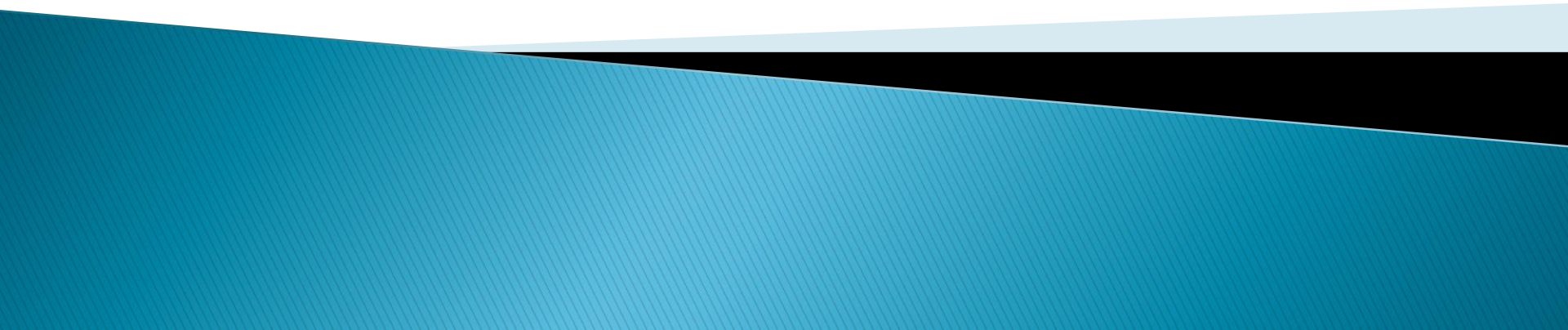


Desalination Plant Financial Analysis & Discussion

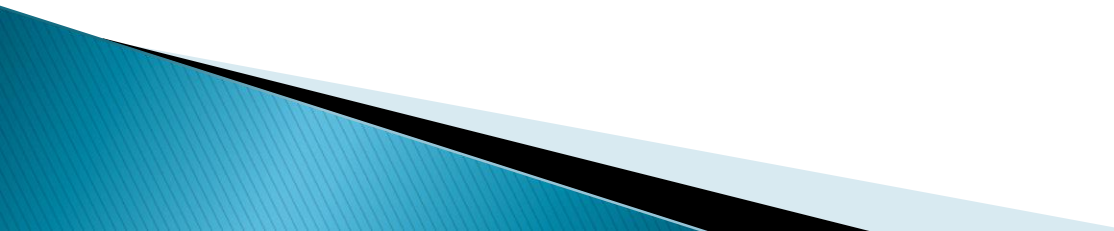
Presented to Metro South Chamber of Commerce – Board

Presented by Dan Hodge, Hodge Economic Consulting


January 31, 2018



Focus Group of the Metro South Chamber of Commerce

- ▶ The Metro South Chamber of Commerce wishes to thank those members who participated in this Focus Group to study the proposal to purchase the Aquaria desalination plant. Among these organizations are the city's largest private employer, largest employer, largest taxpayer, largest accounting firm, largest bank based in Brockton, largest bank holding Brockton based deposits, largest bank headquartered in Massachusetts, news company and several large water users and public and non-profit organizations with specific knowledge helpful to the analysis. The Chamber also engaged consultant, Dan Hodge, former head of research for the UMass Donahue Institute to assist with research, analysis and presentation. Research sources include state filings, new articles, interviews (State DEP, MWRA, City CFO) and industry experts.
- 

Overview

- ▶ Brockton is under an Administrative Consent Decree (mandate) from the MA DEP to have a secondary water supply to Silver Lake
 - ▶ Brockton signed a 20 year lease in 2002 with Aquaria for a desalination facility in Dighton along the Taunton River
 - ▶ 2002–2008 Facility permitted, constructed, & opened (\$90M cost per filings)
 - ▶ 20 year lease runs from 2008 to 2028 with 6, 5 year ext. options
 - ▶ Lease has a dual payment system – Brockton pays (1) an annual fixed fee plus (2) an annual variable fee on supplied water at a specific rate/gallon
 - ▶ Capacity for up to 5 MGD (4MGD reserved for Brockton; Aquaria can't sell to other towns); site allows for up to 10MGD (if facility expanded)
 - ▶ Occasional usage to date but expected to increase per MA DEP
 - ▶ Brockton now has option to purchase the facility for \$78 million
- 

Decision Options

- ▶ With a mandate for the City to have an secondary water supply, the decision options are as follows:
- ▶ 1. Continue with the existing contract with Aquaria
- ▶ 2. Purchase the facility from Aquaria
- ▶ 3. Pursue an alternative water source (MWRA)

For option 3, this would require continuing with the existing contract with Aquaria and have the alternative water source in place when the Aquaria expires in 2028. The focus of this discussion will begin with Option 1 vs. Option 2 (lease vs. own).

