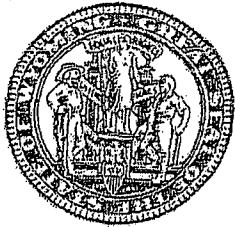


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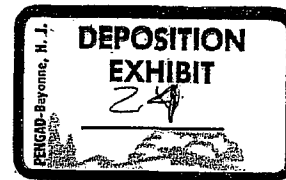


# Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director



**FILED**

September 4, 2008

SEP 04 2008

Wyoming Environmental Quality Council Members

Jim Ruby, Executive Secretary  
Environmental Quality Council

RE: Proposed Appendix H of Chapter 1 of the WQD Rules – Agricultural Use Protection

Dear EQC Members:

The purpose of this letter is to provide you with some preliminary help and guidance before you address the above referenced addition to the surface water quality standards (Chapter 1 of the WQD rules). Those of you who were on the Council in February of 2007 will recall that you approved changes to the surface water quality standards except for Appendix H - Agricultural Use Protection, which was remanded back to DEQ for directed revisions and full vetting by the public and the Water/Waste Advisory Board. The Council also directed the agency to consider the pending University of Wyoming study on livestock water quality criteria before returning to the Council with the proposed rule.

As directed, the agency addressed the concerns raised at the Council hearing, evaluated the recommendations of the UW study, and held four hearings on the matter before the Advisory Board.

The proposed rule has two main sections: (1) Criteria for the protection of irrigation, and (2) Criteria for the protection of livestock watering. Most of the comment and discussion before the Advisory Board in 2007-08 was focused on the livestock watering criteria. I believe that this was because the irrigation proposal has already been well discussed and considered by all interested parties, and the agency was not proposing significant changes from the policy that is currently in use. On the other hand, because of the UW study, the livestock criteria were being considered for extensive revision.

While I expect the irrigation portion of the proposed rules will generate considerable interest and comment during your public hearing(s), the basics of the irrigation portion of the rule are already known by the Council members who were in place in February of 2007. For this reason, in this letter I am going to concentrate on the livestock watering portion of the rule, much of which will be new information to all Council members.

During your consideration of this rule it would be my recommendation that you try to keep deliberations of the irrigation portion of the rule separate from deliberations on the livestock watering portion. This was the approach taken by the Advisory Board, and I believe they found that approach made their deliberations more effective.



## Livestock Watering Criteria Discussion:

Attached is a single page document which divides livestock watering criteria into four "groups". I am going to describe the significance of each group and the Advisory Board's decision concerning each group.

### GROUP 1

These are the livestock watering criteria that have been in place since the 1970's and are already incorporated into Chapter 2 of WQD's rules as effluent limits for conventional oil and gas produced water as well as for CBM discharges. The Board received overwhelming comment from the oil and gas industry, local governments, and the agricultural community that these standards should not be changed. The Board agreed and voted that these criteria should be included in Chapter 1.

### GROUP 2

These criteria are not in rule, but have been used for several years by the WQD as additional criteria to evaluate the livestock watering suitability of conventional oil and gas and CBM discharges. There was strong support from the oil and gas industry, local governments, and the agricultural community for the agency to continue to use these criteria on a "policy" basis, but not to incorporate them into the rules. The Board agreed with this approach and voted that this group of criteria be kept in policy.

### GROUP 3

These are the livestock watering parameters and criteria recommended in the UW study. The agency hired Dr. Merl Raisbeck at UW's Dept. of Veterinary Sciences and Renewable Resources to conduct an extensive review of the available literature on livestock watering criteria. The report (copy attached) provided by Dr. Raisbeck and his colleagues provided exactly the information requested. We believe it provides the most up-to-date summary of the information currently available on the subject of water quality for livestock.

The UW report received only qualified support at the Advisory Board hearings. The general position of the oil and gas industry, local governments, and agricultural community was that the UW report provides valuable information for livestock producers, but should not be used to change DEQ's livestock watering criteria which have been in place for 30+ years. It was argued that the existing criteria have been proven to adequately protect stock and wildlife while allowing most produced water discharges to continue. Such discharges provide livestock operators with an important water source, especially in arid regions of the state such as the Big Horn Basin.

### GROUP 4

These are the livestock watering criteria that the agency proposed to the Advisory Board. Basically, the agency attempted to set limits that included most of the recommendations of the UW study as well as some of the existing standards and policy on livestock watering. The agency proposed that produced water discharges permitted prior to 1/1/98 (see the last paragraph of item (a) in the proposed

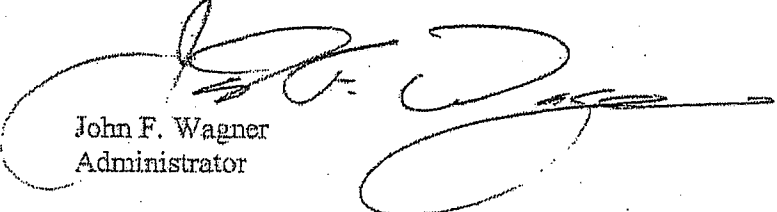
Appendix H) be grandfathered in under the old criteria, but post 1/1/98 discharges would have to meet the more stringent criteria recommended in the UW study. Since almost all conventional oil and gas discharges were permitted prior to 1/1/98 and almost all CBM discharges were permitted after 1/1/98, the overall result of the agency's proposal would have been to grandfather in the existing conventional oil and gas discharges under the old standards, but make CBM and new conventional discharges meet the newer and more stringent criteria.

While industry/agriculture liked the grandfather language, they were concerned that it would not withstand legal appeal. They continued to advocate their favored position which includes using the current criteria for setting effluent limits. Ultimately the Advisory Board decided to adopt the status quo position and did not accept the agency's proposal.

### Summary

Almost all of the oral and written comment on the livestock criteria received by the Advisory Board was clearly and consistently in favor of the status quo and almost all of the comment was provided by the oil and gas industry, by agricultural advocacy organizations, by local governments, and by individual livestock producers. Only one letter (from Kate Fox representing the Powder River Basin Resource Council) expressed support for adoption of the criteria in the UW study. There was no oral testimony in favor of adoption of the UW criteria. Considering the deep and broad support the status quo received during the public comment periods, the agency believes that the action taken by the Advisory Board was appropriate. The agency does not oppose the Board's recommendations.

Sincerely,



John F. Wagner  
Administrator

JFW/rm/8-0665

Enclosure: Univ. of WY Water Quality Criteria for Livestock Report

cc: Teri Lorenzon, EQC Director  
Jim Ruby, EQC Executive Secretary  
Joe Girardin, EQC Paralegal  
John Corra, DEQ Director  
David Waterstreet, WQD Cheyenne  
Bill DiRienzo, WQD Cheyenne

Group 1 (Existing Chapter 2 Effluent Limits)

<u>Parameter</u>	<u>Limit - Units</u>
Total Dissolved Solids (TDS)	5,000 mg/l
Sulfate	3,000 mg/l
Chloride	2,000 mg/l

Group 2 (Existing Policy Limits)

<u>Parameter</u>	<u>Limit - Units</u>
Boron	5.0 mg/l (Dissolved)
Cadmium	.050 mg/l (Dissolved)
Chromium	1.0 mg/l (Dissolved)
Copper	.5 mg/l (Dissolved)
Fluoride	4.0 mg/l (Dissolved)
Lead	.1 mg/l (Dissolved)
Mercury	.01 mg/l (Dissolved)
Selenium	.1 mg/l (Dissolved)
Zinc	2.5 mg/l (Dissolved)

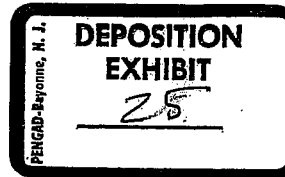
Group 3 (UW Report Recommendations)

<u>Parameter</u>	<u>Short Term Exposure Limit - Units</u>	<u>Chronic Exposure Limit - Units</u>
Arsenic 1 mg/l (Dissolved)		1 mg/l (Dissolved)
Barium 10 mg/l (Dissolved)		10 mg/l (Dissolved)
Fluoride 2 mg/l (Dissolved)		2 mg/l (Dissolved)
Molybdenum .3 mg/l (Dissolved)		.3 mg/l (Dissolved)
Nitrate 500 mg/l		500 mg/l
Nitrite 100 mg/l		100 mg/l
Selenium .1 mg/l		.1 mg/l (Dissolved)
Sodium 4,000 mg/l (Dissolved)		1,000 mg/l (Dissolved)
Sulfate 1,800 mg/l		1,000 mg/l

Group 4 (Agency's Proposed Limits to Advisory Board)

<u>Parameter</u>	<u>Limit - Units</u>
Total Dissolved Solids (TDS)	5,000 mg/l
Sulfate	2,000 mg/l
Boron	5.0 mg/l (Dissolved)
Cadmium	.050 mg/l (Dissolved)
Chromium	1.0 mg/l (Dissolved)
Copper	.5 mg/l (Dissolved)
Fluoride	4.0 mg/l (Dissolved)
Lead	.1 mg/l (Dissolved)
Mercury	.01 mg/l (Dissolved)
Molybdenum	.3 mg/l (Dissolved)
Selenium	.1 mg/l (Dissolved)
Sodium	1,000 mg/l (Dissolved)
Zinc	2.5 mg/l (Dissolved)

9



**Frank Ferris**

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**From:** Frank Ferris  
**Sent:** Monday, April 11, 2005 1:55 PM  
**To:** 'Jennifer Zygmunt'  
**Subject:** WY0049697  
**Attachments:** 2005\_04\_09\_WY0049697\_Res\_Data\_per\_WQD\_request\_sent\_2005\_04\_11.xls;  
2005\_04\_09\_WY0049697\_Mixing\_Calc\_per\_WQD\_request\_sent\_2005\_04\_11.xls;  
2005\_02\_23\_49697\_Water\_Balance\_per\_WQD\_request\_sent\_2005\_04\_11.XLS

Jennifer

Per your request, I have put together a Water Balance, Reservoir Data, and Mixed Water Quality Tables for WY0049697 and they are attached.

In summary, there is an excess outflow capacity from reservoirs, streams, and irrigation of 1,217 acre-feet. Misters would add additional capacity.

The mixing calculation was only done on those reservoirs that would have a discharge in the 10 year event. The reservoirs with significant pass through in the 10 year event had low SARs and the others showed higher SARs.

Please give me a call if you have any questions.

Thanks

Frank

## Reservoir Data

Lance Oil & Gas Company  
Echeta Road - WY0049697

April 11, 2005

Stock		Drainage	2 Year	10 Year
Reservoir	Capacity	Area	Runoff	Runoff
Name	ac-ft	sq-mi	ac-ft	ac-ft
Boone	12	0.2832	2.39	8.66
Chad	8.16	0.0718	1.377	3.444
N & S Lacy	13.8	0.2049	1.74	6.29
Willow Tree	7.96	0.4525	8.559	21.426
Rick's Little	5.58	0.022	0.423	1.057
Rick's	1.98	0.1092	0.94	3.39
James	1.73	0.0143	0.275	0.687
Ty	5.04	0.0539	1.035	2.588
Jason	1.35	0.0243	0.466	1.166
Ryan	2.2	0.0007	0.0135	0.0337
Bull Pen	0.32	0.0021	0.04	0.101
004	9.1	0.2	3.808	9.527



# Mixed Water Quality Table

Lance Oil & Gas Company  
Echeta Road - WY0049697

April 11, 2005

Reservoir Constituents	Storm Water	2/3 Res Capacity	WildHrsCrk Water Quality	Outfall 005 Water Quality	WildHrsCrk Water Quality	Outfall 005 Water Quality	Mixed Water Quality	10-Yr Event Discharge
<b>Ghad SR</b>								
Conductivity	3.44	5.44	1400	1630	na	na	1540.9	
Sodium	3.44	5.44	140	410	6.1	17.8	13.3	
Calcium	3.44	5.44	110	26	5.5	1.3	2.9	
Magnesium	3.44	5.44	46	8	3.8	0.7	1.9	
SAR	3.44	5.44	2.9	18	2.8	18.0	8.6	0.7
<b>Willow Tree SR</b>								
Conductivity	21.4	5.3	1400	1630	na	na	1445.6	
Sodium	21.4	5.3	140	410	6.1	17.8	8.4	
Calcium	21.4	5.3	110	26	5.5	1.3	4.7	
Magnesium	21.4	5.3	46	8	3.8	0.7	3.2	
SAR	21.4	5.3	2.9	18	2.8	18.0	4.3	18.8
<b>Ty SR</b>								
Conductivity	2.6	3.4	1400	1630	na	na	1529.9	
Sodium	2.6	3.4	140	410	6.1	17.8	12.7	
Calcium	2.6	3.4	110	26	5.5	1.3	3.1	
Magnesium	2.6	3.4	46	8	3.8	0.7	2.0	
SAR	2.6	3.4	2.9	18	2.8	18.0	7.9	0.9
<b>Jason SR</b>								
Conductivity	1.2	0.9	1400	1630	na	na	1500.1	
Sodium	1.2	0.9	140	410	6.1	17.8	11.2	
Calcium	1.2	0.9	110	26	5.5	1.3	3.7	
Magnesium	1.2	0.9	46	8	3.8	0.7	2.4	
SAR	1.2	0.9	2.9	18	2.8	18.0	6.4	0.7
<b>004 SR</b>								
Conductivity	9.5	6.1	1400	1630	na	na	1489.4	
Sodium	9.5	6.1	140	410	6.1	17.8	10.7	
Calcium	9.5	6.1	110	26	5.5	1.3	3.9	
Magnesium	9.5	6.1	46	8	3.8	0.7	2.6	
SAR	9.5	6.1	2.9	18	2.8	18.0	5.9	6.5
<b>Boone SR</b>								
Conductivity	8.7	8.0	1400	1630	na	na	1510.4	
Sodium	8.7	8.0	140	410	6.1	17.8	11.7	
Calcium	8.7	8.0	110	26	5.5	1.3	3.5	
Magnesium	8.7	8.0	46	8	3.8	0.7	2.3	
SAR	8.7	8.0	2.9	18	2.8	18.0	6.9	4.7
<b>N &amp; S Lacy SR</b>								
Conductivity	6.3	9.2	1400	1630	na	na	1536.5	
Sodium	6.3	9.2	140	410	6.1	17.8	13.1	
Calcium	6.3	9.2	110	26	5.5	1.3	3.0	
Magnesium	6.3	9.2	46	8	3.8	0.7	1.9	
SAR	6.3	9.2	2.9	18	2.8	18.0	8.3	1.7
<b>Rick's</b>								
Conductivity	3.4	1.3	1400	1630	na	na	1464.4	
Sodium	3.4	1.3	140	410	6.1	17.8	9.4	
Calcium	3.4	1.3	110	26	5.5	1.3	4.3	
Magnesium	3.4	1.3	46	8	3.8	0.7	2.9	
SAR	3.4	1.3	2.9	18	2.8	18.0	4.9	2.7

