# Recent Year-end Groundwater Level Changes within the EBID

# **Summary Points and Generalizations**



E. H. Fuchs 3-13-2013

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#### • http://www.ebid-nm.org/wris2008/RTUInventory.asp?Type=Monitoring%20Well

• An extensive network of monitoring well sites is maintained throughout the EBID.

• Data is posted continuously and almost real-time.





# ESTIMATED CHANGE IN WATER STORAGE – VALLEY FLOOR



		2010	2011	2012
Magilla	Average Water Level Change, in feet	-0.15	-2.9	-1.2
Wiesina	Estimated Storage Change, in AF	-3,400	-66,900	-27,900
Dingon	Average Water Level Change, in feet	-0.24	-2.9	-0.07
KIIICOII	Estimated Storage Change, in AF	-1,700	-16,000	-500
Lower Rio Grande – Valley Floor	Estimated Storage Change, in AF	-5,100	-82,900	-28,400
Lower Rio Grande – Shallow Aquifer	Estimated Storage Change, in AF	-11,400	-175,300	-65,200

- Estimated change in storage in collective LRG valley floor throughout the EBID in 2011 ~ 82,900 AF (net loss, assume consumed)
- Estimated total pumping for 2011 as reported by the OSE from meter records for irrigation throughout the EBID ~ 280,000 AF
- A LOT of water is getting back to the system through return flows!

2 0 -1 -2 Feet -3 -4 -5 -6 -7 -8 Rin\_1R Rin\_2R Rin\_10R Rin\_11R Rin\_12R Rin\_13R Monitoring well: Rin\_3R Rin\_4R Rin\_5R Rin\_6R Rin\_7R Rin\_8R Rin\_9R 0.044 0.333 -1.204 -0.211 ■ 2010 change (ft) -0.661 -0.173 -0.010 0.642 -0.824 -0.261 -0.094 -0.730 -0.011 -4.673 -3.033 -2.739 -1.676 -2.813 -2.245 -1.312 -6.677 -4.975 -2.829 -3.114 -2.486 -0.417 □ 2011 change (ft) -0.084 0.073 -0.105 -0.552 0.352 -0.151 0.293 -1.717 -0.183 0.148 0.708 0.414 -0.191 ■ 2012 change (ft)

Rincon/Hatch - Recent year-end groundwater level changes

2010: 24-inch SWA; avg year-end GW level decline of -0.24 feet
2011: 4-inch SWA; avg year-end GW level decline of -3.00 feet
2012: 10-inch SWA; avg year-end GW level decline of -0.08 feet

Rincon/Hatch - Cumulative net change in year-end groundwater levels since 2010



Not too bad, as long as we don't see very many years like 2011...

Or worse???



• Very generally speaking and assuming all other things being equal (i.e., no significant fallowing or major changes in cropping patterns, etc.) it appears that the Hatch-Rincon alluvial aquifer system is considerably more responsive positively to even moderate increases in the SWA than to substantial decreases in the SWA.

• In other words, the system is currently demonstrating the potential (to the extent that surface water might be available) to gain considerably faster than it may lose.

• For this reason the Hatch-Rincon alluvial system remains highly dependent on surface water (moreso than the Mesilla), or the hope of some alternative source.

• Water quality is rapidly deteriorating (increasing salinity) in the Hatch-Rincon system primarily because irrigators in the area are essentially recycling return flows which comprise a significant part of what remains of the alluvial aquifer in the area. Some migration of geothermal sources may also be contributing.

• GW levels in the Hatch-Rincon system are likely to further decline, along with deteriorating water quality as severe drought persists. Steady-state conditions in the Hatch-Rincon are already questionable and can only worsen if the SWA remains substantially reduced as dictated by ongoing drought.

• Time and a deep aquifer of good quality water is currently NOT on the side of the Hatch-Rincon system.

• Grassroots efforts are currently underway to explore potential partial relief.



Mesilla - Recent year-end groundwater level changes

■ 2010 change (ft) ■ 2011 change (ft) ■ 2012 change (ft)

2010: 24-inch SWA; avg year-end GW level decline of -0.15 feet

2011: 4-inch SWA; avg year-end GW level decline of -3.00 feet

2012: 10-inch SWA; avg year-end GW level decline of -1.21 feet



• Established pumping at greater depths appears to be intersecting and/or combining with established shallow effects, thereby augmenting an established negative hydraulic gradient.

#### Good news is that...

Mesilla - Cumulative net year-end groundwater level changes since 2010 and approximate water column available assuming average max well depth at ~200 ft and 67% max drawdown



• We've got some time (in the Mesilla) to work with.

• But, many years of full or near full surface supply might be necessary to recover.



• Very generally speaking and assuming all other things being equal (i.e., no significant fallowing or major changes in cropping patterns, agronomic and/or pumping practices, etc.) it appears that the Mesilla alluvial aquifer system is considerably more responsive negatively to substantial decreases in the SWA than to moderate increases in the SWA.

• In other words, the system is currently demonstrating the potential to lose somewhat faster than it may gain.

• GW levels in the Mesilla are very likely to further decline and at an increasing rate as long as drought conditions dictate a substantially reduced SWA. Increased salinity concentrations in the shallow alluvium can be expected.

• Nevertheless, steady-state conditions are highly likely in the Mesilla for many years to come and can be readily utilized (as long as wells are maintained at adequate depths), even if the SWA remains substantially reduced.

• If and when the drought subsides, many years of full or near full surface supply will be needed to facilitate recovery, but flux of this nature is not uncommon and can be expected just as surely as periodic droughts are guaranteed. But for how long????

