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2005-2006

INTRODUCTION

Currently water and wastewater charges in Trinidad and Tobago are among the lowest in the world. The operating ratio as a result has now reached crisis proportions with an expense to revenue ratio of 2.4:1 as at fiscal year ended September 30, 2006 ***(Un-audited Financials)***.

The Authority is therefore currently seeking to introduce a new rating system that will permit the recovery of costs efficiently incurred in the production, treatment and distribution of water to our valued customers.

This will be done on the basis of measured consumption as opposed to the unmeasured Annual Rateable Value (ARV) charges that are currently principally relied upon to charge tariffs to domestic customers. Current tariffs paid by the majority of customers are less than half the cost of producing and supplying potable water.

Provisions were built into the assumptions to deal with consumption associated with non-metered customers, estimating their consumption based on that of their metered counterparts which were then used as a basis to levy tariff increases.

This new rating structure will benefit both the Authority and its customers. Besides the recovery of cost, the Authority will become more financially viable and will be able to improve current levels of service and embark on new water winning projects that will increase the water supply and service to customers.

This rating structure will serve only as an interim structure pending the completion of the Authority's metering programme.

This programme involves domestic customers being metered at a rate of 10,000 accounts per year for the first three years and 15,000 accounts thereafter for the last two years of the five-year programme.

The domestic A3 accounts were also grouped according to their Class of Supply (I-III) and (IV-V). This was done to reflect the difference in water available and hence consumption and to determine the number of accounts that would pay for the downscaled consumption.

When this programme is completed tariffs will be revisited and actual meter cubed (m^3) consumption by each class of customers will be the basis for their average bill.

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2005-2006)

Consumption is the basis for all cost apportionment in The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non- Domestic

The proposed non – domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non – domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. ***(See Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal (2005-2006) is $387,966,116.00. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2005-2006)

	Total Consumption m^3	%of cost to be borne OVERALL	Variable Cost to be borne by each class	Percentage of Variable Cost
Commercial	17,969,712.88	11.8 %	$ 46,045,074	12%
Industrial	5,307,492.98	3.51 %	$ 13,599,767	4%
Agricultural	1,084,83	0.72%	$ 2,779,750	1%
Domestic	127,046,984.4	83.91%	$ 325,541,526	84%
Total	**151,409,025.24**	**100.00%**	**$ 387,966,116**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2005-2006)

	Cost	
Fixed Cost incl depn	$ 800,961,400.25	A
92% of Fixed Cost	$ 736,884,488.23	
DESAL	$ 204,222,000.00	B
Fixed Cost 92% to water	$ 941,106,488.23	
Total variable cost	$ 421,702,300.00	C
Variable Cost 92% to water	$ 387,966,116.00	
* Total Opex = A+B+C		

- The majority of costs (75%) associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The rationale behind this is that desalinated water serves the Pt. Lisas customers for the most part and therefore they should bear the greater part of this cost. (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost
Fixed Cost minus DESAL	$ 736,884,488.23
DESAL to Pt. Lisas @ 75%	$ 153,166,500.00
Remainder of desal	$ 51,055,500.00

The other 25% ($51.1 Mn.) of the Desal cost is apportioned to the other Domestic and Non Domestic customer classes. This is done along with the remainder of fixed cost and depreciation charges. (***See worksheet Fixed cost allocated to all Classes.)***

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption m3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			$ 20,282,040.00	56,339	$ 360.00
DOMESTIC	Consumption m3	%	Apportionment of F.C	No of accounts	Per Account
A2	15,943,187.23	12.55%	$ 17,230,590.70	34,930	$ 493.29
A3 Class (I-III)	101,524,226.13	79.91%	$ 109,722,250.78	181,880	$ 603.27
A3 Class (IV-V)	7,470,085.28	5.88%	$ 8,073,290.50	53,530	$ 150.82
A4	1,264,355.44	1.00%	$ 1,366,451.43	3,755	$ 363.90
A5	837,462.35	0.66%	$ 905,086.97	1,529	$ 591.95
A6	7,663.07	0.01%	$ 8,287.26	14	$ 591.95
	127,046,984.49	1	$ 137,305,957.65	275,638	
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 787,939,988.23	$ 157,587,997.65	$ 630,351,990.58		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

NON-DOMESTIC APPORTIONMENT OF FIXED COSTS (PLUS REMAINDER DESAL) BASED ON CONSUMPTION (2005-2006)

Non-Domestic	Consumption M3	Percentage	Apportionment of F.C.	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	5,307,492.98	21.79%	$ 137,327,9[illegible]5.73	429	$ 320,111.74	$ 26,675.98
Commercial (C3,C4,D3,D4)	17,969,712.88	73.76%	$ 464,954,[illegible]5.19	7,563	$ 61,477.54	$ 5,123.13
Agricultural	1,084,835	4.45%	$ [illegible]8,069,3[illegible]3.66	1,074	$ 26,135.38	$ 2,177.95
Total (Non-Domestic excluding Point Lisas)	24,362,040.75	100.00%	$ 630,351,990.58	9,066		
Industrial Point Lisas	25,399,142.4	98.6%	$ 151,084,507.20	80	$ 1,888,556.34	$ 157,379.69
Commercial Point Lisas	363,788.6	1.4%	$ 2,081,992.80	24	$ 86,749.70	$ 7,229.14
Total	25,762,931.0	100.0%	$ 153,166,500.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 787,939,988.23	$ 157,587,997.65	$ 630,351,990.58			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2005-2006)

COST PER M3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2005-2006)		
CLASS	**Consumption m3**	**Av Consumption per acc m3**
Internally serviced - Unmetered (A3)	131,404,567.25	558.19

Cost per m3		
Fixed Cost to domestic	$ 157,587,997.65	
No. of domestic accounts including externally serviced accounts	$ 331,977	
Fixed element per account	$ 475	
Variable element (variable costs to domestic/no of domestic acc)	$ 981	
Total contribution to cost	$ 1,455	
Total contribution to cost	$ 1,455	
Average Consumption	558.19	
Cost per m3	$ 2.61	
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$ 877.87	

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

Cost per Account A4 = Average consumption/Cost per m3

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2005-2006)

Class	Consumption m3	Av Consumption per acc m3
Internally serviced - Metered (A4)	1,264,35[illegible]44	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$	364
Variable element (vari[illegible]le cost to domestic/no of domes[illegible]accounts)	$	1,181
Total contribution to co[illegible]	$	1,545

Total Contribution to cost	$	1,545
Average Consumption **Metered Domestic**(m3)		336.71
Av. Bill/cost per m3	$	4.59

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.61 and $4.59 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small

size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2005-2006)

Class	Consumption m3	Av Consumption per acc m3
Point Lisas	26,762,931	257,335.88

DESAL to Point Lisas	$	153,166,500.00
Cost per m3	$	5.72

* Apportionment of DESAL cost to Pt. Lisas is 75%.

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption MB	Percentage	Apportionment of F	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	5,307,492.98	21.79%	$ 137,327,9 5.73	429	$ 320,111.74	$ 26,675.98
Commercial (C3,C4,D3,D4)	17,969,712.88	73.76%	$ 464,954, .19	7,563	$ 61,477.54	$ 5,123.13
Agricultural	1,084,835	4.45%	$ 28,069,39	1,074	$ 26,135.38	$ 2,177.95
Total (Non-Domestic excluding Point Lisas)	24,362,040.7	0%	$ 630,351,990.58	9,066		
Industrial Point Lisas	6,399,142.4	98.6%	$ 151,084,507.20	80	$ 1,888,556.34	$ 157,379.69
Commercial Point Lisas	363,788.6	1.4%	$ 2,081,992.80	24	$ 86,749.70	$ 7,229.14
Total	762,931.0	100.0%	$ 153,166,500.00			

		20% to domestic	80% to Non-Domestic
Total Fixed Cost to be apportioned	$ 787,939,988.23	$ 157,587,997.65	$ 630,351,990.58

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

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2006-2007

TABLE 1

CLASS OF SUPPLY 2002 - 2006

2002

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		**1,237,809**	**100%**

2003

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	300,586	25%
4	48-84	129,504	12%
5	0-48	76,994	6%
Total		**1,194,737**	**100%**

2004

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	327,677	27%
2	120-168	482,048	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		**1,230,405**	**100%**

2005

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	240,058	20%
2	120-168	454,055	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		**1,204,364**	**100%**

2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		**1,231,805**	**100%**

TABLE 2
WATER AND SEWERAGE AUTHORITY
WATER SUPPLY DEPARTMENT
TOTAL WATER PRODUCTION DATA

Year	Surface Sources	Well Sources	Desalinated Water Supply	Total	Total	Daily Average	
	m^3	m^3	m^3	m^3	imgd	m^3/d	imgd
1995	184,095,810	66,621,078	-	250,716,888	[illegible]158	686,896	151.12
1996	209,946,842	75,811,502	-	285,758,344	6[illegible]357	780,761	171.77
1997	199,864,784	69,782,616	-	269,[illegible]47,400	59,322	738,760	162.53
1998	203,465,296	71,369,332	-	274,[illegible]4,628	60,464	752,972	165.65
1999	209,373,216	76,760,990	-	286,[illegible],206	62,950	783,929	172.46
2000	219,925,252	78,9[illegible]3,547	-	[illegible]98,903,599	65,759	816,677	179.67
2001	205,829,644	85,277,900	-	291,107,544	64,044	797,555	175.46
2002	222,723,426	84,317,373	25,859,219	332,900,018	73,238	912,055	200.65
2003	209,611,926	85,138,957	35,209,970	329,960,853	72,591	903,739	198.82
2004	220,362,292	[illegible]8,028,245	37,675,560	346,066,098	76,135	945,255	207.96
2005	218,926,818	[illegible]89,938	39,603,924	351,840,680	77,405	963,947	212.07
2006	235,003,790	92,621,670	37,416,905	365,042,365	80,309	1,000,398	220.09

Source: CSO and Production Totals, Water Supply Department

TABLE 3
NUMBER OF ACCOUNTS (2002-2006)

Class	Sep-02	Sep-03	Sep-04	Sep-05
A1	61,550	59,994	59,157	58,300
A2	26,584	29,925	33,529	34,791
A3	211,639	218,162	221,524	225,653
A4	3,685	3,671	3,691	3,725
A5	1,411	1,447	1,468	1,499
A6	10	12	11	14
B3	129	13[illegible]	123	119
B4	292	29[illegible]	307	310
C1	12[illegible]	131	138	137
C2	72	77	80	83
C3	1,855	1,939	1,937	1,921
C4	4,321	4,377	4,400	4,472
D3	395	514	502	488
D4	421	428	431	442
E3	572	583	582	578
E4	452	459	471	475
Total without A1	**251,964**	**262,153**	**267,194**	**274,707**
Total with A1	313,514	322,147	326,351	333,007
B6	**90**	**97**	**103**	**104**
Total without A1 but including B6	252,054	262,250	267,297	274,811

B6, FD, FN and FV Classes are not included.

Source CIS Receivables September 2002 to September 2006.

Sep-06
56,339
34,930
235,410
3,755
1,529
14
119
310
143
92
2,029
4,501
589
444
600
474
284,939
341,278
104
285,043

TABLE 4
WATER AND SEWERAGE AUTHORITY

ANALYSIS OF ANNUAL COST INTO VARIABLE AND FIXED COMPONENTS

	2004-2005 $'000'S	2003-2004 $'000'S	2002-2003 $'000'S	2001-2002 $'000'S	2000-2001 $'000'S
VARIABLE COST					
MONTHLY PAID OVERTIME & OTHER VARIABLE MONTHLY PAID ALLOWANCES	78,900	68,388	51885	37,744	46,432
DAILY PAID OVERTIME & OTHER VARIABLE DAILY PAID ALLOWANCES	30,368	20,185	22,600	17,825	14,573
CHEMICALS	22,175	23,279	22,050	19,866	19,818
DESAL WATER	204,222	174,170	168,633	72,730	-
ELECTRICITY	52,924	49,117	46,937	44,432	43,052
LEAK REPAIRS (CONTR COST)	13,403	18,674	9,690		
OTHER HIRED & CONTRACTED SERV.	16,918	6,185	25,918	36,239	37,818
MATERIALS	9,334	15,698	12,339	13,379	20,126
ROAD RESTORATION	7,077	8,356	10,993	5,706	1,956
WATER TRUCKING	8,808	9,875	13,618	11,000	7,357
VEHICLE RENTAL & OTHER RELATED	26,864	23,028	20,787	16,785	19,030
HEAVY EQUIPMENT RENTAL	14,218	11,609	14,848	9,161	11,731
PLANT, EQUIPMENT & TOOLS	5,253	4,732	5,172	4,349	736
HIRED SERVICES (MAINLY SECURITY SERVICES)	8,798	8,286	10,169	7,008	4,475
TELEPHONES	9,573	9,076	6,892	6,576	7,018
POSTAGES	1,664	1,107	1,265	708	749
PROMOTIONS & PUBLICITY	1,679	1,843	2,706	2,020	947
PROFESSIONAL FEES	6,914	5,308	4,217	2,449	3,130
OFFICE MATERIALS & SUPPLIES	5,522	3,481	2,390	1,289	1,224
LEGAL FEES	8,422	1,663	6,774	-	-
CLAIMS & FINES	6,737	7,742	11,035	5,209	(25)
RIC & GREEN FUND LEVY	1,622	1,570	1,439	1,218	323
OTHER ADMINISTRATIVE COST	6,960	3,419	(15,847)	(11,596)	3,653
BAD DEBT PROVISION	30,422	29,283	40,239	29,466	33,398
SHORT-TERM FINANCING COST	39,703	49,311	43,198	24,663	14,766
TOTAL VARIABLE COST	**618,480**	**553,385**	**539,888**	**358,226**	**292,287**
FIXED COST					
BASIC PAY SALARY & OTHER FIXED SALARY COST	246,492	241,400	163,862	158,679	169,519
BASIC PAY WAGES & OTHER FIXED WAGES COST	86,558	79,897	66,557	62,867	53,946
HOUSE RATES	344	4	15	16	-
INSURANCE	4,984	3,152	2,539	3,166	1,470
OTHER PREMISES COST	4,599	2,141	2,017	1,846	1,235
AUDIT FEES	413	817	383	436	34
LONG TERM FINANCE COST	318,499	280,044	257,374	221,748	180,774
TOTAL FIXED COST	**661,889**	**607,455**	**492,747**	**448,758**	**406,978**
DEPRECIATION	**75,488**	**77,955**	**82,595**	**85,810**	**137,276**

