LEADERSHIP

1. The first job of leadership is to tell it like it is.
2. The second job is to describe how it can be.
3. The third job is to begin the hard work of moving from where we are to where we want to be.

Alan Webber

TRANSPARENCY

1. As used in science, engineering, business, the humanities and in other social contexts, implies openness, communication, and accountability *Wikipedia*
2. A representative government is dependent upon an informed electorate…all persons are entitled to the greatest possible information regarding the affairs of government and the official acts of those officers and employees who represent them. *New Mexico Open Meetings Act NMSA 1978 §10-15-1(A)*

REASONS I ASKED TO PRESENT TO YOU TODAY

1. Context of elements of the WRMS in 1997—Water resources staff and the then Customers Advisory Committee knew that full consumptive use of SJC water would tip the Middle Rio Grande into excess depletions with respect to its Rio Grande Compact entitlements.
    a. ABCWUA's full direct use increases depletions of water within the Middle Rio Grande
        i. Illustrate with before and after descriptions
    b. Albuquerque's strategy evolution
        i. original strategy—infinite aquifer, no limits to pumping
        ii. The original San Juan-Chama utilization strategy (unworkable)
            1. Pump and use SJC for offset of river depletions
        iii. The Water Resources Management Strategy
            1. Full direct consumptive use of San Juan-Chama water
            2. Water budget
            3. Drought reserve
            4. Complimentary elements to address the problems created by full direct use.
2. Certain policies of the WRMS that have not received sufficient attention to date are very important and should be pursued, not discarded.
    a. Other policies are deserving of publicly transparent disclosures and a report card.
3. Critically important context of the Rio Grande Compact needs emphasis
    a. The Compact is a perfect dividing line as long as NM remains in compliance with its deliveries of water through the Middle Rio Grande to Elephant Butte Dam
    b. Failure to comply will invite turmoil and bring much risk to ABCWUA and customers
    c. ABCWUA has a huge stake in NM's continued compliance
        i. ABCWUA should advocate for compliance
        ii. ABCWUA should plan and prepare for non-compliance

1. The importance of the Water Resources Management Strategy's Policies A, B, and C to Albuquerque and Bernalillo County water supply reliability and resilience.

    a. **Policy A—Update and Maintain a Water Budget *(create it first)***

    Water budget must take aquifer contamination, creation and maintenance of the groundwater drought reserve, and reduction of SJC volumes due to climate change into account to be meaningful. The process of developing the budget should explore the best uses of SJC water that cannot be diverted for direct use.

    Conservation program success yielding 40% consumptive use and the difficulties of diverting and treating surface water means full consumptive use of SJC pursuant to Policy A cannot be achieved under the existing State Engineer permit conditions.

    SJC water, the "current income," comes with 100% matching native Rio Grande water for free when diverted and used for drinking water under the ABCWUA permit. (ABCWUA needs a permit modification to all native Rio Grande Diversions of 150% of SJC amounts for full consumptive use.)

    SJC water used for aquifer storage and recovery does not come with any free water when it goes into the aquifer, but requires pumping 150% of native groundwater (savings account withdrawal) when removed for use in order to get full consumptive use. The ripple effects make aquifer storage and recovery of SJC water inferior to diversion and direct use.

    Policy A.3. requires consistency with the regional water budget, meaning the water budget that recognizes overarching Rio Grande Compact limits.

    b. **Policy B—Balance Demand with Renewable Supply by Using San Juan-Chama Water as the Primary Source of Supply**

    "The Authority shall limit the use of groundwater to meet peak demands or during times of drought."

    Determination of groundwater safe yield is a requirement of Policy B.

    Water budget must take aquifer contamination and creation and maintenance of drought reserve into account.

    c. **Policy C—The Authority shall establish a groundwater drought reserve that maintains sufficient water in storage in the aquifer to provide water supply during a prolonged drought**

    This is a unique feature that dramatically increases water supply resilience and a competitive advantage.