**WATER BALANCE**

Echeta Road - WY0049697

Table date: April 11, 2005

**INFLOW**

Number of Wells	gpd/well	gpm/well	cfs/well	Total flow (cfs)	Annual flow volume (cu feet)	Annual flow volume (acre-ft)
78	10,800	7.5	0.02	1.30	41,106,417	944

**OUTFLOW**

**Reservoir Losses**

Pond / Reservoir	Containment (acre-ft)	Estimated combined evaporation and seepage rate		Estimated annual losses due to evaporation and seepage	
		(gpm)	(cfs)	(acre-ft)	
Boone	12.00	97.1	0.22	157	
Chad	8.16	68.9	0.15	111	
N & S Lacy	13.80	228.1	0.51	368	
Willow Tree	7.96	67.6	0.15	109	
Rick's Little	5.58	54.7	0.12	88	
Rick's	1.98	39.6	0.09	64	
James	1.73	38.7	0.09	62	
Ty	5.04	52.1	0.12	84	
Jason	1.35	37.4	0.08	60	
Ryan	2.20	40.4	0.09	65	
Bull Pen	0.32	34.1	0.08	55	
<b>Total</b>	<b>49.48</b>			<b>1224</b>	

**Irrigation Losses**

Area to be Irrigated acres	Amount of Water to be Applied inches	Amount of Water Consumed acre-feet
809	4	270

**Stream Losses**

Outfall	Stream Length * (res to ICP) (miles)	Loss/Mile		Total Loss (Assuming Continual Flow) (acre-ft)
		(gpm)	(cfs)	
001 - ICP 3	0.43	45	0.10	31
002	0.64	45	0.10	46
003	0.78	45	0.10	57
004	0.98	45	0.10	71
005	2.49	45	0.10	181
006 - ICP 2	0.20	45	0.10	15
007 - ICP 4	0.02	45	0.10	1
008	1.53	45	0.10	111
009	0.39	45	0.10	28
010 - ICP 1	0.14	45	0.10	10
011	0.95	45	0.10	69
012	0.64	45	0.10	46
<b>Additional Excess Capacity</b>				<b>667</b>

Where flow paths/drainages merge, distances to the ICPs were not duplicated.

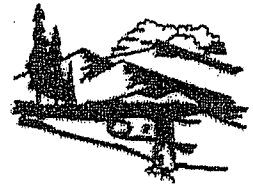
**SUMMARY**

OUTFLOW (acre-ft)	-	INFLOW (acre-ft)	=	EXCESS CAPACITY (acre-ft)
2,161		944		1,217

**10**



# Department of Environmental Quality

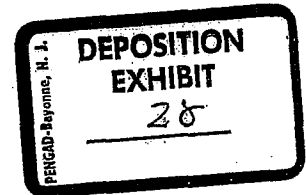


To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

February 27, 2009



Mr. Jim Ruby  
Executive Secretary  
Wyoming Environmental Quality Council  
Herschler Bldg. - 2W  
Cheyenne, WY 82002

RE: Questions from Consultants

Dear Mr. Ruby:

The purpose of this letter is to respond to the questions that you forwarded to the Water Quality Division from Jan Hendrickx. I would appreciate it if you would convey a copy of this letter to Mr. Hendrickx along with our offer to answer any additional questions that he might have.

### General Background

The water quality standard for the protection of irrigation uses in Wyoming is to maintain water quality in surface waters to the degree that there will be no decrease in crop production. This standard is not in question in the current rule making. The intent of the proposed rule is to provide the process for establishing effluent limits on permitted discharges that will achieve that standard.

There are a few important concepts that need to be stated in order to understand the procedures that have been developed:

- A "surface water" is not necessarily a flowing stream but is rather any defined drainage with perennial, intermittent or ephemeral flows. In most cases in Wyoming, discharges are to non-perennial streams;
- The irrigation standard of "no measurable decrease in crop production" implies that there is a pre-existing irrigation use. It is a standard that applies to decreases in production that may be attributed to water quality.
- The "no measurable decrease" standard applies to the in-stream water quality. The proposed procedure applies to the end-of-pipe discharge quality. These do not need to be the same because water quality changes from where it is discharged to where it is applied for irrigation.
- The intent of the proposed rule is to develop effluent limits for EC and SAR on discharges that will reach and potentially affect:

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • <http://deq.state.wy.us>

ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6482	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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- A. Artificially irrigated lands – lands that have been conventionally irrigated, i.e. where there is a water right and a point of diversion for that water right (canals, ditches, pumps sprinklers, spreader dikes etc.); and
- B. Naturally irrigated lands – naturally occurring floodplains and bottomlands along stream channels where there exists a significant amount of enhanced forage production that may be negatively affected by the produced water discharges even though there may not be an irrigation water right or point of diversion.

Questions:

1. *Assume that you know exactly the EC and SAR value of the historical water in the drainages, how is Tier II implemented using these numbers?*

Historic water quality information on intermittent and ephemeral drainages is not usually available and the great majority of our permit applications are for discharges to such non-perennial drainages. When data on such waters are available, they are extremely variable due to the "flashy" nature of the flow events. For example, water quality at the beginning of a flow event is much different from water quality at the end of the event.

It is because we do not have reliable in-stream water quality data for our non-perennial waters that we have developed the approach described in the proposed rule. It is our position that using soil quality information from the lands to be impacted by the discharges allows us to judge the historic situation for those soils. With that information we can then set permit effluent limits for discharge waters which could be applied to those soils.

On discharges to perennial waters where we are more likely to have decent historical water quality data, the idea is to match the effluent water EC with the historic background EC. In all circumstances, background water quality will be variable and we would set effluent limits based upon the average EC. The SAR limits would not be based upon background SAR but would be calculated to a level that would result in no reduction in infiltration. This calculation would use the background EC to derive an appropriate SAR based upon the EC/SAR relationship developed by Ayers and Westcott and referred to in the proposed rule as the "Hanson Diagram"

2. *Assume that you also know exactly the temporal variability of the EC and SAR values of the historical water in the drainages, how is Tier II implemented? Will the threshold value be the average, the minimum, or the maximum of these values?*

Again, since the great majority of permitting circumstances occur in ephemeral drainages, historical water data is not available and it is not possible to quantify the variability of infrequent storm flows. Also, in answering this question, we have interpreted "temporal variability" to mean seasonal variability rather than day-to-day or hour-to-hour variability.

In the less common circumstances where a discharge is to a perennial stream that is diverted in a conventional sense for irrigation, the effluent limits may be derived using irrigation-season background values and applied during the growing season. The EC effluent limit in the discharge permit would be derived from the average historic EC of the irrigation water within the drainage using a straight mean of the available EC data (generally from USGS stations).

If it is a passive type of irrigation diversion such as a spreader dike in an ephemeral drainage, the effluent limits would be applied year-round since the water would be applied to the land whenever it was

discharged, not just during an irrigation season. These are the most common circumstances encountered in Wyoming and measured surface water quality data is always scarce or unavailable. In these situations, soil sampling may then be employed within the drainage in order to estimate the historic EC of the applied water. In soil sampling, we also look for an average EC, but because there is an added spatial variable in the sampling, WDEQ tests the straight mean of the sample set with a 95% confidence interval. The lower bound of that 95% confidence interval is the value that is then divided by 1.5, to yield a final EC effluent limit for the discharge.

Example: Tier 2 EC effluent limit calculated from soil samples collected within an ephemeral irrigated drainage (Bitter Creek; Campbell County, WY); Data Attached.

Total Soil Samples Analyzed (n): 28

Observed Average EC of Sample Set (straight average): 5397  $\mu\text{mhos/cm}$

95% Confidence Interval of the Observed Average: 1019  $\mu\text{mhos/cm}$

Adjusted Average (Observed Average minus 95% Confidence Interval): 4378  $\mu\text{mhos/cm}$

Discharge Effluent Limit (Adjusted Average  $\div$  1.5): 2919  $\mu\text{mhos/cm}$

Therefore, average values are used whether we have established limits based upon measured water data (perennial streams) or estimated from soil sampling (ephemeral streams) when implementing the Tier 2 procedure.

3. *If one cannot determine the EC and SAR value of the historical water in the drainages, what will happen? Go to Tier III?*

No, by default we calculate the effluent limits using Tier 1. If the discharger does not believe he can meet the Tier 1 limits with his raw untreated effluent, he can choose to provide whatever water treatment is necessary to meet the Tier 1 standards, or he can choose to proceed with a Tier 2 analysis. Tier 3 may also be an option but it is more site-specific and requires an agreement between the discharger and each irrigator that may be affected by the discharge.

4. *Is Tier I as simple as: (1) Check if SAR is less than 10, if yes proceed without restriction. If no, go to (2) Check if EC and SAR are below the Hanson line. If yes, proceed without restrictions. If no, go to Tier II.*

No. Tier 1 uses published soil salinity threshold values for the affected crops to establish the effluent EC limit. The soil salinity threshold ( $EC_e$ ) is divided by 1.5 to get the EC water value ( $EC_w$ ) that would be used as the effluent limit. The only information that is needed to establish the Tier 1 limit is an identification of where the irrigation is occurring (*natural or artificial*) and the species of crop. Tier 1 would limit the EC to be no greater than the 100% yield threshold value for the most salt sensitive crop and would limit the SAR to be below the Hanson line up to a maximum of 10.

For example, if alfalfa is the most salt sensitive crop grown in a drainage, the Tier 1 limits effluent for EC and SAR would be calculated as follows:

The USDA threshold value for alfalfa ( $EC_e$ ) = 2000  $\mu\text{mhos/cm}$

The calculated effluent limit ( $EC_w$ ) would be  $2000/1.5 = 1333 \mu\text{mhos/cm}$  (1.333 dS/M)

The maximum SAR would be  $(1.333 \text{ dS/M} \times 6.67) - 3.33 = 5.6$  (rounded to 6)

In the simplest application of a direct discharge of produced water to this drainage, the discharger would be limited to a maximum EC of 1330  $\mu\text{mhos/cm}$  and an SAR of 6.

It is also important to note that the derived SAR value is based upon the actual EC of the discharge rather than the maximum allowed value. Produced water that is better than the threshold EC plant value would have a more stringent SAR limit.

If the actual quality of the produced water was 1000  $\mu\text{mhos/cm}$ , the SAR limit would be calculated using 1.0 dS/M resulting in an SAR limit of 3.

At this point the discharger must decide whether to install whatever treatment is necessary to meet the Tier 1 limits or proceed on with a Tier 2 study which usually results in less stringent effluent limits.

*5. When is Tier III invoked? Is it the default for Tier II only? Or, can any producer and land owner come to a mutual agreement that is worked out in a Tier III procedure?*

The idea behind Tier 3 is that under proper management (i.e. flood event timing, duration, volume; fields selected for application; the application of soil amendments: gypsum, sulfur) it is possible to use water that is of a lower quality than background for irrigation and not suffer a loss of productivity. It is not a default for Tier 2. It can be invoked whenever a landowner chooses to accept the increased risks associated with irrigating with water that is a lower quality than background and we are assured there will be no damage to adjacent or downstream water users.

*6. Is there no state oversight for Tier III? In other words, could a land owner follow Tier III to sacrifice his land quality to make it available for release of low quality produced waters?*

The proposed rules apply only if the discharger releases water to the drainage. If an operator applies wastewater directly from his operation onto the land, that becomes a "Land Application Disposal Facility" and is regulated by the agency through another set of rules. In that situation we are primarily concerned with the protection of groundwater and assuring that there is no runoff to adjacent property.

If the water is released into the drainage and a downstream landowner wants to use the water under Tier III, there is oversight of the limits that would be approved as Tier III limits. Some judgment has to be exercised by the DEQ in establishing Tier III limits on a discharge permit. A primary consideration would be whether the water would be actually applied for a beneficial agronomic purpose or whether, as the question asks, is it simply a means of water disposal? There would be a burden placed upon the permit applicant to demonstrate that the circumstances of the use of the lower quality water would not cause harm to ground water or adjacent or downstream landowners.

*7. When a producer has Tier I water quality, can the landowner refuse release of this water in the landowner's drainage?*

No, landowner concurrence is only required when water quality is worse than Tier 1 or Tier 2.

