

Proposed Replacement for Section 4B.11.4 in 2006 Regional Water Plan (Volume I)**4B.11.4 City of Corpus Christi**

The City of Corpus Christi meets its demands with its own water rights in the CCR/LCC System fed by the Nueces, Frio, and Atascosa Rivers and through a contract with the Lavaca-Navidad River Authority (LNRA) that provides water from Lake Texana through the Mary Rhodes Pipeline. Although no shortages are projected for the City's own municipal needs, the City also provides surface water to SPMWD, STWA, and manufacturing and steam-electric water user groups in Nueces and San Patricio Counties. The City's contract with LNRA expires in 2035; however, it is anticipated that this contract will be renewed when it expires. Therefore, water supply tables in Section 4 and in the water supply plans for Nueces County-Manufacturing (Section 4B.11.11) and San Patricio County-Manufacturing (Section 4B.12.12) include Lake Texana contract water as existing supply throughout the 60-year planning horizon.

In addition to these water supply sources, the City has a permit to divert up to 35,000 acft/yr of run-of-river water under its interbasin transfer permit on the Colorado River (via the Garwood Irrigation Co.). While the City owns the water right on the Colorado River, it does not have the facilities to divert and convey this water to the City. In the long-term (beyond 2030), the City will have to access this water – either directly or via a trade – to help offset the manufacturing shortages in Nueces and San Patricio Counties.

Proposed Replacement for Sections 4B.11.11 and 4B.12.12 in 2006 Regional Water Plan (Volume I)

4B.11.11 *Manufacturing*

4B.11.11.1 *Description*

The City of Corpus Christi provides the surface water for manufacturing in Nueces County from the CCR/LCC/Texana System. Additional manufacturing supplies are from the Gulf Coast Aquifer. The City also provides surface water for manufacturing in San Patricio County. *In the analysis that follows, the manufacturing needs of Nueces and San Patricio Counties are considered jointly.* A shortage in manufacturing supply occurs in 2040.

4B.11.11.2 *Options Considered*

Over 90 percent of the water supplied to Manufacturing users in Nueces and San Patricio Counties is from the CCR/LCC/Lake Texana System via Wholesale Water Providers (City of Corpus Christi and SPMWD). Beginning in 2040, shortages begin to appear and grow to a combined 42,192 acft/yr in 2060 (37,893 acft/yr in Nueces County and 4,299 acft/yr in San Patricio County). Table 4B.11-6 lists the water management strategies, references to the report section discussing the strategy, total project cost, and unit costs that were considered for meeting the shortage for manufacturing in Nueces and San Patricio Counties.

**Table 4B.11-6.
Water Management Strategies Considered for
Manufacturing in Nueces and San Patricio Counties**

Option	Yield (acft/yr)	Approximate Cost ¹	
		Total	Unit (\$/acft)
Manufacturing Conservation (Section 4C.3)	up to 2,050	N/A	N/A
O.N. Stevens Water Treatment Plant Improvements (Section 4C.19)	16,000	\$31,324,000 ²	\$444 ²
Reclaimed Wastewater Supplies (Section 4C.5)	250	\$1,500,000 ³	\$725 ³
Gulf Coast Aquifer Groundwater Supplies (Section 4C.7)	up to 18,000	\$45,642,000 ⁴	\$598 ⁴
Garwood Pipeline (Section 4C.14)	35,000	\$81,117,000 ⁵	\$505 ⁵
Stage II Lake Texana (Palmetto Bend) (Section 4C.13)	23,000	\$149,185,000 ⁶	\$788 ⁶
Voluntary Redistribution and USCOE Nueces Feasibility Projects (Section 4C.12)	up to 62,205 ⁶	\$178,281,250 ⁷	\$348- \$491 ⁷

¹ Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft/yr) for treated water delivered to the water supply entity or entities. Unit cost is for full utilization of project capacity.

² Total project cost includes improvements to the following WTP components: raw influent, raw water intake pump station, and O.N. Stevens solids handling facilities.

³ See Section 4C.5. Total cost provided by City for Allison Demonstration Project. Unit costs based on annual program costs of \$500,000 per year and \$225 per acft for treatment.

⁴ Source of Cost Estimate: Section 4C.7, Table 4C.7-15. Unit cost includes \$225/acft for treatment. Treatment may not be required if separate pipeline is constructed so that groundwater would not be blended with water in Mary Rhodes pipeline.

⁵ Source of Cost Estimate: Section 4C.14, Table 4C.14-2. Unit cost = \$225/acft for treatment + \$280/acft for raw water supply development.

