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EXPERT ECONOMIC REPORT OF ROGER WARE

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DATED: **February 20, 2004**

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EXPERT ECONOMIC REPORT OF ROGER WARE[1]

I. INTRODUCTION

1. I have been retained by Canada Pipe Company Ltd ("Canada Pipe" or "CPC") to provide an economic analysis of the Stocking Distributor Program operated by the Bibby Ste-Croix Division of Canada Pipe ("Bibby") and of the history of acquisitions by Canada Pipe. Both of these are described as anticompetitive acts in the Application by the Commissioner of Competition under section 79 of the Competition Act. My analysis is provided in the form of the following report.

2. The following is a summary of my qualifications in the area of Economics, Competition Policy and Industrial Organization. I am a Full Professor of Economics at Queen's University, Kingston, Ontario. I have held full-time faculty positions for 23 years at the University of Toronto and Queen's University, and a visiting position at the University of California, Berkeley in 1987-88. I have published many articles in the area of Industrial Organization and Competition Policy, and a recent major textbook on the Economics of Industrial Organization, much of which is devoted to antitrust economics and competition policy.[2] From 1993-94, I held the T.D. MacDonald Chair at the Competition Bureau, and provided advice to the Director and other officers on many cases and issues. I have testified, given evidence, and consulted in several matters involving competition issues, and have been an invited speaker to the Canadian Bar Association Annual Competition Law Conference on several occasions.

3. A full version of my *curriculum vitae* is attached as Appendix A to this affidavit.

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[1] I have prepared this report with assistance from Dr. Andy Baziliauskas, Managing Economist , LECG, LLC Toronto.

[2] Church, J.R. and R. Ware. *Industrial Organization: a Strategic Approach* (2000) San Francisco: McGraw-Hill-Irwin.

4. In preparing my report I have reviewed the following documents:

   a. The Application by the Commissioner of Competition under section 79 of the Competition Act, and the Statement of Grounds and Material Facts that accompanied it.

   b. The *Statement of Economic Theory* that accompanied the Commissioner's Disclosure statement.

   c. CPC's Reply to the Commissioner's Application and its Response to the Commissioner's *Statement of Economic Theory.*

   d. The Commissioner's response to CPC's reply

   e. Documents contained in the Disclosure statements of the Commissioner and of Canada Pipe.

   f. Various public documents and journal articles that are either attached to my report as exhibits or clearly cited therein.

5. My report is divided into several sections. Section II provides an overview and a summary of my conclusions. Section III discusses the Drain Waste and Vent (DWV) industry as a whole, and describes the important developments that have taken place over the past several decades. Section IV identifies the activities of Canada Pipe that are relevant to the application, and discusses these activities in the context of the DWV industry. Section V describes Bibby's Stocking Distributor Program, which appears to lie at the heart of the Commissioner's Application. Section VI carries out an analysis of the product and geographic market that are relevant to the Commissioner's Application. Section VII considers whether Bibby possesses market power in the relevant markets, and considers the extent of barriers to entry. Section VIII provides an economic analysis of the SDP. Section IX discusses the reference in the Application to Canada Pipe's acquisitions of other companies, and to

"restrictive covenants". Section X provides an assessment of the likely effects of providing the relief sought by the Commissioner in her Application.

II. OVERVIEW AND SUMMARY OF CONCLUSIONS

Overview

6. The Commissioner's allegations are misconceived. It is clear from my review that the Stocking Distributor Program ("SDP") is not anti-competitive and that it is a legitimate preferential dealing arrangement. It does not possess the attributes that would reflect an anti-competitive intent, or indicate an anti competitive effect. My analysis also demonstrates that in any event, Bibby does not possess the market power alleged by the Commissioner. In this respect, as explained below, the narrow definitions of the product markets proposed by the Commissioner are simply untenable, whereas her definition for the geographic markets are not supported by the evidence disclosed by Canada Pipe or the Commissioner .

7. The SDP arrangements between Bibby and its distributors are not exclusive dealing arrangements, but belong to the class known as preferential dealing arrangements. A preferential dealing arrangement provides a financial incentive for loyalty to a single supplier, but does not require such loyalty in order for supplies of the product to be made available. Under Bibby's SDP arrangement distributors are not required to join as a condition of supply, but they are rewarded with incentive discounts if they do join the program.

8. Partnership programs of this general type are common, and are regarded generally by economists as playing an important role in promoting efficiency of the arms length relationship between a manufacturer and distributor. The economic analysis of preferential arrangements (and even of exclusive dealing arrangements) indicates that, in most cases, anticompetitive effects are unlikely to occur. There is no convincing evidence in this case that such effects have occurred in relation to the SDP.

9. The SDP also has a pro competitive rationale. The purpose of the SDP is to encourage distributors to promote cast iron against other DWV materials, especially plastic, in order to stem any further erosion of cast iron's share in DWV installations. This pro-competitive rationale is consistent with loyalty programs with a structure similar to Bibby's SDP that are widely employed throughout the economy, and are also commonly used among plumbing and construction supply manufacturers and distributors in Canada and in the United States.

No Market Power in a Properly Defined Market

10. The product market proposed by the Commissioner is incorrectly described as DWV products made only from cast iron. An analysis of the product market according to the principles of antitrust economics indicates that DWV products made from cast iron, plastic, copper, and asbestos cement constitute the relevant product market, and that there is no reasonable basis on which to restrict the product market in the fashion set out in the application. Indeed, the dominant feature of the DWV market over the past 40 years has been the steady and continuing substitution of plastic DWV products for cast iron and copper DWV products.

11. The DWV industry is characterized by competing "systems" of DWV products made from different materials: Polyvinyl Chloride ("PVC"), Acrylonitrile Butadiene Styrene ("ABS"), copper, asbestos, cast iron and stainless steel. The market structure is one of classic differentiated products competition, including in respect of any buildings in which DWV materials must conform to the combustibility requirements of provincial building codes.

12. In her reply to Bibby's response, the Commissioner appears to narrow the relevant market even further to certain types of buildings, in particular to buildings 'of a certain height and occupancy'. There is no basis for this. A restriction of the product market, not only to cast iron DWV products, but *within* cast iron applications, requires that Bibby be in a position to price

discriminate between sales destined for the buildings described and sales to other buildings. The record that I have reviewed indicates that Bibby is not able to price discriminate in this way, has not done so, and will not be able to do so in the future.

13. The geographic market proposed by the Commissioner is also incorrectly and too narrowly defined. The Commissioner has proposed two alternate geographic markets, consisting of six regions of Canada in the former case and all of Canada in the latter case. The evidence for such smaller markets that I have reviewed is weak and unconvincing. The geographic market for these products is at least as large as Canada (and very likely larger).

14. Bibby does not have market power or a substantial market share in the properly defined market. Bibby's market share of DWV products, under a proper market definition, amounts to well under 10%. Such a small share does not permit Bibby to exercise market power. This fact by itself points toward an efficiency explanation for Bibby's SDP program.

Low barriers to Entry

15. Barriers to entry into the supply of cast iron DWV products are low. This reinforces my conclusion that Bibby is unable to exercise market power (no matter how the market is defined). As I explain in more detail below, entry can take a variety of forms: manufacturers can join with existing foundries to manufacture cast iron DWV products; distributors can import cast iron DWV products directly; contractors can import cast iron DWV products for their own use, without a formal distribution channel. The costs of setting up production in Canada are modest, and the costs of establishing a new importing operation are even lower.

16. Major entry, in each of these forms, has in fact occurred since the introduction of the SDP. To cite just one example, an essentially one-family importing operation in British Columbia, which initially used the yard of the family home

as the distribution centre, gained a share of about 2%-3% of total cast iron DWV sales in Canada, and up to 10% of sales in British Columbia, within a period of two or three years after entering in 1999.

The SDP does not Have Anticompetitive Attributes

17. Bibby's SDP program does not in any event possess attributes that indicate it has or could have an anti-competitive effect in the DWV industry. In support of this conclusion, I refer in particular to the following attributes and facts, none of which are consistent with the allegations of anticompetitive effect made in the application:

18. The SDP does not impose any contractual restrictions on Bibby's wholesale distributor customers. Distributors are free to purchase the products of any cast iron manufacturer at any time;

19. The costs of switching to a new supplier vary between zero (at the beginning of each year) to a small percentage of accrued sales. These are not sufficient to prevent a distributor from switching if a competitive source of supply were available;

20. Many wholesale distributors have left the SDP; some have switched to Bibby's domestic competitor, Vandem, and some have switched to imported products. Westburne/Wolseley, a very large plumbing and heating supplies distributor is currently *not* a Bibby Stocking Distributor in the West, and has also previously left the SDP in order to purchase imported products on a number of occasions.

21. Some distributors have in effect "cheated" on their SDP commitment, and because Bibby has not detected this, they have continued to receive SDP rebates and multipliers. In other instances, it appears that Bibby was aware that certain distributors had violated the SDP's eligibility conditions, yet Bibby still provided most of the SDP discounts and rebates. In both cases the net effect is to reduce the already low "switching costs" that might face a distributor who is

contemplating a switch to an alternative source of supply. In addition, the lower switching costs make it even easier for an efficient cast iron competitor to enter.

Distributors also Curtail Possible exercise of Market Power

22. Bibby's ability to exercise market power is further constrained by the fact that the demand side of the DWV market is highly concentrated: for example, one of Bibby's distributors (Emco) typically accounts for more than a quarter of Bibby's DWV sales. Such large customers have a strong interest in maintaining competition among suppliers. If such suppliers believed that the SDP would result in a substantial lessening of competition (ie. a higher overall cost to them over time) they would be motivated and in a position to take corrective action.

Conclusions Reinforced By Actual Events

23. My conclusions regarding the SDP are strongly reinforced by a review of what has actually occurred in the cast iron segment of the DWV products industry since the introduction of the SDP by Bibby in early 1998. Such events are wholly inconsistent with a claim that the SDP has, or is likely to, lessen competition substantially. In the more than six years since the SDP was introduced, Bibby's prices for pipe, fittings, and couplings have fallen in most regions, cast iron imports have increased significantly along with the number of importers, and there has been at least one new sustained and profitable domestic manufacturing entrant.

Acquisitions were not anticompetitive

24. There is no basis for the Commissioner's allegation that Canada Pipe's acquisitions were anticompetitive acts under section 79 of the Competition Act.

III. THE DWV INDUSTRY

25. In this section I review the function of DWV products, and their manufacture from a variety of materials including cast iron. My description of the DWV industry derives from a study of the documents cited above, as well as several discussions with industry participants. I conclude that the industry has been characterized for four decades by a steady substitution of plastic DWV products for cast iron products, and that this trend is expected to continue.

26. DWV products are used in residential, commercial and institutional buildings and other structures to carry waste and drain water from appliances and drains to a sewer, septic tank or other outlets. These products are also used to vent plumbing systems. There are three categories of product: pipe, fittings and couplings.

    a. Pipe comes in various diameters and lengths, varying from 1" to 6" for the former, and from 3' to 10' for the latter.

    b. Fittings are used to anchor the pipe, and are usually made from the same material as the pipe.

    c. Couplings are used to connect sections of pipe. They are often made from a different material than the pipe itself. For example, couplings for cast iron pipe are usually made from rubber. Couplings are often made by specialized firms who do not manufacture other DWV components.

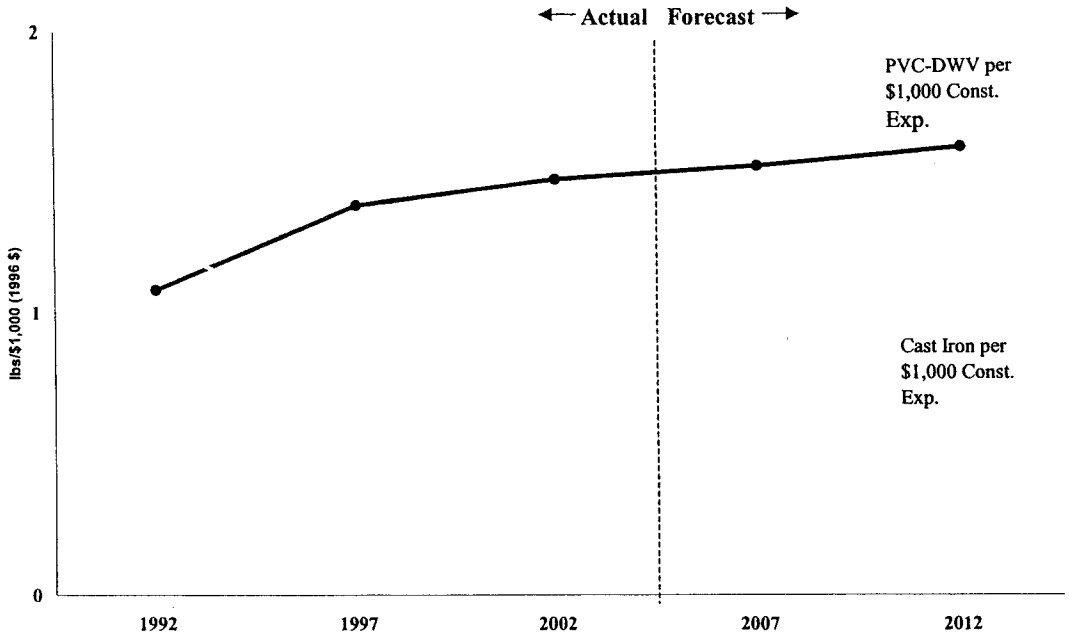
27. The past 40 years have been characterized by steady innovation in plastic DWV products, leading to cheaper plastic products that have increasingly greater functionality. The effect of this ongoing stream of innovations on users has been a steady and decisive substitution away from traditional DWV products, most notably cast iron and copper, towards synthetic DWV product, most notably PVC.

28. DWV pipes and fittings can be manufactured from a variety of different materials. Significant sales of DWV products occur with products manufactured from cast iron, plastic (both PVC and ABS), copper and asbestos cement.[3] The economic history of the DWV market over the past 40 years is really the story of continuous substitution of plastic pipe for pipes made from cast iron. Figure 1 illustrates this process of substitution of plastic for cast iron by graphing two indices, the first for pounds of cast iron DWV pipe per thousand dollars of construction, and the same statistic for PVC DWV pipe. The graph uses data published by Freedonia Group Inc.,[4] which forecasts these values up to 2012. The indices provide a graphic illustration of the ongoing substitution of plastic for cast iron DWV pipe, and a forecast that such substitution will continue for at least several years into the future.

[3] There are also some sales of stainless steel DWV pipe (such as at Pearson Airport in Toronto) but I believe the current scale is small and the scope for significant expansion is limited.

[4] Source: Freedonia Group, "Plastic & Competitive Pipe to 2007 - Market Size, Market Share, Demand Forecast and Sales", Study #107, September 2003. A copy of a section of this report is appended as Appendix B, Tab 4 to my report. Freedonia Group is an international study/database company, which has published nearly 2,000 reports on industries such as building materials, chemicals, communications, health care, packaging, pharmaceuticals, plastics, and security.

Figure 1: Demand per $1,000 Construction Expenditure (lbs/$1,000)



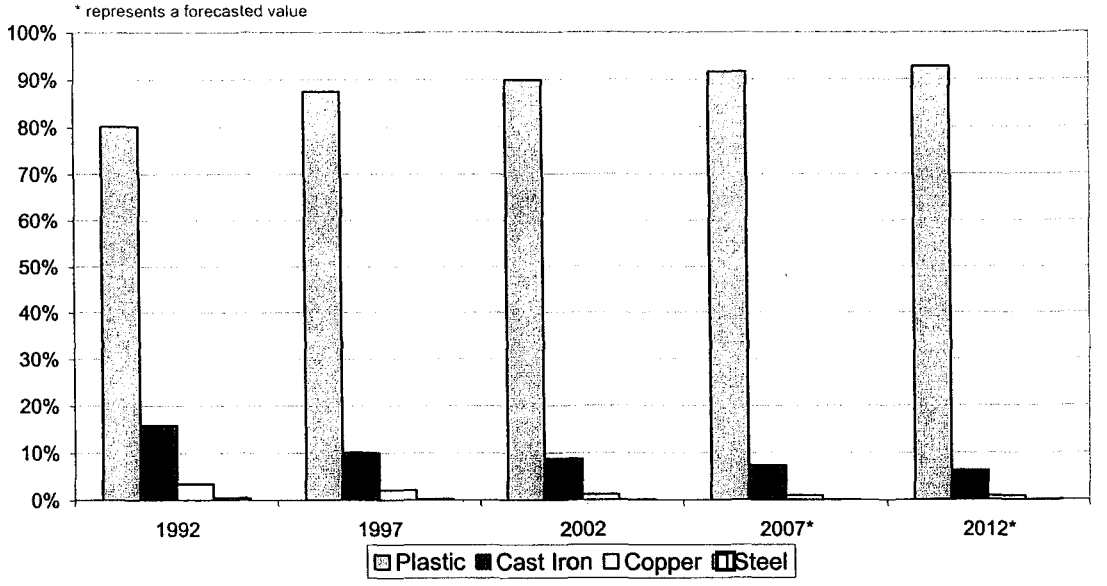
Source: Freedonia Group, "Plastic & Competitive Pipe to 2007 - Market Size, Market Share, Demand Forecast and Sales"

29. As a further illustration of the increasing dominance of plastic DWV products, between 1992 and 2002 the U.S. demand for all DWV pipe increased by 49% (from 550 million square feet to 822 million square feet), but the demand for cast iron DWV pipe fell by 17%, while the demand for plastic DWV pipe increased by 68% over the same period.[5] The same point is made in Figure 2, which graphs the share of feet of DWV pipe installed for each of plastic (PVC and ABS), cast iron, copper and steel. The graph shows that plastic increased its share from 80% in 1992 to 90% in 2002, while cast iron's share dropped from 16% to only 9% in 2002.[6]

[5] Source: Freedonia Group, "Plastic & Competitive Pipe to 2007 - Market Size, Market Share, Demand Forecast and Sales", Study #107, September 2003.

[6] I have examined data on U.S. sales of cast iron DWV pipe and fittings from the Cast Iron Soil Pipe Institute ("CISPI"), and I find that the ratio of fittings to pipe is roughly constant over the period 1993-2003 (the ratio ranges from .24 to .27). Assuming that the ratio of plastic DWV fittings to plastic DWV pipe is also roughly constant over time, this suggests that the market share of cast iron DWV fittings has also fallen relative to plastic DWV fittings. The CISPI data are appended at Appendix B, Tab 6.