Source: Finance Division

OVER ALL TOTAL COST	**1,355,857**	**1,238,795**	**1,115,230**	**892,794**	**836,541**

TABLE 5

WATER AND SEWERAGE AUTHORITY

ANALYSIS OF ANNUAL COST INTO VARIABLE AND FIXED COMPONENTS

	2004…05 $'000'S	2005…06	2006…07	2007…08	2008…09	2009…10	2010..11
VARIABLE COST							
MONTHLY PAID OVERTIME & OTHER VARIABLE MONTHLY PAID ALLOWANCES	78,900,000	82,845,000	86,987,250	91,336,613	95,903,443	100,698,615	105,733,546
DAILY PAID OVERTIME & OTHER VARIABLE DAILY PAID ALLOWANCES	30,368,000	31,886,400	33,480,720	35,154,756	36,912,494	38,758,118	40,696,024
CHEMICALS	22,175,000	22,840,250	23,525,458	24,231,221.23	24,958,157.86	25,706,902.60	26,478,109.68
DESAL WATER	204,222,000	204,222,000	204,222,000	204,222,000	204,222,000	204,222,000	204,222,000
ELECTRICITY	52,924,000	54,511,720	56,147,072	57,831,483.75	59,566,428.26	61,353,421.11	63,194,023.74
LEAK REPAIRS (CONTR COST)	13,403,000	13,805,090	14,219,243	14,645,819.98	15,085,194.58	15,537,750.42	16,003,882.93
OTHER HIRED & CONTRACTED SERV.	16,918,000	17,425,540	17,948,306	18,486,755.39	19,041,358.05	19,612,598.79	20,200,976.75
MATERIALS	9,334,000	9,614,020	9,902,441	10,199,513.82	10,505,499.23	10,820,664.21	11,145,284.14
ROAD RESTORATION	7,077,000	7,289,310	7,507,989	7,733,228.98	7,965,225.85	8,204,182.62	8,450,308.10
WATER TRUCKING	8,808,000	9,072,240	9,344,407	9,624,739.42	9,913,481.60	10,210,886.05	10,517,212.63
VEHICLE RENTAL & OTHER RELATED	26,864,000	27,669,920	28,500,018	29,355,018.13	30,235,668.67	31,142,738.73	32,077,020.89
HEAVY EQUIPMENT RENTAL	14,218,000	14,644,540	15,083,876	15,536,392.49	16,002,484.26	16,482,558.79	16,977,035.55
PLANT, EQUIPMENT & TOOLS	5,253,000	5,410,590	5,572,908	5,740,094.93	5,912,297.78	6,089,666.71	6,272,356.71
HIRED SERVICES (MAINLY SECURITY SERVICES)	8,798,000	9,061,940	9,333,798	9,613,812.15	9,902,226.51	10,199,293.31	10,505,272.10
TELEPHONES	9,573,000	9,860,190	10,155,996	10,460,676.57	10,774,495.84	11,097,730.71	11,430,662.63
POSTAGES	1,664,000	1,713,920	1,765,338	1,818,297.73	1,872,846.66	1,929,032.06	1,986,903.02
PROMOTIONS & PUBLICITY	1,679,000	1,729,370	1,781,251	1,834,688.63	1,889,729.29	1,946,421.17	2,004,813.81
PROFESSIONAL FEES	6,914,000	7,121,420	7,335,063	7,555,114.48	7,781,767.91	8,015,220.95	8,255,677.58
OFFICE MATERIALS & SUPPLIES	5,522,000	5,687,660	5,858,290	6,034,038.49	6,215,059.65	6,401,511.44	6,593,556.78
LEGAL FEES	8,423,000	8,674,690	8,934,900	9,202,946.79	9,479,035.20	9,763,406.25	10,056,308.44
CLAIMS & FINES	6,737,000	6,939,110	7,147,283	7,361,701.80	7,582,552.85	7,810,029.44	8,044,330.32
RIC & GREEN FUND LEVY	1,622,000	1,670,660	1,720,780	1,772,403.19	1,825,575.29	1,880,342.55	1,936,752.82
OTHER ADMINISTRATIVE COST	6,960,000	-					
BAD DEBT PROVISION	30,422,000	31,334,660	32,274,700	33,242,940.79	34,240,229.02	35,267,435.89	36,325,458.97
SHORT-TERM FINANCING COST	39,703,000	40,894,090	42,120,913	43,384,540.08	44,686,076.28	46,026,658.57	47,407,458.33
TOTAL VARIABLE COST	**618,480,000**	**625,924,300**	**640,869,997**	**656,378,796**	**672,473,328**	**689,177,186**	**706,514,976**
FIXED COST							
BASIC PAY SALARY & OTHER FIXED SALARY COST	246,492,000	258,816,600	271,757,430	285,345,301.50	299,612,566.58	314,593,194.90	330,322,854.65
BASIC PAY WAGES & OTHER FIXED WAGES COST	86,558,000	90,885,900	95,430,195	100,201,704.75	105,211,789.99	110,472,379.49	115,995,998.46
HOUSE RATES	344,000	354,320	364,950	375,898.09	387,175.03	398,790.28	410,753.99
INSURANCE	4,984,000	5,133,520	5,287,526	5,446,151.37	5,609,535.91	5,777,821.99	5,951,156.65
OTHER PREMISES COST	4,599,000	4,736,970	4,879,079	5,025,451.47	5,176,215.02	5,331,501.47	5,491,446.51
AUDIT FEES	413,000	425,390	438,152	451,296.25	464,835.14	478,780.19	493,143.60
LONG TERM FINANCE COST	318,499,000	328,053,970	337,895,589	348,032,456.77	358,473,430.48	369,227,633.39	380,304,462.39
TOTAL FIXED COST	**661,889,000**	**688,406,670**	**716,052,920**	**744,878,260**	**774,935,548**	**806,280,102**	**838,969,816**
DEPRECIATION	**75,488,000**	**77,752,640**	**80,085,219**	**82,487,775.78**	**84,962,409.05**	**87,511,281.32**	**90,136,619.76**
OVER ALL TOTAL COST	**1,355,857,000**	**1,392,083,610**	**1,437,008,136**	**1,483,744,832**	**1,532,371,285**	**1,582,968,569**	**1,635,621,412**
TOTAL COST BEFORE ASSUMPTIONS	**1,355,857,000**	**1,392,083,610**	**1,437,008,136**	**1,483,744,832**	**1,532,371,285**	**1,582,968,569**	**1,635,621,412**
RIC Cess	13,558,570	13,920,836	14,370,081	14,837,448	15,323,713	15,829,686	16,356,214
Guaranteed & Overall Penalties	20,337,855	20,881,254	21,555,122	22,256,172	22,985,569	23,744,529	24,534,321
Return On Investment @ 9.5%			23,203,947	94,593,186	98,556,512	99,095,574	55,200,350
NEW FIXED COST incl depn, RIC Cess, Penalties and ROI	771,273,425	800,961,400	855,267,290	959,052,843	996,763,751	1,032,461,171	1,025,197,321
NEW TOTAL COST (inc	1,389,753,425	1,426,885,700	1,496,137,287	1,615,431,640	1,669,237,078	1,721,638,357	1,731,712,298
		1,222,663,700	1,496,137,287	1,615,431,640	1,669,237,078	1,721,638,357	1,731,712,298
8% for waste water	111,180,274.00	114,150,856.02	119,690,982.92	129,234,531.16	133,538,966.27	137,731,068.56	138,536,983.81
92% for water	1,278,573,151.00	1,312,734,844.23	1,376,446,303.62	1,486,197,108.38	1,535,698,112.14	1,583,907,288.48	1,593,175,313.85

Source: Tariff Analysis of Opex

TABLE 6A
SYSTEM BALANCE FOR THE PERIOD 2002-2006

	2002	2003	2004	2005	2006
CLASS (imgd)					
Domestic Demand					
A1	2.298	2.240	2.209	2.177	2.104
A2	8.411	9.468	9.975	11.007	11.051
A3	81.886	84.410	85.710	87.308	91.083
A4	0.860	0.857	0.861	0.869	0.876
A5	0.318	0.221	0.219	0.452	0.656
A6	0.002	0.002	0.002	0.004	0.005
Total Domestic demand	**93.77**	**97.20**	**98.98**	**101.82**	**105.78**
Non Domestic Demand					
B3	2.377	2.014	1.814	1.775	1.848
B4	2.690	2.389	2.264	2.312	2.408
C3	6.[illegible]	6.2[illegible]	6.359	6.163	6.510
C4	7.[illegible]	7.018	7.222	7.173	7.220
D3	0.[illegible]50	0.169	0.162	0.164	0.215
D4	0.138	0.141	0.139	0.149	0.162
E3	0.435	0.439	0.419	0.351	0.419
E4	0.344	0.345	0.339	0.289	0.331
Total Non-domestic demand	**19.20**	**18.65**	**18.72**	**18.37**	**19.11**
Total domestic + Non Domestic demand(excluding Point Lisas)	**112.97**	**115.85**	**117.70**	**120.19**	**124.89**
Point Lisas demand	**10.54**	**12.39**	**13.01**	**14.55**	**16.13**
Total (including Point Lisas)	**123.51**	**128.24**	**130.70**	**134.74**	**141.02**
UFW	110.36	109.35	114.38	116.64	121.05
Total System Demand	233.87	237.59	245.08	251.38	262.07
Supply	200.65	198.82	207.96	212.07	220.09
Surplus/Deficit	**-33.22**	**-38.77**	**-37.12**	**-39.31**	**-41.98**

* All Domestic classes are increased by 15%

Source: Tariff Analysis of Per Capita Demand

*Classes B3 and C3 are increased by 100%
*UFW decreases 2007-2011 by 1, 1, 2, 2, and 4%

TABLE 6B
PROJECTED SYSTEM BALANCE FOR THE PERIOD 2007-2012

	PROJECTED YEARS					
	2006-2007	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
CLASS (imgd)						
Domestic Demand						
A1	2.06	2.01	1.97	1.93	1.88	1.85
A2	11.84	12.69	13.60	14.58	15.62	16.79
A3	93.54	94.14	93.59	92.25	92.03	94.77
A4	0.88	2.05	3.93	6.28	7.94	8.00
A5	0.85	1.11	1.44	1.88	2.44	3.18
A6	0.01	0.01	0.01	0.02	0.02	0.03
Total Domestic demand	**109.19**	**112.01**	**114.54**	**116.93**	**119.95**	**124.61**
Non Domestic Demand						
B3	1.61	1.41	1.23	1.08	0.94	0.82
B4	2.35	2.29	2.23	2.18	2.13	2.07
C3	6.67	6.83	7.00	7.17	7.34	7.52
C4	7.27	7.31	7.36	7.41	7.46	7.50
D3	0.25	0.28	0.33	0.37	0.43	0.49
D4	0.17	0.18	0.18	0.19	0.20	0.21
E3	0.419	0.42	0.42	0.42	0.42	0.42
E4	0.330	0.33	0.33	0.33	0.33	0.32
Total Non-domestic demand	**19.06**	**19.05**	**19.08**	**19.14**	**19.23**	**19.36**
Total domestic + Non Domestic demand(excluding Point Lisas)	**128.25**	**131.07**	**133.62**	**136.06**	**139.18**	**143.97**
Point Lisas demand	**17.96**	**19.99**	**22.25**	**24.77**	**27.57**	**30.69**
Total (including Point Lisas)	**146.21**	**151.06**	**155.87**	**160.83**	**166.75**	**174.67**
UFW	118.85	116.65	112.24	107.84	99.04	99.04
Total System Demand	265.05	267.70	268.12	268.68	265.79	273.70
Supply	220.09	220.09	220.09	220.09	220.09	220.09
Surplus/Deficit	**-44.97**	**-47.62**	**-48.03**	**-48.59**	**-45.70**	**-53.62**

* metering programme A3 to A4	**2008**	**2009**	**2010**	**2011**

Source: Tariff Analysis of Per Capita Demand

Metering programme …A3 to A4	5000	8000	10000	7000

Source: Tariff Analysis of Per Capita Demand

TABLE 7
DOMESTIC CONSUMPTION 2006 - 2007

Domestic Classes	No. Accounts	Per Capita Demand	persons per h/hold	Days per year	Demand m3	Demand m3 downscaled	Weights
A2	37,434	305	4.1	365	17,086,048.14	17,086,048.14	9.304%
A3 (Class I-III)	179,069	373	4.1	365	99,955,514.93	99,955,514.93	54.431%
A3 Class (IV-V)	52,703	373	4.1	365	29,418,642.20	7,354,660.55	4.005%
A4	13,773	225	4.1	365	4,637,459.01	4,637,459.01	2.525%
A5	1,822	451.61	4.1	365	1,231,189.61	1,231,189.61	0.670%
A6	15	451.61	4.1	365	10,382.65	10,382.65	0.006%
Total	284,816					**130,275,254.89**	**70.94%**

1 Litres = 4.54609 Gallons

1 cubic metre = 219.969248299 Gallons

Therefore Litres to Cubic Meters divide by 1000 (4.54609 X 219.969248299)

TABLE 8

SUMMARY OF COST IN PROJECTED OPEX 2006-2007

	Cost	
Fixed Cost	$ 855,267,289.55	A
92% of Fixed Cost	$ 786,845,906.38	
DESAL	$ 204,222,000.00	B
Fixed cost 92%	$ 991,067,906.38	
Total variable cost	$ 436,647,997.00	C
Variable Cost 92%	$ 401,716,157.24	

Total Opex = A+B+C

PT. LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost
Fixed Cost minus DESAL	$ 786,845,906.38
DESAL to Pt. Lisas @ 85%	$ 173,588,700.00
Remainder of desal	$ 30,633,300.00

Percent of Cost Apportioned	Cost
85%	$173,588,700.00

Note: The Total fixed cost includes cost due to RIC cess, guaranteed and overall penalties, and return on investment @ 9.5%.

