

Water Assembly – Annual Meeting 2011

“Aquifer Storage & Recovery: Boon or Boondoggle”

ASR & Water Quality

Amigos Bravos
April 9, 2011





Bridge Blvd.



MRG Water Quality Concerns

NH₃ [ammonia] toxicity must be considered seriously with increasing populations upstream and downstream of Albuquerque, accidental spills, synergistic effects of mixed toxicants [Passell, Dahm, & Bedrick (2007)]

Turbidity spikes, sharp **DO** drops, higher **salt** levels, and **nutrient** loading in the MRG that reflect the impact of episodic events [David Van Horn, UNM Biology (2009)]

PCB spikes at extraordinarily high levels from the North Diversion Channel and other Bernalillo County stormwater outfalls [NMED DOE Oversight Bureau (2010); BernCo Public Works (2011)]

Sediment samples showed some **arsenic**, **cyanide**, and semivolatile/polycyclic **aromatic hydrocarbons** (especially above the Alameda Bridge). **Fish samples** (mercury & PCBs in carp with lesions), **zinc** everywhere, several other **metals**, **DDT** associated with the Angostura and Albuquerque WWTPs, **PCBs** [Middle Rio Grande Annual Baseline Condition and Trends (2009)]

Middle Rio Grande Impairments

303(d)/3059b) List 2010-2012

Hwy 550 – Alameda Reach

- *E. Coli* [TMDL Schedule 2009]
- DO (nutrients?) [TMDL Schedule 2009]
- PCBs (fish tissue)
- Ambient Bioassays – Acute Aquatic Toxicity [TMDL Schedule 2009]

Alameda – Isleta Pueblo Boundary Reach

- *E. Coli* [TMDL Schedule 2009]
- DO (nutrients?) [TMDL Schedule 2013]
- PCBs (fish tissue)
- Temperature [TMDL Schedule 2013]

Middle Rio Grande 303(d)/305(b) Impairments



Middle Rio Grande 303(d)/305(b) Impairments

AMAFCA North Diversion Channel @ Outfall 5800cfs July 1990; <http://www.amafca.org/media/photos.html>



Pharmaceuticals & Personal Care Products (PPCPs)

Kathryn Brown (2004) – focus on hospital and other medical waste streams and effectiveness of the WUA wastewater treatment plant (SWRP)

Maceo Martinet (2004) – demonstrated PPCPs in relation to the SWRP and presence in the shallow groundwater along the river

SWQB/EPA (ESA Collaborative Project; 2009) – effluent samples from seven MRG WWTPs; detected 36 of the 54 PPCP analytes in at least one of the 7 WWTP effluents; 20 PPCPs were detected in all 7 WWTP effluents

Amigos Bravos (2010) – showed presence of PPCPs in the east riverside drain from Angostura to the I-25 Bridge

ABCWUA (2011) -

Pharmaceuticals & Personal Care Products (PPCPs)

Environmental Improvement Board Petition (EIB 10-13R) to amend the Solid Waste rules to accommodate pharmaceutical take-back programs

Prescription Drug Disposal Task Force – ABCWUA was a member; Task Force made recommendations that went into the proposed new rules

Petitioners

Solid Waste Bureau/NMED; NMAG; NM Board of Pharmacy

“[H]ousehold pharmaceutical waste is of great concern because of potential negative impacts on human health and the environment ... ”

Water Treatment Byproducts

ABCWUA Drinking Water Project Treatment Process

“Biological activated carbon (BAC) process” or “biologically enhanced activated carbon process”

- Ozone
- Granular Activated Carbon Filtration

Treatment Byproducts (2010 Customer Water Quality Report)

Sampling Results (ppb)	Min	Avg	Max	MCL
<i>Trihalomethanes</i>	0	20	45	80
<i>Haloacetic Acids</i>	0	5	17	60

MRG Water Quantity Concerns

Water Quantity is a Water Quality issue

Declining water quality is a “hidden” consequence of drought in effluent-influenced streams

Water Quantity Affects Operation of the DWP and ASR

What do we do if Rio Grande flows drop by 20 or 30%?

What if there are significant drops in Colorado flows and/or fully implemented settlements on the San Juan system leading to a renegotiated Colorado Compact and possible cuts in SJ-C deliveries?