2. The potential for Rio Grande Compact depletion limits for the Middle Rio Grande to adversely impact Albuquerque's water rights portfolio in the relatively near-term.
    a. Rio Grande Compact legal limitations are the "elephant in the room."
    b. LRG legal crisis, Rio Grande Compact protections of MRG, and preeminent need for MRG compliance
    c. ABCWUA's vested rights (from pumping before the basin was put under regulation in 1954 (?) are in jeopardy. Perhaps Valley Wells rights also.
    d. Current excess depletions
        i. Middle Rio Grande Water Supply Study results—40,000 acre-feet per year excess depletions on average
        ii. Expert update of the Middle Rio Grande Water Budget—48,000 acre-feet per year of depletions 2008-2012 during drought
    e. Large compact delivery credits accrued in the extraordinarily wet 1980s and 1990s were exhausted over the period from 2002 through 2014. Credit balance is now zero.
        i. Relinquishment credits mask the magnitude of our problem.
    f. We knew in the mid 1990s that full use of San Juan-Chama water would trigger a compact compliance problem, thus WRMS policies E.3 and E.4.
        i. Albuquerque's historical gifts of SJC water to MRGCD
        ii. Delayed pumping effects of historical groundwater pumping are catching up with us.
        iii. Full use of SJC water while offsetting delayed effects of historical groundwater pumping a major problem
        iv. My assessment as ISC Director of MRG issues relative to LRG and Pecos controversies.
    g. MRGCD's practice to allow lands from which pre-1907 water rights have been acquired/transferred to be irrigated from MRGCD's 1930 rights.
    h. Compact compliance crisis has been postponed by slow implementation of the Drinking Water Project due to treatment plant design and operations limitations, water availability in the river and fortuitous State actions.
    i. We have lost much precious time and likely will be up against the wall soon, so to speak.