TABLE 9

DOMESTIC APPORTIONMENT OF FIXED COSTS (PLUS REMAINDER DESAL) BASED ON CONSUMPTION (2006-2007)

DOMESTIC	Consumption M3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			17,984,5[illegible].54	55,109	$ 326.35

DOMESTIC	Consumption M3	%	Apportionment of F.C	No of accounts	Per Account
A2	17,086,048.14	13.12%	19,084,307.73	37,434	$ 509.81
A3 Class (I-III)	99[illegible]93	7[illegible]73%	$ 111,645,583.08	179,069	$ 623.48
A3 Class (IV-V)	7,354,66[illegible]5	5.65%	$ 8,214,808.02	52,703	$ 155.87
A4	4,637,45[illegible]1	3.56%	$ 5,179,822.40	13,773	$ 376.09
A5	1,231,1[illegible].61	0.95%	$ 1,375,180.57	1,822	$ 754.87
A6	1[illegible],382.65	0.01%	$ 11,596.93	15	$ 754.87
	130,275,254.89	1	$ 145,511,298.74		

		20% to domestic	80% to Non-Domestic
Total Fixed Cost to be apportioned	$ 817,479,206.38	$ 163,495,841.28	$ 653,983,365.11

TABLE 10

NON-DOMESTIC APPORTIONMENT OF FIXED COSTS (PLUS REMAINDER DESAL) BASED ON CONSUMPTI

Non-Domestic	Consumption M3	Percentage	Apportionment of F.C	No of accounts	Per Account
Industrial (B3&B4)	5,343,598.34	21.51%	$ 140,703,227.94	431	$ 326,191.49
Commercial (C3,C4,D3,D4	18,252,202.68	73.49%	$ 480,601,359.86	7,729	$ 62,179.78
Agricultural	1,241,045	5.00%	$ 32,678,777.31	1,087	$ 30,062.84
Total (Non-Domestic excluding Point Lisas)	24,836,845.13	100.00%	$ 653,983,365.11	9,248	

Industrial Point Lisas	28,141,804.1	99%	$ 171,213,903.92	84	$ 2,039,078.60
Commercial Point Lisas	390,336.5	1%	$ 2,374,796.08	26	$ 92,976.02
Total	28,532,140.6	100%	$ 173,588,700.00		

		20% to domestic	80% to Non-Domestic
Total Fixed Cost to be apportioned	$ 817,479,206.38	$ 163,495,841.28	$ 653,983,365.11

Source: Tariff Analysis of Opex

ON (2006-2007)

Monthly charge	
$	27,182.62
$	5,181.65
$	2,505.24

$	169,923.22
$	7,748.00

TABLE 11
NON DOMESTIC CONSUMPTION 2006-2007

Non -domestic Classes	No. Accounts	Consumption (m3) per year	Av. Consumption per Account	Weights
C3- Commercial	1,820	4,825,402.91		2.63%
C4- Commercial metered (excluding Pt. Lisas)	4,803	12,736,4[illegible]76	2,651.65	6.94%
D3- Cottage	582	363[illegible]94		0.20%
D4- Cottage metered	[illegible]	326,990	624.07	0.18%
E3- Agricultural	53[illegible]	606,602		0.33%
E4- Agri metered	556	634,443	1,141.72	0.35%
B3- Industrial	10[illegible]	1,259,382.58		0.69%
B4 Industrial metered	[illegible]50	4,084,215.75	12,388.03	2.22%
Pt.Lisas	110	28,526,307	260,494.38	15.53%
Total	**9,357**	**53,363,153.24**		**29.06%**

Actual metered Consumption for B4, C4, D4, E4 was used as a proxy of consumption for their unmetered counterparts in the same relative classes.
Of the 104 companies comprising Pt.Lisas, B4 accounts for 80 companies and C4 accounts for 24 companies.
(Corresponds to the Pt. Lisas B6 charge in no of accounts)

TABLE 12

NON-DOMESTIC PER CAPITA DEMAND PER YEAR WITH ASSUMPTIONS (2006-2007)

M3	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
CLASS					
Non Domestic					
B3	1,259,382.58	1,008,294.80	[illegible]709.37	285,286.17	0
B4	4,084,215.75	4,164,491.94	4,38[illegible]776.11	4,587,370.63	4,741,434.22
C3	4,825,[illegible]2.91	4,242,[illegible]2.64	[illegible]544,570.27	820,884.32	0
C4	12,736,415.76	[illegible]495,9[illegible]0.29	15,363,497.76	17,236,653.26	18,185,383.36
D3	[illegible]363,394.44	368,820.27	247,702.82	104,035.15	0
D4	[illegible]326,989.5[illegible]	388,178.89	579,266.76	783,282.73	935,360.49
E3	606,602.49	519,315.88	341,628.25	167,112.58	0
E4	634,442.62	717,905.71	891,767.14	1,062,438.64	1,225,670.71

Source: Tariff Analysis of metered consumption

TABLE 13
VARIABLE COST BORNE BY EACH CLASS 2006-2007

	Total Consumption m^3	% of cost to be borne OVERALL	Variable Cost to be borne by each class	Percentage of Variable Cost
Commercial	18,252,202.68	11.77%	$ 47,270,359	12%
Industrial	5,343,598.34	3.44%	$ 13,839,087	3%
Agricultural	1,241,045	0.80%	$ 3,214,113	1%
Domestic	130,275,254.89	83.99%	$ 337,392,598	84%
Total	**155,112,101.01**	**100.00%**	**$ 401,716,157**	**100%**

Source: Tariff Analysis of Opex

TABLE 14

COST PER M3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2006-2007)

CLASS	Consumption m3	Av Consumption per acc m3
Internally serviced - Unmetered (A3)	1[illegible]9,374,157.12	558.19

Cost per m3		
Fixed Cost to domestic	$	163,495,841.28
No. of domestic accounts including externally serviced accounts	$	339[illegible]25
Fixed element per account	$	481
Variable element (variable costs to domestic/no of domestic acc)	$	993
Total contribution to cost	$	1,474

Total contribution to cost	$	1,474
Average Consumption	$	558.19
Cost per m3	$	2.64

Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$	888.86

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

Cost per Account A4 = Average consumption/Cost per m3

Source: Tariff Analysis of Opex

TABLE 15

COST PER M3 BASED ON METERED A4 CONSUMPTION (2006-2007)

Class	Consumption m3	Av Consumption per acc m3
Internally serviced - Metered (A4)	4,457,459.01	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$	376
Variable element (variable cost to domestic/no of domestic accounts)	$	1,185
Total contribution to cost	$	1,561

Total Contribution to cost	$	1,561
Average Consumption **Metered Domestic**(m3)		336.71
Av. Bill/cost per m3	$	4.64

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

TABLE 16

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2006-2007)

Class	Consumption m3	Av Consumption per m3
Point Lisas	28,526,367	274,291.41

DESAL to Point Lisas	$	173,588,700.00
Cost per m3	$	6.09

* Apportionment of DESAL cost to Pt. Lisas is 75%.

TABLE 17
PER CAPITA DEMAND FOR THE PERIOD 2002-2012

	PER CAPITA DEMAND					PROJECTED YEARS					
	2002	2003	2004	2005	2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
CLASS l/h/d											
Domestic Demand											
A1 - Unmetered Stand pipe	36	36	36	36	36	36	36	36	36	36	36
A2 - Unmetered Yard tap	305	305	305	305	305	305	305	305	305	305	305
A3 - Unmetered Internal	373	373	373	373	373	373	373	373	373	373	373
A4 - Metered Internal	225	225	225	225	225	225	225	225	225	225	225
A5 - Unmetered Charities/ Churches	217	147	144.00	[illegible]	366	451.61	557.23	687.57	848.38	1046.82	1291.66
A6 - metered Charities/ Churches	217	[illegible]	144.00	[illegible]	[illegible]	451.61	557.23	687.57	848.38	1046.82	1291.66
Total	1373	1233	1227	1521	1671	1842.21	2053.47	2314.13	2635.77	3032.63	3522.32

Note:
The per capita demand for the domestic classes A1-A4 are estimated to be the same through out out the years, assuming a realistic scenario where no metering programme is implemented.

Source: Tariff Analysis of Per Capita Demand

TABLE 18

NUMBER OF DOMESTIC ACCOUNTS FOR THE PERIOD 2007-2011

	PROJECTED YEARS					
	2006-2007	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**
CLASS						
Domestic						
A1	55,109	53,905	52,728	51,576	50,450	49348
A2	37,434	40,117	42,993	46,075	49,378	52917
A3	231,773	228,307	225,083	216,911	208,989	216260
A4	13,773	23,791	33,809	48,827	63,845	63863
A5	1,852	1,919	2,022	2,131	2,245	2366
A6	15	17	18	20	22	24
Total	339,925	348,056	356,589	365,540	374,929	384,778

Source: Tariff Analysis of Number of Accounts, CIS Receivables September 2002 to September 2006

TABLE 19

NUMBER OF NON -DOMESTIC ACCOUNTS FOR THE PERIOD 2007-2012

REALISTIC SCENARIO

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
CLASS					
Non Domestic					
B3	102	85	55	26	0
B4	330	350	383	417	448
C3	1820	1606	967	313	0
C4	4853	5109	5837	6573	6960
D3	582	575	375	153	0
D4	524	605	878	1155	1341
E3	531	462	308	153	0
E4	556	638	805	974	1140
Total	9248	9429	9609	9764	9890

Source: Number of Accounts, CIS Receivables September 2002 to September 2006

TABLE 20
WATER AND SEWERAGE AUTHORITY

CONSUMPTION (M^3) BYCLASS FOR ALL POINT LISAS METERED ACCOUNTS BETWEEN OCOTOBER 2004 - SEPTEMBER 2005

		Class				Grand Total
No.	Customer Name	B4		C4		(M^3)
1	AERO MARINE SEAFOOD LIMITED	2,707				2,707
2	AGRIFIN COMPANY LTD	408				408
3	ALLIED PETROLEUM MARKETING	850				850
4	ANALYTICAL TECHNOLOGY	1,995				1,995
5	ANSA MC AL CHEMICALS LTD	71,152				71,152
6	ARESTECH	19,850				19,850
7	ATLANTIC PLAZA			51,510		51,510
8	ATLAS METHANOL PLANT	531,966				531,966
9	C & L BLANCHFIELD CO LTD	0				0
10	CARIBBEAN NITROGEN CO LTD	1,086,950				1,086,950
11	CARONI SHIPPING TERMINAL	3,088				3,088
12	CENTRIN	24,271				24,271
13	CERAMICS DESIGNS LIMITED	7,180				7,180
14	CHEMICAL SPECIALISTS LTD	864				864
15	CONSOLIDATED TERMINALS LTD	104				104
16	CUST. & EXCISE CONT. EXAM. STA	1,084				1,084
17	D2F TECHNICAL LIMITED	560				560
18	DAMUS ROOFING SYSTEMS	523				523
19	FIRST CITIZENS BANK			560		560
20	GEMIMI CONCRETE SUPP	0				0
21	GEO TECHNOLOGIE LIMITED	0				0
22	GILBERT PARK REC GROUND			4,012		4,012
23	GORMANDY'S ENGINEERING LTD	58				58
24	INDUSTRIAL GASES LIMITED	73,239				73,239
25	INDUSTRIAL GASES LTD	4,981				4,981
26	INDUSTRIAL WELDING EQUIPMENT	328				328
27	INSERTECH (CARIB)LTD	2,855				2,855
28	ISG TRINIDAD UNLIMITED	653,610				653,610
29	JOHN WILLIAM CONST CO LTD	2,662				2,662
30	JOKHAN GENERAL CONTRACTORS LTD	1,634				1,634
31	JUPITER PLASTICS LTD			262		262
32	KWELF INDUSTRIES	0				0
33	L JOHN WILLIAMS SER. CO. LTD	0				0
34	MAGIC MIST SERVICES LTD	0				0
35	METHANOL HOLDING (TRINIDAD)LTD			3,688		3,688
36	METHANOL HOLDING LTD(M 5000)	428,504				428,504
37	METHANOL HOLDINGS LTD (METH I)	1,913,051				1,913,051
38	METHANOL HOLDINGS LTD(CAR.MET)	2,101,890				2,101,890
39	METHANOL HOLDINGS LTD(METH II)	1,414,403				1,414,403
40	METHANOL HOLDINGS LTD.(MET.IV)	1,763,860				1,763,860
41	MITTAL STEEL POINT LISAS LTD.	3,974,980				3,974,980
42	N E C PIER IV	3,145				3,145
43	NATIONAL AGRO CHEMICALS	1,737				1,737
44	NATIONAL GAS CO	17,176				17,176
45	NATIONAL GAS COMPANY OF T&T	5,213				5,213
46	NAVARRO HOLDINGS LIMITED	9,599				9,599
47	NITROGEN (2000) UNLIMITED	989,744				989,744
48	NITROGEN 2000 AMMONIA PLANT			1,327		1,327