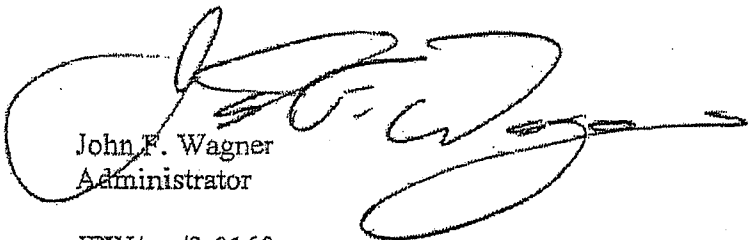
*8. Is there any mention of the quantity of produced water that can be released in a drainage? Maybe the discharge of produced water (cubic feet per second) is always less than the discharge of the drainage. But what on an annual basis (cubic feet per year)?*

There are provisions in the permitting program that address the quantity of water that can be discharged but quantity is not a subject of this part of the regulation. This section is concerned only with establishing

water quality limits. Water quantity is addressed by an "Assimilative Capacity" program that limits the total load of pollutant that can be added to a particular river system. The quantity and rate of discharge is also limited to an amount that would not result in unacceptable erosion.

With regard to the request for any additional guidelines for Tier 1, 2, and 3 and how the state works through them, it should be noted that the current rule being proposed consists of what has been our implementation policy for many years. This policy is now being considered for adoption as a rule. Essentially there are no additional guidance documents outside this implementation policy which is now being proposed as a rule.

Sincerely,



John F. Wagner  
Administrator

JFW/rm/9-0160

cc: John Corra, DEQ Director  
David Waterstreet, WQD Cheyenne  
Bill DiRienzo, WQD Cheyenne  
Jason Thomas, WQD Cheyenne



Attachment 1:

Bitter Creek Soils Data:

Sampler / Date	Sample Location	Soil Depth (inches)		EC ( $\mu\text{mhos/cm}$ )
		Upper	Lower	
SWCA / August 2007	Odekoven Flood-Irrigated	0	12	488
		12	24	448
		24	36	1664
		36	48	1940
		48	60	1902
		60	72	1936
SWCA / August 2007	Odekoven Sub-Irrigated	0	12	390
		12	24	3000
		24	36	8010
		36	48	7060
		48	60	6090
		60	72	6540
SWCA / June 2007	Crockett Section 36 (Field 3, Zone 1)	0	12	3050
		12	24	5630
		24	36	4780
		36	48	5300
KC Harvey / Dec 2007	Crockett Section 26 (Field 7)	0	12	1350
		12	24	6380
		24	36	8920
		36	48	8870
		48	60	7820
		60	72	7510
KC Harvey / Dec 2007	Crockett Sections 23 + 26 (Field 6)	0	12	7540
		12	24	11800
		24	36	10700
		36	48	7600
		48	60	8300
		60	72	6110

Observed Average                      5397  
 AVEDEV                                      2752

Effluent Limit Calcs	
0.05	= 1 - 0.95
2752	AveDev
28	Sample Pop (n)
1019	95% Conf Int
4378 Adjusted Avg: (Observed Average minus conf interval)	
2919 Calculated EC Limit: (Adjusted average / 1.5)	

**11**

ANALYSIS OF COMMENTS

Subject: Public comments and Wyoming DEQ/WQD responses regarding the Draft of the Agricultural Use Protection document. This document has been prepared for deliberation by the Environmental Quality Council (EQC) at upcoming hearings in Cheyenne on October 24, 2008, Gillette on October 28, 2008, and Thermopolis on November 6, 2008.

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In connection with proposed revisions to the Chapter 1 Water Quality Rules and Regulations, the Department of Environmental Quality (DEQ), Water Quality Division (WQD) is proposing to incorporate the revised Agricultural Use Protection document into a new rule appendix (Appendix H). The purpose of this document is to interpret the narrative standard which protects agricultural uses and is contained in Chapter 1, Section 20.

On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix H, Agricultural Use Protection, which was removed from the rule and remanded back to DEQ for further directed revisions. In May of 2007, proposed revisions to Appendix H were posted on the DEQ website and public notice was published in the Casper Star Tribune. Comments were received at a Water and Waste Advisory Board (Advisory Board) meeting on June 15, 2007 in Casper, Wyoming. On September 14, 2007, the Advisory Board held a second meeting in Jackson, Wyoming. At the Jackson meeting, testimony was heard and comments were received on the previously published University of Wyoming (UW) report entitled "Water Quality for Wyoming Livestock and Wildlife" which discusses recommended safe drinking water levels for Wyoming livestock and wildlife. On December 7, 2007 the Advisory Board received comments on revisions to Appendix H due to comments received at the previous two Advisory Board meetings. On March 28, 2008 the Advisory Board convened a final meeting to hear responses to comments made during the December meeting before making recommendations and giving direction to the WQD.

This document summarizes the comments received for deliberation by the EQC at the upcoming hearings described above and includes the WQD's responses. In the tables, comments have been organized according to topics and paraphrased to create a manageable summary. Comments are formatted in normal typeface and the agency responses are in italics. A list of commenters is also included to help track the comments. DEQ has incorporated some suggested revisions to Appendix H for the EQC to consider. Revisions that DEQ believes need consideration are incorporated in responses to the associated comments.

List of Commenters

1	Barlow Ranch	BR
2	Bill Bense	BB
3	Coalbed Natural Gas Alliance	CNGA
4	U.S. Bureau of Land Management	BLM
5	Charles L. Tweedy	CLT
6	Dave Clarendon	DC
7	Devon Energy Production Co., L.P.	DEP
8	Edward H. Swartz	EHS
9	U.S. Environmental Protection Agency	EPA
10	Hot Springs County Commissioners	HSCC
11	Jordan Bischoff & Hiser, P.L.C. for Yates Petroleum Corporation	JBH
12	Larry C. Munn	LCM
13	Larsen Ranch Company	LRC
14	Marjorie E. West	MEW
15	Mary Lou Morrison	MLM
16	Meeteetse Conservation District	MCD
17	Nancy and Robert Sorenson	NRS
18	Neil O. and Jennifer S. Miller	NJM
19	Pennaco Energy, Inc.	PEI
20	Petroleum Association of Wyoming	PAW
21	Powder River Basin Resource Council	PRBRC
22	Rocky Mountain Farmers Union	RMFU
23	Western Fuels – WY, Inc.; Powder River Coal, LLC; Thunder Basin Coal Co, LLC	WPT
24	Western Watersheds Project	WWP
25	Williams Production RMT Co.	WPR
26	Wyoming Farm Bureau Federation	WFBF
27	Wyoming House of Representatives, Representative Lorraine Quarberg	LQ
28	Wyoming Outdoor Council	WOC
29	Wyoming Stock Growers Association	WSGA
30	Wyoming Wool Growers Association	WWGA
31	Yates Petroleum Corporation	YPC

**General**

<p>WSGA / WWGA / WFBF / RMFU / MCD / HSCC / LRC / LQ</p>	<p>1. <b>Comment:</b> Representatives from WSGA, WWGA, WFBF and RMFU indicate that they have been intimately involved in providing input during the Advisory Board process of evaluating proposed revisions to Chapter 1, Appendix H – Agricultural Use Protection, especially where related to developing livestock watering limits. In a joint letter, these associations have requested that an upcoming meeting of the EQC be held in the Big Horn Basin to assure an adequate opportunity for affected ranchers to participate. MCD and LRC request a public hearing in the Big Horn Basin. The HSCC request that a public hearing is held in the Big Horn Basin to solicit local input from northwest Wyoming. State Representative, Lorraine Quarberg requests a public hearing be held in Thermopolis, WY.</p> <p><b>Response:</b> <i>Public hearings have been scheduled by the EQC to occur in Cheyenne on October 24, 2008, Gillette on October 28, 2008, and Thermopolis on November 6, 2008. The public notice has been placed in the administrative record and is currently posted on the DEQ/WQD web site: <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p>
<p>PRBRC</p>	<p>2. <b>Comment:</b> If nothing else, the huge volumes of effluent generated by Coal Bed Methane (CBM) discharges in the Powder River Basin should focus the policy emphasis where large volume flows accompany the extraction of CBM gas. Because of these impacts, we would urge that public hearings be held in the Powder River Basin in addition to other Wyoming locations.</p> <p><b>Response:</b> <i>Public hearings have been scheduled by the EQC to occur in Cheyenne on October 24, 2008, Gillette on October 28, 2008, and Thermopolis on November 6, 2008. The public notice has been placed in the administrative record and is currently posted on the DEQ/WQD web site: <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p>
<p>LRC / MCD / YPC / DEP / PAW</p>	<p>3. <b>Comment:</b> Would like to see the WQD submit a “non-severability” request to the U.S. EPA when submitting the rule for final approval. This would ensure the rule and policy remain whole, as the EPA would have to approve or deny all documents together.</p> <p><b>Response:</b> <i>When WQD submits the revised Chapter 1 document to EPA for approval, it will include those policies referenced in the Chapter. EPA would have no authority to disapprove policy, but could disapprove a rule or part of rule which referenced a policy and EPA found to be out of compliance with the Clean Water Act.</i></p>
<p>MCD</p>	<p>4. <b>Comment:</b> Wyoming citizens benefit from the recirculation in the local economy of dollars initially generated by industry and through the use of natural resources by the agricultural and petroleum industries. That use must be</p>

	protected by adopting properly crafted policy.
	<b>Response:</b> <i>Comment noted.</i>
MCD	<p>5. <b>Comment:</b> The MCD accepts Appendix H as the product of collaboration and urges the EQC to recognize these collaborative efforts and progress made through the advisory board process and as directed by the EQC. The MCD urges EQC to reject the arguments made by those who voluntarily and strategically chose not to participate in that process because such participation was unnecessary and because renewed argument before the EQC was an appropriate and acceptable strategy.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
MCD	<p>6. MCD urges the EQC to continue to recognize, along with the Advisory Board, the tremendous environmental benefits that produced water provides to aquatic life, the riparian zone ecology and terrestrial livestock and wildlife including the sage grouse.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
MCD	<p>7. MCD supports the Advisory Board's recommendation of exemptions from water quality standards based on background water quality and for landowner waivers allowing use of water not meeting the standards for livestock watering and irrigation, thus making beneficial use of otherwise unavailable resources.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
MCD	<p>8. The MCD believes that agricultural use protection is important enough that the State of Wyoming should commission a cost-benefit analysis of the impact of the Agricultural Use Protection document to ensure that agricultural use protection will be achieved.</p> <p><b>Response:</b> <i>Section 35-11-302(a) (vi) of the Environmental Quality Act requires the division administrator and advisory board to consider the "economic value of the source of pollution" and the "economic reasonableness of reducing or eliminating the source of pollution" when adopting rules. The agency believes it and the Advisory Board have done that and that there is no need to commission a formal cost benefit analysis for these rules. In addition, the agency has no provision in its budget which would allow it to pay for a cost benefit analyses for this or any other rule.</i></p>
MCD	<p>9. <b>Comment:</b> The owners and leasers of minerals also enjoy property rights. It follows that if property rights are denied there may be reasonable grounds for claims of governmental taking of private property. This includes a person's right to accept the potential risk to his private property, including land and livestock,</p>

<p>MCD</p>	<p>from water that does not meet water quality standards.</p> <p><b>Response:</b> <i>Waters which cross private property are still considered to be "waters of the state" requiring protection under Wyoming law.</i></p> <p>10. <b>Comment:</b> The MCD requests that water quality rules should be implemented to encourage the use of reservoirs for containment of produced water, that water stored in reservoirs is not a pollutant, and the reservoirs should not be regulated as water treatment facilities because of their benefit to agriculture and wildlife production.</p> <p><b>Response:</b> <i>The WQD has no authority to dictate to dischargers where to discharge; however, landowners may influence that decision through their surface use agreements with the discharger. Discharges of produced water have been designated in federal rule, and in at least one federal court, as discharges requiring regulation under the federal National Pollution Discharge and Elimination System (NPDES) program. Since Wyoming has primacy for the NPDES program, produced water discharges must be regulated under Wyoming's Pollution Discharge Elimination System (WYPDES) program. WQD agrees that reservoirs are not treatment facilities and does not regulate them as treatment facilities.</i></p>
<p>MCD</p>	<p>11. <b>Comment:</b> The MCD believes that efforts by Wyoming's Coal Bed Methane Task Force and stakeholders responsible for developing the Wyoming Produced Water Initiative (WPWI) to address issues in the Powder River Basin have delivered a model that can be used to address produced water issues on a local and regional basis. The MCD asks the EQC and DEQ/WQD to finalize the Agricultural Use protection Policy and Appendix H in a manner that will provide for adaptive management responsive to local and regional needs and support the creation of locally directed initiatives based on the WPWI model.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
<p>MCD / YPC</p>	<p>12. <b>Comment:</b> As has previously been brought before the EQC, the state owns a watercourse easement through which waters of the state may flow. When produced water meets livestock water standards, it becomes a surface water of the state and should be allowed to flow down the water course for use by livestock and wildlife. The MCD believes that Appendix H should not be a means of determining the priority of water use or otherwise partitioning use between irrigation and stockwater use.</p> <p><b>Response:</b> <i>WQD has no authority to regulate water allocations and is making no attempt to assume such authority in the proposed rule. WQD does identify the uses to which a water is made and protects the quality of that water for those uses.</i></p>

DC / MLM	<p>13. <b>Comment:</b> Please do not permit discharges that exceed protective limits that will damage downstream landowners, irrigation waivers of limits simply set up this type of situation.</p> <p><b>Response:</b> <i>WQD believes that the waiver provisions adequately protect downstream users while still allowing upstream landowners to make use of discharged water.</i></p>
WPT	<p>14. <b>Comment:</b> The rule should be modified to make allowances for upset conditions, in order to exempt all operators who might be inadvertently discharging while their treatment systems were unknowingly out of service.</p> <p><b>Response:</b> <i>Discharge permits contain standard language on upset conditions. Such language is not appropriate in a water quality standard.</i></p>
WPT / DEP	<p>15. <b>Comment:</b> Has the WQD conducted an analysis of the technical practicability and economic reasonableness of the proposed rules? Such an analysis is required by the Wyoming Environmental Quality Act, 35-11-302(a) (vi) (D) (WPT). There is no evidence that either the Administrator or the Advisory Board have identified, evaluated, or considered these balancing criteria. We believe there is ample evidence that the surface discharge of produced water suitable for livestock has resulted in an environmental gain. Clearly the use of produced water is critical to the economic viability of numerous ranching operations across the state (DEP).</p> <p><b>Response:</b> <i>See response to comment # 8</i></p>
WPT	<p>16. <b>Comment:</b> To be compliant, many industrial facilities will opt to not discharge. This will deny water to downstream agricultural users. The purpose of the Western Alkaline Rules that were promulgated into Wyoming's DEQ rules and regulations was to ensure that water was not unnecessarily retained by facilities, but rather was more readily discharged so that the water could be put to beneficial use downstream. In addition, we are concerned that the State is inconsistent with the intent of the Western Alkaline Rules.</p> <p><b>Response:</b> <i>WQD does not understand this comment or how the proposed provisions of Chapter 1, Appendix H are contrary to the provision of the Western Alkaline Rules which are incorporated into Chapter 2, Appendix J (h). The Western Alkaline Rules provide certain coal mining operations with some relief from effluent limits for sediment and would not be affected by adoption of these rules.</i></p>
WPT	<p>17. <b>Comment:</b> Appendix H needs to include a provision for mixing studies to determine the actual impact on irrigation potential or livestock watering from the discharge water. Appendix H should also allow for water to be stored and discharged during periods of high flow when irrigation is not taking place. A</p>



numerical standard-based on water quality would also be much easier to administer by the DEQ/WQD and the dischargers.

