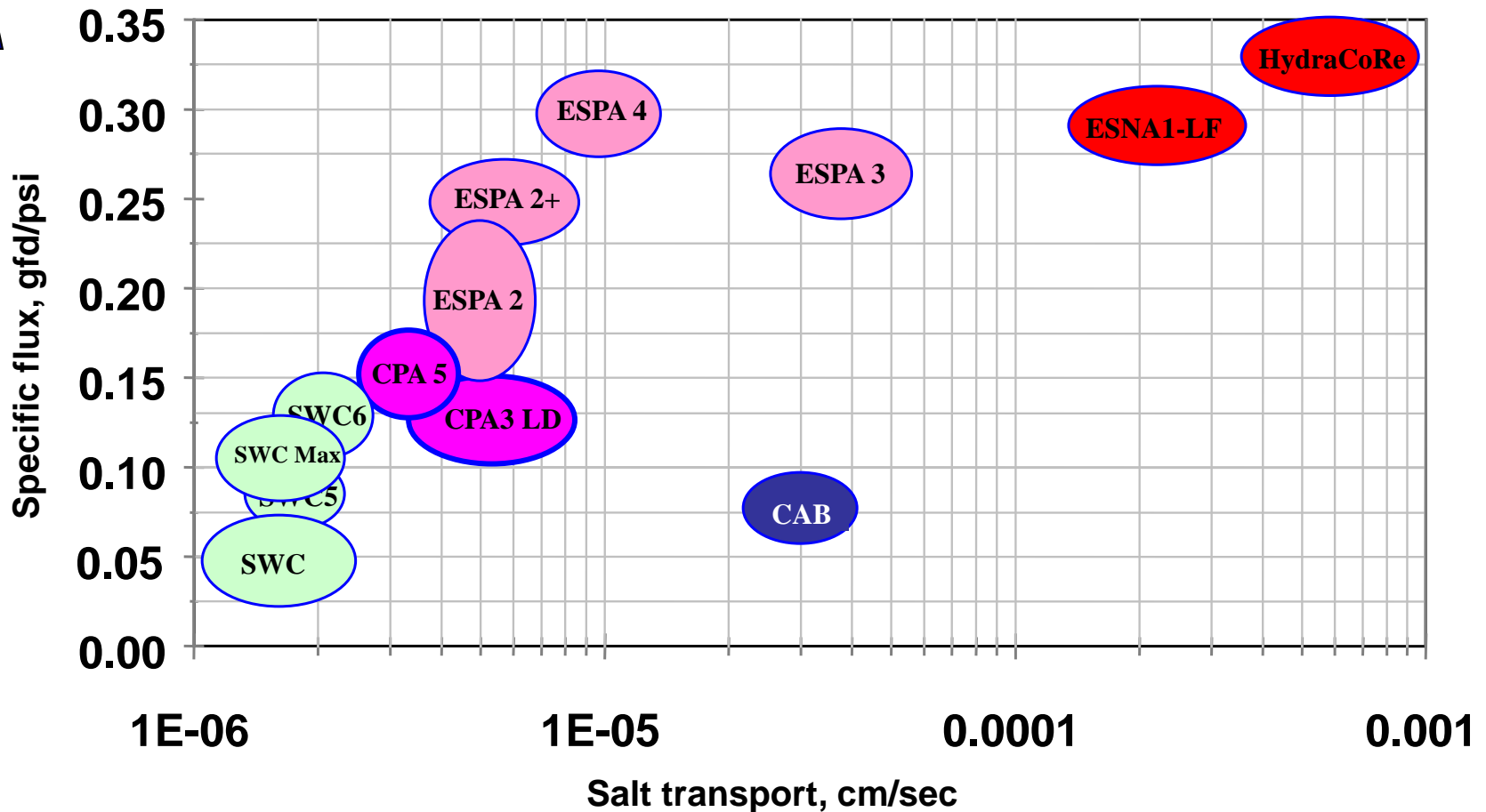


Advances in RO/NF Performance



Advances in Seawater RO

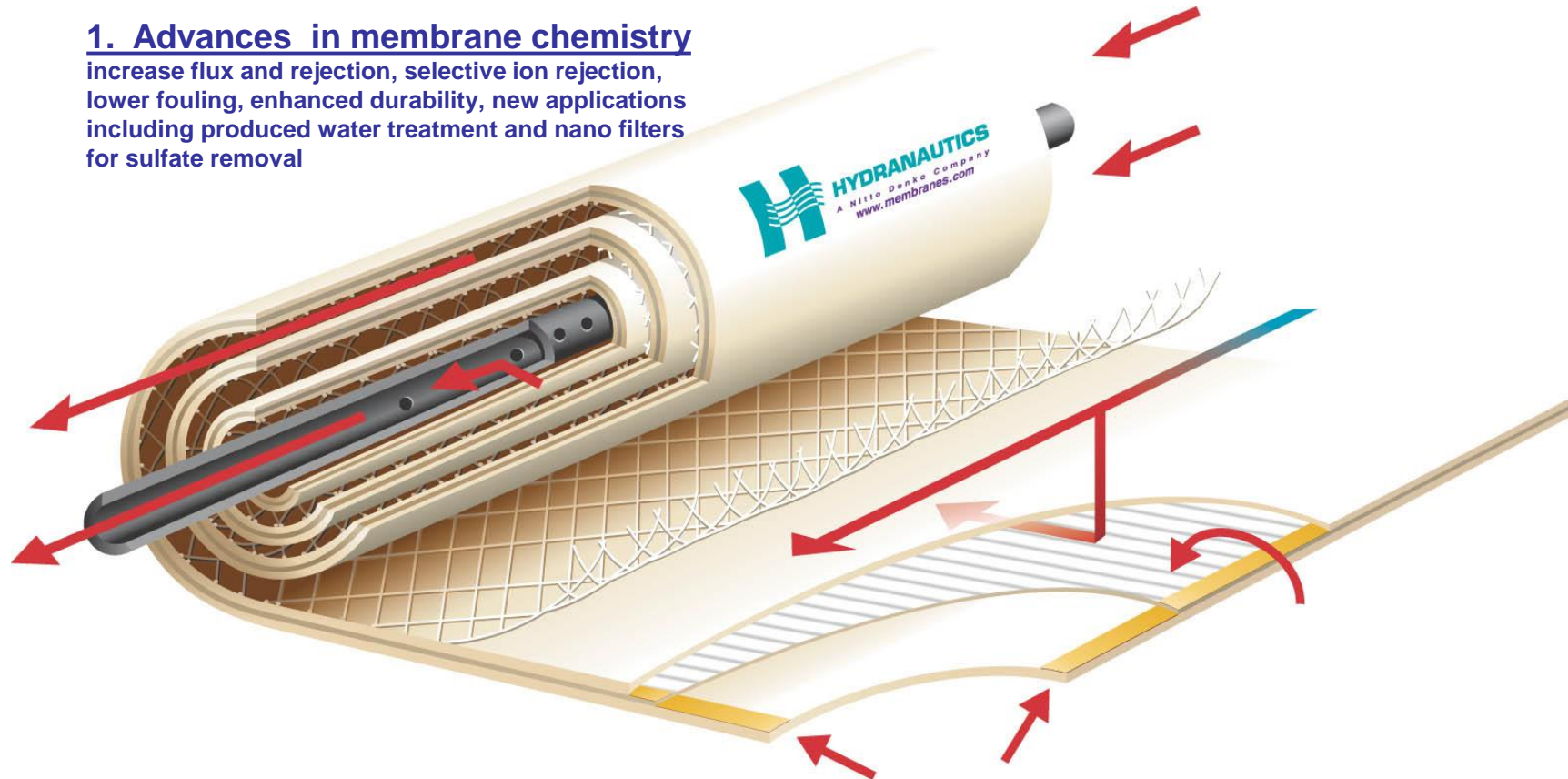
(Performance at Standard Test Condition)

Product	Area (sq ft)	Flow (gpd)	TDS Rej (%)	Boron Rej (%)	Year
SWC3	370	5900	99.7	89	2001
SWC4+	400	6500	99.8	93	2003
SWC5	400	9000	99.8	92	2005
SWC5 Max	440	9900	99.8	92	2008
SWC4+ Max	440	7200	99.8	93	2008
SWC6	400	12000	99.8	91	2008