Figure 2: United States - DWV Market Share by Material (1992-2012)



Source: Freedonia Group, "Plastic & Competitive Pipe to 2007 - Market Size, Market Share, Demand Forecast and Sales"

30. In conclusion, over the past four decades, plastic has replaced cast iron and copper as the dominant material for DWV applications. The significance of cast iron has dramatically declined, and cast iron DWV applications may become economically insignificant within the foreseeable future.

IV. THE ACTIVITIES OF THE CANADA PIPE COMPANY LTD.

31. CPC is a wholly-owned subsidiary of McWane, Inc. The company was formed by McWane from the ductile iron assets that it purchased from Canron Pipe in 1989. Canron Pipe purchased Stanton Pipe Ltd. in 1985. Ductile iron pipe was produced at the Stanton Pipe facility in Hamilton, Ont., beginning in the early 1960's. CPC continued to produce ductile iron pipe at the Hamilton facility until 1998. At that time, it became McWane's distributor of ductile iron pipe in Canada.

32. McWane Inc. is based in Birmingham, Alabama, and has businesses that manufacture and sell ductile iron pipe, soil pipe, valves, hydrants, and accessories.

33. CPC, through its Clow Canada division, acquired the current Bibby Ste. Croix assets in 1997. Bibby is a division of Canada Pipe Company Ltd.

34. Bibby's activities include:

- the manufacture, at its foundry in Ste. Croix, Quebec, of cast iron pipe and fittings for DWV systems;
- the sale of cast iron soil pipe, fittings, and couplings for DWV systems to plumbing distributors and building contractors;
- the manufacture and sale of cast iron valve boxes, cast iron and ductile iron street castings, ductile iron waterworks fittings, cast iron meter boxes, cast iron chimney pipe, and OEM castings.[7]

35. Virtually all of the cast iron DWV pipe and fittings sold by Bibby are manufactured in the Bibby foundry at Ste. Croix. Bibby does not manufacture couplings, but rather purchases them in the United States. Tyler Couplings and anaco are sister companies to Bibby: they are both divisions of Ransom Industries, which is owned by McWane, Inc. Bibby also purchases couplings from non-affiliated companies. For example, in 2000, Bibby purchased worth of couplings from Mission Rubber Co. of California[agb9].[8]

A. Cast Iron Soil Pipe Manufacturing[9]

36. Metal pipe and fittings have been manufactured using roughly the same simple and straightforward processes for centuries. These low technology processes

[7] This information is available at the Bibby website at www.bibby-ste-croix.com; and in Documents 704, 886 in CPC's Disclosure Statement.
[8] Couplings are purchased primarily from Tyler Couplings, which manufactures them in Marshfield, Missouri and also from anaco, which is located in Corona, California. (Source: Document 362 in the Commissioner's Disclosure Statement, Document 704 in CPC's Disclosure Statement).
[9] The primary source of this information is Document 33 in the Commissioner's Disclosure Statement.

are protected by few if any patents, and are freely available to any startup entrant in Canada or thoughout the world.

37. Iron is derived from ferrous ores by heating off impurities, such as oxygen and sulfur. Steel is a pure form of iron, with low carbon content (about 1.5% or less). Cast iron is the name used for a family of alloys of iron, carbon, and silicon. The addition of carbon to molten iron lowers its melting point, making it more fluid and therefore easier to cast, while silicon lowers iron's melting point. The most common types of cast iron for use in manufacturing pipe are gray iron and ductile iron. The term 'cast iron' is normally used in the industry to refer to gray iron, while ductile iron is commonly referred to by that name.

38. Gray iron has certain desirable properties, including an ability to dampen shocks and withstand thermal pressure, and it also has moderate tensile strength. Ductile iron was discovered during World War II, and because of its superior strength and toughness has replaced gray iron in pressure pipe applications. Gray iron is now used primarily to manufacture pipe, fittings, and couplings for use in the DWV systems of buildings.

39. The raw materials used to produce cast iron soil pipe and fittings, primarily scrap iron, steel scrap, alloys, coke, and limestone are widely available and are used in the production of many other products.

40. The first stage in the manufacture of cast iron soil pipe and fittings is the combining and melting of raw materials in a Cupola Furnace, which is a vertical cylindrical shell that varies in diameter from 32 inches to 150 inches. The next stage is the casting of the molten material. Pipe is produced using a centrifugal casting process. A metal mold is rotated on its horizontal axis as it is injected with molten iron, and the rotation causes the iron to be distributed uniformly onto the inner surface of the mold.

41. Fittings are produced using highly mechanized static casting methods. Fittings are shaped by pouring molten iron into either a sand mould or a permanent metal mould.

B. Overview of Bibby Cast Iron Production and Sales

42. In 2002, Bibby sold almost tons of pipe, tons of fittings, and units of couplings in Canada. Total Bibby sales of cast iron DWV pipe, fittings, and couplings amounted to approximately million in 2002. Over the period 1998-2003 pipe sales accounted for nearly half of revenues, with fittings and couplings each accounting for about a quarter of sales[10].

43. Table 1 provides a breakdown of Bibby's revenues by region over the period 2000-2003.

Table 1: Shares by Region of Bibby DWV Sales* (2000-2003)

*Includes CREMCO Sales

	East	Quebec	Ontario	Prairies	Alberta	B.C.
Sales (net of rebates and freight)	3.0%	18.4%	43.6%	2.7%	8.5%	23.8%

Source: Various Bibby Sales and Gross Profit Reports, 2000-2003

44. Bibby's five most popular pipe products accounted for almost 90% of Bibby's sales of cast iron DWV pipe in 2000. The top five selling fittings accounted for about 20% of Bibby's cast iron DWV fittings sales, and its top five selling couplings accounted for about 65% of Bibby's couplings sales.

[10] Source: Various Bibby Sales and Gross Profit Analysis Reports

V. BIBBY'S STOCKING DISTRIBUTOR PROGRAM

45. The description of Bibby's SDP in this section of my Report is based on information contained in various documents included in CPC's disclosure statement. Bibby's SDP is a partnering program that rewards distributors for giving Bibby the opportunity to supply all of the distributor's cast iron DWV requirements with the opportunity to earn rebates and discounts. There are three major components to the SDP: a multiplier that reduces prices below the list price, and quarterly and annual rebates. In addition, Stocking Distributors are awarded a marketing allowance for the promotion of Bibby products at the local level.

Eligibility

46. Bibby administers the SDP on a regional basis. A distributor qualifies as a Stocking Distributor in a given region if it provides to Bibby the opportunity to supply all of its cast iron DWV product requirements in that region. This applies to distributors with multiple branches as well as those with a single outlet. Bibby has updated its regional breakdown for the purpose of administering the SDP from time to time, and since 2000 the SDP's eligibility requirements have been based on two regions: the East, which includes Ontario, Quebec, and the Maritime provinces, and; the West, which includes Manitoba, Saskatchewan, Alberta, and British Columbia.

47. A distributor that satisfies the SDP's eligibility requirements can earn discounts off the list price, in the form of a multiplier, and can also earn quarterly rebates and annual rebates. Stocking Distributors purchasing DWV products made of any other materials, including PVC/ABS, copper, and asbestos cement in any quantity are eligible for the full measure of the SDP's rewards.

Multipliers

48. Bibby publishes price lists that include the prices for each of its cast iron DWV products.[11] The price lists are available to distributors and contractors and are occasionally updated by Bibby.

49. In exchange for the opportunity to supply all of a distributor's cast iron requirements, Bibby reduces its list price by the Stocking Distributor multiplier. This multiplier is applied to all purchases made by a Stocking Distributor while it is on the SDP, and is applied at the time of sale. A different multiplier is applied to purchases of Bibby products by non-Stocking Distributors. The non-Stocking Distributor multiplier typically results in a smaller discount from the Bibby list price.

Quarterly and Annual Rebates

50. In addition to the multiplier, Stocking Distributors can earn quarterly and annual rebates. The total quarterly rebate dollar amount credited to a Stocking Distributor in a given quarter (i.e. three month period) is calculated as the applicable quarterly rebate rate multiplied by the total dollar value of eligible purchases by the Stocking Distributor during that quarter. Eligible purchases are the sum of purchases, net of applicable multipliers, of Bibby cast iron DWV products by all branches of the distributor in the relevant region.

51. Similarly, the annual rebate dollar amount credited to a Stocking Distributor in a given year is calculated as the annual rebate rate multiplied by the dollar value of eligible purchases by the Stocking Distributor during that year. Bibby notifies distributors of the quarterly and annual rebate rates that will be applied to purchases by Stocking Distributors before the beginning of the period during which they will be in effect.

52. A distributor that fails to provide to Bibby the opportunity to meet the distributor's cast iron DWV requirements loses the quarterly rebate on all

[11] Examples of Bibby price lists can be found in Documents 16, 17, 18, 19, 20, 21, 23, 25, 26, 27, 28, 29, and 31 in the Commissioner's Disclosure Statement.

purchases made by the distributor from Bibby during the quarter in which the eligibility requirement is not met. The failure to meet the eligibility requirement in a given quarter does not affect a distributor's eligibility to qualify for a quarterly rebate, and multiplier, in any other quarter, nor does it affect the distributor's ability to earn the annual rebate in any other year. Similarly, a distributor is not credited with an annual rebate if it fails to allow Bibby to meet all of its cast iron DWV requirements during a given calendar year, but such a failure does not affect a distributor's eligibility to earn any rebate or a Stocking Distributor multiplier during any future period nor does the distributor lose the benefit of the Stocking Distributor multiplier for completed sales during the period when it left the SDP.

53. Each distributor's eligibility for the quarterly and annual rebates is determined on a calendar basis. If a distributor satisfies the eligibility requirement for the first calendar quarter (i.e. January to March), it is credited with the quarterly rebate based on purchases during those months. The next quarter begins in April, and so on. Similarly, eligibility for annual rebates is depends on whether a distributor has satisfied the eligibility requirements during a given calendar year.

54. Bibby's multipliers and rebates are revised from time to time and can, and do, vary across regions. In addition, Bibby occasionally supplements its quarterly and annual Stocking Distributor rebates with additional rebate payments.

Marketing Allowances

55. Bibby also provides a Marketing Allowance rebate, which is intended to compensate distributors for promoting Bibby's products—for example through advertising or by distributing promotional material--to the construction trade. The amount of the allowance paid to a Stocking Distributor is one *per cent* of the distributor's purchases of DWV product from Bibby.

Table 2: Quarterly & Annual Base Bibby Rebates (1998-2003)

Year	QTR	Pipe		Fittings		Couplings		Region
		Q	A	Q	A	Q	A	
1998*	1	7%	3%	7%	3%	7%	3%	Program administered on a provincial basis.
	2	7%	3%	7%	3%	7%	3%	Each province is its own region
	3	7%	3%	7%	3%	7%	3%	
	4	7%	3%	7%	3%	7%	3%	
1999	1	9%	3%	9%	3%	9%	3%	Based on three regions
	2	9%	3%	9%	3%	9%	3%	1. East - Maritimes, Quebec, Ontario
	3	9%	3%	9%	3%	9%	3%	2. Prairies - Manitoba, Saskatchewan, Alberta
	4	15%**	3%	15%**	3%	15%**	3%	3. West - British Columbia
2000	1	7%	3%	15%	3%	9%	3%	
	2	7%	3%	15%	3%	9%	3%	
	3	7%	3%	15%	3%	9%	3%	
	4	7%	3%	15%	3%	9%	3%	
2001	1	7%	3%	15%	3%	9%	3%	
	2	7%	3%	15%	3%	9%	3%	
	3	7%	3%	15%	3%	9%	3%	Based on two regions
	4	7%	3%	15%	3%	9%	3%	1. East - Maritimes, Quebec, Ontario
2002	1	7%	4%	15%	4%	9%	4%	2. West - Manitoba, Saskatchewan, Alberta, British Columbia
	2	7%	4%	15%	4%	9%	4%	
	3	7%	4%	15%	4%	9%	4%	
	4	7%	4%	15%	4%	9%	4%	
2003	1	7%	4%	15%	4%	9%	4%	
	2	7%	4%	15%	4%	9%	4%	
	3	7%	4%	15%	4%	9%	4%	

* In 1998, couplings were not part of program in B.C.

** Quarterly Rebate changed to 9% in December

Sources: Rebates: Canada Pipe Disclosure Document 1159, 1160
Region: Commissioner's Disclosure Document 396, CPC Disclosure Document 830

56. The levels of the rebates for Stocking Distributors since the program began are reported in Table 2. Note that these are base values only in some cases the core rebates were supplemented.[12]

VI. MARKET DEFINITION

A. Product Market

57. The process of defining a product market is a fundamental element to most cases under the Competition Act, in particular those coming under the merger sections and those brought under the Abuse of Dominance section. Identification of a relevant market in which alleged anticompetitive acts have taken place facilitates the important step of determining whether a respondent has market power in the identified market.

58. I have carried out an analysis of the relevant product market in which Canada Pipe supplies cast iron DWV products. I find that the relevant market includes

[12] See Documents 1159 and 1160 of CPC's Disclosure Statement for the values of these supplemental rebates.

all DWV product manufactured from the materials of PVC, cast iron, copper and asbestos. With regard to the product breakdown, I believe that the best description of the market is that for "systems" of DWV products consisting of pipe, fittings and couplings. Although the Commissioner argues for separate product markets for each of pipe, fittings and couplings, I have not seen sufficient evidence to support this claim. Jobs are competed for on the basis of competing materials, and once a material is chosen, the pipe, fittings and couplings are purchased together as a system. In fact, plastic DWV manufacturers use the term "system" as part of their marketing language.[13]

59. I have restricted my product market analysis primarily to an assessment of the degree of functional substitution between Bibby's cast iron DWV products and DWV products made with other materials, specifically plastics, copper, asbestos cement and stainless steel.[14] I have supplemented this analysis with indirect evidence of substitutability, which includes information about advertising and marketing by manufacturers of DWV products made of various materials that directly targets other DWV materials. I have also studied a number of Bibby documents relating to the influence of competition from plastics and other materials.

60. I begin by reiterating that the dominant feature of the DWV market over the past 40 years has been the steady and continuing substitution of plastic DWV products for cast iron and copper DWV products. In the 1960s before plastic DWV products were available cast iron accounted for most [15] of DWV installations, including both residential and commercial applications. These

[13] For example, IPEX, a leading manufacturer of plumbing supplies, markets its DWV products as 'systems'. See IPEX's web site at http://www.ipexinc.com/Content/EN_CA/2_0_Products/2_4_Plumbing_Mechanical/index.asp for a description of three of its DWV systems: System 15, System XFR, and the Drainway DWV system. A print out from this website is available as Appendix B, Tab 13.

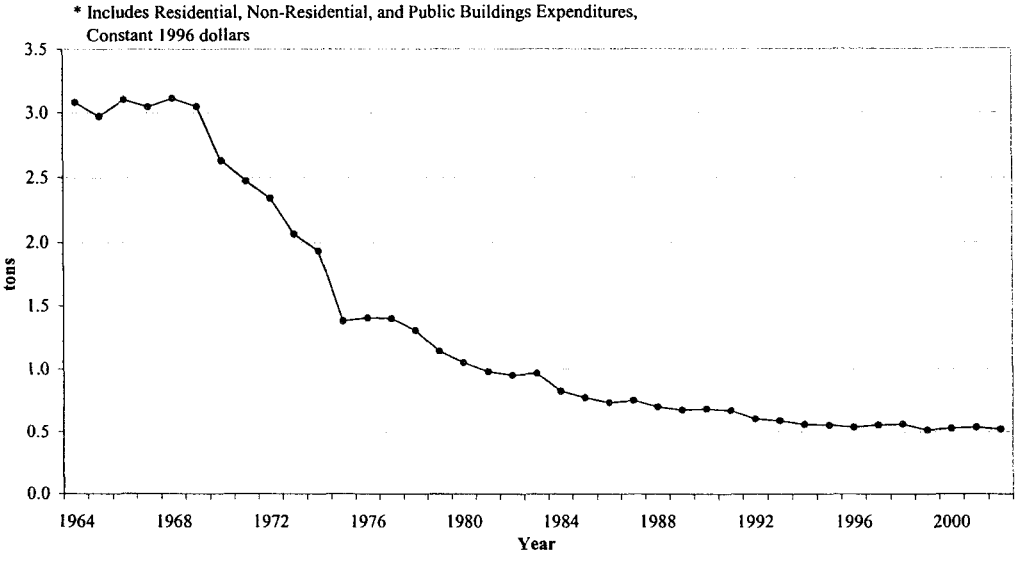
[14] There are two reasons why I did not attempt to directly estimate the own price elasticity of demand for cast iron DWV products and compare it with a critical value – a procedure described in my textbook with Jeffrey Church, *op. cit.* p. 607-608. First, I have not been able to obtain quality data on prices for non-cast iron DWV products (and the Commissioner has not disclosed price data sufficient to calculate transaction prices on these competing materials). Second, the *cellophane fallacy* implies that estimates of price elasticities at current prices have to be viewed with great caution in Abuse cases.

[15] Document 33 in the Commissioner's Disclosure Statement.

plastic DWV products started to become available in the late 1960s and were substituted at the decision of building owners and contractors at a continuously increasing rate so that in the current decade cast iron accounts for less than 10% by installed feet of pipe of the total market.

61. This wholesale replacement of cast iron DWV products by plastic is strong evidence of the high degree of substitutability between the two products. I have not been able to obtain a long time series of sales in Canada of DWV products comprising different materials, but one illustration of the dramatic substitution can be made in Figure 3, which graphs a long time series of U.S. cast iron DWV pipe shipments, normalizing for construction activity.[16]

Figure 3: United States - Tons of Cast Iron DWV Pipe and Fittings Shipped per million dollars of Construction* (1964 – 2002)



Source: U.S. Census Bureau Construction Division and the Cast Iron Soil Pipe Institute

62. The index is constructed by dividing tons of cast iron DWV pipe shipped divided by the dollar value of private residential and non-residential construction plus public building construction, on an annual basis from 1964 to 2002. I have used U.S. data because these are the only data available with a

[16] The point here is to "net out" fluctuations in cast iron sales that are due solely to fluctuations in construction demand, so that the index indicates the *relative* importance of cast iron in construction.

long time series, but I have no reason to believe that the picture for Canada would have been significantly different over this period. Indeed, all of the evidence disclosed by the parties in this case is consistent with this pattern.