**Response:** *Mixing analyses are done whenever there is a discharge to perennial water. When the discharge is to an intermittent or ephemeral water body, no mixing analysis is done because the discharge itself makes up the entire stream flow for substantial periods of time. WQD policy has been to allow untreated CBM discharges to on-channel reservoirs designed to completely contain the 50-yr/24-hr storm event. However, in their Pumpkin/Willow Creek appeal decision, the EQC disallowed that approach, at least in those drainages. The approach of adopting numeric criteria for irrigation (specifically EC and SAR) has been suggested in the past. Such an approach would increase certainty for dischargers and landowners at the expense of eliminating much of the flexibility provided by the current narrative standard. (Chapter 1, section 20).*

WPT

**18. Comment:** There continue to be enough questions and potential economic impacts from these proposed rules that we believe it would be prudent to utilize this document as a guideline or policy so that through practical application the document can be improved without having to go through formal rulemaking.

**Response:** *The proposed rule does have utility as policy and has been used in that capacity for developing permit effluent limits. When evaluating the implications of these procedures as a policy or a rule, the primary reason for this procedure remaining as a policy is to maintain a certain degree of flexibility to accommodate site specific conditions, while the primary reason for developing these procedures as a rule is to ensure a degree of enforceability.*

*The current draft has been through several revisions, with input from all known stakeholder groups who will likely be affected by these decisions. The current process for developing permit effluent limits for agricultural uses has been used since the mid 1990s and revised periodically to address various issues as they arose. Furthermore, the potential effects on designated uses and land owners have been discussed and debated to the extent that many of the comments contained in this document are the same or similar in nature to those for which we have already provided a response. We believe that the comments and concerns which have been brought to our attention have been addressed and resulted in an updated procedure that allows a good degree of flexibility for both applicants who need an effective way to surface discharge produced water, and for land owners to use that water for beneficial uses when that water is protective of designated agricultural uses.*

*On the other hand, the one component that is not addressed in a policy is the ability to enforce these procedures with the effect provided by a rule. Although it will be a more cumbersome process to proceed with changes to a rule, we believe that most issues have been addressed, whereas the needs for enforcing agricultural use protection is best addressed if approved as a rule. It should be*

<p>PRBRC</p>	<p><i>noted that DEQ has recently received appeals for produced water discharge permits based on the fact that the proposed rule is currently a policy.</i></p> <p>19. <b>Comment:</b> In the opening two paragraphs, PRBRC express their frustrations with the failure of DEQ and the Advisory Board to generate a truly substantive agriculture protection policy in any of the seven versions generated in more than three years time. They state that the implementation of the policy which DEQ is already operating under does/will memorialize that destruction and/or taking of property, specifically soil and vegetation, without compensation and for the sole purpose of assisting the gas industry in disposing of their wastewater product at the lowest possible cost.</p> <p><b>Response:</b> <i>DEQ believes that the preceding Advisory Board meetings and stakeholder involvement have resulted in a refined process which takes into account the varying sentiments and needs of stake holders while ensuring protection of agricultural uses from produced water discharges, and allowing every opportunity for the beneficial use of the resulting highly valued surface water resource.</i></p>
<p>MCD /DEP</p>	<p>20. <b>Comment:</b> The MCD encourages the EQC to recognize that it is important to proper range management and the management of wildlife populations that livestock and wildlife be able to disperse across the range. This decreases overgrazing, improves the condition of riparian areas, and increases wildlife population and diversity. The flow of produced water meeting livestock watering standards supplements the surface water supply, making good water available to livestock and wildlife in areas that seldom have flow. The State of Wyoming should assert its ownership of the watercourse easement due to the value to the environment of water flowing therein. DEP adds that when produced water meets livestock watering standards and is discharged, it becomes a water of the state and may flow down the state's watercourse easement for use by livestock and wildlife as well as existing or new water users.</p> <p><b>Response:</b> <i>Comment noted. DEQ is aware that produced discharges become water of the state to be used beneficially as regulated by the State Engineer. DEQ is making every opportunity available for the continued use of the discharge water to the extent that water quality is protected.</i></p>
<p>EPA</p>	<p>21. <b>Comment:</b> Is the State bound by the regulations in Appendix H for interpretation of the water quality standards provisions in Chapter 20? In other words, does Appendix H establish a binding norm for the levels of the pollutants in ambient waters of the State to protect the uses of the Agricultural Water Supply classification?</p> <p>If so, after the adoption process is complete, could the State apply a different interpretation of the narrative standards of Section 20 without modifying either Chapter 1 or Appendix H?</p>

	<p>Does DEQ consider the Appendix H procedures to be part of the State's WYPDES permitting program, as opposed to a new water quality standard or a new interpretation of Section 20 of Chapter 1?</p> <p><b>Response:</b> <i>Appendix H does not create a new agricultural use standard. The section 20 narrative (no measurable decrease in crop or livestock production) is still the standard. Appendix H provides the procedures for translating that standard into site-specific effluent limits.</i></p> <p><i>Because it is being made part of the rule, the DEQ could not apply a different or inconsistent interpretation without modifying Appendix H.</i></p>
EPA	<p>22. <b>Comment:</b> Subsection (b) of Appendix H states that the limits for TDS, sulfate, and chloride for protection of the livestock watering use apply "at the end-of-pipe prior to mixing with the receiving stream." Although it may be generally understood that the same point of application is intended for any limits established for protection of the irrigation use, it may be helpful to state so in the regulation.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
EPA	<p>23. <b>Comment:</b> Several terms that govern implementation of the regulation are not defined, for example, "relatively good" and "salt tolerant" in (c)(vi)(A), and "significantly better than would otherwise be required based on a theoretical 100% yield" in (c)(vi)(A)(II). We suggest that DEQ include definitions of these terms in the regulation.</p> <p><b>Response:</b> <i>The purpose of this language is to offer guidance as to how and when Tier 1 will likely be the driving procedure for establishing effluent limits. Relatively good water is meant to be a broad statement because of the varying water quality and soil conditions verses the quality of water being discharged. Discharge water quality may be acceptable for crop production in one part of the state but unacceptable in another depending on site specific conditions including surface geology and background water quality. Salt tolerance in plants is believed to be generally understood as the level to which a plant can no longer continue to be productive in the presence of elevated salinity. The statement referred to in (c)(vi)(A)(II) seems to clearly state that when the concentration of a pollutant in a discharge is better than what is required by the calculated Tier 1 default value then DEQ will establish that effluent limit at or near the concentration provided by the discharge.</i></p>
EPA	<p>24. <b>Comment:</b> The State's "Analysis of Comments," as posted on DEQ's Surface Water Standards web site is useful, as it explains certain aspects of how the new rule will be implemented. We suggest that it would be beneficial in understanding the intent of the rule if some of the details provided on the web site</p>

	<p>were included in the rule language. Some examples of these clarifying statements made by the State on its web site including: discussion regarding implementation of the waiver provision and the Tier 3 criteria development process.</p> <p><b>Response:</b> <i>DEQ intentionally removed or refined some of the explanatory language from earlier versions of the policy to make it more clearly enforceable, to put it in rule form, and because of questions and concerns raised during public meetings as to how the additional language would be interpreted when developing permit limits. However, most of the removed language was added to the Statement of Principal Reasons for the purpose of offering additional explanation. It should also be noted, that the response summaries are a part of the administrative record and can be used to offer additional insight as to how the DEQ intends to permit these types of discharges.</i></p>
HSCC	<p>25. <b>Comment:</b> It is the County's position that specific problems related to CBM development, primarily in the Powder River Basin, should not be allowed to impact the entire State; and that, CBM water discharge problems and concerns would best be addressed separately.</p> <p><b>Response:</b> <i>A review of Hot Springs County oil and gas operations during the advisory board process indicated that the currently proposed limits and provisions of Appendix H will not result in an operator's inability to renew their WYPDES discharge permit and meet the proposed limits.</i></p>
HSCC	<p>26. <b>Comment:</b> During the extensive and thorough review conducted by the Advisory Board, comments were decidedly against tightening of the State's water discharge standards. Private landowners almost unanimously opposed the proposed revisions. The existing ranching and oil/natural gas industries would be affected by the proposed rules whereas the CBM industry would not.</p> <p><b>Response:</b> <i>The Advisory Board took into consideration the concerns and comments of private landowners and chose to retain the existing of livestock watering criteria based largely on that input. The proposed limits before the EQC have been in place for many years and should ensure that the status quo for permitting will be largely maintained. The same can be said about irrigation limits. The proposed methods for determining effluent limits have been used for several years with the exception that naturally irrigated lands are now part of those protections and that the methods for developing effluent limits have been revised and updated as necessary to address new or site specific situations.</i></p>
HSCC	<p>27. <b>Comment:</b> Hot Springs County has not been affected in the current economic boom in Wyoming. The County has not been able to sustain the productivity of the State and Federal lands within the county resulting in incurred reductions in oil/natural gas productivity, losses in the agricultural industry, and 7.1% of the population. As a result, Hot Springs County government has adopted pro-active policies and measures, in an attempt to stabilize the economy and</p>

	<p>reverse the economic trends of the past 25 years.</p> <p>Both of the proposed revisions to the State's water quality standards were written to primarily address the "new" problems created by the CBM industry and heightened interest in the oil/natural gas industry. The County cautions State regulators and boards, to consider the impact of their actions such as rule and regulation making, upon the small "have not" counties. Strengthened regulations intended to address exploding development in "have" counties, should not have the consequences of further depressing the economic conditions of the "have nots".</p> <p><b>Response:</b> <i>See response to comment #25 and #26.</i></p>
HSCC	<p><b>28. Comment:</b> Hot Springs County strongly recommends separation of CBM discharge water standards from the historically occurring discharge standards in Wyoming in order to prevent CBM problems from impacting the other activities in Wyoming, particularly in the "have not" counties. The proposed separation of the discharge standards, as proposed in Appendix "H" and Appendix "I" (both attached documents) of the Chapter 2 revisions petitioned by the PRBRC, are deemed essential to protect the social/economic structure of Hot Springs County.</p> <p><b>Response:</b> <i>DEQ believes that Appendix H as proposed appropriately addresses and separates historically occurring discharges and newer CBM discharges.</i></p>
HSCC	<p><b>29. Comment:</b> Hot Springs County asserts that enabling legislation for the DEQ/WQD (Wyoming Statute 35-11-302) requires:</p> <p style="padding-left: 40px;">“(vi) In recommending any standards, rules and regulations, or permits, the administrator and Advisory Board shall consider all the facts and circumstances bearing upon the reasonableness of the pollution involved including:</p> <p style="padding-left: 80px;">(A) The character and degree...</p> <p style="padding-left: 80px;">(B) The social and economic value of the source of pollution;”</p> <p>Based on the above mentioned provisions in the Statutes, Hot Springs County requests that the Administrator and EQC, consider social/economic impacts of the proposed rule and regulation making upon Hot Springs County's economy and social structure.</p> <p>The administrative record should show evidence of the economic impact studies and analyses which the Advisory Board, Director, Administrator and EQC utilized during the rule and regulation formulating process.</p> <p><b>Response:</b> <i>The rule which is currently being proposed was initiated in 2002 as part of the triennial review for water quality standards and required by Section</i></p>

303(c) of the Federal Clean Water Act. It was determined during this review process, with input from the Advisory Board and the public, that a policy would be developed to clarify how discharges of produced water which are used for agricultural purposes would be permitted. This process was largely driven by the increased development of coal bed methane (CBM) in certain areas of the state. As the policy developed through several revisions and public meetings, it was suggested that the policy looked more like a rule and should therefore be proposed as a rule. After internal review, DEQ agreed. On February 5, 2006, the Advisory Board took comments and deliberated about DEQ's intentions to incorporate the Agricultural Use Protection Policy into Chapter 1, Appendix H. During a hearing before the Environmental Quality Council (EQC) on February 15 and 16, 2007, Appendix H of Chapter 1 was remanded back to DEQ for additional revisions and to allow time for further public consideration and deliberation as a rule instead of a policy. We believe that the directives given by the EQC have been addressed.