49	NUTRIMIX FEEDS LTD	2,396				2,396
50	PCS NITROGEN T'DAD LTD.	4,963,660				4,963,660
51	PETROGAS	37				37
52	PHOENIX ENGINEERING	318				318
53	PHOENIX PARK GAS PROCESSORS	11,916				11,916
54	PHOENIX PLASTICS LTD	8,203				8,203
55	PIOCHEM SALES & SERVICE LTD	868				868
56	PLIPDECO			903		903
57	PLIPDECO PORT			349,531		349,531
58	PLIPDECO WAREHOUSE	14,400				14,400
59	POINT LISAS NITROGEN LIMITED	877,584				877,584
60	POWER GENERATION OF T & T	5,252				5,252
61	PROCESS MANAGEMENT LTD			585		585
62	PROGRESS PLASTIC LTD			1,234		1,234
63	PT LISAS IND & TECHNICAL SERV	51				51
64	PT LISAS PORT CUSTOMS BLDG			14,396		14,396
65	PT LISAS STEEL PRODUCTS LTD	790				790
66	QUALITECH MACHINING SERV LTD	0				0
67	READYMIX	309				309
68	REFINERY IND. FAB LTD.			533		533
69	ROTIV WELDING SPECIALISTS	827				827
70	SCAFFOLDING MANUFACTURING TDAD	2,681				2,681
71	SHELL LUBRICANT CARIBBEAN LTD	22,175				22,175
72	SOUTHERN SALES AND SERVICES CO			920		920
73	ST JAMES INVESTMENT LIMITED	4,339				4,339
74	SUPER INDUSTRIAL SERVICES			6,869		6,869
75	SUPER INDUSTRIAL SERVICES LTD	4,345				4,345
76	SURE COAT ASPHALT PRODUCTS LTD			29		29
77	T & T E C	3,437				3,437
78	TEXTEL - PT LISAS			131		131
79	THE CARIBBEAN CHOCOLATE CO	955				955
80	TITAN METHANOL PLANT	64,760				64,760
81	TRINGEN I & II	2,298,556				2,298,556
82	TRINIDAD IRON CARBIDE INC	43,209				43,209
83	TRINTOGAS CARBONICS LTD	2,679				2,679
84	TRUSPEC PLASTIC CO LTD			151		151
85	UNITED ENGINEERING SERVICES			642		642
86	UNIVERSAL FOODS	45,114				45,114
87	YARA TRINIDAD LTD	175,740				175,740
88	. DECKER PETROLEUM	217				217
89	. INDUST GASES (ADMIN & SALES)	2,896				2,896
90	AC MANUFACTURING & TRADING	151				151
91	CARIBBEAN SAFETY PRODUCTS LTD	1,115				1,115
92	CARIBBEAN STEEL MILLS LTD.	147				147
93	DE SALINATION PLANT PROJECT	0				0
94	ENMAN SERVICES LTD			869		869
95	ESCO WEST INDIES LTD			440		440
96	P.C.S NITROGEN	1,543				1,543
97	PARAMOUNT TRANSPORT			614		614
98	POINT LISAS PIPE SERVICES INTERNATIONAL	3,448				3,448
99	PRESTIGE HOLDINGS LTD			3,124		3,124
100	SHYMDEO GOSINE			5,068		5,068
101	TCL PONSA MANUFACTURING LTD			814		814
102	THE NATIONAL ENERGY SKILLS CENTER	0				0
103	V A G & B MAHARAJ	6,990				6,990
104	WESTERN SCIENTIFIC	147				147
	Grand Total (M^3)	**23,687,478**		**448,214**		**24,135,692**

Prepared By: Isa Emamdeen

Source: CIS_METER_READING_TABLE

Date: 26th April, 2007

TABLE 21

POINT LISAS B4 AND C4 HISTORICAL AND PROJECTED CONSUMPTION (M3) 2001-2011

historical Consumption m3						
Point Lisas	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**
B4	19,669,623	17,196,692	20,167,115	21,[illegible]2,179	23,687,478	26,399,142
C4	273,203	290,043	[illegible]87,077	38[illegible],361	448,214	363,789

Projected Consumption m3					
Point Lisas	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
B4	28,1[illegible]804.07	29,999,502.44	31,979,831.30	34,090,885.75	36,341,295.24
C4	39[illegible]56	418,821.87	449,385.93	482,180.44	517,368.17

Source: Tariff Analysis of Point Lisas CIS Meter Reading Table

TABLE 22

WATER AND SEWERAGE AUTHORITY
POINT LISAS
TOTAL CONSUMPTION (M^3) FOR ALL POINT LISAS METERED ACCOUNTS
FOR THE PERIOD 2002 - 2011

	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Total(M^3)	**19,942,827**	17,486,735.48	20,554,192.32	21,581,540.02	24,135,691.96	26,762,931.00
m3/year converted to daily m3	54,638	47,909	56,313	59,128	66,125	73,323
Daily m3 converted to gallons/day	12,020,334	10,539,950	12,388,828	13,008,052	14,547,540	16,131,082
Million gallons	12.02	10.54	12.39	13.01	14.55	16.13

	PROJECTED YEARS				
	2007	2008	2009	2010	2011
Total(M^3)	28526307.11	30[illegible]869.87	32409274.68	34544681.32	36820787.25
m3/year converted to daily m3	78154.27	83303.75	88792.53	94642.96	100878.87
Daily m3 converted to gallons/day	17193938.53	18326825.68	19534357.34	20821451.76	22193351.22
Million gallons	**17.19**	**18.33**	**19.53**	**20.82**	**22.19**

* To convert m3/year to m3/day divide by 365
To convert m3/day to gallons/day multiply by 220

Note:
The total consumption for Point Lisas Metered Accounts has increased since 2002 by an average of 11.3%.
Taking 2006 as a base year, it is projected that by 2012 the total consumption for Point Lisas will increase by 90.3%.

Source: Tariff Analysis of CIS Meter Reading Table

TABLE 23

NON-DOMESTIC BILL PER MONTH 2006-2007

	Category	No. of Accounts	Variable Cost (monthly)	Fixed Cost (Monthly)	Total Cost	Yearly Cost per account	Yearly cost overall	Consumption m3 per year	per m3 charge
Industrial	B3/B4	431	$ 2,673.59	$ 27,182.62	$ 29,856.21	$ 358,274.57	$ 154,542,314.49	5,343,598.34	$ 28.92
Point Lisas industrial		84		$ 169,923.22	$ 169,923.22	$ 2,039,078.60	$ 171,213,903.92	28,141,804	$ 6.08
Commercial Cottage	C3/C4/D3/D4	7729	$ 509.65	$ 5,181.65	$ 5,691.30	$ 68,295.57	$ 527,872,318.98	18,252,202.68	$ 28.92
Point Lisas Commercial		26		$ 7,748.00	$ 7,748.00	$ 92,976.02	$ 2,374,796.08	390,337	$ 6.08
Agricutlural	E3/E4	1087	$ 246.41	$ 2,505.24	$ 2,751.64	$ 33,019.71	$ 35,892,290.66	1,241,045	$ 28.92

Source: Tariff Analysis of Opex

TABLE 24
TARIFF FOR WATER SERVICES (2006-2007)

Customer Class	Category	per m3 charge	Meter Charges per month	Unmetered per month
DOMESTIC				
Standpipe	A1			$ 27.20
Externally Serviced	A2	$ 2.64		$ 122.79
Internally Serviced	A3	$ 2.64		$ 122.79
Internally Serviced (M)	A4	$ 2.64	$ 122.79	
Charitable institutions	A5	$ 2.64		$ 122.79
Charitable institutions (M)	A6	$ 2.64	$ 122.79	
NON-DOMESTIC				
Industrial	B3	$ 28.92		$ 29,856.21
Industrial (M)	B4	$ 28.92	$ 29,856.21	
Commercial	C3	$ 28.92		$ 5,691.30
Commercial (M)	C4	$ 28.92	$ 5,691.30	
Cottage	D3	$ 28.92		$ 5,691.30
Cottage (M)	D4	$ 28.92	$ 5,691.30	
Agricultural	E3	$ 28.92		$ 2,751.64
Agricultural (M)	E4	$ 28.92	$ 2,751.64	
Point Lisas Industrial		$ 6.08	$ 169,923.22	
Point Lisas Commercial		$ 6.08	$ 7,748.00	

*1. All domestic classes are grouped together
*2. Commercial and Cottage Classes are grouped together
*3. Point lisas Commercial and industrial classes are separated from regular commercial and industrial classes

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2006-2007)

Consumption is the basis for all cost apportionment in this The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non- Domestic

The proposed non- domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non - domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal is $401,715,157.24. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2006-2007)

	Total Consumption m^3	% of cost to be borne OVERALL	Variable Cost to be borne by each class	Percentage of Variable Cost
Commercial	18,252,202.68	11.77%	$ 47,270,359	12%
Industrial	5,343,598.34	3.44%	$ 13,839,087	3%
Agricultural	1,241,045	0.80%	$ 3,214,113	1%
Domestic	130,275,254.89	83.99%	$ 337,392,598	84%
Total	**155,112,101.01**	**100.00%**	**$ 401,716,157**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2006-2007)

	Cost	
Fixed Cost	$ 855,267,289.55	A
92% of Fixed Cost	$ 786,845,906.38	
DESAL	$ 204,222,000.00	B
Fixed cost 92%	$ 991,067,906.38	
Total variable cost	$ 436,647,997.00	C
Variable Cost 92%	$ 401,716,157.24	
Total Opex = A+B+C		

- The majority of costs (85%) associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The rationale behind this is that desalinated water serves the Pt. Lisas customers for the most part and therefore they should bear the greater part of this cost. (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost
Fixed Cost minus DESAL	$ 786,845,906.38
DESAL to Pt. Lisas @ 85%	$ 173,588,700.00
Remainder of desal	$ 30,633,300.00

The other 15% ($30.6 Mn.) of the Desal cost is apportioned to the other Domestic and Non Domestic customer classes. This is done along with the remainder of fixed cost and depreciation charges. (***See worksheet Fixed cost allocated to all Classes.)***

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption M3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			17,984,542.54	55,109	$ 326.35
DOMESTIC	**Consumption M3**	**%**	**Apportionment F.C**	**No of accounts**	**Per Account**
A2	17,086,048.14	13.12%	$ 19,084,307.73	37,434	$ 509.81
A3 Class (I-III)	99,955,514.93	76.73%	$ 111,645,583.08	179,069	$ 623.48
A3 Class (IV-V)	7,354,660.55	5.65%	$ 8,214,808.02	52,703	$ 155.87
A4	4,637,459.01	3.56%	$ 5,179,822.40	13,773	$ 376.09
A5	1,231,189.61	0.95%	$ 1,375,180.57	1,822	$ 754.87
A6	10,382.65	0.01%	$ 11,596.93	15	$ 754.87
	130,275,254.89	1	$ 145,511,298.74		
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 817,479,206.38	$ 163,495,841.28	$ 653,983,365.11		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption M3	Percentage	Apportionment of F.C	No of accounts	Per Account	Monthly charge
Industrial (B3&B4)	5,343,598.34	21.51%	$ 140,703,227.64	431	$ 326,191.49	$ 27,182.62
Commercial (C3,C4,D3,D4	18,252,202.68	73.49%	$ 480,601,929.86	7,729	$ 62,179.78	$ 5,181.65
Agricultural	1,241,045	5.00%	$ 32,678,177.31	1,087	$ 30,062.84	$ 2,505.24
Total (Non-Domestic excluding Point Lisas)	24,836,846.13	100.00%	$ 653,983,365.11	9,248		
Industrial Point Lisas	23,141,804.1	99%	$ 171,213,903.92	84	$ 2,039,078.60	$ 169,923.22
Commercial Point Lisas	390,336.6	1%	$ 2,374,796.08	26	$ 92,976.02	$ 7,748.00
Total	23,532,140.6	100%	$ 173,588,700.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 817,479,206.38	$ 163,495,841.28	$ 653,983,365.11			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2006-2007)

COST PER M3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2006-2007)			
CLASS	**Consumption m3**		**Av Consumption per acc m3**
Internally serviced - Unmetered (A3)		129,374,157.12	558.19
Cost per m3			
Fixed Cost to domestic	$	163,495,841.28	
No. of domestic accounts including externally serviced accounts	$	339,925	
Fixed element per account	$	481	
Variable element (variable costs to domestic/no of domestic acc)	$	993	
Total contribution to cost	$	1,474	
Total contribution to cost	$	1,474	
Average Consumption	$	558.19	
Cost per m3	$	2.64	
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$	888.86	
* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)			
Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost			
Cost per Account A4 = Average consumption/Cost per m3			

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2006-2007)			
Class	**Consumption m3**		**Av Consumption per acc m3**
Internally serviced - Metered (A4)	4,637,459.01		336.71
Cost per m3			
Fixed element of cost to each domestic metered customer	$	376	
Variable element (variable cost to domestic/no of domestic accounts)	$	1,185	
Total contribution to cost	$	1,561	
Total Contribution to cost	$	1,561	
Average Consumption **Metered Domestic**(m3)		336.71	
Av. Bill/cost per m3	$	4.64	
Average Consumption = Total Consumption/No of accounts			
* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.			