63. Figure 3 can be interpreted as an index of market share. Since almost all the substitution that has taken place has been in the form of plastic for cast iron, the vertical axis of Figure 3 can be read as indicating market share for cast iron and copper. Conversely, the vertical axis read from the "top down" would provide a reasonable statistical series of the market share of plastic DWV pipe over this long time series.

64. The increasing dominance of PVC reflects a trend commented on over 30 years ago by the Restrictive Trade Practices Commission ("RTPC") in its report on cast iron DWV pipe, where it stated:

> "For many years cast iron was used almost exclusively, but in the last twenty years the other materials have made inroads into the market. Factors in this displacement of cast iron have been lower costs of manufacture, lower weight, and lower costs of installation of the new materials. The use of soil pipe is governed by provincial and municipal building codes which in most areas have been revised to permit the use of newer materials." [17]

65. Although functional substitution can be analyzed independently of price, the degree to which two goods are substitutes in an economic context depends on the prices at which the comparison is made. In most construction, the installed price of a plastic DWV system is significantly lower than the price of competing systems, in particular cast iron—I understand that the difference is on the order of 15%-30%. What has slowed the complete replacement of cast iron by plastic DWV products is that until recently cast iron was viewed as having superior combustibility properties (as do copper and asbestos cement), and it was considered quieter.

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[17] Restrictive Trade Practices Commission, "A Report Concerning the Production, Manufacture, Supply and Sale of Cast Iron Soil Pipe and Fittings in the Prairie Provinces and British Columbia", (Ottawa, 1967) ("RTPC Report"), at 1.

Competition among Differentiated Products

66. The DWV industry is characterized by competing systems of DWV products made from different materials: PVC, ABS plastics, copper, asbestos, cast iron and stainless steel. The market structure is one of classic differentiated products competition. Because each material has some advantages and disadvantages in certain contexts over the other, the competing systems are substitutes but not perfect substitutes for each other.

67. Each DWV material has certain characteristics that differentiate it slightly from the other DWV materials. For instance, plastic is very light and highly resistant to corrosion but can be vulnerable to certain chemical reactions. Cast iron is heavy and requires more time to install than plastic. Cast-iron has been previously regarded as being quieter than plastic, however, recent tests commissioned by IPEX reported that plastic DWV systems are quieter than cast iron as reported by some users.[18] Asbestos cement is lighter than cast-iron, however, asbestos cement is thought to have safety concerns associated with its use and it is prohibited by certain provincial building codes. Finally, copper is lightweight and malleable and preferred by some end-users for working in small diameter DWV systems. While each of these characteristics may influence an end-user's choice of DWV material for a particular project or application, these characteristics are not sufficient to define a separate relevant product market for each of these materials.

68. Based on my review of the documents contained in Canada Pipe's Disclosure Statement, it is evident that manufacturers, contractors and distributors alike consider and treat DWV products made from each material as competing alternatives and functional substitutes for all DWV applications.

[18] Tests in both a laboratory setting behind a drywall and in apartment buildings found that IPEX System 15 is quieter than cast iron. Documents 1097, 0345, and 660 in CPC's Disclosure Statement, and Document 341 in the Commissioner's Disclosure Statement.

Competition between DWV manufacturers

69. At the manufacturer level, it is evident that cast-iron, plastic and asbestos-cement DWV producers view one another as competitors. For instance, Bibby's advertisements and promotional materials repeatedly refer to the strengths of cast-iron as compared to plastic[19] as well as to the safety issues associated with asbestos cement.[20]

70. Similarly, IPEX advertisements also refer to the similar and superior qualities of its plastic DWV products. For instance, a recent IPEX advertisement makes the following comparison to cast-iron DWV:[21]

> "...there is no difference between noise in System 15 or Cast-Iron pipe. However, you can expect more noise from mechanical contractors using Cast-Iron pipe which is six times heavier than PVC and more labour intensive to install. You can anticipate some serious noise from the industry as the momentum continues to build for System 15."

71. A marketing brochure for IPEX's System 15 and XFR products, titled "Complete Drainage Systems for Non-Combustible Buildings" explains that IPEX's PVC DWV products can be used be used in code-restricted construction[22]. In addition, an IPEX-commissioned study compares the sound attenuation qualities of plastic DWV materials to cast-iron and copper.[23] It concludes that "System 15™ is at least as quiet as traditional cast iron".

72. Logard, a Canadian manufacturer and importer of asbestos cement makes the following statements in its promotional materials:

- "pipes and fittings made of asbestos cement have several advantages on equivalent products, that is to say concrete and cast-iron. Being, that pipes are much longer as well as lighter, saving you time and money for cost of installation

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[19] See for example, Documents 900 and 1028 in CPC's Disclosure Statement.
[20] See Document 951 in CPC's Disclosure Statement.
[21] See Document 897 in CPC's Disclosure Statement.
[22] See Document #1096 in CPC's Disclosure Statement.
[23] See Document 345 in CPC's Disclosure Statement.

and handling, including the fact of their lightness, they will require less supports to complete an installation.";
- "the thermal conductivity is 60 times more reliable than cast iron and prevents dripping in all normal use conditions"; and
- "drainage noise is not transmitted by the partitions which in fact is the choice of public buildings."[24]

73. Furthermore, it is clear that Bibby considers DWV materials made from other materials to be serious competitors which affect its business and prices. Bibby regularly tracks the prices of DWV materials made from plastic,[25] copper[26] and asbestos cement.[27] Bibby also tracks the sales of asbestos-cement,[28] and plastic [29] where cast-iron could have been used. Furthermore, Bibby has faced competitive price pressure from asbestos cement,[30] copper[31] as well as plastic.[32] In fact, Bibby has lowered its prices on a number of occasions to address competitive pricing from each one of these alternative DWV materials.

74. Charlotte Pipe and Foundry manufactures and sells cast iron DWV systems in the United States. Its web site promotes its "The Quiet House® System", and the site allows the visitor to compare the noise produced by a PVC DWV system with the noise produced by its own DWV system by linking to sound clips.[33]

75. Bibby sales representatives spend a significant amount of time visiting with distributors, contractors, building authorities and engineers and promoting the

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[24] See Document 398 in CPC's Disclosure Statement.
[25] See for example, Document 109 and 464 in CPC's Disclosure Statement.
[26] See for example, Documents 450 and 465 in CPC's Disclosure Statement.
[27] See for example, Document 234, 233, 268, 466 and 608 in CPC's Disclosure Statement.
[28] See for example, Document 161 in CPC's Disclosure Statement.
[29] See for example, Document 691 in CPC's Disclosure Statement.
[30] See for example, Document 604 in CPC's Disclosure Statement, where Fred Albert, Bibby's national sales manager states that Bibby will do the following "determine where the current A/C prices are; determine how much we would have to drop our price in order to get contractors to switch to cast iron". Similarly Document 607 in CPC's Disclosure discusses various pricing strategies that Bibby is considering in reaction to asbestos cement.
[31] See for example, Document 603 in CPC's Disclosure Statement.
[32] *Ibid.*
[33] These clips can be found on the by linking from the url http://www.charlottepipe.com/quiet_house/noise_comparison.asp?BusSeg_ID=1

unique qualities of cast-iron and its continued use for DWV applications.[34] In the course of these promotional visits, Bibby representatives have reported on plastic DWV manufacturers making similar promotional efforts.[35] Recently, it appears that IPEX, in particular, has been dedicating its efforts to promoting coated PVC products.

Distributors views on competing products

76. Some distributors have listed several other materials as substitutes for cast iron in DWV uses in their responses to the Commissioner's section 11 orders: Emco Ltd. listed ABS, asbestos cement, brass, copper, ductile iron, FRP, PVC, and steel as "(c)ompeting products in the Drain, Waste, and Vent categories",[36] and Bartle and Gibson Co. Ltd responded that "(t)he products that might be used as a substitute are ABS, PVC DWV, or Copper DWV".[37] Crane lists copper, asbestos, and imports as competitors to Bibby.[38] Some of the Commissioner's will say statements contain references to other DWV materials as substitutes for cast iron.[39]

77. Furthermore, based on my review of the documents contained in Canada Pipe's Disclosure Statement, it appears that certain distributors have chosen at different times to promote plastic or asbestos-cement DWV rather than cast-iron DWV because of the increased margins that these other DWV products may offer[40]. Whatever the reason, however, the simple fact that a distributor has a choice as to which DWV material to promote suggests that cast-iron DWV is viewed as being on equal footing with other DWV products from other materials and that

[34] See, for example, Document 579 in CPC's Disclosure Statement and Document 343 in the Commissioner's Disclosure Statement.
[35] See for example, Documents 318, 581 and 701 in CPC's Disclosure Statement.
[36] Source: Emco's response to the Commissioner's section 11 order. Document 559 in the Commissioner's Disclosure Statement.
[37] Source: Bartle & Gibson Co. Ltd. response to the Commissioner's section 11 order. Document 534 in the Commissioner's Disclosure Statement.
[38] Source: Crane's. response to the Commissioner's section 11 order. Document 558 in the Commissioner's Disclosure Statement.
[39] For example: Scott Phillips (engineer), "Generally he will allow for the option of either cast iron or plastic materials in DWV applications". Commissioner Witness 30.
[40] See for example, Document's 398 and 256 in CPC's Disclosure Statement.

it is not crucial for a distributor to carry cast-iron DWV materials. Indeed, a great many plumbing distributors do not carry cast-iron DWV products at all but carry DWV products made from other materials.

Contractors views on competing products

78. Another indication of the competition between DWV products of different materials can be gleaned from the numerous occasions where contractors or builders have chosen to use plastic DWV products over cast-iron based on price.[41]

79. In some cases price appears to be the overriding factor in the contractors choice of DWV material as there are instances where the builder or contractor has asked for lower cost plastic DWV to be installed despite an engineer's specification that cast-iron or copper DWV be installed.[42]

Plastic Pipe and Fittings Association (PPFA)[43]

80. The PPFA is a national (U.S.) trade association whose members include manufacturers of plastic pipe, fittings, and solvent cements for plumbing and related applications. I have found many PPFA publications that promote PVC and ABS DWV products through a direct comparison with cast iron and other metals.

Specifying PVC Pipe and Fittings in Commercial Plumbing Applications.[44] This brochure describes how "(s)pecifying PVC pipe and fittings over 'traditional' metal piping, like cast iron or copper" can benefit contractors and their clients. It states that "(e)very model plumbing code in the United States approves the

[41] For instance, Documents 341 and 240 in CPC's Disclosure Statement refer to contractors choosing to use PVC DWV or asbestos cement over cast-iron because of the lower material and labour costs associated with using PVC.

[42] See, for example, Document 812 in CPC's Disclosure Statement.
[43] The url for the PPFA's web site is http://www.ppfahome.org.
[44] See document 36 in CPC Disclosure Statement.

use of PVC piping systems", and devotes considerable attention to convincing the reader that PVC can and should be used where building codes impose combustibility limitations.

The brochure also directly compares the cost of plastic and cast iron:

"Consider this example. Using a PVC DWV system instead of a cast-iron system in a commercial construction job saved $40,000 in the initial costs for the client of an architectural firm in Colorado"

Specification Sheet: Polyvinyl Chloride (PVC) Plastic Pipe and Fittings for Drainage, Waste, and Vent Systems:[45] This document states that "PVC pipe and fitting materials are combustible; however, they are difficult to ignite and will not continue to burn without an outside heat source. PVC piping may be used in buildings that require non-combustible construction". It also compares the cost of PVC DWV systems with other materials: "PVC plastic pipe is less expensive than metallic piping materials used in equivalent sanitary and storm drainage systems".

Plastic piping: a positive response:[46] This PPFA User Bulletin discusses a number of previously conducted tests of the properties of PVC DWV systems in fire situations. It notes that "(p)lastic piping has been used for DWV and storm water drains within buildings for more than 30 years. In some areas more than 90% of new one and two-family residences are being plumbed with plastic DWV piping". It concludes that:

"The "fire-danger" challenges to plastic piping have been adequately refuted by various studies showing plastic piping to be a safe product under proper use. Plastic piping has shown itself to be an economical product, comparative cost studies have shown it to be cheaper to purchase and to install than other piping, as well as having a longer life. People who pay the bills are the ultimate

[45] This document can be downloaded from the PPFA web site at http://www.ppfahome.org/pdf/pvcpipedwvspec.pdf.
[46] This document can be downloaded from the PPFA web site at http://www.ppfahome.org/ub8.html.

judges of cost effectiveness and have decided that plastic piping is the product of choice. Plastic piping is presently used in almost all major U.S. cities. A number of companies that previously manufactured only metal piping have recognized plastic piping's significant place in the market and now also manufacture plastic piping."

This User Bulletin also contains a table that reports the changes in the usage of various materials during the 1970's:

Piping Materials	Percent Change (Lbs.)
Plastics	+67%
Steel	+ 6%
Concrete	- 6%
Copper	-17%
Cast Iron	-24%
Clay	-33%

Code restricted buildings do not form a sub-market

81. Although the Commissioner's Statement of Grounds and Material Facts and the Commissioner's Statement of Economic Theory both refer to three separate product markets defined as "the supply of cast iron DWV pipe, fittings and MJ couplings"[47] in her Reply to the respondent's Response document he refers to a different product market: "the supply of cast iron DWV products for use in buildings of a certain height and occupancy."[48] Although this is not very precise, I believe that the Commissioner is referring here to buildings where the DWV system installed is required to be non-combustible (hereafter referred to as "code restricted buildings".

82. There are two overriding reasons why I believe that this narrower product market definition is incorrect.

[47] Statement of Grounds and Material Facts, at 50.
[48] Commissioner's Reply, at 6.

a. Recent innovations in plastic DWV products have resulted in systems that satisfy all building codes for code restricted buildings.

b. A necessary condition for such a restricted product market to be identified would be the ability for Bibby to price discriminate between uses of its products in code restricted buildings and other uses of its product. In particular, Bibby would have to be able to charge a higher price for DWV product destined for code restricted buildings than for the product that is sells for other applications. Bibby has not price discriminated in this way, and could not do so, because any attempt to raise price to one set of users would be frustrated by arbitrage from the distributors who were able to purchase at the low price. Moreover, since contractors do not generally specialize into those who construct code restricted buildings and those who do not, contractors themselves would provide sufficient arbitrage (i.e. they would buy DWV material for their "low rise" applications and use it in the "high rise" applications) to prevent price discrimination from occurring.

Building Codes and Substitutability

83. In the following paragraphs I describe in some detail the relationship between the regulatory environment and the functionality of DWV products made from cast iron and plastic.

84. The materials used for any building's DWV system must conform to the relevant provincial building code. Each provincial code[49] is based on the

[49] The applicable provincial building codes, as listed in Document 704 in CPC's Disclosure Statement, are as follows:

British Columbia: *1998 British Columbia Building Code*, B.C. Reg. 298/98
Alberta: *Alberta Building Code 1997*, Alberta Regulation 50/98
Saskatchewan: *Uniform Building and Accessibility Standards Act*, C.C.S.S., c. U-1.2
Manitoba: *The Buildings and Mobile Homes Act*, C.C.S.M., c. B93.
Ontario: *Building Code Act*, 1992, S.O.1992, c.23
Quebec: *Building Act*, R.S.Q., c. B-1.1
New Brunswick: *Community Planning Act*, R.S.N.B., c. C-12
Prince Edward Island: *Provincial Building Code Act*, R.S.P.E.I. 1988, c. P-24
Nova Scotia: *Building Code Act*, R.S.N.S. 1989, c. 46

National Building Code ("NBC"), which is developed and periodically updated by the National Research Council of Canada. The latest edition of the NBC was published in 1995.

85. All building codes contain fire safety requirements for DWV materials, which circumscribe the surface burning characteristics of combustible materials and require building assemblies to have certain fire resistance properties. The fire safety requirements that must be met by a given building's DWV system depend primarily on the height of the building and its use. The NBC requires that DWV materials used in buildings exceeding certain heights (depending on the use) must be either non-combustible or meet the requisite flame spread rating of no greater than 25 and a smoke developed classification of no more than 50.

86. The building code requirements relating to fire resistance of building assemblies, including DWV systems, are designed to ensure that fire does not spread unduly through wall and floor penetrations. Cast iron, copper, and asbestos cement are not combustible, and they therefore satisfy the codes' surface burning characteristics requirements. These requirements are met in plastic DWV systems through the use of fire-stop systems and devices. Fire-stop devices for plastic DWV systems are widely available on a commercial basis, and contractors often purchase fire-stop systems and devices directly from manufacturers.[50]

87. Building codes do not specifically prohibit the use of plastics or any other materials in any building's DWV system. Any material—even a combustible material--can be used in any DWV system, along as the material satisfies the relevant building code's smoke development/flame spread requirements.

Newfoundland: *Building Standards Act*, R.S.N. 1990, c. B-8.

[50] See Document 1127 in CPC's Disclosure Statement.

88. An important illustration of this principle is the fact that IPEX has recently developed two PVC-based DWV systems that have been accepted for installation in code-protected buildings.

89. IPEX is a Canadian company with head offices in Toronto, which bills itself as "The North American Leader in theromoplastic piping systems'. Its share of Canadian DWV sales (all materials) was estimated by Bibby to be over 50% in 2002 . IPEX now has two relatively new products, 'System 15' and XFR, which threaten the use of cast iron even in code restricted applications.

90. IPEX's System 15 and System XFR both satisfy building code flame spread requirements. According to IPEX's brochure titled "Complete Drainage Systems for Noncombustible Buildings":

> "System 15 pipe and fittings are tested to CAN/ULC-S102.2 and exhibit a flame spread rating of 15. National and provincial building codes require that thermoplastic piping used in non-combustible construction must meet a flame spread rating of 25 or less."[51]

91. IPEX's System XFR pipe and fittings have a PVC substrate upon which a permanent coating is fused to produce a fire-retardant material. According to IPEX, System XFR eliminates flame spread (ie. it has a flame spread rating of 0) and reduces the amount of smoke generated in case of fire (it has a smoke development classification of 35), meeting even stricter building code requirements. IPEX claims that System XFR is compliant with the following building code classifications:

- High-rise buildings as defined by NBC article 3.2.6
- Air plenums as defined by NBC article 3.6.4.3
- Non-combustible buildings as defined by NBC article 3.1.5.15
- Penetrating a rated fire separation as defined by NBC article 3.1.9.4.(4).[52]

[51] See Document #1096 in CPC's Disclosure Statement.
[52] *Ibid.*

92. It is very instructive to note that IPEX's brochure directly compares its new PVC products with traditional materials that have been considered non-combustible:

> "No more limits. IPEX now offers the only complete thermoplastic drain, waste and vent system for all types of low and high-rise construction. *The days of having to use traditional materials in high-rise buildings and air plenums are over*"[53] (emphasis added).