Regarding compliance with W.S. 35-11-302(a)(v1), the statute provides:

*“(vi) In recommending any standards, rules, regulations, or permits, the administrator and advisory board shall consider all the facts and circumstances bearing upon the reasonableness of the pollution involved including:*

- (A) The character and degree of injury to or interference with the health and well-being of the people, animals, wildlife, aquatic life and plant life affected;*
- (B) The social and economic value of the source of pollution;*
- (C) The priority of location in the area involved;*
- (D) The technical practicability and economic reasonableness of reducing or eliminating the source of pollution; and*
- (E) The effect upon the environment.”*

*We believe, we have complied with all of the conditions of WS 35-11-302 (a)(vii) in the establishment of the proposed rules and continued to do so through the advisory board process. This public process that we engage in is specifically designed to meet those provisions of the statute. The provisions of the proposed rules were largely developed in a previous rulemaking process containing a lengthy administrative record documenting 5 draft iterations, 5 advisory board public meetings and 4 solicitations of written public comment in which all of the above were considered. A brief summary of the relevant considerations is as follows:*

- A) The proposed rule addresses the character and degree of injury to crops and native plants that may be irrigated with produced water and the degree of injury to livestock that may drink the water. It creates the data requirements and procedures for calculating discharge water quality limits to an extent that*

ensures no measurable decrease in crop or livestock production. In past comments, CBM industry representatives contended that prohibiting the discharge of new water is injurious to wildlife that would otherwise use the habitat that would be created. However, the document doesn't prohibit the discharge of water, it regulates the quality of the water being discharged and it only regulates that quality to the extent that livestock and wildlife will not be harmed. They also contend that by requiring water quality that will support irrigation harms livestock and wildlife because it will result in less water being discharged. In this, they ask the agency to choose between irrigated agriculture and livestock and wildlife. Instead, we chose to protect them all by regulating water quality sufficient to support all of the uses as is contemplated by the statute and the regulations. We have considered the potential impact to water uses that have developed around historic discharges and structured the document in a way that will allow those discharges to continue. We have also included provisions that will allow the discharge of poorer quality water if the affected water users accept the risks associated with the poorer quality water.

B) The source of pollution is oil and gas development and the social and economic importance of that industry has clearly been considered in the formation of the proposed rule. Indeed, oil and gas development has continued under the agency's past interpretation of the Section 20 standard and will continue under the proposed new appendix to the rule. The opponents of CBM development have argued that we considered too much the economic importance of energy development at the expense of local agriculture in the formulation of the proposed rule. We believe we have struck an appropriate balance evidenced by the fact that the provisions of the rule have already been implemented in part through the permitting policy. Throughout this implementation, the energy industry continued to operate and significant degradation of water quality has not occurred.

C) We have considered the priority of location in the area involved. This proposed rule contains the necessary flexibility to assign appropriate water quality limits on a site-specific basis. The Tier 2 procedures allow the adjustment of effluent limits to equal the many differing background water qualities in different receiving waters across the state. The Tier 3 provisions allow further modifications based on site-specific geologies, soils and management practices.

D) The proposed rule addresses the technical practicability of reducing or eliminating the source of pollution. The 3-tiered approach is specifically designed to address technical practicability. The purpose of Tier 1 is to alleviate requirements for detailed studies in circumstances where the quality of the discharge is exceptionally good or the affected crops are salt-tolerant. It provides a clear and simple means of assigning EC and SAR values that are supported by scientific literature. Tier 2 allows effluent limits to be adjusted to equal background water quality and provides specific procedures that can be used to estimate background water quality. The industry often points out that the

*CBM produced water is of a better quality than background. Wherever this is true, there is no technical problem in meeting the requirements of the proposed rule. Wherever the produced water is worse than background, the assumption must be made that the lower water quality will have a depressing effect on crop production. Tier 3 allows this assumption to be rebutted by a study or demonstration by the permit applicant that the lower water quality can be managed in a way that maintains crop productivity. These approaches were developed with input from a technical workgroup that included industry and university agricultural experts. The techniques involved in each of the tiers are all considered to be economically feasible and have been routinely employed by CBM operators and consultants.*

*E) The proposed rule in its entirety considers the effects upon agricultural uses which are the parts of the environment intended to be addressed by Section 20.*

*All proceedings associated with this rule package are maintained in the administrative record.*

HSCC

**30: Comment:** Federal NEPA legislation requires State actions which are "connected" to Federal actions to undergo a full NEPA review along with the associated economic impact studies required by federal law.

Hot Springs County asserts that revision of the State's water quality standards is mandated by the CWA, reviewed by the EPA and has significant impact on the social-economic structure of the County; and therefore, may require a full NEPA analysis.

The administrative record should show evidence of the economic impact studies and analyses which the Advisory Board, Director, Administrator and EQC utilized during the rule and regulation formulating process.

Hot Springs County includes an attached memorandum regarding application of the requirements of the NEPA to non-federal projects.

**Response:** *According to section 511(c)(1) of the federal Clean Water Act, actions taken by the EPA, other than a few specifically identified exceptions, are not "deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969..." Because approval of state water quality standards is not identified as one of the exceptions, it is not considered a major federal action and NEPA analysis is not required by the EPA.*

*However, the public process used by the WQD to develop water quality standards is very similar to the NEPA process where interested members of the public have ample opportunity to provide comments on several drafts of the water quality standards.*



NRS	<p>31. <b>Comment:</b> As long time ranchers in the Powder River Basin we have seen our ranch affected by many aspects of the oil and gas industry, including for the last 10 years, coal bed methane development. The most troubling aspect of the recent development has been due to the discharge of water onto the ground, resulting in irreversible damage to the soils and vegetation in our area, not to mention the wanton waste of a valuable resource.</p> <p><b>Response:</b> <i>DEQ believes that Appendix H contains the needed protections necessary to ensure that the quality of produced water discharges is sufficient to use for both livestock watering and crop irrigation. The Tiered approach for developing EC and SAR limits is based on protecting 100 % crop production of the most sensitive crop affected or by setting limits that reflect the natural background water quality in the drainage.</i></p>
PRBRC	<p>32. <b>Comment:</b> DEQ has been presented with ample evidence that the water chemistry of a CBM discharge in an ephemeral or intermittent stream may change, but it steadfastly refuses to account for this in any of its permitting policies and practices. DEQ can account for dilution that occurs when a discharge is made to a flowing stream (and correspondingly relaxes effluent limits for the permittee) but is apparently unable (or unwilling) to account for the opposite effect (i.e. the concentration of the constituents) that occurs in the stream channel downstream of the end of pipe. This dichotomy reveals how DEQ, by taking every opportunity to relax effluent limits for discharges instead of keeping in the forefront its mandate to prevent, reduce and eliminate pollution and to preserve and enhance the air, water and lands of Wyoming has subverted the Environmental Quality Act.</p> <p><b>Response:</b> <i>WDEQ does establish irrigation monitoring points (IMP's) below discharges in irrigated drainages. These sampling locations serve a feedback mechanism to provide in-stream data for EC and SAR.</i></p>
PRBRC	<p>33. <b>Comment:</b> PRBRC discusses and describes CBM discharge water as an "industrial waste" and sites court cases to prove the point, as well as discussing DEQ's authority to regulate pollution (i.e. industrial waste). PRBRC notes that the Environmental Quality Act (EQA) specifically recognizes that quantity of water has important environmental impacts that can and should be regulated. Also, the Wyoming Attorney General has recognized that authority when stating that the EQC has "the authority to regulate <u>the quantity</u> of water produced" from CBM, if the EQC determines that the produced water is a "nuisance" under the statutory definition of "pollution." CBM water quality and quantity is creating a nuisance that renders the waters harmful to agricultural (and other) uses. The rule as proposed fails to consider in any manner the detrimental effects related to quantity of flow and timing of discharges to agricultural lands. The nature of CBM flows and ephemeral drainages gives a practical basis for the need to regulate all parameters of water quality.</p>

	<p><b>Response:</b> <i>As has been discussed at previous meetings and during the previous EQC hearings, the State Engineer is delegated through the Wyoming constitution and state statute for the regulation of water quantity. While the WQD does typically set limits on discharge quantity in its WYPDES permits, those limits are almost always based on the discharge quantity that the permittee requests in their application. For example, if a discharge were to a perennial stream and the discharger applied to discharge 5 million gallons per day (MGD), the WQD would write a permit with a flow limit of 5 MGD and we would calculate the effluent limits based on the size and classification to the receiving water with a 5 MGD discharge. If the applicant were to change its mind and was willing to be limited to only 1 MGD, WQD would adjust the flow limit in the permit to 1 MGD and adjust the effluent limits to reflect the resultant change in dilution factor.</i></p> <p><i>When discharges are to intermittent or ephemeral drainages, no dilution factor calculations are made because the in-stream low flow condition is zero. However, WQD has, on occasion, set limits on the volume of discharge to intermittent and ephemeral streams when there is concern that the volume of effluent would cause a water quality problem (i.e. overwhelm the channel and cause scouring and/or excessive sedimentation).</i></p> <p><i>The thrust of the comment is that WQD should be limiting the discharge volume to eliminate problems with flooding and other property damage. The Attorney General has provided an opinion to the agency and the EQC that the WQD's authority to limit flow is restricted to water quality impacts only.</i></p>
WPR	<p><b>34. Comment:</b> WPR has been active participant in the proceedings associated with Chapter 1, Section 20 and Appendix H and incorporates by reference its comments submitted during previous public comment periods to DEQ and the Advisory Board.</p>
	<p><b>Response:</b> <i>Submittal noted. Responses to the enclosed comments from previous Advisory Board and EQC meetings/hearings are included in the administrative record and currently posted on the DEQ Surface Water Quality web site at <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p>
WPR	<p><b>35. Comment:</b> The purpose of Chapter 1, Section 20 is to protect irrigation that existed prior to an application for a WYPDES permit. The proposed rule continues to authorize DEQ's historic practice of recognizing irrigation without confirmation of a valid Wyoming water right.</p>
	<p><b>Response:</b> <i>Chapter 1, Section 20 protects the quality of agricultural water supplies of any type. These existing uses are not limited to just those permitted through the State Engineer's Office.</i></p>
DEP	<p><b>36. Comment:</b> Devon notes their participation in the water quality standard</p>

	<p>rulemaking process by preparing comments and presenting information and testimony. Devon's submittal includes prior comments and transcripts from the December 2007 Advisory Board meeting.</p> <p><b>Response:</b> <i>Submittal noted. Responses to the enclosed comments from previous Advisory Board and EQC meetings/hearings are included in the administrative record and currently posted on the DEQ Surface Water Quality web site at <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>. Transcripts are also included in the administrative record and currently posted on the DEQ web site at <a href="http://deq.state.wy.us/wqd/WOD_home/Advisory%20Board%20-%20Misc/index.asp">http://deq.state.wy.us/wqd/WOD_home/Advisory%20Board%20-%20Misc/index.asp</a>.</i></p>
DEP	<p>37. <b>Comment:</b> It is the DEQ's responsibility to manage risks to the production of crops and livestock, not to attempt to eliminate all risk. Crop and livestock production are high risk enterprises, and agricultural producers regularly manage a wide variety of risks, which are outside the producer's control. If the DEQ assumes that <i>any</i> potential negative impact to livestock, no matter how minor, outweighs the benefits of having supplemental water supplies available in areas where there is little or no natural water, it will significantly affect the outcome of the risk analysis. Whenever a standard or rule is being considered the DEQ is obligated to complete a comprehensive risk management decision-making which involves the rigorous collection of data, a detailed analysis of risks, and a comprehensive evaluation of alternatives, which includes identifying the potential problem, collecting data, assessing risk, evaluating alternatives, and selecting alternatives. In this case the DEQ has not identified and documented a problem.</p> <p><b>Response:</b> <i>See response to comments # 8 and # 29.</i></p>
PAW	<p>38. <b>Comment:</b> The Petroleum Association of Wyoming welcomes this opportunity to re-submit comments to the EQC, regarding the DEQ/WQD's proposed revisions to Chapter 1, including Appendix H and the associated Agricultural Use Protection Policy. Submittal includes comments and testimony from previous Advisory Board and EQC meetings/hearings.</p> <p><b>Response:</b> <i>Submittal noted. Responses to the enclosed comments from previous Advisory Board and EQC meetings/hearings are included in the administrative record and currently posted on the DEQ Surface Water Quality web site at <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p>
WSGA	<p>39. <b>Comment:</b> The Wyoming Stock Growers Association wishes to re-submit the enclosed comments to the EQC regarding the proposed Chapter 1, Appendix H and the associated Agricultural Use Protection Policy. Submittal includes comments and testimony from previous Advisory Board and EQC meetings/hearings.</p> <p><b>Response:</b> <i>Submittal noted. Responses to the enclosed comments from previous</i></p>

CNGA	<p><i>Advisory Board and EQC meetings/hearings are included in the administrative record and currently posted on the DEQ Surface Water Quality web site at <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p> <p><b>40. Comment:</b> The Coalbed Natural Gas Alliance wishes to re-submit the enclosed comments to the EQC regarding the proposed Chapter 1, Appendix H and the associated Agricultural Use Protection Policy. Submittal includes comments and testimony from previous Advisory Board and EQC meetings/hearings.</p> <p><b>Response:</b> <i>Submittal noted. Responses to the enclosed comments from previous Advisory Board and EQC meetings/hearings are included in the administrative record and currently posted on the DEQ Surface Water Quality web site at <a href="http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp">http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp</a>.</i></p>
NJR	<p><b>41. Comment:</b> Ensure protection of agricultural uses for livestock, soils and vegetation. The DEQ Ag protection policy should avoid impacts to these resources as the top priority.</p> <p><b>Response:</b> <i>Comment noted.</i></p>

**Purpose – Section (a)**

PRBRC	<p><b><u>General</u></b></p> <p><b>42. Comment:</b> CBM water's elevated SAR damages soil's physical condition and particularly its infiltration rate. "Application of salty water to arid and semi-arid soils containing clay minerals with poor drainage may accumulate salts, decrease infiltration, and increase runoff and erosion." The breakdown is irreversible. The possibility of long-term damage to soils, cost and feasibility of reclamation and allocation of those costs to the proper parties are not even contemplated in the proposed rule. The protection against pollution that is required by the EQA is not met without that consideration.</p> <p><b>Response:</b> <i>DEQ has taken these concerns into consideration and consulted with professional and academic soil scientist. The result is the current proposed rule which sets effluent limits based on either the most sensitive crop affected and uses clay soils as the soil type when calculation appropriate Tier 1 effluent limits, or setting effluent limits which reflect background conditions.</i></p>
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BLM

Measurable Decrease

43. **Comment:** Regarding the discussion in Appendix H, page H-1, lines 17 – 20, “For irrigation purposes, there needs to be either a current irrigation structure or mechanism in place for diverting water from the stream channel, or a substantial acreage of naturally sub-irrigated pasture within a stream floodplain. Where neither of these conditions exists, there can be no irrigation use or loss in crop production attributable to water quality,” the following concerns were observed associated with Public Lands:

A. **Comment:** Much of the agricultural activity occurring on public lands would not be covered under this condition.

*Response: The provision of Appendix H takes into account both active irrigation uses of surface water and naturally occurring drainages. The commenter does not elaborate on additional considerations that need to be accounted for.*

B. **Comment:** The potential for cumulative degradation of larger water bodies through incremental changes to smaller contributing systems is not covered under this definition.

