[204] The Judy Creek landfill operated by Tervita is also located on the edge for the Secure facility's 90 percent draw area and inside of the Tervita facility's 90 percent draw area[redacted] See Engel testimony, December 21, 2021, pp. 407-408, questions 1149-1153; Footnote to Harington Affidavit, Schedule 3.2, "Facilities Cost Savings, One-Time Costs and Avoided Capital Expenditure," [RCFD00001_000000014] p. 222.

[205] To determine the boundaries of the 90 percent draw area, I sort the facility's customers according to their travel distance from the facility. I then add the revenues from these customers starting with the closest customer until I capture 90 percent of the facility's revenues. The locations of these customers is the facility's 90 percent draw area. In the exhibit, I represent this area using a circle. The radius of the circle is the farthest travel distance among the customers that comprise 90 percent of the facility's revenues.

EXHIBIT 18
Example of competitive pricing pressure, Fox Creek landfill facilities



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: For the Secure facility, 90 percent draw area is calculated using revenues based on final price excluding taxes variable. For the Tervita facility, 90 percent draw area is calculated using revenues based on the total producer value variable.

115. This example illustrates an area where customers face only a few landfill options, and a Tervita facility is the nearest alternative for many of Secure's customers. The merger removes the ability of these customers to viably threaten to switch to Tervita if it fails to negotiate with Secure and, hence, weakens customers' bargaining leverage. The Fox Creek local market is not uncommon across the WCSB, and many other local markets share its feature—that customers in the relevant antitrust market tend to be clustered in areas where Secure and Tervita own facilities and the competing third-party facility is located in areas further away relative to the Parties' facilities.[206] As I describe in

[206] See, for example, Exhibit 10 and Exhibit 11 in Section 5.2.2, which describes that average distances to nearest Secure or Tervita facility versus the distances to the nearest competitor facility. Generally, distances to the nearest Secure and Tervita facilities are shorter. See also Exhibit 9 in Section 5.1, which reports the combined Secure-Tervita market shares for customer-defined markets. Several large markets are comprised of zero or only

the following section, distance is also not the only differentiating factor between facilities for customers that are located in similar geographic locations.

5.3. Merger simulation results indicate that the merger will likely result in higher prices

116. In this section, I use a merger simulation model to quantify the magnitude of the likely price increases resulting from the merger.

117. As discussed in Section 3.4, a key feature in this industry is that waste service facilities can and do charge customers different prices for waste services—i.e., the market for waste services resembles that of a price discrimination market. To reflect this fact, I consider a second-score auction model of price discrimination to model the industry.[207] This model has been used in academic studies as well as in prior merger reviews involving price discrimination in other jurisdictions.[208]

118. The second-score auction model corresponds to a bargaining framework in which a waste service provider's price depends on the incremental value of its facility relative to what the next-best facility has to offer to a customer, and evidence in record confirms that this framework reflects the structure of this industry.[209] As I described above, the Parties consider the locations of alternative facilities that a customer may use and set their prices accordingly.

---

a few other competitors. I also note that other factors (such as type of waste facilities take in, wait times, etc.) may also prevent other third-party facilities from effectively constraining the pricing of Secure and Tervita.

[207] Miller, Nathan H. "Modeling the effects of mergers in procurement." International Journal of Industrial Organization 37 (2014): 201-208.

[208] Examples of merger review matters include U.S. health insurer mergers in the Anthem-Cigna matters and U.S. mergers of vessel ship cleaning suppliers in the recent Drew-Wilhelmsen matter. See United States v. Anthem, Inc., 236 F. Supp. 3d 171 (D.D.C. 2017), aff'd, 855 F.3d 345 (D.C. Cir.), available at https://www.justice.gov/atr/case-document/file/940946/download (accessed February 21, 2022); Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA, et al., "Plaintiff's proposed findings of fact and conclusions of law," Civil Action No. 18-cv-00414-TCS, July 13, 2018, available at https://appliedantitrust.com/14_merger_litigation/cases_ftc/wilhelmsen/2_13b/wilhelmsen_ddc_pff_ftc7_13_2018.pdf (accessed February 21, 2022). See also Sweeting, Andrew et al., "Economics at the FTC: Fertilizer, Consumer Complaints, and Private Label Cereal," *Review of Industrial Organization* 55 (2020):751–781; Beckert, Walter, Howard Smith, and Yuya Takahashi, "*Competition in a spatially-differentiated product market with negotiated prices*," University of Oxford : Economics, Department of Economics Discussion Paper Series (2020); Miller, Nathan H., Matthew Osborne, Gloria Sheu, and Gretchen Sileo, "The Evolution of Concentration and Markups in the United States Cement Industry," February 2022, available at http://www.nathanhmiller.org/cementmarkups.pdf (accessed February 21, 2022).

[209] The second-score auction approach is realistic for this industry. As an alternative, one can use a bargaining parameter to divide the surplus between the customer and the waste service provider. Customers' bargaining power depends on their alternative options. For example, customers who have access to other nearby facilities may have higher bargaining power. However, the merger reduces the bargaining power of customers because, as I described above, for many customers the next-best alternative to a Party's facility is a facility owned by the other Party.

For example, if the next best facility is farther away, the facility may quote a higher price to take advantage of its proximity to the customer location.[210] Testimony on behalf of oil and gas producers suggests that, indeed, waste service providers are often aware of customers' "next-closest option" and offer waste services prices accordingly.[211] Furthermore, there may be other physical characteristics of the drilling site and the waste produced at it that requires specialized services, and thus specialized pricing.[212] Even in instances when the oil and gas producers sign MSAs with the Parties, producers are able to negotiate and obtain lower unit pricing for specific jobs or in response to competing rates from competitors, for example.[213]

119. The following hypothetical example illustrates how competitive conditions at a producer's well site may determine the Parties' pricing behavior, independent of any other factors that may inform the outcomes of price negotiations. Suppose an oil and gas producer considers waste services across all facilities to be of the same quality and that transportation costs and prices are the only two factors it considers. Furthermore, suppose that the customer considers three competing locations, a Secure site, a Tervita site, and a Ridgeline site, each with a per-unit cost of $15 to dispose of one cubic-meter of waste. Therefore, each company would be willing to serve the customer if the price is at least $15.

120. Additionally, assume that Secure has the nearest facility, followed by Tervita and then Ridgeline, with transportation costs given by $10, $20, and $30, respectively, which are often paid by the customer independent of the price paid for waste services. The diagram in **Exhibit 19** captures the costs across three facilities that may inform the customer's decision. The gray segments of each bar capture the minimum price any customer might pay for waste services, i.e., the price at which the facility covers its variable costs and

---

[210] See also Section 3.3, fn. 56, which describe Tervita's Trucking differential analysis.

[211] Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 44 ("In PECL's experience, companies offering waste disposal services are aware of their customers' transportation costs and offer specific customers prices that are comparable with the next-closest option, taking into account those transportation costs.").

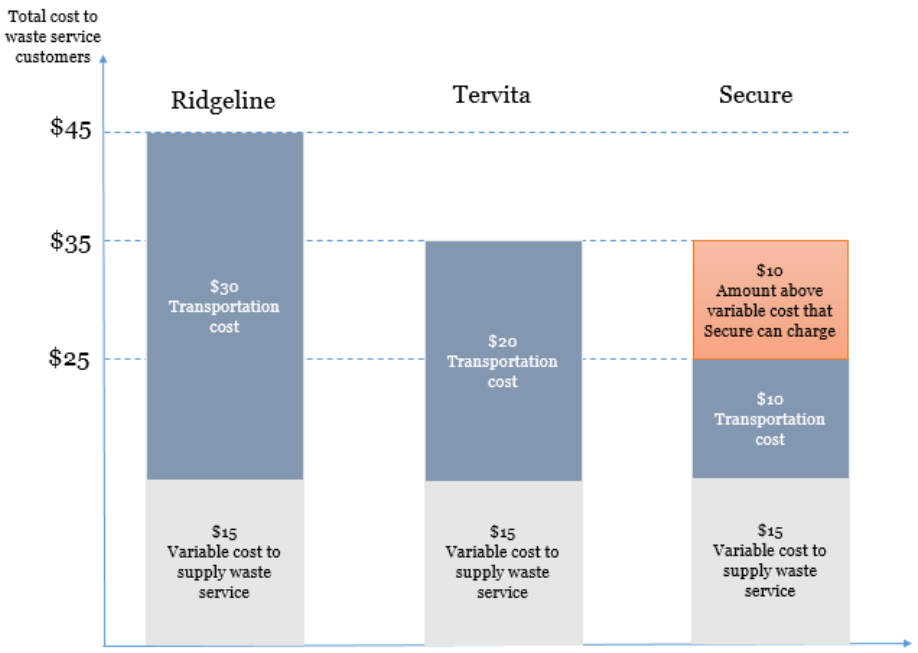
[212] Engel testimony, December 20, 2021, p. 48-50, questions 122-123 ("Q. Okay. Does Secure agree that it can and does adjust the tipping fees it may charge a customer based on the competitive options it believes the customer has? A. That is one consideration among many. Q. Okay. Can you tell me what other considerations go into this analysis?... A. Well, different customers, firstly, operate across different geographies. They also handle different services, so each customer is unique in that way. The specific waste streams are unique, so not all soil is created equal, and there are times operationally where at a landfill specifically a waste that maybe has better stacking or handling capabilities could be more advantageous for the operations of the site versus, you know, if you were bringing soil that was maybe from a spill onto, say, muskeg or a wet material versus a dry material or more gravel and rock....).

[213] See Section 3.4. MSA SES0089949; SES0064462.; SES0084905.

does not earn any profit from the transaction. The blue segments capture the customer's transportation costs to transport waste to each facility. If only considering costs, the customers select the facility with the lowest overall costs, i.e., transportation costs plus price for waste services.

121. Since Secure has the nearest facility to the oil and gas producer's well site, the model predicts that Secure wins the contract at a price slightly below $25, captured by the sum of the $15 variable costs and $10 profit in the orange segment in **Exhibit 19**. At that price, the total costs to the buyer of picking Secure is just below $35, whereas the total cost of picking Tervita, even at the lowest price that Tervita would consider, is $35 (sum of the $15 variable cost and $20 transportation costs). Thus, Tervita constrains the price that Secure is able to obtain—if Secure charges a price that is higher than $25, Tervita (the next-closest facility) can win the contract.

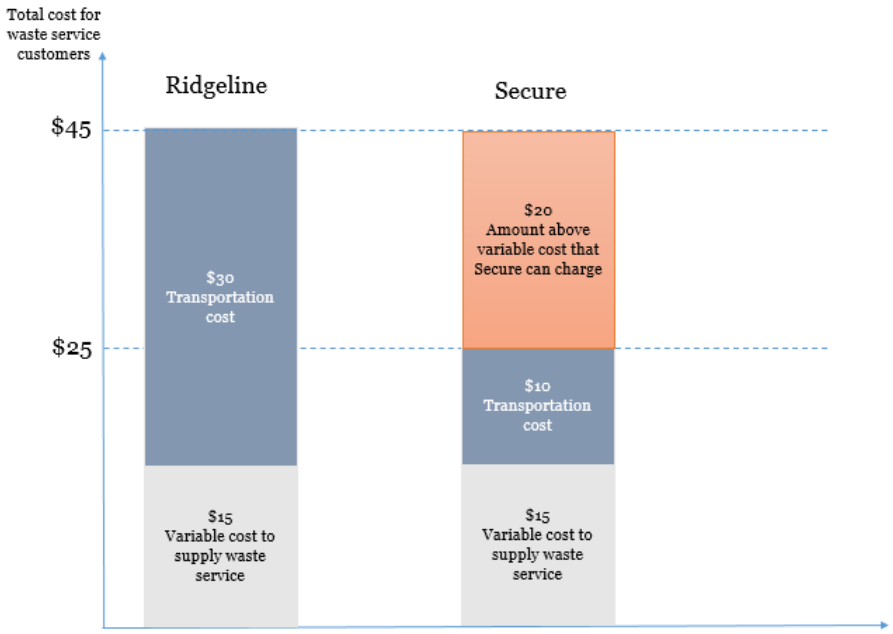
EXHIBIT 19
Illustrative pre-merger pricing behavior



122. Now consider a merger between Secure and Tervita. In the model, the merged firm does not bid against its own facilities. Therefore, the competitor nearest to the customer is the Ridgeline facility. Captured in Exhibit 20, Ridgeline can offer its services at cost, which results in a total waste service cost of $45 to the customer. Therefore, Secure can now charge up to $35 (sum of $15

variable costs and $20 in profit) without causing the customer to switch to Ridgeline.

EXHIBIT 20
Illustrative post-merger pricing behavior



123. In the illustrative example above, I assume that oil and gas producers view the services supplied by the facilities as the same (i.e., of equal quality) and that location is the only characteristic of the waste service facility valued by the customers. However, in my merger simulation model, I relax this assumption and allow for product differentiation. Specifically, I allow for the possibility that other facility characteristics may factor into how oil and gas producers value facilities, including expected wait times to unload the waste at the facility,[214]

[214] Witness Statement of Shanley Bowersock, February 23, 2022, ¶ 13 ("Where LB Energy is asked to find a disposal site, disposal fees, wait times at the facility, and distance from the producer's location to the facility are important factors in selecting a facility. As trucking costs are often higher than disposal fees, distance and wait times are significant factors.").

available waste capacity at the facility,[215] and types of wastes accepted,[216] among other potential factors.[217]

124. More formally, I model an oil and gas producer's choice of waste service facility using a discrete choice framework, particularly the often used conditional logit model.[218, 219] Under this framework, oil and gas producers choose among a number of potential waste service facilities in each of the three

---

[215] Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶ 11 ("Another important factor in deciding which site to choose for disposal is capacity at the facility. Pricing is typically determined by phoning the representatives at each facility on an as-needed basis. Generally speaking, when a facility is capacity-constrained, prices to dispose of waste will be higher, and when there is enough capacity, the prices will be lower."); Witness Statement of Chad Hayden, February 9, 2022, ¶ 11 ("Higher tipping fees, longer waittimes, or limited capacity may result in a customer optimally choosing a site that is further from the waste's origin."); Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 16.

[216] Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022, ¶ 12 ("Further, Crew Energy's choice of a facility also depends on the characteristics of the waste that is acceptable to a particular waste company."); Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 75 ("The vast majority of solid oilfield waste produced by PECL contains less than the threshold amount of NORM allowing it to be disposed of at the Tervita Silverberry Landfill. This waste volume cannot be accommodated at the Secure Saddle Hills landfill."); Witness Statement of Paul Dziuba, February, 24, 2022, p. 6 ("Chevron chooses a disposal facility based on waste type and distance from Chevron's relevant operations. As long as the facility can legally accept the waste type, distance (or travel time) typically determines which facility will get our business."). Tervita describes how it requires that customers characterize the waste they want to dispose of in a landfill and how samples of the waste may be tested in an analytical lab to ensure landfill compliance and, if not in compliance, offer alternative services to the customer. See Tervita Annual Information Form for the fiscal year ended December 31, 2020 [RBBC00003_000000017], p. 17.

[217] One witness describes how the road conditions are another factor considered. See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 15 ("As a result, the distance to the waste disposal facility, wait times at the facility, the transportation route and road conditions to and from a waste disposal facility can have a significant impact on CNRL's transportation costs. For example, trucks can typically travel faster on higher grade highways than on gravel roads."). Secure documents reference "truck turnaround time" guarantees, as well as the "all-weather tipping pads" that are intended to "ensure the upmost safely for truckdrivers and operators while guaranteeing the quick turnaround of trucks at the facility." See SES0045741.

[218] This widely adopted method of analyzing consumer choice was pioneered by Professor Daniel McFadden, who in 2000 received the Nobel Prize in Economics for developing these methods. See The Nobel Prize Press Release "The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2000," October 11, 2000, available at https://www.nobelprize.org/prizes/economic-sciences/2000/press-release/, accessed on September 4, 2019 ("Citation of the Academy: 'to James Heckman for his development of theory and methods for analyzing selective samples and to Daniel McFadden for his development of theory and methods for analyzing discrete choice.'"); McFadden, Daniel , "Conditional Logit Analysis of Qualitative Choice Behavior," *Frontiers in Econometrics*, ed. Paul Zarembka (New York: Academic Press, 1974), pp. 105–142 at p. 106 ("This paper outlines a general procedure for formulating econometric models of population choice behavior from distributions of individual decision rules. […] The relevance of these methods to economic analysis can be indicated by a list of the consumer choice problems to which conditional logit analysis has been applied: choice of college attended, choice of occupation, labor force participation, choice of geographical location and migration, choice of number of children, housing choice, choice of number and brand of automobiles owned, choice of shopping travel mode and destination.").

[219] Raval, Devesh, Ted Rosenbaum, and Steven A. Tenn. "A semiparametric discrete choice model: An application to hospital mergers." *Economic Inquiry* 55, no. 4 (2017): 1919-1944. See Sections 7.5, 7.6, 7.7 for estimation details. Miller, Nathan, and Gloria Sheu, "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," *Review of Industrial Organization* 58 (2021):143–177, at p. 150 ("More recently, the antitrust agencies have relied on more sophisticated simulations, which approach the structures that are commonly seen in the scholarly literature, where complex demand and supply functions are the norm: In *AT&T/DirecTV* (2015), experts who worked on behalf of the FCC and those who worked on behalf of the merging firms both constructed simulation models with nested logit demands that were estimated with the use of detailed, geographically disaggregated data. Based in part on these results, the FCC decided to approve the transaction. During the litigation of *Aetna/Humana* (2016), the DOJ's expert also used a merger simulation with nested logit demand.").

product markets, i.e., TRDs, landfills, and waste water disposal. In the model, the oil and gas producer's value for a waste service facility depends on two components: (i) a component that is common across all well sites located in roughly in the same geographic region and (ii) an idiosyncratic component that changes across customer well sites even if they are equidistant from a facility.[220]

125. The first common component quantifies common factors that affect the facility choices of customers (i.e., the frequency with which facilities are chosen by well sites in a given location), such as the distance between well site and facility and the quality of the services offered by the facility.[221] The second component allows for the fact that a customer operating at a specific well site may prefer one facility to another due to an idiosyncratic factor that is not shared by other, nearby well sites. For example, a given oil and gas producer may have a strong business relationship with a particular waste service facility, the producer may be able to negotiate a price based on historical pricing at that facility, or the producer may have types of wastes that require specialized services or a bundle of services that can be handled at a selected facility.[222]

126. Customers that value a specific facility more than other facilities will more often deliver waste there over their alternatives. Consequently, the model will use market shares to capture customers' relative preference for one facility over another and determine which facilities are the first or second-best alternatives for clusters of well sites located in specific regions. The model also allows me to identify the extent to which a third-best competitor can replace the second-best competitor as a viable alternative after the merger. In Section 7.4, I provide details of this approach to estimating waste service demand.

127. In my analysis, I group customers, or well sites, that are in similar geographic locations, and I measure an average price impact from the merger

[220] Note that I describe the model and customer preferences in terms of well site instead of oil and gas producer. This is because the transactions that enter the model are in relation to specific well locations and are not the set of all well locations operated by any given producer active in the WCSB.

[221] As noted just above, these factors might include capacity, wait times, or services rendered at the facilities. See fn. 214, 215, and 216.

[222] Engel testimony, December 20, 2021, p. 48-50, questions 121-127 ("A. Well, different customers, firstly, operate across different geographies. They also handle different services, so each customer is unique in that way. The specific waste streams are unique, so not all soil is created equal, and there are times operationally where at a landfill specifically a waste that maybe has better stacking or handling capabilities could be more advantageous for the operations of the site versus, you know, if you were bringing soil that was maybe from a spill onto, say, muskeg or a wet material versus a dry material or more gravel and rock. So they are both soils, but the actual product has a big part in that because every site that is being cleaned up is unique in that sort of way. … Things like where the trucking is coming out of; relationships; I think I mentioned other products that we are handling, so if it's a customer that we're also handling their oil or other things to consider as far as providing a price. … Historical pricing is something that plays into it.").

for them.[223] These groupings are based on the customer-based geographic markets I described in Section 4.2. I calculate the average price effect in each of these locations. Modeling the merger simulation requires two inputs:

- **Shares within each geographic market**. I calculate revenue-based market shares as described in Section 5.1. Recall that my approach conservatively accounts for services acquired both inside and outside of the relevant market. Furthermore, my market share calculations conservatively account for services rendered at municipal landfills and facilities operated by oil and gas producers that can take in waste from other producers.[224]
- **Facility markups**. I calculate average variable cost markup at the market-level using the Parties' financial data, which describe the revenue, fixed costs, and variable costs for individual facilities. I describe my markup calculations in detail in Section 7.2.

128. My model also accommodates the possibility that the Parties complete the planned facility closures, which tend to lower the estimated price impact of the merger on the Parties' services because the closures may lessen the market power attributed to the merged firm if some of the customers of closed facilities divert to competitors.[225] Facility closures also likely increase the prices paid to third-party facilities. This is because the Parties' closed facilities may have constrained third-party pricing pre-merger, to the extent that the closed facility provided the second-highest surplus.[226] To be conservative in my analyses, however, I do not account for the increase in third-party facilities prices in both my competitive effects and deadweight loss analysis. In the exhibits below, I

[223] As described above, the underlying customer preferences for waste service facilities include both a common and idiosyncratic component, where the latter describes how an operator of a specific well site may value a facility different than another nearby well site operator. I am interested in measuring the average price impact experienced by clusters of customers that face similar competitive conditions, and my modeling framework allows me to measure these average price impacts even when the well sites have idiosyncratic preferences underlying their decisions to deliver wastes to specific facilities.

[224] To accurately calculate market shares for facilities that are part of particular customer-defined markets, I must also account for the share of revenue generated by those customers at facilities located outside the defined market. See Section 5.1 and 7.6 for implementation details.

[225] Absent the closure, the Parties are more likely to have a post-merger market share closer to the sum of the pre-merger market shares. With a facility closure, the Parties' combined post-merger market share is likely to be less than what it would have been absent the merger because my model assumes that the closed facilities' revenue is apportioned to the remaining market participants, including third-party competitors.

[226] Miller, Nathan H., and Gloria Sheu. "Quantitative methods for evaluating the unilateral effects of mergers." *Review of Industrial Organization* 58, no. 1 (2021): 143-177.

report the results from the scenario where Parties close all facilities that they have planned.[227]

129. I present results of this merger simulation in **Exhibit 21,** which conveys that many customers' well locations are likely to experience price increases for waste services.[228] In particular, landfill and TRD customers may experience, on average, between 13.6 and 25 percent price increase, respectively, and water disposal customers may experience, on average, an increase of around 11.4 percent.[229] Customers in markets where the number of TRD providers are reduced from 2-to-1 may experience an average price increase of 51.7 percent. Landfill customers who face a 3-to-2 merger may experience an average 17.6 percent price increase. Water disposal well customer who face a merger to monopoly may experience a 24.7 percent price increase, on average. See my Appendix (Section 7.1.2) and backup materials for the market-level results.

EXHIBIT 21
Merger Simulation Price Increase Estimates

	TRD	Landfill	Water Well
2-to-1	51.7%	-	24.7%
3-to-2	25.1%	17.6%	22.6%
4-to-3 (or higher)	15.1%	11.0%	10.5%
Total weighted average	25.0%	13.6%	11.4%

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Note: Simulation assumes that Parties complete planned closures. Each predicted percentage price increase is based on the revenue-weighted average across each of the Parties' geographic markets. To calculated the percentage change in prices, or the percentage change in markups, the post-merger implied markups are compared to the pre-merger implied markups. Markets in which either Secure or Tervita do not generate at least 5 percent of revenue are excluded from the percentage changes in markups because these markets appear to have less direct competition between the Parties and may not experience a change in competitive conditions due to the merger. Markets comprised only of a Secure or Tervita draw area are also excluded because these markets are already monopolies and may not experience and change in competitive conditions due to the merger. See the Appendix (Section (7.6) for more details.

[227] I also calculated the price impact without facility closures (see my backup files). This scenario approximates the case where all customers of closed facilities are captured by Parties' remaining facilities. Mr. Harington has used this scenario in his Affidavit.

[228] See Section 7.3, which describes some of the ways in which my share calculations are conservative, rendering my predicted price effects conservative, as well.

[229] Note that my baseline price-predictions compare implied pre-merger markups to implied post-merger markups that account for customer-level variation in preferences in a given market. However, my conclusions do not change if instead I compared the implied post-merger markets to actual pre-merger markets that stem directly from the total revenue and variable cost margins in my data. See Workpaper 14. See Section 7.6 for implementation details regarding how my model accounts customer-level variation in preferences in each customer-defined market.

130. I note that while the results of the merger simulation are based on a second-score auction model, the academic literature has shown that the predicted price impact of second-score model is similar to the predicted price impact of a merger simulation first-price auction model.[230] Therefore, the results are unlikely to be sensitive to the use of second-score auction model.[231] A merger simulation based on the first-price auction model captures the post-merger pricing incentives in transactions where waste service suppliers bid to provide waste services to oil and gas producers, and then producers decide which facility best fits their needs and pays the bid price. This approach also captures the post-merger pricing incentives when firms "post" prices to its customers, or a posted price market.

131. Given that the merger simulation based on either approach yields approximately similar predictions on pricing incentives, it is immaterial which of the bargaining processes better describes the industry. Showing a large price impact of the merger based on the second-score auction model indicates that the price impact is likely to be of similar magnitude in a first-price auction model.[232]

132. Moreover, in implementation, I assume that 10 percent of revenue is generated outside the market. I make this assumption even in markets where I observe that the Parties' facilities comprise the only viable facilities for customers' well sites located in those local geographic market.[233] This assumption mechanically underestimates the price impact, and it builds in some competition and source of price constraint, even in markets where there are no apparent competitors but the Parties.

[230] Miller, Nathan H., and Gloria Sheu. "Quantitative methods for evaluating the unilateral effects of mergers." *Review of Industrial Organization* 58, no. 1 (2021): 143-177.

[231] The model results are instead driven by data on market shares and the markups, which capture the competitive significance of the merging firms and their ability to exert pricing power, respectively.