93. Building inspectors and certified testing agencies such as Warnock Hersey Intertek have confirmed that System XFR meets building code flame spread and smoke developed classification requirements.[54] Even in code-restricted construction, therefore, contractors are not restricted to using non-combustible materials such as cast iron in DWV systems. The significant price advantage of plastic also encourages contractors to use plastic in most lower-priced residential construction. Building inspectors across the country have confirmed their acceptance of PVC DWV systems for use in code restricted buildings.[55]

PVC DWV installations in construction where cast iron and copper were historically favoured

94. IPEX System 15 and/or System XFR have already been installed in buildings that are required by building codes to have non-combustible DWV systems. PVC systems have also been installed in buildings that have traditionally had cast iron or copper systems because of their desirable sound properties. Examples include:

- Bibby and PVC competed for the Marriot Residence Inn (a 5-storey hotel) and the Marriot Hotel (a 6-storey hotel) in Mississauga, Ontario;[56]
- The Sandman Inn hotel chain used IPEX PVC products for their hotels;[57]

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[53] This document can be downloaded from the IPEX web site http://www.ipexinc.com/Publication/KioskPDF/CompleteDrainageSystemsOverview.pdf
[54] Document 747 in CPC's Disclosure Statement.
[55] Documents 700 and 885(Manitoba); 871 (Alberta); 747 (Saskatchewan), in CPC's Disclosure Statement.
[56] Document 792 in CPC's Disclosure Statement.

- Two large four story wood construction buildings in Edmonton that Bibby found to be using PVC pipe and fittings;[58]

- Two commercial projects in Edmonton used coated IPEX PVC DWV pipe and fittings;[59] IPEX used information about this installation in a presentation given to the Alberta Building Inspectors Association Conference.

- Four three-story walk-ups in Edmonton totaling 230 units in which PVC DWV systems were installed

- In 2001, a contractor seriously considered cast iron and PVC before deciding to install a PVC DWV system (using a combination of IPEX System 15 and the Proset System) in a Long Term Care facility in Ancaster, Ontario;[60]

- Bornhurst Mechanical installed a PVC DWV system in a 110 unit condo project in Winnipeg because PVC offered substantial cost savings over cast iron;[61]

B. Geographic Market

95. A geographic market is defined in a similar way to a product market – an area in which sellers, if acting jointly, could exercise market power. I find that the evidence for the restricted geographic market alleged by the Commissioner, which corresponds to Bibby's different SDP multiplier zones, is weak, and amounts to nothing more than observing that multipliers differ across the country.[62] The evidence on shipments, for plastic pipe as well as cast iron, suggests that pipe is shipped on a regular basis all over the country, as well as

[57] Document 581 in CPC's Disclosure Statement.
[58] Document 602 in CPC's Disclosure Statement.
[59] Document 343 in the Commissioner's Disclosure Statement.
[60] Document 748 in CPC's Disclosure Statement.
[61] Document 341 in CPC's Disclosure Statement.
[62] The "six relevant geographic markets" alleged by the Commissioner are British Columbia, Alberta, the Prairies (Saskatchewan and Manitoba), Ontario, Quebec and Atlantic Canada (New Brunswick, Nova Scotia, Newfoundland and Labrador and Prince Edward Island). See the *Application* at [5].

significant shipments to and from the United States and imports from Asia. The shipment pattern would certainly suggest that the market is at least as large as Canada, and that quite possibly there is a worldwide market for DWV products.

96. There are several pieces of evidence that have a bearing on the geographic market issue. First, Bibby does use different multipliers in different parts of the country, and average prices for cast iron have differed somewhat between regions in the recent period. However, I have not been able to obtain comparable price data for plastic, copper and asbestos cement DWV products. Second, indicating a broader geographic market is the fact that product is shipped from one province to another. Indeed, outside of Quebec where Bibby's product is manufactured, every province ships its cast iron DWV product from outside.[63] Further pointing in the direction of a broad market are significant exports (by Vandem)[64] and imports (from Asia and the United States).[65]

Conclusion on Product and Geographic Market Definition

97. My review of the evidence on functional substitution between cast iron DWV products and those manufactured from competing materials leads me to conclude that the relevant product market consists of DWV products made from PVC plastics, asbestos cement, copper and cast iron. With respect to the geographic market, the available evidence supports a market at least as large as Canada, and probably larger. What little evidence there is to support narrow geographic markets is weak, incomplete, and outweighed by the evidence in favour of a larger geographic market.

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[63] Examples of distributors shipping Bibby products bought in one province to another province can be found in Documents 248 (wholesalers in Ontario and Quebec buying from a wholesaler in BC) and 283 (Bibby Ontario tonnage would be 15% higher if not for shipments from the West to Ontario) of the Commissioner's Disclosure Statement. See also Document 768 of CPC's Disclosure Statement regarding Emco shipping Bibby product from Edmonton into Saskatoon, and Document 1119 of CPC's Disclosure Statement regarding Bibby's re-examination of price differentials between Manitoba, Saskatchewan, and provinces further west.Document.

[64] Document 578 in the Commissioner's Disclosure Statement.

[65] See for example, Document 827 in CPC's Disclosure Statement

VII. MARKET POWER AND BARRIERS TO ENTRY

98. In the relevant market for DWV products, Canada Pipe has less than a 10% market share. Even before a consideration of entry conditions, I would conclude that there is no possibility of Canada Pipe exercising market power. In the following section, I consider the entry conditions in the cast-iron DWV industry.

Barriers to Entry

99. There are a variety of means by which a new entrant can begin to supply cast iron DWV products to the Canadian market. These can be divided broadly under the headings of imports and domestic production. It is a striking indication of the openness of this industry to entry that all of these forms of entry have been successfully employed since the introduction of the SDP in 1998.

Importing

100. A cast iron importing business can be started at low cost by taking the following steps:

- Locate a foreign manufacturer of cast iron DWV pipe, fittings, and/or couplings;
- Contract with the foreign manufacturer to supply product and have it delivered in containers to an appropriate port;[66]
- Arrange for delivery of the product from the port dock to a stocking yard. Transportation of DWV products requires no special equipment. For short hauls, a standard medium-sized truck is sufficient; for longer hauls, products

[66] Bibby frequently receives solicitations from foreign foundries looking for representation in Canada. See for example, Document #241 in CPC's Disclosure Statement.

can be transported via standard rail freight carriers. A stocking yard is simply a space to store product, and requires no special equipment.

- Arrange for delivery of product from the stocking yard directly to contractors or to distributors. Deliveries can be made by the importer, with a pick-up truck or a medium sized truck, or product can be picked up by the contractor or distributor.

101. In addition, CSA registration must be obtained, either by the foreign manufacturer or by the Canadian importer. The cost of registering a full line of pipe and fittings is less than $50,000. My understanding is that several foreign manufacturers, including Charlotte Pipe & Foundry Co. and Richmond Foundry in the US, Heibei and Tiger Pipe in China, Kentsharp Co. Ltd. of Hong Kong, and Metalurgicas Del Caribe Indumet C.A. in Venezuela, have registered their cast iron DWV products with the CSA. Several Canadian importers have also had their products registered, including Taurus Industries Ltd., John L. Schultze Ltd., and Sino-Canwest Trading Inc.[67]

102. Importers use a variety of means for getting their products to contractors. Some operate as 'middlemen', and sell product to distributor and directly to contractors. Examples of this type of importer include Sierra Distributors in British Columbia, and Davcon in Alberta. Sierra Distributors began importing cast iron DWV fittings in 1999, and then supplemented its product line with imported pipe beginning in 2000. I understand that Davcon has been importing cast iron DWV products since 2000.

103. There are also examples of contractors who import product for their own use. William Kelly in Richmond, BC is an importer that has been importing cast iron products for its own use since 1998.[68] Another example is LGC Plumière in Quebec, who I understand has just recently been importing cast iron

[67] See, for example Document # 704
[68] See for example, Document # 160 in CPC's Disclosure Statement.

pipe and fittings for its own use and also for re-sale to other contractors and distributors.

104. Westburne/Wolseley, a very large distributor of plumbing products, is an example of a different form of import entry. Westburne has been a Bibby Stocking Distributor, but it left the SDP in the West region in April of 2002 and has sourced most of its cast iron DWV products for sale in Western Canada from offshore.

Retooling an Existing Foundry

105. There are several existing foundries in Canada with excess melt capacity that, with minor modification, could produce cast iron DWV pipe and fittings. This is not a purely hypothetical consideration: the recent domestic entrant, Vandem, entered the cast iron segment of the DWV industry in precisely this way.

106. It is my understanding that Vandem manufactures cast iron DWV pipe at the Crowe Foundry in Cambridge, Ont., and that in order to begin production, the principals of Vandem needed only to have a single new piece of equipment-- a double centrifugal spinner—added to the existing foundry.) It is also my understanding that the aggregate initial capital investment for pipe production (sufficient to supply 90% of the Cdn market) can range from $350,000 to $750,000, while the cost of obtaining fittings patterns sufficient to supply about 80% of Canadian demand would cost about $700,000-$750,000.[69]

107. The members of the Canadian Foundry Association ("CFA") operate more than 50 foundries across Canada. CFA members are major metal casters accounting for approximately 80% of sales by all Canadian foundries. Crowe Foundry is a member, and I expect that many other members could also begin

[69] See Document 704 in CPC's Disclosure Statement.

manufacturing cast iron DWV pipe and fittings after making relatively low cost modifications to their existing facilities.[70]

Greenfield Entry

108. Although greenfield entry is technically possible, given the level of scale economies in cast iron pipe manufacture and the existing foundry capacity in the industry, it would not be economic or rational for a new greenfield production facility to be built to supply only the Canadian market. Such entry could only occur if a substantial export market were contemplated, an unlikely event given the competitiveness of imports of cast iron pipe originating from Asian countries.

Conclusion on Market Power and Barriers to Entry

109. In the foregoing analysis of product market definition and barriers to entry I have found that cast iron DWV products make up less than 10% of the relevant market, and that there are a variety of low cost channels for entry into the supply of cast iron DWV products. These entry opportunities are not just theoretical possibilities, but successful entry has occurred in each of these modes since Bibby's SDP was introduced. Taking both of these factors together, I see no possibility that Canada Pipe could exercise market power in the relevant product market.

VIII. AN ECONOMIC ANALYSIS OF THE STOCKING DISTRIBUTOR PROGRAM

110. Bibby's SDP program is a partnering program designed to create incentives for distributors to promote cast iron, and to protect the investment that Bibby has made and is making in training and marketing activities, from free riding by other cast iron manufacturers.[71]

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[70] A list of foundries can be obtained at www.foundryassociation.ca and is also attached hereto as Appendix B, Tab 70.

[71] I was informed by Bibby executives that the SDP was introduced as a defensive measure to educate distributors and end users about the virtues of cast iron DWV Products, and the superiority of Bibby's

111. Appendix C contains a description of loyalty programs operated by other firms in the Plumbing industry, and by firms in other industries. The conclusion that I draw from the widespread use of such programs in competitive industries is that they are invariably initiated for pro-efficiency reasons.

112. Partnership programs of this general type are common, and are regarded generally by economists as playing an important role in promoting efficiency of the arms length relationship between a manufacturer and distributor.[72] Marvel[73] originally pointed out the importance of these relationship specific investments, and his work has had considerable impact on the U.S. antitrust treatment of exclusive and preferential dealing arrangements.[74] Without the protection afforded by the existence of a preferential dealing program, a manufacturer would be subject to "free riding" by rival producers taking a variety of forms. A distributor could use training, information and local level marketing provided by the company to stock and promote rival cast iron products. The manufacturer's advertising at a wider level could also be appropriated by suppliers of rival cast iron products.[75]

113. Bibby's SDP also has an important role in maintaining quality. By creating a brand reputation for itself as a manufacturer of a full line of high quality cast iron DWV products, Bibby would suffer from confusion among

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products over some low quality imports. Moreover, given the continuing increase in the use of plastic DWV Products, Bibby was concerned to inform consumers that cast iron is still cost effective and indeed superior in some applications. The decline of cast iron is further reflected in the consolidation of Canadian cast iron pipe manufacturers from more than 13 in the 1960s to only two today.

[72] Appendix C contains a description of loyalty programs operated by other firms in the plumbing supply industry, and by firms in other industries. The conclusion that I draw from the widespread use of such programs in competitive industries is that they are invariably initiated for pro-efficiency reasons.

[73] Howard Marvel, "Exclusive Dealing", *Journal of Law and Economics*, 25: 1-25, (1982).

[74] Carlton describes the treatment of these arrangements in U.S. antitrust courts as a trade off between "free riding" and "scale economies". If there is potential for free-riding but little in the way of scale economies courts tend to allow these arrangements. In the opposite case, they are less tolerant of them. Dennis W. Carlton, "A General Analysis of Exclusionary Conduct and Refusal to Deal--Why Aspen and Kodak are Misguided", *Antitrust Law Journal*, 68: 659-683 (2001).

[75] The important role that distributors play in promoting the different DWV materials is illustrated in Document 256 in CPC's Disclosure Statement, which describes Westburne Winnipeg's decision not to promote cast iron, and Document 398 in CPC's Disclosure Statement that describes Emco promoting asbestos cement over cast iron.

buyers between Bibby's product and those of competitng suppliers. In this case, the competing suppliers would be free riding on Bibby's reputation.

114. In this section I consider the theoretical analysis of partnership and preferential dealing programs similar to the SDP offered by Bibby. I find that such programs are generally pro-competitive. Moreover, the conditions that are required for such a program to be anticompetitive are not found in Bibby's Stocking Distributor Program. My conclusion therefore is that Bibby's Stocking Distributor Program has been efficiency enhancing, and is not anticompetitive.

115. The SDP arrangements between Bibby and its distributors are not exclusive dealing arrangements, but belong to the class known as preferential dealing arrangements. A preferential dealing arrangement provides a financial incentive for loyalty to a single supplier, but does not require such loyalty in order for supplies of the product to be made available. Under Bibby's SDP arrangement distributors are not required to join as a condition of supply, but they are rewarded with incentive discounts if they do join the program.

116. Economic Analysis of exclusive and preferential arrangements indicates that, in most cases, anticompetitive effects are unlikely to occur. This was recognized by Posner and Bork, who pointed out that a distributor would have to be compensated with a reduced wholesale price in order to induce them to accept an exclusive arrangement.[76] In no case could a distributor or dealer be coerced into accepting an arrangement that would make them worse off. A more recent and rigorous analysis by Bernheim and Whinston has firmed up this conclusion.[77] They show that in a static framework with flexible pricing,

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[76] See Richard A. Posner, *Antitrust Law: An Economic Perspective* 203-04 (1976); Robert H. Bork, *The Antitrust Paradox: A Policy at War with Itself*: 138-432, 304, 309 (1978).

[77] See Bernhein, D. and M. Whinston, "Exclusive Dealing" *Journal of Political Economy*, 106, (1998). These authors reach the following conclusions:

> The preceding analysis corroborates Bork's (1978) argument that exclusive dealing cannot be used profitably to foreclose a rival from the market. Because each manufacturer must

exclusive dealing and preferential dealing arrangements will only occur where they are efficient i.e. where they contribute to an increase in total surplus. As I have described above, exclusive and preferential dealing arrangements can promote investment by making demand and supply more predictable and by reducing free-riding by rivals who may benefit from a firm's investments.

117. The special circumstances that give rise to an anticompetitive effect always require the exploitation of a potential entrant, or of one group of buyers at the expense of another group of buyers and the seller. Neither set of circumstances corresponds to this case.[78]

118. All of the models of this kind of agreement that have the potential to be anticompetitive do so by virtue of some asymmetry between buyers (distributors) who are party to the agreement and buyers who are not. But

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effectively compensate the retailer to attract it to an exclusive deal, manufacturer's internalize the retailer's cost from the loss in product variety.

and

..for this model, Bork is correct that a ban on exclusive dealing cannot promote social welfare.

[78] To expand on this point, there are two standard models in which exclusive dealing can be anticompetitive:

-*the Aghion Bolton model (AB)*- this works by getting the buyer(s) to commit to an exclusive dealing contract with substantial penalties for breach. The exercise of this penalty clause in the event that a low cost entrant appears provides a way of "taxing" the entrant to the benefit of the manufacturer. Bibby does not even have contracts with buyers, so they obviously could not have any such breach penalties. The Bureau may argue (in fact they appear to be doing so in l.3, p.80) that Bibby's rebates act as exactly this kind of "breach penalty". However, this claim does not bear close examination: at the end of every quarter, there are no "switching costs" in the form of rebates that would be foregone by a distributor in changing to a new supplier. That leaves the annual rebate, which is much too small to play a role like the Aghion-Bolton model, and in any case, at the end of every year, there are no annual rebate "switching costs" either. Thus, the markets for supply of cast iron products to distributors is completely contestable every quarter and certainly every year. Thus, this anticompetitive model of exclusive dealing contracts cannot apply to Bibby's relationships with distributors. (Aghion P and Bolton P, "Contracts as a Barrier to Entry", *American Economic Review* 77(3): 388–401, (1987)).

–*Rasmusen, Ramsey, and Wiley* (RRW)- (the "Naked Exclusion" model). In this model the manufacture exploits a lack of coordination among buyers by getting some buyers to sign an exclusive agreement which effectively forecloses the market to entry by new suppliers. A feature of this model is that buyers are treated asymmetrically, some are under an exclusive contract, and some are not and must pay higher prices at the margin. There is no such asymmetry among Bibby's distributors – in any geographic "market" (say those defined by the Bureau) all distributors are treated the same. Thus this model cannot be applied to the Bibby circumstances. (Rasmusen, E., Ramseyer, J., and Wiley, J., "Naked Exclusion", *American Economic Review* 81: 1137-45 (1991).

Bibby's SDP treats all distributors equally, and so cannot serve to exploit one group at the expense of another.