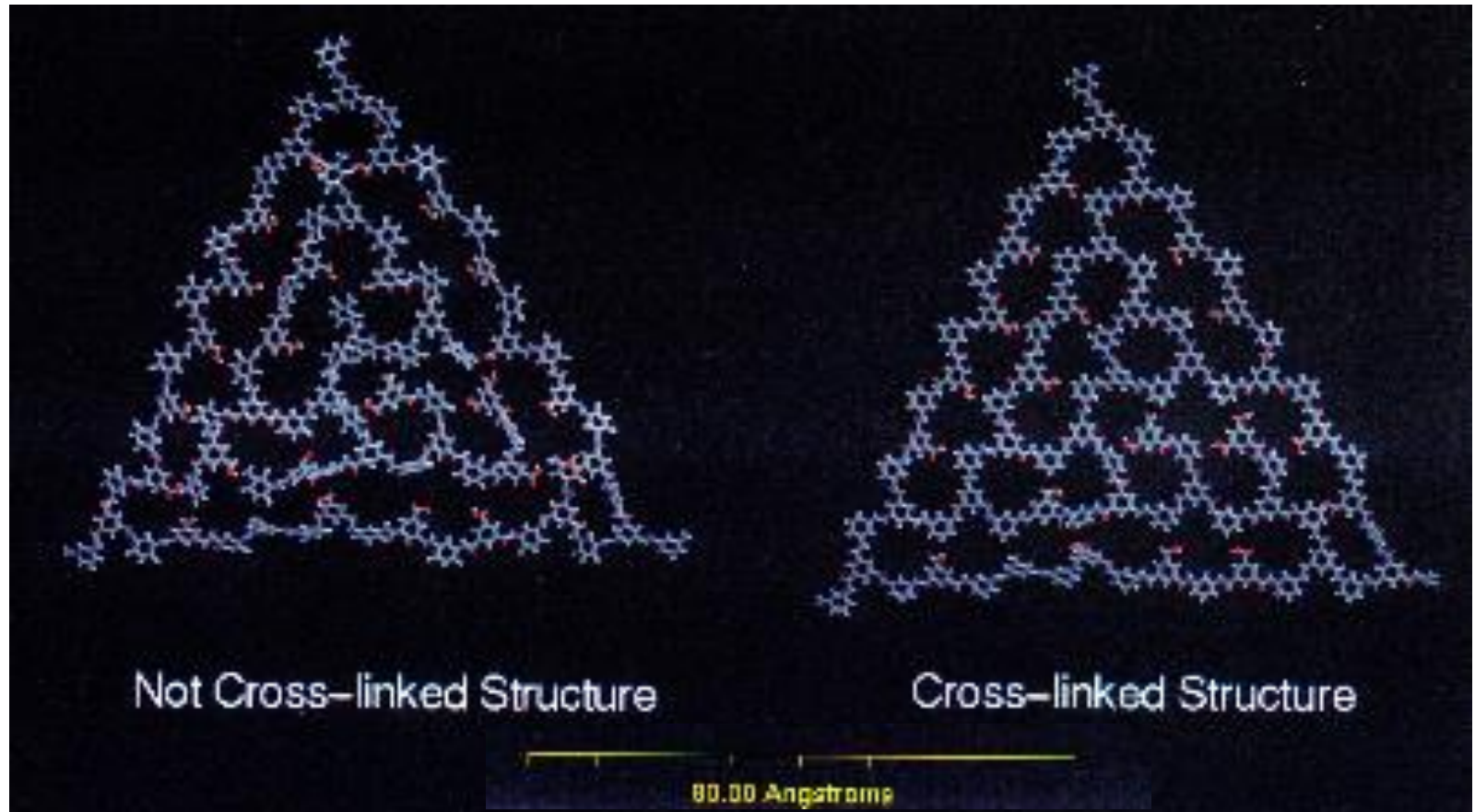
Advances in Membrane Performance

1. Advances in membrane chemistry

increase flux and rejection, selective ion rejection, lower fouling, enhanced durability, new applications including produced water treatment and nano filters for sulfate removal



