

Aqua North Carolina, Inc.
Docket No. W-218, Sub 526
Historical Conservation Experience

Thill Direct Exhibit 1

Test Year Ended	Total Customers Bills	Total kGallons Billed	Avg Gallons per Month	3-Yr Avg Gallons per Month	Change in 3-Yr Avg	Compounded Annual Growth Rate
Consolidated						
9/30/2009	844,871	47,428,082	5,614			
9/30/2010	849,911	49,188,432	5,787			
9/30/2011	857,409	49,885,466	5,818	5,740		
9/30/2012	861,297	46,813,921	5,435	5,680	-1.06%	
9/30/2013	878,244	43,607,549	4,965	5,403	-4.87%	
9/30/2014	895,252	46,482,452	5,192	5,196	-3.83%	
9/30/2015	912,661	47,565,124	5,212	5,125	-1.37%	
9/30/2016	926,901	47,287,963	5,102	5,168	0.85%	
9/30/2017	937,577	48,076,057	5,128	5,147	-0.41%	
9/30/2018	952,244	47,845,083	5,024	5,084	-1.21%	
9/30/2019	966,565	48,891,837	5,058	5,070	-0.28%	-1.54%
Aqua NC						
9/30/2009	639,606	34,171,851	5,343			
9/30/2010	643,070	35,433,430	5,510			
9/30/2011	649,629	36,092,568	5,556	5,470		
9/30/2012	654,306	33,950,878	5,189	5,417	-0.96%	
9/30/2013	670,955	31,553,318	4,703	5,144	-5.04%	
9/30/2014	687,071	33,766,698	4,915	4,933	-4.11%	
9/30/2015	702,835	35,297,154	5,022	4,882	-1.03%	
9/30/2016	714,272	35,083,286	4,912	4,950	1.38%	
9/30/2017	724,037	36,060,305	4,980	4,971	0.44%	
9/30/2018	734,818	35,757,333	4,866	4,919	-1.05%	
9/30/2019	745,135	36,044,481	4,837	4,894	-0.51%	-1.38%
Brookwood						
9/30/2009	165,505	10,141,652	6,128			
9/30/2010	166,045	10,461,136	6,300			
9/30/2011	166,461	10,249,282	6,157	6,195		
9/30/2012	164,677	9,521,052	5,782	6,081	-1.85%	
9/30/2013	164,018	9,163,475	5,587	5,843	-3.90%	
9/30/2014	162,951	9,523,561	5,844	5,737	-1.81%	
9/30/2015	163,099	8,993,485	5,514	5,648	-1.55%	
9/30/2016	164,015	8,760,644	5,341	5,566	-1.45%	
9/30/2017	162,897	8,564,599	5,258	5,371	-3.50%	
9/30/2018	163,535	8,497,683	5,196	5,265	-1.97%	
9/30/2019	164,873	8,332,197	5,054	5,169	-1.83%	-2.24%
Fairways						
9/30/2009	39,760	3,114,579	7,833			
9/30/2010	40,817	3,293,866	8,070			
9/30/2011	41,361	3,543,616	8,568	8,162		
9/30/2012	42,185	3,341,991	7,922	8,185	0.29%	
9/30/2013	43,277	2,890,756	6,680	7,709	-5.82%	
9/30/2014	45,230	3,192,193	7,058	7,212	-6.45%	
9/30/2015	46,727	3,274,485	7,008	6,919	-4.05%	
9/30/2016	48,614	3,444,033	7,084	7,050	1.89%	
9/30/2017	50,643	3,451,153	6,815	6,966	-1.19%	
9/30/2018	53,891	3,590,067	6,662	6,846	-1.72%	
9/30/2019	56,557	4,515,159	7,983	7,174	4.78%	-1.60%

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Impact of 3-Yr Avg in Determining Rates

