

## **Industry Structure and Competition Law in Harbour Towage**

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### **Introduction**

Harbour towage is an essential component of global shipping. The industry has become increasingly globalized as major multinational corporations (including subsidiaries of shipping lines and terminal operators) have entered what, traditionally, has been a local business.

Harbour towage has unique structural features which have invited the scrutiny of competition authorities in many developed countries. The scale of operations in harbour towage is limited by the level of demand in each port. In general it is not practical to serve multiple ports with the same tugs unless they are essentially co-located. The towing capacity (BHP or bollard pull – BP) of assist tugs must be sufficient to safely handle the largest ships calling at the port, and is usually determined by rules that reflect local navigating conditions. In turn, the capital requirements for new assist tugs are determined by towing capacity.

In 2008 existing and potential container line customers at the port of Prince Rupert expressed concern that the charges for assist tugs in Prince Rupert exceeded that at other West Coast ports by a considerable margin. For example, approximate charges to shipping lines for a single call by a 5500 TEU vessel (70,000 dwt) at Prince Rupert totaled \$25,000 compared to \$12,000 at Deltaport on Roberts Bank, and \$7,000 at Port Metro Vancouver Inner Harbour terminals and Seattle-Tacoma. This paper highlights the results of a study undertaken for the Port of Prince Rupert to investigate the causes of

high tug costs and evaluate options for reducing costs, including the potential for tendering of an exclusive contract by the Port<sup>1</sup>.

### **Harbour Towing and Competition Law**

Three elements of the harbor towing industry – the essential nature of the service, the limited extent of the market, and potentially high capital costs – limit local competition. It is common in smaller ports for service to be provided by a single operator, and this lack of competition has raised concern over the potential for tug operators to extract monopoly rents in their local markets. Consequently there has been extensive analysis of the economics of the industry over the last 15 years, focusing on two major issues:

- efforts by local port authorities to influence local costs and service levels through exclusive (or non-exclusive) tug franchises; and
- the impact of mergers on competition within the industry.

Economic arguments related to these issues have focused on the conventional indicators of industry structure which affect the ability of firms to exercise market power:

- Demand elasticity and the size of the market.
- Industry cost structure, particularly barriers to entry in the form of capital costs, commercial relationships, and other issues, and the extent to which the threat of entry of new competitors functions as an effective deterrent to monopoly pricing.

A summary of experience in Australia, the UK, the US and Canada is highlighted below.

**Australia** - The nature of the harbour towing industry in Australia was summarized in a report published by the Australia Productivity Commission in 2002. Harbour towing services were dominated by

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<sup>1</sup> This paper summarizes research undertaken for the Port of Prince Rupert by Jonathan Seymour of Jonathan Seymour and Associates Inc. and Philip Davies of Davies Transportation Consulting Inc. in October-December 2008. The authors wish to thank the Prince Rupert Port Authority for permission to publish this summary of the results.

Australia's largest towage service provider, Adsteam Marine Limited (Adsteam) or its fully-owned subsidiaries. Adsteam, which provided towage in 37 ports), operated 66 per cent of Australia's harbour tugs.

In 1999 the Port of Bunbury issued a tender for an exclusive license to provide towage services. The previous service provider, an Adsteam-Howard SMITH joint venture, filed suit on the grounds that the contract violated the terms of the Trade Practices Act. Both sides agreed that the service was a "natural monopoly". However, Adsteam argued that the incumbent operator was continuously subject to the risk of displacement, because entry and exit barriers were low; and that the capital costs of tugs was not a significant barrier to entry because the tugs could be easily relocated to different markets.

Bunbury Port Authority (BPA) contended that the monopoly was not exposed to a realistic threat of displacement. Entry and exit barriers resulted from the capital costs required to obtain tugs; from the established relations between the incumbent and its customers; and from the risk that the incumbent would respond aggressively to entry. The court sided with BPA on the grounds that the Port's actions did not reduce the level of competition from the previous situation (i.e. a single operator for the service).

**UK** - In 2006, SvitzerWijismuller, a Maersk subsidiary, tendered an offer for 90% of Adsteam subject to regulatory approval in the UK, where the two firms competed. The transaction was referred to the UK Competition Commission (CC) for evaluation.

The Commission conducted a review of structural characteristics of harbor towage markets in the UK. On the supply side, it concluded that the relevant geographic market was local, restricted to individual ports serviced by fleets of tugs. They found that tugs in one port are generally precluded from providing regular effective support for peak periods of demand in other ports where the time taken to travel between the ports exceeds 3 to 4 hours.