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.64 and $4.64 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small

size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2006-2007)		
Class	**Consumption m3**	**Av Consumption per acc m3**
Point Lisas	28,526,307	274,291.41
DESAL to Point Lisas	$ 173,588,700.00	
Cost per m3	$ 6.09	

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption M3	Percentage	Apportionment of F.C	No of accounts	Per Account	Monthly charge
Industrial (B3&B4)	5,343,598.34	21.51%	$ 140,703,227.94	431	$ 326,191.49	$ 27,182.62
Commercial (C3,C4,D3,D4	18,252,202.68	73.49%	$ 480,601,959.86	7,729	$ 62,179.78	$ 5,181.65
Agricultural	1,241,045	5.00%	$ 32,678,177.31	1,087	$ 30,062.84	$ 2,505.24
Total (Non-Domestic excluding Point Lisas)	24,836,846.13	100.00%	$ 653,983,365.11	9,248		
Industrial Point Lisas	28,141,804.1	99%	$ 171,213,903.92	84	$ 2,039,078.60	$ 169,923.22
Commercial Point Lisas	390,336.5	1%	$ 2,374,796.08	26	$ 92,976.02	$ 7,748.00
Total	28,532,140.6	100%	$ 173,588,700.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 817,479,206.38	$ 163,495,841.28	$ 653,983,365.11			

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

TABLE OF CONTENTS

2007-2008

TABLE 1

CLASS OF SUPPLY 2002 - 2006

2002

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		**1,237,809**	**100%**

2003

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	300,586	25%
4	48-84	129,504	12%
5	0-48	76,994	6%
Total		**1,194,737**	**100%**

2004

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	327,677	27%
2	120-168	482,048	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		**1,230,405**	**100%**

2005

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	240,058	20%
2	120-168	454,055	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		**1,204,364**	**100%**

2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		**1,231,805**	**100%**

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2007-2008)

Consumption is the basis for all cost apportionment in this The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non - Domestic

The proposed non- domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non - domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. ***(See Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal is $415,984,252.61. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2007-2008)

	Total Consumption m^3	% of cost to be borne OVERALL	Variable Cost to be borne by each class	Percentage of Variable Cost
Commercial	18,495,082.09	11.33%	$ 47,149,227	11%
Industrial	5,172,786.74	3.17%	$ 13,186,905	3%
Agricultural	1,237,222	0.76%	$ 3,154,030	1%
Domestic	138,271,771.04	84.74%	$ 352,494,090	85%
Total	**163,176,861.46**	**100.00%**	**$ 415,984,253**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2007-2008)

	Cost	
Fixed Cost	$ 959,052,843.24	A
92% of Fixed Cost	$ 882,328,615.78	
DESAL	$ 204,222,000.00	B
Fixed Cost 92%	$ 1,086,550,615.78	
Total Variable cost	$ 452,156,796.31	C
Variable Cost 92%	$ 415,984,252.61	
Total Opex = A+B+C		

- 100% of the cost associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The desalinated water serves 100% of the Pt. Lisas customers and therefore bear the whole cost (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost
Fixed Cost minus DESAL	$ 882,328,615.78
DESAL to Pt. Lisas @ 100 %	$ 204,222,000.00
Remainder of desal	$ -

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption M3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			19,411,229.55	53,905	$ 360.10
DOMESTIC	**Consumption M3**	**%**	**Apportionment F.C**	**No of accounts**	**Per Account**
A2	18,310,833.13	13.24%	$ 20,798,161.50	40,117	$ 518.43
A3 Class (I-III)	102,773,621.27	74.33%	$ 116,734,304.65	184,118	$ 634.02
A3 Class (IV-V)	7,562,014.95	5.47%	$ 8,588,232.78	54,189	$ 158.50
A4	8,010,590.85	5.79%	$ 9,098,742.86	23,791	$ 382.45
A5	1,600,652.61	1.16%	$ 1,818,083.93	1,919	$ 947.18
A6	14,058.23	0.01%	$ 15,967.89	17	$ 947.18
	138,271,771.04	100%	$ 157,054,493.61		
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 882,328,615.78	$ 176,465,723.16	$ 705,862,892.62		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

NON-DOMESTIC APPORTIONMENT OF FIXED COSTS (PLUS REMAINDER DESAL) BASED ON CONSUMPTION (2007-2008)

Non-Domestic	Consumption M3	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	5,172,786.74	20.77%	$ 146,607,707.57	434	$ 337,539.85	$ 28,128.32
Commercial (C3,C4,D3,D4)	18,495,082.09	74.26%	$ 524,189,710.68	7,894	$ 66,403.13	$ 5,533.59
Agricultural	1,237,222	4.97%	$ 35,065,474.37	1,100	$ 31,873.77	$ 2,656.15
Total (Non-Domestic excluding Point Lisas)	24,905,090.42	100.00%	$ 705,862,892.62	9,429		
Industrial Point Lisas	29,999,502.4	99%	$ 201,410,121.27	88	$ 2,285,394.37	$ 190,449.53
Commercial Point Lisas	418,821.9	1%	$ 2,811,878.73	27	$ 103,442.03	$ 8,620.17
Total	30,418,324.3	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 882,328,615.78	$ 176,465,723.16	$ 705,862,892.62			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2007-2008)

COST PER M3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2007-2008)

CLASS	Consumption m3	Av Consumption per acc m3
Internally serviced - Unmetered (A3)	133,021,681.06	558.19

Cost per m3		
Fixed Cost to domestic	$ 176,465,723.16	
No. of domestic accounts including externally serviced accounts	$ 358,056	
Fixed element per account	$ 493	
Variable element (variable costs to domestic/no of domestic acc)	$ 984	
Total contribution to cost	$ 1,477	
Total contribution to cost	$ 1,477	
Average Consumption	$ 558.19	
Cost per m3	$ 2.65	
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$ 891.14	

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

Cost per Account A4 = Average consumption/Cost per m3

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2007-2008)		
Class	**Consumption m3**	**Av Consumption per acc m3**
Internally serviced - Metered (A4)	8,010,590.85	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$	382
Variable element (variable cost to domestic/no of domestic accounts)	$	1,159
Total contribution to cost	$	1,541

Total Contribution to cost	$	1,541
Average Consumption **Metered Domestic**(m3)		336.71
Av. Bill/cost per m3	$	4.58

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.65 and $4.58 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2007-2008)

Class	Consumption m3	Av Consumption per acc m3
Point Lisas	30,405,870	292,364.13
DESAL to Point Lisas	$ 204,222,000.00	
Cost per m3	$ 6.72	

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

NON-DOMESTIC APPORTIONMENT OF FIXED COSTS (PLUS REMAINDER DESAL) BASED ON CONSUMPTION (2007-2008)

Non-Domestic	Consumption M3	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	5,172,786.74	20.77%	$ 146,607,707.57	434	$ 337,539.85	$ 28,128.32
Commercial (C3,C4,D3,D4)	18,495,082.09	74.26%	$ 524,189,710.68	7,894	$ 66,403.13	$ 5,533.59
Agricultural	1,237,222	4.97%	$ 35,065,474.37	1,100	$ 31,873.77	$ 2,656.15
Total (Non-Domestic excluding Point Lisas)	24,905,090.42	100.00%	$ 705,862,892.62	9,429		
Industrial Point Lisas	29,999,502.4	99%	$ 201,410,121.27	88	$ 2,285,394.37	$ 190,449.53
Commercial Point Lisas	418,821.9	1%	$ 2,811,878.73	27	$ 103,442.03	$ 8,620.17
Total	30,418,324.3	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 882,328,615.78	$ 176,465,723.16	$ 705,862,892.62			

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

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2008-2009

TABLE 1

CLASS OF SUPPLY 2002 - 2006

2002

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		**1,237,809**	**100%**

2003

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	303,586	25%
4	48-84	125,504	12%
5	0-48	76,994	6%
Total		**1,194,737**	**100%**

2004

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	327,677	27%
2	120-168	482,048	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		**1,230,405**	**100%**

2005

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	240,058	20%
2	120-168	454,055	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		**1,204,364**	**100%**

2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		**1,231,805**	**100%**

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2008-2009)

Consumption is the basis for all cost apportionment in this The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non- Domestic

The proposed non- domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non - domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas Industrial
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. ***(See Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal is $430,791,221.00. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2008-2009)

VARIABLE COST BORNE BY EACH CLASS 2008-2009				
	Total Consumption m^3	**% of cost to be borne OVERALL**	**Variable Cost to be borne by each class**	**Percentage of Variable Cost**
Commercial	18,735,037.61	10.92%	$ 47,051,535	11%
Industrial	5,014,485.48	2.92%	$ 12,593,476	3%
Agricultural	1,231,395	0.72%	$ 3,097,573	1%
Domestic	146,550,054.81	85.44%	$ 368,048,637	85%
Total	**171,532,973.29**	**100.00%**	**$ 430,791,221**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2008-2009)

		Cost	
A	Fixed Cost	$	996,763,750.35
	92% of Fixed Cost	$	917,022,650.78
B	DESAL	$	204,222,000.00
	Fixed Cost 92% to water	$	1,121,244,650.78
C	Total variable cost	$	463,251,327.57
	Variable Cost 92% to water	$	430,791,221.36

Total OPEX = A + B + C

- 100% of the cost associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The desalinated water serves 100% of the Pt. Lisas customers and therefore bear the whole cost (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost	
Fixed Cost minus DESAL	$	917,022,650.78
DESAL to Pt. Lisas @ 100 %	$	204,222,000.00
Remainder of desal	$	-

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption m^3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			$ 20,174,498.32	52,728	$ 382.62
DOMESTIC	**Consumption m^3**	**%**	**Apportionment of F.C**	**No of accounts**	**Per Account**
A2	19,623,414.81	13.39%	$ 21,856,904.99	42,993	$ 508.38
A3 Class (I-III)	105,667,873.94	72.10%	$ 117,694,761.12	189,303	$ 621.73
A3 Class (IV-V)	7,774,973.61	5.31%	$ 8,659,902.53	55,715	$ 155.43
A4	11,383,751.09	7.77%	$ 12,679,422.44	33,809	$ 375.04
A5	2,080,986.34	1.42%	$ 2,317,839.23	2,022	$ 1,146.06
A6	19,035.02	0.01%	$ 21,201.54	18	$ 1,146.06
	146,550,054.81	1	$ 163,230,031.84		
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 917,022,650.78	$ 183,404,530.16	$ 733,618,120.62		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption m^3	%	Apportionment of F.C	No of accounts	Per Account	Monthly charge
Industrial (B3&B4)	5,014,485.48	20.07%	$ 147,249,366.30	438	$ 336,209.63	$ 28,017.47
Commercial (C3,C4,D3,D4)	18,735,037.61	74.97%	$ 550,150,419.43	8,057	$ 68,279.72	$ 5,689.98
Agricultural	1,233,395	4.94%	$ 36,218,394.89	1,872	$ 19,346.65	$ 1,612.22
Total (Non-Domestic excluding Point Lisas)	24,982,918.49	100.00%	$ 733,618,120.62	10,367		
Industrial Point Lisas	31,979,831.3	0.98614256	$ 201,392,005.93	92	$ 2,177,243.55	$ 181,436.96
Commercial Point Lisas	449,385.9	0.01385744	$ 2,829,994.07	29	$ 97,823.19	$ 8,151.93
Total	32,429,217.2		$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 917,022,650.78	$ 183,404,530.16	$ 733,618,120.62			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2008-2009)

CLASS	Consumption m3	Av Consumption per acc m3
Internally serviced - Unmetered (A3)	136,767,788.39	558.19

Cost per m3		
Fixed Cost to domestic	$ 183,404,530.16	
No. of domestic accounts including externally serviced accounts	$ 376,589	
Fixed element per account	$ 487	
Variable element (variable costs to domestic/no of domestic acc)	$ 977	
Total contribution to cost	$ 1,464	
Total contribution to cost	$ 1,464	
Average Consumption	$ 558.19	
Cost per m3	$ 2.62	
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$ 883.31	

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2008-2009)		
Class	**Consumption m3**	**Av Consumption per acc m3**
Internally serviced - Metered (A4)	11,383,751.09	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$ 375	
Variable element (variable cost to domestic/no of domestic accounts)	$ 1,136	
Total contribution to cost	$ 1,511	

Total Contribution to cost	$ 1,511	
Average Consumption **Metered Domestic**(m3)	336.71	
Av. Bill/cost per m3	$ 4.49	

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.62 and $4.49 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2008-2009)		
Class	**Consumption m3**	**Av Consumption per acc m3**
Point Lisas	32,409,275	311,627.64
DESAL to Point Lisas	$ 204,222,000.00	
Cost per m3	$ 6.30	