Thill Direct Exhibit 2

TABLE 1

Modeled annual conservation rate		1.00%			
Month	Avg Monthly Consumption (Gal)	Month	Avg Monthly Consumption (Gal)	Month	Avg Monthly Consumption (Gal)
1	5,100	13	5,052	25	5,004
2	5,096	14	5,048	26	5,000
3	5,092	15	5,044	27	4,996
4	5,088	16	5,040	28	4,992
5	5,084	17	5,036	29	4,988
6	5,080	18	5,032	30	4,984
7	5,076	19	5,028	31	4,980
8	5,072	20	5,024	32	4,976
9	5,068	21	5,020	33	4,972
10	5,064	22	5,016	34	4,968
11	5,060	23	5,012	35	4,964
12	5,056	24	5,008	36	4,960
3-Yr Avg Monthly Consumption		5,030			

When rates decline steadily, 3-yr avg is equivalent to the average of month 18 and 19.

TABLE 2

Assumptions*		
1.	Revenue requirement	\$ 24,600,000
2.	Customer count	81,000
3.	Beginning consumption figure	5,100
Revenue Requirement		
		\$ 24,600,000 (A)
Pro forma consumption using 3-year avg from Table 1		
(5,030 gal/mo * 12 mos * 81,000 customers)		4,889,160,000 (B)
Volumetric rate determined using 3-yr avg (per kilogallon)		
[(A)/(B) * 1,000]		\$ 5.03 (C)
Pro forma consumption using TYE actual from Table 1		
(4,960 gal/mo * 12 mos * 81,000 customers)		4,821,120,000 (D)
Pro forma revenue based on actual usage levels		
[(C)*(D) / 1,000]		\$ 24,257,654 (E)
Annual revenue shortfall from use of 3-yr avg		
[(A) - (E)]		\$ 342,346

* Assumptions are based on the following:

- 1) Revenue requirement is the approximate amount approved for recovery via volumetric rates in the Company's last rate case.
- 2) Customer count is approximate number of water customers as of the end of the test year.
- 3) Beginning consumption figure is the approximate average monthly consumption for the consolidated entity for the 12 months ended 9/30/16 (the current three-year average calculation would have begun on the next day, 10/1/16)

Aqua North Carolina, Inc.

Thill Direct Exhibit 3

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Key Customer Statistics for Pilot Areas

For the Test Year Ended 9/30/2019

	<u>The Cape</u>	<u>Arbor Run</u>	<u>Bayleaf</u>	<u>Merion</u>	<u>Pebble Bay</u>	<u>Total</u>
Rate Entity	Fairways	ANC	ANC	ANC	ANC	
Geographic Region	East	West	Central	Central	West	
Primary City	Wilmington	Winston-Salem	Raleigh	Apex	Denver	
Total customers with 12 months of consumption in test year	3,675	213	5,501	94	174	9,657
For those customers with 12 bills in test period:						
Avg consumption (in gallons per month)	7,084	9,326	7,298	5,625	9,764	7,289
Consumption in customer's 2nd highest month*	12,695	17,379	12,380	7,973	19,134	12,689
Consumption in customer's 2nd lowest month*	2,839	3,830	3,643	3,696	3,390	3,338
Volatility Ratio (2nd highest/2nd lowest)	4.5	4.5	3.4	2.2	5.6	3.8
Customers with Volatility Ratios of:						
Less than 1.5 (minimal volatility)	17%	9%	20%	38%	9%	19%
Greater than 4.0 (significant volatility)	34%	46%	26%	11%	59%	30%
Total CUSTOMERS with consumption in test year	4,224	226	6,003	101	200	10,754
Number/% of customers with any bill above threshold:						
>20,000 gallons	1,100 / 26%	97 / 43%	1,481 / 25%	12 / 12%	104 / 52%	2,794 / 26%
>50,000 gallons	282 / 7%	12 / 5%	311 / 5%	1 / 1%	17 / 9%	623 / 6%
Total BILLS with consumption in test year	48,396	2,656	70,025	1,197	2,274	124,548
Number/% of bills above threshold						
>20,000 gallons	3,963 / 8%	321 / 12%	4,651 / 7%	29 / 2%	332 / 15%	9,296 / 7%
>50,000 gallons	667 / 1%	20 / 1%	604 / 1%	1 / 0%	21 / 1%	1,313 / 1%

* The 2nd highest and lowest months were selected in order to minimize the impact of potential anomalies (billing errors, leaks, other adjustments).