Lease vs. Own Analysis

- ▶ Decision Option 1 – Continue with existing lease


Continue to lease through 2028 with intention (requirement) of exercising the lease extension option in 2028 – the key component of this decision is projecting what the annual fixed fee cost will be in 2029 and beyond (as it is subject to negotiation with Aquaria)

- ▶ Decision Option 2 – Purchase the facility

Purchase for \$78 million financed through a 20 year general city obligation bond offering – the key component of this decision is appropriately estimating the future operating and capital costs of the facility



Purchase Agreement Notes

- ▶ Agreed upon price of \$78,000,000
 - ▶ P&S was to be completed in January 2018 – new one could be developed?
 - ▶ Aquaria to operate facility alongside the City for one year following the purchase
 - ▶ \$5,000,000 escrowed to settle claims against Aquaria should their warranties and representations not hold up
 - ▶ Additional \$3,000,000 escrowed for certain capital projects (filter replacement, intake and pipeline transmission systems)
 - ▶ Brockton's Water Commission and CFO have recommended this purchase to the City council
- 

Analysis Approach

- ▶ 20 year view needed to account for bond financing
- ▶ Analysis viewed as two segments: Years 1–10 and 11–20
- ▶ Years 1–10 – Known costs; more quantifiable
- ▶ Years 11–20 – More assumption driven
- ▶ Analysis provided by the City of Brockton and CDM Smith
- ▶ Further analysis review by Hodge Economic Consulting working with the Metro South Chamber
- ▶ Focus group built its own analysis to compare/contrast to City/CDM/Hodge analysis
- ▶ Analysis supports the purchase of the desalination facility by the City of Brockton
 - However, the key uncertainties of the analysis are the estimates of future operating and reinvestment costs vs. the cost to renew the lease in 2028

Years 1–10
2018–2028

(11th year prorated)

Years 1-10+ (2018-2028) – 0 MGD – City Projections

(10 year+ analysis per City as 2028 is prorated year)

Lease		0 Gallons	2.50%	
Year	Fixed Fee	Per Day	Total Cost	Discount Rate
2018	\$7,593,473	\$0	\$7,593,473	\$7,408,266
2019	\$7,722,562	\$0	\$7,722,562	\$7,350,446
2020	\$7,853,845	\$0	\$7,853,845	\$7,293,076
2021	\$7,987,361	\$0	\$7,987,361	\$7,236,155
2022	\$8,123,146	\$0	\$8,123,146	\$7,179,677
2023	\$8,261,239	\$0	\$8,261,239	\$7,123,640
2024	\$8,401,680	\$0	\$8,401,680	\$7,068,041
2025	\$8,544,509	\$0	\$8,544,509	\$7,012,876
2026	\$8,689,766	\$0	\$8,689,766	\$6,958,142
2027	\$8,837,492	\$0	\$8,837,492	\$6,903,835
2028	<u>\$8,238,751</u>	\$0	<u>\$8,238,751</u>	<u>\$6,279,121</u>
	\$90,253,824		\$90,253,824	\$77,813,276

Own						
	Variable	Fixed	Dighton	Op. Cost	Total	2.50%
Bond P&I	Op. Costs	Op. Costs	Taxes	Conting.	Cost	Discount Rate
\$1,267,500	\$0	\$1,524,442	\$77,320	N/A	\$2,869,262	\$2,799,280
\$6,371,625	\$0	\$1,550,357	\$79,253	N/A	\$8,001,235	\$7,615,691
\$6,244,875	\$0	\$1,576,713	\$81,235	N/A	\$7,902,823	\$7,338,557
\$6,118,125	\$0	\$1,603,518	\$83,266	N/A	\$7,804,909	\$7,070,862
\$5,991,375	\$0	\$1,630,777	\$85,347	N/A	\$7,707,499	\$6,812,306
\$5,864,625	\$0	\$1,658,501	\$87,481	N/A	\$7,610,607	\$6,562,603
\$5,737,875	\$0	\$1,686,695	\$89,668	N/A	\$7,514,238	\$6,321,467
\$5,611,125	\$0	\$1,715,369	\$91,910	N/A	\$7,418,404	\$6,088,630
\$5,484,375	\$0	\$1,744,530	\$94,207	N/A	\$7,323,112	\$5,863,823
\$5,357,625	\$0	\$1,774,187	\$96,563	N/A	\$7,228,375	\$5,646,795
<u>\$5,230,875</u>	<u>\$0</u>	<u>\$1,804,348</u>	<u>\$98,977</u>	N/A	<u>\$7,134,200</u>	<u>\$5,437,293</u>
\$59,280,000	\$0	\$18,269,437	\$965,227		\$78,514,664	\$67,557,307

	Total	PV
Lease	\$90,253,824	\$77,813,276
Own	<u>\$78,514,664</u>	<u>\$67,557,307</u>
Savings	\$11,739,160	\$10,255,969