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption m^3	%	Apportionment of F.C	No of accounts	Per Account	Monthly charge
Industrial (B3&B4)	5,014,485.48	20.07%	$ 147,249,366.30	438	$ 336,209.63	$ 28,017.47
Commercial (C3,C4,D3,D4)	18,735,037.61	74.97%	$ 550,150,419.43	8,057	$ 68,279.72	$ 5,689.98
Agricultural	1,233,395	4.94%	$ 36,218,394.89	1,872	$ 19,346.65	$ 1,612.22
Total (Non-Domestic excluding Point Lisas)	24,982,918.49	100.00%	$ 733,618,120.62	10,367		
Industrial Point Lisas	31,979,831.3	0.98614256	$ 201,392,005.93	92	$ 2,177,243.55	$ 181,436.96
Commercial Point Lisas	449,385.9	0.01385744	$ 2,829,994.07	29	$ 97,823.19	$ 8,151.93
Total	32,429,217.2		$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 917,022,650.78	$ 183,404,530.16	$ 733,618,120.62			

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

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2009-2010

TABLE 1

CLASS OF SUPPLY 2002 - 2006

2002

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		**1,237,809**	**100%**

2003

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	[illegible]	25%
4	48-84	129,504	12%
5	0-48	76,994	6%
Total		**1,194,737**	**100%**

2004

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	327,677	27%
2	120-168	482,048	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		**1,230,405**	**100%**

2005

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	240,05[illegible]	20%
2	120-168	454,05[illegible]	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		**1,204,364**	**100%**

2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		**1,231,805**	**100%**

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2009-2010)

Consumption is the basis for all cost apportionment in this The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non - Domestic

The proposed non- domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non - domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. ***(See Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal is $446,158,771.24. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2009-2010)

VARIABLE COST BORNE BY EACH CLASS 2009-2010				
	Total Consumption m^3	**% of cost to be borne OVERALL**	**Variable Cost to be borne by each class**	**Percentage of Variable Cost**
Commercial	18,944,855.46	10.56%	$ 47,070,828	11%
Industrial	4,872,656.81	2.71%	$ 12,106,716	3%
Agricultural	1,229,551	0.68%	$ 3,054,972	1%
Domestic	154,520,914.87	86.05%	$ 383,926,255	86%
Total	**179,567,978.37**	**100.00%**	**$ 446,158,771**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2009-2010)

		Cost	
A	Fixed Cost	$	1,032,461,170.90
	92% of Fixed Cost	$	949,864,277.23
B	DESAL	$	204,222,000.00
	Fixed Cost 92% to water	$	1,154,086,277.23
C	Total Variable Cost	$	484,956,186.13
	Variable Cost 92% to water	$	446,158,771.24

Total OPEX =A + B + C

- 100% of the cost associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The desalinated water serves 100% of the Pt. Lisas customers and therefore bear the whole cost (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

Pt. Lisas	Cost	
Fixed Cost minus DESAL	$	949,864,277.23
DESAL to Pt. Lisas @ 100%	$	204,222,000.00
Remainder of desal	$	-

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption m^3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			20,8[illegible]014.10	51,576	$ 405.17
DOMESTIC	**Consumption m^3**	**%**	**Apportionment F.C**	**No of accounts**	**Per Account**
A2	21,030,086.72	13.61%	$ 23,010,992.46	46,075	$ 499.43
A3 Class (I-III)	106,434,063.70	68.91%	$ 116,514,212.18	190,765	$ 610.77
A3 Class (IV-V)	7,835,026.24	5.07%	$ 8,573,038.52	56,145	$ 152.69
A4	16,440,502.37	10.64%	$ 17,989,097.29	48,827	$ 368.43
A5	2,705,461.53	1.75%	$ 2,960,299.55	2,131	$ 1,389.20
A6	25,773.64	0.02%	$ 28,201.36	20	$ 1,389.20
	154,520,914.87	1	$ 169,075,841.35		
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 949,864,277.23	$ 189,972,855.45	$ 759,891,421.79		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption m^3	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	4,872,656.81	19.45%	$ 147,829,[illegible]83	443	$ 333,940.00	$ 27,828.33
Commercial (C3,C4,D3,D[illegible]	18,944,855.46	75.64%	$ [illegible]74,759,31[illegible]74	8,194	$ 70,142.25	$ 5,845.19
Agricultural	1,229,551	4.91%	$ 37,302,793.[illegible]	1,895	$ 19,688.98	$ 1,640.75
Total (Non-Domestic excluding Point Lisas)	25,047,063.50	100.00%	$ 759,891,421.79	10,531		
Industrial Point Lisas	34,090,8[illegible]7	99%	$ 201,373,775.53	97	$ 2,074,209.52	$ 172,850.79
Commercial Point Lisas	482,13[illegible]4	1%	$ 2,848,224.47	31	92509.50657	$ 7,709.13
Total	34,573,066.2[illegible]	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 949,864,277.23	$ 189,972,855.45	$ 759,891,421.79			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2009-2010)

COST PER M3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2009-2010)		
CLASS	**Consumption m3**	**Av Consumption per acc m3**
Internally serviced - Unmetered (A3)	137,824,171.07	558.19

Cost per m3		
Fixed Cost to domestic	$	189,972,855.45
No. of domestic accounts including externally serviced accounts	$	395,540
Fixed element per account	$	430
Variable element (variable costs to domestic/no of domestic acc.)	$	971
Total contribution to cost	$	1,451
Total contribution to cost	$	1,451
Average Consumption	$	558.19
Cost per m3	$	2.60
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$	875.22

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

Cost per Account A4 = Average consumption/Cost per m3

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2009-2010)		
Class	**Consumption m3**	**Av Consumption per acc m3**
Internally serviced - Metered (A4)	16,440,502.37	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$	368
Variable element (variable cost to domestic/no of domestic accounts)	$	1,116
Total contribution to cost	$	1,485
Total Contribution to cost	$	1,485
Average Consumption **Metered Domestic**(m3)		336.71
Av. Bill/cost per m3	$	4.41

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.60 and $4.41 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION

Class	Consumption m3	Av Consumption per acc m3
Point Lisas	34,544,681	332,160.40

DESAL to Point Lisas	$ 204,222,000.00	
Cost per m3	$ 5.91	

* Apportionment of DESAL cost to Pt. Lisas is 100%.

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption m^3	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	4,872,656.81	19.45%	$ 147,829,[illegible]83	443	$ 333,940.00	$ 27,828.33
Commercial (C3,C4,D3,D4	18,944,855.46	75.64%	$ [illegible]74,759,31[illegible]74	8,194	$ 70,142.25	$ 5,845.19
Agricultural	1,229,551	4.91%	$ 37,302,793.[illegible]	1,895	$ 19,688.98	$ 1,640.75
Total (Non-Domestic excluding Point Lisas)	25,047,063.50	100.00%	$ [illegible]59,891,421.79	10,531		
Industrial Point Lisas	34,090,8[illegible]7	99%	$ 201,373,775.53	97	$ 2,074,209.52	$ 172,850.79
Commercial Point Lisas	482,1[illegible]4	1%	$ 2,848,224.47	31	92509.50657	$ 7,709.13
Total	3[illegible]573,066.2[illegible]	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed [illegible]ost to be apportioned	$ 949,864,277.23	$ 189,972,855.45	$ 759,891,421.79			

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

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2010-2011

TABLE 26
TARIFF FOR WATER SERVICES (2010-2011)

Customer Class	Category	per m3 charge	Metered Charges per month	Unmetered per month
DOMESTIC				
Standpipe	A1	$ 2.78		$ 34.27
Externally Serviced	A2	$ 2.78		$ 129.43
Internally Serviced	A3	$ 2.78		$ 129.43
Internally Serviced (M)	A4	$ 2.78	$ 129.43	
Charitable institutions	A5	$ 2.78		$ 129.43
Charitable institutions (M	A6	$ 2.78	$ 129.43	
NON-DOMESTIC				
Industrial	B3	$ 32.80		$ 28,926.94
Industrial (M)	B4	$ 32.80	$ 28,926.94	
Commercial	C3	$ 32.80		$ 6,296.13
Commercial (M)	C4	$ 32.80	$ 6,296.13	
Cottage	D3	$ 32.80		$ 6,296.13
Cottage (M)	D4	$ 32.80	$ 6,296.13	
Agricultural	E3	$ 32.80		$ 2,938.08
Agricultural (M)	E4	$ 32.80	$ 2,938.08	
Point Lisas Industrial		$ 5.54	$ 164,670.85	
Point Lisas Commercial		$ 5.54	$ 7,290.37	

*1. All domestic classes are grouped together
*2. Commercial and Cottage Classes are grouped together
*3. Point lisas Commercial and industrial classes are separated from regular commercial and industrial classes

Water and Sewerage Authority Proposed Tariff Structure – Methodology (2010-2011)

Consumption is the basis for all cost apportionment in this The Tariff Book.

The proposed Customer Classes are as follows:

1. Domestic
2. Non - Domestic

The proposed non- domestic class includes the current non - domestic classes of the Authority but will now be grouped as follows and charged the non - domestic rate.

- Commercial including Cottage excluding Pt. Lisas
- Industrial excluding Pt. Lisas
- Point Lisas Industrial
- Agricultural

Consumption for domestic customers was estimated using per capita demand from WASA's demand model. Weights were then assigned based on these relative consumption numbers. (See ***Worksheet Water Consumption of Domestic Customers.)***

The demand for domestic customers is calculated by:

- Per capita demand * 4.1 (persons per household) * 365 (days per year).

Non-domestic customers consumption of the metered accounts was used as a proxy for the consumption of the unmetered non-domestic accounts.

The metered non-domestic accounts are: B4, C4, D4, E4

The unmetered non-domestic accounts are: B3, C3, D3, E3

The average consumption of metered accounts (***consumption m^3/ no. of accounts***) was then used as an approximation of unmetered average consumption. This multiplied by the number of accounts for unmetered non-domestic is used as an estimate of their consumption in the absence of meters. The assumption is that within the same class, both the metered and unmetered show similar characteristics in terms of activity and hence the volume of water that they consume. Weights were then assigned based on these relative consumption numbers. (***See Worksheet Water Consumption of Non-Domestic customers.)***

For domestic accounts this assumption was not applied since the metered domestic accounts (A4) represents less than 1% of total domestic accounts. This percentage is considered too small to be a representative of the characteristics of the entire domestic class.

The weights arising out of this analysis were:

- Domestic customers account for approximately 84% of the total consumption and should pay this percentage of Variable cost.
- Industrial customers account for 4% of the total consumption and should pay this percentage of Variable cost.
- Commercial customers including Cottage (excluding Pt. Lisas) account for 12% of the total consumption and should pay this percentage of Variable cost.
- Agricultural customers account for approximately 1% of the total consumption and should pay this percentage of Variable cost.
- **The Pt. Lisas accounts pay no Variable Cost**.

(See Worksheet Variable Cost by Class.)

The variable cost for the tariff proposal is $462,109,538.28. Using the calculated weights for the various classes, the apportionment is as follows:

TABLE#1: VARIABLE COST BORNE BY EACH CLASS (2010-2011)

VARIABLE COST BORNE BY EACH CLASS (2010-2011)

	Total Consumption m^3	% of cost to be borne OVERALL	Variable Cost to be borne by each class	Percentage of Variable Cost (2010-2011)
Commercial	19,120,743.86	10.05%	$ 46,438,262	10%
Industrial	4,741,434.22	2.49%	$ 11,515,450	2%
Agricultural	1,225,671	0.64%	$ 2,976,768	1%
Domestic	165,183,659.21	86.81%	$ 401,179,059	87%
Total	**190,271,508.70**	**100.00%**	**$ 462,109,538**	**100%**

FIXED COST

Total fixed cost was also apportioned on the basis of consumption.

Desal is assumed to be a relatively fixed cost.

TABLE#2: SUMMARY OF COST PROJECTED IN OPEX (2010-2011)

		Cost	
A	Fixed Cost	$	1,025,197,321.28
	92% of Fixed Cost	$	943,181,535.56
B	DESAL	$	204,222,000.00
	Fixed Cost 92% to water	$	1,147,403,535.56
C	Total Variable Cost	$	502,292,976.39
	Variable Cost 92% to water	$	462,109,538.28

Total OPEX=A + B + C

- 100% of the cost associated with Desalination ($204 Mn.) would be borne by Pt. Lisas customers. The rationale behind this is that desalinated water serves the Pt. Lisas customers for the most part and therefore they should bear the greater part of this cost. (***See Worksheet Contribution of Pt. Lisas Customers to DESAL Costs***.)