The industry cost structure was analyzed to evaluate the potential for entry (or the threat of entry) for constraining prices. The Commission

noted that the minimum number of tugs required at each port was determined by the nature of vessel traffic, navigational requirements, and the peak arrival rate of vessels. Fixed costs per tug are very high; in the context of harbor towage, labour costs are essentially fixed due to the need to maintain crews on call to accommodate demand. The Commission also noted that existing firms had high legacy costs due to labour agreements.

The Commission concluded that the costs of entry –acquiring a fleet of tugboats; recruiting crew personnel; and obtaining permission to operate – were not a significant barrier to entry. They identified the need to acquire a sufficiently large customer base to cover fixed costs – in the face of determined opposition by the incumbent firm – as the major barrier to the entry of new competition. The merger was approved, subject to divestiture at certain ports where the two firms actually competed.

**United States** - In contrast to Australia and the UK where port services are subject to general competition law provisions, marine terminal operators (including port authorities) in the U.S. are regulated by the Federal Maritime Commission under the Shipping Act of 1984. In 2003 the FMC made a ruling on an exclusive tug franchise granted by Port Canaveral in Florida.

Port Canaveral had a requirement for prospective suppliers of various services, including tug services, to obtain a franchise from the port. Beginning in 1958, a single tug company, Seabulk Towing Inc., held a "non-exclusive" franchise to perform tug assist and towing services in Port Canaveral. Another company, Petchem, Inc., obtained a contract from the U.S. government to provide tug and towing services for military vessels calling at Port Canaveral. Petchem was denied a franchise to provide service for commercial traffic on two occasions, in 1984 and 2000. A third company, Tugz International, also applied for a franchise in 2000 but the Port refused to consider the application. The FMC ruled that the Port was in violation of the Shipping Act and imposed a civil penalty of US\$750,000 and required them to eliminate the tug franchise system and allow vessels calling at the port to select the tug company of their choice from

among companies holding permits from CPA based on insurance coverage and payment of fees

**Canada** - As in Australia and the UK, anticompetitive behaviour in the port services sector is regulated by general competition law provisions. In 1986 a new Competition Act was passed which introduced new civil provisions to deal with merger review and abuse of dominance.

In 1992 C.H. Cates and Sons Ltd. was purchased by Dennis Washington. Cates was a family owned business providing ship assist services in Vancouver harbour. In 1996 Mr. Washington purchased Seapan and its subsidiaries. Seapan and Cates were the only companies providing ship assist services in Vancouver. In 1996 an application was filed with the Competition Tribunal opposing the transaction on the grounds that the mergers were likely to prevent or lessen competition in the provision of tug boat services used to berth ships in the Port of Vancouver. In 1997 the Tribunal issued an order requiring Seapan to divest 5 ship berthing tugs and a line boat engaged in harbor towing in Burrard Inlet. This order was subsequently varied due to the entry of Tiger Tugz, a subsidiary of Rivtow,<sup>2</sup> into the market.

Seapan is also the sole provider of ship docking services at Roberts Bank under an agreement with the BC Chamber of Shipping. The agreement was concluded in 1995 on the basis of a proposal for services approved by a committee including the Chamber, the Roberts Bank terminal operators and Vancouver Port Authority in 1995. While the arrangement was agreed between the Chamber and Seapan, there was no formal contract. The agreement was extended for a further ten years in 1999.

The 1999 agreement expired at the end of March 2009. The Chamber of Shipping indicated dissatisfactions with the existing agreement on

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<sup>2</sup> Rivtow was purchased by the Dutch firm SMIT International in 2000 and now provides harbor towage services as SMIT Harbour Towage Vancouver Inc.

the basis that costs are excessive. Port Metro Vancouver issued a new Request For Proposals for the Roberts Bank tug basin prior to expiration of the existing lease, with proposals evaluated on the basis of proposed costs and levels of service. The tug basin is critical to tug operations at Roberts Bank because of the distance from existing tug bases on the Fraser River and in the Inner Harbour, and the lack of suitable locations for construction of alternative tug mooring facilities in the vicinity of Roberts Bank. Seaspan was the successful bidder and remains the sole provider of tug services at Roberts Bank.