A. Has Bibby's SDP foreclosed distribution of cast iron DWV products?

119. The Commissioner's Application states at [7] that "Bibby's Stocking Distributor Program forecloses the distribution network to potential entrants and current competitors." I find, in contrast, that entrants have a variety of avenues available for distributing cast iron products, none of which is foreclosed or diminished by the presence of Bibby's SDP. My conclusion is supported by the fact that each of these avenues have been successfully employed since the SDP was introduced.

120. When evaluating the Commissioner's claim, it is important to take into account several features of the SDP. First, the program imposes no contractual obligations on distributors and provides only short-term incentives to individual distributors to give Bibby the first opportunity to meet their cast iron DWV requirements. As I show in this section of my Report, the short term nature of the SDP implies that an any point in time, a distributor's costs of switching from Bibby to alternative cast iron DWV suppliers are not prohibitive, and are in fact zero at the beginning of each calendar year. Furthermore, since Bibby administers its SDP on a calendar basis, the timing of distributors' incentives to remain on the SDP is not staggered: for example, at the beginning of each calendar year, *all* Bibby Stocking Distributors from the previous year would incur no switching costs whatsoever if they purchased from an alternative supplier. In this section I also discuss the results of my analysis of how Bibby actually administers the SDP. I find that in many cases, Bibby does not always withdraw all of the rewards from distributors who lose their eligibility for rebates and multipliers by not allowing Bibby to meet their cast iron DWV requirements. In several cases, a distributor has lost only the quarterly rebate component, and has still benefited from the annual rebate and from the Stocking Distributor multiplier.

121. The second important fact relating to the question of whether the SDP forecloses access to distribution is that the program, at most, modifies the incentives of existing distributors of cast iron DWV products, and by no means forecloses all channels for the distribution of cast iron. As other competitors to Bibby have done, entrants can sell directly to contractors, set up their own distribution facilities, or induce distributors not currently selling cast iron DWV products to begin doing so. Thus, even if the SDP did impose prohibitive switching costs on existing Bibby Stocking Distributors, competitors would have many other alternatives—all of which have been successfully exploited by Bibby;s competitors--for accessing customers.

The SDP imposes no contractual obligations on distributors and provides only short term incentives to stock Bibby products

122. The SDP is weighted heavily towards the quarterly rebate component; the annual rebate was only 3% from 1998 to 2001, and has been 4% since 2002[79]. In addition, the rebate program is structured on a calendar basis, so that every distributor's eligibility requirement for the quarterly rebate expires at the same time.

123. This means that at the end of every calendar quarter, if a distributor leaves the program to purchase cast iron DWV products that Bibby is ready and able to supply from another manufacturer, it loses only the annual rebate component. If a Bibby Stocking Distributor leaves the program at the beginning of a calendar year, it forfeits no rebates at all. Thus, at the beginning of every calendar year, all cast iron DWV suppliers are on an exactly equal footing, except to the extent that any competitor has an advantage in terms of quality or service. At this point, the only effect of the SDP occurs through the multiplier, which rewards distributors that allow Bibby to supply all of their cast iron DWV requirements. But every other manufacturer is free to match or exceed Bibby's offer with their

[79] Documents 1159 and 1160 in CPC's Disclosure Statement.

own multiplier – to use a different terminology, all cast iron DWV distributors are perfectly contestable at least once a year.

124. At the beginning of the second, third, and fourth calendar quarters of each year, the only cost to a distributor of switching from Bibby to another cast iron supplier is the value of the annual rebate accrued to the end of a quarter. The annual rebate rate is currently 4%, so that a competitor to Bibby can fully compensate a Bibby Stocking Distributor for switching from Bibby at the beginning of the second quarter of a calendar year with a payment equal to 4% of the value of the distributor's purchases from Bibby during the first quarter of the year. This payment need not be made as a lump sum. An alternative form of compensation for lost annual rebates is a reduction on unit prices.

125. I have calculated the payment that an entrant would have had to provide to distributors to fully compensate them for foregoing their Bibby Stocking Distributor status at the end of each calendar quarter in 2000. As I have already explained, on January 1, all of Bibby's Stocking Distributors can switch to a new supplier without losing any rebates at all. Any cast iron DWV competitor to Bibby can compete for all distributors, including all distributors that were Bibby Stocking Distributors in the previous year, without having to compensate them for any lost rebates.

126. At the end of the first quarter of 2000, the sum of annual rebates earned on the sale of pipe, fittings, and couplings by all of Bibby's Stocking Distributors in Canada was $ '. A Bibby Stocking Distributor who switched to another supplier on April 1 (the beginning of the second quarter) had already received credit for the quarterly rebate on purchases from Bibby during the first quarter, and had not yet earned any quarterly rebates from Bibby for second quarter purchases. A distributor's total loss in rebates from switching to another supplier on April 1 would therefore just be the accrued annual rebate. The sum of annual rebates earned by all Bibby Stocking Distributors as of April 1--

[80] Documents 301, 310, and 312 in the Commissioner's Disclosure Statement. Documents 551, 564, and 573 in CPC's Disclosure Statement.

$ –is thus the total amount that a competitor to Bibby would have to pay to distributors to fully compensate them for switching. For a total payment of just over $, for example, a competitor (or a group of competitors) could fully compensate Bibby Stocking Distributors accounting for one quarter of Bibby's sales for their lost rebates. The compensation required to induce 25% of Bibby Stocking Distributors in Ontario (where Vandem manufactures and makes most of its sales) to switch after the first quarter is only $; for Vandem could compensate half of Bibby's Ontario Stocking Distributors for lost rebates.

127. These switching costs are small, when compared to the annual sales of cast iron DWV products of approximately $30 million per year[81]. Another yardstick is the cost of any investment that would be incurred by an entrant into the market. I have estimated that the investment cost for an entrant that produces only pipe and fittings is in the range $1million-$1.5 million. The annual rebate earned by Bibby Stocking Distributors during the first quarter of 2000 was which would add only about to initial investment costs for a new entrant.

128. I understand from Vandem's Will Stay Statement that it currently has 10% of the Canadian cast iron DWV market, and that it believes it could sustain its business if it could grow its share to 15%. I have calculated the value of annual rebates accrued at the end of each quarter to Bibby Stocking Distributors that account for enough purchases of DWV products to bring Vandem up to the 15% market share level should they switch to Vandem. The value of annual rebates accrued to end of a given quarter represent the maximum payment that Vandem would have to make to Distributors to induce them to leave the SDP. The results of my calculations are reported in Table 3.

129. At the beginning of quarter four, the total compensatory payment required is just under $ –this is the amount that Vandem would have to pay if it

[81] Source: Various Bibby Sales and Gross Profit Analysis Reports.

wanted to convert enough Bibby customers to reach a 15% share of cast iron sales in the fourth quarter. The cost of reaching its market share target falls significantly if it switches Bibby's customers earlier in the year: at the beginning of the third quarter, the compensation required is about $ while in order to convert enough customers to reach its 15% target at the beginning of the second quarter, Vandem's total compensation payment is only about It is important to keep in mind that these costs to Vandem are likely to be offset by the profits it earns on sales to its new customers. As I show in a later section of my Report, during the period for which I have data on Vandem's prices, volumes, and costs (parts of 1999 and 2000), Vandem earned positive profit margins, and although I do not have access to more recent data, I have no reason to believe that it is currently earning negative profits. The costs to Vandem of inducing Bibby Stocking Distributors to switch from Bibby are therefore likely to be lower than those reported in Table 3.

130. These estimates indicate that any switching costs created by Bibby's SDP are unlikely to be of sufficient magnitude to act as a barrier to entry or expansion. These costs are small compared to both the investment costs that must be incurred by an entrant and also to the size of the market. There remains the issue of whether Bibby's Stocking Distributor multipliers foreclose the distribution channel to Bibby competitors.

131. As I explained above, if the multipliers have an anti-competitive effect, it is through the impact they have on the nature of competition for each individual distributor. Economic theory is clear on the principal that competition for the field can be just as, or more effective, than competition within the field. Competition 'for the field', and the resulting partnership between manufacturer and distributor can also have significant efficiency advantages. These are discussed below.

Table 3: Compensation Required to Switch 5% of Bibby's Customers (2002)

Quarter	Total Bibby Cumulative Annual Rebate	Amount needed to Switch 5% of Bibby's Customers
2		
3		
4		

Source: Various Bibby Sales and Gross Profit Reports, 2002

B. The Competitive Effects of Bibby's SDP:

1. Bibby does not enforce the SDP to the letter

132. In order to understand whether the SDP has had, or is likely to have, an anticompetitive effect, I have analyzed how Bibby actually implements the program. The documents show that in many instances where distributors purchased cast iron DWV products from manufacturers that compete with Bibby, and Bibby was able to supply these products, Bibby continued to reward these distributors with the rebates and discounts available under the SDP.

133. In some cases, Bibby continued to pay some of the rebates and apply multipliers to purchases by distributors who purchased from other cast iron DWV suppliers (in the examples discussed in the footnote distributors who didn't fulfill their obligations under the SDP received the annual rebates and multipliers, and only lost the quarterly rebate for the quarter during which they purchased from competing manufacturers). This suggests that in many cases the SDP's discounts simply amounted to price reductions, and any 'switching costs' imposed on distributors were negligible.[82]

[82] *Examples:*

Emco Supply

Quarter 4 - 1998

The SDP only affects at most the incentives of existing distributors and does not foreclose other distribution channels

134. I have shown how the SDP does not preclude Bibby's cast iron competitors from competing for existing distributors on an equal footing with

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Emco Supply was a Bibby Stocking Distributor in Alberta for the first three quarters of 1998. Recall that in 1998, the SDP was administered on a provincial basis. During the fourth quarter of 1998, Emco Supply branches in Alberta purchased couplings from Mission Rubber Co. Since Bibby was able to supply these couplings, Emco Supply did not satisfy the requirements for Bibby Stocking Distributor status, and it was removed from the SDP in Alberta. According to the terms of the SDP, Emco Supply became ineligible for the quarterly rebate for the fourth quarter of 1998 and for the annual rebate for the calendar year 1998. Furthermore, Emco Supply became ineligible for the Stocking Distributor multiplier.

Notwithstanding the fact that it purchased cast iron products from manufacturer other than Bibby, Emco Supply lost only its 7% quarterly rebate for Alberta purchases during the fourth quarter of 1998. It still received the 3% annual rebate on the purchases of Bibby pipe, fittings, and couplings by all Emco Supply branches in Alberta during 1998. Emco Supply's total purchases from Bibby in 1998 were $, and the amount of the annual rebate payment made by Bibby to Emco was

Furthermore, Emco Supply continued to receive the Stocking Distributor Multiplier on all its purchases during the fourth quarter of 1998, and also on all of its purchases after it rejoined the SDP in January of 1999

Emco Supply became eligible for the SDP in the Prairie region again beginning in the first quarter of 1999, and since that time it has continued to receive quarterly and annual rebates and the Stocking Distributor multiplier. Emco Supply branches in oth r regions did not have their rebates withheld because an Alberta branch breached the SDP's eligibility requirements.

Crane Supply

Quarter 4 - 1998

Crane Supply (Ontario) withdrew from the SDP in the last quarter of 1998. It had always been a Bibby Stocking Distributor and accounted for of Bibby's Ontario sales of cast iron DWV products in 1998. For not allowing Bibby to supply all of its cast iron DWV requirements, Crane Supply lost only the credit for a quarterly rebate on its Ontario purchases. It received a credit for an annual rebate based on all of its purchases for 1998, and Bibby continued to apply the Stocking Distributor multiplier to all of Crane Supply's purchases in 1999.

Quarter 1 - 2000

Crane Supply withdrew from the SDP in the first quarter of 2000 because it chose to purchase 0.02 tons of fittings in March 2000 from Vandem. Crane accounted for of Bibby's Ontario sales of cast iron DWV products in 1999.

Noble Trade

Noble Trade went off the SDP for the Ontario region during the 4th quarter of 1999 because it bought fittings from BMI. Like Crane Supply and Emco Supply, it lost only the quarterly rebate, but it still received credit for an annual rebate for 1999. It also continued to receive the Stocking Distributor multiplier even when it became ineligible for Stocking Distributor Status.

Documents 66, 140, 141, 142, 164, 166, 170, 172, 182, 185, 190, 194, 195, 196, 197, 279, 281, 492, 495, 578 in the Commissioner's Disclosure Statement; various Bibby Sales and Gross Profit analysis reports.

Bibby at the beginning of each calendar year. An alternative (or complementary) entry strategy for a competitor to Bibby is to make sales by bypassing Bibby's stocking distributors. There are several ways for a competitor to do this: a competitor can make sales to contractors directly, perhaps with the assistance of third parties for transportation, storage, and warehousing; it can set up its own distribution facility, and; it can induce established distributors that do not stock cast iron DWV products to begin doing so.

Existing Wholesale Distributors who do not consistently stock cast iron DWV products

135. Recall that the vast majority of DWV product sold is plastic, and not surprisingly, many DWV distributors do not carry cast iron DWV products at all. The simplest and lowest cost method of entry into cast iron distribution in many cases would be to convince a DWV distributor who does not currently stock the product to stock it. The entry costs for entry of this kind would be essentially zero, and barriers to entry are negligible. Clearly, whether or not any distributor who currently stocks cast iron DWV products does or does not belong to the SDP will not affect the conditions of entry for a distributor who is not currently carrying the product. The domestic entrant, Vandem, appears to have taken advantage of this type of opportunity. It lists as customers many wholesale distributors of plumbing supplies that do not regularly purchase from Bibby (either as a Stocking Distributor or as a non-Stocking Distributor).[83]

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[83] These customers include:
Ontario: Brampton Plumbing & Heating Supplies Inc., Centennial Plumbing Supply, Central Plumbing Supply, G.C. McDonald Supply, Dupont Plumbing and Heating Supplies Inc., Fulford Supply Ltd., Imperial Plumbing Supplies, Hill Supplies, Holmar Plumbing Supplies Inc., Hamilton Plumbing Supply Ltd., Irving's Plumbing Supplies, McKeough Supply Inc., O P Hamlin Co. Ltd., Peninsula Plumbing & Heating Supply Co. Ltd., Penmar Plumbing And Heating Supplies Ontario Ltd., Runnalls Industries Inc., Windsor Factory Supply Ltd., Windsor Plumbing Supply Co Inc.
Quebec: Schultz John L Ltd., Main (1996) Matériaux De Plomberie Et Chauffage, Viau M I & Fils Ltée,Plumtel Ltée
Maritimes: J.W. Bird and Company Limited.
Source: Document 578 of the Commissioner's Disclosure Statement.

Establishing Wholesale Distribution De Novo

136. Bibby sells its products to distributors of many sizes, ranging from single-outlet distributors, such as Nelco Supply, to large companies with national networks of outlets, such as Wesburne/Wolsley and Emco. It is likely that a new entrant who wanted to establish a network of distributors would do so initially on a fairly small scale.

Selling Directly to Contractors

137. Some importers have sold their products directly to contractors, thereby by-passing distributors altogether. The best examples are Sierra and Davcon, who have had a significant impact on pricing in Western Canada by entering on a very modest scale and with minimal up front investment.

138. Because of the structure of the SDP and the nature of the distribution stage of the DWV industry, the SDP does not appear to pose a significant risk to competition. In a later section, I consider in detail whether the SDP may result in any competitive benefits, which would outweigh any possible anticompetitive effects.

C. The Role of Wholesale Distributors in Maintaining a Competitive DWV Market

139. Several of Bibby's distributors are much larger companies than Bibby. For example, Emco Ltd. had sales of billion in 2002 compared to Bibby sales of DWV products of approximately million in 2002[84]. Bibbys sales to Emco represent more than a quarter of Bibby's total sales, whereas Emco's purchases from Bibby are approximately 1% of its total purchases. [85]

140. As a result, these large distributors could exercise countervailing power if Bibby attempted to increase prices or to lessen competition. More generally, if

[84] Source: Various Bibby Sales and Gross Profit Analysis Reports, 2002
[85] http://www2.cdn-news.com/scripts/ccn-release.pl?/2003/02/24/0224008n.html?cp=ccnmatthews_f

these distributors believe that could obtain supplies more cheaply elsewhere, they have sufficient volume to make it worthwhile to encourage entry, either from new domestic production or from imports.

141. Two examples illustrate that such policing of competition by the largest distributors is not just theoretical, it has in fact frequently occurred. First, Nuroc apparently decided to switch to Vandem in 2000 to encourage and support its entry.[86] Second, Westburne/Wolsely, a large Western distributor, has left the SDP on numerous occasions in both Alberta and B.C. and since April 2002 in the whole of Western Canada.[87]

D. Events in the cast iron segment of the Canadian DWV industry since the introduction of the SDP

142. It is my understanding that Bibby introduced a loyalty program that rewarded distributors of plumbing supplies for stocking a full line of Bibby cast iron DWV products in January of 1998. If, as the Commissioner has alleged, Bibby's SDP has lessened competition in the supply of cast iron DWV products substantially, I would expect that Bibby's prices would have increased, and that competitors to Bibby, including importers and domestic manufacturers, would have become less effective competitors. I have therefore analyzed trends in prices of cast iron DWV products sold by Bibby, and I have also analyzed trends in entry and exit in the industry.

Bibby's Prices from 1997 to 2003

143. Since the introduction of the SDP in January of 1998, Bibby's average price per ton of pipe and fittings has fallen.[88] The average price per ton of pipe in 1997 was $ and by 2003, the price had fallen by more than 12%, to $

[86] Document 313 in the Commissioner's Disclosure Statement.
[87] Westburne was off the SDP in Alberta from January 1998 to July 1998, in British Columbia from January 1998 to July 1999, and in British Columbia since Jan 2002. Source: Document 492 of the Commissioner's Disclosure Statement.
[88] Price is measured as the total revenue (net of rebates and the portion of freight costs that is paid by Bibby) generated by sales of each product in all regions, divided by the total number of tons sold. All prices are in current dollars.

The fall in fittings prices was even more dramatic: in 1997, the price per ton of fittings was $, and by 2003 the price was $ a decrease of more than 33%. The price of couplings increased by a modest 5.5% between 1998 and 2003.[89]

144. The fall in overall Bibby prices was accompanied by large increases in volume sold. Bibby sold 58% more tons of pipe, and 109% more tons of fittings, in 2002 than in 1997.[90]

145. Bibby measures sales and volumes of its DWV products for the following six regions: the East (which consists of the Maritime provinces), Quebec, Ontario, the Prairies (Manitoba and Saskatchewan), Alberta, and British Columbia. Bibby began recording data separately for Alberta and British Columbia only in 2000, and prior to that year Bibby recorded the data for these two provinces as a single region, the West. In order to facilitate comparisons of 1997 with 2003 prices and volumes with 2003 data, I've aggregated the 2003 data for Alberta and British Columbia so that it is comparable to the 1997 data.