*Response: These considerations are taken into account when developing permit limits and requirements.*

C. **Comment:** Resources other than agricultural production may be affected by changes to water bodies not covered by this definition including fisheries, wildlife, tourism, soil productivity and erosion, and salt production.

*Response: All designated uses in Chapter 1, Section 3 are considered when developing permit limits. Appendix H is directly related to Section 20, Agricultural Water Supply.*

D. **Comment:** Additional ambiguities are introduced with the term, “substantial acreage of natural sub-irrigated pasture within a stream floodplain.” What determines if an area is large enough to be defined as “substantial?” Given the relatively small size, the disbursed nature of many of the streams on public lands, the importance of a waterbody to wildlife, agriculture, and tourism is not solely determined by the volume of water they contain. Considering only the larger system is not practical under these conditions.

*Response: Section c(iii) quantifies the area of naturally irrigated land as well as other criteria proposed for protection under the rule.*

BLM	<p>44. <b>Comment:</b> Additional consideration should be given to the relative volume and flow pattern of the augmented flows to natural background volumes and timing. Converting a stream channel from ephemeral to perennial or intermittent will produce channel adjustments that entrain additional sediments and salts.</p> <p><b>Response:</b> <i>It is not clear what changes or adjustments to the proposed rule are being suggested. WYPDES permits do contain erosion control requirements when determined to be appropriate.</i></p>
BLM	<p>45. <b>Comment:</b> Given that many of the artificial discharges will be ephemeral, on a multiyear time scale, the changes in surface flow will not persist, resulting in additional physical and vegetative adjustments upon cessation of flow.</p> <p><b>Response:</b> <i>It is not clear what changes or adjustments to the proposed rule are being suggested</i></p>
BLM	<p>46. <b>Comment:</b> Draft regulations regarding surface discharges on BLM lands are enclosed for discussion. The general purpose of these regulations would be to encourage discharges into larger perennial waterbodies that could absorb energies and/or promote close monitoring where discharges dominate flow volumes and energies.</p> <p><b>Response:</b> <i>Unless a water body has been designated by the EQC as a Class 1 water, WQD has no authority to prohibit discharge to any specific water body.</i></p>
EPA	<p>47. <b>Comment:</b> Is there a threshold that the State intends to use as a “measurable decrease in crop or livestock production”?</p> <p><b>Response:</b> <i>See the third paragraph of Section (a) (page H-1) titled “Measurable Decrease.” Section (b) lays out methods for ensuring no measurable decrease in livestock production from produced water discharges through establishing permit limits protective of the use. Section (c) lays out methods for doing the same for associated irrigation uses.</i></p>
EPA	<p>48. <b>Comment:</b> Section (a), page H-1, lines 16 – 20: “For livestock watering...within a stream floodplain”: Is the State’s intent of this provision to restrict the designated use to places where the use is actually occurring in the manner specified in Appendix H? Understanding the purpose of this methodology is for setting effluent limits the provisions of Chapter 1, Section 20 appear to remain in effect for any water body that is designated for Agricultural Water Supply uses, regardless of whether or not these uses occur.</p> <p><b>Response:</b> <i>No, it is not the State’s intent to restrict the designated uses to places where the use is actually occurring. “Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality potential for use as an agricultural water supply.” Appendix H lays out a method for ensuring produced</i></p>

*water discharges meet specific requirements of Section 20. It in no way limits Section 20 protections to surface waters described in Appendix H, rather it focuses on recent development of CBM production which has the potential to affect agricultural uses.*

EPA

**49. Comment:** Regarding grandfathering historic discharges - The State's Analysis of Comments document explains: "... we have determined that the presence of those discharges occurring prior to January 1, 1998, many of which occurred before the founding of DEQ, have resulted in an established beneficial use and would create a significant impact to those uses if removed. Furthermore, the existing uses of those watercourses are largely established and defined by the quality of those historical discharges being grandfathered. On the other hand the combination of oil and CBM (predominantly CBM) discharges occurring after January 1, 1998 increased in number from approximately 470 outfalls prior to 1998 to more than over 8,000 outfalls in the Powder River drainage alone. It was this increased number of discharges which resulted in the growing awareness of potential impacts to agricultural uses and the need to reevaluate current agricultural use protection regulations. Through this evaluation, we learned that agricultural uses should be provided with additional protections." Does this Analysis of Comments discussion mean that the state is by this action categorically establishing a new designated use for all waters in the state with pre-1998 discharges? If so, what was the previous designated use for those waters? What is the new designated use for those waters? Does the state believe it is legally required to perform a UAA to change the designated use of those waters? If not, why not? What is the legal and scientific basis for treating pre-1998 discharge waters differently than post-1998 discharge waters?

**Response:** *No, the grandfather clause (pre-1998 discharges) recognizes existing uses that were established during the introduction of a small number of discharges that were previously unregulated with all of the currently proposed effluent limits. It further takes into account that these historically established discharges have resulted in what is now considered to be natural background conditions. It recognizes that the existing uses in these drainages are largely the result of the discharges and necessary for those agricultural operations that are dependent on the flow of the discharge water as long as it is still available, and that those uses are thriving with the presence of these discharges. The uses will continue to be the same according to their current classification. A UAA would not be required unless there becomes a need for changing a classification or use, of which DEQ is not proposing to do within the framework of these proposed revisions. DEQ is proposing to maintain the existing uses and permit requirements of these streams, while recognizing the need to regulate the new increase of similar discharges to ensure those new discharges also protect the existing uses.*

<u>Historic Discharges – Discharges Occurring Prior to January 1, 1998</u>	
CLT / LRC / MCD / YPC	<p>50. <b>Comment:</b> Supports Advisory Board's recommendations that effluent limits on discharges that began prior to Jan. 1, 1998 not be affected by Chapter 1, Appendix H. There is no evidence that discharges that occurred prior to that date have had adverse effect on agricultural production. It would be very difficult to replace the discharges water in a cost effective manner.</p> <p><b>Response:</b> <i>WQD has no information on the cost of replacement water. The existing livestock criteria have been in place since the 1970's and over the years the agency has received almost no objections from livestock producers about adequacy of protection provided by those criteria. Adverse effects on irrigation from CBM discharges have mostly been related to excess water rather than water quality; however, most of those deliberately using CBM water for irrigation are adding soil amendments.</i></p>
WPT	<p>51. <b>Comment:</b> We are very concerned that the rules must be passed with a grandfather clause (paragraph 5 of Appendix H) and we feel that it is an essential part of the rule as written. Removing the grandfather clause would be a radical change to these proposed rules, requiring the rules to go back to the Advisory Board for rehearing.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
WPT	<p>52. <b>Comment:</b> We believe the grandfather clause needs to be slightly revised to correctly word as intended. Regarding paragraph 5 of Appendix H, we strongly recommend the word "discharges" be changed to "discharge permits".</p> <p><b>Response:</b> <i>As described in Section(a), any discharge occurring after January 1, 1998 would be required to obtain a permit. The WQD see no need for a wording change.</i></p>
PRBRC	<p>53. <b>Comment:</b> Pre-1998 discharges exempt effluent sources already existing prior to January 1, 1998 from these proposed requirements. We ask DEQ to respond to concerns of landowners and lessees. Due to management changes or water chemistry alteration over time, water quality of older discharges may well degrade and become problematic. We suggest additional language to read:</p> <p><i>"Where landowner or lessee asserts evidence of crop or grazing land damage or health threats to livestock and wildlife, DEQ shall establish effluent limits to protect these uses."</i></p> <p><b>Response:</b> <i>The suggested language is not supported by DEQ. Section (a), lines 29 – 37 stipulates that grandfathered discharges will not be required to meet the provisions of Appendix H, but will be required to maintain the existing quality of the discharge. The overall intent of this paragraph is to recognize the established</i></p>



*uses of historic discharges while ensuring that current and future discharge quality will not be degraded. A caveat at the end of the paragraph stipulates that the established limits are contingent on being protective of other designated uses in Chapter 1. If other uses are threatened then new limits may be applied to a permit.*

HSCC

**54. Comment:** Hot Springs County strongly recommends additional language for Chapter 1 revisions being formulated by WQD, which clearly establish the "grandfathering" of historic and existing discharge water standards. Although the intent is implied within the existing text of the draft Chapter 1 – Agricultural Use Protection Policy, it should be reworded to leave no doubt.

**Response:** *DEQ believes the current language clearly indicates that dischargers will not be required to revise permits to meet the requirement of Appendix H if permitted prior to Jan. 1, 1988, unless the discharge is shown to constitute a threat to any other designated use described in Chapter 1.*

WPR

**55. Comment:** DEQ will not use Appendix H to establish new effluent limits on discharges that began prior to January 1, 1998. The proposed rule arbitrarily protects certain historical conventional oil and gas discharges while expressly targeting coalbed natural gas operations for application of the more stringent standards. The proposed rule should not apply to valid and existing permits as of the date of the adoption of the proposed rule.

**Response:** *Increased development by the CBM industry has resulted in the need to readdress irrigation uses that until that time were considered to be protective and in accordance with Chapter 1, Section 20. January 1, 1997 was the original date chosen as the cut-off date when all permits would require more stringent standards because it was the time frame when DEQ began observing an increase in the planned development of CBM production in certain areas of the state. Based on the comments received, we have since taken a closer look at this trend of development and determined that the more appropriate date to begin requiring more stringent limits should begin with those discharges that were permitted after January 1, 1998.*

*Wyoming began experiencing an unprecedented boom in coal bed natural gas production beginning around 1998. Prior to this time, the total number of oil and gas outfalls was approximately 470 at any one time. Today there are approximately 7,100 outfalls permitted and almost all of this growth is attributable to CBM discharges.*

*This rapid growth in coal bed methane production has raised legitimate concerns over the effects that such large development may have on agricultural production, and is the primary impetus for the development of the Agricultural Use Protection Policy. On the other hand, comments from agricultural producers, who have been utilizing discharge water over the years from*

discharges from the historic conventional oil and gas discharges, have been overwhelmingly in favor of retaining those discharges. In response to those comments, the policy that was proposed for adoption as a rule in February 2007 contained a provision that would have exempted those historic discharges from meeting the new agricultural protection criteria. The relevant language in the proposed rule stated: "Effluent limits on historic discharges of produced water will not be affected by this policy in relation to the protection of agricultural uses. Where discharges have been occurring for many years, the permitted quality of those discharges shall be considered to be "background" conditions and be fully protective of the agricultural uses that have developed around them. Therefore, it is not necessary to modify those discharges in order to achieve the goal of "no measurable decrease" in crop or livestock production. It would only be necessary to maintain the existing quality of the discharge."

When considering adoption of the above proposed language, the EQC concluded that the terms "historic discharge" and "occurring for many years" needed to be better defined. We have done so by modifying the original language to read:

"Effluent limits on discharges that began prior to January 1, 1998 will not be affected by this Appendix in relation to the protection of agricultural uses. Where discharges have been occurring prior to that date, it will be assumed that the discharge has had no adverse effect on production. Therefore, it is not necessary to modify those discharges in order to achieve the goal of "no measurable decrease" in crop or livestock production. It would only be necessary to maintain the existing quality of the discharge. It is important to note, however, that effluent limits on historic discharges may be made where the quality of the discharge is shown to constitute a threat to any other designated uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations."

We believe that the inclusion of the 1998 cutoff date achieves the original purpose of separating those historic discharges which have been demonstrated to be useful for agricultural purposes from the more recent coal bed methane discharges which present new risks and challenges to agricultural productivity. January 1, 1998 is the year that marks the beginning of the current expansion of produced water discharges.

Some commenters argue that the proposed rule and cutoff date for grandfathering discharges unfairly singles out coal bed methane for overly restrictive regulation. We do not agree that the proposed rule is unfair. The current state of energy development is unlike anything that has occurred historically. The impact of these historically produced water discharges on agriculture (primarily ranching) is mitigated to a great extent by the fact that it includes only approximately 470 outfalls distributed across the entire state. In just the past 10 years, coalbed methane has accounted for the majority of approximately 7,100 outfalls. The sheer scale of the development requires new

concepts in regulation. Additionally, the proposed rule is not specific to CBM but applies equally to all discharges of produced water including conventional oil and gas development and mining.