**Summary** - While harbour towage has become an increasingly globalized industry, the market at individual ports is localized due to service requirements and the costs of transferring equipment between ports on a routine basis.

- Demand substitution, for example shifting of traffic to other competitive ports, is generally not a significant constraint to the pricing of tug services, due to the relative insignificance of tug costs in proportion to total costs, the costs of shifting ports and the need to position cargo for local markets.
- Tug operations are characterized by a high level of fixed costs arising from the need for a minimum fleet size based on safety requirements for the largest vessels calling the port, and the need to accommodate demand peaks. Fixed costs include the cost of tugs and labour costs. The high level of fixed costs makes asset utilization a key factor in overall service costs.
- The potential entry of new competitors is a key constraint to the pricing power of incumbent firms. This is particularly important in small ports which are served by a single firm. While fixed costs of providing ship docking services are high, they are not a substantial barrier to the entry of new firms into the market because the capital assets can be easily redeployed.
- The major barrier to entry is the need for firms to capture a sufficiently large share of the market to ensure the financial viability of operations in the face of competition from incumbent firms. Exclusive licensing through competitive bids can be an effective way of stimulating competition by reducing the risks for new entrants by allowing them to maximize the utilization of assets committed to the service.

### **Tug Services at the Port of Prince Rupert**

Prior to construction of Ridley Terminals Inc (RTI) and Prince Rupert Grain (PRG) in the 1980's, Rivtow was the sole provider of tug services at the Port of Prince Rupert. The two new terminals created a significant shift in the types of vessel calling at the port and, consequently, the requirement for assist tugs. RTI was designed to handle capesize bulk carriers, with the capability of handling some of the largest bulk ships afloat. PRG was designed to handle panamax bulk carriers.

Vessels up to panamax size calling at PRG would generally require a minimum of two conventional tugs. In practice this resulted in the deployment of 2 x 1,800 BHP conventional units. Callers at RTI up to 170,000 dwt would generally require a minimum of two tractor tugs. In practice this resulted in the deployment of 2 x 4,000 BHP tractor tugs. For ships over 170,000 dwt, the two tractor tugs were supplemented by conventional units. Rivtow Straits (Rivtow) was the sole supplier of assist tug capacity in Prince Rupert prior to the commencement of traffic through RTI. Rivtow expressed interest in servicing RTI but was unwilling to commit to building tractor tugs.

Minette Bay, a local firm, secured two tractor tugs able to meet RTI's requirements. RTI entered into an exclusive contract with Minette Bay. The exclusive contract was for an initial fifteen year term and has been extended twice, with second extension ending December 31, 2008. The 2008 rate was 64.07 cents per ship's deadweight tonne per call, with an annual adjustment based on the Consumer Price Index. Additional resources (a lineboat and additional tugs as required) were subcontracted to Minette Bay by Rivtow/SMIT. The RTI/Minette Bay contract prohibited Minette Bay from undertaking ship assist work at any other terminal at a rate below the contract rate. In practice this meant that the two tractor tugs were deployed elsewhere only in exceptional circumstances. In 2009 Minette Bay took delivery of the TP3, a new 7,000 BHP Azimuth Stern Drive (ASD) tractor tug suitable for both assist work and medium escort service.

While assist tug service at RTI was relatively unchanged for 25 years, there were major changes affecting freight traffic and tug operations including: the closure of the local Skeena pulp mill; the steady decline of breakbulk traffic through the former Fairview breakbulk terminal; elimination of other towing work previously undertaken by conventional assist tugs; and SMIT's purchase of Rivtow. Completion of Fairview Container Terminal Phase I introduced a new type of vessel to Prince Rupert; the 67,000 dwt COSCO and Hanjin container ships and, subsequently, COSCO's larger ships of 93,000 and 101,000 dwt. Initial pilotage simulations suggested the need for two high-powered tractor tugs. Subsequent refinements to the model resulted in reduced criteria that could be met by one powerful tractor and one conventional tug. In 2007 SMIT imported the SMIT Clyde, a 3660 kw (4900 horsepower) tractor tug into Canada and deployed it to Prince Rupert.