Key Assumptions & Facts

Fixed Fee per CDM Smith/City/Contract

Bond = \$78 million, 3.25%, 20 years (payment schedule per City)

Fixed costs estimated by City & CDM Smith

Dighton Taxes estimated by CDM Smith vs. actual

Actual Property Taxes - \$600,000 (\$400,000 RE; \$200,000 PP)

City Pro Rated 2028 Fixed Fee to \$8,238,751 (11 months)

The full Month Fee would be \$8,987,729 (estimated)

Years 1-10+ (2018-2028) – 2MGD – City Projections

(10 year+ analysis per City as 2028 is prorated year)

Lease				
Year	Fixed Fee	2MGD Per Day	Total Cost	2.50% Discount Rate
2018	\$7,593,473	\$983,959	\$8,577,432	\$8,368,226
2019	\$7,722,562	\$1,000,687	\$8,723,249	\$8,302,914
2020	\$7,853,845	\$1,017,698	\$8,871,543	\$8,238,110
2021	\$7,987,361	\$1,034,999	\$9,022,360	\$8,173,813
2022	\$8,123,146	\$1,052,594	\$9,175,740	\$8,110,017
2023	\$8,261,239	\$1,070,488	\$9,331,727	\$8,046,719
2024	\$8,401,680	\$1,088,687	\$9,490,367	\$7,983,916
2025	\$8,544,509	\$1,107,194	\$9,651,703	\$7,921,602
2026	\$8,689,766	\$1,126,017	\$9,815,783	\$7,859,776
2027	\$8,837,492	\$1,145,159	\$9,982,651	\$7,798,431
2028	<u>\$8,238,751</u>	<u>\$1,164,627</u>	<u>\$9,403,378</u>	<u>\$7,166,735</u>
	\$90,253,824	\$11,792,109	\$102,045,933	\$87,970,259

Own						
Bond P&I	Variable Op. Costs	Fixed Op. Costs	Dighton Taxes	Op. Cost Conting.	Total Cost	2.50% Discount Rate
\$1,267,500	\$547,500	\$1,524,442	\$77,320	N/A	\$3,416,762	\$3,333,426
\$6,371,625	\$978,299	\$1,550,357	\$79,253	N/A	\$8,979,534	\$8,546,850
\$6,244,875	\$994,829	\$1,576,713	\$81,235	N/A	\$8,897,652	\$8,262,354
\$6,118,125	\$1,011,741	\$1,603,518	\$83,266	N/A	\$8,816,650	\$7,987,450
\$5,991,375	\$1,028,941	\$1,630,777	\$85,347	N/A	\$8,736,440	\$7,721,740
\$5,864,625	\$1,046,433	\$1,658,501	\$87,481	N/A	\$8,657,040	\$7,464,938
\$5,737,875	\$1,064,222	\$1,686,695	\$89,668	N/A	\$8,578,460	\$7,216,760
\$5,611,125	\$1,082,314	\$1,715,369	\$91,910	N/A	\$8,500,718	\$6,976,935
\$5,484,375	\$1,100,714	\$1,744,530	\$94,207	N/A	\$8,423,826	\$6,745,196
\$5,357,625	\$1,119,426	\$1,774,187	\$96,563	N/A	\$8,347,801	\$6,521,289
<u>\$5,230,875</u>	<u>\$1,138,456</u>	<u>\$1,804,348</u>	<u>\$98,977</u>	N/A	<u>\$8,272,656</u>	<u>\$6,304,962</u>
\$59,280,000	\$11,112,875	\$18,269,437	\$965,227		\$89,627,539	\$77,081,901

	Total	PV
Lease	\$102,045,933	\$87,970,259
Own	<u>\$89,627,539</u>	<u>\$77,081,901</u>
Savings	\$12,418,394	\$10,888,358

Total Year 2 Op Costs = \$2,528,656
(excludes RE Taxes)

Key Assumptions

2MGD cost approximated at \$1.30 per 1,000 gallons per City communications

2,000,000 MGD / 1000 = 2,000 X \$1.30 = \$2,600 X 365 = \$949,000

Further adjusted over time by the Producers Price Index (PPI)

(Section 6.1.2 of lease: \$1.23 initial rate in 2008)

Variable Cost estimated by City/CDM Smith; effectively a "wash" with contractual purchase costs of \$1.30+ per gallon, except for Year 1, where Aquaria is contractually obligated to sell for \$0.75 per gallon (\$547,500 above). Of note, other towns have reportedly been offered water by Aquaria but will not purchase at the \$1.30+ rate.