*Some commenters contend that the grandfathering provisions contained in the proposed rule should apply to all current discharge permits and not be retroactive to permits issued after January 1, 1997 (now January 1, 1998). Taking this approach would render some of the important concepts in the rule as meaningless. For example, DEQ did not apply irrigation protections to naturally irrigated lands (bottom lands) until 2006. This was identified as a major defect in DEQ's regulatory approach during the development of the Agricultural Protection Policy which has since been remedied. To grandfather all of the current permits would continue to leave most of the naturally irrigated lands in the Powder River development area without appropriate protection from potential effects of elevated salinity and SAR. Therefore, we have concluded that January 1, 1998 is the appropriate point to delineate the regulation of grandfathered discharges.*

DEP

**56. Comment:** We agree it is reasonable and proper to assume that discharges prior to January 1, 1998 have had no adverse effects on agricultural production. However, there is no scientific basis for regulating pre-1978 discharges differently from post-1978 discharges. There is no evidence of adverse effects on crop or livestock production from any existing produced water discharges. Since Coal Bed Natural Gas (CBNG) operations discharge less produced water, and significantly more, poorer quality water is and has been discharged from conventional operations in The Bighorn Basin than from CBNG operations in the Powder River Basin (PRB), it makes no sense to require more stringent standards for post-1978 discharges to protect the same agricultural uses.

Also, the proposed draft would prohibit new discharges in the Bighorn Basin even though the water quality is similar to pre-1978 discharges that have been used in agricultural operations for decades. This ban on new discharges with similar water quality is unreasonable.

**Response:** *This comment primarily relates to a provision in Chapter 2 of the Wyoming Water Quality Rules and Regulations and should be considered separately from this proposed rule package. That provision provides an exception from the livestock watering criteria is a "beneficial use" letter is provided by the water user. This exception is clearly intended to apply to pre-1978 discharges only, post 1978 discharges are expected to meet the livestock watering criteria.*

Livestock Watering Uses – Section (b) – (stopped comment review)

<p>CLT / MCD / YPC / LRC / DEP / PAW</p>	<p><u><i>Effluent Limits</i></u></p> <p><b>57. Comment:</b> The Advisory Board listened to the public comment when evaluating the rule package to move forward to the EQC. Public comment was overwhelmingly in favor of keeping the 5,000 mg/l TDS, 3,000 mg/l [Sulfate], and 2,000 mg/l Chloride limits unchanged. Supports these same limits as they have proven acceptable to livestock welfare for many decades. MCD adds, “[MCD] believes that the existing standards provide adequate protection for livestock production.” LRC states, Larsen Ranch has been blessed with produced water discharges from a traditional oil and gas facility for more than forty years. This water has been invaluable. Cattle are healthy and there is no unusual sickness or death loss associated with the discharge water. DEP states that the evidence demonstrates that agricultural production has increased due to the availability of produced water under the current standards and landowner waivers. Landowners using produced water for stock watering have provided overwhelming evidence that the current standards provide adequate protection. DEP opposes any new livestock watering standards or effluent limits, whether by rule or policy. DEP states that the DEQ acknowledges that there has been overwhelming public comment asking that the current standards remain unchanged, and admits that leaving the criteria unchanged would not have particularly significant adverse effects. The DEQ lacks sufficient data to say with certainty whether existing produced water discharges comply with these standards. They also admit they have no data on at least half of the existing conventional discharges.</p> <p><b>Response:</b> <i>This comment gets to the major issue the EQC must face with regards to the livestock watering portion of the proposed rule. A thorough review of the scientific literature conducted by the University of Wyoming concluded that significant changes to Wyoming’s water quality criteria for livestock should be made. However, during the Advisory Board’s hearing process comment from the agricultural community, the oil and gas industry, and local governments and officials in the Big Horn Basin was overwhelming that those criteria should not be changed. During the Advisory Board hearing process there was almost no support for changing the criteria.</i></p> <p><i>It should be noted that while individual livestock producers are receiving water with discharge effluent limits of 5,000 mg/l TDS, 3,000 mg/l sulfate, and 2,000</i></p>
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<p>MEW / BR / MLM / BB / NRS / NJM</p>	<p><i>mg/l chloride, the actual water they are using is almost certainly of better quality than the upper limits allowed by the discharge permits</i></p> <p>58. <b>Comment:</b> The revised Appendix H, as it now stands, does nothing to protect the agricultural uses of our lands. The rights of citizens must be protected. The EQC must provide protection of our lands for agricultural uses. We need strict rules and regulations to provide this protection:</p> <p>Water Quality discharges must be set at levels which are safe for livestock and wildlife. The <u>Water Quality</u> standards recommended by the University of Wyoming are as follows:</p> <ol style="list-style-type: none"> <li>1. Sulfates - &lt;1,000 mg/l&gt; in order to avoid livestock health problems</li> <li>2. Total Dissolved Solids - &lt;500 mg/l&gt;</li> <li>3. Fluoride not to exceed &lt;2,000 µg/l&gt;</li> <li>4. Sodium (dissolved) should be less than &lt;1,000 mg/l&gt;</li> </ol> <p>Other specific water chemistry listings should be listed for livestock watering purposes. (BB)</p> <p><b>Response:</b> <i>See response to comment #57. It should be noted that the UW study did not make a recommendation for Total Dissolved Solids (TDS) and suggested that limits on individual parameters are more meaningful. 500 mg/l is the EPA's recommended limit for TDS in drinking water for humans.</i></p>
<p>DC</p>	<p>59. <b>Comment:</b> Why is DEQ not following the recommendations for livestock and wildlife water quality standards recommended in the UW study? We should follow what the UW study recommends and adopt these standards for sulfate, fluoride, TDS and sodium which are recommended in the literature.</p> <p><b>Response:</b> <i>The recommendations before the EQC are from the Water/Waste Advisory Board. The WQD recommends adoption of a modified version of the UW recommendations; however, neither the UW recommendations nor the modified recommendations from the WQD received any substantial support during the Advisory Board's hearing process.</i></p>
<p>WFBF / YPC / DEP / PAW</p>	<p>60. <b>Comment:</b> The MCD / YPC requests the EQC amend Chapter 1, Appendix H (b) to clarify that no additional effluent limits will be incorporated into permits unless it has been demonstrated that a discharge has or will cause a measurable decrease in livestock production, and additionally, no livestock watering waiver has been submitted.</p> <p>WFBF / DEP would like to see the clarifying language in italics added to the first sentence in the second paragraph of Section (b):</p> <p><i>"In addition to the basic effluent limitations above, the Agricultural Use Policy</i></p>

includes additional limits for livestock protection which may be incorporated into WYPDES permits when there is reason to believe they may be associated with a discharge *and will cause a measurable decrease in livestock production, and no livestock watering waiver has been submitted.*"

We feel by adding the above language it clarifies that no additional effluent limits will be incorporated into permits unless it has been demonstrated that a discharge has or will cause a measurable decrease in livestock production and no livestock watering waiver has been submitted:

**Response:** *It is assumed the commenter is suggesting that none of the additional water quality criteria included in the policy document may be included in a discharge permit unless the WQD is able to prove a measurable decrease in livestock production. The WQD does not have the resources to conduct such studies on each separate case that arises and opposes the suggestion.*

*The metals proposed in the Agricultural Use Policy have already been determined to have the potential for causing a measurable decrease in livestock production. As such, limits are proposed to be included in WYPDES permits at the specified levels if identified in the discharge to ensure a measurable decrease in production will not occur. The waiver has been included in this section of the policy to ensure that alternative limits are available if all affected users desire the use of lower quality water and they are willing to assume the additional risk of using that water.*

PRBRC

61. **Comment:** We note that DEQ has failed to require that effluent limitations for water chemistry be established within the levels safe for livestock and wildlife as recommended by M.F. Raisbeck DVM, et al in "Water Quality for Wyoming Livestock and Wildlife" (University of Wyoming, 2007). The following quotations cited are from this study.

E. **Comment:** Sulfates:

*"Assuming normal feedstuff S concentrations, keeping water SO<sub>2</sub>/4 concentrations less than 1800 mg/l should minimize the probability of acute death in cattle." Concentrations less than 1000 mg/l should not result in any easily measured loss in performance."*

DEQ proposes a limit of 2,000 mg/l, down from 3,000 mg/l, but twice that recommended by the University of Wyoming (UW) study. If this standard and the UW are correct, DEQ would permit discharges that cause "easily measured loss in performance" and "probability of acute death in cattle."

**Response:** *First it should be noted that the sulfate value being recommended by the Advisory Board to the EQC is 3,000 mg/l which is*

*the current limit. The 2,000 mg/l sulfate limit was proposed by the DEQ/WQD as a compromise position between the existing limit and the UW recommendation, but was ultimately rejected by the Board. WQD acknowledges that the UW report recommends a limit of 1,000 mg/l for long-term exposure. WQD data indicates that about 28% of existing conventional oil and gas produced water discharges could not meet a limit of 1,000 mg/l sulfate. About 6% could not meet a limit of 2,000 mg/l.*

**F. Comment: Fluoride:**

*"We recommend that water for cattle contain less than 2.0 mg/l F- (2000 µg/l). By extension, these waters should also be safe for sheep, cervids and probably horses."*

DEQ's proposal is 4,000 µg/l, twice that suggested by UW, and above that cited as "safe" for sheep, deer, elk, and probably horses. We urge the Council to follow the UW recommendation for fluoride.

**Response:** *The UW recommendation for fluoride of 2 mg/l is half the 4 mg/l federal human drinking water standard. WQD did not feel comfortable recommending a more stringent standard for livestock than is required by the EPA in human drinking water.*

**G. Comment: Arsenic:**

*"We recommend that drinking water for livestock and wildlife not exceed 1 mg/l"*

Why has this recommended livestock and wildlife limit for Arsenic been eliminated from DEQ's earlier February 2007 version? The Raisbeck study recommends a limit of 1 mg/l and we urge the EQC to include an Arsenic limit no greater than that recommendation.

**Response:** *Four parameters identified in the UW report (arsenic, barium, nitrite, and nitrate) had recommended limits much higher than would reasonably be expected to occur in produced or natural waters. To eliminate the need for unnecessary testing of these parameters, the WQD elected to leave them off the list that was recommended to the Advisory Board. However, WQD would have no strong objection to addition of these parameters at the UW recommended limits.*

**H. Comment: Na – Sodium:**

*"Therefore, assuming water consumption typical of a rapidly growing steer, and only background feed Na concentrations, the no effect level*

would be about 1000 mg Na/l or 2500 mg NaCl/l. Serious effects, including death, become likely at 5,000 mg Na/l. We recommend keeping drinking water Na concentrations less than 1000 mg/l."

This specific water chemistry citation was not contained in previous versions of Appendix H. However, due to the potentially high concentrations of sodium in discharge waters, we urge the Council to include this limit for sodium at no greater than 1,000 mg/l.

**Response:** *WQD recommended the UW suggested limit to the Advisory Board. For the reasons discussed in comment #57 the Board decided not to recommend those limits to the Council.*

**I. Comment: TDS – Total Dissolved Solids:**

*"Total Dissolved Solids in drinking water serves as a very poor predictor of animal health. However, if no other information is available, TDS concentrations less than 500 mg/l should ensure safety from almost all inorganic constituents. Above 500 mg/l, the individual constituents contributing to TDS should be identified, quantified, evaluated."*

Based on the above comment we would urge the Council to bring TDS down from the current 5,000 mg/L to something a little more reasonable.

**Response:** *The 500 mg/l value for total dissolved solids (TDS) referenced in the UW report is the same as the federal recommendation for human drinking water. The authors of the UW report recommend against adoption of any limits for this parameter. WQD believes that TDS has some value as a general indicator of water quality and suggests that it remain as a standard at the current limit.*

PRBRC

**62. Comment:** We request that the Council look carefully at the UW recommendations and that Dr. Raisbeck be invited by the Council to discuss the findings of the review and recommendations from the literature review and study conducted by him and his associates.

**Response:** *Dr. Raisbeck will appear and provide comments on the UW Report at the October 24, 2008 hearing in Cheyenne.*

EPA

**63. Comment:** Please provide the State's rationale for revising the limit for Sulfates in subsection (b) from a value of 2000 mg/L, which was discussed in the State's Analysis of Comments document prepared for deliberation at the Water and Advisory Board meeting on March 28, 2008, to 3000 mg/L.



**Response:** *The 3,000 mg/l limit on sulfate is the recommendation of the Advisory Board for the reasons discussed in comment #57. It should be noted that the EPA has never developed agricultural water quality criteria and probably lacks authority in that area since the federal Clean Water Act speaks only to insuring that waters of the US are "fishable and swimmable".*

DEP

**64. Comment:** We do not believe the Chapter 2, Appendix H livestock watering standards supersede or control the limits in the proposed Chapter 1, Appendix H (b) or the Ag Use Policy. In fact, additional limits are imposed under Chapter 2, Appendix H only when they are required to assure compliance with the Chapter 1 rules. The Ag Use Policy is intended to implement the Chapter 1, Section 20 rule. Therefore, we request that all references to Chapter 2 be deleted from the Ag Use Policy.

**Response:** *The effluent limits for oil and gas produced water in Appendix H of Chapter 2 are based on "beneficial use" of the water for stock and wildlife watering. Therefore, it must be acknowledged that the effluent limits in Appendix H of Chapter 2 should not be significantly different than the livestock criteria in Appendix H of Chapter 1. Recognition and reference to this relationship appears to be appropriate.*

PAW

**65. Comment:** We oppose any new standards for livestock watering, whether by rule or policy, including any new standards for sulfate or sodium. To that end, two reports, by Penny Hunter have been enclosed for your review.