[232] See Section 7.6 for more details linking outcomes from the two modeling frameworks.

[233] See Section 4.2 and my Appendix (Section 7.3).

6. WELFARE LOSS DUE TO THE MERGER

133. In economic theory, deadweight loss ("DWL") arises when the merger results in a loss of trade between customers (e.g., oil and gas producers), and producers, (e.g., waste service suppliers). This is because a transaction between a supplier and producer generates value to consumers (i.e., the consumer surplus) and profits to the producers (i.e., the producer surplus). The Secure and Tervita merger results in loss of efficient trade through a variety of ways.

- First, I understand that the Parties intend to fully or partially close at least 35 facilities.[234] Mr. Harington claims that these facilities are redundant, and facility closures will "allow [the Parties] to cease operations at certain locations in whole or in part without any reduction in total output."[235] Even if the facility closures do not reduce total output, they create loss in consumer surplus because customers will now have fewer waste service options, lose access to their most preferred facilities, and lose the incremental value that these options generate for them. I estimate the DWL arising from lost choice to be $78 million. (**Section 6.1**)
- Second, as discussed in Section 5.3, oil and gas producers are likely to face average price increases for waste services between 11 and 25 depending on the product market. Higher prices result in a loss in trade between oil and gas producers and the merging Parties as follows. (**Section 6.2**)
    - » Oil and gas producers may respond to such price increases by choosing another less efficient option outside the relevant markets, such as bioremediation, municipal landfills, or forms of self-supply or self-storage.[236] I am not able to estimate fully this DWL. But my illustrative calculations show that the loss could range between $0.5 million and $2.4 million for solid waste and between $0.5 million and $2.0 million for water

[234] Harington Affidavit, Table 7, "Summary of Full-Service Integration Groupings Facility Rationalization Decisions," [RCFD00001_000000014] p. 142; Harington Affidavit, Table 8, "Summary of LF Integration Groupings Rationalization Decision," [RCFD00001_000000014] p. 143; SESL0039221.xlsx; SESL0034121.pdf.

[235] Harington Affidavit, [RCFD00001_000000014] p. 131.

[236] As I described above, alternatives such as bioremediation and on-site storage are not large-scale substitutes for waste services and customers would not switch to them in large volumes in response to small price increases. As the magnitude of price increases grow, use of these alternatives would increase.

waste delivered to the Parties' landfills and water disposal wells.[237]

» Economically, the increase in waste service prices may also influence oil and gas producers' decisions to produce from or drill marginally profitable wells. This, in turn, will reduce the volume of waste and create additional DWL.

» Finally, the price increase may lower the volume of legacy waste that is shipped to the Parties' facilities and create DWL.[238]

134. I explain all these sources of DWL in this section. Exhibit 22 displays the DWL I am able to quantify.

6.1. Oil and gas producers value having access to closed facilities, resulting lost customer value due to the merger

135. I understand that the Parties intend to close a set of at least 31 facilities fully and additionally plan to partially close at least 4 as part of the merger,[239] which are listed in **Exhibit 22**.[240, 241] Several other facilities were planned for

[237] Expert Report of Henry J. Kahwaty, Ph.D. October 7, 2011 in "The Commissioner of Competition v. CCS Corporation et al.," 2012 Comp. Trib. 14 File No.: CT-2011-002 [RBBA00007_000000025].

[238] As I understand, legacy waste is accumulated waste from drilling activity that has been left at drilling sites. Legacy waste includes waste remaining on-site at "orphan" wells, which are abandoned wells when oil and gas producers go bankrupt.

[239] To account for Party transactions and profits that are affected by partial facility closures, I classify service types and substances into broad categories such as waste, water, treating, and oil terminalling, the latter of which is excluded from my analysis as I understand it is not part of one of the product markets at issue. Based on these classifications, I then flag transactions that will be affected by a partial facility closure. For example, I understand that the Edson waste and treating services will be closed. Consequently, I only account for those service categories provided by Edson when assessing DWL from facility closures, and all standalone water services are assumed to be unaffected. See Section 7.7.2 for a description about classifying waste services and my backup for more details.

[240] Harington Affidavit, Table 7, "Summary of Full-Service Integration Groupings Facility Rationalization Decisions," [RCFD00001_000000014] p. 142; Harington Affidavit, Table 8, "Summary of LF Integration Groupings Rationalization Decision," [RCFD00001_000000014] p. 143; Engel testimony, December 21, 2022, pp. 400-401, questions 1128-1130; Dec 2021 is the Synergy Tracker [SESL0039221].

[241] Note that my analysis excludes DWL from closing the a few water disposal facilities that were temporarily or partially suspended according to the Parties' documents, rendering my DWL estimates conservative. These facilities include Tervita's Sierra WD, Kindersley East, and Kaybob facilities (all of which provide services more akin to standalone water wells), as well as Secure's Wild River SWD [redacted]

closure regardless of the merger outcome, and they are also listed and identified as such in the exhibit.[242]

[redacted]

[242] I do not allow the price effects or DWL to account for facilities that were planned to close regardless of the merger, which includes Tervita's Spirit River Landfill, Judy Creek Landfill, Bonnyville Landfill, and Swan Hills water disposal well. Excluding these facilities from my analysis is conservative because the revenue generated at those facilities is apportioned across all remaining facilities in each of markets that include them. Consequently, the overall levels and shares of revenue for the Parties will be lower in those markets, decreasing diversion, and thus decreasing the estimated price effects and DWL. Harington Affidavit, "Section D. Incremental Customer Transport Costs," [RCFD00001_000000014] pp. 156-158; Footnote to Harington Affidavit, Schedule 3.2, "Facilities Cost Savings, One-Time Costs and Avoided Capital Expenditure," [RCFD00001_000000014] p. 222.

EXHIBIT 22
Facilities that Secure and Tervita plan to close because of the merger

Facility Name	Party	Type of closure	Facility Type	Share of revenue among... Landfills	TRDs	Water wells
[redacted]						

Source: Harington Affidavit, Table 7, "Summary of Full-Service Integration Groupings Facility Rationalization Decisions," [RCFD00001_000000014] p. 142; Harington Affidavit, Table 8, "Summary of LF Integration Groupings Rationalization Decision," [RCFD00001_000000014] p. 143; SESL0039221.xlsx; SESL0034121.pdf; Footnote to Harington Affidavit, Schedule 3.2, "Facilities Cost Savings, One-Time Costs and Avoided Capital Expenditure," [RCFD00001_000000014] p. 222

Note: The table lists all facility closures that I am aware of that are either merger-specific or were planned regardless of the merger outcome, the latter of which are identified with a star in the type of closure column. The share of landfill, TRD, and water well revenue compares the revenue generated at each of the closed facilities to the total revenue generated by the Parties in each category.

136. Closing these facilities leads to DWL borne by oil and gas producers that place more value on access to these facilities compared to the remaining facilities. The economic theory of revealed preferences suggests that observing

an agent that chooses one alternative over another indicates that agent must derive more value from the chosen alternative.[243] Oil and gas producers choose to deliver waste to specific facilities instead of others, potentially driven by proximity, relationships, quality of service, and wait times at certain facilities, among other potential factors.[244] The Parties claim that these facilities are redundant,[245] yet as displayed in Exhibit 22, these facilities each have sizable shares in their respective product markets. Moreover, as demonstrated in the Appendix (Section 7.2), these facilities have sizable markups, indicating that customers value the services provided by these facilities over other nearby facilities.

137. Indeed, as I explain in detail in **Section 6.1.1**, the economic profitability of a closed facility serves as a marker of its social value to the market. The fact that these facilities continue to earn economic profits today indicates that closing them would result in DWL to the relevant waste service market.[246]

138. I also quantify the DWL resulting from facility closures using two methods.

- **First**, I calculate deadweight loss based on the observation in Section 6.1.1 that the facilities' economic profitability reflects its social value to the relevant market and that the variable profit of the firm reflects the consumer surplus generated by presence of the facility in the relevant market. Using information on the closed facilities' margins, DWL in consumer surplus from facility closures is around $78 million. This estimate does not include Parties' claimed efficiency gains from the closure of facilities. (**Section 6.1.2**)
- **Second**, I use a method often used in the empirical industrial organization literature for valuing product access or new goods.[247]

---

[243] For a theoretical background on the "revealed preferences approach," see Varian, Hal R., "Microeconomic Analysis," *Third Edition,* W. W. Norton & Company, Inc., 1992, at pp. 131–132.

[244] See fn. 215, 216, and 216.

[245] Harington Affidavit, [RCFD00001_000000014] p. 139 ("For each facility ceasing operations in whole or in part, one or more proximate facilities of the parties that is to remain operational will have sufficient capacity for each relevant service to absorb the demand that is currently being supplied, and is expected in the future would be supplied, from the facility coming offline…. Whether a facility is closed fully or partially depends on whether all services at a closing facility can be absorbed into the nearby party facilities or whether only certain services can be absorbed (e.g., given operational differences of the facilities or capacity constraints).").

[246] Moreover, facility-level variable costs markets that are based on the Parties' financial statements suggest that the closed facilities were profitable in both 2019 and 2020. See Section 7.2 for facility-level variable cost margin calculations for 2019, and see my backup for the variable cost margin calculations in 2020.

[247] See, for example, Petrin, Amil, "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy,* 110 no. 4 (2002): pp. 705–729; Ackerberg, Daniel A., and Marc Rysman, "Unobserved Product Differentiation in Discrete-Choice Models: Estimating Price Elasticities and Welfare Effects," *The RAND*

> This method leverages information on consumer choices or relative shares to infer the value of a good. Specifically, I use a widely accepted method that quantifies consumer valuations in terms of closed facilities' market shares, and using this method, consumer valuation from facility closures is around $55 million. (**Section 6.1.2**) I note that the $55 million estimate of DWL is only a partial estimate as it only covers loss to customers' well sites located in relevant markets that include a closed facility and the customers' second alternative. It does not include the loss to customers who are not in a relevant market that include a closed facility but have used the closed facility or value having access to such facility.[248]

139. I also independently quantify a component of the DWL from increased transportation costs. When facilities close, customers of those facilities must transport their waste elsewhere, and in many cases, they may need to travel farther to reach another Secure or Tervita facility. Using a similar technique applied in Harington Affidavit dated July 14, 2021,[249] I estimate that facility closure may increase transportation costs from $6.4 to $7.2 million, a specific source of DWL in the waste services industry (**Section 6.1.3**). I note that this loss is included in the overall $78 million in DWL due to facility closures.

6.1.1. *In markets with price discrimination, DWL arises from the closure of economically profitable firms without any efficiencies stemming from reduced marginal costs*

140. In this section, I explain why the magnitude of the fixed cost savings from an economically profitable facility closure is immaterial to the question of whether or not closing a facility would result in DWL. For this reason, if all of the efficiencies related to a facility closure arise strictly from eliminating the facility's fixed cost, and if the facilities subject to closure are economically profitable (i.e., profitable after deducting fixed costs) before the merger, then closing these facilities would necessarily lead to a DWL in the relevant market.

141. In the second-score auction, the social value created by a facility is equal to its economic profit—i.e., revenue less economic costs, where economic costs

---

Journal of Economics, 36 no. 4 (2005): pp. 771–788; Gentzkow, Matthew, "Valuing New Goods in a Model with Complementarity: Online Newspapers," *American Economic Review,* 97 no. 3 (2007): pp. 713–744.

[248] For example, a customer that uses the closed facility may not be in the overlapping draw areas of a Tervita and Secure facilities and, therefore, may not be in a relevant market even if they are located in the closed facility's draw area. Yet, this customer will also experience a loss once the facility closes.

[249] Harington Affidavit, Section D. Incremental Customer Transport Costs, [RCFD00001_000000014] pp. 156-158.

comprise the variable and fixed cost associated with providing waste services to oil and gas producers. Therefore, if a merger leads to closure of economically-profitable facilities, then the merger necessarily results in a social loss. I provide a proof of this claim in the Appendix (Section 7.6.2); however, the following numerical example illustrates why the social value of the good is equal to or greater than the firm's economic profit in price discrimination markets.

142. Consider the addition of another waste service facility, Facility A, to the market with an existing Facility B. For illustrative purposes, we assume that the fixed cost of operating these facilities is $100, while the variable cost of serving each customer is $10. Suppose that there are 20 customers in the market, each with varying valuations for waste services, or the willingness-to-pay ("WTP"), for each facility.

- Type I customers value shipping waste to Facility A at $40 and Facility B at $20.
- Type II customers value shipping waste to Facility A at $20 and Facility B at $40.

143. Further, suppose that there are 10 customers of each type. If Facility B were the only operational facility, it would serve Type I customers—customers who have a higher WTP for Facility A. By gaining access to Facility A, Type I customers would gain $20 ($40-$20) in consumer welfare since both plants operate at the same cost. Thus, the social value of adding Facility A to the market is $100. Consumers gain a total of $200 in surplus ($20*10 customers) and the operation of Facility A adds $100 in fixed cost to society, an amount less than the consumer surplus gains. In this scenario, it is socially optimal to keep both plants open.

144. In a market where both facilities can negotiate and charge customers different prices, it is economically viable for both facilities to remain open. More importantly, the economic profits earned by these facilities will generally be smaller than the social value. To see this, consider Facility A's pricing incentives and subsequent profitability. Since Facility A has a competitive advantage to secure Type I customers' business, it can attempt to outbid Facility B for them. At best, Facility B can offer its services to Type I customers at its variable cost of $10, and consequently, Facility A can charge as much as

$30 to Type I customers.[250] Indeed, at a price of $30, Facility A would earn a variable profit of $20 per customer ($30-$10), resulting in a total variable profit of $200 ($20 x 10 customers). Thus, the highest economic profit (revenue less variable cost and fixed cost) that Facility A can earn is $100—i.e., its social value. In the second score auction model, Facility A's economic profit is exactly $100.

145. This example illustrates how price discrimination markets generally lead to economic profits are no higher than the social value of a good, which holds for many economic models of price discrimination. Indeed, in the second-score auction model the economic profit is an exact measure of the social value of a good. In the Appendix (Section 7.6.2), I show that this result generalizes to first-price auctions, as well, due to the "revenue equivalence theorem,"[251] and the result holds if the model incorporates buyer power. With buyer power, economic profits is lower than the social value of the good. Therefore, I view the result as fairly general in markets that exhibit price discrimination.

146. An implication of the result is that the merger creates social loss (DWL net of efficiency gains) if (1) it results in the closure of economically profitable facilities, and (2) efficiency gains are due to the avoidance of fixed costs at the closed facilities.

147. Economically-profitable facilities are those in which the owners choose to operate them on an ongoing basis (i.e., they cover their fixed and variable costs). My understanding is that Secure and Tervita planned to continue operating many of the facilities that are now closing as part of the merger.[252] Furthermore, my understanding is that the claimed efficiency gains are due fixed costs savings from closing these facilities. Therefore, I conclude that the merger would necessarily lead to social loss (i.e., loss even after claimed efficiencies from fixed cost savings are considered). The following section describes how I quantify the loss to customers from reduced choice due to facility closures.

[250] The net value (WTP less price) to Type I customers from procuring Facility B's service amounts to $10 ($20 for the WTP for Facility B less the price of $10) for its service and. Since Type I customers' WTP for Facility A is $40, Facility A can charge as much as $30.

[251] See details in Section 7.6.2.

[252] Footnote to Harington Affidavit, Schedule 3.2, "Facilities Cost Savings, One-Time Costs and Avoided Capital Expenditure," [RCFD00001_000000014] p. 222.

6.1.2. *Facility closures may lead to [redacted] in DWL excluding any potential cost savings efficiencies from those closures*

148. Based on documentary evidence and testimony, oil and gas producers may choose to deliver oilfield wastes to one facility over another because of several factors. Due to the high costs of transportation, they may choose facilities that are located closer to the drilling site. They may also select a facility based on shorter wait-times or higher capacity to take in waste more quickly (and the consequent savings in truck rental costs),[253] relationships with customer service representatives,[254] or access to specialized services or infrastructure such as railroad terminals or pipelines that transport oil or gas,[255] among other potential factors. When waste service providers shutter one of their facilities, oil and gas producers lose access to it, along with the value they derived from delivering wastes to that facility over other alternatives. This is a deadweight loss in the market. This section quantifies the DWL stemming from the loss in consumer surplus resulting from fewer choices in the waste service market.

149. In my DWL calculation, I make a distinction between variable and fixed costs. Variable costs are any costs that change with the amount of goods produced. In the waste-supply industry, they comprise the costs that depend on the amount of waste a facility takes in for processing, treating, or disposal. These might include, for example, costs related to equipment maintenance and repairs, costs of sales, and logistics and freight.[256]

---

[253] Engel testimony, December 20, 2021, pp. 144-146, 148, questions 390-403, 409-411 ("Q. Okay. So Secure competes by providing customer satisfaction? A. Yes. Q. Okay. And one way Secure can compete is by increasing offloading capacity. Is that correct? A. Yes. Q. How does Secure increase offloading capacity to compete? A. You can add additional truck risers. You can prepare your offload areas so that more trucks can unload concurrently, things like that. … A. Yes, get the trucks in and out, as fast as we can safely do it. … A. Yes. Wait time would be a truck arriving at a facility, waiting to offload, whereas turnaround time would be time within the site. … Q. 'Another way that Secure can compete is by accurate and timely invoicing/reporting.' Do you see that there? A. Yes. Q. Okay. And another way is by engaging in consistent communication? A. Yes. Okay. What do you mean here? Consistent communication, how do you do that? A. Through our staff at the facilities and our sales team communicating directly with the customers."); Witness Statement of ConocoPhillips, February 23, 2022, ¶ 16; Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶ 16; Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 15; Witness Statement of Paul Dziuba (Chevron), February 24, 2022, ¶ 29; SES0045741.

[254] Engel testimony, December 20, 2021, p. 151, question 420 ("THE WITNESS: Customer service is probably our main point. MS. NEKIAR: Okay. Q. You can't give me any other ways that Secure competes? A. Well, we provide services broadly. So these are very location specific but, you know, there is also broader corporate relationships as well: Reputation, things like that, trust at a high level, that create a competitive advantage.").

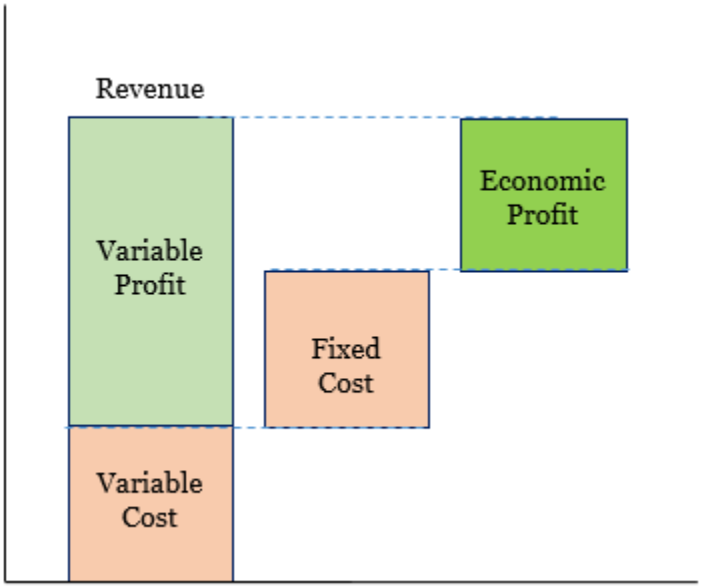
[255] Based on transaction data, some facilities, such as Tervita's Silverberry facility, appear to handle more NORM wastes, for example, and customers tend to travel farther distances to reach those facilities. See Section 3.2.1.

[256] Harington Affidavit, [RCFD00001_000000014] ¶ 17 ("Variable costs are considered to be short term incremental costs incurred directly on account of a ±5% change in output …"); see also the line items classified as "tied to volume" in a. 04-27-2021 SES Analysis (003).xlsx [RBBC00003_000000004].

150. In contrast, fixed costs do not depend on the amount of waste services a facility takes in from oil and gas producers. These might include salary and benefits for non-contracted employees, IT and administrative costs, building rents, and land leasing royalties, among others.[257]

151. **Exhibit 23** illustrates the relationship between variable and fixed costs and firm profits for economically profitable firms. A firm's variable profit is the amount of revenue a firm takes in less its variable costs (i.e., variable profit = revenue – variable costs). A firm is economically profitable if its variable profit exceeds its fixed cost. In this case, it is profitable for the firm to continue operating since it can cover the fixed costs. In contrast, if variable profit is less than the firm's fixed cost, the firm would eventually find it financially sound to cease operating.

EXHIBIT 23
Illustrative relationship between variable and economic profit



152. My DWL calculation, does not include potential fixed cost-savings as efficiencies. Thus, my DWL estimate can be compared to any purported cost-savings claimed by the Parties. As detailed in Section 7.6.1, prices in the second-score auction are based on the incremental value derived from a customer's

[257] Harington Affidavit, [RCFD00001_000000014] ¶ 17 [redacted] see also the line items classified as not "tied to volume" in a. 04-27-2021 SES Analysis (003).xlsx [RBBC00003_000000004].

most preferred facility relative to a customer's next-best alternative. Thus, the variable profit reflects the DWL of closing the facility in my calculation. . Note that because the closing facilities overall were economically profitable (i.e., their variable costs are higher than their fixed costs), the merger will lead to a DWL larger than claimed efficiencies from fixed cost savings.

153. The first row of **Exhibit 24** describes the DWL from facility closures using the method described above. In particular, the first row quantifies the DWL from facility closures using the profit-based method that assumes firms are able to extract the surplus from negotiating waste service prices with individual customers, and the closed facility profits quantify that surplus. I predict that DWL from facility closures could reach around $78 million. The estimates account for harm to oil and gas producers from losing access to their most preferred facilities, which may increase their transportation costs, result in longer wait times to deliver wastes, and require building new relationships with customer service representatives, among other factors. See my Appendix (Section 7.1.2) and backup materials for the market-level results.

EXHIBIT 24
DWL to customer from facility closures

	DWL
Based on profits of closed facilities ***(Accounts for all closed facility customers)***	$78.12 million
Based on market-share approach ***(Accounts for customers in overlapping draw areas)***	$40.05-$55.14 million

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); Harington Affidavit [RCFD00001_000000014]

Note: The range of DWL estimates reflects the underlying demand model. DWL based on the second score auction is $55 million, and the DWL based on the Bertrand model is $41 million. The DWL is greater when using the profits-based approach because it accounts for all revenue (and profits) generated by each of the closed facilities across all customers, whereas the share-based approaches exclude revenue generated by customers that are not located in the closed facilities' overlapping draw areas. Customers of the closed facilities are excluded if they are located outside of the closed facilities' 10-percent draw areas or if they are located in areas that are not one of the Parties' overlapping draw areas.

154. I also quantify the DWL for the set of customers I analyzed in Section 5 using another estimation technique (*share-based approach* to valuing customer options) to calculate DWL, which is reported in the second row of **Exhibit 24**. In particular, I focus on measuring the DWL for customers located in my relevant market that are affected by closures, which is mechanically smaller than the profit-based DWL calculation that accounts for revenue from

all customers of each closed facility. For this calculation, I utilize a common technique in the economic literature for valuing new goods,[258] which leverages the information on customer choices to value the goods. Under this framework, facilities that receive relatively higher market shares are more valued relative to facilities with lower market shares. Consequently, the change in consumer surplus resulting from a plant closure is given by:

$$\text{Change in } Total\ Surplus = \sigma \ln(1 - \text{Share of the Closed Facility})$$

155. Higher facility shares imply higher loss in utility, or a unit-less measure of the consumer's value. The parameter σ converts the unit-less lost value into dollars—i.e., lost profits to oil and gas producers due to the closure. I use information on the firms' markups to quantify consumer loss in dollars as detailed in Appendix (Section 7.6.1).

156. The lower panel of **Exhibit 24** displays the DWL using the share-based method and that is restricted to the customers in locations that will have a reduction in competition because of the merger, which amounts to between $40 and $55 million.[259] These estimates of DWL do not reflect harm to customers of closed facilities that do not operate a well in the overlapping draw are of Secure and Tervita facilities, even if the closed facility had a monopoly in that customers' market before the closure.[260] See my Appendix (Section 7.1.2) and backup materials for the market-level results.

6.1.3. *DWL from increased transportation costs alone will range between $6.4 and $7.2 million*

157. A specific component of the DWL from facility closures is comprised of increased transportation costs incurred by customers of those closed facilities. As described in Section 3.3, transportation costs are a significant component of

[258] See, for example, Petrin, Amil, "Quantifying the Benefits of New Products: The Case of the Minivan," *Journal of Political Economy,* 110 no. 4 (2002): pp. 705–729; Ackerberg, Daniel A., and Marc Rysman, "Unobserved Product Differentiation in Discrete-Choice Models: Estimating Price Elasticities and Welfare Effects," *The RAND Journal of Economics,* 36 no. 4 (2005): pp. 771–788; Gentzkow, Matthew, "Valuing New Goods in a Model with Complementarity: Online Newspapers," *American Economic Review,* 97 no. 3 (2007): pp. 713–744.

[259] While the profit-based method accounts for all closed facilities' customer revenue, the share-based method may not, excluding revenue from customers that are not located in a closed facility's overlapping draw area, for example. Customers may be outside the closed facility's draw area, which excludes 10 percent of revenue, or customers may be located in parts of the closed facility's draw area that do not overlap with the other merging party's draw areas.

[260] The estimates omit customers operating wells located outside the closed facilities' draw area or that are located inside the draw area that is not overlapping with the other merging party. The second set of customers, in particular, may experience harm from the merger that is not quantified in the model since they may lose access to their only viable or Party facility through the closure.

the total money oil and gas producers spend on waste services. A direct consequence of closing facilities is that many customers of those facilities will need to pay more trucking fees in order to transport oilfield waste to an alternative facility located farther away. Largely following the methodology used by Mr. Harington in his declaration dated July 14, 2021, but making corrections to it, I estimate the increased transportation costs from facility closures and find that customers will incur between $6.4 and $7.2 million in harm from that source alone.