Years 1-10± (2018-2028) – Adjusted Projections (higher costs)

2 Million Gallons Per Day (10+ year analysis per City as 2028 is prorated year)

Lease				
Year	Fixed Fee	2M Gallons Per Day	Total Cost	2.50% Discount Rate
2018	\$7,593,473	\$983,959	\$8,577,432	\$8,368,226
2019	\$7,722,562	\$1,000,687	\$8,723,249	\$8,302,914
2020	\$7,853,845	\$1,017,698	\$8,871,543	\$8,238,110
2021	\$7,987,361	\$1,034,999	\$9,022,360	\$8,173,813
2022	\$8,123,146	\$1,052,594	\$9,175,740	\$8,110,017
2023	\$8,261,239	\$1,070,488	\$9,331,727	\$8,046,719
2024	\$8,401,680	\$1,088,687	\$9,490,367	\$7,983,916
2025	\$8,544,509	\$1,107,194	\$9,651,703	\$7,921,602
2026	\$8,689,766	\$1,126,017	\$9,815,783	\$7,859,776
2027	\$8,837,492	\$1,145,159	\$9,982,651	\$7,798,431
2028	<u>\$8,238,751</u>	<u>\$1,164,627</u>	<u>\$9,403,378</u>	<u>\$7,166,735</u>
	\$90,253,824	\$11,792,109	\$102,045,933	\$87,970,259

	Total	PV
Lease	\$102,045,933	\$87,970,259
Own	<u>\$95,963,541</u>	<u>\$82,536,372</u>
Savings	\$6,082,392	\$5,433,888

Note: 2028 Fixed Fee payment is prorated to \$8,238,751 based on actual lease expiration date; full year fee would be \$8,987,779

Own						
Bond P&I	Variable Op. Costs	Fixed Op. Costs	Dighton Taxes	Op. Cost Conting.	Total Cost	2.50% Discount Rate
\$1,267,500	\$547,500	\$1,524,442	\$100,000	\$500,000	\$3,939,442	\$3,843,358
\$6,371,625	\$978,299	\$1,550,357	\$102,000	\$510,000	\$9,512,281	\$9,053,926
\$6,244,875	\$994,829	\$1,576,713	\$104,040	\$520,200	\$9,440,657	\$8,766,589
\$6,118,125	\$1,011,741	\$1,603,518	\$106,121	\$530,604	\$9,370,109	\$8,488,856
\$5,991,375	\$1,028,941	\$1,630,777	\$108,243	\$541,216	\$9,300,552	\$8,220,333
\$5,864,625	\$1,046,433	\$1,658,501	\$110,408	\$552,040	\$9,232,007	\$7,960,731
\$5,737,875	\$1,064,222	\$1,686,695	\$112,616	\$563,081	\$9,164,489	\$7,709,766
\$5,611,125	\$1,082,314	\$1,715,369	\$114,869	\$574,343	\$9,098,019	\$7,467,168
\$5,484,375	\$1,100,714	\$1,744,530	\$117,166	\$585,830	\$9,032,615	\$7,232,671
\$5,357,625	\$1,119,426	\$1,774,187	\$119,509	\$597,546	\$8,968,294	\$7,006,017
<u>\$5,230,875</u>	<u>\$1,138,456</u>	<u>\$1,804,348</u>	<u>\$121,899</u>	<u>\$609,497</u>	<u>\$8,905,076</u>	<u>\$6,786,957</u>
\$59,280,000	\$11,112,875	\$18,269,437	\$1,216,872	\$6,084,358	\$95,963,541	\$82,536,372

Expense Estimates:	Op Exps	With Taxes
Total Yr 2 Operating Costs =	\$3,038,656	\$3,140,656 (Op Exps, Variable, & Conting).
11 Year Avg Cost:	\$3,224,243	\$3,334,867

CDM Smith 2018 high operating cost est. was \$2.878m (no taxes) in DesalFinancialModel2017 file
CDM/City revised estimate per Hodge 6/27/17 ppt: \$3,034 million with taxes (10 year avg)

Hodge Economic Consulting - 10 year average cost with taxes:
Low: \$2,837 million Avg: \$3,034 million High: \$3,447 million

Historical Expenses Varying Usage Excl. RE Taxes	Year	Op Exps	Total Pumped	Avg over 365	Avg Per Day Per Filing
	2013	\$1,977,730	71,286,200	195,305	330,000
	2014	\$2,067,390	192,482,860	527,350	778,091
	2015	\$1,970,476	139,446,560	382,045	382,000
	2016	\$2,446,603	311,207,680	852,624	1,324,288

Years 11–20
2029–2038

Years 11-20 (2029-2038) - City Projections

Fixed Fee Covers Operating Costs and return for \$17 million Refresh Paid by Aquaria under lease scenario