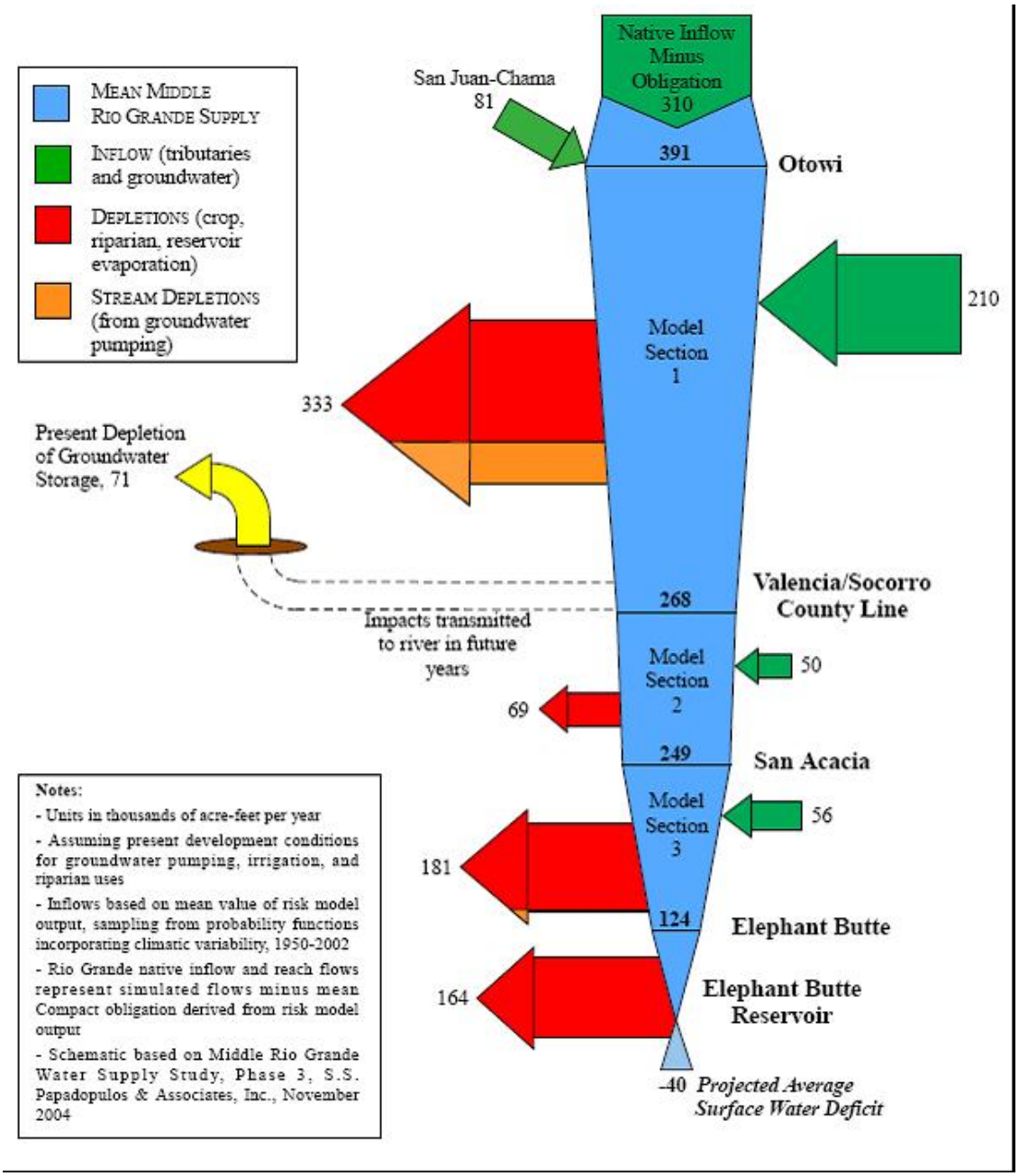


Figure 6. Water budget prepared for NM Interstate Stream Commission by SSPA (2004).

Table 9. Summary of ground water recharge in the Middle Rio Grande basin.

Ground Water Rech	1975-1997	2000-2012	2008-2012
Canals	96	86	89
River Recharge	597	603	607
Ag Seepage	44	39	43
Other Recharge & M	73	74	73
Totals	810	802	812

The detailed water balance for the period of 2008-2012 is presented in Figure 15. The changes between the conditions for the period of 1975-1997 are summarized in Figure 10 through Figure 14 and the numeric data are presented in Table 5 through Figure 9. This diagram represents the best estimate of the hydrologic cycle in the MRG basin for current conditions.

The water balance for 2008-2012 (Figure 15) shows that the basin continues to be out of balance, most recently by 48 KAF/yr. Water deliveries to meet Rio Grande Compact requirements to the lower Rio Grande and TX has been achieved in part by drawing down Elephant Butte Reservoir by 43 KAF/yr and withdrawing 5 KAF/yr more from the deep aquifers than is replenished by ground water recharge. Figure 9, the plot of the volume of water in Elephant Butte Reservoir, shows a sharp decline in storage of about 200 KAF from 2008 to 2012 which is consistent with URGSiM calculation.

Note that the average water budget deficit of 48 KAF/yr for the period 2008-2012 is close to the 40 KAF/yr deficit estimated for the year 2000 by SSPA (2004). Although significant decreases in M&I consumptive use has been achieved and water diversion for irrigation has been reduced, the overall water supply for the MRG basin remains out of balance with the demand. It is clear that further measures for reducing basin wide consumptive use will be required to bring the basin into balance based on current water uses. Furthermore, even more aggressive measures will be required in the future to meet the conflicting situations of increased demand due to projected growth and decreased future supplies as a result of long term drought and climate change.

Summary

The hydrologic data and water budget calculations for the period 2008-2012 show that a total of 1,098 KAF/yr of water entered the basin in the form of flow from the river (987 KAF/yr), tributaries in the MRG (43 KAF/yr) and atmospheric precipitation (68 KAF/yr). Roughly half of this, 598 KAF/yr, was subsequently delivered to the Lower Rio Grande and TX at Elephant Butte Dam. The total losses from the basin of 715 KAF/yr that were calculated by URGSiM for 1975-1997 compare favorably to the depletions of 680 KAF/yr for the year 2000 reported by SSPA (2004). The distribution of the losses is quite different as seen by comparing Figure 7 to Figure 16. While lake and river evaporative losses are roughly the same, URGSiM shows M&I consumption to be 10% of total depletions compared to 3% by SSPA (2004). Furthermore, there are large differences calculated for riparian ET(21% vs 37% by SSPA, 2004) and agricultural ET (39% vs 26% by SSPA, 2004).