158. In this analysis, I calculate the incremental distances and trucking costs that customers of the closed facilities would need to incur in order to send their waste to the next nearest Secure or Tervita facility.[261] I make several changes to Mr. Harington's analysis. First, Mr. Harington uses 2020 data as the basis of his calculations. Oil and gas production activity and associated waste volumes in 2020 were at historically low levels. Instead, I use 2019 waste volumes, and I note that oil and gas production activity has significantly increased in 2021 compared to 2020 and industry sources forecast increased activity in the future.[262] Second, Mr. Harington calculates one way trucking costs. However, documents indicate that trucking companies charge round trip costs because trucks have to travel to the well site and then from the well site to the facility. [263] Third, I assume that oil and gas producers transported waste on the transaction dates, even if the amount of waste indicated on the transaction is less than a truck full.[264] In contrast, I understand that Mr. Harington's analysis aggregates volumes across different transaction dates until they fill a truck.

---

[261] Harington's analysis is also based on customers of the closed facilities traveling to the next-nearest Secure or Tervita facility instead of assuming that some of those customers may instead deliver waste to another non-Party competitor. See Harington Affidavit, [RCFD00001_000000014] ¶ 118 ("Analysis Group has calculated, based on the planned facility closures, (1) the distance that product is currently transported from customer locations to SECURE and Tervita facilities and (2) the distance that the product will be transported once the facility is closed, assuming that the customer selects the closest alternate party facility.").

[262] See, e.g., increased drilling activity by Petronas between 2020 and 2024. Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022, ¶¶ 13-14 ("…in the 2020 and 2021 calendar years PECL drilled fifty (50) and fifty-four (54) new natural gas wells respectively. I am further informed by Mr. Keenan that in anticipation of the start up of the LNG Canada export terminal PECL expects to drill the following number of new natural gas wells: i. In 2022 – 66 wells; ii. In 2023 – 112 wells; iii. In 2024 – 88 wells; and iv. In 2025 – 96 wells. There is a direct relationship between the number of newly wells drilled and the production of oilfield waste discussed below.").

[263] Documents that describe "Trucking Differential" analyses suggest that pricing accounts for roundtrips. See Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: [redacted] Volumes," October 15, 2020, TEV00223412, attachment "Trucking Differential – [redacted] xlsx," TEV00223413; TEV00045140.

[264] I used the variable ticket_date for Tervita transactions and transaction_date for Secure transactions. See Protected & Confidential - Tervita Data Dictionary.xlsx, tab "Spec 17 – Appendix C" [RBEK00004_000000076] (ticket_date refers to the "Transaction/Shipment Date"; Secure IR Response_Data Dictionary (Protected &

159. **Exhibit 25** summarizes the estimated increase in transportation costs stemming from the planned facility closures. In particular, waste service customers may incur between $6.4 and $7.2 million in additional transportation costs due to facility closures. These estimates account for customers that would need to travel farther distances to deliver their oilfield waste to another Party facility once the Parties have closed the facility to which they would otherwise deliver wastes.[265] These estimates account for round trucking fees, but they do not account for any additional trucking fees incurred due to longer wait times at the waste service facility.[266] See the Appendix (Section 7.6.4) for additional details about my calculation.

EXHIBIT 25
DWL from increased transportation costs

	Secure Customers	Tervita Customers	Total
Additional travel costs using driving distances	[redacted]		
Additional travel costs using driving times	[redacted]		

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

Notes: The increased travel costs incurred by Secure and Tervita customers accounts for duplicate volumes (i.e., instances in which the same volume is reported for both processing and disposal services). Similar to the Harington Affidavit, [RCFD00001_000000014] pp. 241-2, the analysis assumes trucks travel 80.5 km per hour on average and that the rental rate is [redacted] per hour. All estimates assume that oil and gas producers pay truck rental rates on the roundtrip, but these estimates do not account for any increased trucking fees incurred by longer wait times at the waste service facilities. Truck capacities to transport different waste types are based on an internal document (d. 05-26-2021 SES Transport Efficiencies InterCo.xlsx). [redacted] See Harington Affidavit, Schedule 3.2, "Facilities Cost Savings, One-Time Costs and Avoided Capital Expenditure," [RCFD00001_000000014] p. 222.

Confidential).xlsx, tab "Data 9" [RBEJ00002_000000015] (transaction date refers to the "Date of the transaction").

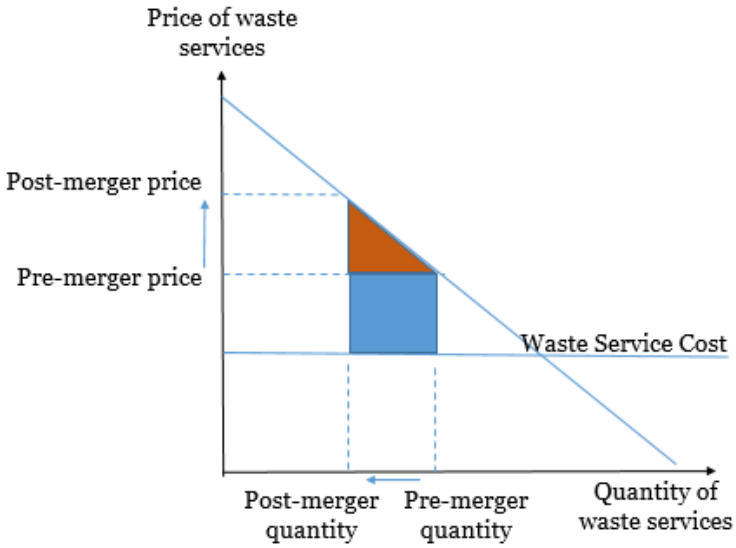
[265] [redacted]

[266] Witness Statement of Paul Dziuba, (Chevron), February 24, 2022, ¶ 16 ("These delays increase transportation costs, as transportation costs are charged for both travel time and wait times. They also result in delayed operations at Chevron's sites if waste trucks are not available when required."); Witness Statement of Shanley Bowersock, February 23, 2022, ¶ 13 ("A rate for any additional wait time is usually built into LB Energy's contracts with the producers. In other words, once LB Energy's trucks get to the facility, if there are additional wait times, the producer is charged on a per hour basis for that time. In LB Energy's experience, some facilities have wait times in excess of 6 hours when they are busy."); Witness Statement of ConocoPhillips, February 23, 2022, ¶ 16; SES0045741 ("SECURE is willing to guarantee truck turnaround times of 30 minutes for [redacted] loads and cover any additional wait time charges in excess of 30 minutes when at the facility. We are confident that elimination of wait-related charges provides additional operational cost savings to [redacted]).

6.2. Price increases will result in DWL because there will be less aggregate demand for waste services

160. Price increases resulting from the merger ultimately will decrease the aggregate demand for waste services. DWL arises when higher prices due to increased market power result in lower quantity demanded (i.e., loss of trade). **Exhibit 26** illustrates the DWL created when waste service prices increase.

EXHIBIT 26
Illustrative market demand for waste services and sources of changes to consumer and producer surplus



161. Pre-merger, the supplier charges the "pre-merger price" and quantity demanded is "pre-merger quantity," as depicted in Exhibit 26. Total surplus is then the area below the aggregate demand curve, above the "waste services cost" curve, and to the left of "pre-merger quantity." This surplus is created because the supplier's cost of providing waste services (as indicated by "waste service cost") is lower that the value customers' place on the services (as indicated by the demand curve). After the merger, when prices increase, the surplus shrinks to the area below the demand curve, above the "waste service cost" and to the left of the "post-merger quantity." The change in total surplus (i.e., the DWL) is the area between the "pre-merger quantity" and the "post-merger quantity," below the demand curve and above the "waste service cost." This area is depicted by the orange-shaded triangle and the blue-shaded rectangle. Conceptually, the DWL represents the transactions that would create a surplus but are not realized because the supplier charges a higher price. The

size of the DWL depends on the elasticity of demand, which captures how responsive customers are to a price change.

162. I have identified three potential sources of why a price increase will reduce the quantity demanded for third-party waste services:

- Oil and gas producers may use alternatives such as bioremediation, municipal landfill disposal, or temporary on-site storage instead of delivering their wastes to third-party disposal facilities.
- Oil and gas producers may decide to drill fewer oil and natural gas wells, forgoing any drilling projects that may not be profitable at higher waste service costs.
- Less legacy waste (accumulated waste that has been left at older drilling sites) may be processed, particularly at abandoned wells in Alberta that require closing and remediation services provided by the Orphan Well Association.

163. As I discussed in Section 4.1 there are alternatives to disposing waste at third-party facilities, such as bioremediation, on-site storage, using municipal landfills or first party facilities. Although these methods are not large scale viable substitutes for third-party facilities (i.e., customers cannot turn to them in sufficient quantities to defeat a small significant non-transitory price increase), oil and gas producers may use them more as prices of waste services increase.[267] For example, oil and gas producers may turn to more inefficient bioremediation (e.g., bioremediate certain types of waste that are less successfully remediated or use bioremediation in less ideal situations) or construct costly water disposal ponds or wells I am not aware of data or elasticity estimates that would allow me to fully quantify the DWL that would be created to the extent that customers turn to these less optimal alternatives. I am aware that Dr. Henry J. Kahwaty, who was CCS Corporation's expert witness in Commissioner of Competition v. CCS Corporation et al., provided an estimate of producer surplus gains if disposal costs decreased and landfill waste

[267] Witness testimony suggests that oil and gas producers that own self-disposal facilities use a cost-benefit analysis when considering whether to deliver waste to their own facilities or a third-party facility. Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022, ¶ 21 ("In particular, CNRL charges itself internally for waste disposal and considers transportation costs and capacity in choosing whether to use its own facilities. Once a CNRL-owned facility is at capacity, CNRL must use a third-party facility. Companies like Secure know where third party owned facilities (including CNRL-owned facilities) are located relative to their own facilities and the estimated trucking costs, and may price their services based on this knowledge.").

volume increased in Northeastern British Columbia.[268] Dr. Kahwaty's analysis implies an elasticity of 0.87. I calculate DWL based on various elasticities, using elasticities ranging from 0.2 to 0.87 (elasticity implied by Dr. Kahwaty's estimates). This illustrative calculation yields DWL between $0.5 million and $2.4 million for landfill waste, and DWL between $0.5 million and $2.0 million for waste water.[269]

164. The second source of DWL may come from oil and gas producers choosing to drill fewer wells and thus producing less waste. Specifically, before drilling a well, oil and gas producers weigh the costs to drill and operate it, which includes the costs to dispose of oilfield wastes, against the expected profits from selling extracted oil and gas. Economically, wells that are minimally profitable—or the "marginal wells"—are less likely to be drilled when any part of the costs increase. While increased costs of waste services may not affect producers' decisions to drill most future wells, it may cause them to forgo drilling *marginal wells*. When oil and gas producers reduce their drilling activity, the demand for waste services decreases, and producers experience a surplus loss as depicted by the orange triangle in Exhibit 26 while the waste service providers experience a loss as depicted by the blue triangle in Exhibit 27. I am not aware of data or estimates that would allow me to quantify this DWL.[270] However, academic studies show that drilling activity is responsive to changes in oil prices. Since costs and prices both affect profits from drilling activity, economics suggests that cost increases will also impact the number of wells drilled.[271]

165. The third source of DWL may result from lower quantities of legacy waste delivered to landfills and TRDs, particularly from abandoned wells to be reclaimed by the Orphan Well Association ("OWA"). I understand that oil and gas producers have a responsibility to close and reclaim well sites once they cease producing minerals from them according to regulations enforced by the

[268] Expert Report of Henry J. Kahwaty, Ph.D. October 7, 2011 in "The Commissioner of Competition v. CCS Corporation et al.," 2012 Comp. Trib. 14 File No.: CT-2011-002 [RBBA00007_000000025]. Dr. Kahwaty uses [redacted] and [redacted] See p. 23.

[269] See Workpaper 16 for the details of my calculations and estimates at other elasticity levels.

[270] Quantification of this reduction in volume would require knowing a number of detailed industry factors that inform oil and gas producers' drilling and production decisions. These factors include how much oil and gas producers pay in waste service costs to produce a barrel of oil (or cubic-meter of natural gas), how producers account for those costs over the life of a well, measure of producers' drilling rates in the WCSB, and a measure of their cost elasticity, among others.

[271] For example, Newell and Prest estimate the elasticity of conventional drilling in the U.S. as 1.3. Richard G. Newell and Brian C. Prest, "The Unconventional Oil Supply Boom: Aggregate Price Response from Microdata," The Energy Journal, Vol. 40, No. 3, 2019.

Alberta Energy Regulator.[272] If producers go bankrupt and abandon well sites, this responsibility falls to the OWA. In response to predicted waste service price increases from the merger, I understand that the OWA may be able to close and reclaim fewer abandoned wells because of the relationship between the number of reclaimed wells in a year and the costs to reclaim them.[273]

166. Delegated by the Alberta Energy Regulator, I understand that the OWA mandate is to "decommission and reclaim oil and gas wells, facilities, and pipelines in Alberta that do not have a solvent and responsible owner."[274] The funds used to pursue this work largely come from the Orphan Fund Levy paid by the oil and gas industry participants in Alberta and through government loans.[275] Based on the OWA's abandoned well inventory, they estimate around $350 million in remediation costs, of which approximately 15% will pay tipping fees to landfills operated by companies such as the Parties.[276]

167. The Parties were the top two vendors used by the OWA for both landfill and TRD services in 2020 and 2021.[277] Because of the types of solid waste disposal required, the OWA does not consider bioremediation or municipal landfills to be viable alternatives.[278] Moreover, the Parties are the only two companies that operate facilities that can dispose of NORM wastes, which the OWA will use to close some well sites.[279]

168. The OWA testimony confirms that the number of reclaimed wells is linked to the costs of waste services, and with price increases, the OWA will be unable to close as many wells per year.[280] However, OWA does not provide data or

---

[272] Alberta Energy Regulator, Directive 088 Licensee Life-Cycle Management, available at https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-088 (accessed February 25, 2022) ("It outlines how information, particularly financial, reserves, closure, and compliance information, will be used to enable the AER to assess the capabilities of licensees to meet their regulatory and liability obligations throughout the energy development life cycle; administer our liability management programs; and ensure the safe, orderly, and environmentally responsible development of energy resources in Alberta throughout their life cycle.").

[273] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 41.

[274] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 10.

[275] Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 12-13.

[276] Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 23.

[277] Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 28-29.

[278] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 25 ("We send most solid waste to Class 2 landfills. The solid waste the OWA disposes of in Secure facilities may be contaminated with salts, heavy end hydrocarbons, or heavy metals. As a result, disposal into Class 2 landfills is the only viable option as bioremediation cannot be used to effective remediate solid waste with some or all of these contaminants."); Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 30.

[279] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 32.

[280] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 41.

estimates of how responsive their volume would be to price increases. Therefore, I am not able to quantify the DWL generated when OWA is able to close and reclaim fewer wells as waste management costs increase.

169. However, the OWA explains that they spent $145 million in fiscal year ending March 31, 2021 and approximately half of its remaining closure costs are for remediation expenditures.[281] OWA further explains that 15 percent of remediation costs are for landfill tipping fees and Tervita and Secure combined accounted for 40 percent of landfill expenditures in the period from January 1, 2020 to November 30, 2021.[282] That means the OWA spent approximately $4.35 million on Secure's and Tervita's landfills.[283] At an average tipping fee of $23.25, this translates to 187 thousand tonnes of waste.[284] If I assume that OWA's annual spending remains constant and Parties' tipping fees increase by 12 percent (my estimated average price increase),[285] the annual reduction of landfill waste that OWA can process decreases by approximately 20 thousand tonnes.[286] This reduction translates to around $150 thousand in annual DWL, excluding any additional DWL from lower volumes of waste sent to TRDs.[287]

7. **APPENDIX**

7.1. Section 104 analysis updates

170. Since submitting my expert report dated June 29, 2021 ("June Expert Report"), I have incorporated into my competitive analysis additional third-party data and facility locations, as well as relevant first-party data and facility locations. My overall conclusions hold—the transaction between Secure and Tervita will likely lead to increased prices for many customers that purchase the Parties' waste services.[288]

---

[281] Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 16, 23.

[282] Witness Statement of the Orphan Well Association, February 22, 2022, ¶¶ 23, 28.

[283] Calculated as $145 million x ½ x 15% x 40%.

[284] I calculate the average tipping fee from Secure's and Tervita's transaction data. See Workpaper 16.

[285] See my backup to Exhibit 16.

[286] Witness Statement of the Orphan Well Association, February 22, 2022, ¶ 41 ("The number of orphan sites that the OWA can reclaim and close in a year is directly tied to the cost of services and landfill costs are anticipated to be a material part of our future expenditures as I described in paragraph 23 above. If landfill costs increase then this decrease the number of sites that the OWA can close in a given year.").

[287] See Workpaper 15.

[288] Miller June Expert Report, RCFC00001_000000015 p. 2716 at 2763, 2768.

7.1.1. *Maps of waste service customers that will experience decrease in competition as a result of the merger*

171. Similar to map exhibits in my June Expert Report,[289] the following updated **Exhibit 27**, **Exhibit 28**, and **Exhibit 29** show the changes in waste service provider concentration for customers of TRD, landfills, and water disposal wells, respectively, because of the merger between the Parties.[290] These maps update the maps in my June Expert Report because they include additional municipal landfills, additional competitor facilities, one additional Secure facility, and several first-party landfills and water disposal wells that take in other oil and gas producers' wastes. I include all of these in my current analyses even though I do not consider municipal landfills and first-party facilities to necessarily be viable substitutes to the Parties' facilities, as I describe in Section 4.1.2 and 4.1.3. Consequently, my analysis likely understates the levels of increased competition.

172. I plot the locations of each Secure and Tervita customer and color-code them depending on the number of alternative waste service providers available to them after the merger.

- Red dots indicate customer locations for whom the merger reduces the number of waste service-provider competitors from two to one (i.e., merger-to-monopoly). These customers currently benefit from the competition between Secure and Tervita facilities, but they will face a monopoly (i.e., no nearby third-party owned facilities) after the merger.
- Purple dots represent customer locations that are currently benefitting from competition between Secure, Tervita, and another competitor, but they will only have two competing waste service-provider options after the merger (i.e., 3-to-2 merger).
- Blue dots represent locations that will experience a reduction in competition due to the merger, but will continue to have at least 3 proximate competitor facilities.
- Gray dots represent customers' locations that will be unlikely to experience a reduction in competition, or that are already located in a

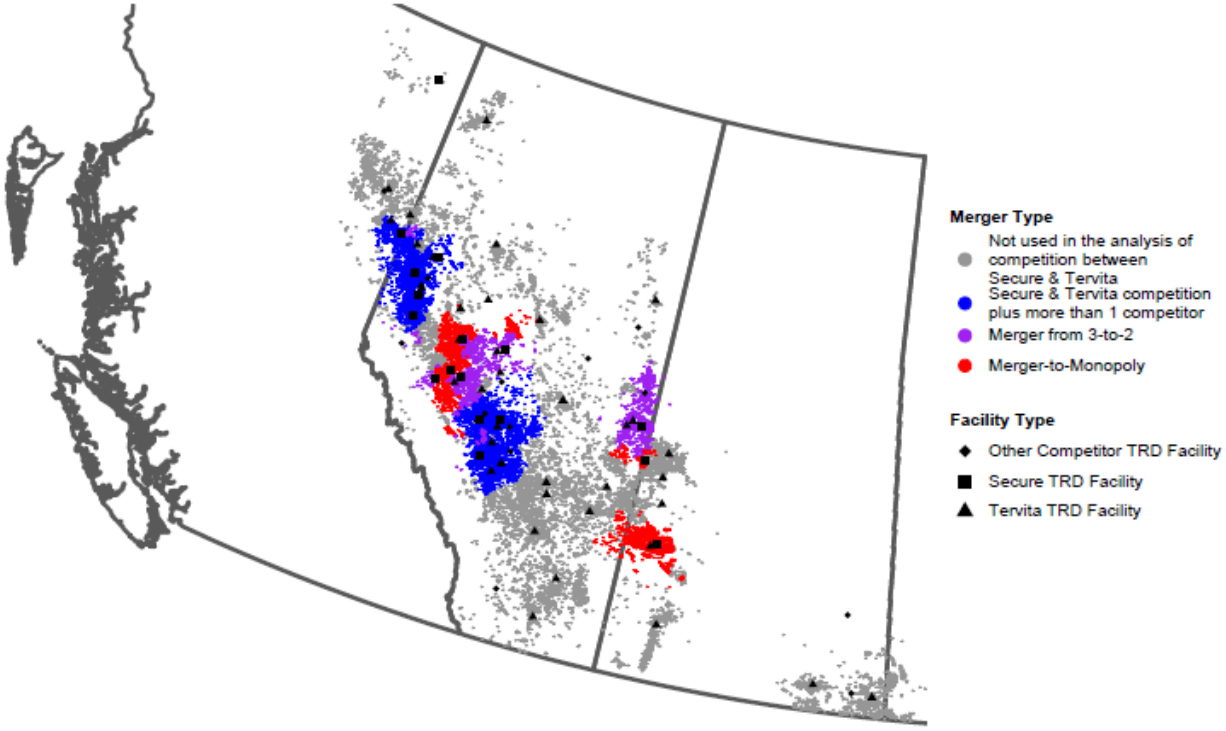
[289] Miller June Expert Report, RCFC00001_000000015 p. 2757-2760.

[290] Refer to Section 4.2 for a description of how I define customer-based markets for each of the three product markets.

monopoly market, where a Secure or Tervita facility is the only viable option.

173. The maps visually indicate that the merger increases concentration and decreases competition in many markets.

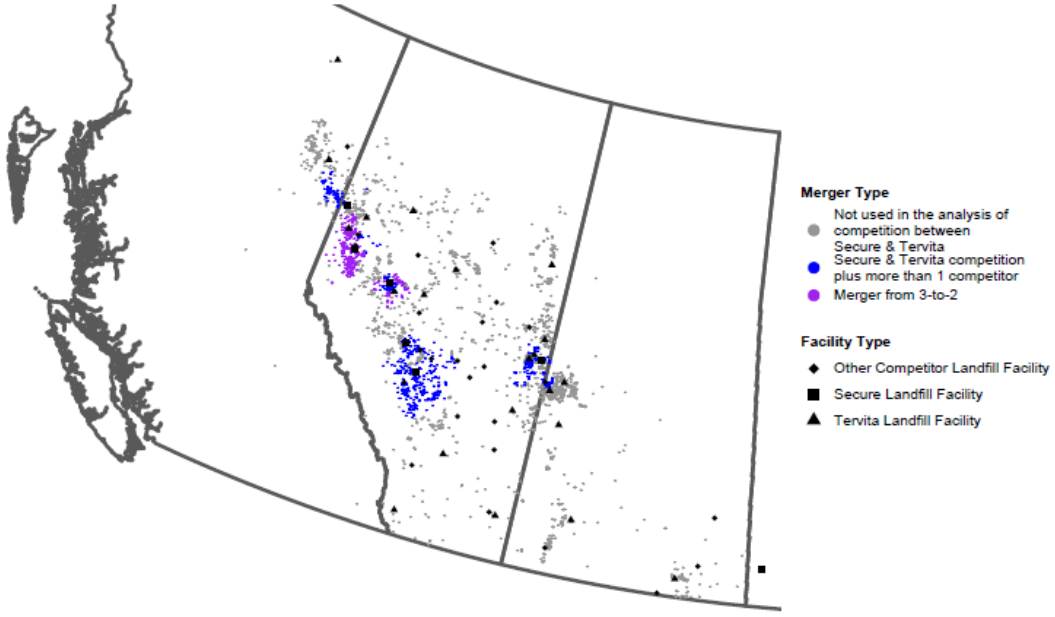
EXHIBIT 27
TRD customers in the WCSB facing a potential reduction in competition from the Tervita-Secure merger



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot represents a single well site with a TRD transaction in the Parties' data. The red dots represent customers most affected by the merger because the reduction in competition will lead to a monopoly market for them. The purple dots represent customers that will be affected by reduction in competition from 3 to 2 competitng firms. The blue dots represent customers that currently have access to more than one non-Tervita/Secure provider. The gray dots represent customers that are not affected by a change in competition from the merger, including customers that are already located in monopoly markets, i.e., they are in a market where either a Tervita or Secure facility is the only viable option.

EXHIBIT 28
Landfill customers in the WCSB facing a potential reduction in competition from the Tervita-Secure merger



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot represents a single well site with a landfill transaction in the Parties' data. The purple dots represent customers that will be affected by reduction in competition from 3 to 2 competing firms. The blue dots represent customers that currently have access to more than one non-Tervita/Secure provider. The gray dots represent customers that are not affected by a change in competition from the merger, including customers that are already located in monopoly markets, i.e., they are in a market where either a Tervita or Secure facility is the only viable option. Self-supply landfills are included among the mapped facilities when the facility takes in waste from other oil and gas producers.