Lease						
	Op & Maint	Reinvestment	Total	2MGD	2.50%	
Year	Fee	Fee	Fixed Fee	Estimated	Total Cost	Discount Rate
2029	\$2,535,022	\$3,328,147	\$5,863,169	\$1,259,261	\$7,122,430	\$5,295,925
2030	\$2,580,218	\$3,384,726	\$5,964,944	\$1,281,480	\$7,246,424	\$5,256,704
2031	\$2,626,223	\$3,442,266	\$6,068,489	\$1,304,097	\$7,372,586	\$5,217,780
2032	\$2,673,054	\$3,500,784	\$6,173,838	\$1,327,119	\$7,500,957	\$5,179,152
2033	\$2,720,725	\$3,560,298	\$6,281,023	\$1,350,554	\$7,631,577	\$5,140,820
2034	\$2,769,250	\$3,620,823	\$6,390,073	\$1,374,410	\$7,764,483	\$5,102,780
2035	\$2,818,646	\$3,682,377	\$6,501,023	\$1,398,693	\$7,899,716	\$5,065,028
2036	\$2,868,928	\$3,744,977	\$6,613,905	\$1,423,412	\$8,037,317	\$5,027,565
2037	\$2,920,112	\$3,808,642	\$6,728,754	\$1,448,575	\$8,177,329	\$4,990,386
2038	<u>\$2,972,214</u>	<u>\$3,873,389</u>	<u>\$6,845,603</u>	<u>\$1,474,189</u>	<u>\$8,319,792</u>	<u>\$4,953,490</u>
	\$27,484,390	\$35,946,429	\$63,430,819	\$13,641,790	\$77,072,609	\$51,229,629

Own						
	Variable	Fixed	Dighton	Op. Cost	Total	2.50%
Bond P&I	Op. Costs	Op. Costs	Taxes	Conting.	Cost	Discount Rate
\$5,104,125	\$1,157,810	\$1,835,022	\$101,451	\$232,560	\$8,430,968	\$6,268,896
\$4,977,375	\$1,177,492	\$1,866,218	\$103,987	\$232,560	\$8,357,632	\$6,062,797
\$4,850,625	\$1,197,510	\$1,897,943	\$106,587	\$232,560	\$8,285,225	\$5,863,679
\$4,723,875	\$1,217,868	\$1,930,208	\$109,252	\$232,560	\$8,213,763	\$5,671,320
\$4,597,125	\$1,238,571	\$1,963,022	\$111,983	\$232,560	\$8,143,261	\$5,485,504
\$4,470,375	\$1,259,627	\$1,996,393	\$114,783	\$232,560	\$8,073,738	\$5,306,021
\$4,343,625	\$1,281,041	\$2,030,332	\$117,652	\$232,560	\$8,005,210	\$5,132,668
\$4,216,875	\$1,302,818	\$2,064,848	\$120,593	\$232,560	\$7,937,694	\$4,965,248
\$4,090,125	\$1,324,966	\$2,099,950	\$123,608	\$232,560	\$7,871,209	\$4,803,570
<u>\$3,963,375</u>	<u>\$1,347,491</u>	<u>\$2,135,649</u>	<u>\$126,699</u>	<u>\$232,560</u>	<u>\$7,805,774</u>	<u>\$4,647,451</u>
\$45,337,500	\$12,505,194	\$19,819,585	\$1,136,595	\$2,325,600	\$81,124,474	\$54,207,153

Years 1-10		
	Total	PV
Lease	\$102,045,933	\$87,970,259
Own	<u>\$89,627,539</u>	<u>\$77,081,901</u>
Savings	\$12,418,394	\$10,888,358

Years 11-20		
	Total	PV
Lease	\$77,072,609	\$51,229,629
Own	<u>\$81,124,474</u>	<u>\$54,207,153</u>
Savings	<u>(\$4,051,865)</u>	<u>(\$2,977,524)</u>

Total		
	Total	PV
Lease	\$179,118,542	\$139,199,888
Own	<u>\$170,752,013</u>	<u>\$131,289,053</u>
Savings	\$8,366,529	\$7,910,835

Fixed Fee Notes
 2028 Contractual Fee is approximately \$8,987,729 (annualized)

 Initial City projected fixed fee at 2029 was \$5,163,169; however, this did not reflect RE Taxes which was confirmed through City communications. Current taxes paid by Aquaria are \$600,000 (est.), inflated to \$700,000 for 2029. Therefore, initial fee per City projection adjusted to \$5,863,169. (\$5,163,169 + \$700,000 for RE Taxes)

Operating & Maintenance Fee
 Reflects projected operating and maintenance costs of \$1,835,022 plus the \$700,000 taxes that need to be paid by Aquaria, which was not included in the original City projection (\$1,835,022 + \$700,000 = \$2,535,022)

Key Assumptions
 No refresh costs included in own scenario
 Operating Cost Contingency = \$232,560 for membrane replacement (annual cost)
 No margin for Aquaria on operating exps
 Minimal margin on Variable Fee

 Years 1-10 Lease vs Own based on City figures without operating cost contingency

Years 11–20 (2029–2038) – City Projections Adjusted for \$15M reinvestment by the City