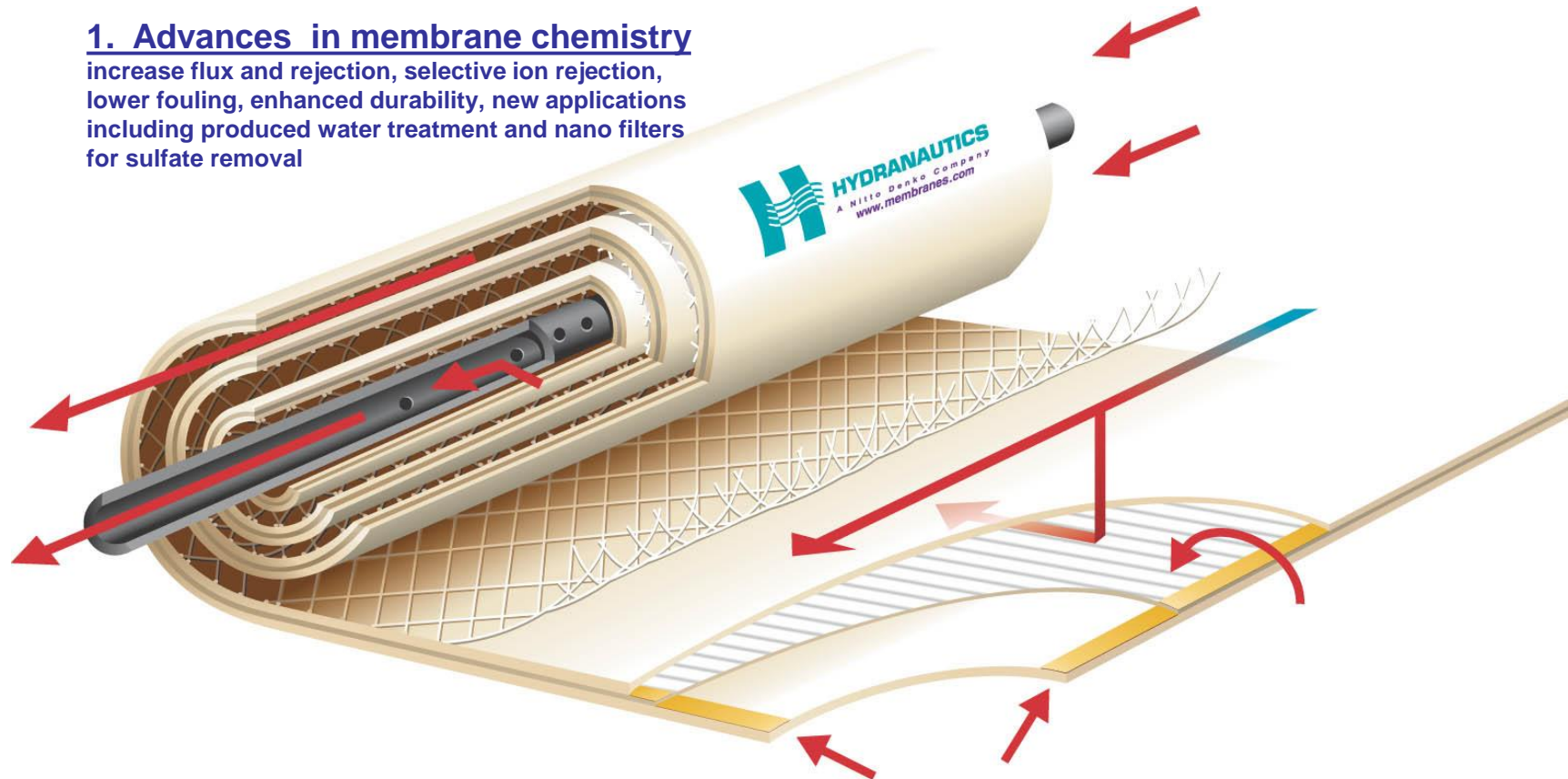
Improved Membrane Chemistry



Advances in Membrane Performance

1. Advances in membrane chemistry

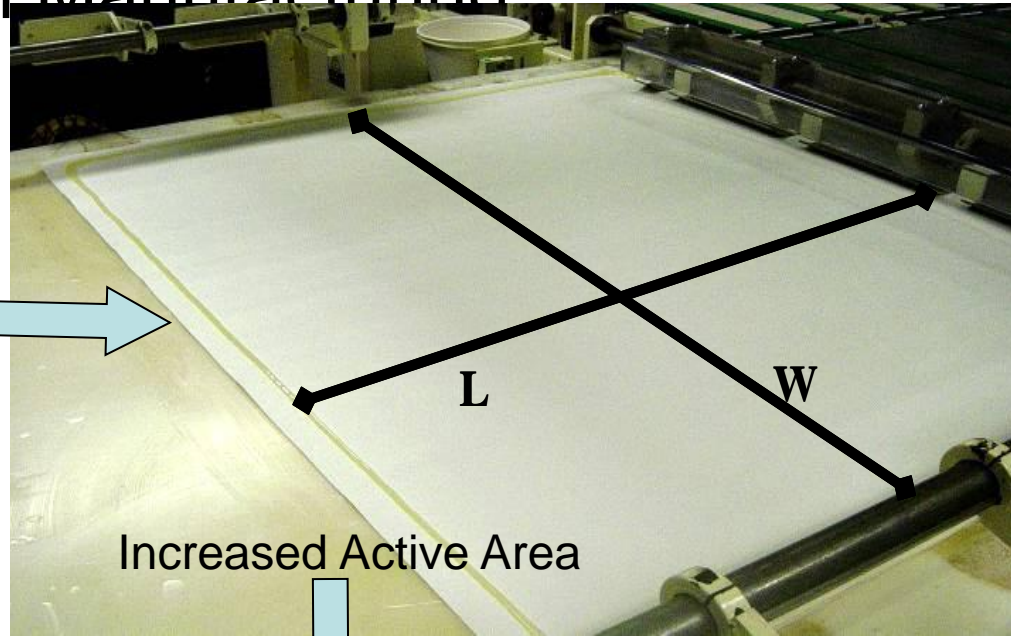
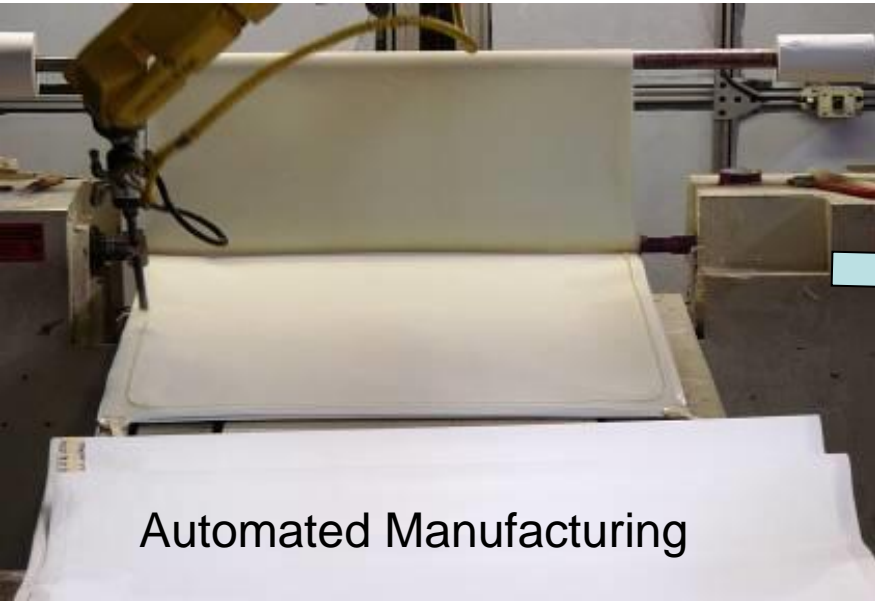
increase flux and rejection, selective ion rejection, lower fouling, enhanced durability, new applications including produced water treatment and nano filters for sulfate removal