174. **Exhibit 28** understates the increase in concentration because 8 out of 24 competitor facilities are municipal landfills, and 3 out of 24 are landfills operated by CNRL, an oil and gas producer. As I discussed in Section 4.1 these facilities are not close substitutes for Secure and Tervita facilities (and not part of the product market) because, on average, they take in less oil and gas waste volume than Secure or Tervita landfills.[291] According to the data by Alberta Environment and Parks, the average volume of oil and gas waste taken in by

[291] See Workpaper 17.

municipal landfills was [redacted][292, 293] In comparison, the average volume at Tervita and Secure landfills were [redacted] and [redacted][294, 295]

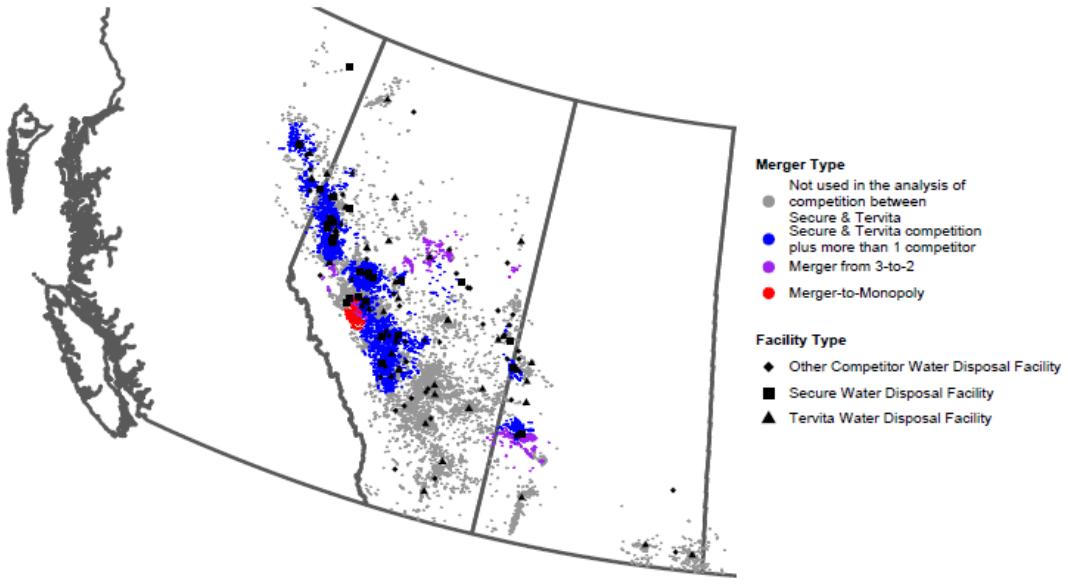
[292] [redacted] See Workpaper 18. Mr. Engel testified that municipal landfill disposal prices are generally less than prices changed by Secure and Tervita. See Engel testimony, December 20, 2021, p. 46, questions 116-117 [redacted] For revenue earned by CNRL, see Workpaper 6.

[293] Municipal landfills that are part of my analysis include Aspen Waste, Camrose Regional, Coronation, Leduc, Rocky Mountain, Clairmont, and Whitecourt. [redacted] See Workpaper 19; Witness Statement of Carol Nelson, January 25, 2022 at Exhibit F (RBED00003_000000002 - CONFIDENTIAL LEVEL A.xlsx).

[294] Note that these figures include tonnage disposed of in both Tervita and Newalta landfills. Some landfills included in this figure have zero volume; the minimum indicates the lowest non-zero volume. See Workpaper 19; Witness Statement of Carol Nelson, January 25, 2022 at Exhibit F (RBED00003_000000002 - CONFIDENTIAL LEVEL A.xlsx).

[295] See Workpaper 19; Witness Statement of Carol Nelson, January 26, 2022 at Exhibit F (RBED00003_000000002 - CONFIDENTIAL LEVEL A.xlsx).

EXHIBIT 29
Water disposal customers in the WCSB facing a potential reduction in competition from the Tervita-Secure merger



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: Each dot represents a single well site with a water disposal or TRD transaction in the Parties' data. The red dots represent customers most affected by the merger because the reduction in competition will lead to a monopoly market for them. The purple dots represent customers that will be affected by reduction in competition from 3 to 2 competing firms. The blue dots represent customers that currently have access to more than one non-Tervita/Secure provider. The gray dots represent customers that are not affected by a change in competition from the merger, including customers that are already located in monopoly markets, i.e., they are in a market where either a Tervita or Secure facility is the only viable option. The black markers reflect the locations of Waste Service facilities in the WCSB that are active as of 2021. The mapped facilities also include deep well disposal facilities available at TRDs, which also take in produced water and waste water. Self-supply on-site water wells are included among the mapped facilities when the facility takes in waste from other oil and gas producers.

7.1.2. *Summaries of markets that will experience a reduction in competition because of the merger between the Parties*

175. The following exhibits list customer-defined markets that will experience a reduction from 2-to-1 competitor due to the merger, from 3-to-2 competitors, or from 4-to-3 competitors. These markets corresponded to the average combined market shares summarized in Exhibit 9 (Section 5.1). For each customer-defined market, I list a single Secure, Tervita, and, if relevant, competitor facility, but each market may be comprised of more than one overlapping draw area from each of the Parties, which is specified in the table.[296]

[296] Lists of all facilities that overlap in a customer-defined market can also be found in my backup materials.

EXHIBIT 30
Sample list of revenue-based market in customer-based TRD

	Secure Facilities	Tervita Facilities	Nearby Competitors	Total Secure and Tervita Market Revenue	No. of Secure and Tervita Well Sites in the Market	Estimated Market Share of Merged Entity
2 to 1						
1.	Kindersley and 1 other	Kindersley and 3 others	-			
2.	Fox Creek and 1 other	Fox Creek East and 8 others	-			
3.	Fox Creek and 1 other	Fox Creek and 7 others	-			
4.	Fox Creek and 0 others	Valleyview and 6 others	-			
5.	Edson and 3 others	West Edson and 6 others	-			
6.	Nosehill and 3 others	West Edson and 6 others	-			
7.	Judy Creek and 0 others	Judy Creek and 4 others	-			
8.	Obed and 2 others	West Edson and 4 others	-			
9.	Kindersley and 1 other	Coronation and 2 others	-			
10.	Silverdale and 1 other	Elk Point and 2 others	-			
3 to 2						
1.	Tulliby Lake and 1 other	Elk Point and 2 others	Pure Environmentaland 1 other			
2.	Silverdale and 1 other	Elk Point and 2 others	Pure Environmentaland 1 other			
3.	Tulliby Lake and 1 other	Lindbergh Caverns and 1 other	Pure Environmentaland 1 other			
4.	Silverdale and 1 other	Lindbergh Caverns and 3 others	Pure Environmentaland 1 other			
5.	Dawson Creek and 1 other	Gordondale and 6 others	Wolverineand 1 other			
6.	Fox Creek and 1 other	Fox Creek and 8 others	Wolverineand 1 other			
7.	Fox Creek and 2 others	Judy Creek and 8 others	Wolverineand 1 other			
8.	Fox Creek and 1 other	Fox Creek East and 8 others	Wolverineand 1 other			
9.	Judy Creek and 2 others	Judy Creek and 8 others	Wolverineand 1 other			
10.	Kakwa and 1 other	Grande Prairie Industrial and 2 others	Wolverineand 1 other			
4 to 3 or more						
1.	South Grande Prairie and 3 others	South Wapiti and 5 others	Envolve Energyand 2 others			
2.	Kakwa and 3 others	South Wapiti and 5 others	White Owland 2 others			
3.	Dawson Creek and 4 others	La Glace and 5 others	Envolve Energyand 3 others			
4.	La Glace and 4 others	La Glace and 7 others	Envolve Energyand 3 others			
5.	South Grande Prairie and 3 others	South Wapiti and 5 others	Envolve Energyand 3 others			
6.	Rycroft and 4 others	Spirit River and 8 others	Wolverineand 3 others			
7.	La Glace and 3 others	Grande Prairie Industrial and 6 others	Wolverineand 3 others			
8.	South Grande Prairie and 3 others	Grande Prairie Industrial and 6 others	Wolverineand 3 others			
9.	Kakwa and 3 others	South Wapiti and 5 others	Wolverineand 3 others			
10.	Kakwa and 3 others	South Wapiti and 5 others	Wolverineand 3 others			

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes customer-based market revenues and shares for those customers that would be most affected by a merger between Secure and Tervita since they would lose one of their two viable alternatives. The markets are described by the customers located in the overlapping draw areas of Secure and Tervita facilities. There may be more than one Secure or Tervita facility with a draw area that overlaps the draw areas for the listed facilities, and the revenue generated by those facilities is included in the Secure and Tervita revenue totals listed. In this case closest facilities are listed for each of the competing parties. These market-level measures underly the average combined market shares in Section 5.1. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials.

EXHIBIT 31
Sample list of revenue-based market shares in customer-based landfill markets

	Secure Facilities	Tervita Facilities	Nearby Competitors	Total Secure and Tervita Market Revenue	No. of Secure and Tervita Well Sites in the Market	Estimated Market Share of Merged Entity
3 to 2						
1.	Fox Creek and 0 others	Fox Creek and 3 others	Municipal			
2.	South Grande Prairie and 1 other	South Wapiti and 4 others	Municipal			
3.	South Grande Prairie and 1 other	La Glace and 4 others	Municipal			
4 to 3 or more						
1.	Saddle Hills and 0 others	Spirit River and 3 others	Municipaland 2 others			
2.	Saddle Hills and 0 others	Silverberry and 0 others	CNRLand 2 others			
3.	Willy Green and 1 other	Willesden Green and 2 others	Waste Managementand 3 others			
4.	Pembina and 1 other	Willesden Green and 2 others	RemedXand 2 others			
5.	Pembina and 1 other	Willesden Green and 2 others	Municipaland 2 others			
6.	Tulliby Lake and 0 others	Marshall and 5 others	Ridgelineand 3 others			
7.	Willy Green and 0 others	Willesden Green and 2 others	RemedXand 4 others			
8.	Pembina and 1 other	Willesden Green and 2 others	Clean Harborsand 3 others			
9.	Willy Green and 1 other	Willesden Green and 2 others	Clean Harborsand 4 others			
10.	Tulliby Lake and 0 others	Elk Point LF and 5 others	Ridgelineand 4 others			

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes customer-based market revenues and shares for those customers that would be most affected by a merger between Secure and Tervita since they would lose one of their two viable alternatives. The markets are described by the customers located in the overlapping draw areas of Secure and Tervita facilities. There may be more than one Secure or Tervita facility with a draw area that overlaps the draw areas for the listed facilities, and the revenue generated by those facilities is included in the Secure and Tervita revenue totals listed. In this case closest facilities are listed for each of the competing parties. These market-level measures underly the average combined market shares in Section 5.1. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials.

EXHIBIT 32
Sample list of revenue-based market shares in customer-based water well markets

Secure Facilities	Tervita Facilities	Nearby Competitors	Total Secure and Tervita Market Revenue	No. of Secure and Tervita Well Sites in the Market	Estimated Market Share of Merged Entity
2 to 1					
1. Edson and 1 other	West Edson and 4 others	-			
2. Obed and 1 other	West Edson and 4 others	-			
3. Nosehill and 3 others	West Edson and 4 others	-			
3 to 2					
1. Edson and 1 other	West Edson and 5 others	TAQA and 1 other			
2. Judy Creek and 1 other	Judy Creek and 4 others	TAQA and 1 other			
3. Eccles and 3 others	West Edson and 5 others	TAQA and 1 other			
4. Nosehill and 3 others	West Edson and 5 others	TAQA and 1 other			
5. Kindersley and 0 others	Kindersley and 2 others	Whitecap and 1 other			
6. Kindersley and 0 others	Gull Lake and 0 others	Whitecap and 1 other			
7. Obed and 1 other	Kakwa and 2 others	Wolverine and 1 other			
8. Nosehill and 3 others	West Edson and 4 others	Catapult and 1 other			
9. Athabasca and 0 others	Mitsue and 3 others	CNRL and 1 other			
10. Judy Creek and 1 other	Mitsue and 4 others	TAQA and 1 other			
4 to 3 or more					
1. Kindersley and 1 other	Kindersley and 3 others	CNRLand 2 others			
2. Nosehill and 3 others	West Edson and 5 others	Wolverineand 2 others			
3. Brazeau and 2 others	Brazeau and 6 others	TAQAand 2 others			
4. Brazeau and 2 others	Brazeau and 4 others	Rush Energy Servicesand 4 others			
5. Brazeau and 3 others	Brazeau and 8 others	Wolverineand 3 others			
6. Obed and 1 other	West Edson and 5 others	Wolverineand 2 others			
7. Wonowon and 0 others	Mile 103 and 1 other	Aquaterraand 2 others			
8. Edson and 2 others	West Edson and 7 others	TAQAand 2 others			
9. Brazeau and 3 others	Niton Junction and 8 others	Wolverineand 3 others			
10. Big Mountain Creek and 6 others	South Wapiti and 7 others	Aquaterraand 6 others			

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes customer-based market revenues and shares for those customers that would be most affected by a merger between Secure and Tervita since they would lose one of their two viable alternatives. The markets are described by the customers located in the overlapping draw areas of Secure and Tervita facilities. There may be more than one Secure or Tervita facility with a draw area that overlaps the draw areas for the listed facilities, and the revenue generated by those facilities is included in the Secure and Tervita revenue totals listed. In this case closest facilities are listed for each of the competing parties. These market-level measures underly the average combined market shares in Section 5.1. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials.

176. The following exhibit describes the DWL from facility closures for each facility that is planned to close (or has already closed) because of the merger. These DWL figures use the revenue-based approach described in Section 6.1.2 and Section 7.6.1.

EXHIBIT 33
DWL from facility closures

Market	Company	Facility	DWL
[redacted]			

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes the DWL for each closed facility using the revenue-based method described in Section 5.3.

177. The following exhibits describe the predicted price effects resulting from the merger, as well as DWL resulting from merger-specific facility closures, for the top ten customer-defined markets falling into each category describing the change in competition from the merger. In these exhibits, the predicted price effects and DWL are quantified for those customers that operate wells in the Parties' overlapping draw areas. The DWL figures use the share-based approach

described in Section 6.1.2 and Section 7.6.1, and I report them assuming second-price framework.[297]

EXHIBIT 34
Predicted price effects and DWL in the customer-defined markets for TRD services

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes the weighted-average price effects and second-score DWL loss figures for specific customer-defined markets in my analysis. These market-level measures underly the average price effects reported in Section 5.3 and share-based DWL reported in Sectin 6.1.2. Price effects can be negative in my analysis due to closing facilities. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials. See my backup for details about how I calculate the market-level price effects.

[297] Estimated DWL that is based on the first-price Bertrand framework can be found in my backup materials. Lists of all facilities that overlap in a customer-defined market can also be found in my backup materials.

EXHIBIT 35
Predicted price effects and DWL in the customer-defined markets for landfill services

Secure Facilities	Tervita Facilities	Nearby Competitors	Predicted price change	DWL	Facility Closure Overlap: Secure	Facility Closure Overlap: Tervita
[redacted]						

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes the weighted-average price effects and second-score DWL loss figures for specific customer-defined markets in my analysis. These market-level measures underly the average price effects reported in Section 5.3 and share-based DWL reported in Sectin 6.1.2. Price effects can be negative in my analysis due to closing facilities. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials. See my backup for details about how I calculate the market-level price effects.

EXHIBIT 36
Predicted price effects and DWL in the customer-defined markets for water well services

Secure Facilities	Tervita Facilities	Nearby Competitors	Predicted price change	DWL	Facility Closure Overlap: Secure	Facility Closure Overlap: Tervita
[redacted]						

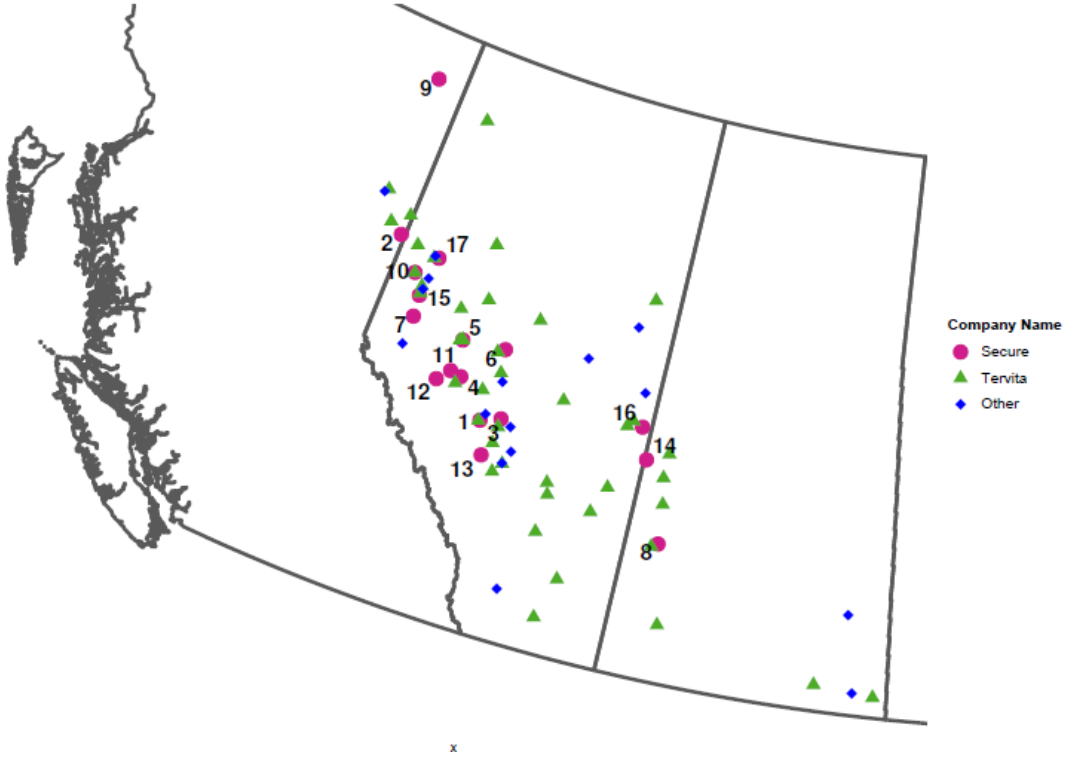
Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The table describes the weighted-average price effects and second-score DWL loss figures for specific customer-defined markets in my analysis. These market-level measures underly the average price effects reported in Section 5.3 and share-based DWL reported in Sectin 6.1.2. Price effects can be negative in my analysis due to closing facilities. Only the top ten markets in terms of combined share are listed in the table, and the remaining statistics for all customer-defined markets in my analysis can be found in my backup materials. See my backup for details about how I calculate the market-level price effects.

7.1.3. *Facility maps*

178. **Exhibit 37**, **Exhibit 39**, and **Exhibit 41** map the TRD, landfill, and water disposal facilities, respectively, operated by Tervita, Secure, and other third-party competitors in the waste service industry in the WCSB. Municipal landfills are included among the "other" competitors marked by blue diamonds. The orange-colored diamonds mark the locations of the landfills and water disposal wells operated by oil and gas producers that can take in waste from other oil and gas producers.

EXHIBIT 37
Map of TRD facilities operated by Tervita, Secure, and competitors in the WCSB



Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)

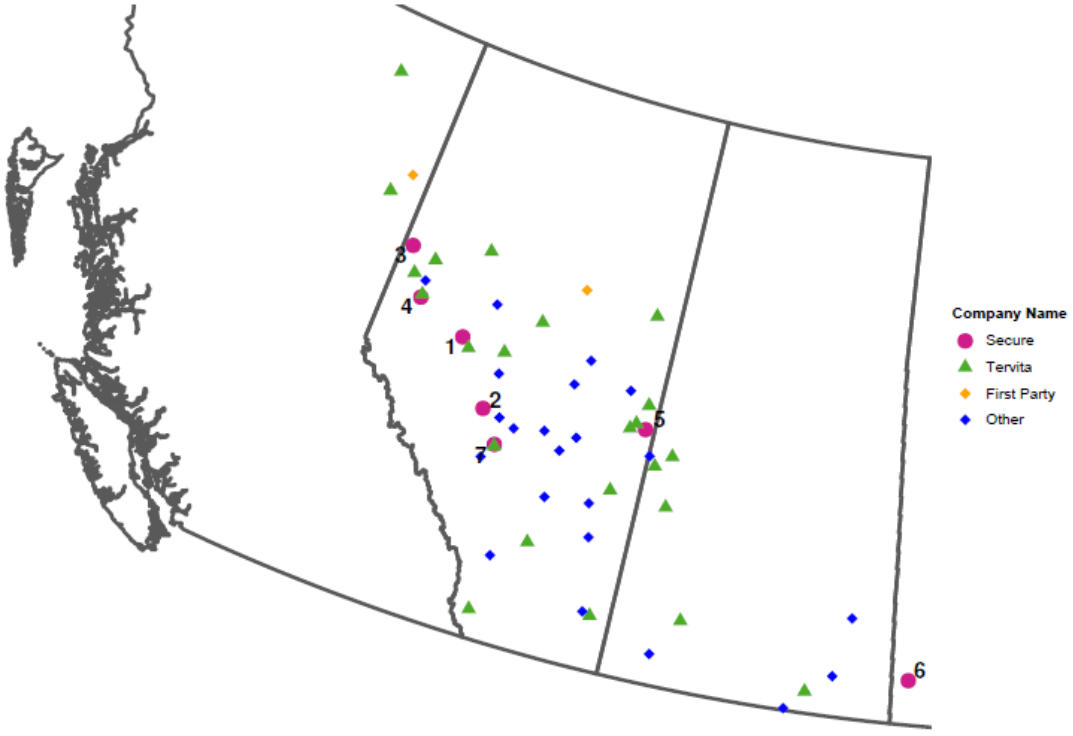
Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities. The pink, green, and blue marked locations indicate the water disposal wells owned by waste services firms.

EXHIBIT 38
Key for TRD facilities operated by Secure

Facility Name	Number Key	Facility Name	Number Key
Brazeau	1	La Glace	10
Dawson Creek	2	Nosehill	11
Drayton Valley	3	Obed	12
Edson	4	Rocky Mountain House	13
Fox Creek	5	Silverdale	14
Judy Creek	6	South Grande Prairie	15
Kakwa	7	Tulliby Lake	16
Kindersley	8	Rycroft	17
Kotcho	9		

Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx); Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx); SES0030460.html; SES0030461.docx; GridAtlas; ArcGIS
Note: The number key corresponds to the Secure TRD facility locations marked in updated Exhibit 37.

EXHIBIT 39
Map of landfill facilities operated by Tervita, Secure, and competitors in the WCSB



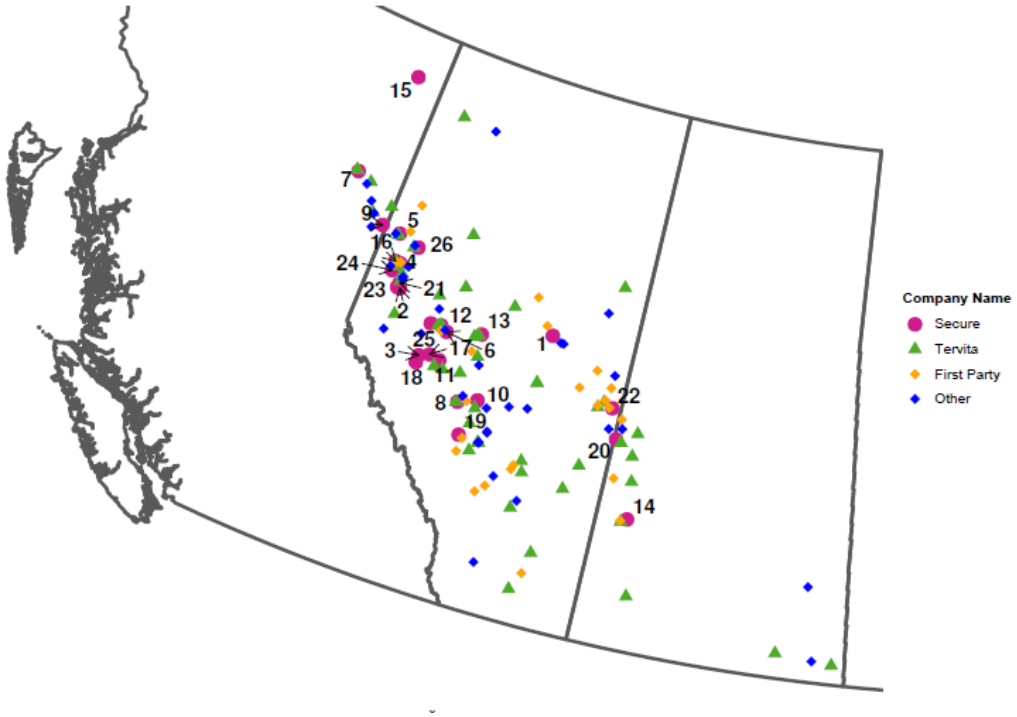
Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)
Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities. The pink, green, and blue marked locations indicate the water disposal wells owned by waste services firms, whereas the orange markers are locations operated by oil and gas producers that have taken in waste from other oil and gas producers.

EXHIBIT 40
Key for landfill facilities operated by Secure

Facility Name	Number Key
Fox Creek	1
Pembina	2
Saddle Hills	3
South Grande Prairie	4
Tulliby Lake	5
Virden	6
Willy Green	7

Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx); Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx); SES0030460.html; SES0030461.docx; GridAtlas; ArcGIS
Note: The number key corresponds to the Secure TRD facility locations marked in updated Exhibit 39.

EXHIBIT 41
Map of water disposal facilities operated by Tervita, Secure, and competitors in the WCSB



Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7)
Note: There are five cavern facilities that can handle both solid and fluid waste disposal, so those facilities are mapped among the TRD, water disposal, and landfill facilities. The mapped facilities also include waste water disposal facilities available at TRDs, which also take in produced water and waste water. The pink, green, and blue marked locations indicate the water disposal wells owned by waste services firms, whereas the orange markers are locations operated by oil and gas producers that have taken in waste from other oil and gas producers.

EXHIBIT 42
Key for water disposal facilities operated by Secure

Facility Name	Number Key	Facility Name	Number Key
Athabasca	1	Kindersley	14
Big Mountain Creek	2	Kotcho	15
Eccles	3	La Glace	16
Emerson	4	Nosehill	17
Gordondale	5	Obed	18
Kaybob	6	Rocky Mountain House	19
Wonowon	7	Silverdale	20
Brazeau	8	South Grande Prairie	21
Dawson Creek	9	Tulliby Lake	22
Drayton Valley	10	Gold Creek	23
Edson	11	Pipestone	24
Fox Creek	12	Tony Creek	25
Judy Creek	13	Rycroft	26

Source: Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx); Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx); SES0030460.html; SES0030461.docx; GridAtlas; ArcGIS
Note: The number key corresponds to the Secure water disposal and TRD facility locations marked in updated Exhibit 41.