Table 4: Change in Bibby Price/Ton and Tons Sold (1997-2003) - Pipe
(net of rebates and freight)

	West	Prairies	Ontario	Quebec	East
% Change in Price/Ton	-40.0%	-8.8%	2.2%	14.3%	-4.9%
% Change in Tons	37.4%	132.4%	120.1%	0.0%	15.8%

Note: Compared data from last 9 months of 1997 with first 9 months of 2003
Source: Various Bibby Sales and Gross Profit Reports

146. I have calculated Bibby's prices and volumes for pipe and fittings for each of the five regions. In almost every region, the prices of pipe and fittings have fallen since 1997. The only exceptions are the price of pipe in Ontario, which

[89] Source: Various Bibby Sales and Gross Profit Analysis Reports
[90] Source: Various Bibby Sales and Gross Profit Analysis Reports

increased by 2.2% between 1997 and 2003, and the price of pipe in Quebec, which increased by 14.3% (most of the increase occurred between 1997 and 1998, when the price jumped by 13%). In all other regions, prices fell, in many cases significantly: in the West, for example, the price of pipe fell by 40% and the price of fittings fell by more than 48%. Tables 4-5 summarize the regional price and tonnage changes for Bibby pipe and fittings between 1997 and 2003.

Table 5: Change in Bibby Price/Ton and Tons Sold (1997-2003) - Fittings
(net of rebates and freight)

	West	Prairies	Ontario	Quebec	East
% Change in Price/Ton	-48.4%	-42.2%	-29.1%	-8.0%	-22.6%
% Change in Tons	82.0%	295.0%	207.7%	17.3%	68.5%

Note: Compared data from last 9 months of 1997 with first 9 months of 2003
Source: Various Bibby Sales and Gross Profit Reports

147. The changes in Bibby couplings unit prices and number of units sold between 1998 and 2003 are reported in Table 6. I have only calculated the change in couplings prices and sales since 1998 since Bibby does not have data on couplings sold in 1997.

Table 6: Change in Bibby Price/Unit and Units Sold (1998-2003) - Couplings*
(net of rebates and freight)

* Includes CREMCO sales

	West	Prairies	Ontario	Quebec	East
% Change in Price/Unit	19.5%	-22.3%	-7.6%	15.7%	11.2%
% Change in Units	15.5%	178.7%	68.2%	3.7%	-35.1%

Note: Compared data from first 9 months of 1998 with first 9 months of 2003
Source: Various Bibby Sales and Gross Profit Reports

1. Entry by Importers

148. Imports of cast iron DWV pipe and fittings have increased significantly since the introduction of the SDP in 1998. There were virtually no imports of

cast iron soil pipe from non-US sources before 1998,[91] but since 1998, importers from China and other low-cost sources have begun to bring significant volumes of soil pipe into Canada. Similarly, imports of fittings have generally trended upward since 1998. The average annual volume of imports of cast iron pipe and fittings during the five year period immediately before the introduction of the SDP (1993-1997) was 564,014 kilograms, while during the first five years after Bibby introduced the SDP, average annual imports of pipe and fittings increased by 72%, to 968,414. The annual average value of imports increased by even more: from $638,652 during the period 1993-1997 to $1,417,382 during 1998-2002, and increase of 122%.[92]

149. The fact that imports have been significant is not surprising given the substantial capacity of foreign producers, the ease with which importers can bring product into Canada, and the relatively low prices of imports.

150. Bibby has estimated that China has the capacity to produce 250,000 tons of cast iron DWV pipe and 150,000 tons of fittings (compared to Canada's capacity to produce 48,000 tons of pipe and 22,000 tons of fittings). Venezuela also has significant production capacity, as does the US.

151. Canadian companies that are importing cast iron DWV product include Taurus Industries Ltd., John L/ Schultz Lte., Kent Sharp Company Ltd., Sierra Distributors, and Sino-West Trading Inc.

152. Imported cast iron DWV products reach contractors in a number of different ways: importers (eg. Sierra) who sell primarily to plumbing contractors, but also to distributors; large wholesale distributors who import directly (eg. Westburne).

[91] My understanding is that imports from the US during the early and mid-1980's consisted largely of intra-company transfers.
[92] Source: Statistics Canada: Canadian International Merchandise Trade Database.

Sierra Distributors

153. Sierra Distributors is owned by Dave Kelm. It has been selling cast iron products, including manhole frames and covers, for about 6 years. Sierra began importing cast iron DWV fittings in about 1999, and in 2000, it began to import cast iron DWV pipe. It also now carries Ideal couplings, so it has a full line of cast iron DWV products, except for some specialty fittings.

154. Sierra sells cast iron DWV pipe and fittings to wholesalers and directly to contractors. Note that since Sierra started importing these products only in 1999, it entered the DWV market *after* Bibby introduced its SDP. Products are sold to contractors on a project-by-project basis, and there appears to be no limit to the size of project that Sierra can supply.

155. Sierra has been able to achieve a significant market share despite the fact that it is essentially a family operation. Bibby estimates that Sierra's share of Canadian cast iron DWV sales is about 2-3%, while its share of cast iron DWV sales in BC and Alberta is about 8%.[93] Since imports are usually sold at a much lower price than domestically produced cast iron products, Sierra's share of total volumes are likely to be higher.

156. Sierra's influence on market prices appears to be even stronger than these sales share figures would suggest. Many distributors and contractors use the threat of ordering imports from Sierra in order to extract more favourable prices from Bibby and other DWV manufacturers and distributors.[94]

2. Domestic Entry

157. Vandem Ltd started production of cast iron pipe and fittings in Cambridge, Ontario in 1999. In order to begin production of soil pipe, only one new piece

[93] Source: Document 1024 in CPC's Disclosure Statement.

[94] For example, see Document 908 of CPC's Disclosure Statement regarding a contractor request, in January 2002, to Emco Supply (a Bibby Stocking Distributor) to match Sierra's prices. Similarly see Document 998 of CPC's Disclosure Statement regarding Emco Supply reducing its prices of Bibby products to Keith Plumbing in June 2002 in order to secure a job with a contractor who was considering purchasing its DWV requirements from an importer.

of equipment had to be added to the existing Crowe foundry—a double centrifugal spinner.[95]

158. Vandem has reported that its fixed cost per tonne[96] of pipe in 1999 was is , and its fixed cost per ton in 2000 was . Variable cost per ton of pipe in both years was and therefore, total cost per ton (not including transportation costs) was in 1999 and in 2000. This implies that fixed costs represented only of total costs in 1999, and only of total costs in 2000.

159. The proportion of Vandem's total cost of producing fittings accounted for by fixed costs is even smaller. Vandem's variable costs for fittings are $ per ton in each of 1999 and 2000, while fixed costs per ton are in 1999 and in 2000, implying that fixed costs represented 4.6% of total costs in 1999, and 4.1% of total costs in 2000 .

160. The Commissioner has not disclosed any information explaining how Vandem has calculated its costs. There are many procedures for estimating fixed and variable costs, and each makes different assumptions about what items are included, whether a return on capital is built in to the estimates, etc. But however Vandem has calculated its costs, it appears that its estimates of fixed costs are not consistent with those of a capital intensive industry in which barriers to entry are significant.

161. The founders and top executives of Vandem both worked for Canada Pipe before entering the market themselves with Vandem, and presumably knew the Canadian DWV industry well. Bibby's SDP program had been in place for a year when Vandem's entry occurred.

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[95] It is my understanding that the aggregate initial capital investment for pipe production (sufficient to supply 90% of the Canadian market) can range from $350,000 to $750,000, while the cost of obtaining fittings patterns sufficient to supply about 80% of Canadian demand would cost about $700,000-$750,000.

[96] The Commissioner's disclosure statement includes data from Vandem but does not include any explanation of the data. Appendix C of Vandem's data set includes data referred to only as "T", and I have assumed that T means metric tonnes. My conclusions would not be materially affected by alternative assumptions about the interpretation of "T".

162. I have calculated Vandem's margins based on the data submitted to the Commissioner in response to various information requests and s. 11 orders. These data cover only the period March 1999 to October 2000. They are reported in Appendix D.[97]

163. Unfortunately, the Commissioner has not disclosed any price, sales volume, or cost data for Vandem after 2001 (and even the 2001 data are very limited). Consequently, I am unable to determine whether Vandem continues to earn healthy profits, but we may infer some degree of profitability from the continuing (and indeed expanding)[98] operation.

164. In addition to the profits it made on domestic sales of cast iron pipe and fittings, Vandem has apparently leveraged its investments in cast iron soil pipe production to make sales in other markets. For example, in (at least) 2001, Vandem made significant sales in the US: according to documents submitted to the Commissioner, Vandem sold about units of its 5 top selling pipe products in Canada, and sold almost units in the U.S. The Commissioner has not disclosed any information about Vandem sales in the U.S. after 2001, but I believe that Vandem has continued to maintain a profitable presence in the marketplace.[99]

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[97] I have calculated that Vandem's profit (revenues net of fixed and variable costs) on sales between March of 1999 and October of 2000, was . Document 578 of the Commissioner's Disclosure Statement.

[98] I have estimated, based on the Vandem data in Document 578 of the Commissioner's Disclosure Statement and on Bibby sales data contained in its Sales and Gross Profit Analysis reports, that Vandem had less than a 6% share of domestic cast iron DWV sales in 2000. Russ Demeny's Will Say Statement for the Commissioner (Commissioner Witness 11) indicates that Vandem "currently has 10% of the Canadian market". This suggests that Vandem has experienced substantial growth over the last several years.

[99] I have some additional information indicating that Vandem has had some success in the market.

- Vandem is the (only) 'approved supplier' of cast iron soil pipe and fittings to Canaplus, a buying group. Canaplus is made up of 57 beneficiaries in Canada: including 34 wholesaler distributors and 23 retailers, who collectively operating more than 300 sales points across Canada. Canaplus beneficiaries had sales of about $2.8 billion in 2000. According to the Canaplus web site, 'a vendor has to supply at least five beneficiaries of Canaplus'. Source: Canaplus website at: www.canaplus.com
- Vandem is a 'Supplier' to Octo Purchasing Group Ltd.

IX. THE COMMISSIONER'S REFERENCE TO CANADA PIPE'S ACQUISITIONS

165. The Commissioner alleges that "Canada Pipe's acquisition of rivals and imposition of unreasonable restrictive covenants constitute further anti-competitive acts.....".[100] I assume that the Commissioner is referring to the acquisition by Canada Pipe of Cremco Couplings in 1998 and the acquisition of BMI's inventory of imported fittings. I assume that the reference to "restrictive covenants" refers to the non-compete agreements made with Dave Gooding, owner of Bibby Ste. Croix, as part of that acquisition.

166. I find it difficult to understand, given the little information provided by the Commissioner, how acquisitions can be treated as anticompetitive acts under section 79 of the Competition Act. The possibility that an acquisition can create market power and lead to a substantial lessening of competition can be investigated under the merger sections of the Act, but these transactions were not challenged at the time under those sections. Without a more specific allegation I can find no basis that these acquisitions constituted anticompetitive acts.

167. Non-compete clauses are common features of acquisitions. Since we observe them in competitive markets it is reasonable to conclude that they serve a purpose of enhancing efficiency. Moreover, in this industry, several ex employees of Bibby have in fact entered the industry, and acted as a significant competitive force. Both Vandem and Sierra Marketing were started by former employees of Bibby.

[100] Statement of Grounds and Material Facts, at 8.

X. AN ECONOMIC ANALYSIS OF THE RELIEF REQUESTED BY THE COMMISSIONER

168. The Commissioner has requested that the Tribunal make a number of orders should it find that Bibby's allegedly anti-competitive acts require a remedy. In the ensuing paragraphs I consider what the likely consequences of various orders prohibiting Bibby from employing a loyalty program would be.

169. As I have explained in my Report, partnership programs similar to Bibby's SDP are common throughout the plumbing and construction supplies industry, and are a normal and likely efficient element of a competitive market structure. To prohibit one firm, Bibby, from using such programs, will handicap Bibby's ability to compete, particularly against the plastic pipe producers, who, I understand, do themselves use loyalty programs. The likely effects of such a handicap will not only be a further erosion of Bibby's market share, but will also weaken the ability of all cast iron DWV manufacturers to compete against other DWV materials, including plastic.

170. I have explained how the SDP is integral to Bibby's efforts to convince contractors to continue to specify cast iron for DWV installations in buildings where cast iron has traditionally been favoured, including buildings covered by the fire safety requirements of building codes, and in buildings, such as hotels and high-end residential homes, where sound suppression is a priority. PVC manufacturers, such as IPEX, have made significant inroads into these applications, primarily through the development of new products (such as System 15 and System XFR) which IPEX has heavily promoted with contractors, building inspectors, and engineers. Bibby's SDP is largely a response to these developments.

171. Another possible scenario, suggested to me by Bibby, is that the loss of the SDP will render the Quebec manufacturing operation uneconomic, and that

Bibby will be forced to close the foundry with a consequent loss of jobs and source all of their products through Asian imports.

172. An end to Bibby's SDP is likely to have a significant effect on the number and size distribution of distributors. Whether or not Bibby continues to produce in Canada, by ending the SDP they would be forced to end their support for the smaller distributors. Most likely the SDP would be replaced by a volume discount program, which would make it difficult for smaller distributors to survive. Once again, since contractors do place some value on the availability of a local distributor, this could further erode Bibby's competitive position and hasten the end of cast iron DWV product being produced in Canada.

173. The purpose clause of the Competition Act, section 1.1, includes the phrase "to ensure that small and medium-sized enterprises have an equitable opportunity to participate in the Canadian economy ". I note that a prohibition order on Bibby's SDP would be likely have the opposite effect.

SWORN BEFORE ME at the City of Toronto, in the Province of Ontario this 20th day of February, 2004.

A Commissioner of Oaths

R. Ware

ROGER WARE, Ph.D.

APPENDIX A

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

CURRICULUM VITAE

January 2004

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DATE AND PLACE OF BIRTH: February 23, 1951 - England

CITIZENSHIP: Canadian and U.K.

EDUCATION:

B.A. Honours (Economics)
Cambridge University
Awarded June 1972

M.A. (Cantab) awarded July 31, 1976

M.A. (Industrial Economics)
University of Sussex, England
Awarded December 1973

Ph.D., Queen's University,
Kingston, Canada, Awarded October 1981

POSITIONS HELD:

July 1997 - present	Professor, Queen's University
January 1991 - June 1997	Associate Professor, Queens University
August 1993 - August 1994	Holder of T.D.MacDonald Chair in Industrial Economics, Bureau of Competition Policy, Ottawa
1989 - December 1990	Associate Professor, University of Toronto
1987-88	Visiting Associate Professor, Department of Economics, University of California, Berkeley.
1986-87	Sabbatical Leave. Visiting Research Scholar, Carleton University and National Bureau of Economic Research, Stanford University
July 1986	Promoted to Associate Professor with Tenure, University of Toronto.
1981-86	Assistant Professor (Economics), Erindale College, University of Toronto.
1980-81	Lecturer in Economics, Erindale College, University of Toronto.
1979-80	Instructor, Introductory Economics, Queen's University
1977-79	Various Tutorial and Research Assistantship Positions held, Queen's University.

POSITIONS HELD (continued)

1975-1977	U.K. Department of Industry, Industrial Policy Analysis and Briefing Division. Provided advice on government support for research and development, and special assistance schemes for industry. During this period I completed a cost-benefit study of cost sharing support for industrial development projects.
1973-1975	U.K. Department of Industry. Economic Assistant, working on an econometric forecasting model of U.K. trade flows. Promoted to Senior Economic Assistant, October 1974.

AWARDS:

Holder of R. Samuel Mclaughlin Scholarships for graduate studies at Queen's University, 1977-78, 1978-79, 1980-81 sessions.

Awarded a Social Sciences and Humanities Research Council Post Doctoral Fellowship for 1983-84, renewed for 1984-85.

Awarded an SSHRC Leave Fellowship, 1986-87.

MAJOR FIELDS OF RESEARCH INTEREST:

Industrial Organization:

- Antitrust Economics and Competition Policy
- Strategic Behavior
- Research and Development
- Dynamic Modelling
- Trade and Industrial Policy

Public Economics

BOOKS

Industrial Organization: a Strategic Approach. (with Jeffrey Church, University of Calgary) 2000. Boston: Irwin McGraw-Hill.

JOURNAL PUBLICATIONS

"Predatory Pricing In Canada, The United States And Europe: Crouching Tiger or Hidden Dragon," with Brian Facey, December 2003, *World Competition Review*

"Is Competition Law 'Beyond the Ken of Judges'?" 2001. *Canadian Competition Record.* Vol 20, No. 3.

"Efficiencies and the Propane Case" (2000), *International Antitrust Bulletin.*

"A Dynamic Model of Endogenous Trade Policy," (2001) joint with Bev Lapham,
Canadian Journal of Economics.

"Interac, Essential Facilities and Access to Electronic Funds Networks: a Comment on Mathewson and Quigley," (1998) with Brian Rivard, *Canadian Competition Record*, 18: 12-21.

"Abuse of Dominance under the 1986 Canadian *Competition Act*," with Jeffrey Church, (1998) *Review of Industrial Organization*, 13: 85-129.

"Trade Dress and Pharmaceuticals: Efficiency, Competition and Intellectual Property Rights," 1997 with Jeffrey Church, *Policy Options*, September.

"Delegation, Market Share and the Limit Price in Sequential Entry Models," (1996) with Jeffrey Church, *International Journal of Industrial Organization*, 14: 575-609.

"Public Firms as Regulatory Instruments with Cost Uncertainty," (1996) with Devon Garvie, *Canadian Journal of Economics*, XXIX No. 2: 357-378.

"Raising Rivals' Costs and Alcoa: a Rejoinder" (1994) *Canadian Competition Policy Record*, October.

"Understanding Raising Rivals' Costs: a Canadian Perspective," (1994) *Canadian Competition Policy Record*, March.

"Markov Puppy Dogs and Related Animals," (1994) with Bev Lapham, *International Journal of Industrial Organization*, 12, 569-593.

