6.0 Distillate Heating Fuels – Distribution

Whereas the reduction in the number and consolidation of marine terminals around the province has also impacted heating fuel, the logistics of delivering these fuels directly via tank-wagon to consumers' home fuel tanks has not significantly changed. The storage facility from which home heat trucks obtain their supply must be within a reasonable distance to enable the area to be properly serviced, particularly during the high volume winter months when deliveries are often necessary under treacherous road conditions. Hence, the need for local area bulk plants has, in essence, increased as marine terminals have been closed. Generally, the major oil companies have not responded to fill this need. In fact, they have tended to reduce the number of local bulk plants they operate and in recent years have withdrawn completely from certain areas. This rationalization has occurred primarily in rural areas of the province where there has been a significant reduction in the population base and where any new or replacement homes being built generally install cheaper electric heating systems, thereby further reducing the demand for home heating fuel. Local 'resellers' either carrying a major oil company brand, or their own brand, have stepped in to fill this void. A notable exception to this general trend has been the expansion of North Atlantic Petroleum (with the only operating refinery in the province at Come by Chance) in the marketplace with the construction of several new bulk plants throughout the province over the past few years.

Some resellers have bought bulk plants previously owned by major oil companies, while others have constructed their own. In a growing number of instances, they now provide the only source of home heating fuels in a particular rural area.

6.1 Tractor Trailer Deliveries of Heating Fuels to Bulk Plants:

The same costing model that was used for gasoline has also been utilized for distillate deliveries to bulk plants. The only modification necessary was to integrate the volume difference of full loads in the calculations. A typical tractor-trailer carries 43,000 litres of gasoline but only approximately 38,000 litres of stove, furnace or diesel, because these fuels are heavier per unit volume and a full load must be reduced to conform to highway weight restrictions. The resultant rates in CPL for each known or probable delivery of distillate from marine terminals to bulk plants are summarized in Appendix G, Table G-1. (Probable or hypothetical delivery locations are included in italics in Table G-1. They represent delivery rates to bulk plants that may be under consideration, but do not currently exist). Three representative sample calculation sheets detailing how the costing model was adapted to arrive at these figures are also included in Appendix G.

These are:

Table G-2	Source Terminal: St. John's	Receiving Bulk Plant: Harbour Grace
Table G-3	Source Terminal: Holyrood	Receiving Bulk Plant: Fogo Island
Table G-4	Source Terminal: Corner Brook	Receiving Bulk Plant: Springdale

Table 9 below summarizes the T/T estimated haulage rates for all identified deliveries of home heating fuels from marine terminals to bulk plants around the province.

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Table 9

Tractor Trailer Costs - Heating Fuel Deliveries to Bulk Plants where Applicable

Zone	Sub	Zone Description	Originating Storage Terminal	Bulk Plant Location	T/T Freight To Bulk Plants (See Appendix G for details) CPL
1	ANW	Avalon North West	St. John's/ Holyrood/ Come by Chance	Bay Roberts / Harbour Grace Area	0.98
1	AS	Avalon South	St. John's/ Holyrood/ Come by Chance	Aquaforte/ Trepassey/ St Mary's/ Dunville Areas	1.09
1	a	Bell Island	St. John's/ Holyrood/ Come by Chance	Bell Island	2.11
2		Burin-Bonavista Peninsulas	St. John's/ Holyrood/ Come by Chance	Marystown/ Clarenville/ Bonavista areas	1.94
3		Central Newfoundland from Avalon Peninsula	St. John's/ Holyrood/ Come by Chance	Gander/ Lewisporte/ Grand Falls areas	1.95
3	a	St. Brendan's from Avalon Peninsula (Existing)	Holyrood	Gander	2.24
3	b	Fogo Island from Avalon Peninsula (Existing)	Holyrood	Fogo Island	4.82
3	c	Change Islands - from Fogo BP via TW (Existing)	Holyrood	Fogo Island	4.82
4		Connaigre Peninsula from Avalon (Existing)	Holyrood	Pool's Cove Crossroads	3.99
4	a	Gaultois-McCallum-Rencontre East (Drums)	Holyrood	Pool's Cove Crossroads	3.99
5		Springdale-Baie Verte from Springdale BP	Corner Brook	Springdale	1.63
5	a	Long Island via T/W Ex Springdale Bulk Plant	Corner Brook	Springdale	1.63
5	b	Little bay Islands via T/W ex Springdale BP	Corner Brook	Springdale	1.63
7	W	Stephenville and Port aux Basques	Corner Brook	Stephenville/ Port aux Basques	1.45
7	SW	Burgeo	Corner Brook	Burgeo	2.05
7	a	Ramea	Corner Brook	Burgeo	2.05
7	b	Grey River/La Poile/Grand Bruit/Francois (Drums)	Corner Brook	Burgeo	2.05
9		Northern Peninsula North	Corner Brook	Plum Point/ Other areas	2.64