Lease						
Year	Op & Maint Fee	Reinvestment Fee	Total Fixed Fee	2MGD Estimated	Total Cost	2.50% Discount Rate
2029	\$2,535,022	\$3,328,147	\$5,863,169	\$1,259,261	\$7,122,430	\$5,295,925
2030	\$2,580,218	\$3,384,726	\$5,964,944	\$1,281,480	\$7,246,424	\$5,256,704
2031	\$2,626,223	\$3,442,266	\$6,068,489	\$1,304,097	\$7,372,586	\$5,217,780
2032	\$2,673,054	\$3,500,784	\$6,173,838	\$1,327,119	\$7,500,957	\$5,179,152
2033	\$2,720,725	\$3,560,298	\$6,281,023	\$1,350,554	\$7,631,577	\$5,140,820
2034	\$2,769,250	\$3,620,823	\$6,390,073	\$1,374,410	\$7,764,483	\$5,102,780
2035	\$2,818,646	\$3,682,377	\$6,501,023	\$1,398,693	\$7,899,716	\$5,065,028
2036	\$2,868,928	\$3,744,977	\$6,613,905	\$1,423,412	\$8,037,317	\$5,027,565
2037	\$2,920,112	\$3,808,642	\$6,728,754	\$1,448,575	\$8,177,329	\$4,990,386
2038	\$2,972,214	\$3,873,389	\$6,845,603	\$1,474,189	\$8,319,792	\$4,953,490
	\$27,484,390	\$35,946,429	\$63,430,819	\$13,641,790	\$77,072,609	\$51,229,629

Own						
Bond P&I	Variable Op. Costs	Fixed Op. Costs	Dighton Taxes	Op. Cost Conting.	Total Cost	2.50% Discount Rate
\$7,909,125	\$1,157,810	\$1,835,022	\$101,451	\$232,560	\$11,235,968	\$8,354,570
\$7,242,365	\$1,177,492	\$1,866,218	\$103,987	\$232,560	\$10,622,622	\$7,705,866
\$7,025,625	\$1,197,510	\$1,897,943	\$106,587	\$232,560	\$10,460,225	\$7,402,986
\$6,808,875	\$1,217,868	\$1,930,208	\$109,252	\$232,560	\$10,298,763	\$7,110,941
\$6,592,125	\$1,238,571	\$1,963,022	\$111,983	\$232,560	\$10,138,261	\$6,829,385
\$6,375,375	\$1,259,627	\$1,996,393	\$114,783	\$232,560	\$9,978,738	\$6,557,977
\$6,158,615	\$1,281,041	\$2,030,332	\$117,652	\$232,560	\$9,820,200	\$6,296,377
\$5,941,875	\$1,302,818	\$2,064,848	\$120,593	\$232,560	\$9,662,694	\$6,044,283
\$5,725,125	\$1,324,966	\$2,099,950	\$123,608	\$232,560	\$9,506,209	\$5,801,363
\$5,508,375	\$1,347,491	\$2,135,649	\$126,699	\$232,560	\$9,350,774	\$5,567,323
\$65,287,480	\$12,505,194	\$19,819,585	\$1,136,595	\$2,325,600	\$101,074,454	\$67,671,072

Years 1-10		
	Total	PV
Lease	\$102,045,933	\$87,970,259
Own	<u>\$89,627,539</u>	<u>\$77,081,901</u>
Savings	\$12,418,394	\$10,888,358

Years 11-20		
	Total	PV
Lease	\$77,072,609	\$51,229,629
Own	<u>\$101,074,454</u>	<u>\$67,671,072</u>
Savings	(\$24,001,845)	(\$16,441,443)

Total		
	Total	PV
Lease	\$179,118,542	\$139,199,888
Own	<u>\$190,701,993</u>	<u>\$144,752,973</u>
Savings	(\$11,583,451)	(\$5,553,085)

Fixed Fee Notes

See Fixed Fee Notes on Previous Slide

Operating and Maintenance Fee

See Notes on Previous Slide

Years 1-10

Years 1-10 Lease vs Own based on City figures without operating cost contingency

Key Assumptions

Operating Cost Contingency = \$232,560 for membrane replacement (annual cost)
Equates to approximately \$2.3M over term
\$2.3M investment in membranes over term plus \$15M refresh totals \$17M, to be consistent with the Aquaria \$17M refresh under the lease scenario

Bond assumptions: new \$15M bond issued at 6.00%, 10 years and debt service added to remaining bond payments from the original \$78M bond issuance.

Section 6.6 of Lease (renewal)

“Based upon the minimum volume commitment that Brockton seeks for the renewal term, the Fixed Fee shall be adjusted to:

- ▶ (1) Reflect the then current capital balance for capital necessary to provide service to Brockton,
- ▶ (2) Reflect the estimated additional capital improvement needs of the Project required to provide service to Brockton including without limitation unamortized portions of Major Capital Additions, and
- ▶ (3) Credit Brockton fully for the capital cost amortized by Brockton through its payment of the Fixed Rate during the term of this Agreement”

“Variable Rate to be recalculated to reflect the actual per volume costs of Operation and Maintenance reflected in the supplier’s filings to the Massachusetts Department of Telecommunications and Energy”.