"A Sequential Entry Model with Strategic Use of Excess Capacity," (1993) with

Brad Barham, University of Wisconsin, *Canadian Journal of Economics*, XXVI, No. 2, 286-298.

"Evolutionary Stability in the Repeated Prisoner's Dilemma," (1989) with Joseph Farrell, *Theoretical Population Biology*, 36, 161-166.

"Eliminating Price Supports: a Political Economy Perspective," (1989) with Tracy Lewis and Robert Feenstra, *Journal of Public Economics*, 40, 159-185.

"Forward Markets, Currency Options and the Hedging of Exchange Risk," (1988) with Ralph Winter, *Journal of International Economics*, 25, 291-302.

Review of The New Industrial Organization: Market Forces and Strategic Behavior by Alexis Jacquemin (1988), *Southern Economic Journal*.

"A Theory of Market Structure with Sequential Entry" (1987), with Curtis Eaton, *Rand Journal of Economics*, Vol. 18, #1, 1-16.

"A Model of Public Enterprise with Entry" (1986), *Canadian Journal of Economics*, XIX, 642-655.

"Long Term Bilateral Monopoly: The Case of a Resource" (1986), with Tracy Lewis and Robin Lindsey, *Rand Journal of Economics*, vol. 17, No. 1.

"Public Pricing Under Imperfect Competition" (1986), with Ralph Winter, *International Journal of Industrial Organization*, 4, 87-97.

"On the Shapes of Market Lattices in Loschian Spatial Models" (1986), with Mukesh Eswaran, *Journal of Regional Science*."Inventory Holding as a Strategic Weapon to Deter Entry" (1985) *Economica*, 52, 93-102.

"Lumpy Investment in a Growing Differentiated Market" (1984), *Economica*, 51, 377-391

"Sunk Costs and Strategic Commitment: A Proposed Three-Stage Equilibrium" (1984), *Economic Journal*, 94, 370-378.

"Strategic Timing and Pricing of a Substitute in a Cartelized Resource Market" (1983), with Nancy Gallini and Tracy Lewis, *Canadian Journal of Economics*, XVI, 429-446.

Three Essays on the Economics of Differentiated Markets (1981), Ph.D. Thesis, Queen's University,

"The Relationship Between Efficiency and Technical change" (1977), in *Industrial Efficiency and the Role of Government*, edited by C.Bowe, HMSO, London.

ARTICLES IN BOOKS

Publication (on CD) of paper "Recent legislative changes: is competition law becoming too industry specific?"contained in proceedings of Canadian Bar Association 2002 Annual Fall Conference on Competition Law

"The Effect of Uncertainty on theValue of Strategic Commitment." 2002. With B.C.Eaton, in volume, Applied Microeconomic Theory: Selected Essays of B. Curtis Eaton. Northampton, MA: Edward Elgar.

"Leading Edge Issues in the Economics of Competition Law," in J.B.Musgrove ed., *Competition Law for the 21st Century*, (proceedings of the 1998 Canadian Bar Association), Juris Publishing.

"Network Industries, Intellectual Property Rights, and Competition Policy." 1998. in N. Gallini and R. Anderson ed., *Competition Policy, Intellectual Property Rights and International Economic Integration* Industry Canada Research Series, The University of Calgary Press.

"Entry Deterrence" (1991) chapter in *New Developments in Industrial Organization* ed. by Manfredi La Manna and George Norman, Edward Elgar Publishing, London.

Review of Market Structure and Innovation, by M.I.Kamien and N.L.Schwartz (1983), *Canadian Journal of Economics*.

RECENT PROFESSIONAL ACTIVITIES

Refereeing on a regular basis for *American Economic Review, Canadian Journal of Economics, The International Journal of Industrial Organization, The Journal of Industrial Economics*, and occasionally for *Journal of International Economics*, and *International Economic Review*.

Presentation of a paper "Efficiencies and the Propane Case" at the CBA Competition Law Section Meetings, Ottawa, September 2000.

Organizer, Paper presenter and Chair of two Sessions on *Competition Act* at 1997 Canadian Economics Association Annual Conference, St. John's, Nfld., June 1997.

Organizer and Chair of Panel Session on Canadian Competition Policy at 1992 Canadian Economics Association Annual Conference, Charlottetown, June 1992.

Co-Organizer of UBC Conference on Industrial Organization, July 1993

Organizer of a Conference on *Barriers to Entry*, March 1995, at the Bureau of Competition Policy, Ottawa.

Holder of the T.D.McDonald Chair in Industrial Organization at the Competition Bureau, Ottawa, from 1993-94.

Membership of Professional Societies -

Member of Canadian Economics Association, American Economics Association.

APPENDIX B – TAB 4

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

Freedonia

INTRODUCTION

Methodology & Sources of Information

The Freedonia Group Incorporated is a leading international industry study/database company. Since 1985, Freedonia has published nearly 2,000 titles covering such areas as building materials, chemicals, communications, health care, packaging, pharmaceuticals, plastics, security and many other industries. Studies cover entire industry sectors as well as key niche markets. Each study includes such valuable intelligence as growth markets and products, market share, product analyses and forecasts, market analyses and forecasts, and company profiles. Studies specific to the United States also place the industry into its international context.

This comprehensive study analyzes the US pipe industry, with particular emphasis on plastic pipe and resins consumed. Historical data (1992, 1997 and 2002) and forecasts to the years 2007 and 2012 are provided for seven competitive pipe materials and eight types of plastic pipe in 14 markets. All demand data reflect apparent consumption (production plus imports minus exports) and are given in pounds or feet. Although distinctions are sometimes made between pipes and tubes, for the purposes of this study the terms "pipe," "tubes"and "tubular products" are used interchangeably.

Information and data on the pipe industry were obtained from a variety of primary and secondary sources including government and trade associations, publications such as 2002 Building Construction Cost Data (RJ Means), industry participants, online databases and other Freedonia studies. Principal government sources included the US Department of Commerce Current Industrial Reports, including M32D, Clay Construction Products; MA33B, Steel Mill Products; MA33A, Iron and Steel Castings; and M33D Aluminum Ingot and Mill Products; as well as the US Industrial Outlook and Census of Manufactures. Trade associations were another important source of information and included the Aluminum Association, American Concrete Pipe Association, American Iron & Steel Institute, American Plastics Council (APC), Cast Iron Soil Pipe Institute, the Copper Development Association, the Corrugated Steel Pipe Institute, Ductile Iron Pipe Research Association, the Plastic Pipe Institute (a division of the Society of the Plastics Industry), the Steel Tube Institute of North America, and the Uni-Bell PVC Pipe Association. Other sources included various trade publications, such as American City & County, American Metal Market, Chemical and Engineering News, Chemical Week, Modern Plastics, Oil & Gas Journal, Plastics News, Pipeline and Gas Journal and Pipe Line Industry. Various other government and trade association publications, trade journals, corporate annual reports, SEC Form 10-K filings, promotional literature, industry reports, security analyst reports and other publications were utilized, in addition to on-line data bases.

Throughout this study demand is related to various indicators for comparative purposes and to facilitate further analysis. Tabular details may not add to totals due to independent rounding, and calculated ratios reflect unrounded numbers. The macroeconomic indicators used in this study were obtained from The Freedonia Group Consensus Forecasts dated April 2003. Due to the Bureau of Economic Analysis' use of chain weighted price indices, inflation-adjusted gross domestic product components (1996 dollars) do not add to the total. Freedonia Group Industry Studies covering related topics include #1719 World Plastic Pipe (September 2003), #1661 Reinforced Plastics (April 2003) anad #1644 Large Diameter Pipe (February 2003).

Also included are profiles (listed alphabetically) of a selected group of US pipe producers which are considered representative of the various pipe markets and materials used. Companies may specialize in particular types of pipe or

produce a variety of types for different markets. Firms profiled range from large, broad line material producers to smaller and/or more specialized manufacturers. These profiles should not be considered all-inclusive, but rather a sampling or cross-section of the types of companies involved in the industry. Sources for the information presented in this section include annual reports, SEC 10-K filings, security analyst reports, corporate product literature, company web sites and interviews with responsible corporate officers. The sales figures presented for privately held firms represent the best available information at the time of publication. Information presented reflects data received as of September 2003 and may not include the latest corporate releases.

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COMPETITIVE PIPE MATERIALS

PLASTIC PIPE DEMAND BY MARKET (million pounds) 1992-2012

Item	1992	1997	2002	2007	2012
Construction Expenditures (bil 96$)	533	633	692	779	850
lbs/000$ expend	9.4	11.3	11.9	12.6	13.4
Plastic Pipe Demand	4990	7155	8250	9800	11410
Potable Water:	1496	1947	2259	2668	3053
Service & Distribution	923	1148	1195	1373	1521
Municipal	495	677	921	1135	1356
Rural	78	122	143	160	176
Drain & Sewer:	1197	1964	2377	2931	3552
Drain	777	1250	1436	1660	1951
Sewer	420	714	941	1271	1601
Drain, Waste & Vent	662	963	1108	1275	1442
Conduit:	651	958	981	1085	1200
Communications Duct	91	209	166	195	225
Electrical & Other	560	749	815	890	975
Gas & Oil:	296	385	488	620	737
Gas	240	311	396	503	599
Oil	56	74	92	117	138
Process Industries	285	375	408	460	514
Drain & Irrigation:	293	416	466	565	682
Drain	225	310	350	432	532
Irrigation	68	106	116	133	150
Structural, Mechanical & Misc.	110	147	163	196	230
% plastic	10.3	11.6	12.7	13.7	14.5
Total Pipe Demand	48450	61530	65100	71650	78440

PLASTIC PIPE DEMAND BY MARKET, 2002 (percent)
(8.3 billion pounds)

Item	Percent
Drain & Sewer	29
Potable Water	27
DWV	13
Conduit	12
Drain & Irrig	6
Gas & Oil	6
Other	7

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COMPETITIVE PIPE MATERIALS

PLASTIC PIPE & FITTINGS DEMAND 1992-2012

Item	1992	1997	2002	2007	2012
Total Pipe & Fittings Demand (mil $)	3160	5270	6595	8815	11465
$/lb	0.60	0.70	0.76	0.85	0.95
Total Pipe & Fitting Demand (mil lbs)	5280	7560	8720	10355	12060
Pipe Demand (mil $)	2600	4460	5630	7540	9800
$/lb	0.52	0.62	0.68	0.77	0.86
Pipe Demand (mil lbs)	4990	7155	8250	9800	11410
Pipe Fittings Demand (mil $)	560	810	965	1275	1665
$/lb	1.93	2.00	2.05	2.30	2.56
Pipe Fittings Demand (mil lbs)	290	405	470	555	650

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COMPETITIVE PIPE MATERIALS

CAST IRON PIPE DEMAND BY MARKET (million pounds) 1992-2012

Item	1992	1997	2002	2007	2012
Bldg Construction Expend (bil 1996$)	410.1	515.8	559.1	631.0	685.0
lbs/000$ expend	9.1	7.6	7.9	7.3	7.1
Cast Iron Pipe Demand	3740	3940	4400	4620	4850
Municipal Water	3130	3400	3870	4120	4380
Drain, Waste & Vent	520	444	430	410	390
Drain	90	96	100	90	80
% cast iron	7.7	6.4	6.8	6.4	6.2
Total Pipe Demand	48450	61530	65100	71650	78440

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COMPETITIVE PIPE MATERIALS

Cast Iron Pipe - Markets

Municipal water distribution markets for cast iron pipe will expand at an above average pace to 4.1 billion pounds in 2007, accounting for 89 percent of all cast iron applications. This results from cast iron's superior pressure capabilities, durability and strength. Cast iron has a comparative advantage in high pressure water uses, particularly in diameters of more than 14 inches.

Despite continued demand declines, cast iron drain, waste and vent (DWV) pipe will remain the preferred material in higher performance applications such as multi-story buildings where greater structural strength is mandatory. Cast iron DWV pipe is also frequently used as the main stack pipe in residential buildings due to its better sound deadening properties compared to plastic. Smaller drain markets for cast iron pipe will also decline over the forecast period as a result of competition from lighter and easier to install high density polyethylene pipe.

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COMPETITIVE PIPE MATERIALS

COPPER PIPE DEMAND BY MARKET (million pounds) 1992-2012

Item	1992	1997	2002	2007	2012
Bldg Construction Expend (bil 1996$)	410.1	515.8	559.1	631.0	685.0
lbs/000$ expend	2.3	2.5	2.4	2.4	2.4
Copper Pipe Demand	956	1271	1322	1490	1620
Service & Distribution	510	734	717	800	860
Refrigeration Equipment	412	508	587	675	747
Drain, Waste & Vent	34	29	18	15	13
% copper	2.0	2.1	2.0	2.1	2.1
Total Pipe Demand	48450	61530	65100	71650	78440

Freedonia

PLASTIC PIPE BY RESIN

POLYVINYL CHLORIDE PIPE DEMAND BY MARKET (million pounds) 1992-2012

Item	1992	1997	2002	2007	2012
Construction Expenditures (bil 1996$)	533	633	692	779	850
lbs/000$ expend	7.0	8.2	8.4	8.7	9.1
Polyvinyl Chloride Pipe Demand	3715	5200	5800	6745	7705
Potable Water	1400	1808	2053	2360	2640
Drain & Sewer	810	1250	1355	1650	1960
Drain, Waste & Vent	575	875	1020	1185	1350
Conduit	570	760	830	910	1000
Drainage & Irrigation	195	285	310	378	465
Process Industries	87	115	118	128	136
Gas & Oil Production:	46	60	70	84	98
Gas	34	42	50	60	70
Oil	12	18	20	24	28
Structural, Mechanical & Misc.	32	47	44	50	56
% PVC	74.4	72.7	70.3	68.8	67.5
Plastic Pipe Demand	4990	7155	8250	9800	11410

PVC PIPE DEMAND BY MARKET, 2002 (percent)
(5.8 billion pounds)

Item	Percent
Potable Water	35
Drain & Sewer	23
DWV	18
Conduit	14
Drain & Irrig	5
Other	4

Freedonia

PLASTIC PIPE BY RESIN

Polyvinyl Chloride Pipe - Characteristics & Technologies

Polyvinyl chloride resins are readily modified by fillers and additives to serve a wide range of pipe uses and conditions. Although polyvinyl chloride is normally beige in color, the addition of chalk as a filler results in a white-colored pipe. Properties are also easily altered by using additives such as flame retardants and ultraviolet light stabilizers. Polyvinyl chloride has established itself as the plastic pipe leader because of its light weight, extrudability, abrasion and corrosion resistance, installation ease, cost efficiency, immunity to chemical attack and resistance to ultraviolet light and electrolytic attack. PVC is also self-extinguishing after exposure to and removal from flame. It can tolerate water temperatures up to 165 degrees Fahrenheit and pressures up to 265 pounds per square inch without deformation. Primary non-plastic competitors of PVC pipe are concrete, copper and steel.

Freedonia

INDUSTRY STRUCTURE

PLASTIC PIPE INDUSTRY MARKET SHARE, 2002 (percent)

($5.6 billion)

Company	Percent
Market Leaders	34.6
J-M Manufacturing	9.6
Performance Pipe	6.4
ADS	5.8
NAPCO	4.6
PWPipe	4.2
Hancor	4.0
Others	65.4

Freedonia

INDUSTRY STRUCTURE

Competitive Strategies

Primary strategies employed in the pipe industry include low cost leadership and market segmentation. Low cost leadership can be achieved via vertical integration, permitting ready access to stable, low cost feedstock materials. Sizable producers also have more control over additive and other costs by virtue of their purchasing volume. Examples of vertically integrated firms include Chevron Phillips Chemical and J-M Manufacturing.

Chevron Phillips Chemical is a major high density polyethylene resin producer that is integrated downstream into high density polyethylene pipe production. The firm produces drain, sewer and gas distribution pipe using different densities of its MARLEX resins. J-M Manufacturing, a leading polyvinyl chloride pipe producer, also has captive production capabilities for chlorine, ethylene dichloride and vinyl chloride monomer feedstocks, giving it a distinct competitive advantage. The firm's management philosophy is to better serve its customers by offering a full range of product lines. Corporate strategies include centralizing operations, maintaining economies of scale in order to lower operational costs and pursuing continual improvement and rationalization programs.

Some firms employ market segmentation strategies by concentrating their marketing, research and production efforts on one product, material or geographic market in order to gain a competitive advantage over other firms. For instance, American Cast Iron Pipe has the largest ductile iron pipe plant in the US. Can-Clay, Logan Clay Products and MCP specialize in clay pipe and related products such as flue liners and wall coping.

Other competitive strategies include product innovation, good technical service backup, product quality and on-time delivery. For example, George Fischer stresses the firm's services, such as one-stop shopping, by providing valves, measuring devices and other flow-related products in addition to the plastic pipe. Other firms promote pipe use by focusing on safety and technology. Producers of chlorinated polyvinyl chloride pipe promote their product's safety advantages in residential sprinkler systems, as a lower cost alternative to a copper pipe based system. The promotion of radiant heating systems for home underfloor heating systems, and under patios, walkways and driveways also increases demand for crosslinked polyethylene and other pipe. Lamson & Sessions has taken another approach by equipping two extrusion plants with compounding capabilities in order to lessen the impact of PVC resin price fluctuations on gross margins. The firm runs different PVC compounds depending on the diameter of pipe being produced.

Freedonia

INDUSTRY STRUCTURE

Cooperative Agreements

In light of high research costs and often lengthy payback times, firms frequently use cooperative agreements such as joint ventures, partnerships and licensing agreements to expand markets, product lines and territory. Joint ventures enable a firm to reduce risks by spreading research and development, production and marketing costs. They also provide a synergistic relationship whereby the advantages of both firms are combined to provide a sum greater than the parts. Many of the cooperative agreements in the large diameter pipe industry center around securing feedstock supplies.

An excellent example of a synergistic relationship is Chevron Phillips Chemical Company (CPChem). The firm, a 50/50 joint venture between ChevronTexaco and ConocoPhillips, is a leading worldwide manufacturer of olefins and polyethylene. Additionally, Chevron Phillips Chemical is the largest manufacturer of polyethylene pipe in North America, including large diameters. The firm is also vertically integrated and captively produces the MARLEX polyethylene resin used in pipe manufacture.