6.2 Tank Wagon Deliveries of Heating Fuel to Homes:

The approach to developing a costing model for the delivery of home heating fuels by tank wagon was much different than that for tank wagon deliveries of gasoline to retail outlets. The estimated operating costs of both tandem and single axle tank wagon vehicles are the same in most respects and are presented in Appendix H, Table H-1. The operating days per year are also assumed at 300, which provides for one day off per week and 13 days per year for statutory holidays and / or other non-operating days.

However, the method of operation for a tank wagon vehicle delivering home heat fuel to consumer household storage tanks is much more intricate and demanding than the relatively large volume drops at a retail gasoline outlet. In developing a costing model, firstly, the number of households in a specific area that used oil as a heating medium had to be estimated followed by an estimate of the average annual consumption of each household. Wood stoves used for supplementary heating had to be considered as one of the factors affecting oil consumption.

Other relevant data and sources were identified for input in the costing model. These are listed in Table 10 below.

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TABLE 10

Variables considered for Home Heat Fuel Deliveries

Item	Sources for Information
Population of specific geographic sub-areas	Statistics Canada
Number of households located in a specific area	Statistics Canada
Average population per household	Calculated
Number of homes with electric heat	Newfoundland Power – where available – otherwise estimated.
% of Homes with oil / other heating methods	By difference
Annual volume for households using oil	Industry Sources
Average T/W drop per household – winter/ summer	Industry Sources
Loading time per vehicle	Industry Sources
Distance between communities	Road Distance Database - Newfoundland & Labrador Statistics Agency
Estimated kilometres travelled per load	Calculated
Drop time for each delivery	Industry Sources
Average speed attained during travel times per load	Estimated
Average delivery time for each load	Calculated
Volume delivered over a period of months	Calculated
Average volume delivered litres per hour	Calculated
Required trips per day for period	Calculated
Ferry rates where applicable	NL Government Services Website (2004 Rates)

The identification of each specific geographic home-heat area or zone and an overview of how existing home heat businesses service particular areas was ascertained by field visits and follow-up contact with key personnel. These areas were then further delineated using population profiles, natural geographic boundaries, and estimated demand for home heating fuels. Considerable effort was made in keeping the final model structure practical and understandable, yet universally applicable and as accurate as possible.

The first area to be studied was the Avalon Peninsula, all of which is now included in one Home Heat Pricing Zone. A close examination of this zone with its highly populated urban section around St. John's, contrasted with sparsely populated sections in its south western portion and other large and small towns spread around the rest of the area, resulted in some interesting anomalies. Nevertheless, through a methodical application of the costing model, it became apparent, as explained below, that the Avalon Peninsula should be divided into three Home Heat Zones in addition to the existing Sub-Zone, Bell Island.

The North East Avalon, supplied from marine terminals at St. John's and Holyrood and from a large bulk plant at Donovans, Mount Pearl, would become Home Heat Pricing Zone 1 – Avalon North East (HH-1 ANE) and would include all communities from Georgetown/ Marysvale in Conception Bay, to Holyrood, north to Pouch Cove and then south to Maddox Cove and Petty Harbour, including the town of Conception Bay South and the cities of Mount Pearl and St. John's. (See Map portion Appendix I Figure I -1) All this area can be serviced via tank-wagon deliveries directly from storage facilities in St. John's, Mount Pearl and Holyrood.

The costing model as applied to this Avalon North East Base Zone is presented in Appendix H as Table H1-ANE. The cost calculations are based on the equipment and manpower needed to deliver the estimated demand volumes during the peak demand winter months (December through March - about 61% of annual volume). For the remaining months of the year, fewer tank-wagons and lower operating hours per day are needed, however fixed costs such as insurance, depreciation, etc. must still be covered so the unit cost (in cents per litre delivered) will not necessarily be lower. In the peak period, costs for required full time vehicles, part time vehicles, and the idle time for the part time vehicles (except in special circumstances) are all included in the total cost calculation. In the off-season months, the idle time for any part time vehicles required is not included since it is assumed that these vehicles would not be on 'stand-by' status. They would most likely be laid up or involved in other delivery work such as commercial fuel deliveries. This logic is applied consistently in the calculation tables for all identified zones with annual volumes in excess of one million litres. For total annual volumes less than a million litres, only one part time vehicle is required for the entire volume and the cost of the idle time for the vehicle is not applied since it would, in most cases, distort the CPL delivery rates unnecessarily. Since home heat deliveries are generally made by owner/ operator type businesses, no provision was included for overtime for drivers when the standard eight hours per day is exceeded during the peak demand months.