#### **Cost Structure of West Coast Harbour Towing Operations**

In 1999 the US Coast Guard undertook a study on the use of tugs to help prevent oil spills in the Puget Sound Area<sup>3</sup>. Two of the options examined included the use of a dedicated rescue tug permanently stationed in the vicinity of the Strait of Juan de Fuca to assist tankers in the event of an incident. As part of this study, Glosten Associates of Seattle estimated the costs for dedicated rescue tugs. This duty is similar to harbor towing in that the service requires a large tug and an on-duty crew for availability as required. Glosten estimated 1999 costs for a 5500 BHP tug at US\$11,023 per day (US\$3.75 million per year with 340 days on duty). The capital costs were based on a purchase price of US\$7.7 million with an annual capital cost of 11% per year depreciated over 15 years.

Washington State has provided funding for a dedicated rescue tug at Neah Bay since 1999. Funding was extended in 2008 to allow year-round operations. The price under the 2008 contract with Crowley

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<sup>3</sup> Regulatory Assessment Use of Tugs to Protect Against Oil Spills in the Puget Sound Area prepared for The United States Coast Guard, Report No 9522-002 November 15, 1999

was US\$8,500 per day plus fuel costs; total daily costs were estimated at US\$10,000 per day for an annual cost of US\$3.6 million. The tug assigned to the service in 2008 was the Gladiator, a 1975-built Invader-class 7,200 BHP ocean-going tug located at Neah Bay.

### Theoretical Tug Costs Prince Rupert

The theoretical cost of operating a single 6,600 BHP tractor tug at Prince Rupert was estimated using a methodology similar to that in the 1999 Glosten study, adjusted for 2008 BC unit costs. These estimates represent the costs of providing service with a new tug crewed under provisions of existing Canadian Merchant Service Guild contracts. Acquisition costs are based on the construction cost of the America, a 2008 new building constructed by J M Martinac in Tacoma. The America is a 6610 hp Z-drive tractor tug which was constructed for a cost of approximately US\$12 million.

The most striking feature of the cost structure is the dominance of capital and crew costs. Due to the requirement for the tug to be available for duty on demand, these costs are essentially fixed; the only significant variable costs are fuel and lube oil.

Prince Rupert Tug Cost Estimates 2008		
Cost Summary 6600 hp Tractor Tug		
Costs	2008 CDN\$	Assumptions
Capital	\$1,460,104	Purchase price \$15 million, depreciation 15% per year declining balance over 15 years, cost of capital 6%
Labour	\$928,364	3 crews of 2 (Master and Non-certificated Mate, plus one Engineer) at CMSG rates
Fuel & Lube Oil	\$950,184	Fuel price CDN\$90 per litre; lube oil \$2.70 per litre.
Maintenance and Insurance	\$545,000	Insurance, maintenance as % of purchase price as per Glosten
Manager-Dispatch	\$153,000	
Total	\$4,036,652	
Cost Per Day	\$11,059	

Note that the capital cost estimates reflect the cost of service using a new tug; costs for existing operations would be lower, particularly for the Minette Bay tugs TP1 and TP 2 which were converted in the 1980's and would be fully depreciated.

### **Benchmarking Tug Operations**

A detailed analysis of harbor towage operations at major West Coast ports was undertaken to explore the factors influencing costs.

Demand for tug assist services on the west Coast of North America can be divided into two markets: ship-docking and tanker escort. Ship-docking assistance is required for most deepsea cargo vessels due to their limited manoeuvrability.

Tanker escort requirements have been set by federal and state regulations in the US. In Canada, Port Metro Vancouver prescribes tanker escort requirements for vessels transiting the Second Narrows Movement Restriction Area. Tanker escort requirements have an impact on the volume of demand and on tug specifications at ports with significant tanker traffic.

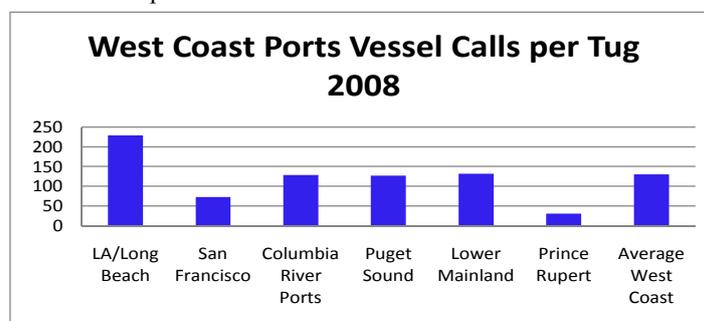
**West Coast Tug Fleets** - Details on major harbor towage operators at West Coast ports are highlighted below<sup>4</sup>. The largest operators in US West Coast ports are Foss Maritime Inc and Crowley Marine Services. In addition to these, there are a number of smaller private firms offering services. With the exception of the Columbia River Ports, all of the major port complexes have more than two service providers.