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Thill Direct Exhibit 4

Illustration of Revenue Reconciliation for Pilot Program

Scenario 1 - Total gallons consumed equal that used in determining rates, but allocation between consumption tiers is different

<u>Determinants used in calculating rates</u>						<u>Assumed "Actuals" for Illustration</u>	
	<u>Upper Limit</u>	<u>Factor</u>	<u>\$/kGal</u>	<u>Usg kGals</u>	<u>Revenue</u>	<u>Usg kGals</u>	<u>Revenue</u>
Block 1	4,000	1.00	\$ 4.65	250,000	\$ 1,162,500	260,000	\$ 1,209,000
Block 2	8,000	1.50	\$ 6.98	100,000	\$ 698,000	95,000	\$ 663,100
Block 3	15,000	2.25	\$ 10.46	90,000	\$ 941,400	90,000	\$ 941,400
Block 4	15,000+	3.00	\$ 13.95	80,000	\$ 1,116,000	75,000	\$ 1,046,250
			7.53	520,000	\$ 3,917,900 (A)	520,000 (J)	\$ 3,859,750 (D)
					Bill count in rate design		Actual bill count
					79,200 (B)		79,200 (E)
					Revenue per Bill as Authorized [(A)/(B)] \$		Rev/Bill-Actual [(D)/(E)] \$
					49.47 (C)		48.73 (F)
Average per Customer Usage Excess/Deficit [(F)-(C)]						\$	(0.73) (G)
Excess/Deficit Rate [(G)/(C)]							-1.48% (H)
Revenue DEFICIT to be recovered on a VOLUMETRIC BASIS :							
					Revenue deficit to be recovered [(A)*(H)] \$	58,150 (I)	
					Surcharge per kilogallon [(I)/(J*9/12)] \$	0.15 *	

Scenario 2 - Customers conserve 1% LESS than modeled for rates; average consumption is HIGHER than in rates

<u>Determinants in calculating rates</u>						<u>Assumed "Actuals" for Illustration</u>	
	<u>Upper Limit</u>	<u>Factor</u>	<u>\$/kGal</u>	<u>Usg kGals</u>	<u>Revenue</u>	<u>Actual</u>	<u>Revenue</u>
Block 1	4,000	1.00	\$ 4.65	250,000	\$ 1,162,500	252,500	\$ 1,174,125
Block 2	8,000	1.50	\$ 6.98	100,000	\$ 698,000	101,000	\$ 704,980
Block 3	15,000	2.25	\$ 10.46	90,000	\$ 941,400	90,900	\$ 950,814
Block 4	15,000+	3.00	\$ 13.95	80,000	\$ 1,116,000	80,800	\$ 1,127,160
			7.53	520,000	\$ 3,917,900 (A)	525,200 (J)	\$ 3,957,079 (D)
					Bill count in rate design		Actual bill count
					79,200 (B)		79,200 (E)
					Revenue per Bill as Authorized [(A)/(B)]		Rev/Bill-Actual [(D)/(E)]
					\$ 49.47 (C)		\$ 49.96 (F)
Average per Customer Usage Excess/Deficit [(F)-(C)]						\$ 0.49 (G)	
Excess/Deficit Rate [(G)/(C)]						1.00% (H)	
Revenue EXCESS to be refunded as a FLAT RATE CREDIT :							
					Revenue excess to be refunded [(A)*(H)]	\$ 39,179 (I)	
					Surcredit per customer [(I)/(E*9/12)]	\$ 0.66 *	

Scenario 3 - Customers conserve MORE than modeled for rates; average consumption is LOWER than in rates