The proposed HH- Zone 1- Avalon North East was 'backed into' upon testing the pricing model for other areas of the Avalon Peninsula. For example, it was concluded that to properly service the Bay de Verde (Conception Bay North) Peninsula, a bulk fuel storage plant was required somewhere in, or near, the Bay Roberts – Carbonear area. In fact, it was determined by field trips that there was one bulk plant in Bay Roberts and two fuel storage facilities in Harbour Grace from which tank-wagons currently pick up heating fuels for most of the peninsula. The costing model sheet for this area is presented in Appendix H, Table H1-ANW. Whereas the cents per litre delivery cost calculated at 4.19 cpl is not dramatically more than that for Zone 1 – NE at 3.42 cpl, the main difference between the two proposed home heat zones would be the added cost of an area bulk plant and tractor-trailer deliveries to keep it supplied. The HH Zone 1 – Avalon North West would encompass the area from Brigus in the south, north along the Conception Bay North coastline to Grates Cove, then south along the Trinity Shore side of the peninsula to Old Shop and then to the Trans Canada Highway (TCH). The outline of this HH Zone 1 - Avalon North West is shown in Appendix-I as Figure I-2.

The costing model calculations for each of the Avalon South West and Avalon South East peninsulas are given in Tables H1-ASW and H1-ASE of Appendix H. Notwithstanding that separate bulk storage plants are assumed to be located in each of these areas, the average delivery costs of 4.95 cpl and 5.21 cpl are sufficiently close to regard the entire area as one home heat zone. This also alleviates the difficulty of determining a geographic dividing point between the two areas around St. Mary's Bay. When taken as one zone, the average delivery cost for this proposed HH Zone 1 - Avalon South is 5.06 cpl as calculated in Appendix H Table H1-AS. This proposed new zone would include the balance of the existing Zone 1 of the Avalon Peninsula as shown by the map portion included in Appendix I as Figure 1-3.

Where applicable, in each of the costing model calculation sheets, delivery costs for both single and tandem axle tank-wagon units are considered and the average of each mode is taken as the final CPL estimated cost. The tandem axle units generally become more

economically feasible as the size of the area and the average distance travelled per delivered load increases.

The developed home heat costing model was applied to all areas, irrespective of existing zonal boundaries. Nevertheless, this extensive iterative process resulted in a mix of recommended home heat zones for the province, the majority of which did align with existing boundaries. For clarity and completeness, a detailed cost model calculation sheet for every home heat pricing zone is included in Appendix H.

Besides the recommended increase of two additional zones for the Avalon Peninsula, the only other additional zone would be for Burgeo, which would separate that area from the current Zone 7, which includes Stephenville, the Port au Port Peninsula and Port aux Basques areas, as well as Burgeo. This results in a recommended Zone 7 - West and a Zone 7 - South East as is indicated in Appendix H, Tables H-7W and H-7SE. The main reason for designating Burgeo as a separate home heat zone was the higher CPL cost of operating the bulk plant and the delivery tank wagons therein due to its relatively lower volume thruput.

6.3 Drum Deliveries of Heating Fuels to Isolated Communities:

The same areas where drum deliveries are necessary for gasoline also apply to home heating fuels. Drum delivery calculation sheets are not separated but are included in turn by sub-zone in the tables of Appendix H. Particular note should be made of the proposed new Zone 11b where drum delivery costs are calculated for Williams Harbour and Norman Bay on a different ferry freight basis than for the south coast of the Island. If the same rates applied in the case of Zone 11b, the calculated freight rate would be reduced by approximately 9.5 CPL.

In areas where drum delivery to households is required from dockside, the cost to handle and deliver the drums and return the empties for refilling is maintained at 10.0 CPL, which is the existing retail margin established for this service, both for heating and automotive fuels.

6.4 Heating Fuels Dispensing Fees at Isolated Marine Depots:

In areas that have isolated marine depots such as coastal Labrador, the householder generally brings the drum or other container to the depot for filling. A similar situation exists for the distribution of automotive fuels in these communities. The retail margin or filling fee in these instances, is also 10.0 CPL, however, included in this fee is a portion of the depot's operating labour cost. In the case of gasoline sold at full serve retail outlets around the province, the maximum retail margin has been established at 7.61 cpl. before taxes. The portion of the filling fee attributable to depot operation can therefore be taken as 10.0 – 7.61 or 2.39 cpl. A similar expense can also be allocated to heating fuels. Hence in the operating cost calculations for isolated marine depots per Appendix B, Table B-15, 2.39 cpl has been deducted from the operating cost of these marine depots and applied to the retail margin as part of the dispensing fee.