⁶ Source of Cost Estimate: Section 4C.13, Table 4C.13-6, cost of construction of the dam and delivery to Lake Texana. Unit cost = \$225/acft for treatment + \$563/acft for raw water supply development.

⁷ Water supplied is 65 percent of project potential, with 35 percent dedicated for ecosystem restoration. Source of Cost Estimate: Includes off-Channel Reservoir (Section 4C.11), CCR/LCC Pipeline (Section 4C.10), and Seawater Desalination Projects (Section 4C.17) with cost reduction of 65 percent due to Federal participation. Unit cost includes \$225/acft for treatment of water associated with CCR/LCC Pipeline and Off-Channel Reservoir Project, and varies based on project implementation schedule.

4B.11.11.3 Water Supply Plan

Working within the planning criteria established by the Coastal Bend RWPG and TWDB, the following water supply plan is one potential plan to meet the projected 2040 to 2060 shortages for manufacturing in Nueces and San Patricio Counties:

- Manufacturing Water Conservation
- O.N. Stevens WTP Improvements
- Reclaimed Wastewater Supplies
- Gulf Coast Aquifer Groundwater Supplies

- Garwood Pipeline
- Stage II of Lake Texana
- Voluntary Redistribution and USCOE Nueces Feasibility Projects

The O.N. Stevens WTP Improvement Projects will provide 14.3 MGD of new water supply to the water users downstream of the O.N. Stevens WTP, including manufacturers, steam-electric users, SPMWD, and the STWA. These improvements will also enhance the quality of the finished water leaving O.N. Stevens WTP.

The USCOE is currently studying six projects as part of the Nueces River Basin Feasibility Study to evaluate opportunities for flood damage reduction, ecosystem restoration, and/or benefit water supplies in South Texas. The six projects selected by the USCOE and participating sponsors for feasibility studies are: desalination facilities, wastewater diversion to the Nueces Delta, Cotulla Diversion Project, CCR/LCC Pipeline with Off Channel Storage, Recharge Enhancement Projects, and brush management opportunities.

Three of the six projects were considered in the cost estimate in Table 4B.11-7 (desalination, CCR/LCC Pipeline, and Off-Channel Storage). Costs to implement these projects could potentially be reduced through Federal participation as may be available through the USCOE Nueces River Basin Feasibility Study.

In addition to the management strategies listed above, the RWPG supports strategies for increased conservation and reuse of existing supplies.

4B.11.11.4 Costs

The recommended Water Supply Plan including anticipated costs is summarized by decade in Table 4B.11-7.

**Table 4B.11-7.
Potential Plan Costs by Decade for
Manufacturing in Nueces and San Patricio Counties¹**

<i>Plan Element</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>	<i>2060</i>
Projected Surplus/(Shortage) ² (acft/yr)	—	—	—	(11,627)	(25,283)	(42,192)
Manufacturing Water Conservation³						
Supply From Plan Element (acft/yr)	1,260	1,418	1,576	1,734	1,892	2,050
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
O.N. Stevens Water Treatment Plant Improvements						
Supply From Plan Element (acft/yr)	16,000	16,000	16,000	16,000	16,000	16,000
Annual Cost (\$/yr)	\$7,099,000	\$7,099,000	\$7,099,000	\$7,099,000	\$4,823,000	\$4,823,000
Unit Cost (\$/acft)	\$444	\$444	\$444	\$444	\$301	\$301
Reclaimed Wastewater Supplies⁴						
Supply From Plan Element (acft/yr)	250	250	250	250	250	250
Annual Cost (\$/yr)	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000
Unit Cost (\$/acft)	\$725	\$725	\$725	\$725	\$725	\$725
Gulf Coast Aquifer Groundwater Supplies						
Supply From Plan Element (acft/yr)	11,000	11,000	11,000	11,000	11,000	18,000
Annual Cost (\$/yr)	\$9,182,000	\$9,182,000	\$9,182,000	\$9,182,000	\$9,182,000	\$10,757,000
Unit Cost (\$/acft)	\$598 ⁵	\$598 ⁵	\$598 ⁵	\$598 ⁵	\$598 ⁵	\$598 ⁵
Garwood Pipeline						
Supply From Plan Element (acft/yr)	—	—	35,000	35,000	35,000	35,000
Annual Cost (\$/yr)	—	—	\$17,679,000	\$17,679,000	\$17,679,000	\$17,679,000
Unit Cost (\$/acft)	—	—	\$505	\$505	\$505	\$505
Stage II of Lake Texana						
Supply From Plan Element (acft/yr)	—	—	—	—	—	23,000
Annual Cost (\$/yr)	—	—	—	—	—	\$18,132,000
Unit Cost (\$/acft)	—	—	—	—	—	\$788
Voluntary Redistribution and USCOE Nueces Feasibility Projects⁶						
Supply From Plan Element (acft/yr)	—	25,000	25,000	62,205	62,205	62,205
Annual Cost (\$/yr)	—	\$8,699,400	\$8,699,400	\$30,549,725	\$30,549,725	\$30,549,725
Unit Cost (\$/acft)	—	\$348	\$348	\$491	\$491	\$491
Total Annual Cost (\$/yr)	\$16,406,000	\$25,105,400	\$42,784,400	\$64,632,725	\$62,358,725	\$82,065,725
Total Unit Cost (\$/acft)	\$486	\$420	\$453	\$492	\$473	\$525
¹ Supplies exceed shortages in case water growth patterns and demands exceed TWDB projections or supplies are reduced under the City's contract with LNRA for Lake Texana water. ² Surplus/(Shortage) includes both Nueces and San Patricio Counties. ³ Water supply represents water saved by blending of Lake Texana water with Nueces River water. ⁴ Costs to maintain ongoing Nueces Delta studies are \$500,000 per year (assumed cost associated with Allison Demonstration Project is 25 percent). Water supply for Allison Project based on ratio of yield recovered by a 2-MGD project as compared to an						