7.2. Calculating variable cost margins for waste service

179. My price effects (Section 5.3) and DWL from facility closure (Section 6.1.2) analyses both rely on variable cost margins, by which I mean the amount a facility profits after deducting its variable costs to process, treat, and/or dispose of oilfield wastes. I calculate the variable cost margins using facility-level financial statements from the Parties.[298] I used the same variable and fixed cost categorizations specified by the Parties' expert Mr. Harington in his backup materials.[299] I use the following formula to calculate the variable cost margins for each Secure and Tervita facility indexed by j:

$$Variable\ cost\ margin_j = \frac{revenue_j - variable\ costs_j}{revenue_j}$$

[298] I do not calculate separate margins for facilities that are part of both the TRD and water disposal markets. Based on the Parties' financial data, I cannot assign variable cost expenses to TRD-specific services versus those services that could be completely handled at a standalone water well. However, based on margins for standalone water wells that are not tethered to a TRD or FST (Exhibit 42 and Exhibit 44), I understand that water well margins tend to be higher than TRD margins. Consequently, using TRD margins for water wells tethered to a TRD or FST is a conservative assumption for my analyses.

[299] Harington Affidavit, [RCFD00001_000000014] backup materials (a. 04272021 TRD-Financial Summary wo EM_no link Costs Analyzed.xlsx).

180. The Secure margins are presented in **Exhibit 43**, Tervita landfill margins are presented in **Exhibit 44**, and Tervita TRD, cavern, and water well margins are presented in **Exhibit 45**. Note that my analysis relies on 2019 data; however, the weighted average variable cost margins across Secure or Tervita facilities are similar across years.[300]

[300] See Exhibits 43, 44, 45 and backup.

EXHIBIT 43
Variable cost margins for Secure facilities (2019)

Facility name	Facility type	Revenue	Revenue less variable costs	Variable cost margins
[redacted]				
Weighted averages				
	Landfill			[redacted]
	FST			
	Water Treatment			
	Total			

Source: V.A.2 Dec 2020 01.14.2021 ALL PRD Canada Facility Statements - Secure Details.xlsx

EXHIBIT 44
Variable cost margins for Tervita landfill facilities (2019)

Facility name	Revenue	Revenue less variable costs	Variable cost margins
[redacted]			
Weighted average total for landfills			[redacted]

Source: SESL0002187 (landfills).xlsx
Note [redacted]

EXHIBIT 45
Variable cost margins for Tervita TRD, cavern, and water disposal well facilities (2019)

Facility name	Facility type	Revenue	Revenue less variable costs	Variable cost margins
[redacted]				
Weighted averages				
	TRD/Cavern			[redacted]
	WD			
	Total			

Source: a. 04272021 TRD-Financial Summary wo EM_no link Costs Analyzed.xlsx

7.3. Approximating competitors' market shares and outside good market shares

181. I have received and analyzed transaction-level data from the Parties that report the volumes transported to specific waste service facilities, services rendered, and revenues collected from each well site and customer. I identified the services that fall into the relevant product markets and used this data to summarize the revenues generated at each Secure and Tervita facility. Details about how I processed the Parties' data are provided in Section 7.7 and in my backup materials.

182. Transaction data provided by other third-party competitors was not as detailed as the data provided by the Parties.[301, 302] Their data reported their facility locations but generally do not report customer specific information such as customer locations or waste volumes. Therefore, I not able to determine their draw areas and the overlaps with Tervita and Secure facilities' overlapping draw areas as illustrated in Exhibit 46). Further, I do not have sufficient information to directly calculate the revenues generated at competitors' facilities in each local relevant market based on their data.[303] Below, I describe how I estimate competitor facilities' revenues in relevant geographic markets.

183. While I observe the overall revenues generated by other third-party competitors, I do not uniformly observe customer locations for competitors,

---

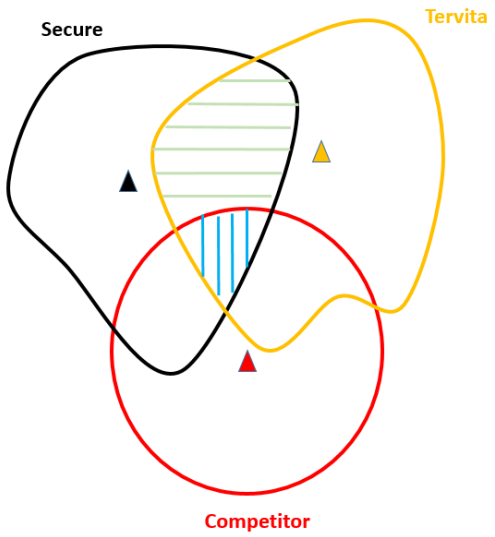
[301] I received data from [redacted] active in at least one of the three product markets. Datasets are in different formats, with different levels of detail, and, if they are at transaction level, they classify transaction with different service descriptions. I implemented a uniform methodology to process the data to ensure consistency and comparability across all third-party waste service providers, including the Parties. Details about how I processed the third-party data are provided in the Appendix (Section 7.7.3) and in my backup materials.

[302] There are two companies, [redacted] and two facilities, [redacted] for which I did not receive any revenue information. For the relevant facilties, I impute their revenues based on markets in which they overlap with the Parties. In particular, I assign the competing facility the maximum of the revenues received by either a Secure or a Tervita facility located in the same market as one of these competitor facilities. Using the diagram of a customer-based market in Exhibit 45 to illustrate, assume that the overlapping draw area is comprised of one Secure and one Tervita facility, and that Secure's and Tervita's revenues from customers located in the blue shaded area are $100 and $50, respectively. I estimate the competitor facility's revenues from the customers in the blue shaded area as $100. The market size is then $250 ($100 + $50 + $100) and market shares after the merger are 60% for the merged entity ($150/$250) and 40% for the competitor ($100/$250). This is likely a conservative approach because third-party competitor facilities typically process less waste volume than Secure and Tervita facilities. See also Miller June Expert Report, RCFC00001_000000015 p. 2716 [redacted] I omit all other Gibson facilities because they are either closed, offer only terminal-related services, or do not accept waste from third-parties. See details in fn. 329 Witness Statement of Gibson Energy Inc., February 24, 2022 ¶¶ 8-10; Gibson Energy, available at https://www.gibsonenergy.com/locations/ (accessed February 22, 2022).. See also Witness Statement of Tinu Odeyemi, January 8, 2022 at Exhibit A.

[303] Specifically, I generally do not observe the customer locations of the third-party waste service providers. Refer to my Appendix (Section 7.7) and back-up materials for additional details about the provided competitor data and how I incorporate it into my analyses.

and competitor customer locations are not likely to be random. In particular, customers are likely to be more concentrated in regions where facility draw areas overlap because waste service companies are more likely to open facilities nearer to customers requiring those types of services. Consequently, I apportion observed competitor revenue based on the distribution of Secure-Tervita customers across markets to which a competitor facility belongs.

EXHIBIT 46
Illustration of customer-based geographic market definition



184. For example, **Exhibit 46** demarcates four markets:

1. between Secure and Tervita captured by the green shading,
2. between Secure, Tervita, and another "Competitor" captured by the blue shading,
3. between Tervita and the "Competitor" captured by the overlapping yellow and red circles, less the blue shaded region, and
4. between Secure and the "Competitor" captured by the overlapping black and red circles, less the blue shaded region.

185. I apportion the Competitor's revenue across all three markets to which it belongs based on the share of Secure and Tervita revenue in each market. Based on the example, suppose that the second market includes 40 percent of Secure and Tervita revenue (relative to all Secure and Tervita revenue generated across the three relevant markets), the third market includes 20 percent, and the fourth market includes 40 percent. Then I apportion 40 percent of the

Competitor's revenue to the second market, 20 percent to the third, and 40 percent to the fourth. Note that this is a conservative approach as I apportion all of the Competitor's revenue to one of the markets where it competes with Secure or Tervita. I do not apportion any revenue to the red area that does not overlap with Secure and Tervita draw areas. This approach is conservative because it likely overstates the Competitor's presence in the relevant markets.

186. Because my markets are customer-based markets, market shares represent the share of revenues that the customers spend on any waste service facility. A small amount of revenue may be spent on facilities that are not part of the customer-defined markets. These facilities are farther away and their draw areas do not overlap with the particular customer-defined markets. These "outside" facilities can be owned by Secure, Tervita or competitors. I observe the spending by Secure and Tervita customers at "outside" Secure and Tervita facilities. However, I do not observe the Secure and Tervita customers' spending at "outside" competitor facilities nor do I observe the spending oil and gas producers that are not Secure and Tervita customers.

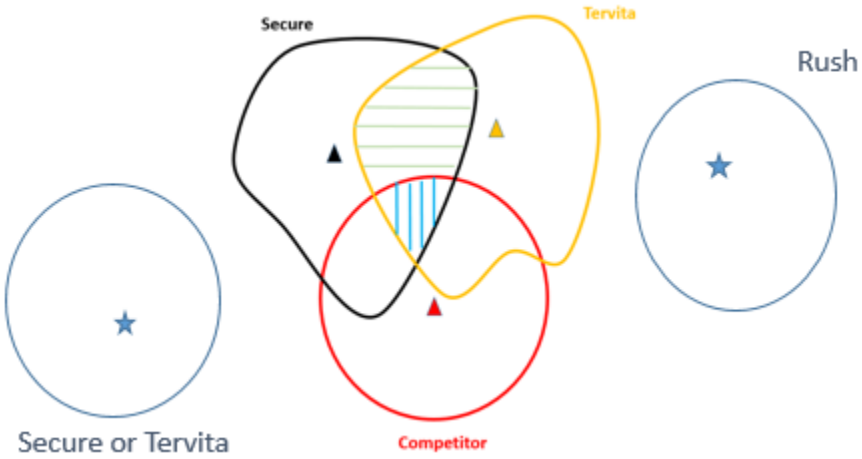
187. As noted in Section 5.1 and described in fn. 173 and 174, I account for waste revenue spent on "outside" facilities by assuming that customers that comprise the local market spend 10 percent of their waste service expenses on facilities outside the market. **Exhibit 47**, the assumed outside revenue could have been spent at Secure or Tervita facilities located far away, or at a facility operated by a competitor such as Rush. This assumption is likely to be conservative.

188. Assuming 10 percent of revenue is captured by outside facilities is likely to be conservative because Secure and Tervita data indicate that customer well sites that are located in relevant markets spend smaller amounts of their waste service expenditures on facilities located outside of the market (i.e., at a Secure or Tervita facility represented by the blue star in Exhibit 47). Specifically, compared to the Parties' transaction data, assuming that customers spend 10 percent of waste service expenditures outside of relevant geographic markets results in "outside revenue" that is, on average, between 30 and 40 percent higher (depending on the product market) than the amount of expenditure that is actually spent at Secure and Tervita facilities outside of the market.[304]

[304] See Workpaper 9.

189. By assuming that customers spend on average more outside the market than inside the market I understate the Parties' revenue-based shares inside the market.[305] Consequently my analysis under-estimates the predicted price effects and share-based DWL, both of which depend on the Parties' shares inside the affected markets, rendering my analysis more conservative overall.[306]

EXHIBIT 47
Illustration of customers with facilities located outside the customer-defined market



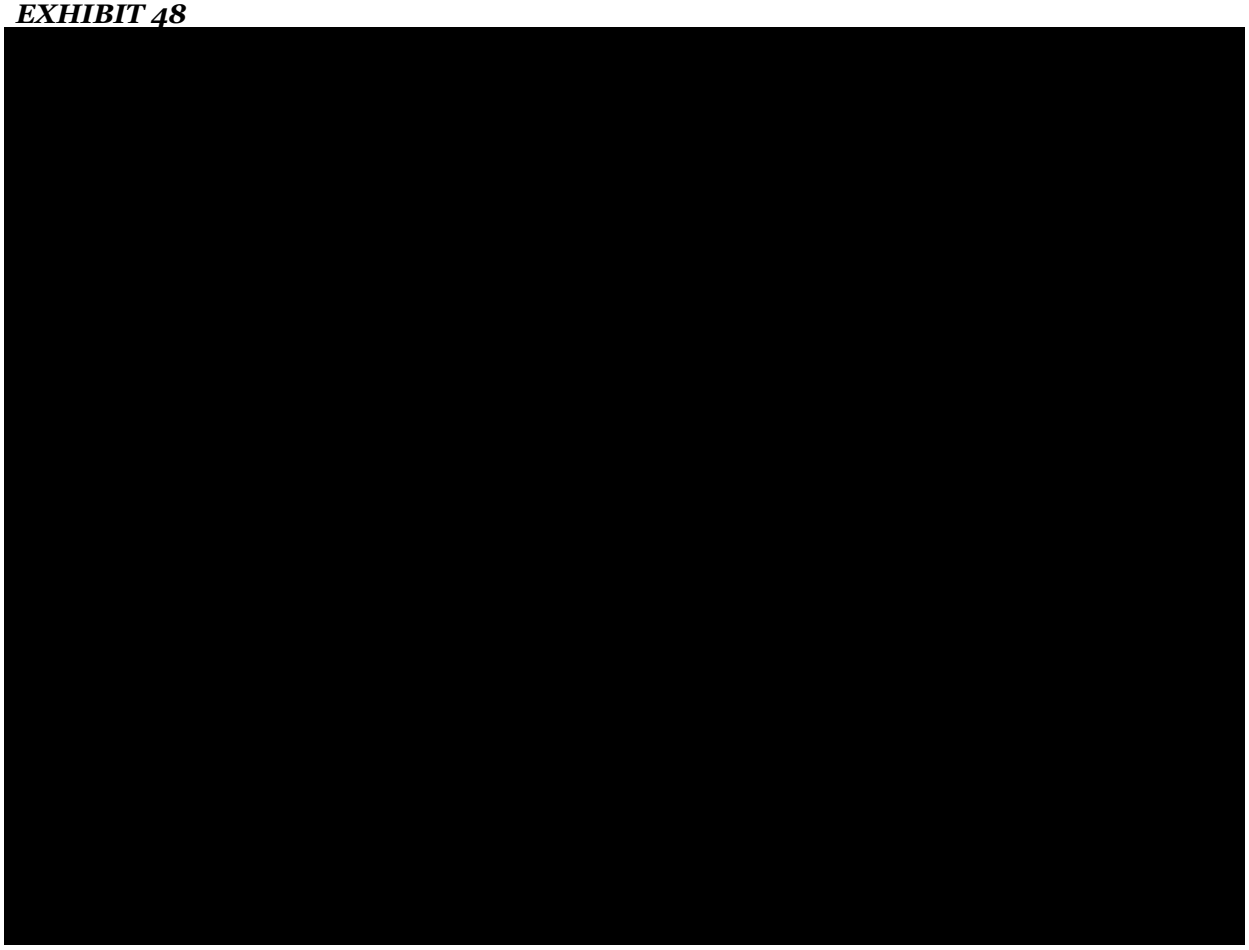
7.4. Examples of customer-defined markets

190. For visualization, the following maps provide examples of clusters of customers that are part of the same customer-defined markets for each of the TRD, landfill, and water well product markets. The first set of maps describes the locations of markets along the Alberta and British Columbia border. The second set of maps describe locations southeast of the Alberta and British Columbia border. Each cluster of colored dots depicts the locations of customers that are part of a customer-defined market comprised of the same overlapping draw area. The gray dots depict other customer locations that are part of different customer-defined markets.

[305] Section 5.1, Exhibit 9.

[306] See Section 7.7 for a description of the formula that measures the predicted changes in markups, which is a function of the Parties' revenue in affected markets. See Section 7.6.1 for a description of the formula that measure the share-based DWL. See Sections 5.3 and 6.2.2 for my estimates of predicted price effects and share-based DWL that depend on the conservative assumptions in my model.

EXHIBIT 48



Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Taylor, Secure's Dawson Creek, Wolverine's Rycroft, and Albright facilities; the yellow dots describe the customers' well sites that are part of the overlapping draw area between Tervita's La Glace, Secure's La Glace, Wolverine's Rycroft, Envolve's Grovedale, and White Owl facilities; the orange dots describe customers' well sites that are part of the Tervita's South Wapiti, Secure's South Grande Prairie, Wolverine's Rycroft, Envolve's Grovedale, and White Owl facilities; the purple dots describe the customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's Kakwa, Wolverine's Grande Cache, Envolve's Grovedale, and White Owl facilities; and the green dots describe the customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek East, Secure's Fox Creek, and Wolverine's Mayerthorpe facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

EXHIBIT 49

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The green dots describe customers' well sites that are part of the overlapping draw area between Tervita's Silverberry Landfill, Secure's Saddle Hills, Municipal's Grande Prairie Clairmont Landfill, and CNRL's Peejay facilities; the purple dots describe customers' well sites that are part of the overlapping draw area between Tervita's La Glace Landfill, Secure's South Grade Prairie, and Municpal's Grande Prairie Clairmont Landfill; the blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti Landfill, Secure's South Grande Prairie, and Municipal's Grande Prairie Clairmont Landfill; the orange dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek Landfill, Secure's Fox Creek, Ridgeline's High Prairie, and Municipal's Whitecourt Regional Landfill facilities; the yellow dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek Landfill, Secure's Fox Creek, and Municipal's Whitecourt Regional Landfill facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

EXHIBIT 50

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The yellow dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's South Grande Prairie, Wolverine's Rycroft, Aquaterra's Gold Greek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the purple dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's Gold Creek, Wolverine's Rycroft, Aquaterra's Gold Creek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the orange dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's Big Mountain Creek, Wolverine's Rycroft, Aquaterra's Gold Creek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the green dots describe customers' well sites that are part of the overlapping draw area between Tervita's Kakwa, Secure's Big Mountain Creek, Wolverine's Grande Cache, Aquaterra's Gold Creek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek, Secure's Tony Creek, Catapult's Fox, Dragos, Sprocket Energy, and TAQA facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

EXHIBIT 51

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The yellow dots describe customers' well sites that are part of the overlapping draw area between Tervita's Wouth Wapait, Secure's South Grande Prairie, Wolverine's Rycroft, Envolve's Grovedale, and White Owl facilities; the orange dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's Kakawa, Wolverine's Grande Cache, Envolve's Grovedale, and White Owl faciliteis; the purple dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek, Secure's Fox Creek, and Wolverine's Mayerthorpe facilities; the blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's Buck Creek, Secure's Drayton Valley, Wolverine's Cynthia, Gibson's Rimbey, MROR, and Rush Energy facilities; the green dots describe customers' well sites that are part of the overlapping draw area between Tervita's Willesden, Secure's Rocky Mountain House, Wolverine's Cynthia, Gibson's Rimbey, MROR, and Rush Energy facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

EXHIBIT 52

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The green dots describe customers' well sites that are part of the overlapping draw area between Tervita's La Glace, Secure's South Grande Prairie, Municipal Grande Prairie Clairmont facilities; the blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's South Grande Prairie, and Municipal Grande Prairie Clairmont facilities; the purple dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek, Secure's Fox Creek, Ridgeline's High Prairie, and Municipal Whitecourt Regional facilities; the yellow dots describe customers' well sites that are part of the overlapping draw area between Tervita's Fox Creek, Secure's Fox Creek, and Municipal Whitecourt Regional facilities; the orange dots describe customers' well sites that are part of the overlapping draw area between Tervita's Willesden Green, Secure's Willy Green, Remedx' Breton, Waste Management's Big Valley, and Municipal Rocky Mountain House facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

EXHIBIT 53

Source: Tervita Transaction Data; Secure Transaction data; Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx): RBEJ00002_000000306; Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068; Appendix (Section 7.7); GridAtlas; ArcGIS

Note: The blue dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's South Grande Prairie, Wolverine's Rycroft, Aquaterra's Gold Creek, Catapult's Pipstone, Envolve Energy's Grovedale, CNROL's Wembly, White Owl, and TAQA facilities; the purple dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapita, Secure's Gold Creek, Envolve's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the orange dots describe customers' well sites that are part of the overlapping draw area between Tervita's South Wapiti, Secure's Big Mountain Creek, Wolverine's Rycroft, Aquaterra's Gold Creek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAQA facilities; the green dots describe customers' well sites that are part of the overlapping draw area between Secure's Big Mountain Creek, Tervita's Kakwa, Wolverine's Grande Cache, Aquaterra's Gold Creek, Catapult's Pipestone, Envolve Energy's Grovedale, CNRL's Wembly, White Owl, and TAA facilities; the yellow dots describe customers' well sites that are part of the overlapping draw area between Tervita's West Edson, Wolverine's Cynthia, Secure's Edson, and TAQA facilities. The gray dots describe locations of other customers in the region that are part of other customer-defined markets.

7.5. Modeling demand for waste services

191. The competitive effects analyses in Section 5 utilizes the logit share-based demand model for waste services. I model demand for waste services as a function the bid prices from the facilities, as well as observable and unobservable facility characteristics.

192. Specifically, I model customer i's valuation of waste service facility j as follows:

$$v_{ij} = \delta_j - d_{ij} + \epsilon_{ij} - b_{ij}$$

193. The value customer i derives for a transaction with waste service facility j (i.e., v_{ij}) depends on observable factors such as the distance between the customer's well site and the facility (d_{ij}),[307] other market-level characteristics that may be equally valued by customers in the same customer-defined markets (δ_j), the bid price (b_{ij}), as well as an idiosyncratic factor that is specific to customer i (ϵ_{ij}).

194. In the second-score auction model, firms bid at cost so that $b_{ij} = c_j$,where c_j is facility $j's$ cost of supplying waste services. [should we say "This maximizes profit" or "firms maximize profit by bidding at cost…"]

195. I group customers into "bins," or groups of customers' well sites indexed by g, where each bin pertains to a local geographic market (i.e., well locations that are close to each other) as defined in Section 4.2. Thus, I estimate the following model under the assumption that customer well sites that are grouped into a bin face similar competitive conditions and share a common observable preference for each facility:[308]

$$\mathrm{v_{ij}} = \delta_{\mathrm{j}}^{\mathrm{g}} + \epsilon_{\mathrm{ij}} \; where \; \delta_j^g \equiv \delta_j - d_j - c_j$$

196. Customers choose the facility that provides the highest value. As such, customers that value a specific facility more than other facilities will more often deliver waste there over their alternatives. Consequently, revenue-based market shares for a particular facility reflect customers' relative preference for that facility over another in a given local geographic market.

197. Something about distribution of the epsilon, including the sigma definition? We need to maintain that assumption for the pricing model, the diversion, and the share-based DWL, but we do not need it for the variable profit-based DWL; that is more general.

198. These customer values underlie the aggregate-level market shares used to assess the extent to which customer-defined markets are more concentrated

[307] Note that d_{ij} will not be the exact same across all customers in a customer-defined market, but on average, geographically proximate customers will travel around the same distances to reach any waste service facility part or out of the customer-defined market.

[308] The group-level value is defined to capture that the model estimates the average effects of the merger on customers that have similar preferences because they experience similar competitive conditions and facility quality based on their customer-defined markets.

because of the merger (Section 5.1), as well as to estimate levels of diversion between the Parties' facilities (Section 5.2.2), predicted price effects (Section 5.3), and DWL from the merger in the affected markets (Section 6.1.2). For each of these analyses, I measure an average merger impact on markets that are defined to capture common preferences among geographically proximate customers, even though the model allows for individual customers to have idiosyncratic preferences.

7.5.1. *Share-based diversion ratios*

199. In Section 5.2.2, I present an analysis of share-based diversion ratios across waste service customers in the WCSB. I calculate the diversion ratios for each market in my analysis, which are based on the following formula that captures the level of diversion between Secure and Tervita facilities in each market i (Shapiro, 1996).[309]

$$Diversion^{i}_{S \to T} = \frac{s^{i}_{T}}{1 - s^{i}_{S}}$$

- i defines the separate markets,
- S and T capture the diversion between the two parties, and
- s^{i}_{T} describes the local market share for Tervita.

200. These diversion ratios approximate the extent to which customers that are part of customer-defined markets are likely to switch between merging Parties' facilities. Higher levels of diversion in a given customer-defined market suggest that those customers view the merging Parties other facility as the next-best substitute.

7.6. Calculating DWL from merger-related facility closures

201. The total per-consumer surplus to gaining access to a group of J goods in logit model has a closed form expression and is given by the following:

$$TS = \sigma \ln\left(\sum_{k=0}^{J} \exp(\frac{\delta_k}{\sigma})\right)$$

[309] Shapiro, Carl, "Mergers with Differentiated Products," Antitrust, Spring 1996.

202. Hence, the per-consumer DWL from closing the facility j can be calculated as the difference between the total consumer surplus with the facility and the total consumer surplus without the facility. This is expressed as :

$$DWL_j = \sigma \ln\left(\sum_{k=0}^{J} \exp(\frac{\delta_k}{\sigma})\right) - \sigma \ln\left(\sum_{k\neq j} \exp\left(\frac{\delta_k}{\sigma}\right)\right) = -\sigma \ln\left(1 - \frac{\exp\left(\frac{\delta_j}{\sigma}\right)}{\sum_{k=0}^{J} \exp\left(\frac{\delta_k}{\sigma}\right)}\right)$$
$$= -\sigma \ln(1 - s_j) = \sigma \ln\left(\frac{1}{1 - s_j}\right)$$

203. The total DWL is then obtained by scaling this expression (DWL_j) by the total affected market size N, i.e., markets in which customers will experience facility closures.

$$DWL_j = \sigma N \ln\left(\frac{1}{1 - s_j}\right)$$

204. This closed-form formula DWL is defined from the demand side of the model and remains the same independent of assumptions on the bidding process, i.e., whether customers are price-takers as in a posted-price market or whether they negotiate prices as in a price discrimination market. The expression depends on the following components:

- The share of the closed facility within a given local geographic market. Generally, facilities that received higher share are more valued by customers in that market; and
- The scaling parameter σ, which quantifies unobserved preference heterogeneity via mark-ups and converts the DWL from a measureless "util" into dollars.

205. I derive σ using the margins implied by two distinct pricing models: the first and second score auction frameworks as I explain in the subsection below. Moreover, I show that under the second-score auction model, the DWL is a function of economic profitability.