2. Advances in Manufacturing

for increased membrane area and a more consistent product

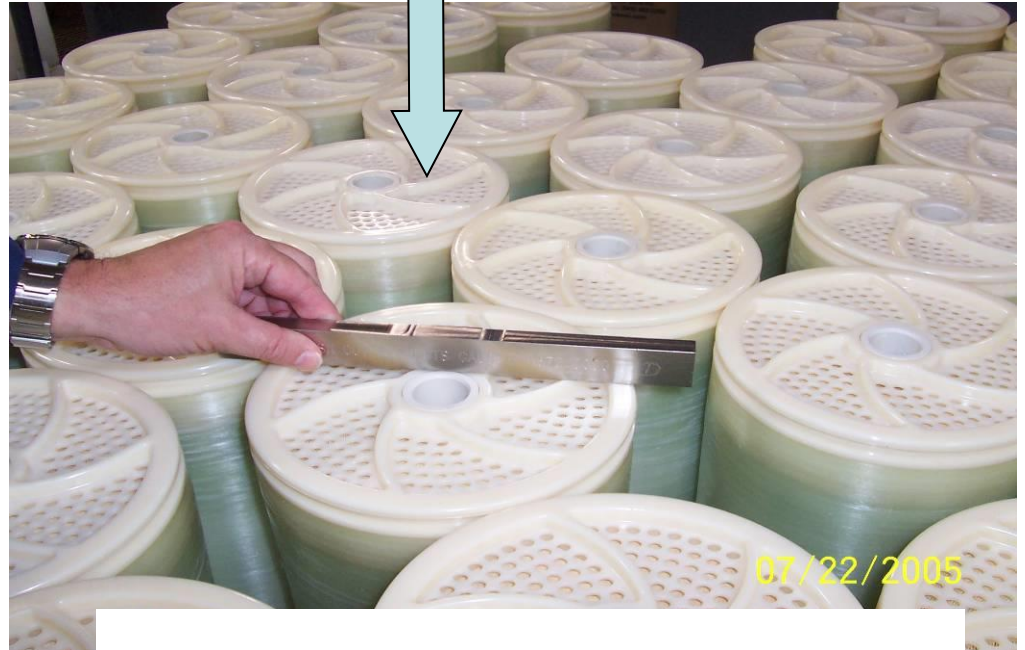
Advances in Manufacturing



ESPA2 Ideal for treating well, surface and wastewater. Where high salt rejection AND high flow is required.

ESPA2 99.6% Salt Rejection **9,000 GPD**

ESPA2 + 99.6% Salt Rejection **12,000 GPD**



Increased Consistency Higher

Rigorous QA / QC



100% Wet Test

- Commitment to continuous improvement in quality management
- Goal of defect-free products
- On time delivery
- Products and service which meets or exceed customer expectations.



Inspection



Calibration

Analytical Capabilities

SEM -
Scanning
Electron
Microscopy

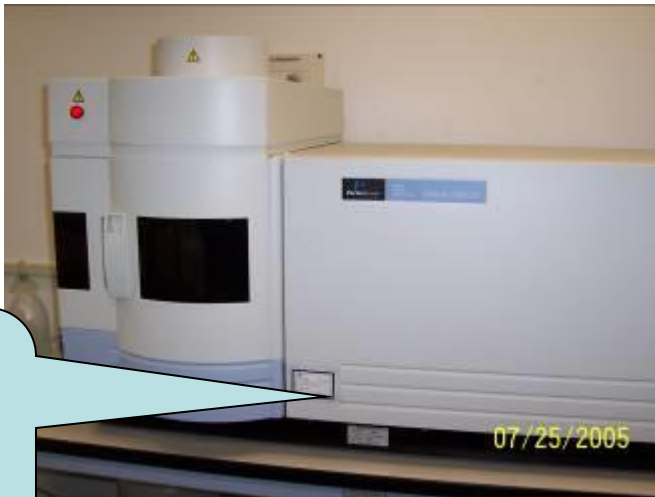
EDAX -
Energy
Dispersion X-
Ray
Microanalysis



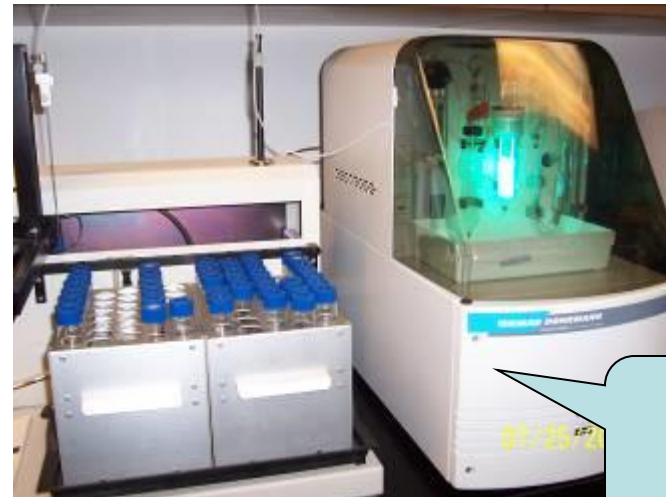
**Dionex - Ion
Chromatograph
(Anion analysis)**