8.8-MGD project (See Section 4C.5). Costs to supply Allison discharge to delta includes \$225/acft for treatment of additional yield.

⁵ Assumes full utilization of project. Unit cost based on 18,000 acft project + \$225/acft for treatment (See Section 4C.7) although treatment may not be required if separate pipeline is constructed so that groundwater would not be blended with water in Mary Rhodes pipeline.

⁶ Annual costs and unit cost are based on Federal funding participation of 65 percent. Water supplied is 65 percent of project potential, with 35 percent dedicated for ecosystem restoration. \$225/acft added for treatment for supplies from Off-Channel and CCR/LCC Pipeline. Assumes implementation of CCR/LCC pipeline in 2020 with desalination plant and off-channel reservoir by 2040.

4B.12.12 *Manufacturing*

4B.12.12.1 *Description*

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**Table 4B.12-4.
Water Management Strategies Considered for
Manufacturing in Nueces and San Patricio Counties**

Option	Yield (acft/yr)	Approximate Cost ¹	
		Total	Unit (\$/acft)
Manufacturing Conservation (Section 4C.3)	up to 2,050	N/A	N/A
O.N. Stevens Water Treatment Plant Improvements (Section 4C.19)	16,000	\$31,324,000 ²	\$444 ²
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⁴ Source of Cost Estimate: Section 4C.7, Table 4C.7-15. Unit cost includes \$225/acft for treatment. Treatment may not be required if separate pipeline is constructed so that groundwater would not be blended with water in Mary Rhodes pipeline.

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In addition to the management strategies listed above, the RWPG supports strategies for increased conservation and reuse of existing supplies.

4B.12.12.4 Costs

The recommended Water Supply Plan including anticipated costs is summarized by decade in Table 4B.12-5.

**Table 4B.12-5.
Potential Plan Costs by Decade for
Manufacturing in Nueces and San Patricio Counties¹**

<i>Plan Element</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>	<i>2060</i>
Projected Surplus/(Shortage) ² (acft/yr)	—	—	—	(11,627)	(25,283)	(42,192)
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Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—
O.N. Stevens Water Treatment Plant Improvements						
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Reclaimed Wastewater Supplies⁴						
Supply From Plan Element (acft/yr)	250	250	250	250	250	250
Annual Cost (\$/yr)	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000
Unit Cost (\$/acft)	\$725	\$725	\$725	\$725	\$725	\$725
Gulf Coast Aquifer Groundwater Supplies						
Supply From Plan Element (acft/yr)	11,000	11,000	11,000	11,000	11,000	18,000
Annual Cost (\$/yr)	\$9,182,000	\$9,182,000	\$9,182,000	\$9,182,000	\$9,182,000	\$10,757,000
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Garwood Pipeline						
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Annual Cost (\$/yr)	—	—	\$17,679,000	\$17,679,000	\$17,679,000	\$17,679,000
Unit Cost (\$/acft)	—	—	\$505	\$505	\$505	\$505
Stage II of Lake Texana						
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Annual Cost (\$/yr)	—	—	—	—	—	\$18,132,000
Unit Cost (\$/acft)	—	—	—	—	—	\$788
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