MRG Water Quantity Concerns

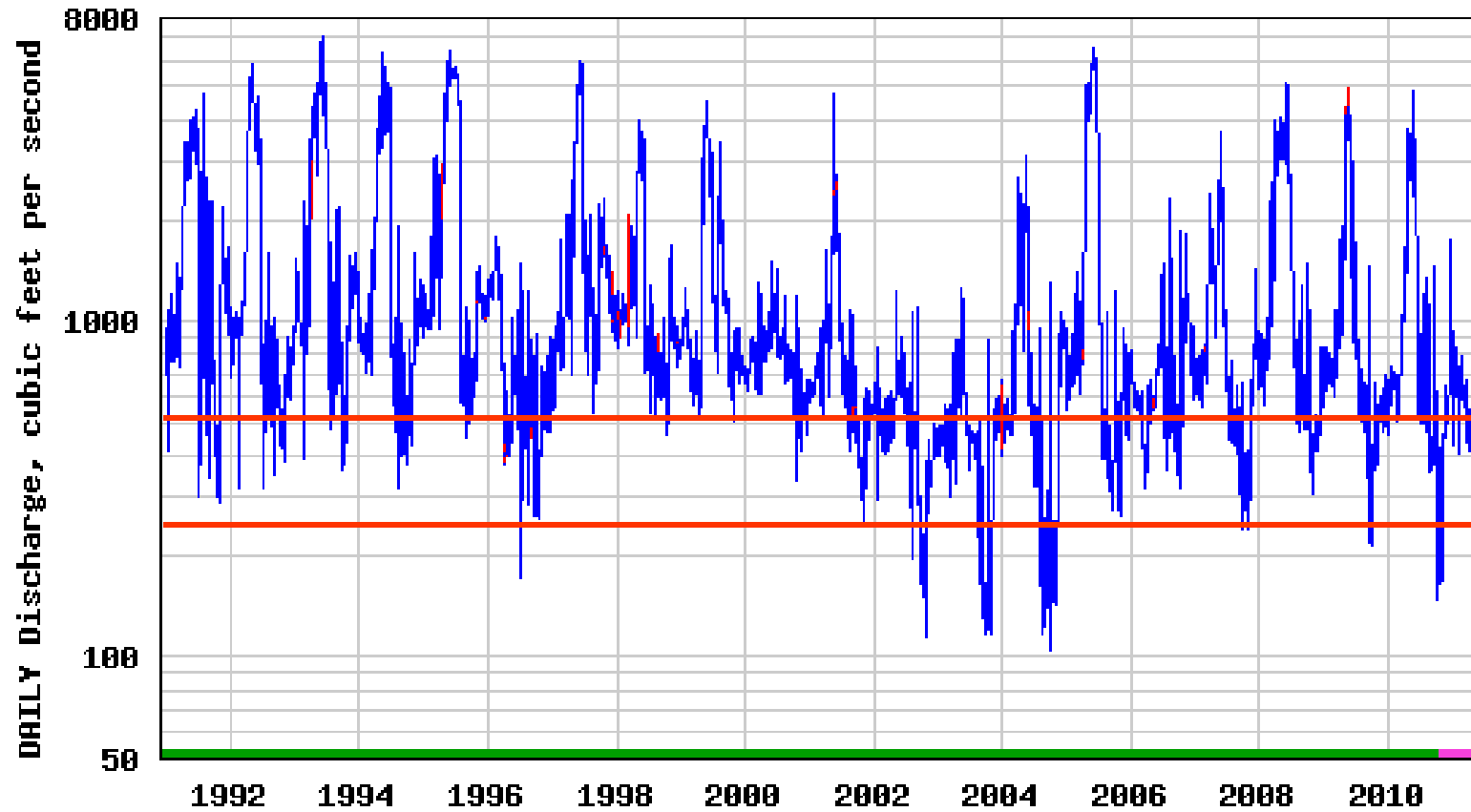
“The management, monitoring, and accounting of recharged water are inherently obscure as groundwater is not visible. Therefore, computer models, monitoring wells, and sophisticated accounting systems are employed to accomplish these tasks. Even with these tools it can be challenging to adequately demonstrate control and capture of recharged water.”

-Southwest Hydrology May/June 2008

- How will ASR using SJC water be accounted for? How transparent will the process be?
- How well will the ASR project follow the San Juan Chama permit, e.g. “immediate” return of native Rio Grande water
- How will use of ASR affect accounting for river depletions by groundwater pumping?

MRG Water Quantity Concerns

USGS 08330000 RIO GRANDE AT ALBUQUERQUE, NM



MRG Water Quantity Concerns

ESA 10-Year Water Acquisition Schedule (2005 - 2014)

Declining Projected Supply = ~36,000afy

- ~8000afy from SJ-C Supplemental Water – down from 15,000afy in 2005
- ~6000afy from “Emergency” Water (S/T Supply) – down from ~35,000afy in 2005

Increasing Projected Supply = ~42,000afy

- ~10,000afy of Long-Term Water (permanent acquisition plus storage ...) – *starting from zero in 2005*
- ~6000afy from “Voluntary Irrigation Forbearance and Conservation” water – *starting from zero in 2005*
- ~26,000afy from “Water Management Efficiencies, Salvage, and Habitat Savings” – *starting from zero in 2005*

ABCWUA ASR Process

1. Pump the SJC Water from the river
2. Treat the water at the Drinking Water Project Treatment Plant
- 3. Pump the treated water into the aquifer at depths of 400 – 1200 feet**
- 4. Pump the water back out of the aquifer from those depths**
- 5. Treat the water at the Drinking Water Project Treatment Plant**
6. Pump the water to storage tanks
7. Distribute the water

ABCWUA ASR Process

What is the additional energy use to pump down, pump up, and re-treat the San Juan Chama water for ASR?

Energy uses water – even if it isn't “our” water

That water use has impacts on both surface and groundwater quantity and quality and impacts other communities

That energy use has implications for local and regional air quality and for climate change

Conservation

ABCWUA usage in 2010 = 157gpd/person

- 543,000 “water users”
 - 19.6 billion gallons pumped groundwater
 - 14.2 billion gallons of San Juan Chama water
- [The above numbers give a total of 170.54gpd/”user” ...]

157gpd/person = 31,116,615,000b gallons [95,493.39afy]

125gpd/person = 24,774,375,000 [76,029.77afy]

Savings: 19,463.53afy

110gpd/person = 21,801,450,000 [66,906.19afy]

Savings: 28,587.2afy

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