**ICP - Inductively
Coupled Plasma
Optical
Emissions
Spectrometer
(Cation Analysis)**



**TOC
Analyzer**



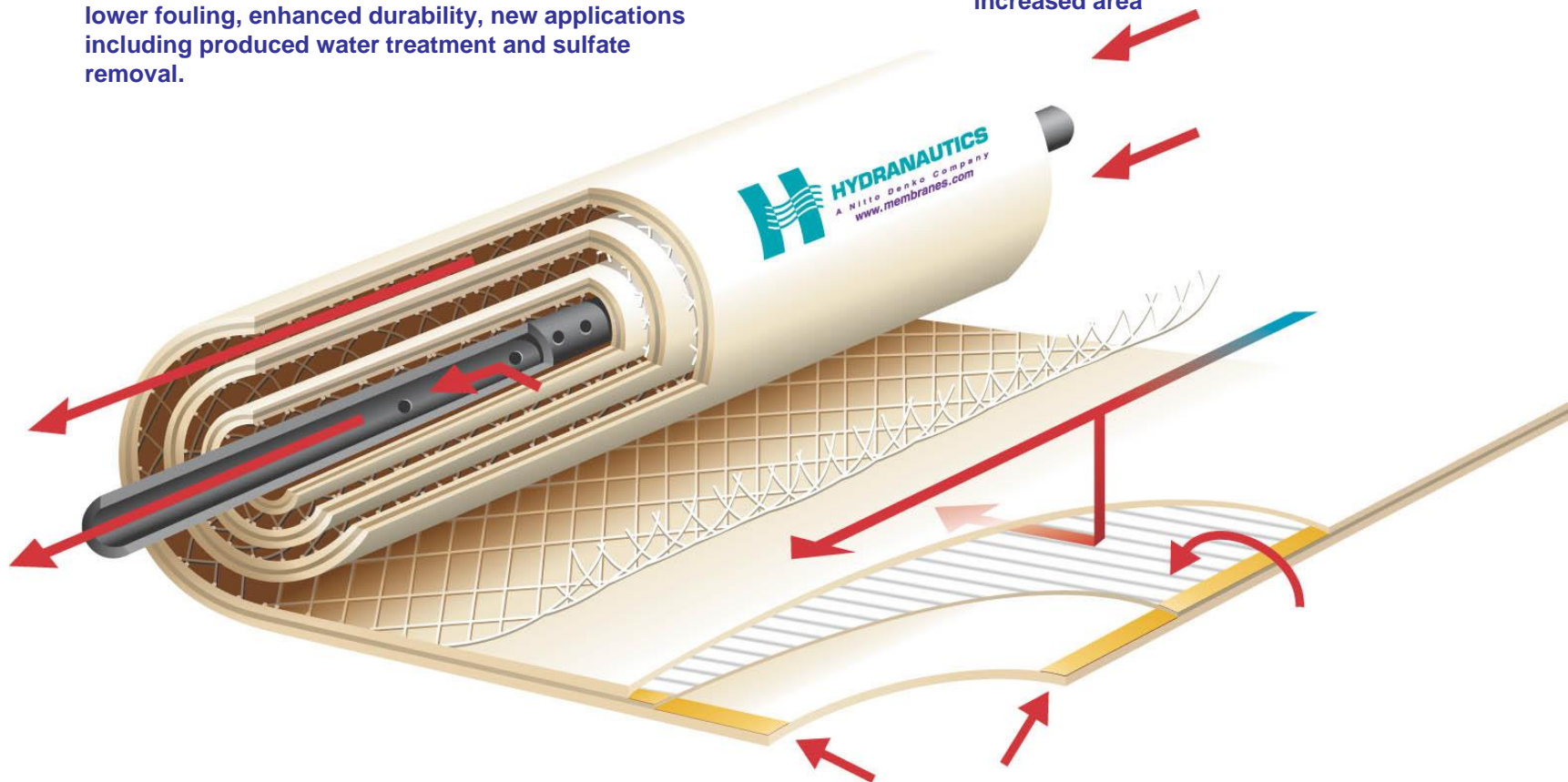
Advances in Membrane Performance

1. Advances in membrane chemistry

increase flux and rejection, selective ion rejection, lower fouling, enhanced durability, new applications including produced water treatment and sulfate removal.

3. Advances in Element Design

improved seal carriers to release air and increased area



2. Advances in Manufacturing

for increased membrane area and a more consistent product

Skirtless Seal Carrier



Advances in Membrane Performance

1. Advances in membrane chemistry

increase flux and rejection, selective ion rejection, lower fouling, enhanced durability, new applications including produced water treatment and sulfate removal.