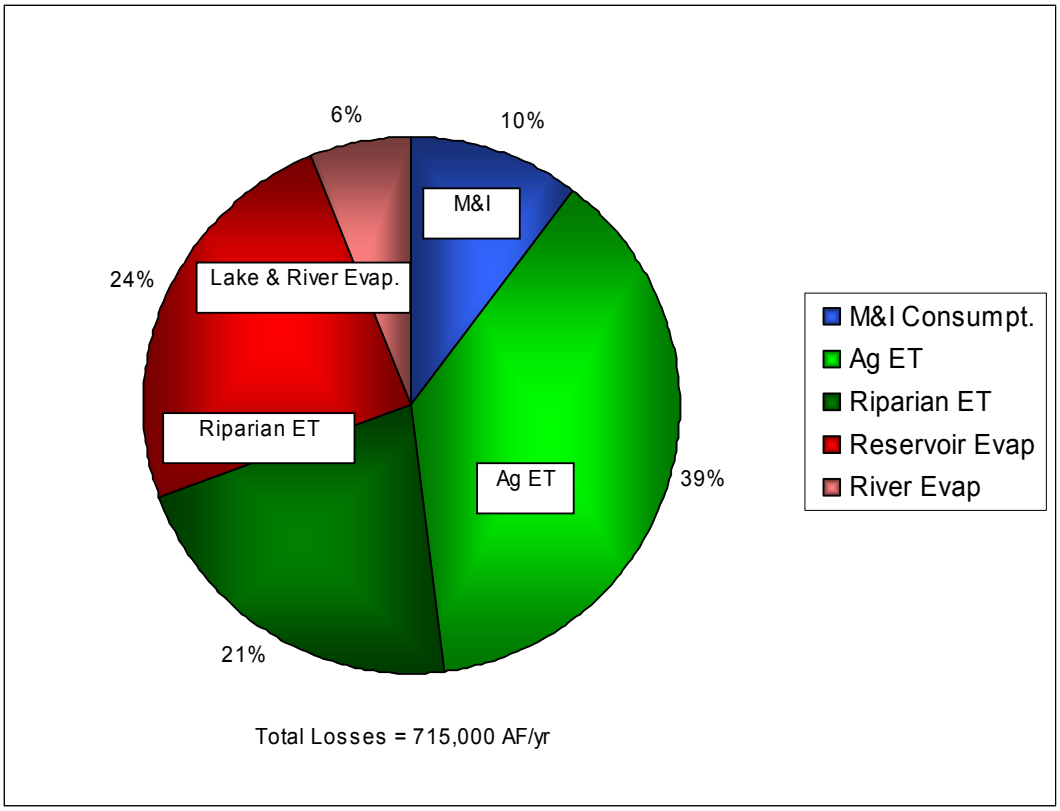
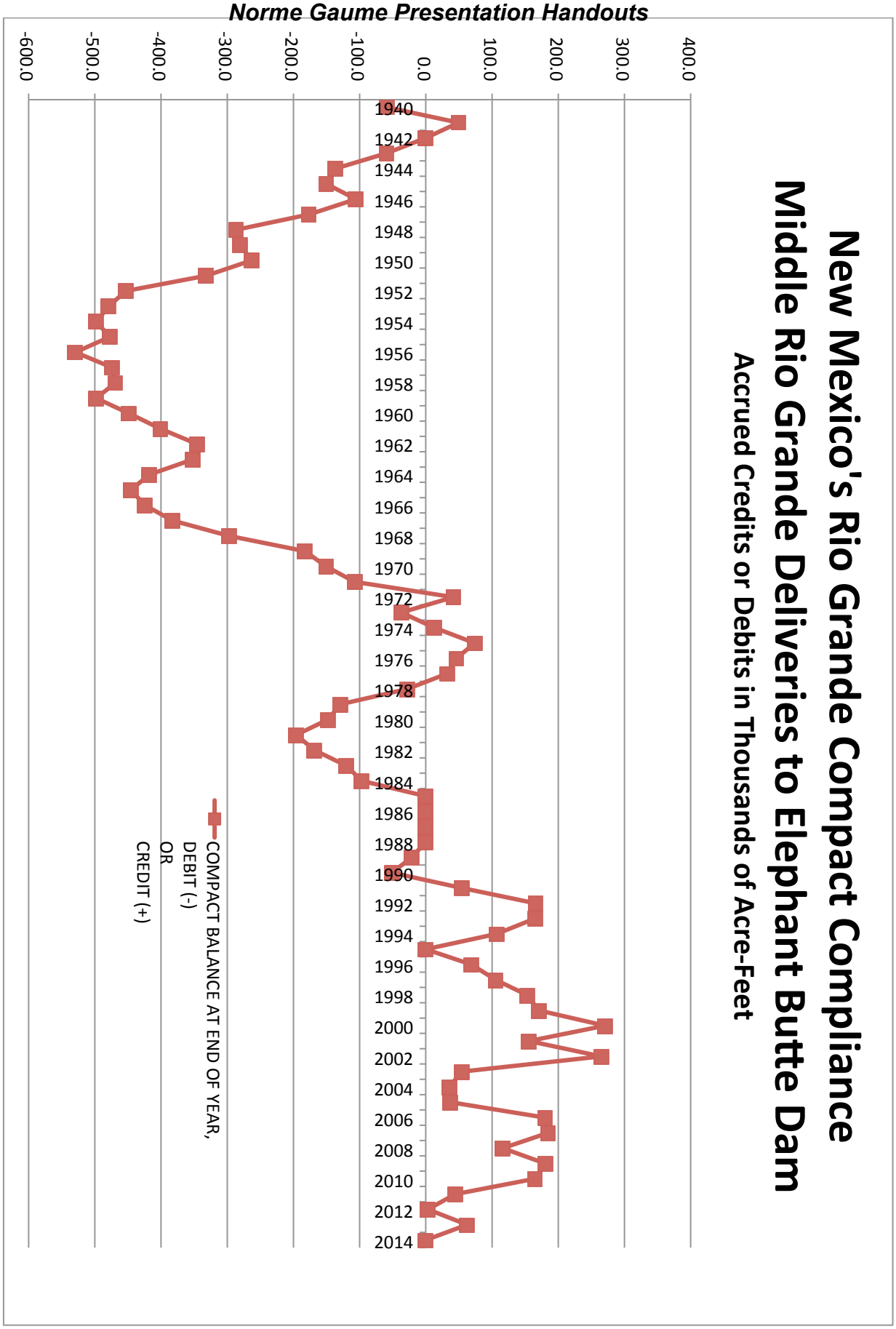


Figure 16. Distribution of the losses of water from the Middle Rio Grande Basin for the period 1975-1997 as calculated by URGSiM.

A second similarity between the two studies is that whereas SSPA (2004) reported a net deficit of 40 KAF/yr (Figure 6) for 2000, URGSiM reports a decrease in storage in Elephant Butte Reservoir of 43 KAF/yr. In other words, deliveries to the lower Rio Grande and TX are being met in part by draining this lake. Of course one benefit of this strategy is that reservoir evaporation is reduced from 164 KAF/yr to 84 KAF/yr; it is important to remember that the SSPA (2004) study included Caballo Reservoir in its study area.


New Mexico's Rio Grande Compact Compliance
Middle Rio Grande Deliveries to Elephant Butte Dam
Accrued Credits or Debits in Thousands of Acre-Feet
400.0
300.0
200.0
100.0
0.0
-100.0
-200.0
-300.0
-400.0
-500.0
-600.0
1940
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2002
2004
2006
2008
2010
2012
2014
COMPACT BALANCE AT END OF YEAR,
DEBIT (-)
OR
CREDIT (+)