Other examples include Hancor's January 2002 agreement with Amanco Group (Mexico) to market HDPE drainage pipe in Mexico. Amanco (Nueva AG - Switzerland) is a producer of plastic and concrete pipe and other building products for the Latin American market. The company operates 17 facilities in 14 Latin American countries, including three plants in Mexico in Mexico City, Leon and Monterrey. Pipes sold under the agreement, including large diameter types, are manufactured at plants located in Texas and California. This was Hancor's first alliance outside of the US market.

Can-Clay markets and distributes DENLOK pipe in North America through a joint venture with Naylor Industries plc (United Kingdom), which gives Can-Clay the exclusive North American license to produce the pipe. Naylor Industries markets DENLOK outside of North America. DENLOK pipe is engineered to be placed through trenchless installation methods such as microtunneling and slip lining.

Walter Industries (US Pipe and Foundry)	licensing	McWane	TYTON joints

SECTION VII
DRAIN, WASTE & VENT PIPE

General

Drain, waste and vent (DWV) pipe demand is expected to increase 2.5 percent annually to 928 million feet in 2007. Growth will be stimulated by rapid advances in the nonresidential construction segment and expanding residential remodeling and improvement markets, particularly in the do-it-yourself segment. Further advances will be derailed by a stabilized private housing start picture and slow growth in residential construction expenditures. Average home size, although stabilizing, has expanded significantly over the past decade and the average number of bathrooms per house has increased. Residential drain, waste and vent pipe demand is greater on a per unit basis than its nonresidential counterpart because nonresidential facilities tend to be more clustered. DWV pipe opportunities will be particularly evident in nonresidential applications such as office buildings, schools and hospitals.

Demand for plastic DWV pipe is projected to expand 2.8 percent annually to 850 million feet in 2007, representing 92 percent of all pipe used in DWV applications. Advantages of plastic pipe in non-load bearing applications include low cost, corrosion resistance, installation ease and longevity. Continued declines in cast iron and copper DWV pipe are anticipated due to the cost and performance advantages offered by plastic pipe. However, cast iron pipe will remain the material of choice in uses such as multi-story buildings because of the material's superior high pressure capabilities, sound deadening properties and flame resistance. Copper pipe demand in DWV uses will decline to nine million feet, and copper pipe will be mainly used where

durability and corrosion resistance are prime requirements. Steel pipe demand will also stabilize at low levels in uses where building codes demand it, or where steel's higher cost can be economically justified.

Drain, waste and vent pipe forms the interlocking network which deals with waste removal within a building or structure. It consists of two primary parts: pipe used for actual waste removal and pipe used for venting purposes. The former pipe is directly connected to the sink, shower stall or sanitary facility and conducts waste material directly to the sewer. Venting pipe enables the system to breathe and promotes smooth pipe operation by eliminating in-line vacuums and the possibility of backflow. Vent pipe is of smaller diameter than waste pipe as its only purpose is to provide access to the atmosphere. Fittings comprise a much larger percentage of pipe requirements in DWV applications (30 percent versus five or six percent for most other pipes) because of the large number of structural interconnections required.

Plastic drain, waste and vent pipe producers include Genova Products, Hancor, North American Pipe and PWPipe. Charlotte Pipe & Foundry is the largest producer of plastic drain, waste and vent pipe and fittings in the US. Producers of cast iron and copper drain, waste and vent pipe include Cerro Copper Products, McWane and Mueller Industries.

Item	1992	1997	2002	2007	2012
Bldg Construction Expend (bil 1996$)	410	516	559	631	685
feet/000$ expend	1.3	1.4	1.5	1.5	1.5
DWV Pipe Demand	550	734	822	928	1036
Plastic	441	642	739	850	961
Cast Iron	87	74	72	68	65
Copper	19	16	10	9	9
Steel	3	2	1	1	1
% DWV	5.5	5.5	6.0	6.0	6.0
Total Pipe Demand	10060	13330	13740	15520	17250

Source: The Freedonia Group, Inc.

Plastic DWV Pipe by Resin

Demand for plastic drain, waste and vent pipe will advance 2.8 percent yearly to 1.3 billion pounds in 2007, reaching 850 million feet. Stimulants include plastic's cost and performance advantages over cast iron, copper and steel, as well as attributes such as light weight and installation ease for the do-it-yourselfer. Polyvinyl chloride (PVC) and acrylonitrile-butadiene-styrene (ABS) are the two resins used in drain, waste and vent applications. PVC pipe will remain dominant based on its low cost and easy processing. Demand for ABS pipe will grow 0.5 percent per annum to 90 million pounds, primarily in specialized applications requiring greater impact strength.

Item	1992	1997	2002	2007	2012
Total DWV Pipe Demand (mil ft)	550	734	822	928	1036
% plastic	80.2	87.5	89.9	91.6	92.8
Plastic DWV Pipe Demand (mil ft)	441	642	739	850	961
lbs/foot	1.5	1.5	1.5	1.5	1.5
Plastic DWV Pipe Demand (mil lbs)	662	963	1108	1275	1442
Polyvinyl Chloride	575	875	1020	1185	1350
Acrylonitrile-Butadiene-Styrene	87	88	88	90	92

Source: The Freedonia Group, Inc.

APPENDIX B – TAB 6

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

United States - Total Year End Cast Iron Pipe Sales (1946-2003)

Source: Cast Iron Soil Pipe Institute

Year	Pipe (tons)	Fittings (tons)	Total (tons)
1946			409,214
1947			583,503
1948			653,993
1949			581,798
1950			794,633
1951			687,503
1952			651,467
1953			677,166
1954			743,711
1955			869,515
1956			817,762
1957			758,308
1958			874,123
1959			861,791
1960			782,051
1961			834,356
1962			888,475
1963			912,650
1964			939,900
1965			958,197
1966			986,203
1967			939,513
1968			1,004,337
1969			1,021,402
1970			824,230
1971	653,198	215,882	869,080
1972	684,972	218,822	903,794
1973	608,792	198,375	807,167
1974	509,226	135,078	644,304
1975	314,653	85,526	400,179
1976	353,255	93,456	446,711
1977	390,576	106,080	496,656
1978	390,576	106,590	497,166
1979	346,224	96,189	442,413
1980	285,688	73,454	359,142
1981	257,866	72,487	330,353
1982	233,558	64,267	297,825
1983	281,315	65,714	347,029
1984	278,019	69,219	347,238
1985	282,131	68,518	350,649
1986	277,215	69,520	346,735
1987	283,309	69,647	352,956
1988	266,541	63,779	330,320
1989	254,963	61,477	316,440
1990	246,626	59,680	306,306
1991	212,250	48,184	260,434
1992	196,985	50,437	247,422
1993	198,432	49,705	248,137
1994	203,417	50,487	253,904
1995	200,353	49,499	249,852
1996	216,851	51,962	268,813
1997	229,195	56,439	285,634
1998	241,670	63,016	304,686
1999	228,908	60,510	289,418
2000	241,894	63,373	305,267
2001	240,436	61,551	301,987
2002	228,513	61,307	289,820
2003	216,688	57,819	274,507

Source: Cast Iron Soil Pipe Institute

APPENDIX B – TAB 13

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

PRODUCTS

PLUMBING AND MECHANICAL SYSTEMS

Please click on the images above

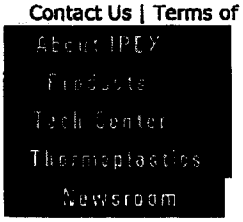
As one of the world's leading manufacturer's of thermoplastic pipe, valves, fittings and related products for plumbing and mechanical applications, IPEX offers a comprehensive range of integrated solutions to meet the needs of engineers and contractors in commercial, institutional, industrial and residential construction.

We offer a broad range of products for use in both combustible and non-combustible construction, as well as outdoor applications both above and below grade – from our System 15™, System XFR™ and Drainway® DWV systems, to our versatile PVC sewer line and polyethylene *Pipe with the Stripe®*, to our innovative PlumbBetter® hot & cold water tubing and Philmac® compression valves and fittings.

Available in a wide variety of materials including PVC, CPVC, ABS, PE, PEX and PEX-Al-PEX composite – depending on the application – IPEX plumbing and mechanical systems are engineered to provide excellent corrosion-resistance, low maintenance, safety and long service life, even under continued exposure to moisture, salts, aggressive soils and most acids.

- System 15™ and System XFR™ PVC DWV Systems
- Drainway® ABS DWV Systems
- PVC Solvent Weld Sewer Systems
- Schedule 40 & Schedule 80 Pipe, Fittings & Valves
- Philmac® Compression Fittings & Valves
- Polyethylene *Pipe with the Stripe®*
- PlumbBetter® Hot & Cold Water Systems
- IPEX Solvent Cements, Primers & Applicators

For detailed specifications, dimensional data and product catalogs, visit our Tech Library.



PRODUCTS

DWV SYSTEM 15 & SYSTEM XFR

IPEX offers the industry's only top-to-bottom thermoplastic DWV system for all types of low and high-rise construction. Tested to the demanding CAN / ULC-S102.2 standard for flame spread and smoke developed classifications, System 15™ and System XFR™ DWV are approved for installation in hospitals, senior care facilities, apartment buildings and other multi-storey or non-combustible structures.

IPEX System 15™

Our complete line of System 15™ DWV – the broadest selection of thermoplastic DWV pipe and fittings available today – is tested and approved to a flame spread rating of 15. Engineered to safely endure years of continuous use in harsh environments corrosive to other materials, System 15™ is suitable for use both above and below grade. Available from 1½" to 24" in diameter.

New! IPEX System XFR™

The ideal complement to System 15™ in high rises, air plenums and high-risk buildings where tighter fire and smoke regulations have previously limited the use of thermoplastic, System XFR™ DWV pipe and fittings incorporate a special protective layer (FR Coating) applied over the PVC substrate, which eliminates flame spread and reduces the volume of smoke generated. Available in sizes from 1½" to 12".

Firepro™ Firestop Systems

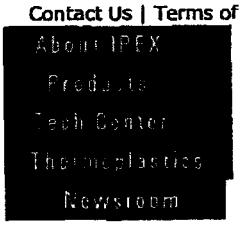
Approved for use with System 15™ and System XFR™ DWV – the IPEX Firepro™ line of firestop systems includes straps, collars and cast-in-place devices, as well as caulk and sealants for many types of horizontal and vertical fire separation penetrations.

System 15™ and System XFR™ Solvent Cements

Choosing the correct solvent cement is vital to the performance of your DWV system. IPEX System 15™ and System XFR™ solvent cements are specially formulated for use with our DWV piping and fittings.

Technical Bulletin

Noise in DWV Piping Systems



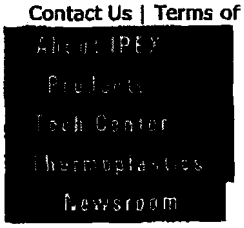
PRODUCTS

DRAINWAY® DWV PIPE & FITTINGS

IPEX Drainway® ABS drain, waste and vent (DWV) systems have been proving themselves across North America – both below and above grade – for more than three decades. Lightweight and easy to install, even in confined spaces, ABS DWV has become the material of choice in residential, industrial and commercial construction, where codes permit.

Certified to CSA B181.1, IPEX ABS DWV will not rust, pit or deteriorate, even under continuous long-term exposure to moisture and harsh household chemicals that are corrosive to traditional metal piping. It can also be used to penetrate horizontal or vertical fire separations, where approved firestop devices certified for use with combustible pipe are installed.

To help reduce component and project costs, IPEX works with engineers, designers, plumbing and building officials, and of course, contractors – providing comprehensive information regarding the application and installation of Drainway® ABS DWV. A broad range of Drainway® pipe and fittings are available in nominal sizes from 1¼" to 6".



APPENDIX B – TAB 70

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

CFA / AFC Members - Updated 10/06/03

A.G. Anderson Ltd. Member - Ontario
A.H. Tallman Bronze Ltd. Member - Ontario
AMSCO Cast Products (Canada) Inc. Member - Western Canada
Amsted Canada Member - Western Canada
Amsted Canada Inc. Member - Quebec
Ancast Industries Ltd. Member - Western Canada
Bibby Ste. Croix Member - Quebec
Bibby Ste-Croix Member - Ontario
Brake Parts Canada Inc. -- St. Catharines Member - Ontario
Brake Parts Canada Inc. -- Sudbury Member - Ontario
Brown Foundry Member - Ontario
Canada Alloy Castings Company Member - Ontario
Canadian Steel Foundries Ltd. Member - Quebec
Crane Valve Group Member - Ontario
Crowe Foundry Ltd. Member - Ontario
Custom Aluminum Limited Member - Ontario
ESCO Corporation Member - International
ESCO Limited Member - Ontario
ESCO Limited Member - Western Canada
Fonderie Grand Mere Ltee Member - Quebec
Fonderie Laperle Inc. Member - Quebec
Fonderie Laroche Ltee. Member - Quebec
Gamma Foundries Company Member - Ontario
Grenville Castings Ltd. (Merrickville) Member - Ontario
Grenville Castings Ltd. (Perth) Member - Ontario
Grenville Castings Ltd. (Smiths Falls) Member - Ontario
Haley Industries Limited Member - Ontario
Hopper Foundry (1977) Limited Member - Ontario
Kubota Metal Corporation - Fahramet Division Member - Ontario
Lethbridge Iron Works Company Ltd. Member - Western Canada
Machine-O-Matic Member - Ontario
Magotteaux Canada Member - Quebec
Maritime Steel and Foundries Limited Member - Maritime Canada
McCoy Foundry Co. Member - Ontario
McLean Foundry Limited Member - Ontario
Metal Technologies - Woodstock Gray Iron Plant Member - Ontario
Molten Metallurgy Inc. Member - Ontario
Mueller Canada Member - Ontario
Mueller Canada Member - Quebec
Nemak Member - International
Nemak Canada Corporation (EA) Member - Ontario
Nemak Canada Corporation (WA) Member - Ontario
Niagara Bronze Limited Member - Ontario
Paber Aluminum Member - Quebec
Ramsden Manufacturing Member - Ontario
Tiffany Metal Casting Ltd. Member - Ontario
Wabi Iron & Steel Corporation Member - Ontario
Wabtec Foundry Limited Member - Ontario
Wells Foundry Limited Member - Ontario
Wescast Industries Inc. (Brantford) Member - Ontario
Wescast Industries Inc. (Corporate Office) Member - Ontario
Wescast Industries Inc. (North Huron Casting) Member - Ontario

Wescast Industries Inc. (Wingham) Member - Ontario
AISCO Systems Inc. Associate Members - Ontario
Ajax Magnethermic Tocco Canada Ltd. Associate Members - Ontario
Asbury Wilkinson Associate Members - Ontario
Ashland Canada Corp. Associate Members - Ontario
BEI - New Orleans Associate Members - International
BEI - Quebec Associate Members - Quebec
BEI Pecal Associate Members - Ontario
Church & Trought Inc. Associate Members - Ontario
Elkem Metal Canada Inc. Associate Members - Ontario
EMSCO Canada Ltd. Associate Members - Ontario
Foseco Canada Inc. Associate Members - Ontario
Foseco Metallurgical Inc. Associate Members - International
Hickman Williams & Company Associate Members - International
Hickman Williams Canada Associate Members - Ontario
Kalexa Inc. Associate Members - Ontario
Lakeshore Sand Company Ltd. Associate Members - Ontario
Mancuso Chemicals Limited Associate Members - Ontario
Maumee Pattern Company Associate Members - International
OCL Industrial Materials Ltd. Associate Members - Western Canada
PanAbrasive Inc. Associate Members - Ontario
Plaza Integrated Environments Ltd. Associate Members - Ontario
Quebec Metal Powders Ltd. Associate Members - Quebec
Rio Tinto Iron & Titanium America Inc. Associate Members - International
Rio Tinto Iron & Titanium Inc. Associate Members - Quebec
Robert Shnay & Associates Ltd. Associate Members - Quebec
Saint-Gobain Advanced Ceramics Hamilton Associate Members - Ontario
Wesmat Supplies Ltd. Associate Members - Western Canada

APPENDIX C

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

APPENDIX C

Other Loyalty Programs in the DWV Industry

Tyler Pipe

Tyler Pipe's Loyalty Rebate Program includes a Base Rebate, a Corporate Rebate, and a Promotional Rebate. The Base Rebate is paid annually for each quarter in which a branch qualifies as a 'Tyler Loyal Branch'. To qualify, a branch must purchase, sell, and promote only Tyler cast iron pipe and fittings. In 2002, the rebate on cast iron pipe and fittings shipped into stock to a qualifying branch was 8%. The rebate on cast iron pipe and fittings ordered by a qualifying branch but shipped to a job site or another location (other than the branch's stock) was 2%. The Corporate Rebate rewards a company with one or more branches qualifying for the base rebate with an additional 3% rebate on cast iron pipe and fittings delivered to the qualifying branch's stock. The Promotional Rebate adds another 1% of total cast iron pipe and fittings purchases, whether shipped to stock or to a job site, to the rebate for any qualifying branch. A Tyler Loyal Branch can therefore earn a total of 12% on rebates by stocking only Tyler Pipe cast iron pipe and fittings.

Charlotte Pipe and Foundry

Charlotte Pipe also has a loyalty program for distributors. In 2001, rebates to 'loyal' distributors (ie. those stocking and ordering *only* Charlotte Pipe cast iron pipe and fittings) ranged from 5% to 12%, depending on the volume of the distributor's purchases. Until July 1999, Charlotte Pipe had a 'VIP' program that rewarded purchasers for reaching targets for purchases of *both* plastic and cast iron DWV products. Loyal distributors who reached specific targets were paid additional 3% rebates on their cast iron pipe and fitting purchases.

AB&I

AB&I Foundry is the largest manufacturer of cast iron soil pipe and fittings in the Western US. It had a Stocking Distributor Program in 1997, and it may still have some kind of loyalty program. Under the Stocking Distributor program Stocking Distributors, who must be 'loyal' to AB&I, meet target sales levels, and maintain target inventory levels, received more favourable prices and also received sales and marketing support from AB&I.

IPEX

IPEX is Canada largest manufacturer of plastic pipe and fittings and uses a loyalty rebate program with distributors that rewards them for stocking IPEX PVC DWV systems exclusively.

APPENDIX D

TO THE EXPERT ECONOMIC REPORT OF

ROGER WARE

APPENDIX D

Vandem Quarterly Margins 1999-2000

Margin = (P-Cost)/P
Cost = Fixed Cost + Variable Cost
Price = $/T

		Pipe	Fittings
1999	Q2		
	Q3		
	Q4		
2000	Q1		
	Q2		
	Q3		

Source: Commissioner's Disclosure Document 578