TABLE#3: POINT LISAS APPORTIONMENT TO FIXED COST

	Cost	
Fixed Cost minus DESAL	$	943,181,535.56
DESAL to Pt. Lisas @ 100%	$	204,222,000.00
Remainder of desal	$	-

TABLE#4: DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

DOMESTIC	Consumption m^3	%	Apportionment of F.C	No of accounts	Per Account
A1 (wwsc)			$ 20,749,993.78	50,450	$ 411.30
DOMESTIC	**Consumption m^3**	**%**	**Apportionment F.C**	**No of accounts**	**Per Account**
A2	22,537,593.58	13.64%	$ 22,906,342.55	49,378	$ 463.90
A3 Class (I-III)	109,536,900.41	66.31%	$ 111,3[illegible]089.05	196,234	$ 567.33
A3 Class (IV-V)	8,059,652.54	4.88%	$ 8,191,520.60	57,755	$ 141.83
A4	21,497,282.33	13.01%	$ 21,849,010.24	63,845	$ 342.22
A5	3,517,333.24	2.13%	$ 3,574,882.11	2,245	$ 1,592.19
A6	34,897.81	0.02%	$ 35,468.79	22	$ 1,592.19
	165,183,659.91	1	$ 167,886,313.33		
		20% to domestic	80% to Non-Domestic		
Total Fixed Cost to be apportioned	$ 943,181,535.56	$ 188,636,307.11	$ 754,545,228.45		

TABLE#5: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	4,741,434.22	18.90%	$ 142,603,359.36	448	$ 318,262.90	$ 26,521.91
Commercial (C3,C4,D3,D4	19,120,743.86	76.22%	$ 575,077,846.05	8,302	$ 69,271.89	$ 5,772.66
Agricultural	1,225,671	4.89%	$ 36,863,423.04	1,917	$ 19,226.19	$ 1,602.18
Total (Non-Domestic)	25,087,848.78	100.00%	$ 754,545,228.45	10,667		
Industrial Point Lisas	36,341,395.2	99%	$ 201,355,429.37	102	$ 1,976,050.23	$ 164,670.85
Commercial Point Lisas	517,368.2	1%	$ 2,866,570.63	33	$ 87,484.41	$ 7,290.37
Total	36,858,663.4	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 943,181,535.56	$ 188,636,307.11	$ 754,545,228.45			

COST PER M^3

After apportioning a Fixed and Variable element to the various classes a meter cube (m^3) charge is then the next step of the process. In respect of domestic consumption this is done in two ways for the purpose of comparison. One is done based on per capita consumption of Internally serviced-unmetered (A3) accounts and the other is done based on Internally serviced-metered accounts (A4) by actual consumption.

For domestic accounts (Internally serviced-unmetered) the sum of Fixed and Variable Cost apportioned to them becomes their total contribution to cost. Their total contribution required divided by the average consumption per account yields a cost per m^3 charge. ***(See Worksheet Cost per m3 based on per capita consumption.)***

TABLE#6: COST PER M^3 BASED ON DOMESTIC PER CAPITA CONSUMPTION (2010-2011)

CLASS	Consumption m3	Av Consumption per acc m3
Internally serviced - Unmetered (A3)	141,775,510.59	558.19

Cost per m3		
Fixed Cost to domestic	$ 188,636,307.11	
No. of domestic accounts including externally serviced accounts	$ 419,929	
Fixed element per account	$ 449	
Variable element (variable costs to domestic/no of domestic acc)	$ 955	
Total contribution to cost	$ 1,405	
Total contribution to cost	$ 1,405	
Average Consumption	$ 558.19	
Cost per m3	$ 2.52	
Metered (A4) customers based on per capita demand (Average consumption x cost per m3)	$ 847.25	

* Fixed Cost apportioned - 10% to Externally Serviced and 10% to remainder of Domestic Accounts (A2 - A6)

Externally serviced Domestic accounts (A1) are apportioned Infrastructure cost but no Variable cost

Cost per Account A4 = Average consumption/Cost per m3

TABLE#7: COST PER M^3 BASED ON METERED A4 CONSUMPTION

COST PER M3 BASED ON METERED A4 CONSUMPTION (2010-2011)

Class	Consumption m3	Av Consumption per acc m3
Internally serviced - Metered (A4)	21,497,282.33	336.71

Cost per m3		
Fixed element of cost to each domestic metered customer	$ 342	
Variable element (variable cost to domestic/no of domestic accounts)	$ 1,086	
Total contribution to cost	$ 1,426	
Total Contribution to cost	$ 1,428	
Average Consumption **Metered Domestic**(m3)	336.71	
Av. Bill/cost per m3	$ 4.24	

Average Consumption = Total Consumption/No of accounts

* Infrastructure and variable elements of cost are added for Domestic customers and divided by their average consumption to give a cost per m3 for Domestic customers.

The resulting costs per m3 based on per capita consumption for unmetered internally serviced and actual consumption of metered internally serviced are $2.52 and $4.24 respectively.

Both methods possess their drawbacks, as unmetered domestic internally serviced are not as reliable as actual data for metered domestic consumption. On the other hand, the small size of the metered internally serviced domestic (<1%) makes statistical inferences unreliable.

COSTS PER M3 PT. LISAS

The same basis for apportionment of costs to Point Lisas was used except it must be noted that Pt. Lisas accounts pay no variable cost. For simplicity's sake we can say they pay two elements of Fixed Cost. One associated with DESAL water and the other toward the balance of infrastructure cost including those attributable to the Pt. Lisas Industrial Estate.

Cost per m3 based on DESAL is as follows:

TABLE#8: PT. LISAS APPORTIONMENT OF DESAL BASED ON CONSUMPTION

POINT LISAS APPORTIONMENT OF DESAL COSTS BASED ON CONSUMPTION (2010-2011)

Class	Consumption m3	Av Consumption per acc m3
Point Lisas	36,820,787	354,046.03
DESAL to Point Lisas	$ 204,222,000.00	
Cost per m3	$ 5.55	

* Apportionment of DESAL cost to Pt. Lisas is 100%.

Cost based on the balance of infrastructure costs is as follows:

TABLE#9: NON-DOMESTIC APPORTIONMENT OF FIXED COSTS BASED ON CONSUMPTION

Non-Domestic	Consumption	%	Apportionment of F.C	No of accounts	Cost Per Account	Monthly charge
Industrial (B3&B4)	4,741,434.22	18.90%	$ 142,603,359.36	448	$ 318,262.90	$ 26,521.91
Commercial (C3,C4,D3,D4	19,120,743.86	76.22%	$ 575,077,846.05	8,302	$ 69,271.89	$ 5,772.66
Agricultural	1,225,671	4.88%	$ 36,863,423.04	1,917	$ 19,226.19	$ 1,602.18
Total (Non-Domestic)	25,087,848.78	100.00%	$ 754,545,228.45	10,667		
Industrial Point Lisas	36,341,095.2	99%	$ 201,355,429.37	102	$ 1,976,050.23	$ 164,670.85
Commercial Point Lisas	517,368.2	1%	$ 2,866,570.63	33	$ 87,484.41	$ 7,290.37
Total	36,858,663.4	100%	$ 204,222,000.00			
		20% to domestic	80% to Non-Domestic			
Total Fixed Cost to be apportioned	$ 943,181,535.56	$ 188,636,307.11	$ 754,545,228.45			

Source of Revenue: **Management Accounts**

Source of Consumption: **Customer Information Services**

**N.B This table was used for consumption only.*

Source: Number of Accounts: **Customer Information Services**

Source of Production: **Water Supply Department**

ASSUMPTIONS

1. Eight (8%) percent of the Authority's total cost is apportioned to wastewater based on ratio between water and wastewater customers.

2.Wasa plans to takeover HDC treatment plants and customers.

3. Wasa plans to takeover private treatment plants and customers.

4. Projections based on trend analysis of previous years 1999-2005.

5. For A3 (domestic unmetered) accounts, the percentage changes for 2003-2004 and 2004-2005 are excluded when calculating the projected years since these values represent significant changes due to HDC and private plant takeover. Inclusion of these percent changes would give an incorrect representation of the overall average percent change and also the projection of the number of accounts.

6. Fixed cost based on weights according to number of accounts.

7. Until Wasa introduces the Magden formula for calculating industrial effluent charges it is suggested that 25% premium charge be charged per Industrial customer.

8. Desal cost is not considered for sewer projections

NUMBER OF SEWER CUSTOMERS FOR THE PERIOD 2001-2006

Class	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2005-2006 % weights	Average % change
Domestic								
A2	548	618	561	1,003	2,029	1,951	3.1%	36%
A3	36,873	38,290	37,478	46,890	54,768	55,582	89.2%	1%
A4	915	918	908	951	1,043	1,054	1.7%	3%
A5	199	199	201	209	244	242	0.4%	4%
A6	5	4	6	5	6	6	0.0%	7%
Industrial								
B3	14	13	13	10	18	18	0.0%	10%
B4	54	53	52	53	79	82	0.1%	10%
Commercial								
C1	26	29	27	29	42	43	0.1%	12%
C2	32	33	34	37	43	46	0.1%	8%
C3	633	652	667	680	733	768	1.2%	4%
C4	1,994	2,003	2,012	2,032	2,217	2,222	3.6%	2%
Cottage							0.0%	
D3	95	96	123	121	118	135	0.2%	8%
D4	138	142	146	148	156	156	0.3%	2%
Agricultural								
E3	9	8	7	9	14	14	0.0%	12%
E4	2	2	2	2	2	2	0.0%	0%
Total	41,537	43,060	42,237	52,179	61,512	62,321		

Source: Finance Division, Customer Business Services

* Average percentage change based on account percentage changes throughout the years.

PROJECTED NUMBER OF SEWER CUSTOMERS FOR THE PERIOD 2007-2011 AND THEIR RESPECTIVE RATES

Class	Average % change based on historical data	2006-2007	Weights % of accounts	2007-2008	Weights % of accounts	2008-2009	Weights % of accounts	2009-2010	Weights % of accounts	2010-2011	Weights % of accounts
Domestic											
A2	36%	2,656	4.17%	3,617	5.52%	4,925	7.29%	6,705	9.56%	9,130	12.44%
A3	1%	56,176	88.08%	56,777	86.68%	57,385	84.90%	57,998	82.66%	58,619	79.87%
A4	3%	1,085	1.70%	1,117	1.71%	1,150	1.70%	1,184	1.69%	1,218	1.66%
A5	4%	252	0.40%	263	0.40%	274	0.40%	285	0.41%	297	0.40%
A6	7%	6	0.01%	7	0.01%	7	0.01%	8	0.01%	8	0.01%
Industrial											
B3	10%	20	0.03%	22	0.03%	24	0.04%	26	0.04%	29	0.04%
B4	10%	90	0.14%	100	0.15%	110	0.16%	121	0.17%	133	0.18%
Commercial											
C1	12%	48	0.08%	54	0.08%	60	0.09%	67	0.10%	75	0.10%
C2	8%	50	0.08%	53	0.08%	57	0.08%	62	0.09%	66	0.09%
C3	4%	798	1.25%	830	1.27%	863	1.28%	897	1.28%	933	1.27%
C4	2%	2,272	3.56%	2,323	3.55%	2,375	3.51%	2,428	3.46%	2,483	3.38%
Cottage											
D3	8%	146	0.23%	157	0.24%	170	0.25%	183	0.26%	197	0.27%
D4	2%	160	0.25%	164	0.25%	168	0.25%	172	0.25%	176	0.24%
Agricultural											
E3	12%	16	0.02%	18	0.03%	20	0.03%	22	0.03%	25	0.03%
E4	0%	2	0.00%	2	0.00%	2	0.00%	2	0.00%	2	0.00%
Total		63,778		65,503		67,588		70,161		73,392	

Industrial Weights	2005-2006		2006-2007		2007-2008		2008-2009		2009-2010		2010-2011	
B3	18	18%	20	18.0%	22	17.9%	24	17.9%	26	17.9%	29	17.8%
B4	82	82%	90	82.0%	100	82.1%	110	82.1%	121	82.1%	133	82.2%
Total	100		110		121		134		147		162	

PROJECTED COST FOR WASTE WATER BASED ON HISTORICAL DATA FOR THE PERIOD 2006-2011						
	2005-2006 (base year)	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**
TOTAL COST	$ 1,519,062,665.00	$ 1,564,634,544.95	$ 1,611,573,581.30	$ 1,659,920,788.74	$ 1,709,718,412.40	$ 1,761,009,964.77
92 % for water	$ 1,397,537,651.80	$ 1,439,463,781.35	$ 1,482,647,694.79	$ 1,527,127,125.64	$ 1,572,940,939.41	$ 1,620,129,167.59
8% for waste water	$ 121,525,013.20	$ 125,170,763.60	$ 128,925,886.50	$ 132,793,663.10	$ 136,777,472.99	$ 140,880,797.18
25% of wastewater cost as premium for industrial class	$ 30,381,253.30	$ 31,292,690.90	$ 32,231,471.63	$ 33,198,415.77	$ 34,194,368.25	$ 35,220,199.30
Remaining 75% to be apportioned throughout	$ 91,143,759.90	$ 93,878,072.70	$ 96,694,414.88	$ 99,595,247.32	$ 102,583,104.74	$ 105,660,597.89