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<sup>4</sup> Data on West Coast tug fleets was assembled from company websites and interviews, US Army Corps of Engineers data, Transport Canada [Canadian Ships Register](#), Marine Exchange of San Francisco, and the Port of Los Angeles [Mariners Guide 2008](#).

Major West Coast Harbor Assist and Escort Service Providers 2008		
Company	Fleet Size*	Markets Served
Foss Maritime Inc.	34	SD, LA/LB, SF, CSR, PNW
Crowley Maritime Services	16	SD, LA/LB, SF, PNW
SMIT Harbour Towing	13	LM, Prince Rupert, Kitimat, Stewart
Westar Marine Services	12	SF
Seaspan	12	LM
Harley Marine Services	10	LA/LB, SF
Shaver Transportation	10	CSR
Western Towboat Services	9	PNW
Total	116	
SD=San Diego		CSR=Columbia Snake River System
LA/LB=Los Angeles/Long Beach		PNW= Pacific Northwest (WA)
SF=San Francisco		LM=Lower Mainland
*Tugs 1000 hp or larger		

**West Coast Tug Utilization** - Tug utilization has a major impact on average costs, due to the high proportion of fixed costs involved in purchasing tugs and maintaining crews. The level of tug utilization is a function of the actual number of assignments performed by each tug. However, data on the number of tug assignments in a port is difficult to obtain. For purposes of this analysis, the number of cargo vessel calls has been used as an indication of the level of demand for tug services. Comparative data for major West Coast port complexes and Prince Rupert is shown below.



**West Coast Tug Service Prices** - Prices for tug assist services are quoted a number of different ways:

- price per ship assist – normally based on a maximum number of hours for the tug assignment, with hourly rates for additional time;
- flat rate price per tug job with a similar provision for hourly rates past the maximum number of hours in the assist rate;
- flat rate price per tug job based on tug size (generally BHP) with a similar provision for hourly rates past the maximum number of hours included in the base rate;
- vessel deadweight – this is the basis applied under the exclusive contracts for coal shipments at RTI, Prince Rupert and Westshore Terminals at Roberts Bank.

Prices typically include a fuel surcharge, which may be a flat fee per tug, or a percentage of the normal rate. Data on actual prices for harbor towage services paid in major markets was obtained from shipping lines for purposes of this analysis. In many cases, particularly at US ports, these were substantially lower than published rates. Actual prices in major markets are summarized below. In order to facilitate comparisons, per tug prices have been estimated under the assumption that each vessel call requires the use of three tugs: two inbound, and one outbound. This is consistent with available data on ship calls in the San Francisco Bay region, and with the existing deployment of tugs assisting container ships at Prince Rupert.

<b>Major West Coast Ports Harbour Towage Prices 2008</b>				
<b>Market</b>	<b>Vessel Size</b>	<b>Price per Vessel Call</b>	<b>Estimated Price Per Tug</b>	<b>Estimated Discount*</b>
LA/Long Beach US\$	5500 TEU	\$2,140	\$713	59%
San Francisco/Oakland (Outer Harbor) US\$	5500 TEU	\$5,000	\$1,667	46%
Columbia River Portland/Vancouver WA US\$	13,000 DWT Tons	\$4,440	\$1,480	52%
Pacific Northwest Seattle & Tacoma US\$	5500 TEU	\$7,000	\$2,333	19%
Vancouver Inner Harbor CDN\$	5500 TEU	\$6,971	\$2,324	0%
Prince Rupert CDN\$	5500 TEU	\$27,244	\$9,081	0%
*Estimated discount rates are calculated on assist rate tariffs excluding fuel surcharges.				
If fuel surcharges were included, discounts would be larger.				

