Region M Adopted Region Plan Errata Sheet

TWDB Comment: “ The plan is required to identify factors to be considered and actions to be undertaken as a part of a drought response for each source. While the plan has an extensive discussion on drought factors and actions as they relate to the region’s primary supply source (the reservoir system), it does not address any other supply source (i.e. groundwater).”

Response: Groundwater is supplied to the region from the Gulf Coast (including the Catahoulla formation in the corner of Webb County) and Carrizo-Wilcox major aquifers, as well as the Rio Grande Alluvium, and the Laredo formation. Water quality from these aquifers varies from fresh water (less than 1000 mg/l total dissolved solids (TDS)), slightly saline (exceeding 1000 mg/liter TDS) and moderately saline waters (exceeding 3000 mg/l TDS). The poorer quality of many of these waters leads them to be considered secondary sources that are only tapped when drought conditions have reduced the amount of surface water available. Of the individual municipal users, only Hebbronville in Jim Hogg County relies exclusively on groundwater. Six other municipal users rely on a combination of surface and ground water, as well as the County Other Municipal users in 6 counties. As a result, the drought triggers for the surface water are usually already moving the M&I users into the demand reduction stages of their drought plans when they begin to draw more heavily on the groundwater to make up for the surface water shortages. Since the quality has been poor, however, the water levels have remained relatively constant in the various sands throughout the region. As a result, the following drought triggers are recommended for all of the groundwater aquifers in the region.

When the static water levels in the early part of spring each year in the wells being monitored decline on average more than 20 feet below the historic average levels then the municipality or water supplier should consider drought contingency measures. The amount of static water level decline required to trigger consideration of drought contingency measures should be subject to revision depending on the growth of a city and whether it begins to provide water to unincorporated areas outside the municipality. It should also take into account the potential for increased total dissolved solids content as the aquifer is pumped more heavily, and the more sensitive areas should include a more restrictive trigger such as a 10 foot decline, where areas where the quality is better may consider a larger decline before instituting the drought responses. Again, these all assume that drought management triggers have not already been instituted by the lack of surface water supplies.

A second trigger mechanism should be developed based on the capacities of the wells, transmission lines, pumping equipment and distribution systems. When the required capacity of any one component exceeds 80 percent of the available capacity of that component, drought contingency measures should be triggered.

For either trigger, the drought contingency measures that should be considered include the following components:

1. Initial Stages
    a. Reduction in outdoor watering uses by city personnel, including vehicle and equipment washing, except for necessary repairs
    b. Elimination of any washing of driveways or vehicle containment areas
    c. Reduction in outdoor watering of City landscapes.
    d. Reduction in water for sprinkling roadways and/or roadway construction
    e. Requests for voluntary reductions in outdoor watering and washing of vehicles at individual residences by the general public
2. Moderate stage – when static water levels fall an additional 10 feet, or total capacity of any one component exceeds 85 percent usage
    a. Prohibition of outdoor washdown of slabs, vehicles, for city workers and residents
    b. Mandatory outdoor watering restrictions for no more than two days per week with watering to occur outside peak system demand hours.
    c. Request voluntary conservation by public in both indoor and outdoor uses
    d. Institution of increasing step rate structure to discourage consumption
3. Severe Stage – static water levels drop an additional 10 feet, or capacity of one or more system components reaches 90 percent of total capacity
    a. Prohibition on outdoor watering

b. Closing of public swimming pools
c. Prohibition on filling private swimming pools
d. Institution of penalties for consuming over fixed percentage of average of three past years monthly usage for the same month.

The above listing is a suggested approach only and is not intended to be an exhaustive listing of all of the potential strategies.

For manufacturing users, the same approach can be taken to monitor water levels in one or more wells, and then to begin reducing water uses not directly related to manufacturing output, instituting water saving measures in the plant processes, and scaling back or curtailing operations during a severe drought. Again, Maverick County Manufacturing is the only county with exclusive reliance on groundwater. Hidalgo and Webb County Manufacturing rely on a combination of ground and surface water. All other counties either rely exclusively on surface water or have no manufacturing demand.

TWDB Comment: "Brownsville Weir costs are listed as $36.2 million (Section 5.6.5.1.3) in part of the text versus $81.2 million in Exhibit B, Tables 11 and 12."

Response: Section 5.6.5.1.3 does not mention the estimated capital cost associated with the construction of a water treatment plant and associated facilities, required to prepare the water for delivery to the end user. In addition to the above comment, the $13.6 million currently shown as the annualized cost has been changed to $9 million to be consistent with Appendix 5.1. The section is revised as follows:

<u>5.6.5.1.3 Cost</u>

The most current cost estimate to construct the Brownsville Weir and Reservoir is just less than $36.9 million. Construction of a water treatment plant and other associated elements, assuming that the Brownsville PUB will build a 35 MGD water treatment plant, will add an estimated capital cost of approximately $44.4 million; bringing the total estimated capital cost for the project to $81.2 million (see Appendix 5.1). TWDB guidelines require an annualized cost to construct the project to deliver water to meet end user needs based on firm yield requirements. Assuming the firm yield from the diversion is used as the basis for providing treated water for DMI use, the following determination of unit cost was developed. Using TWDB cost estimation guidelines, the inflation adjusted annualized cost to construct, operate, and maintain the project, and provide required treatment, is approximately $9 million dollars per year. Consequently, the unit cost of firm water supply from the project is approximately $438 per acre-foot. Of this amount approximately $138 per acre-foot is used to develop the water and the balance is used to treat and transfer the water.

TWDB Comment: “It appears the numerous treatment costs are mistakenly described as cost per one gallon when they are actually and correctly calculated as per one-thousand gallons. This leads to confusion”

Response: The following corrections are made to Appendix 5.1, water management strategy data summaries:

- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 3 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 4 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 5 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 6 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.

- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 7 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 8 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 9 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 10 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.
- Strategy DMI #1-4: Acquisition of Additional Rio Grande Water Supplies, Page 11 of 11. Under CONSTRUCTION CAPITAL COSTS and ANNUAL COSTS sections, Water Treatment Plant cost is in dollars per 1,000 gallons, rather than dollars per gallon.

TWDB Comment: The capital cost associated with the advanced water conservation strategy is wrong. Exhibit B, Tables 11 and 12 estimate the cost at $1,414. Instead, the Technical Memoranda Appendix provides the proper basis for estimating advanced conservation costs. That estimate is closer to $18,000,000 for the region. This number needs to be corrected.

Response: The numbers shown in Exhibit B, Tables 11 and 12 have been previously corrected, using a cost estimate of $18,090,000, and revised tables were provided to TWDB in both hard copy and electronically (on compact disc). Mr. Robert Flores has confirmed the receipt of these revised tables.