APPORTIONMENT OF TOTAL COST TO SEWER CUSTOMERS BASED ON NUMBER OF ACCOUNTS FOR THE PERIOD 2006-2011

Cost apportioned to # of accts	2005-2006 (base year)	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Domestic						
A2	$ 2,853,315.50	$ 3,910,151.64	$ 5,339,276.81	$ 7,256,840.37	$ 9,803,966.11	$ 13,143,963.08
A3	$ 81,288,048.37	$ 82,689,298.91	$ 83,814,074.82	$ 84,559,206.05	$ 84,799,626.02	$ 84,391,221.84
A4	$ 1,541,463.12	$ 1,597,063.57	$ 1,648,755.67	$ 1,694,207.87	$ 1,730,478.42	$ 1,754,025.80
A5	$ 353,922.27	$ 371,111.65	$ 387,745.10	$ 403,240.68	$ 416,841.99	$ 427,611.01
A6	$ 8,774.93	$ 9,420.52	$ 10,077.46	$ 10,730.10	$ 11,356.52	$ 11,927.71
Industrial						
B3	$ 26,324.80	$ 29,133.09	$ 32,125.74	$ 35,261.12	$ 38,470.52	$ 41,651.47
B4	$ 119,924.08	$ 133,021.17	$ 147,021.28	$ 161,739.43	$ 176,864.53	$ 191,926.90
Commercial						
C1	$ 62,887.02	$ 70,795.48	$ 79,413.64	$ 88,666.79	$ 98,404.72	$ 108,378.02
C2	$ 67,274.48	$ 72,879.22	$ 78,668.73	$ 84,523.38	$ 90,269.42	$ 95,669.78
C3	$ 1,123,191.34	$ 1,175,274.66	$ 1,225,377.87	$ 1,271,677.50	$ 1,311,816.36	$ 1,342,886.77
C4	$ 3,249,649.95	$ 3,344,111.52	$ 3,429,019.50	$ 3,499,737.35	$ 3,550,504.36	$ 3,574,497.07
Cottage						
D3	$ 197,435.98	$ 214,404.22	$ 231,998.62	$ 249,869.80	$ 267,504.58	$ 284,196.67
D4	$ 228,148.24	$ 235,361.58	$ 241,935.20	$ 247,536.27	$ 251,748.98	$ 254,077.91
Agricultural						
E3	$ 20,474.84	$ 23,101.54	$ 25,972.06	$ 29,063.51	$ 32,328.00	$ 35,684.52
E4	$ 2,924.98	$ 2,943.91	$ 2,952.38	$ 2,947.11	$ 2,924.21	$ 2,879.34
Total Cost excluding Industrial Premium	$ 91,143,759.90	$ 93,878,072.70	$ 96,694,414.88	$ 99,595,247.32	$ 102,583,104.74	$ 105,660,597.89

APPORTIONMENT OF TOTAL COST TO SEWER CUSTOMERS BASED ON NUMBER OF ACCOUNTS FOR THE PERIOD 2006-2011 INCLUDING AN INDUSTRIAL PREMIUM

Cost apportioned to # of accts	2005-2006 (base year)	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Domestic						
A2	$ 2,853,315.50	$ 3,910,151.64	$ 5,339,276.81	$ 7,256,840.37	$ 9,803,966.11	$ 13,143,963.08
A3	$ 81,288,048.37	$ 82,689,298.91	$ 83,814,074.82	$ 84,559,206.05	$ 84,799,626.02	$ 84,391,221.84
A4	$ 1,541,463.12	$ 1,597,063.57	$ 1,648,755.67	$ 1,694,207.87	$ 1,730,478.42	$ 1,754,025.80
A5	$ 353,922.27	$ 371,111.65	$ 387,745.10	$ 403,240.68	$ 416,841.99	$ 427,611.01
A6	$ 8,774.93	$ 9,420.52	$ 10,077.46	$ 10,730.10	$ 11,356.52	$ 11,927.71
Industrial						
B3	$ 5,494,950.39	$ 5,651,266.18	$ 5,812,070.92	$ 5,977,443.56	$ 6,147,439.38	$ 6,322,083.32
B4	$ 25,032,551.78	$ 25,803,578.98	$ 26,598,547.73	$ 27,417,972.77	$ 28,262,263.92	$ 29,131,694.35
Commercial						
C1	$ 62,887.02	$ 70,795.48	$ 79,413.64	$ 88,666.79	$ 98,404.72	$ 108,378.02
C2	$ 67,274.48	$ 72,879.22	$ 78,668.73	$ 84,523.38	$ 90,269.42	$ 95,669.78
C3	$ 1,123,191.34	$ 1,175,274.66	$ 1,225,377.87	$ 1,271,677.50	$ 1,311,816.36	$ 1,342,886.77
C4	$ 3,249,649.95	$ 3,344,111.52	$ 3,429,019.50	$ 3,499,737.35	$ 3,550,504.36	$ 3,574,497.07
Cottage						
D3	$ 197,435.98	$ 214,404.22	$ 231,998.62	$ 249,869.80	$ 267,504.58	$ 284,196.67
D4	$ 228,148.24	$ 235,361.58	$ 241,935.20	$ 247,536.27	$ 251,748.98	$ 254,077.91
Agricultural						
E3	$ 20,474.84	$ 23,101.54	$ 25,972.06	$ 29,063.51	$ 32,328.00	$ 35,684.52
E4	$ 2,924.98	$ 2,943.91	$ 2,952.38	$ 2,947.11	$ 2,924.21	$ 2,879.34
Total Cost including Industrial Premium	$ 121,525,013.20	$ 125,170,763.60	$ 128,925,886.50	$ 132,793,663.10	$ 136,777,472.99	$ 140,880,797.18

Premium to Industrial Class	2005-2006 (base year)	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
B3	$ 5,468,625.59	$ 5,622,133.09	$ 5,779,945.18	$ 5,942,182.44	$ 6,108,968.86	$ 6,280,431.85
B4	$ 24,912,627.71	$ 25,670,557.81	$ 26,451,526.45	$ 27,256,233.33	$ 28,085,399.39	$ 28,939,767.44

AVERAGE SEWERAGE BILL 2005-2006 BASED ON NUMBER OF ACCOUNTS	
	Average bill
Domestic	
A2	$ 1,462.49
A3	$ 1,462.49
A4	$ 1,462.49
A5	$ 1,462.49
A6	$ 1,462.49
Industrial	
B3	$ 305,275.02
B4	$ 305,275.02
Commercial	
C1	$ 1,462.49
C2	$ 1,462.49
C3	$ 1,462.49
C4	$ 1,462.49
Cottage	
D3	$ 1,462.49
D4	$ 1,462.49
Agricultural	
E3	$ 1,462.49
E4	$ 1,462.49

AVERAGE SEWERAGE BILL 2006-2007 BASED ON NUMBER OF ACCOUNTS

	Average bill
Domestic	
A2	$ 1,471.96
A3	$ 1,471.96
A4	$ 1,471.96
A5	$ 1,471.96
A6	$ 1,471.96
Industrial	
B3	$ 285,531.58
B4	$ 285,531.58
Commercial	
C1	$ 1,471.96
C2	$ 1,471.96
C3	$ 1,471.96
C4	$ 1,471.96
Cottage	
D3	$ 1,471.96
D4	$ 1,471.96
Agricultural	
E3	$ 1,471.96
E4	$ 1,471.96

AVERAGE SEWERAGE BILL 2007-2008 BASED ON NUMBER OF ACCOUNTS	
	Average bill
Domestic	
A2	$ 1,476.19
A3	$ 1,476.19
A4	$ 1,476.19
A5	$ 1,476.19
A6	$ 1,476.19
Industrial	
B3	$ 267,066.98
B4	$ 267,066.98
Commercial	
C1	$ 1,476.19
C2	$ 1,476.19
C3	$ 1,476.19
C4	$ 1,476.19
Cottage	
D3	$ 1,476.19
D4	$ 1,476.19
Agricultural	
E3	$ 1,476.19
E4	$ 1,476.19

AVERAGE SEWERAGE BILL 2008-2009 BASED ON NUMBER OF ACCOUNTS

	Average bill	
Domestic		
A2	$	1,473.55
A3	$	1,473.55
A4	$	1,473.55
A5	$	1,473.55
A6	$	1,473.55
Industrial		
B3	$	249,796.10
B4	$	249,796.10
Commercial		
C1	$	1,473.55
C2	$	1,473.55
C3	$	1,473.55
C4	$	1,473.55
Cottage		
D3	$	1,473.55
D4	$	1,473.55
Agricultural		
E3	$	1,473.55
E4	$	1,473.55

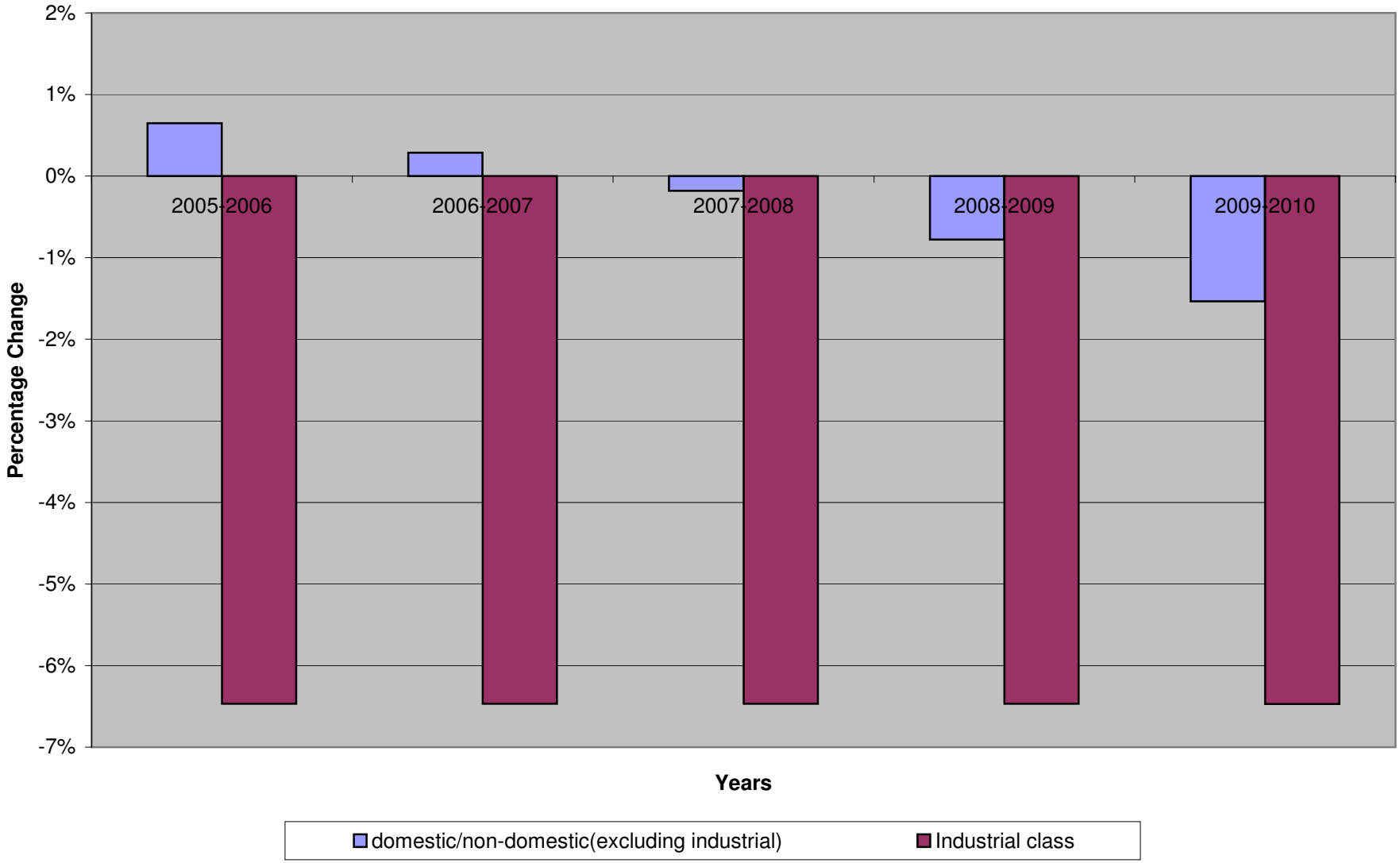
AVERAGE SEWERAGE BILL 2009-2010 BASED ON NUMBER OF ACCOUNTS

	Average bill
Domestic	
A2	$ 1,462.11
A3	$ 1,462.11
A4	$ 1,462.11
A5	$ 1,462.11
A6	$ 1,462.11
Industrial	
B3	$ 233,638.99
B4	$ 233,638.99
Commercial	
C1	$ 1,462.11
C2	$ 1,462.11
C3	$ 1,462.11
C4	$ 1,462.11
Cottage	
D3	$ 1,462.11
D4	$ 1,462.11
Agricultural	
E3	$ 1,462.11
E4	$ 1,462.11

AVERAGE SEWERAGE BILL 2010-2011 BASED ON NUMBER OF ACCOUNTS

	Average bill	
Domestic		
A2	$	1,439.67
A3	$	1,439.67
A4	$	1,439.67
A5	$	1,439.67
A6	$	1,439.67
Industrial		
B3	$	218,520.50
B4	$	218,520.50
Commercial		
C1	$	1,439.67
C2	$	1,439.67
C3	$	1,439.67
C4	$	1,439.67
Cottage		
D3	$	1,439.67
D4	$	1,439.67
Agricultural		
E3	$	1,439.67
E4	$	1,439.67

Average Bill Percentage Change 2006-2011



PERCENTAGE CHANGE ANALYSIS FOR THE AVERAGE BILL FOR THE PERIOD 2006-2011

	2005-2006	%	2006-2007	%	2007-2008	%	2008-2009	%	2009-2010	%	2010-2011
Domestic											
A2	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
A3	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
A4	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
A5	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
A6	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
Industrial											
B3	$ 305,275.02	-6%	$ 285,531.58	-6%	$ 267,066.98	-6%	$ 249,796.10	-6%	$ 233,638.99	-6%	$ 218,520.50
B4	$ 305,275.02	-6%	$ 285,531.58	-6%	$ 267,066.98	-6%	$ 249,796.10	-6%	$ 233,638.99	-6%	$ 218,520.50
Commercial											
C1	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
C2	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
C3	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
C4	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
Cottage											
D3	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
D4	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
Agricultural											
E3	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67
E4	$ 1,462.49	1%	$ 1,471.96	0%	$ 1,476.19	0%	$ 1,473.55	-1%	$ 1,462.11	-2%	$ 1,439.67