7.6.1. *Second-score auction framework that models markets with price discrimination*

206. As described in Section 5, the market for waste services can be characterized as a price discrimination market, where individualized prices are

negotiated between facilities and customers that have varying preferences for facility attributes, including distances between facilities and well sites, specialized waste services, or lower wait times, among other potential factors.

207. Miller (2014) describes a model of price discrimination based on the second score auction framework that can be applied to mergers using information on market participants' market shares, variable cost margins, and product or service prices.[310] In particular, using data on margins and market shares, I am able to back out a measure of customer-level preferences for each customer-defined market in my analysis. Based on these customer-level preferences, I am then able to estimate the DWL stemming from merger-related facility closures. The estimate quantifies customers' DWL from losing access to their most preferred and shuttered facilities, among customers choosing those closed facilities in the data.

208. In particular, equation (B.2) from the addendum to Miller (2014) shows that absolute markups can be derived as a closed form for the second score auction model, which includes a term quantifying the customer-level preferences (σ):[311]

$$E[m_j|w_{ij} > z_{\{k\neq j\}}] = \frac{1}{s_j}\,\sigma \ln\left(\frac{1}{1-s_j}\right)$$

209. This can further be translated into an equation expressed in terms of the variable cost margins (μ_j):

$$\mu_j = \frac{E[m_j|w_{ij} > z_{\{k\neq j\}}]}{E[p_j|w_{ij} > z_{\{k\neq j\}}]} = \frac{1}{s_j E[p_j|w_{ij} > z_{\{k\neq j\}}]}\,\sigma \ln\left(\frac{1}{1-s_j}\right)$$

210. To simplify notation, I will denote $E[p_j|w_{ij} > z_{\{k\neq j\}}]$ as p_j. Denoting the market size as N, we end up with the following equation, where TR_j describes the total revenue at facility j:

$$\mu_j = \frac{N}{TR_j}\,\sigma \ln\left(\frac{1}{1-s_j}\right)$$

[310]Miller, Nathan, "Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization*, Vol. 37, November, 2014, pp. 201–208.

[311] Miller, Nathan, "Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization*, Vol. 37, November, 2014, pp. 201–208 , Addendum, February 19, 2017.

211. This formula leads to two separate approaches for estimating the DWL: a share-based approach and a revenue-based approach. I use both methods to estimate the DWL from facility closures presented in Section 6.1.2 (first row of Exhibit 24).

212. The **share-based** approach to calculating DWL in Section 6.1.2 (second row of Exhibit 24) requires accounting for the σN term, which describes the unobserved preference heterogeneity of customers in a particular customer-defined market (σ) through the mark-ups customers pay for waste services scaled by the market size (N). As described in my report, the σ-term is also used to convert the unit-less util measure of consumer loss due to facility closures into dollars in order to quantity DWL. Those terms, as well as the revenue-based market shares for the closing facilities, are then used in the expression for DWL. The steps are as following:

1. Obtain revenue-weighted average markups for Tervita and Secure across the facilities in the market, $\bar{\mu}^T, \bar{\mu}^S$.
2. Denoting TR^T and TR^S the total revenues of Tervita and Secure, respectively, and s^T and s^S the total shares, back up *firm-specific* values of σN:

$$\sigma^T N = -\frac{\bar{\mu}^T TR^T}{\ln(1 - s^T)}$$

$$\sigma^S N = -\frac{\bar{\mu}^S TR^S}{\ln(1 - s^S)}$$

3. Back-up *market-level* value of $\sigma^M N$ as the revenue-weighted average of firm-specific values, that is $\sigma^M N = \frac{TR^T \sigma^T + TR^S \sigma^S}{TR^T + TR^S} N$.
4. Calculate total market DWL as:

$$DWL^M = -\sigma^M N[\ln(1 - s^{T,closure}) + \ln(1 - s^{S,closure})]$$

213. The **revenue-based approach** to calculating to calculating DWL in Section 6.1.2 (first row of Exhibit 24) uses the fact that the RHS of the equation in paragraph 182 for margins (μ_j) can be re-written as:

$$\mu_j = \frac{DWL_j}{TR_j},$$

… which is equivalent to the following relationship when the terms are re-arranged:

$$DWL_j = \mu_j TR_j = \pi_j^{variable}$$

214. I then can estimate the value of DWL from closing the facility j by multiplying the variable cost margins and total revenues generated by each of the closed facilities. The method aligns with intuition from the second-score auction framework that firms are able to extract surplus from individual price negotiations quantified through facility-level profits. A facility captures higher profits when it provides higher relative value compared to customer's second-best alternative.[312] Moreover, since both total revenue and variable cost margins are readily observable in the data, the revenue-based approach does not require backing out any values for the underlying preference parameters.

7.6.2. *Revenue equivalence between the first score and the second score models*

215. As I explain in Section 6.1.1, the general result that I state is not specific to a second score model. In fact, due to a general principle, called *revenue equivalence principle*, the result will hold for any auction format with the ability to discriminate between the customers. In this subsection I demonstrate the result in a special case of the symmetric first score auction.

216. In the first score auction, each waste provider will submit a "score" $z_j = v_j - p_j$ depending on a value from trade $w_j = v_j - c_j$. The buyer will choose the seller who delivers the highest value to the buyer, i.e., $v_j - p_j = z_j$.

217. I now show that the optimal bidding rule for the seller is:

$$b(w_j) = E[\max_{k \neq j} w_k \mid \max_{k \neq j} w_k < w_j]$$

which is exactly the average price paid in case of winning in the second score auction when the realized value from trade is w_j.

218. Assume that all competing sellers bid according to that rule. If seller j pretends to be some other type than w_j and submits z, the average profit will be:

[312] See Section 6.1.1 for a more detail description of the intuition.

$$P(z > \max_{k \neq j} b(w_k)) \cdot (p_j - c_j)$$

Since $p_j - c_j = v_j - z - c_j = w_j - z$, and $P(z > \max_{k \neq j} b(w_k)) = F^{n-1}(b^{-1}(z))$, I can re-write that as:

$$F^{n-1}\big(b^{-1}(z)\big) \cdot \big(w_j - z\big).$$

219. To get the optimal bidding rule, I need to find the value of z maximizing that equation. To do so, I need to calculate the derivative and set it to zero (that is called a "first-order condition." That means:

$$0 = \big(w_j - z\big) \cdot (n-1) F^{n-2}\big(b^{-1}(z)\big) \cdot f\big(b^{-1}(z)\big) \cdot \frac{1}{b'\big(b^{-1}(z)\big)} - F^{n-1}\big(b^{-1}(z)\big)$$

Which after re-arranging the terms and imposing that $b(w) = z$ constitutes a symmetric equilibrium:

$$b'(w) = \frac{\big(w - b(w)\big)(n-1) f(w)}{F(w)}$$

220. The last expression is what is called the ordinary differential equation, and it admits the following solution:

$$b(w) = w - \frac{\int_{w_0}^{w} F^{n-1}(\hat{w}) d\hat{w}}{F^{n-1}(w)} = \frac{1}{F^{n-1}(w)} \cdot \int_{w_0}^{w} \hat{w}\, dF^{n-1}(\hat{w}) = E[\max_{k \neq j} w_k \mid \max_{k \neq j} w_k < w_j]$$

7.6.3. *First score auction that models markets akin to a Bertrand competition*

221. Assuming Bertrand competition results in a different supply-side first order condition. Specifically, for the Bertrand-pricing game, optimality on the supply side implies (see, Equation (29) in Miller (2014)):

$$p_j = c_j + \frac{\sigma_j}{s_j\big(1 - s_j\big)} s_j.$$

222. Assuming pre-merger price index to be normalized to 1, this is equivalent to $\sigma^T = \bar{\mu}^T(1 - s^T)$, and $\sigma^S = \bar{\mu}^S(1 - s^S)$. After σ^T and σ^S are recovered for each of the Secure and Tervita facilities in a given market, I calculate the

revenue-weighted average market-level σ^M and use it to calculate the DWL in (2) below.

1. Back out *market-level* value of $\sigma^M N$ as the revenue-weighted average of firm-specific values:
$$\sigma^M N = \frac{TR^T \sigma^T + TR^S \sigma^S}{TR^T + TR^S} N.$$
2. Calculate total market DWL:

$$DWL^M = -\sigma^M N[\ln(1 - s^{T,closure}) + \ln(1 - s^{S,closure})]$$

7.6.4. *Increased transportation costs due to planned facility closures*

223. As described in Section 6.1.3, I quantify oil and gas producers' increased transportation costs that they would incur from facility closures, similar to the method used in Harington's Affidavit. I note that increased transportation costs are one part of the DWL caused by facility closures. I describe my estimation methodology below.

224. For each customer of a closed waste service facility, I calculate the distance to the next-nearest Party facility. For customers of facilities to be partially closed, I only include transaction affected by access to the specific services as specified in Harington's Table 7, "Summary of full-service integration groupings facility rationalization decisions." [redacted]

225. For transactions from a well site on a given day to a facility that is marked for closure, I estimate the number of truck loads required to transport the specified waste type and volume. Similar to Mr. Harington, I estimate the truck loads by dividing the waste volume by the truck capacity for each waste type.[314]

[313] Harington Affidavit, [RCFD00001_000000014] ¶ 49 ("Whether a facility is closed fully or partially depends on whether all services at a closing facility can be absorbed into the nearby party facilities or whether only certain services can be absorbed (e.g., given operational differences of the facilities or capacity constraints).").

[314] Harington Affidavit, [RCFD00001_000000014] ¶ 119 ("I first compute the number of loads affected by the facility closures using the internal average load per shipment for SECURE's intercompany transfer under different product categories such as treating, waste processing, and water disposal").

[315] Based on Secure documents, I am able to approximate different truck capacities for solid, processing, treating, and water wastes.[316] I then round up the number of required trucks to the nearest integer since, as I understand, a customer pays for the full truck even if the amount of transported waste does not fill the truck completely.

226. I calculate the increased transportation costs as the additional fees paid for trucking to a Party facility located farther away.[317] In particular, I multiply the number of required trucks by additional rental hours (calculated by dividing the incremental increased travel distance by the assumed speed limit of 80.5 km per hour),[318] and by average per-hour truck rental cost [redacted][319] Note that documents suggest a range of truck rental rates that vary by Province, e.g., between [redacted] in Alberta and around [redacted] in British Columbia.[320] I conservatively use [redacted] [321] I double the additional one-way transportation cost because customers pay for round trip as the truck has to travel to the well location to pick up the waste.[322]

[315] Any transaction with volume that is reported in tons instead of cubic meters is converted cubic-meters. Any transaction reported as "each" or per-"hour" is assumed to require a single truck per report unit (e.g., if the volume is two and the unit of measure is hours, we assume that two trucks were required for one hour each).

[316] See "d. 05-26-2021 SES Transport Efficiencies InterCo.xlsx" [RBBC00003_000000008]

[317] Harington's analysis also calculated the increased transportation costs for customers that would need to transport the waste farther away. See Harington Affidavit, [RCFD00001_000000014] ¶ 121 ("I have therefore included only those transactions where the analysis indicates that the customers will be transporting product *further* than they are currently transporting it."). Harington's analysis also assumes that each customer will select the next nearest Party facility and the next nearest facility when another third-party competitor operates that facility. See Harington Affidavit, [RCFD00001_000000014] ¶ 118 ("… distance that the product will be transported once the facility is closed, assuming that the customer selects the closest alternate party facility.").

[318] Harington Affidavit, [RCFD00001_000000014] ¶ 120.

[319] Harington Affidavit, [RCFD00001_000000014] ¶ 120.

[320] For example, one document assumes a [redacted] per hour fee to rent a truck in Alberta and [redacted] in BC. See Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: [redacted] Volumes," October 15, 2020, TEV00223412, attachment "Trucking Differential – [redacted] lsx," TEV00223413. See also TEV00045140 ($190 per hour in BC, else $150).

[321] [redacted]

[322] Documents that describe "Trucking Differential" analyses suggest that pricing accounts for roundtrips. See Email from tnickel@tervita.com to cmacmullin@tervita.com and lgailey@tervita.com, "RE: [redacted] Volumes," October 15, 2020, TEV00223412, attachment "Trucking Differential – [redacted] xlsx," TEV00223413; TEV00045140.

7.7. Data details

7.7.1. *Analysis flag in the Secure and Tervita transaction data*

227. The following list summarizes the primary steps that I took to prepare Party transaction data. Additional details can be found in my backup.

- Omit transactions with facilities identified as closed or suspended.[323]
- Omit within-firm transactions, i.e., Tervita appears as the customer for a Tervita facility transaction or Secure appears as the customer for a Secure facility transaction.[324]
- Standardize the units of measure for the waste volumes.[325]
- Convert customer UWI to geographic coordinates and calculate the distances between customers and nearby facilities operated by the Parties and other third- and first-party waste service providers.

7.7.2. *Service categorizations*

- I categorized each substance and service type into one of several categories based facility types based on similar substance descriptions, and similar per-unit pricing.[326] These include: contaminated soil delivered to landfills, contaminated soil delivered to TRDs, produced water and waste water, which can be delivered to both TRDs and standalone water disposal wells, emulsion treating, sludge waste, hydrovac waste, tank/truck flushing, processing, drilling fluids, which can be handled at TRDs, and non-oilfield waste.

---

[323] Secure Facilities Data RBEJ00002_000000306 (4 210422 - Revenues and Volumes.xlsx); Tervita Facilities Data, RBEK00004_000000068 (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx); SES0030460.html; SES0030461.docx

[324] I identify within-company transactions by searching "Tervita" in the field ba_name and searching for "Secure in the field billing_customer_name. See RBEK00004_000000076 (Protected & Confidential - Tervita Data Dictionary.xlsx, tab "Spec 17 – Appendix C); RBEJ00002_000000015 (Secure IR Response_Data Dictionary (Protected & Confidential).xlsx, tab "Data 9").

[325] Engel testimony, December 21, 2021, p. 411, questions 1160–1161 ("A. So when waste or product or whatever you wanted to call it is delivered to a landfill it is received and measured in tonnes. It is done using the scale at the facility. That is how you bill customers. Now, on the other side, when you are measuring your capacity it is a measurement of space which is in metres cubed. To be able to reconcile those two numbers you use a conversion factor which is based on an average of waste received to fill a facility. 1.6 seems very accurate to me. That would be typical.").

[326] In the Tervita transaction data, I used the fields substance_name and service_type, and in the Secure transaction data, I used gl_name, product_description, and substance_name. See Protected & Confidential - Tervita Data Dictionary.xlsx, tab "Spec 17 – Appendix C", [RBEK00004_000000076]; Secure IR Response_Data Dictionary (Protected & Confidential).xlsx, tab "Data 9", [RBEJ00002_000000015]. See Secure Tervita service classification.xlsx in my backup.

- For the purposes of the identifying the effects of facility closures on my estimated price effect, DWL, and transportation costs analyses and identifying transaction affected by partial closures, I further aggregated each service and substance into broader categories consisting of waste, water, treating, and non-oilfield waste.
- For the purposes of assigning each transaction to a relevant product market, I classified each service and substance into a "market participant" consisting of landfill, trd, and "water, trd."[327]
- I omitted transactions with substances coded as "non-oilfield" wastes (or NONOFD).[328]
- I omitted transactions with services or substances with per-unit prices greater than $5,000.
- I omitted most types of "add on services" ("AOSs") from the Tervita transaction data and retain all AOSs related to tank or truck flushing services that are most often bundled with waste deliveries on the same ticket or transaction number.

7.7.3. *Competitor data descriptions and assumptions*

228. Below I describe the transaction sales data provided by third-party waste service competitors, which I include in my analysis. Note that I did not receive data from [redacted][329] and I assume that those facilities have the same revenues as the maximum revenue of the Secure and Tervita facilities in that market.

[327] See Section 4.1.1 for a discussion of waste types that can be handled by both a water disposal well and TRD (since TRDs often have water disposal wells on site) versus services that can only be handled by TRDs.

[328] Confidential Level B - Answers to Undertakings from the Examination of Dave Engel held December 20-22, 2021, p. 13 ([redacted]).

[329] I include the Rimbey facility operated by Gibson in the TRD market because I understand that it provides drilling fluid, transfer, waste processing services, but that it no longer disposes of third-party waste or produced water. Witness Statement of Gibson Energy Inc., February 24, 2022 ¶¶ 8-10 ("... the waste management facility in Edson, the oil base mud processing operations in Sexsmith, and the custom treating operations in Hardisty have been shut down. The disposal wells at Gibson's Rimbey, Hardisty, Plato North, and Plato South facilities do not accept produced water or waste water from third parties. The Rimbey and Plato South disposal wells have been shut down. Gibson's Rimbey, Plato South, and Plato North facilities continue to offer some emulsion treating services. However, they do not offer the full suite of processing and disposal services offered at Treatment, Recovery, and Disposal facilities like those owned by Secure."); Gibson Energy, available at https://www.gibsonenergy.com/locations/ (accessed February 22, 2022).

- **Albright Flush Systems**: I understand that Albright operates one TRD facility. [redacted]
- **Aqua Terra**: I understand that Aqua Terra (also known as AQT Water Management) currently operates nine water disposal wells (Drumheller, Gold Creek, Gordondale, High Level, Kitscoty, Dawson Creek, Ft. St. John, Hillmond, and Torrington). [redacted]
- **Cancen Oil Processors Inc.**: I understand that Cancen operates two water disposal wells.[332] [redacted]

[330] See, e.g., Witness Statement of Albright Flush Systems Ltd., February 8, 2022 Exhibit B [redacted]

[331] See Witness Statement of Aqua Terra Water Management, Exhibit A [redacted]

[332] See Cancen Oil Processors, Inc., https://cancenoil.com/about-cancen-2/ (accessed February 22, 2022) ("Cancen Oil Processors Inc owns and operates two deep well disposal facilities with the capacity to dispose of large volumes of liquid waste."); Witness Statement of Cancen Oil Processors Inc. at Exhibit B.

[333] [redacted]

[redacted] [334]

- **Catapult**: I understand that Catapult operates four water disposal wells (Tower, Berland, Fox, and Pipestone). [redacted]
- **Clean Harbors**: I understand that Clean Harbor operates one landfill (at Ryley location) facility and one water disposal (at Seller's location) facility.[336] The Red Deer and Grand Prairie facilities were not considered [redacted] [337]
- **Envolve Energy Services**: I understand that Envolve Energy Services operates one water disposal well (Grovedale). [redacted]

[334] Cancen Oil Processors, Inc., "Morinville Alberta," available at https://cancenoil.com/waste-water-disposal-morinville-alberta/ (accessed February 22, 2022).

[335] [redacted]

[336] See Witness Statement of Clean Harbors Canada Inc., February 17, 2022 at Exhibit C(07), [redacted]

[337] See Witness Statement of Clean Harbors Canada Inc., February 17, 2022 at Exhibit C(07) [redacted]

[338] [redacted]

[339] See Witness Statement of Envolve Energy Services, February 16, 2022 at Exhibit B(02) [redacted]

[redacted][340]

- **MROR**: I understand that MROR operates two water disposal wells and one TRD. [redacted]
- **Plains Environmental**: I understand that Plains Environmental operates one cavern facility (Melville) and one TRD facility (Willmar). [redacted]
- **Pure Environmental**: I understand that Pure Environmental operates one TRD facility (Fort Kent Waste Management facility).[344] [redacted]
- **RemedX**: I understand that RemedX operates one landfill facility (Breton Waste Management). [redacted]

[340] See Witness Statement of Envolve Energy Services, February 16, 2022 at Exhibit B(03) [redacted]

[341] See Witness Statement of Medicine River Oil Recyclers, February 22, 2022 at Exhibit B [redacted]

[342] See Witness Statement of Plains Environmental, February 23, 2022 at Exhibit A(01) and A(02) [redacted]

[343] See Witness Statement of Plains Environmental, February 23, 2022 at Exhibit A(03) [redacted]

[344] See Witness Statement of Pure Environmental, February 11, 2022 at Exhibit B [redacted]

[345] See Witness Statement of Pure Environmental, February 11, 2022 at Exhibit B [redacted]

[redacted][346]

- **Ridgeline:** I understand that Ridgeline operates eight active landfill facilities (Redcliff, Youngstown, Fairview, High Prairie, Lloydminster, Shaunavon, Okotoks, and Edmonton). [redacted]
- **Rush Energy Services**: I understand that Rush operates one TRD facility (Breton) and one water well facility (Rimbey, which opened in March 2020).[349] [redacted]
- **Waste Connections (municipal landfill)**: I understand that Waste Connections operates one landfill (Coronation). [redacted]

[346] See Witness Statement of RemedX Remediation Services Inc., February 7, 2022 at Exhibit D(03) ([redacted]

[347] See, e.g., Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B(03) and B(05) [redacted]

[348] See Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B(03) and B(05) [redacted]

[349] See Witness Statement of Rush Energy Services Inc., February 9, 2022 at Exhibit B(50) and B(135) [redacted]

[350] See Witness Statement of Rush Energy Services Inc., February 9, 2022 at Exhibit B.

[351] See Witness Statement of Canada Waste Connections of Canada Inc., February 16, 2022 at Exhibit B [redacted]

- **Waste Management**: I understand that Waste Management operates two landfills (ThorHild and Big Valley). [redacted]
- **White Owl**: I understand that White Owl operates one TRD facility in Grande Prairie.[353] [redacted]
- **White Swan**: I understand that White Swan operates a TRD (Conklin), a cavern (Atmore West), and a water disposal well (Atmore East), [redacted]
- **Wolverine**: I understand that Wolverine operates five TRD facilities (Claresholm, Rycroft, Grande Cache, Mayerthorpe, and Cynthia) and one landfill (Heward), [redacted]

[352] See Witness Statement of Lorna Engleson of Waste Management of Canada Corporation, February 24, 2022 at Exhibits B(04) and B(06) - [redacted]

[353] See Witness Statement of White Owl Energy Services Inc., February 17, 2022 at Exhibit B.

[354] See Witness Statement of White Owl Energy Services Inc., February 17, 2022 at Exhibit B.

[355] See Witness Statement of White Swan Environmental Ltd., February 3, 2022, Exhibit B(02) [redacted]

[356] [redacted]

[357] [redacted]

[redacted]

- **Municipal landfills**: I rely on 2018 data provided by the AEP to account for the volume of special or contaminated wastes delivered to municipal landfills located in Alberta.[358] [redacted][359] I omitted the Cold Lake municipal landfill from my analysis because [redacted] and its website does not describe taking in oilfield wastes on the page listing the types of tipping fees.[360] I did not receive data from GAP Disposal, a municipal landfill located on the southern border of Saskatchewan, so I imputed revenue for that facility using the same method I use to impute revenue for the [redacted] facilities.[361]

7.7.4. *First-party producer and other data source descriptions and assumptions*

229. The below describes the first-party oil and gas producers from which the Canadian Competition Bureau has requested information. The Bureau has requested from each producer its transaction level sales data for disposal of other producers' waste for the period covering January 1, 2019 and December 31, 2020, including transaction information such as number of units, unit of measure, price, and also product, customer, facility, contract and shipment information if the data is available.[362] Below I describe the data provided, whether I have incorporated it into my analysis, and if not, support for my decision.

- **Canadian Natural Resources Limited ("CNRL")**: I have included CNRL's transaction sales data related to third-party waste it disposed in my analysis. CNRL operates two landfills and thirteen disposal wells (among its more than 300 active disposal wells) that disposed of third-party producers' waste during the 2019-2020

[358] See Witness Statement of Carol Nelson, January 26, 2022 at Exhibit F [redacted]

[359] Engel testimony, December 20, 2021, p. 46 ([redacted]

[360] See City of Cold Lake, https://coldlake.com/en/live/fees-and-penalties.aspx (accessed February 24, 2022).

[361] A recent press release notes that GAP takes in oilfield waste. See GAP Disposal, https://gapdisposal.ca/news_release.html (accessed February 24, 2022).

[362] See, e.g., Witness Statement of Envolve Energy Services, February 16, 2022 at Exhibit A.

period.[363] The two CNRL landfill facilities that accepted third-party waste in the relevant period are Peejay located in BC and Wabasca located in Alberta.[364]

[365]

[369]

[363] See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at ¶ 22 and Exhibit H(07)

[364] Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at Exhibit H(07),

[365] See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at ¶ 22 and Exhibit H

[366] See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at Exhibit H

[367]

[368] See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at Exhibit H

[369] See Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at Exhibit H(16)

- **Galatea**: Galatea does not own or operate waste disposal facilities, so I do not include Galatea's data in my analysis. I understand that Galatea provides oil and gas producers a Waste Coordinator software product that allows them to "optimize processes related to the transport and disposal of oilfield waste."[370] [redacted][371]
- **Obsidian**: I also do not include Obsidian ("OBE") in my analysis, [redacted][372]
- **Plains Midstream**: Plains Midstream accepts some waste from other producers only in its Rimbey facility and I include it in my analysis.[373] [redacted][374]
- **Recover Inc.**: I do not include Recover Inc. in my analysis. Recover Inc. is an environmental technology company cleaning oil base drilling waste of third-party waste generators.[375] The cleaned drill cuttings generated from the oil base drilling waste treating, however,

[redacted]

[370] Witness Statement of Chad Hayden, February 9, 2022, p. 2.

[371] Witness Statement of Chad Hayden, February 9, 2022, p. 5.

[372] Witness statement of Obsidian, Cliff Swadling, February 21, 2022, ¶¶ 24-27 ("Obsidian provides water disposal to third parties where Obsidian is disposing of its own water related to its operations. However, Obsidian does not have dedicated disposal infrastructure for disposal of third-party water. Obsidian's current disposal revenue is relatively insignificant (approximately hundreds of dollars per month) and spread across hundreds of possible wells. These operations are considered normal course for a producer in the Western Canadian Sedimentary Basin and do not represent a significant water disposal business.").