<u>Determinants in calculating rates</u>						<u>Assumed "Actuals" for Illustration</u>	
	<u>Upper Limit</u>	<u>Factor</u>	<u>\$/kGal</u>	<u>Usg kGals</u>	<u>Revenue</u>	<u>Actual</u>	<u>Revenue</u>
Block 1	4,000	1.00	\$ 4.65	250,000	\$ 1,162,500	247,500	\$ 1,150,875
Block 2	8,000	1.50	\$ 6.98	100,000	\$ 698,000	99,000	\$ 691,020
Block 3	15,000	2.25	\$ 10.46	90,000	\$ 941,400	89,100	\$ 931,986
Block 4	15,000+	3.00	\$ 13.95	80,000	\$ 1,116,000	79,200	\$ 1,104,840
			7.53	520,000	\$ 3,917,900 (A)	514,800 (J)	\$ 3,878,721 (D)
					Bill count in rate design		Actual bill count
					79,200 (B)		79,200 (E)
					Revenue per Bill as Authorized [(A)/(B)]		Rev/Bill-Actual [(D)/(E)]
					\$ 49.47 (C)		\$ 48.97 (F)
					Average per Customer Usage Excess/Deficit [(F)-(C)]		\$ (0.49) (G)
					Excess/Deficit Rate [(G)/(C)]		-1.00% (H)
Revenue DEFICIT to be recovered on a VOLUMETRIC BASIS :							
					Revenue deficit to be recovered [(A)*(H)]	\$ 39,179 (I)	
					Surcharge per kilogallon [(I)/(J*9/12)]	\$ 0.10 *	

* The revenue adjustment will be collected or refunded over 9 months (after allowing 3 months for computation of the adjustment) following the end of each 12 month period after implementation of new rates.

Aqua North Carolina, Inc.
Docket No. W-218, Sub 526
Deferred Accounting on Post-Test Year Additions

Thill Direct Exhibit 5

TABLE 1							
Summary of Post-Test Year Additions							
	ANC Water	Brookwood Water	Fairways Water	ANC Sewer	Fairways Sewer	Total	
WSIC/SSIC eligible projects	\$ 3,944,746	\$ 1,480,000		\$ 1,294,510	\$ 31,550	\$ 6,750,806	
Non-WSIC/SSIC projects	\$ 3,512,145	\$ 1,393,120	\$ 11,400	\$ 1,823,022	\$ 312,750	\$ 7,052,437	
Total projects	\$ 7,456,891	\$ 2,873,120	\$ 11,400	\$ 3,117,532	\$ 344,300	\$ 13,803,243	
Routine replacements	\$ 3,004,698	\$ 1,945,570	\$ 96,311	\$ 1,772,712	\$ 151,132	\$ 6,970,423	
Total post-test year additions	\$ 10,461,589	\$ 4,818,690	\$ 107,711	\$ 4,890,244	\$ 495,432	\$ 20,773,666	

TABLE 2							
Summary of Projected WSIC/SSIC Earnings on Post-Test Year Additions							
	Rate	ANC Water	Brookwood Water	Fairways Water	ANC Sewer	Fairways Sewer	Total
WSIC/SSIC eligible projects	\$	3,944,746	\$ 1,480,000	\$ -	\$ 1,294,510	\$ 31,550	\$ 6,750,806
Recovery rate*	\$	0.11	\$ 0.10	\$ -	\$ 0.10	\$ 0.13	
Annual WSIC/SSIC revenue	\$	433,922	\$ 150,960	\$ -	\$ 134,629	\$ 4,196	\$ 723,707
Pro ration factor 1 **		25%	25%	25%	25%	25%	25%
Projected WSIC/SSIC recovery on PTY additions	\$	108,481	\$ 37,740	\$ -	\$ 33,657	\$ 1,049	\$ 180,927

* Recovery Rate is based on the Company's most recent WSIC/SSIC filing but will be trued up when final post-test year information is available.

** Pro ration factor 1 is applied to represent the 3 months of recovery (25% of the year) anticipated from the time WSIC/SSIC rates would go into effect (7/1/20) until the presumed date of new base rates (10/1/20), at which time WSIC/SSIC rates reset to \$0.

