

Morrison presentation
Consequences of Proposed
Ag Protection Policy
Environmental Quality Council
November 6, 2008

Identified Salinity and Sodium Threats from CBM Discharge Water

PRB Final Environmental Impact Statement (FEIS) January
2003

- *"Soils with high clay content are most likely to experience adverse effects from high sodium. Sodicity is a more serious threat than salinity because it is much more difficult to reclaim sodic soils than saline soils." FEIS p.3-86*
- *"Additionally, increased salinity and longer periods of soil saturation or inundation can act synergistically to the detriment of many species of riparian plants (Hart et al. 1991). FEIS p. 4-177*
- *"SARs of 13 or more may cause potentially irreversible changes to soil structure that reduce percolation of rainfall and surface water flows, restrict root growth, limit permeability of gases and moisture, and make tillage difficult (Seelig 2000, U.S. Salinity Laboratory Staff 1954)." FEIS p. 4-177.*

Is the AG Protection Policy "Conservative"

- DEQ Water Quality Rules & Regs Chapter VIII, Table I, specifies that groundwater proposed for Ag use shall not exceed an SAR value of 8
- DEQ Water Quality Rules & Regs Chapter XI, Sections 55 and 56 discuss water suitable for irrigation. They state wastewater utilized for irrigation shall have values that do not exceed 750 EC and SAR values not exceeding 10.

Montana Numeric Standards for EC and SAR

	EC ($\mu\text{mhos/cm}$) Monthly Avg.	EC ($\mu\text{mhos/cm}$) Max Sample	SAR Monthly Avg.	SAR Max Sample
March 2 through October 31				
Powder River	2000	2500	5.0	7.5
Little Powder River	2000	2500	5.0	7.5
Tongue River	1000	1500	3.0	4.5
Rosebud Creek	1000	1500	3.0	4.5
Tributaries	500	500	3.0	4.5
November 1 through March 1				
Powder River	2500	2500	6.5	9.75
Little Powder River	2500	2500	6.5	9.75
Tongue River	1500	2500	5.0	7.5
Rosebud Creek	1500	2500	5.0	7.5
Tributaries	500	500	5.0	7.5

Under the Current DEQ Ag Protection Policy and Tier 2

- DEQ has raised SAR (sodium) and EC (salinity) levels in dozens of permits from the original SAR limit of 6 or 7 to SARs from 15 to 24
- EC (salinity) has gone from a low of 2,000 to ECs of 2310 all the way up 6100 as “protective of ag uses”



Clabaugh Ranch Wild Horse Creek CBM Discharge Water
Flooding – March 2005

Clabaugh Ranch Meadows Flooded by CBM Water January 2006



Wildhorse Creek

- WY0039870 DEQ original discharge permit from 2000 to 2006 had an EC of 2000 and an SAR of 6. The permit limits at the Irrigation Compliance Point could not be met.
- In 2005 KC Harvey conducted Tier 2 and Petro Canada submitted a new permit 51985 which DEQ agreed to raise the SAR to 15 and EC to 2350. DEQ also removed the Irrigation Compliance Point and changed it to a irrigation monitoring point with an EC of 2800 at that point and an SAR using the incorrect equation $(SAR < 7.10 \times EC - 2.48)$ which calculates to an SAR of about 17.

Clabaugh Ranch Meadows Transformed by CBM Waste Water to Non-Palatable Foxtail and Slough Grass



Clabaugh Ranch Salt & Iron Damage to Soil by CBM Waste Water



- Other companies, Pennaco, Yates, Williams and Lance have also used this same 2005 KC Harvey Tier 2 study or an update 2007 version to raise their permit limits to an SAR of 15 and an EC of 2,350.
- Permit WY0059585 – Based on KC Harvey Tier 2 DEQ established an SAR of 24 and EC of 6100 for the Middle prong of Wildhorse Creek
- Permit WY0054747 issued in 2006 had the EC of 6100 and SAR 24. Upon renewal in 2008 the DEQ had revised the permit to be EC of 3260 and an SAR with the incorrect equation. The justification was the maximum industry discharge for the drainage.



CBM Flooding in Spotted Horse Creek
and on Meadows on the West Ranch



West Ranch, Spotted Horse Creek Meadows:
Salts Deposited and Leached from Soil Caused by CBM Flooding



West Ranch: Dead Cottonwood Trees along Spotted Horse Creek from CBM Flooding



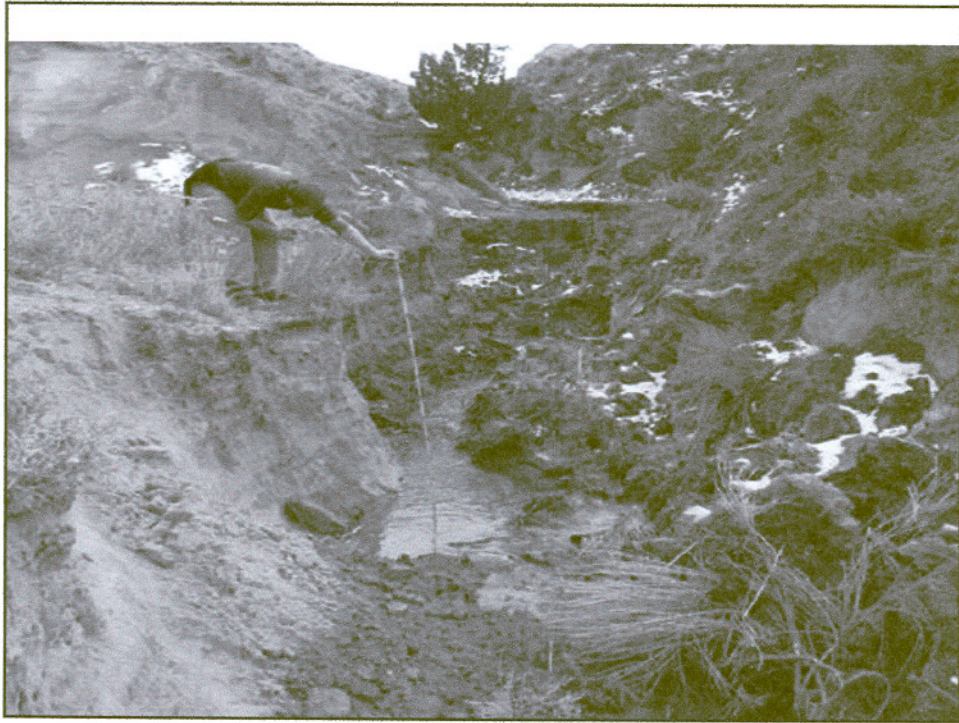
Increasing SAR/EC Permit Limits

Drainage	Old EC	New EC	Old SAR	New SAR*
Spotted Horse (BKS/Norwest)	2000	3126	6	19
		7500		6
		5000		7
		1330		
Beaver Creek (KC Harvey Tier 2)		5070		33
Deadhorse Creek (DEQ w/KC Harvey Tier 2 Proposed)	2000		6	
	2000	1500		8
	1500	2310		14
Fortification Creek (KC Harvey Tier 2)		5300		35
*SAR determined using incorrect equation				

*Irrigation Compliance Point for enforcement changed to an Irrigation Monitoring Point







Conclusion

- Tier 2 is not protective of current and existing uses – leads to high EC and SAR
- Does not scientifically measure or determine background water quality
- Uses an incorrect equation for SAR
- Misapplies the basic methodology of *Hanson, the Ayers and Wescott* diagram and the use of managed irrigation
- Leads to the measurable loss of AG soil viability, alfalfa, grass hay and native vegetation