[373] Witness Statement of Plains Midstream Canada, February 9, 2022 at Exhibit C and [redacted]

[374] See Witness Statement of Plains Midstream Canada, February 9, 2022 at Exhibit C [redacted]

[375] See https://www.recover-energy.com/.

still needs to be sent to landfill facilities ([redacted] .[376] Recover Inc. thus can be considered a customer for landfill services.

- **Sprocket Energy Corporation**: I include Sprocket Energy Corporation in my analysis. [redacted] [377]
- **TAQA**: I incorporate the data related to produced water TAQA accepted from other producers for disposal at its water disposal wells in my analysis. [redacted] [379]
- **Tourmaline**: I also include in my analysis Tourmaline's transaction data related to water waste it took from other oil and gas producers [redacted] [380]
- **Whitecap Resource Inc.**: [redacted] [381]

[376] Witness Statement of Recover Inc., February 2, 2022 at Exhibit B. See also https://www.recover-energy.com/recyling-reuse ("Once processed at our facility, the waste is dry and substantially void of hydrocarbons. This material (known as Recover Dry™) is then sent to an industrial landfill where it is recycled as a stabilization material for other waste streams.")

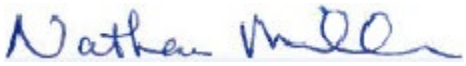
[377] See Witness Statement of Sprocket Energy Corporation, February 1, 2022 at Exhibit B [redacted]

[378] See Witness Statement of Nigel Wiebe, January 27, 2022 at Exhibit A([redacted]

[379] [redacted] See "[redacted]

[380] [redacted].

[381] [redacted]



Nathan Miller, Ph.D.
February 25, 2022

[redacted] See Witness Statement of Whitecap Resources Inc., February 23, 2022 at [redacted]

This is Exhibit B to the Affidavit of Nathan Miller Affirmed on February 25, 2022

Nathan H. Miller

Georgetown University
McDonough School of Business
37th and O Streets, NW
Washington, DC 20057

Work: (510) 735-6411
nhm27@georgetown.edu
www.nathanhmiller.org
Updated January 2022

Positions

Georgetown University
- Provost's Distinguished Associate Professor, 2021-present
- Saleh Romeih Associate Professor, 2019-present, McDonough School of Business
- Affiliated Professor, 2019-present, Economics Department
- Senior Policy Scholar, Center for Business and Public Policy, 2017-present
- Associate Professor, 2017-present, McDonough School of Business
- Assistant Professor, 2013-2017, McDonough School of Business

Toulouse School of Economics
- Visiting Professor, 2019-2020

U.S. Department of Justice, Antitrust Division
- Staff Economist, 2008-2013

Degrees

Ph.D., Economics, University of California at Berkeley, 2008.
B.A., Economics and History, University of Virginia, 2000.

Refereed Publications

"Oligopolistic Price Leadership and Mergers: The United States Beer Industry" (with Gloria Sheu and Matthew Weinberg). *American Economic Review*, Vol. 111, No. 10, 3123-3159 (2021).

"Finding Mr. Schumpeter: Technology Adoption in the Cement Industry" (with Jeffrey Macher and Matthew Osborne). *RAND Journal of Economics*, Vol 52, No. 1, 78-99 (2021).

"Forward Contracts, Market Structure, and the Welfare Effects of Mergers" (with Joseph Podwol). *Journal of Industrial Economics*, Vol. 68, No. 2, 364-407 (2020).

"Understanding the Price Effects of the MillerCoors Joint Venture" (with Matthew Weinberg). *Econometrica*, Vol. 85, No. 6, 1763-1791 (2017).

"Pass-Through in a Concentrated Industry: Empirical Evidence and Regulatory Implications" (with Matthew Osborne and Gloria Sheu). *RAND Journal of Economics*, Vol. 48, No. 1, 69-93 (2017).

"Upward Pricing Pressure as a Predictor of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *International Journal of Industrial Organization*, Vol. 52, 216-247 (2017).

"Pass-Through and the Prediction of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *Journal of Industrial Economics*, Vol. 64, December, 684-709 (2016).

"Spatial Differentiation and Price Discrimination in the Cement Industry: Evidence from a Structural Model" (with Matthew Osborne), *RAND Journal of Economics*, Vol. 45, No. 2, 221-247 (2014, lead article).

"Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization*, Vol. 37, November, 201-208 (2014).

"Automakers' Short-Run Responses to Changing Gasoline Prices" (with Ashley Langer), *Review of Economics and Statistics*, Vol. 95, No. 4, 1198-1211 (2013).

"Why Do Borrowers Pledge Collateral? New Empirical Evidence on the Role of Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Financial Intermediation*, Vol. 20, No. 1, 55-70 (2011).

"Strategic Leniency and Cartel Enforcement," *American Economic Review*, Vol. 99, No. 3, 750-768 (2009).

"Debt Maturity, Risk, and Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Finance*, Vol. 60, No. 6, 2895-2923 (2005).

"Does Functional Form Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks" (with Allen Berger, Mitchell Petersen, Raghuram Rajan, and Jeremy Stein), *Journal of Financial Economics*, Vol. 76, No. 2, 237-269 (2005, lead article).

"Credit Scoring and the Availability, Price, and Risk of Small Business Credit" (with Allen Berger and Scott Frame), *Journal of Money, Banking, and Credit*, Vol 37, No. 2, 191-222 (2005, lead article).

Shorter Refereed Articles

"Bias in Reduced-Form Estimates of Pass-Through" (with Alexander MacKay, Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 123, No. 2, 200-202 (2014).

"Consistency and Asymptotic Normality for Equilibrium Models with Partially Observed Outcome Variables" (with Matthew Osborne), *Economics Letters*, Vol. 123, No. 1, 70-74 (2014).

"Using Cost Pass-Through to Calibrate Demand" (with Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 118, No. 3, 451-454 (2013).

"The Entry Incentives of Complementary Producers: A Simple Model with Implications for Antitrust Policy" (with Juan Lleras), *Economics Letters*, Vol. 110, No. 2, 147-150 (2011).

Book Chapters and Non-Refereed Publications

"Quantitative Methods for Evaluating the Unilateral Effects of Mergers" (with Gloria Sheu), *Review of Industrial Organization*, Vol. 58, No. 1, 143-177 (2021). Special Issue: The 2010 Horizontal Merger Guidelines after Ten Years.

"How the MillerCoors Joint Venture Changed Competition in U.S. Brewing" (with Matthew Weinberg), *Microeconomic Insights*, 2017.

"Ex Post Merger Evaluation: How Does It Help Ex Ante?" (with Daniel Hosken and Matthew Weinberg), *Journal of European Competition Law & Practice*, 2016.

"Choosing Appropriate Control Groups in Merger Evaluations" (with Aditi Mehta), in More Pros and Cons of Merger Control, Konkurrensverket 2012.

Working Papers and Research Projects

"Estimating Models of Supply and Demand: Instruments and Covariance Restrictions" (with Alexander MacKay), 2021.

"Mergers, Entry, and Efficiencies" (with Peter Caradonna and Gloria Sheu), 2021.

"Rising Markups and the Role of Consumer Preferences" (with Hendrik Döpper, Alex MacKay, and Joel Stiebale), 2021.

"On the Misuse of Regressions of Price on the HHI in Merger Review" (with Steven Berry, Fiona Scott Morton, Jonathan Baker, Timothy Bresnahan, Martin Gaynor, Richard Gilbert, George Hay, Ginger Jin, Bruce Kobayashi, Francine Lafontaine, James Levinsohn, Leslie Marx, John Mayo, Aviv Nevo, Ariel Pakes, Nancy Rose, Daniel Rubinfeld, Steven Salop, Marius Schwartz, Katja Seim, Carl Shapiro, Howard Shelanski, David Sibley, and Andrew Sweeting), 2021.

"The Evolution of Concentration and Markups in the Cement Industry" (with Matthew Osborne, Gloria Sheu and Gretchen Sileo), 2022.

"The Curious Case of the Canned Tuna Cartel" (with Minhae Kim, Ryan Mansley, Marc Remer, and Matthew Weinberg), 2021.

"An Empirical Study of Inmate Telecommunication Services Procurement" (with Marleen Marra and Gretchen Sileo), in progress.

"An Empirical Study of Cattle Markets" (with Francisco Garrido, Minji Kim and Matthew Weinberg), in progress.

"An Empirical Study of the Reynolds/Lorillard Merger" (with Kenneth Rios, Ted Rosenbaum, and Nathan Wilson), in progress.

"Modeling the Effects of Mergers in Procurement: Addendum," SSRN Working Paper, 2017.

"Cumulative Innovation and Competition Policy" (with Alexander Raskovich), EAG Discussion Paper 10-5, 2010.

"Competition when Consumers Value Firm Scope," EAG Discussion Paper 8-7, 2008.

Grants and Awards

Washington Center for Equitable Growth Grant, $75,278, 2021-2022
Concurrences Antitrust Award: Best Academic Economics Article, 2021
National Science Foundation Grant, SES 2117197, $59,436, 2021-2022
Washington Center for Equitable Growth Grant, $51,750, 2020-2021
National Science Foundation Grant, SES 1824318, $88,635, 2018-2020
Best Paper Award, Association of Competition Economics, 2017

Robert F. Lanzillotti Prize for Best Paper in Antitrust Economics, 2015
Assistant Attorney General's Award of Distinction, 2013, AT&T/T-Mobile merger
Jerry S. Cohen Award for Antitrust Scholarship, Honorary Mention, 2009
COMPASS Prize for Best Paper in Antitrust Economics by Graduate Students, 2007
UC Berkeley Dean's Normative Time Fellowship, 2006-2007
Competition Policy Center Dissertation Award, 2006
Institute of Business and Economic Research Mini-Grant, 2006

Invited Seminar Presentations

2008: DOJ; Duke (Fuqua); FTC; George Washington University; Johns Hopkins University; University of Iowa; University of North Carolina, Chapel Hill

2009: BEA; BLS; College of William and Mary; Georgetown University

2010: University of British Columbia (Sauder)

2011: University of Virginia

2012: DOJ; Michigan State University

2013: DOJ; Drexel University; Georgetown University (McDonough); Stony Brook University

2014: DOJ; University of California, Berkeley; UCLA; University of Virginia

2015: Clemson University; FTC; Indiana University (Kelley); University of Colorado, Boulder; Yale University

2016: Boston College; Columbia University; Federal Reserve Board; Harvard University; London School of Economics; University of British Columbia (Sauder); University of Texas, Austin; University of Toronto (Rotman)

2017: FTC; University of Kentucky; University of Pennsylvania (Econ/Wharton); University of Wisconsin–Madison

2018: FTC; MIT; Texas A&M; Penn State University; University of Maryland

2019: Harvard (HBS); Toulouse School of Economics; MINES ParisTech; KU Leuven; University of Mannheim; Berlin Applied Economics

2020: Research Institute of Industrial Economics (RIFN); Sciences Po; University of Düsseldorf (DICE); Directorate-General for Competition of the European Commission (DG COMP); Hong Kong University of Science and Technology

2021: CBO, Washington University at St. Louis; George Mason University (Scalia Law); Joint DOJ/FTC; West Virginia University; FTC; University of Maryland

2022: University of California, Berkeley (scheduled); University of Pennsylvania (Econ/Wharton, scheduled); University of Virginia (scheduled); Iowa State University (scheduled); Indiana University (scheduled)

Conference Presentations

APIOS (2018); Association of Competition Economics (2018); Barcelona GSE Summer Forum (2018); DC IO Day (2020); ESEM (2019); FTC Microeconomics (2010, 2014, 2021); Hal White Antitrust (2013, 2014, 2017, 2019); IEF Applied Microeconomics (2016); IIOC (2008, 2009, 2013, 2015, 2016, 2018); NASMES (2019); SEA (2013, 2018); Searle Antitrust (2013, 2015); Triangle Microeconomics (2016)

Conference Discussions

AEA (2015); DC IO Day (2015); Toulouse Digital Economics Conference (2020); HEC Montreal–RIIB Conference on IO (2018); IIOC (2008, 2009, 2013, 2015, 2016, 2018, 2021); NY IO Day (2020); RIDGE IO (2021, scheduled); SEA (2013, 2018); Searle Antitrust (2018); WCEG (2020)

Panels

"Upward Pricing Pressure and Simulation in Merger Review," Economists' Roundtable with the Canadian Competition Bureau, 2017.

"Institutional Shareholdings: Is There an Antitrust Issue?" Concurrences Global Antitrust Conference, 2018.

"Digital Mergers: Need for Reform?" Concurrences International Mergers Conference, 2020.

"Making Competition Work: Promoting Competition in Labor Markets," DOJ/FTC Hearings, December 2021.

Teaching

Firm Analysis and Strategy, MBA Core Curriculum
Industrial Organization, PhD Economics
Strategic Pricing, MBA Elective
Microeconomics, Executive Education
Causal Inference, MSBA Core Curriculum

Ph.D Advising and Dissertation Committees

Georgetown University (Economics)
Francisco Garrido, 2020, ITAM
Yanyang Wang, 2021, Amazon Web Services

Service

Georgetown University
Research Executive Committee, 2021-
MSB Graduate Curriculum and Standards Committee: 2013-2019, 2021

Other Service
Editor, *Journal of Law and Economics*, 2021-present
Associate Editor, *International Journal of Industrial Organization*, 2022-present
Editorial Board, *Review of Industrial Organization*, 2019-present
DC IO Day: Program Committee 2015-2019, Organizer 2017
IIOC: Program Committee, 2019-2021

Referee reports for:

American Economic Journal; American Economic Review; Econometrica; European Economic Review; International Journal of Industrial Organization; Journal of Economics & Management Strategy; Journal of the European Economics Association; Journal of Finance; Journal of Industrial Economics; Journal of Law and Economics; Journal of Political Economy; Management Science; National Science Foundation; *The RAND Journal of Economics; Review of Economic Studies; Review of Economics and Statistics; Review of Industrial Organization; Quarterly Journal of Economics,* others.

This is Exhibit C to the Affidavit of Nathan Miller Affirmed on February 24, 2022

CT-2021-002

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34, as amended;

AND IN THE MATTER OF the acquisition by Secure Energy Services Inc. of all of the issued and outstanding shares of Tervita Corporation;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

BETWEEN:

THE COMMISSIONER OF COMPETITION

Applicant

– and –

SECURE ENERGY SERVICES INC.

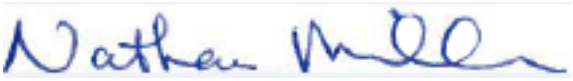
Respondent

ACKNOWLEDGEMENT OF EXPERT WITNESS

I, Nathan H. Miller, acknowledge that I will comply with the Competition Tribunal's code of conduct for expert witnesses which is described below:

1. An expert witness who provides a report for use as evidence has duty to assist the Tribunal impartially on matters relevant to his or her area of expertise.
2. This duty overrides any duty to a party to the proceeding, including to person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.

February 25, 2022



Date

Nathan H. Miller

This is Exhibit D to the Affidavit of Nathan Miller Affirmed on February 25, 2022

Exhibit D

Documents Relied Upon by Nathan H. Miller

Produced Material

RBBA00017_000000001
RCFC00001_000000002 - Supplementary Record - July 23, 2021 v2.pdf
SES0004680
SES0004681
SES0004800
SES0015262
SES0017850
SES0018395
SES0020531
SES0024264
SES0024406
SES0026223
SES0026580
SES0030460
SES0030461
SES0037940
SES0039749
SES0041155
SES0043674
SES0045741
SES0048120
SES0050636
SES0052305
SES0064462
SES0071363
SES0083701
SES0084905
SES0086266
SES0089949
SES0089949
SESL0004441
SESL0005839
SESL0009217
SESL0017504
SESL0034121
SESL0039221
TER_00001910
TER_00023052
TER_00023595
TER_00024414

Documents Relied Upon by Nathan H. Miller

TER_00042320
TER_0005781
TER_00057979
TER_00069850
TER_00071497
TER_00085702
TER_00091578

Tervita “Facilities metrics breakdown-Lindbergh,”, [TEV00107405]

Tervita, “BC Landfills,” TEV00008463

Tervita, “Facilities metrics breakdown-Fort McMurray, [TEV00044566]

Tervita, “Facilities metrics breakdown-Fox Creek Landfill, [TEV00060814];

Tervita, “Facilities metrics breakdown-La Glace TRD, [TEV00046073]

Tervita, “Facilities metrics breakdown-Spirit River Landfill, [TEV00046126]

Tervita, “Facility Metrics Breakdown – TRDs and Disposal Wells,” 2016/2017, [TER_00085702]

Tervita’s PROTECTED & CONFIDENTIAL Water Services 2017-2021 P&Ls.xlsx, [RBEK00004_000000011]

TEV00000285
TEV00000673
TEV00045140
TEV00061715
TEV00114394
TEV00114395
TEV00119499
TEV00137398
TEV00155420
TEV00219518
TEV00223412
TEV00223413
TEV00242986
TEV00242988
TEV00247518
TEV00248947

Exhibit D
Documents Relied Upon by Nathan H. Miller

Public Documents

"Proposed Combination of Tervita Corporation and Newalta Corporation by way of plan of arrangement under the Business Corporations Act (Alberta) (the Proposed Transaction," March 1, 2018, [RBBA00008_000000023]

"The Commissioner of Competition v. CCS Corporation et al.," 2012 Comp. Trib. 14 File No.: CT-2011-002., May 29, 2012, pp. 1-84

BC Environment Industry Association, "General Information Fact Sheet Hazardous Waste Management in BC" https://bceia.com/wp-content/uploads/2018/05/bceia_001_Hazardous_Waste_Management_in_BC_General_Information_2013.pdf (British Columbia)

Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011

Expert Report of Henry J. Kahwaty, Ph.D. October 7, 2011 in "The Commissioner of Competition v. CCS Corporation et al.," 2012 Comp. Trib. 14 File No.: CT-2011-002, [RBBA00007_000000025]

Federal Court of Appeal, 2013 FCA 28, at ¶¶ 6–15.

Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA, et al., "Plaintiff's proposed findings of fact and conclusions of law," Civil Action No. 18-cv-00414-TCS, July 13, 2018, available at https://appliedantitrust.com/14_merger_litigation/cases_ftc/wilhelmsen/2_13b/wilhelmsen_ddc_pff_ftc7_13_2018.pdf (accessed February 21, 2022)

Harington Affidavit, [RCFD00001_000000014]

Letter from Brian A. Facey (Blakes) to Commissioner Matthew Boswell (Competition Bureau of Canada), "SECURE Energy Services Inc.'s acquisition of Tervita Corporation," March 12, 2021, [RBBB00001_000000002]

Letter from Kevin Ackhurst (Norton Rose Fulbright) to Commissioner John Pecman (Competition Bureau of Canada), March 1, 2018, [RBBA00008_000000023]

Miller June Expert Report, RCFC00001_000000015

Newalta Responses to Request for Information (March 23 2018), [RBBA00011_000000028]

Secure 2020 Annual Financial Statement, [SESL0020098]

SECURE ENERGY Annual Information Form for the year ended December 31, 2020, [RBBC00003_000000009]

Secure's Response to Request for Information by the Competition Bureau for the Tervita and Newalta transaction, May 17, 2018, [RBBA00011_000000002]

Exhibit D
Documents Relied Upon by Nathan H. Miller

Secure's submission to the Competition Bureau Re: Proposed Transaction between Tervita and Newalta, May 17, 2018, [RBBA00011_000000002]

SRC Environmental Analytical Laboratories, "Chain of Custody / Analysis Form," https://www.src.sk.ca/sites/default/files/files/resource/EAL%20COC%20and%20TC%20FILLABLE%20CSM-132A_May2021.pdf (Saskatchewan).

Tervita Annual Information Form for the fiscal year ended December 31, 2020, [RBBC00003_000000017]

Tervita, "AER Directive 58 Reference," available at https://tervita.com/files/public-files/aer-directiven-58-reference.pdf (Alberta),

The Commissioner of Competition v. CCS Corporation et al., 2012 Comp. Trib. 14

The Commissioner of Competition v. CCS Corporation et al., 2012 Comp. Trib. 14, Reasons for order and order, May 29, 2021, pp. 19-20.

The Nobel Prize Press Release "The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2000," October 11, 2000, available at https://www.nobelprize.org/prizes/economic-sciences/2000/press-release/, accessed on September 4, 2019

United States v. Anthem, Inc., 236 F. Supp. 3d 171 (D.D.C. 2017), aff'd, 855 F.3d 345 (D.C. Cir.), available at https://www.justice.gov/atr/case-document/file/940946/download (accessed February 21, 2022);

Witness Statements and Testimony

Confidential Level B - Answers to Undertakings from the Examination of Dave Engel held December 20-22, 2021

Examination for Discovery of David Engel, December 20, 2021

Examination for Discovery of David Engel, December 21, 2021

Examination for Discovery of David Engel, December 22, 2021

Witness Statement of Carol Nelson, January 25, 2022 at Exhibit F (RBED00003_000000002 - CONFIDENTIAL LEVEL A.xlsx)

Witness Statement of Chad Hayden, February 9, 2022

Witness Statement of Cliff Swadling, Obsidian Energy LTD., February 21, 2022

Witness Statement of ConocoPhillips, February 23, 2022

Witness Statement of Cory Mercer, February 9, 2022

Witness Statement of Crew Energy Inc., James Taylor, February 14, 2022

Exhibit D
Documents Relied Upon by Nathan H. Miller

Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022

Witness Statement of Gibson Energy Inc., February 24, 2022.

Witness Statement of Jarred Anstett, Murphy Oil Company Ltd., February 21, 2022

Witness Statement of Jeff Biegel, February 15, 2022

Witness Statement of Jeffrey Biegel, February 15, 2022

Witness Statement of LB Energy Services Ltd., February 9, 2022

Witness Statement of Nigel Wiebe (TAQA), January 27, 2022

Witness Statement of Paul Dziuba (Chevron Canada Resources), February 24, 2022

Witness Statement of Petronas Energy Canada LTD., Carl Lammens, February 3, 2022

Witness Statement of RemedX Remediation Services Inc., Barrie Flood, February 7, 2022

Witness Statement of RemedX Remediation Services Inc., February 7, 2022

Witness Statement of Shanley Bowersock, February 23, 2022

Witness Statement of the Orphan Well Association, February 22, 2022

Witness statement of Tina Odeyemi, Alberta Energy Regulator, January 8, 2022

Witness Statement of Tinu Odeyemi, January 8, 2022

Witness Statement of Whitecap Resources, February 23, 2022

Academic Articles

Ackerberg, Daniel A., and Marc Rysman, "Unobserved Product Differentiation in Discrete-Choice Models: Estimating Price Elasticities and Welfare Effects," The RAND Journal of Economics, 36 no. 4 (2005): pp. 771–788

Bailey, DeeVon, B. Wade Brorsen, and Michael R. Thomsen, "Identifying Buyer Market Areas and the Impact of Buyer Concentration in Feeder Cattle Markets Using Mapping and Spatial Statistics," American Journal of Agricultural Economics, Vol. 77 (1995): pp.309–318

Beckert, Walter, Howard Smith, and Yuya Takahashi, "Competition in a spatially-differentiated product market with negotiated prices," University of Oxford : Economics, Department of Economics Discussion Paper Series (2020)

Coate, Malcolm, and Jeffrey H. Fischer, "A Practical Guide to the Hypothetical Monopolist Test for Market Definition," Journal of Competition Law & Economics, Vol. 4 no.4 (April 2008): pp. 1031–1063

Documents Relied Upon by Nathan H. Miller

Farrell, Joseph, and Carl Shapiro, "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," The BE Journal of Theoretical Economics 10(1), 2010, pp. 1–39

Gentzkow, Matthew, "Valuing New Goods in a Model with Complementarity: Online Newspapers," American Economic Review, 97 no. 3 (2007): pp. 713–744

McFadden, Daniel , "Conditional Logit Analysis of Qualitative Choice Behavior," Frontiers in Econometrics, ed. Paul Zarembka (New York: Academic Press, 1974), pp. 105–142

Miller, Nathan H. "Modeling the effects of mergers in procurement." International Journal of Industrial Organization 37 (2014): 201-208.

Miller, Nathan H., and Gloria Sheu. "Quantitative methods for evaluating the unilateral effects of mergers." Review of Industrial Organization 58, no. 1 (2021): 143-177.

Miller, Nathan H., Matthew Osborne, Gloria Sheu, and Gretchen Sileo, "The Evolution of Concentration and Markups in the United States Cement Industry," February 2022, available at http://www.nathanhmiller.org/cementmarkups.pdf (accessed February 21, 2022)

Miller, Nathan, "Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization* , Vol. 37, November, 2014, pp. 201–208, Addendum, February 19, 2017

Miller, Nathan, "Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization* , Vol. 37, November, 2014, pp. 201–208.

Miller, Nathan, and Gloria Sheu, "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," Review of Industrial Organization 58 (2021):143–177

Petrin, Amil, "Quantifying the Benefits of New Products: The Case of the Minivan," Journal of Political Economy, 110 no. 4 (2002): pp. 705–729

Raval, Devesh, Ted Rosenbaum, and Steven A. Tenn. "A semiparametric discrete choice model: An application to hospital mergers." Economic Inquiry 55, no. 4 (2017): 1919-1944.

Richard G. Newell and Brian C. Prest, "The Unconventional Oil Supply Boom: Aggregate Price Response from Microdata," The Energy Journal, Vol. 40, No. 3, 2019

Shapiro, Carl, "Mergers with Differentiated Products," Antitrust, Spring 1996.

Spence, Michael, "Produce Selection, Fixed Costs, and Monopolistic Competition," The Review of Economic Studies, June (1976), Vol. 43 (2), pp. 217-235

Sweeting, Andrew et al., "Economics at the FTC: Fertilizer, Consumer Complaints, and Private Label Cereal," Review of Industrial Organization 55 (2020):751–781

Varian, Hal R., "Microeconomic Analysis," Third Edition, W. W. Norton & Company, Inc., 1992, at pp. 131–132.