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Deferred Accounting on Post-Test Year Additions

Thill Direct Exhibit 5

TABLE 3							
Calculation of Total Costs of PTY Additions for which deferral accounting is sought							
		ANC Water	Brookwood Water	Fairways Water	ANC Sewer	Fairways Sewer	Total
Total projects (TABLE 1)		\$ 7,456,891	\$ 2,873,120	\$ 11,400	\$ 3,117,532	\$ 344,300	\$ 13,803,243
Less depreciation ^^		\$ (270,894)	\$ (83,149)	\$ (179)	\$ (112,446)	\$ (10,012)	\$ (476,680)
Rate base impact (A)		\$ 7,185,997	\$ 2,789,971	\$ 11,221	\$ 3,005,086	\$ 334,288	\$ 13,326,563
	<u>Rate ^</u>						
Lost earnings on projects (B)= [(A)*Rate]	9.70%	\$ 348,542	\$ 135,322	\$ 544	\$ 145,755	\$ 16,214	\$ 646,377
Lost interest on projects [(A)*Rate]	4.63%	\$ 166,356	\$ 64,588	\$ 260	\$ 69,568	\$ 7,739	\$ 308,511
Unrecovered depreciation ^^		\$ 270,894	\$ 83,149	\$ 179	\$ 112,446	\$ 10,012	\$ 476,680
Annual earnings impact		\$ 785,792	\$ 283,059	\$ 983	\$ 327,769	\$ 33,965	\$ 1,431,568
Tax gross-up of equity return ^^^[(B)*Rate]	29.8%	\$ 103,963	\$ 40,364	\$ 162	\$ 43,476	\$ 4,836	\$ 192,801
Annual revenue requirement		\$ 889,755	\$ 323,423	\$ 1,145	\$ 371,245	\$ 38,801	\$ 1,624,369
Pro ration factor 2 ^^^^		75%	75%	75%	75%	75%	75%
Pro rated revenue requirement		\$ 667,316	\$ 242,567	\$ 859	\$ 278,434	\$ 29,101	\$ 1,218,277
WSIC/SSIC recovery		\$ (108,481)	\$ (37,740)	\$ -	\$ (33,657)	\$ (1,049)	\$ (180,927)
Net deferral request		\$ 558,835	\$ 204,827	\$ 859	\$ 244,777	\$ 28,052	\$ 1,037,350
Annual amortization expense (C)		\$ 111,767	\$ 40,965	\$ 172	\$ 48,955	\$ 5,610	\$ 207,470
Deferral to include in rate base		\$ 447,068	\$ 163,862	\$ 687	\$ 195,821	\$ 22,442	\$ 829,880
Pro forma customer count ^^^^^ (D)		62,876	13,973	4,854	16,951	3,075	101,729
Monthly impact of amortization [(C)/(D)*1/12]		\$ 0.15	\$ 0.24	\$ 0.00	\$ 0.24	\$ 0.15	\$ 0.17

^ Financing rates are based on authorized rates in the Company's most recent rate case (W-218, Sub 497).

^^ Based on information supporting Exhibits A-1 through A-5, Schedule 2, of the Application. Note that depreciation attributed to routine replacements is excluded from these figures, and therefore these figures do not fully match the total depreciation identified in Schedule 2. These figures are estimates and will be updated once fully known at the end of the post-test year period.

^^^ Tax gross up rate is calculated as $[(1/(1-(21\%+2.5\%(1-21\%))) - 1]$ where the federal tax rate is 21% and state tax rate is 2.5%.

^^^^ Pro ration factor 2 assumes asset acquisitions occur ratably through the presumed post-test year period, 10/1/19-3/31/20, for an average acquisition date of 1/1/20, and new rates are Ordered effective 10/1/20.

^^^^^ Total pro forma residential and commercial bills (divided by 12 months) from Application Exhibit F for each entity.