6.5 Summary of Heating Fuel Delivery Costs

Table 11 below presents a summarized format of each identified cost in the supply chain that adds up to the total cost at the 'Retail Point of Sale' for heating fuels in each pricing zone.

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Table 11

Home Heating Fuels Calculated Costs of delivery to Customer Tanks (Retail Point of Sale) by Zone				Estimated Marine Freight & Terminal / Depot Operating Cost (Table 5)	Average T/T Freight To Intermed-iate Bulk Plants (Table 9)	Average Bulk Plant Operating Cost where Applicable (Table 4)	Average Cost T/W Delivery to Homes in Area	Average Cost Filling of Drums at Dockside and Shipping	Average Freight & Handling or Filling Cost for Drums for Customers in Remote Com-munities	Average Delivered Cost to Households for Area (Point of Retail Sale)
Zone	**Sub**	**Supply Point and Methods**			**CPL**	**CPL**	**CPL**	**CPL**	**CPL**	**CPL**
1	**ANE**	**Avalon -North East**	Ex Marine Terminals 75%	1.66	-	-	3.42			(Weighted Average)
			From Come by Chance 25%	N/A	1.32	0.50	3.42			**5.12**
1	**ANW**	Avalon North West		1.66	0.98	1.19	4.19			**8.02**
1	**AS**	Avalon South		1.66	1.09	1.46	5.06			**9.26**
1	**a**	Bell Island		*1.66*	*2.11*	*1.86*	*3.82*			***9.45***
2		Burin and Bonavista Peninsulas		1.66	1.94	1.36	4.25			**9.21**
3		Central Newfoundland from Avalon Peninsula		1.66	1.95	0.84	4.41			**8.86**
3	**a**	St. Brendan's from Avalon Peninsula (Existing)		1.66	2.24	0.84	7.49			**12.23**
3	**b**	Fogo Island from Avalon Peninsula (Existing)		1.66	4.82	1.23	3.93			**11.64**
3	**c**	Change Islands - from Fogo BP via TW (Existing)		1.66	4.82	1.23	6.71			**14.42**
4		Connaigre Peninsula from Avalon (Existing)		1.66	3.99	1.17	4.97			**11.79**
4	**a**	Gaultois-McCallum-Rencontre East (Drums)		1.66	3.99	1.17	-	4.85	10.00	**21.67**
5		Springdale-Baie Verte from Springdale BP		2.41	1.63	1.17	4.22			**9.43**
5	**a**	Long Island via T/W from Springdale Bulk Plant		2.41	1.63	1.17	4.94			**10.15**
5	**b**	Little Bay Islands via T/W from Springdale BP		2.41	1.63	1.17	5.38			**10.59**
6		Corner Brook Area		2.41	-	-	3.62			**6.03**
7	**W**	Stephenville and Port aux Basques		2.41	1.45	1.34	3.98			**9.18**
7	**SE**	Burgeo		2.41	2.05	2.35	4.80			**11.61**
7	**a**	Ramea		2.41	2.05	2.35	8.58			**15.39**
7	**b**	Grey River/La Poile/Grand Bruit/Francois (Drums)		2.41	2.05	2.35	-	4.27	10.00	**21.08**
8		Northern Peninsula South		2.41	-	-	4.64			**7.05**
9		Northern Peninsula North		2.41	2.64	1.40	4.84			**11.29**
10		Labrador-The Straits		6.87	-	-	5.79			**12.66**
11		Mary's Harbour-Cartwright area		14.03	-	-	6.35			**20.38**
11	**a**	Labrador Coast- South (Isolated Marine Depots)[1]		20.73	-	-	-	-	10.00	**30.73**
11	**b**	Labrador Coast- South (Drum Deliveries via Coastal Freight Ferry)		*14.03*	-	-	-	*16.29*	*10.00*	***40.32***
12		Central Labrador (Goose Bay and Area)		4.51	-	-	3.84			**8.35**
13		Western Labrador (Labrador City / Wabush)		6.50	-	-	3.88			**10.38**
13	**a**	Churchill Falls		6.50			*5.94*			***12.44***
14		Labrador Coast- Norht (Isolated Marine Depots)[1]		20.73	-	-	-	-	10.00	**30.73**

Notes: 1. For Isolated Marine Depots - Product is dispensed at the depot into consumer drums or other containers.

In Appendix K, supply chain cost diagrams for each zone and sub-zone are presented to show more clearly how the laid-in costs to households or to the 'Retail Point of Sale' are built up by each cost element identified in Table 11.