Exhibit D
Documents Relied Upon by Nathan H. Miller

Party Data

17 - Sales and SES Truck Tickets Data (Midstream).txt, [RBEJ00002_000000007]

a. 04-27-2021 SES Analysis (003).xlsx, [RBBC00003_000000004]

a. 04272021 TRD-Financial Summary wo EM_no link Costs Analyzed.xlsx

d. 05-26-2021 SES Transport Efficiencies InterCo.xlsx, [RBBC00003_000000008]

energy_services_qfaim_sales_2017_2021.txt, [RBEK00004_000000048]

Protected & Confidential - Tervita Data Dictionary.xlsx, tab “Spec 17 – Appendix C”, [RBEK00004_000000076]

PROTECTED & CONFIDENTIAL LF-Financial Summary_no link.xlsx, [RBEK00004_000000085]

PROTECTED & CONFIDENTIAL TRD-Financial Summary with EM Final_no link 05-27-2021.xlsx, [RBEK00004_000000057]

PROTECTED & CONFIDENTIAL Waste - RW STD GP PLs.xlsx [XXXX]

PROTECTED & CONFIDENTIAL Waste_Services_HMM_Sales_2018_2021.txt: RBEK00004_000000084

RBEJ00002_000000007 = 17 - Sales and SES Truck Tickets Data (Midstream).txt

RBEK00004_000000004 = PROTECTED & CONFIDENTIAL Waste_Services_QFAIM_Sales_2019_2020
RBEK00004_000000048 = PROTECTED & CONFIDENTIAL Energy_Services_QFAIM_Sales_2017_2021
RBEK00004_000000054 = PROTECTED & CONFIDENTIAL Waste_Services_SAP_NAL_TRD_Landfill_Sales_2017_2018

RBEK00004_000000056 = PROTECTED & CONFIDENTIAL Energy_Services_SAP_NAL_TRD_Landfill_Sales_2017_2018
RBEK00004_000000084 = PROTECTED & CONFIDENTIAL Waste Services HMM Sales 2018 2021

Secure Facilities Data (4 210422 - Revenues and Volumes.xlsx: RBEJ00002_000000306

Secure IR Response_Data Dictionary (Protected & Confidential).xlsx, tab “Data 9”, [RBEJ00002 000000015]

SESL0002187 (landfills).xlsx

Tervita Facilities Data (PROTECTED & CONFIDENTIAL Facility List - FINAL – 05282021.xlsx: RBEK00004_000000068

V.A.2 Dec 2020 01.14.2021 ALL PRD Canada Facility Statements - Secure Details.xlsx

waste_services_qfaim_sales_2019_2020.txt, [RBEK00004_000000004]

First and Third Party Data

Witness Statement of Rush Energy Services Inc., February 9, 2022 at Exhibit B.

(RCAC00002_000000010)

(RCEC00001_000000030), [Report 1 Remedx Customer Contract Listing.xls]

"2019- 2020 Facility Product Balance by Owner for Injection Facilities v3.xlsx."

"Volume Reconciliation.xlsx."

CNRL Exhibit 7(a)-(m), "Revenue" tab.The data also provided transactions for other non-relevant services such as "Gas Gathering", "Oil Treating" and "Overhead"

Email from Tim Richardson re. Application for an order pursuant to paragraph 10(1)(b)(ii) of the Competition Act, Oct 14, 2021

Exhibit A(c) (RBJL00001_000000002), [2019- 2020 Facility Product Balance by Owner for Injection Facilities v3.xlsx], tab "Facility Product Balance by Ow" and tab "original."

Exhibit H (3)(RCAC00002_000000004) , [Exh 7(j) Senlac disposal well.xlsx], "Facility Charges" tab and variable "Linked FacilityName."

Exhibit H (RCAC00002_000000003-RCAC00002_000000005; RCAC00002_000000013; RCAC00002_000000016-RCAC00002_000000017; RCAC00002_000000019-RCAC00002_000000022; RCAC00002_000000024-RCAC00002_000000026), [CNRL Exhibit 7 (a)-(m)]

Exhibit H(16) (RCAC00002_000000019), [Exh 7(k) Wembley disposal well.xlsx], "Facility Charges" tab and variable "Linked FacilityName."

Exhibit H(07) (RCAC00002_000000010)

RBBA00017_000000001

RBEH00001_000000007 [Master Transaction Level Sales Data.xlsx]

Witness Statement of Albright Flush Systems Ltd., February 8, 2022 Exhibit B (RCAE00002_000000002), [Albright May 2019 Plant Balance, RCAE00002_000000002 - CONFIDENTIAL LEVEL A.xlsx]

Witness Statement of Aqua Terra Water Management, Exhibit A (RBDG00001_000000012), [AQT Schedule I.xlsx]

Witness Statement of Canada Waste Connections of Canada Inc., February 16, 2022 at Exhibit B (RBDE00001_000000001), [CONFIDENTIAL 7430 Coronation Volume Revenue Location Data since 2017.xls]

Witness Statement of Cancen Oil Processors Inc. at Exhibit B

Documents Relied Upon by Nathan H. Miller

Witness Statement of Carol Nelson, January 26, 2022 at Exhibit F (RBED00003_000000002), [RBED00003_000000002 - CONFIDENTIAL LEVEL A.xlsx]

Witness Statement of Clean Harbors Canada Inc., February 17, 2022 at Exhibit C(05), C(08) (RBDK00001_000000024 and RBDK00001_000000056), [Ryley waste log 2019.xlsx, Ryley waste shipments 2017 to current.xlsx]

Witness Statement of Clean Harbors Canada Inc., February 17, 2022 at Exhibit C(07), Tab "Clean Harbors" (RBDK00001_000000048), [Western Canada waste facilities (AB BC).xlsx] "Clean Harbors" tab.

Witness Statement of Envolve Energy Services, February 16, 2022 at Exhibit B(02) (RCCA00001_000000004)

Witness Statement of Lorna Engleson of Waste Management of Canada Corporation, February 24, 2022 at Exhibits B(04) and B(06) - (RBEE00001_000000020 and RBEE00001_000000022), [WM_Data_WM_Data_CCB WM Big Valley 2019.xls, WM_Data_WM_Data_CCB WM Thorhild 2019.xlsx]

Witness Statement of Medicine River Oil Recyclers, February 22, 2022 at Exhibit B (RBDM00001_000000002), [2017-2020 Customer sales.xlsx] It did not provide transaction level data or sales by facility.]

Witness statement of Obsidian, Cliff Swadling, February 21, 2022

Witness Statement of Plains Environmental, February 10, 2022 at Exhibit A(01) and A(02) (RBEB00002_000000009 and RBEB00002_000000010), [2019 report by customer.xlsx, 2020 report by customer.xlsx]

Witness Statement of Plains Environmental, February 10, 2022 at Exhibit A(03) (RBEB00001_000000001), [load tracker (OLD) 2021-01-14.mdb]

Witness Statement of Plains Midstream Canada, February 9, 2022 at Exhibit C (RCDL00001_000000007), [Rimbey CT - Contracts, Volumes and Fees V2.xlsx] "Summary Pivot" tab.

Witness Statement of Pure Environmental, February 11, 2022 at Exhibit B (RCDM00001_000000002)

Witness Statement of Recover Inc., February 2, 2022 at Exhibit B. See also https://www.recover-energy.com/; https://www.recover-energy.com/recyling-reuse.

Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B(03) and B(05) (RBEC00001_000000022 and RBEC00001_000000026), [Greenfill Revenue Tracker 2018-19.xlsx, Greenfill Revenue Tracker 2019-2020.xlsx]

Witness Statement of Ryan Kaminski

Witness Statement of Sprocket Energy Corporation, February 1, 2022 at Exhibit B, [Sprocket Energy 4-29 Disposal Well Revenue Summary, Sprocket Appendix A.1.xlsx and Appendix A.2.xlsx], "4-29" tab.

Witness Statement of Tourmaline Oil Corp., February 23, 2022 at Exhibit B (RCEL00001_000000008)

Witness Statement of White Owl Energy Services Inc., February 17, 2022 at Exhibit B.

Documents Relied Upon by Nathan H. Miller

Witness Statement of White Swan Environmental Ltd., February 3, 2022, Exhibit B(02) (RBEG00001_000000055), [Protected and Confidential - White Swan - Production Data (August 26, 2021).xlsx]

Witness Statement of Whitecap Resources Inc., February 23, 2022 at Exhibit B (03) and B (01) (RCFA00001_000000013 and RCFA00002_000000001), [Whitecap Resources Inc. - 2019_2020 Volumetric Facility Activity Report _SK FINAL.xlsx], tab "Pivot Table-REC to WCP Disposal."

Public Websites

"Fracking Explained," Petroleum Services Association of Canada, available at https://oilandgasinfo.ca/all-about-fracking/fracking-explained/

"SECURE Energy Services Inc. and Tervita Corporation Merge to Create a Stronger Midstream Infrastructure and Environmental Solutions Business," Tervita, March 9, 2020, available at https://tervita.com/news/article/secure-energy-services-inc-and-tervita-corporation-merge-to-crea/.

"What is Produced water?" American Geosciences Institute, available at https://www.americangeosciences.org/critical-issues/faq/what-produced-water.

AER, "Hydraulic Fracturing," available at https://www.aer.ca/providing-information/by-topic/hydraulic-fracturing

AER, "Remediation," https://www.aer.ca/regulating-development/project-closure/remediation

Alberta Energy Regulator ("AER"), "Drilling," available at https://www.aer.ca/providing-information/by-topic/drilling.

Alberta Energy Regulator, "Approved Oilfield Waste Management Facilities," available at http://www1.aer.ca/ProductCatalogue/41.html

Alberta Energy Regulator, Directive 088 Licensee Life-Cycle Management, available at https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-088 (accessed February 25, 2022)

Canadian Association of Petroleum Producers (CAPP), Statistical Handbook, https://www.capp.ca/wp-content/uploads/2021/12/Frequently-Used-Stats-Nov-2021.pdf (accessed February 21, 2022)

Cancen Oil Processors Inc., "About Cancen," https://cancenoil.com/about-cancen-2/ (accessed February 22, 2022)

Cancen Oil Processors, Inc., "Morinville Alberta," available at https://cancenoil.com/waste-water-disposal-morinville-alberta/ (accessed February 22, 2022)

City of Cold Lake, https://coldlake.com/en/live/fees-and-penalties.aspx (accessed February 24, 2022)

GAP Disposal, https://gapdisposal.ca/news_release.html (accessed February 24, 2022)

Documents Relied Upon by Nathan H. Miller

Gibson Energy, available at https://www.gibsonenergy.com/locations/ (accessed February 22, 2022)

Rigzone.com, “How does well completion work?” available at https://www.rigzone.com/training/insight.asp?insight_id=326

Science World, “Bioremediation of oil spills,” available at https://www.scienceworld.ca/resource/bioremediation-oil-spills/ (“Bioremediation is any process that uses decomposers and green plants, or their enzymes, to improve the condition of contaminated environments.”). See also Witness Statement of RemedX Remediation Services Inc., February 7, 2022, ¶ 9.

Statistics Canada, "Census Profile, 2016 Census, Wembley, [Population centre], Alberta and Alberta, [Province]," https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=POPC&Code1=1197&Geo2=PR&Code2=48&SearchText=Wembley&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=1197&TABID=1&type=0 (accessed February 24, 2022)

Wolverine Energy + Infrastructure Inc., “Trailer Rentals,” available at https://wnrgi.com/rentals/transportation/

Company and Facility	Facility Type	Source for facility location and type
Secure Energy Services: Fox Creek Pembina Saddle Hills South Grande Prairie Tulliby Lake Virden Willy Green	Landfill	Secure SIR Response, Specification 13, Midstream folder, document name: "4 210422 - Revenues and Volumes.xlsx" (RBEJ00002_000000306)
Secure Energy Services: Alida Brazeau Chamberlain Dawson Creek Drayton Valley Edson Fox Creek Judy Creek Kakwa Kindersley Kinsella Kotcho La Glace Nosehill Obed Rocky Mountain House Silver Valley Silverdale South Grande Prairie Tulliby Lake	TRD	Secure SIR Response, Specification 13, Midstream folder, document name: "4 210422 - Revenues and Volumes.xlsx" (RBEJ00002_000000306)
Secure Energy Services: Athabasca Big Mountain Creek Bittern Lake Eccles Emerson Gordondale Kaybob	SWD	Secure SIR Response, Specification 13, Midstream folder, document name: "4 210422 - Revenues and Volumes.xlsx" (RBEJ00002_000000306)

Kaybob South Wild River Wonowon Gold Creek Pipestone Tony Creek		
Secure Energy Services: Beadle East High Prairie Mannville	Rail terminal	Secure SIR Response, Specification 13, Midstream folder, document name: "4 210422 - Revenues and Volumes.xlsx" (RBEJ00002_000000306)
Tervita: Babkirk Landfill Bailey Contract Landfill Bonnyville Landfill East Peace Landfill Fox Creek Landfill Gull Lake Landfill Highwest Landfill Janvier Landfill Judy Creek Landfill Kindersley Landfill La Glace Landfill Lomond Landfill Marshall Landfill Medicine Hat Landfill Mitsue Landfill Mervin Landfill Northern Rockies Landfill Pincher Creek Landfill Rainbow Lake Landfill Silverberry Landfill Skyway Landfill South Wapiti Landfill Spirit River Landfill Tower Road Landfill Wabasca Landfill Willesden Green Landfill Willow Creek Landfill Gold Creek	Landfill	Tervita SIR Response to spec 13, document name: PROTECTED & CONFIDENTIAL Facility List - FINAL - 05282021.xlsx (RBEK00004_000000068)

Swift Current Unity Elk Point LF		
Tervita: Hoey 08-09 Flatrock Marshall Maxhamish Mile 103 Moose Creek Stanmore Swan Hills Wabasca Wolf Lake Amelia Pigeon Lake Eckville WD Silverberry WD Kakwa Drayton Valley WD Bonnyville Disp	TRD	Tervita SIR Response to spec 13, document name: PROTECTED & CONFIDENTIAL Facility List - FINAL - 05282021.xlsx (RBEK00004_000000068)
Tervita: Big Valley Boundary Lake Brazeau Brooks Buck Creek Coronation Eagle Butte Fox Creek Fox Creek Highway Terminal Gull Lake High Prairie Judy Creek Kindersley La Glace Mitsue	SWD	Tervita SIR Response to spec 13, document name: PROTECTED & CONFIDENTIAL Facility List - FINAL - 05282021.xlsx (RBEK00004_000000068)

Peace River Rainbow Lake Sierra Silverberry South Taylor South Wapiti Spirit River Turtleford Valleyview West Edson Brooks West Drayton Valley Drumheller Eckville Elk Point Fort McMurray Fox Creek East Gold Creek Gordondale Grande Prairie Industrial Green Court Hays Kitscoty Niton Junction Peace River Red Earth Redwater Stauffer Stettler Taber Valleyview West Willesden Green Fort St. John West Stoddart Alida Carruthers Halbrite Kindersley East Plover Lake Richmound		

Shaunavon Silver Lake Waskada Zama Seal Lake TRD		
Tervita: Lindbergh Caverns Unity Caverns	Cavern	Tervita SIR Response to spec 13, document name: PROTECTED & CONFIDENTIAL Facility List - FINAL - 05282021.xlsx (RBEK00004_000000068)
Albright	TRD	Witness Statement of Albright Flush Systems Ltd., February 8, 2022 Exhibit B [B(01) - B (25), RCAE00002_000000002 - RCAE00002_000000026] Document RBBA00017_000000001: Albright Flush Systems Ltd operates one treatment recovery and disposal facility Located at Mile marker 74.5 of the Alaska Highway. The disposal well is identified as a10-09-87-21 W6M. The 911 address of the facility 12576 Highway 97 north. The mailing address is PO Box 6148 Fort St. John, BC V1J 4H6.
Aqua Terra Drumheller	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Aqua Terra Gold Creek	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) - RBDG00001_000000013]
Aqua Terra Gordondale	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Aqua Terra High Level	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013] See also RBDG00001_000000025
Aqua Terra Kitscoty	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Aqua Terra Dawson Creek	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Aqua Terra Ft. St. John	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Aqua Terra Hillmond	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]

Aqua Terra Torrington	SWD	Witness Statement of Aqua Terra Water Management, February 24, 2022, Exhibit B [B(02) RBDG00001_000000012, B(03) RBDG00001_000000013]
Cancen New Sarepta	SWD	Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A Witness Statement of Cancen Oil Processors Inc. at Exhibit B (RCKG00001_000000001-RCKG00001_000003319)
Cancen Morinville	SWD	Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A Witness Statement of Cancen Oil Processors Inc. at Exhibit B (RCKG00001_000000001-RCKG00001_000003319)
Catapult Tower	SWD	Witness Statement of Ryan Kaminski, February 22, 2022 at paragraphs 7-8, and Exhibit D [D(02) RBDH00001_000000016, D(03) RBDH00001_000000017] Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Catapult Berland	SWD	Witness Statement of Ryan Kaminski, February 22, 2022 at paragraphs 7-8, and Exhibit D [D(02) RBDH00001_000000016, D(03) RBDH00001_000000017] Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Catapult Fox	SWD	Witness Statement of Ryan Kaminski, February 22, 2022 at paragraphs 7-8, and Exhibit D [D(02) RBDH00001_000000016, D(03) RBDH00001_000000017] Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Catapult Pipestone	SWD	Witness Statement of Ryan Kaminski, February 22, 2022 at paragraphs 7-8, and Exhibit D [D(02) RBDH00001_000000016, D(03) RBDH00001_000000017] Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Clean Harbors Ryley	Landfill (Class I Hazardous Waste Landfill)	Witness Statement of Clean Harbors Canada Inc., February 21, 2022 at Exhibit C [C(01) RBDK00001_000000006, C(02) RBDK00001_000000007, C(03) RBDK00001_000000012, C(04) RBDK00001_000000016, C(05) RBDK00001_000000024, C(06) RBDK00001_000000032, C(07) RBDK00001_000000048, C(08) RBDK00001_000000056, C(09) RBDK00001_000000087] Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C
Clean Harbors Seller's	SWD (Class 1a Disposal Well)	Witness Statement of Clean Harbors Canada Inc., February 21, 2022 at Exhibit C (RBDK00001_000000048)
Clean Harbors Red Deer	Transfer station	Witness Statement of Clean Harbors Canada Inc., February 21, 2022 at Exhibit C (RBDK00001_000000048)
Clean Harbors Grande Prairie	Transfer station	Witness Statement of Clean Harbors Canada Inc., February 21, 2022 at Exhibit C (RBDK00001_000000048)
CNRL Peejay	Landfill	Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at paragraph 22 and Exhibit H (H(05) and H(07) in particular) (RCAC00002_000000008 and RCAC00002_000000010)

CNRL Manatokan	Landfill	Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at paragraph 22 and Exhibit H (H(05) and H(07) in particular) (RCAC00002_000000008 and RCAC00002_000000010)
CNRL Wabasca	Landfill	Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at paragraph 22 and Exhibit H (H(05) and H(07) in particular) (RCAC00002_000000008 and RCAC00002_000000010)
CNRL Disposal Wells (Saddle Lake, Bear Trap, Frog Lake, Lindbergh, Siebert Lake, Worsley, Ferrier, Frenchman Butte, Senlac, Wembly, Elkpoint, and Martin Hills)	SWD	Witness Statement of David Hart (Canadian Natural Resources Limited), February 22, 2022 at paragraph 22 and Exhibit H (H(05) and H(07) in particular) (RCAC00002_000000008 and RCAC00002_000000010)
Dragos Water Management	SWD	Witness Statement of Dragos Water Management, February 23, 2022 at paragraph 4 https://www.dragoswatermanagement.com/ Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Envolve Energy Services Grovedale	SWD	Witness Statement of Envolve Energy Services, February 16, 2022 at Exhibit B [B(01) RCCA00001_000000003, B(02) RCCA00001_000000004, B(03) RCCA00001_000000008] See also SES0051323
Gibson Energy Rimbey	Custom treating	Witness Statement of Gibson Energy Inc., February 24, 2022 at paras 8-10;
Gibson Energy Hardisty	Custom treating (closed)	Witness Statement of Gibson Energy Inc., February 24, 2022 at paras 8-10;
Gibson Energy Plato North	Custom treating	Witness Statement of Gibson Energy Inc., February 24, 2022 at paras 8-10;
Gibson Energy Plato South	Custom treating	Witness Statement of Gibson Energy Inc., February 24, 2022 at paras 8-10;
MROR (Eckville)	SWD	Witness Statement of Medicine River Oil Recyclers, February 22, 2022 at Exhibit B (RBDM00001_000000002) Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Municipal Landfills	Landfill	Witness Statement of Carol Nelson, January 26, 2022 at Exhibits C, F (RBED00001_000000016, RBED00001_000000002)
Plains Environmental Melville	Cavern	Witness Statement of Plains Environmental, February 23, 2022 at Exhibit A (A(01) (RBEB00002_000000009), A(02) (RBEB00002_000000010), and A(03) (RBEB00001_000000001)) Plains Environmental Website: http://plainsenvironmental.com/

Plains Environmental Willmar	TRD	Witness Statement of Plains Environmental, February 23, 2022 at Exhibit A(03) (RBEB00002_000000001) Plains Environmental Website: http://plainsenvironmental.com/
Pure Environmental Fort Kent	FST and Cavern	Witness Statement of Pure Environmental, February 11, 2022 at Exhibit B (RCDM00001_000000003, RCDM00001_000000002)
RemedX Breton	Landfill	Witness Statement of RemedX Remediation Services Inc., February 7, 2022 at Exhibits A-D (no doc ID for Exhibit A and B since they,re public docs, RCEC00001_000000022, RCEC00001_000000017, RCEC00001_000000029, RCEC00001_000000030, RCEC00001_000000031) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016)
Ridgeline Redcliff	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) https://www.ridgelinecanada.com/greenfill Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016)
Ridgeline Youngstown	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016) https://www.ridgelinecanada.com/greenfill
Ridgeline Fairview	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016) https://www.ridgelinecanada.com/greenfill
Ridgeline High Prairies	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016) https://www.ridgelinecanada.com/greenfill
Ridgeline Lloydminster	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) https://www.ridgelinecanada.com/greenfill
Ridgeline Shaunavon	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) https://www.ridgelinecanada.com/greenfill
Ridgeline Okotoks	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026) https://www.ridgelinecanada.com/greenfill
Ridgeline Edmonton	Landfill	Witness Statement of Ridgeline Canada Inc., February 8, 2022 at Exhibit B (RBEC00001_000000019, RBEC00001_000000021, RBEC00001_000000022, RBEC00001_000000024, RBEC00001_000000026)

		Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C (RBED00001_000000016) https://www.ridgelinecanada.com/greenfill
Rush Breton	Custom blending and treating terminal	Witness Statement of Rush Energy Services Inc., February 9, 2022 at Exhibit B (B (50) (RCAB00001_000000136)) http://rushenergyservices.com/locations/#1600784560699-9be7205a-1e83
Rush Rimbey	SWD	Witness Statement of Rush Energy Services Inc., February 9, 2022 at Exhibit B (B (135) (RCAB00001_000000051)) http://rushenergyservices.com/locations/#1600784560699-9be7205a-1e83
Waste Connections Coronation	Landfill	Witness Statement of Canada Waste Connections of Canada Inc., February 16, 2022 at Exhibit B (RBDE00001_000000001)
Waste Management Thorhild	Landfill	Witness Statement of Lorna Engleson of Waste Management of Canada Corporation, February 24 , 2022 at Exhibit B (RBEE00001_000000017-RBEE00001_000000024) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C
Waste Management Big Valley	Landfill	Witness Statement of Lorna Engleson of Waste Management of Canada Corporation, February 24, 2022 at Exhibit B (RBEE00001_000000017-RBEE00001_000000024) Witness Statement of Carol Nelson, January 26, 2022 at Exhibit C
White Owl	TRD	Witness Statement of White Owl Energy Services Inc., February 17, 2022 at exhibit B (RCEM00001_000000006)
White Swan Conklin	TRD	Witness Statement of White Swan Environmental Ltd., February 3, 2022 Exhibit B (02) Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
White Swan Atmore West	Cavern	Witness Statement of White Swan Environmental Ltd., February 3, 2022 Exhibit B (02) Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
White Swan Atmore East	SWD	Witness Statement of White Swan Environmental Ltd., February 3, 2022 Exhibit B (02) Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A
Wolverine Claresholm	TRD	RBEH00001_000000007, RBEH00001_000000003
Wolverine Rycroft	TRD	RBEH00001_000000007, RBEH00001_000000003
Wolverine Grande Cache	TRD	RBEH00001_000000007, RBEH00001_000000003
Wolverine Mayerthorpe	TRD	RBEH00001_000000007, RBEH00001_000000003
Wolverine Cynthia	TRD	RBEH00001_000000007, RBEH00001_000000003
Wolverine Heward	Landfill	RBEH00001_000000007, RBEH00001_000000003
Plains Midstream Rimby	SWD	Witness Statement of Plains Midstream Canada, February 9, 2022 at Exhibit C (RCDL00001_000000007) RBBA00017_000000001

Recover (Lodgepole)	Environmental technology	Witness Statement of Tinu Odeyemi, January 8, 2022 Exhibit A Witness Statement of Recover Inc., February 2, 2022. Exhibit B (RCEB00001_000000007)
Sprocket	SWD	Witness Statement of Sprocket Energy Corporation, February 1, 2022 at Exhibit B (RCFF00001_000000009-RCFF00001_000000035)
TAQA	SWD	Witness Statement of Nigel Wiebe, January 27, 2022 at Exhibit A(c) (RBJL00001_000000002)
Tourmaline	SWD	Witness Statement of Tourmaline Oil Corp., February 23, 2022 at Exhibit B (RCEL00001_000000008)
Whitecap	SWD	Witness Statement of Whitecap Resources Inc., February 23, 2022 at Exhibit B (RCFA00001_000000013, RCFA00002_000000001, RCFA00002_000000002)

I considered parties responses to supplementary information requests, Commissioner's affidavit of documents produced, Secure's affidavit of documents produced, Secure's responses to undertakings, and all items in my Documents Relied Upon.

Note: In addition to the documents on this list, I relied upon all documents cited in my report, appendices, exhibits, and workpapers to form my opinions.