Aqua North Carolina, Inc.
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Deferred Accounting on Post-Test Year Additions

Thill Direct Exhibit 5

TABLE 4				
Calculation of Revenue Deficiency	Reference	Gross	Taxes	Net w/ Debt*
Authorized earnings	W-218, Sub 497			9,238,491
Interest on additions	Table 3	(308,511)	70,880	(237,631)
Depreciation on additions	Table 3	(476,680)	109,517	(367,163)
Earnings before WSIC/SSIC revenue				8,633,698 (A)
Annual WSIC/SSIC revenue	Table 2	723,707	(166,272)	557,435 (B)
Pro forma earnings				9,191,133 (C)
			Equity	
		Rate base	Funded	Equity Base
Rate base at Order date	W-218, Sub 497	190,472,859	50%	95,236,430
Rate base impact of additions	Table 3	13,326,563	50%	6,663,282
Pro forma rate base		203,799,422		101,899,711 (D)
Pro forma return on equity rate base	[(C)/(D)]			9.02%
Authorized return on equity rate base	W-218, Sub 497			9.70% (E)
Annual return deficiency				-0.68%
Reconciliation of annual return deficiency to net deferral request				
Return on pro forma rate base, at authorized	[(D)*(E)]			9,884,868
Earnings before WSIC/SSIC revenue	(A)			8,633,698
Annual earnings deficit before WSIC/SSIC				1,251,171
Annualization during recovery period ^	Note 1			75%
Deficiency, before WSIC/SSIC				938,378 (F)
Annual WSIC/SSIC earnings	(B)			(557,435)
Annualization during recovery period ^^	Note 2			25%
WSIC/SSIC earnings during recovery period				(139,359) (G)
Net earnings deficiency	[(F)+(G)]			799,019
Tax gross-up ^^^	Note 3		29.8%	238,331
Net revenue deficiency				1,037,350

* The "Net w/ Debt" evaluation assumes that the Company has ready access to financing in the debt market and is able to finance the post-test year additions at a borrowing rate equal to that approved in its last rate case.

Note 1 - Assumes asset acquisitions occur ratably through the presumed post-test year period, 10/1/19-3/31/20, for an average acquisition date of 1/1/20, and new rates are Ordered effective 10/1/20.

Note 2 - Represents the 3 months of recovery (25% of the year) anticipated from the time WSIC/SSIC rates would go into effect (7/1/20) until the presumed date of new base rates (10/1/20), at which time WSIC/SSIC rates would reset to \$0.

Note 3 - Tax gross up rate is calculated as $[(1/(1-(21\%+2.5\%*(1-21\%)))-1]$ where the federal tax rate is 21% and state tax rate is 2.5%.

Aqua North Carolina, Inc.
Docket No. W-218, Sub 526
Regulatory Asset - Johnston County Transmission Fee

Thill Direct Exhibit 6

	<u>Debt</u>	<u>Equity</u>	<u>Total</u>
Johnston County Transmission Fee			\$ 785,000
Less: First year amortization included in rates (6 yr amortization)			<u>\$ (130,833)</u>
Proposed regulatory asset excluded from W-218, Sub 497 rate base, allocated 50/50 based on debt/equity ratio approved in Order	\$ 327,084	\$ 327,084	\$ 654,167
Authorized return rates in W-218, Sub 497	4.63%	9.70%	7.17%
Annual return deficit	<u>\$ 15,144</u>	<u>\$ 31,727</u>	<u>\$ 46,871</u>
Gross-up equity portion for taxes* 29.8%		<u>\$ 9,464</u>	<u>\$ 9,464</u>
Annual revenue deficit	<u>\$ 15,144</u>	<u>\$ 41,191</u>	<u>\$ 56,335</u>
Reg Asset - Revenue deficit pro rated for 21.5 months**	<u>\$ 27,133</u>	<u>\$ 73,800</u>	<u>\$ 100,933</u> (A)
Original amortization term in months (per Order)			72.0
Amortization term elapsed**			<u>21.5</u>
Remaining term in months			<u>50.5</u> (B)
Monthly amortization of revenue deficit [(A)/(B)]			<u>\$ 1,999</u>
Annual amortization of revenue deficit			<u>\$ 23,984</u>
Revised annual amortization			\$ 154,817

* Tax gross up rate is calculated as $[(1/(1-(21\%+2.5\%(1-21\%)))]-1]$ where the federal tax rate is 21% and state tax rate is 2.5%.

** 21.5 months is the period from 12/18/18 (date of Sub 497 Order) and 10/1/20 (assumed effective date of new rates).