Years 11-20 (2029-2038) - Adjusted Projections

Increased Fixed Fee and with higher operating / R&M costs and a \$15 million Capital Investment by City for a refresh

Lease				2M Gallons		2.50%
Year	Op & Maint Fee	Reinvest. Fee	Fixed Fee	Per Day	Total Cost	Discount Rate
2029			\$9,000,000	\$1,259,261	\$10,259,261	\$7,628,334
2030			\$9,180,000	\$1,281,480	\$10,461,480	\$7,588,971
2031	Estimated Combined		\$9,363,600	\$1,304,097	\$10,667,697	\$7,549,819
2032			\$9,550,872	\$1,327,119	\$10,877,991	\$7,510,878
2033			\$9,741,889	\$1,350,554	\$11,092,443	\$7,472,146
2034			\$9,936,727	\$1,374,410	\$11,311,137	\$7,433,623
2035			\$10,135,462	\$1,398,693	\$11,534,155	\$7,395,307
2036			\$10,338,171	\$1,423,412	\$11,761,583	\$7,357,196
2037			\$10,544,934	\$1,448,575	\$11,993,509	\$7,319,290
2038			<u>\$10,755,833</u>	<u>\$1,474,189</u>	<u>\$12,230,022</u>	<u>\$7,281,587</u>
			\$98,547,489	\$13,641,790	\$112,189,279	\$74,537,153

Own						
	Variable	Fixed	Dighton	Op. Cost	Total	2.50%
Bond P&I	Op. Costs	Op. Costs	Taxes	Contingency	Cost	Discount Rate
\$7,909,125	\$1,157,810	\$1,835,022	\$121,899	\$832,560	\$11,856,416	\$8,815,908
\$7,242,365	\$1,177,492	\$1,866,218	\$124,337	\$849,211	\$11,259,623	\$8,167,960
\$7,025,625	\$1,197,510	\$1,897,943	\$126,824	\$866,195	\$11,114,097	\$7,865,749
\$6,808,875	\$1,217,868	\$1,930,208	\$129,360	\$883,519	\$10,969,831	\$7,574,290
\$6,592,125	\$1,238,571	\$1,963,022	\$131,947	\$901,190	\$10,826,855	\$7,293,240
\$6,375,375	\$1,259,627	\$1,996,393	\$134,586	\$919,214	\$10,685,195	\$7,022,257
\$6,158,615	\$1,281,041	\$2,030,332	\$137,278	\$937,598	\$10,544,864	\$6,761,007
\$5,941,875	\$1,302,818	\$2,064,848	\$140,024	\$956,350	\$10,405,914	\$6,509,188
\$5,725,125	\$1,324,966	\$2,099,950	\$142,824	\$975,477	\$10,268,342	\$6,266,471
<u>\$5,508,375</u>	<u>\$1,347,491</u>	<u>\$2,135,649</u>	<u>\$145,681</u>	<u>\$994,986</u>	<u>\$10,132,182</u>	<u>\$6,032,562</u>
\$65,287,480	\$12,505,194	\$19,819,585	\$1,334,760	\$9,116,300	\$108,063,319	\$72,308,632

Years 1-10		
Lease	Total	PV
Lease	\$102,045,933	\$87,970,259
Own	<u>\$95,963,541</u>	<u>\$82,536,372</u>
Savings	\$6,082,392	\$5,433,888

Years 11-20		
Lease	Total	PV
Lease	\$112,189,279	\$74,537,153
Own	<u>\$108,063,319</u>	<u>\$72,308,632</u>
Savings	\$4,125,960	\$2,228,521

Total		
Lease	Total	PV
Lease	\$214,235,212	\$162,507,412
Own	<u>\$204,026,860</u>	<u>\$154,845,003</u>
Savings	\$10,208,352	\$7,662,409

Key Assumptions

Lease is renewed at \$9,000,000 with 2% inflation factor vs. 2028 contractual fee of \$8,987,729

Own scenario - City invests \$15MM in refresh costs in 2028 through a 10 year bond at 6% plus \$2MM over term for membrane replacement

Operating Cost Contingency = \$600,000 adjustment with 2% inflation plus \$232,560 for membrane replacement

Years 1-10 based on adjusted figures with higher operating cost contingency

Analysis does not include residual value beyond 2038. Two ways to integrate this:

- Add residual value estimated by CDM Smith of \$9 million total PV = \$16.5 million
- Extend analysis to include years after bond is repaid – just going to 2043 increases PV by about \$10 million