3. Advances in Element Design

improved seal carriers to release air and increased area

4. Advances in Element Materials

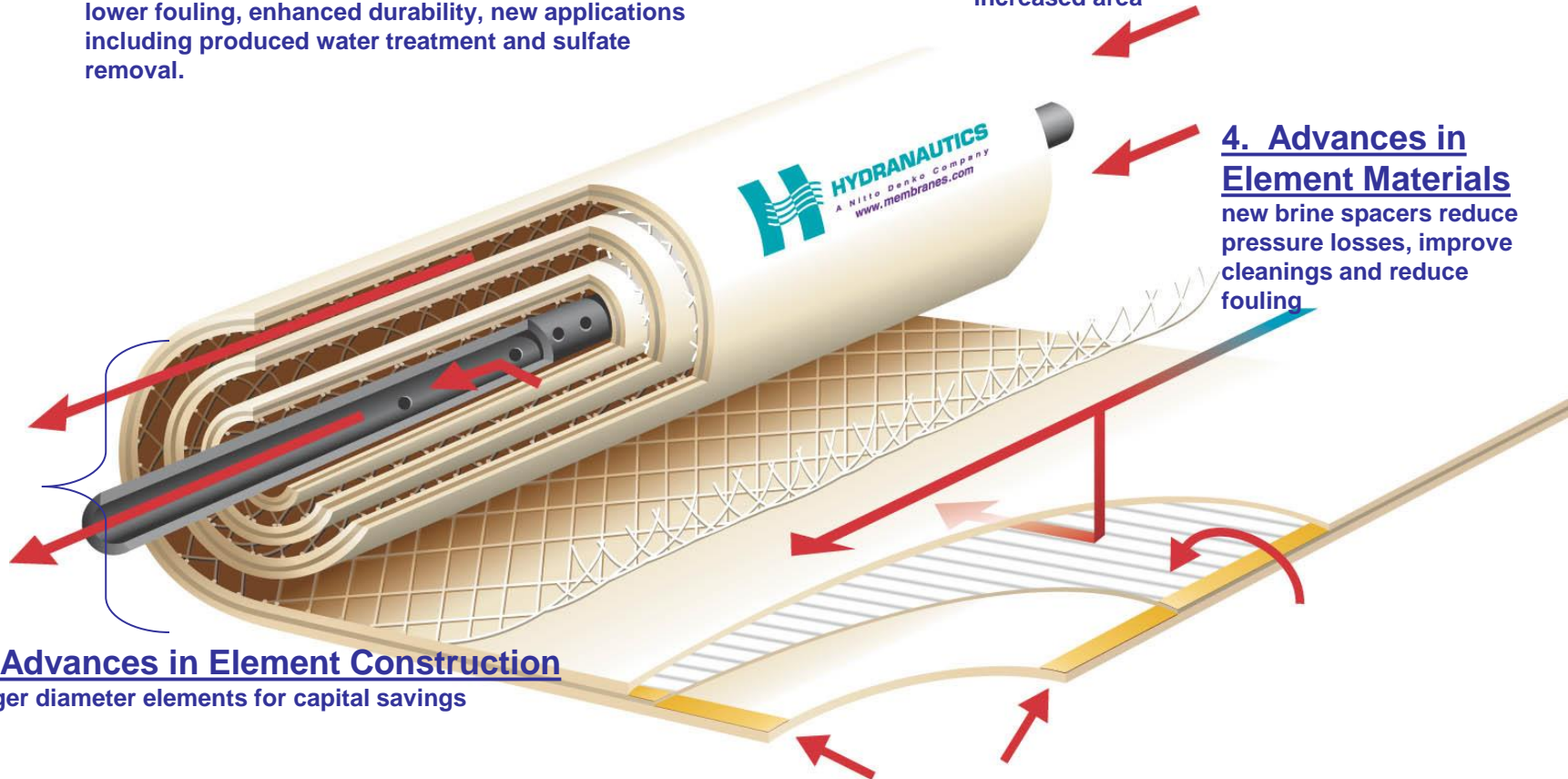
new brine spacers reduce pressure losses, improve cleanings and reduce fouling