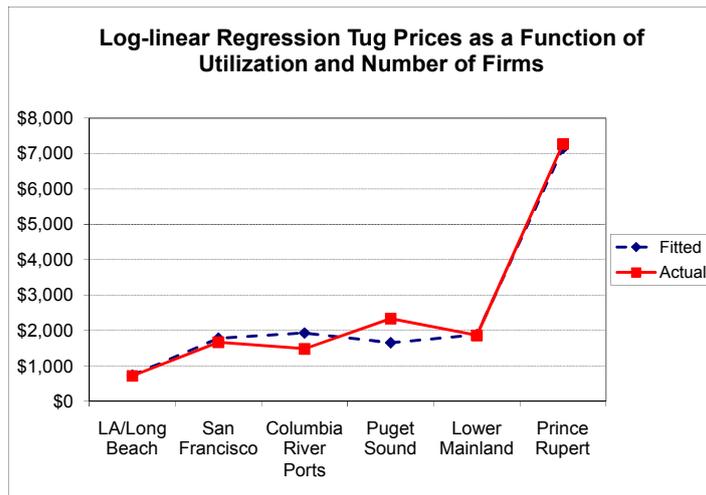
Prices for Vancouver in the table above are published rates. Shipping lines serving Vancouver indicated that rate discounts of 7% of assist tug rates (excluding fuel surcharges) are offered to all contract customers by Seaspan and SMIT.

**Impact of Utilization and Number of Firms on Prices** - Previous research has highlighted the importance of tug utilization in determining firms' costs and prices, and the impact of multiple service providers on prices. The key issue for tug services at smaller ports is the trade-off between the productive efficiency of higher asset utilization for a single firm versus the benefits of competition. Tug utilization has major impact on average costs due to the high proportion of fixed costs involved in purchasing tugs and maintaining crews. Consequently the level of traffic at a port is a major determinant of charges for service. The number of firms in the market may also have a significant influence due to the additional pressure for productive efficiency and competitive pricing.

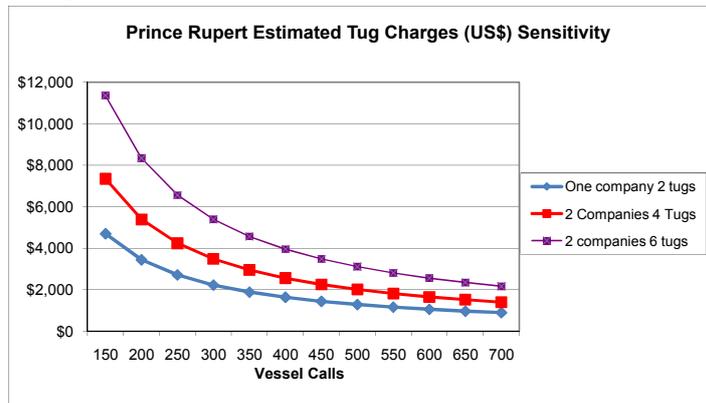
To estimate the impact of these variables on actual assist rates, a regression analysis was carried out for major West Coast ports and Prince Rupert. The analysis was structured as follows:

- Assist rates are estimated on a per tug job basis from actual charges reported by shipping lines, on the assumption that each vessel call represents three tug jobs.
- Rates for Canadian ports have been converted into US\$ at an exchange rate of CDN\$1=US\$0.80; rates for Prince Rupert are based on SMIT rates for a container vessel calling at Fairview.
- Tug utilization is based on the number of vessel calls per tug for each major port. For Prince Rupert, however, vessel calls at RTI have been excluded, as RTI constitutes a separate market under the existing contractual arrangement. Therefore, SMIT is the only firm included in the regression analysis.

The regression analysis shows a very strong logarithmic relationship between assist rates, tug utilization and the number of firms competing in the market.



As expected, higher utilization results in lower charges. More firms also results in lower charges. Based on the regression results, the estimated relationship between tug charges, number of assist tugs, and number of firms at the Port of Prince Rupert (under the assumption that the RTI contract is not renewed) is shown below.



The results suggest that there is potential for a reduction in costs at Prince Rupert if operations were to be conducted by a single firm, particularly while annual vessel calls remain below 500. There were 247 vessel calls at Prince Rupert in 2008. In general the results suggest that for smaller ports with relatively infrequent ship calls, the benefits of competition among two or more firms are offset by additional costs due to poor asset utilization.

#### **Subsequent Developments**

In March 2009, SMIT entered into an agreement to acquire all shares of Minette Bay Ship Docking Ltd subject to approval of authorities under the Investment Canada Act. The acquisition was completed in January 2010<sup>5</sup>.

A similar rationalization of services took place at the Port of Halifax in August 2010. Prior to the rationalization service was provided by two firms: Atlantic Towing Ltd. and Svitzer Canada. Halifax Marine Towing Limited Partnership, a joint venture of the two companies, now provides all ship berthing in Halifax, using the tugs of Atlantic Towing Ltd.

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