MWRA Option – Initial Findings

Per Hodge Economic Consulting

- ▶ Based on discussion with MWRA, Brockton could become a new MWRA community (e.g., Reading had a water supply but determined joining would be lower cost and better environmentally)
 - Brockton would be abandoning Desal Plant but that source uses a lot of electricity compared to MWRA to produce water
 - Requires environmental impact report
 - MWRA using about 200 MGD with capacity for 300 MGD from Quabbin Reservoir – but other potential users south of Boston may limit that capacity for Brockton
 - In MEPA filing, Union Point (Weymouth) mentioned both MWRA and Brockton's Desal Plant as possible water supplies
- ▶ Earliest Brockton could join is 2028 given current Aquaria agreement
- ▶ Could help relieve pressure on Silver Lake water use, but may face opposition from other environmental groups

MWRA – Initial Findings per Hodge (cont.)

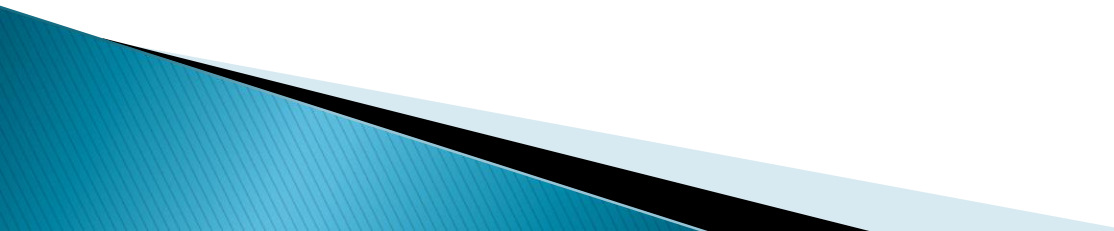
- ▶ Costs include: 1) entrance fee; 2) permitting; 3) connection cost; 4) water treatment consistency; and 5) actual water usage charges
 - Entrance fee \$4.5 million per MGD – zero interest loan paid over years 4–25 upon joining (\$409,091 /year if 2 MGD)
 - Permitting costs for new pipeline connections – estimated to be \$11 million (present value) by City
 - Connection costs – about 11 miles of pipeline; could easily be \$50–60 million; would require new engineering study
 - Actual usage fee \$3,500 per MG used – if Brockton used 2 MGD annually then about \$2.6 mill/yr; if used 1.5 MG for half the year, then \$960,000
 - Water treatment for consistency (MWRA and Brockton) – costs associated with making sure MWRA water compatible with existing Brockton water
 - Total annual cost at least \$5–7 mill/yr (depends on water consumption)
- ▶ Lots of uncertainties and challenges remain – MWRA willing to talk to Brockton and very open to helping new communities join
 - Need for regional coordination given other communities looking to join MWRA (e.g., Weymouth's Union Point moving forward with MWRA)

Summary Findings

The Decision: 3 Choices

- ▶ Status quo – remain in current agreement with Aquaria, and negotiate/determine required secondary water source at later date; Cost to City = \$7.5 to \$9 million/year
- ▶ Purchase Desal Plant – upfront payment of \$78 million via 20-year bond; while complex, anticipate cost savings to City over next 10 years and beyond
- ▶ Become MWRA Community – earliest would be in 2028, requires significant environmental/engineering study, construction costs, water consistency; high uncertainty, likely high cost

Context and Considerations

- ▶ By state consent decree, Brockton must have a secondary water source
 - ▶ State officials are very clear that Brockton is drawing too much water from Silver Lake today, and will need to start using more water from Aquaria (in the near-term)
- 

Summary Findings (continued)

Context and Considerations (continued)

- ▶ Brockton does use water from Aquaria Desal Plant, but facility not fully tested at consistent level of 2–4 MGD
 - Limits understanding of operating costs and equipment sustainability
- ▶ Purchase option was through January 2018 – develop new one?
- ▶ Bond interest rates are still low – good time to borrow and invest in long-term infrastructure assets

Findings

- ▶ Purchase the Aquaria Desal Plant because of cost savings and Brockton's near-term / long-term water needs
 - Cost savings of \$5 – 11 million over next 10 years (high degree of certainty)
 - Some uncertainty from 2029–2038, but cost savings much stronger once bond is paid off (e.g., total cost savings of \$14 to \$20 million over 25 years)
 - Biggest uncertainty is operating costs and renewal investment but even using very conservative assumptions, measurable cost savings are still expected

Summary Findings (continued)

Findings (continued)

- ▶ MWRA option is too uncertain with likely costs well-above Desalination Purchase option
 - New water pipeline construction, negotiations with neighbor communities, extensive permitting process, water consistency tests, etc.
 - This does not appear to be a good option for Brockton – would require lots of time and money just to determine feasibility
- ▶ Add requirement in Aquaria purchase agreement for them to operate the plant at 3–4 MGD for sustained period of time to fully test equipment, costs, etc.