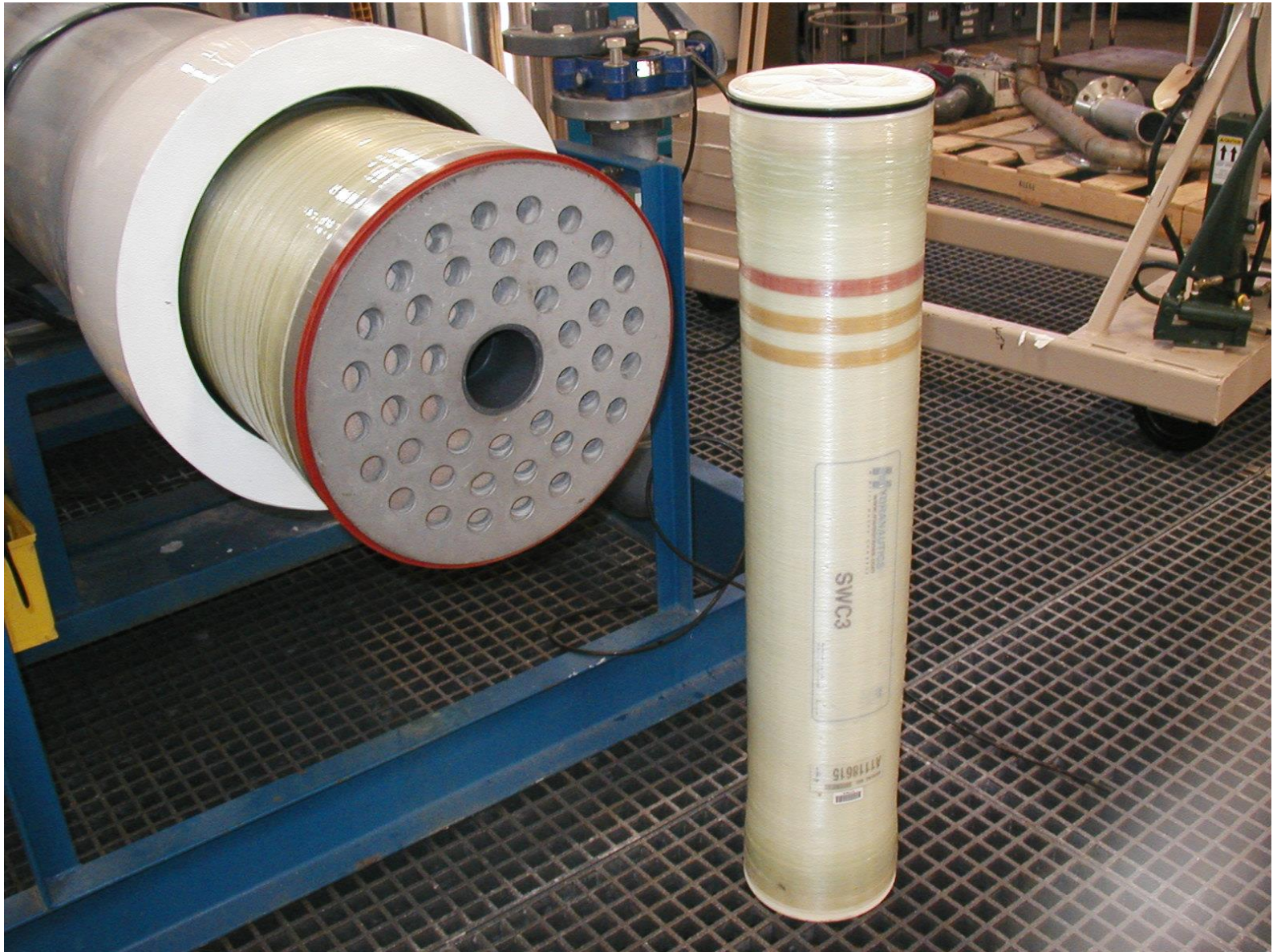
5. Advances in Element Construction

Larger diameter elements for capital savings

2. Advances in Manufacturing

for increased membrane area and a more consistent product





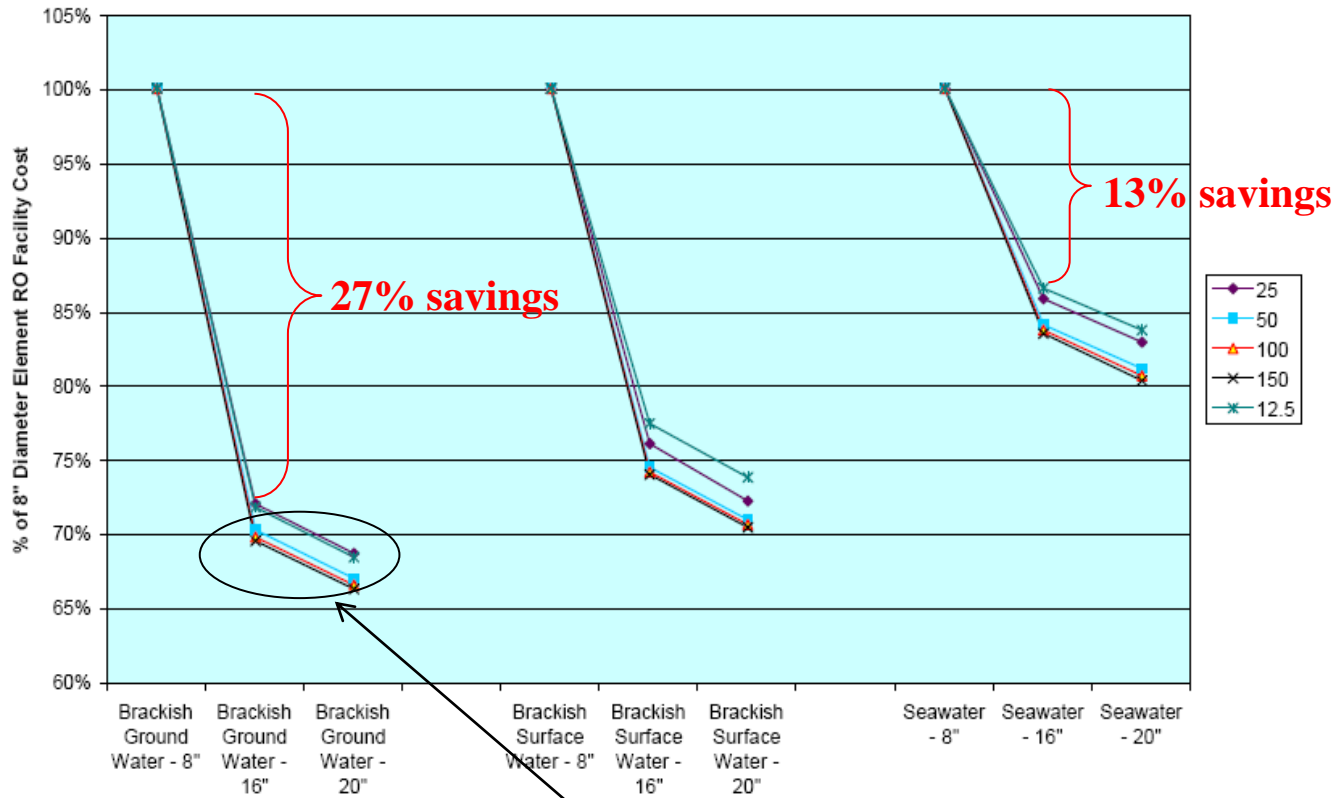
ESPA2 16x40 compared to a traditional 8 x 40 Element

RO facility costs as a function of plant size and element size

Design of RO trains and facility w/ 16" and 20" reduced plant construction costs in all cases:

- Brackish groundwater: 27 to 30% reduction
- Brackish surface & seawater: 13-23% reduction

RO Facility % of 8" Diameter Elements



Majority of construction cost realized from the 8" to 16" increase.

Little benefit realized in 16" to 20" increase

16 Inch Elements = Savings

Capital Costs (\$Million)	8x40	16x60	%Savings
Elements and press. vessels	28.8	25.0	13
Skid piping & support frame	14.6	2.8	81
Additional train equipment	17.8	12.2	31
Additional process items	16.3	16.3	0
Building, site, electrical	32.8	24.2	26
Construction contingency	28.4	20.0	30
Overall project contingency	28.6	20.2	29
Total Capital Costs	\$167	\$121	27