**Response:** *The referenced report on sulfate was presented to the Advisory Board and was considered by the WQD when it suggested its "compromise" limit of 2,000 mg/l to the Board. The referenced report on sodium was not presented to the Board and WQD recommended the UW report's suggested limit on sodium to the Board.*

*The authors of the UW report and the PAW reports will present their findings to the Council during the hearing process. At this time WQD would prefer to withhold any further opinion on sodium and sulfate limits pending conclusion of the hearings.*

*WQD's data suggests that all existing produced water discharges (CBM and conventional oil and gas) would meet PAW's recommended limits of 3,500 mg/l sodium and 3,010 mg/l sulfate.*

*WQD Data indicates that about 28% of existing conventional oil and gas produced water discharges could not meet the UW recommended limit of 1,000 mg/l sulfate, but that all CBM discharges could meet the UW limit on sulfate. For sodium, about 22% of conventional oil discharges and 2% of current CBM discharges could not meet the UW recommendation.*

	<u>Ambient Background Water Quality</u>
CLT	<p>66. <b>Comment:</b> I am supportive of the background water quality exemption and the livestock watering waiver, and the irrigation waiver. These provisions allow us, the landowners, to make decisions for our operations.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
MCD / YPC / WFBF / RMFU / DEP / PAW	<p>67. <b>Comment:</b> MCD requests that the EQC amend Chapter 1, Appendix H (b) to clarify that, in drainages where there were pre-1998 discharges, background will be considered to be pre-1998 effluent limits or background water quality, whichever is poorer.</p> <p>WFBF, RMFU, and DEP suggests the following language changes be added to subsection (b) of the livestock watering section (<i>italics added / strike through removed</i>):</p> <p><i>“When <del>ambient</del> background water quality is demonstrated to be <del>above of poorer quality than</del> the limits listed above, effluent limits <del>may will</del> be set to <del>that ambient</del> background water quality.” <i>In drainages where there were pre-1998 discharges, background will be considered to be the pre-1998 effluent limits or background water quality, whichever is poorer.</i>”</i></p> <p>This would ensure that it is clearly understood that the pre-1998 uses could continue.</p> <p>DEP states the following language should be added to subsection b of the livestock watering section:</p> <p><i>“In drainages where there were pre 1998 discharges, background will be considered to be the pre-1998 effluent limits or background water quality, whichever is poorer.”</i></p> <p>The evidence clearly supports the assumption that discharges prior to January 1, 1998 have had no adverse effect on agricultural production. Therefore, in those drainages with pre-1998 discharges, background should be identified as the poorer of the pre-1998 effluent limits or background water quality.</p> <p>The following revisions are also needed in Appendix H and the Ag Use Policy (DEP).</p> <p>Appendix H (b) – add italicized language:</p> <p>“In addition to the basic effluent limitations above, the Agricultural Use Protection Policy includes additional limits for livestock protection which may be incorporated into WYPDES permits <i>in drainages where there were no pre-1998</i></p>

	<p><i>discharges</i> when there is reason to believe they may be associated with a discharge”.</p> <p>Ag Use Policy – lines 11 – 13 – add italicized language:</p> <p>“In addition to the basic effluent limitations for livestock watering in Chapter 1, Appendix H and Chapter 2, the following limits for livestock protection may be incorporated into WYPDES permits <i>in drainages where there were no pre-1998 discharges</i> when there is reason to believe they may be associated with a discharge.”</p> <p><b>Response:</b> <i>WQD believes that the proposed language in the third paragraph of Appendix H section (a), adequately addresses the “historic discharge” issue. The WQD does agree that the two paragraphs in the policy portion need clarification and it is suggested that those two paragraphs be deleted and replaced with the following:</i></p> <p><u><i>“An exception to the limits above may be made whenever the background water quality of the receiving water is of poorer quality than that listed or when the livestock producer requests use of the water and thereby accepts any potential risk to his livestock. Waivers provided to livestock producers must be approved by all potentially affected livestock producers and landowners.”</i></u></p>
PAW	<p>68. <b>Comment:</b> PAW believes that, when background water quality is of poorer quality than the limits in either chapter 1, Appendix H or the Ag Use policy, the WQD should be required to set effluent limits to background water quality.</p> <p><b>Response:</b> <i>The WQD prefers to have the flexibility to make that decision on a case by case basis. There may be cases where downstream uses such as drinking water, fish and wildlife, recreation etc. would be adversely affected by increasing the flow volume of poor quality down a tributary drainage.</i></p> <p><u><i>Livestock Watering Waiver</i></u></p>
MCD	<p>69. <b>Comment:</b> The MCD believes that in order to better protect the livestock producer’s right to use produced water, language regarding the livestock water waiver should be changed from “An exception to the limits above may be made...” to “An exception to the limits <i>shall</i> be made.”</p> <p><b>Response:</b> <i>See comment #68.</i></p>
CLT / MCD / YPC /	<p>70. <b>Comment:</b> Requests that the WQD move the background water quality exemption and livestock watering waiver section back into the Chapter 1, Section 20 rule. These sections both relate to Section (b)(i) of Appendix H, and should</p>

<p>WFBF / LRC / PAW / PEI</p>	<p>remain as rule. Only the metals portion should be moved to the Implementation Policy. DEP adds that there was no suggestion by the Advisory Board that these exceptions should apply only to the metals constituents in the Ag Use Policy. The exceptions to the livestock watering standards are extremely important as they assure effluent limits will not be more stringent than background water quality, and they allow livestock producers the flexibility to make sound management decisions. PAW adds that the livestock watering waiver should be included in both Appendix H and the Ag Use Policy.</p>
	<p><b>Response:</b> <i>In reviewing page 102, lines 4-18 of the Advisory Board transcript of their 3/28/08 meeting, the Board voted (4-1) to retain the waiver language in the rule. Therefore, WQD suggests that the waiver language shown in the response to comment #67 be incorporated into the rule as well as being included in the policy section.</i></p>
<p>MCD / YPC / WFBF / DEP / PAW</p>	<p>71. <b>Comment:</b> The livestock watering waiver provision should be amended to provide clarification that a landowner <u>or</u> livestock producer could provide written statement accepting the potential risk to livestock. (MCD / DEP)</p>
	<p>The provision would provide that the waiver would be granted unless the landowner, not being the livestock producer, submits written objections and provides evidence demonstrating the discharge will cause probable harm to other livestock on those same landowner's lands that are under the control of the livestock producer. The provision would provide that other landowners affected by the discharge would submit written objections and provide evidence demonstrating that the discharge will cause probable harm to their livestock. These proposed revisions will assure the livestock producers who want to use produced water are not denied as a result of frivolous, groundless objections. (MCD / YPC / DEP)</p>
	<p>Instead of the currently proposed language, WFBF and DEP suggests the following language be considered:</p>
	<p><i>"Livestock watering waiver – An exception to the limits above may be made whenever the background water quality of the receiving water is of poorer quality than the value listed for the associated pollutant or a landowner or livestock producer provides a written statement accepting the potential risk to his livestock and no other landowner or livestock producer who is reasonably expected to have direct flow from the discharge submits a written objection providing evidence demonstrating probable harm to his livestock."</i></p>
	<p>WFBF believes the proposed wording would provide the flexibility and protection needed by those producers who testified in Thermopolis about the impact that would occur should the wrong standard be applied for livestock. These members provided the Advisory Board with examples of how they were utilizing water with very poor water quality without significant impact to their</p>

operations.

WFBF also suggests this wording be considered for adoption in the implementation policy section.

DEP suggests the following language for the livestock watering waiver (italics added / strike through removed):

*“Livestock watering waiver - An exception to the limits above ~~may~~ will be made whenever the background water quality of the receiving water is of poorer quality than the value listed for the associated pollutant and the landowner requests use of the water and thereby accepts any or a landowner or livestock producer provides a written statement accepting the potential risk to his livestock and no other landowner or livestock producer who is reasonably expected to have direct flow from the discharge submits a written objection providing evidence demonstrating probable harm to his livestock.”*

DEP notes that Chapter 2, Appendix H, Sections (c)(ii) and (d)(ii) provide exceptions to the livestock watering standards where a landowner waiver is submitted. Thus, it is appropriate to include the background exception and livestock watering waiver in both the Chapter 1, Appendix H rule and the Ag Use Policy.

**Response:** *WQD opposes this suggestion. If effluent does not meet the adopted livestock watering criteria and a downstream landowner has indicated that he does not want the water, that landowner should not have to bear the additional burden of proving the water quality is unacceptable in his individual case.*

*In the suggested waiver language provided in response to comment #67, the waiver request would come from the “livestock producer”, but “potentially affected downstream users” would also have to be satisfied. The comment does raise the issue of the potential for a difference of opinion between the livestock producer and the landowner when those are not the same: For example, a rancher with a lease on BLM land may be interested in a waiver, but the landowner (the BLM) may be opposed. The most conservative approach would be that a waiver request would have to come from both the landowner and producer. The most liberal approach would be that suggested with this comment which would allow a waiver to be granted if either the producer or the landowner wanted one. WQD believes that the language suggested in the response to comment #67 provides the opportunity for waiver with reasonable assurance of protection to all potentially affected parties.*

Irrigation Uses – Section (c)

WOC / WWP	<p><u>General</u></p> <p>72. <b>Comment:</b> Regarding the EQC ruling discussed in comment # 99, just as important was the elimination of the option that DEQ had put into the general permits of allowing the CBM industry to build in-channel 50 year / 24 hour reservoirs and (if built) discharge water of a lower quality (7500 for EC and no limit for SAR) into those on-channel reservoirs. The EQC eliminated this option on the ground that it appeared to them to be ill-advised to allow water of such low quality to be discharged directly into the drainage (i.e. on channel). The EQC decided to eliminate reservoirs as a permit option.</p> <p><b>Response:</b> <i>We do not understand the relevance of this comment. The proposed Appendix H has no provisions regarding on-channel containment options.</i></p>
WOC / WWP	<p>73. <b>Comment:</b> At a minimum, WOC and WWP ask that the EQC at least follow the precedent it has already set with its ruling on the Willow Creek and Pumpkin Creek Watershed General Permits. The DEQ's Agricultural Use Policy should, at a minimum, reflect the outcome of this case, and recognize that bottomlands, riparian areas, and native grasses deserve protection, and the water quality effluent limits need to be set accordingly.</p> <p><b>Response:</b> <i>Appendix H has been designed to establish appropriate effluent limits based upon site specific circumstances.</i></p>
MEW	<p>74. <b>Comment:</b> The revised Appendix H, as it now stands, does nothing to protect the agricultural uses of our lands. The rights of citizens must be protected. The EQC must provide protection of our lands for agricultural uses. We need strict rules and regulations to provide this protection.</p> <p><b>Response:</b> <i>Appendix H sets up a method for developing effluent limits for EC and SAR on produced water discharges based on a tiered approach. Tier 1 limits are based on 100 % crop production of the most sensitive crop plant. Tier 2 and Tier 3 look at site specific soil and water quality for estimating background conditions. Both of these approaches were developed to ensure that the existing quality of the background conditions (soil and water) is similar in nature to the quality of the produced water discharges. The proposed rules focus on both active irrigation and naturally irrigated lands (bottom lands) for these protections. DEQ believes the provisions of Appendix H offer the maximum use of produced water while ensuring water quality is protective of agricultural uses.</i></p> <p>75. <b>Comment:</b> As a rancher on Wildcat Creek in Campbell County, with irrigation rights on about 285 acres dating back to the early 1900's, there has never been a problem with plants and trees dying until the beginning of CBM</p>

discharges in 1999. All the natural and native grasses and trees in the upper and lower ends were dead by 2000. These discharges have also resulted in soil erosion and very steep banks that will not support vegetation.

I sued DEQ and Redstone Resources when no action was taken to protect my water rights and to protect the alfalfa meadows and grasses along the creek. Prior to the completion of the hearings all parties settled upon EC and SAR levels which would be set at levels agreed upon by both sides. However, problems with water quality persisted.

Until the CBM discharges, I was able to grow large quantities of hay for a cheap winter supply. The indiscriminate dumping of CBM water is threatening this ranch and its ability to be an economically viable operation.

*Response: The effluent limits for discharges of produced CBM water in Wildcat Creek are not based upon the procedures in the proposed Appendix H, nor will they be affected by this rulemaking. The limits on discharges that may reach the Swartz ranch are based upon a legal agreement to which the Mr. Swartz is a party.*

MCD

76. **Comment:** The MCD continues to believe that the Agricultural Use Protection document places additional and incremental burdens on the agricultural producer, agricultural community, the local community, and the State of Wyoming. While revisions may ensure practical water quality, the document must truly protect the agricultural community and bona fide agricultural producers.

*Response: Appendix H and the associated policy have been developed to comply with the narrative standard of Chapter 1, Section 20 which stipulates that the quality of Wyoming surface waters will be maintained to protect the agricultural uses of that water. DEQ recognizes the benefit of produced water discharges for both irrigation and livestock uses and has developed the proposed Appendix H to offer every opportunity for applicants to show that their proposed discharges will maintain the background water quality.*

MCD

77. **Comment:** The MCD presents to the EQC for consideration that a net environmental benefit, meaning the benefit to livestock and wildlife and an increased plant diversity, merely by having water provided (by discharge water) outweighs the potential harm to initially existing vegetation in or near the channel. This has been documented by field tours and testimony. The flow of produced water that meets livestock water standards and that flows down the channel through the watercourse easement therefore generally provides net environmental benefits and should be considered.

**Response:** *Comment noted.*

PEI	<p>78. <b>Comment:</b> Putting end-of-pipe EC or SAR limits on water discharged into on-channel impoundments that may later discharge under "wet" conditions (i.e. precipitation) is not a reasonable approach to protect irrigated crops at downstream locations. This blanket requirement on discharges to impoundments was the result of inadequate consideration to the factors prescribed in Wyoming Statute §35-11-302(a)(vi), specifically the effects of a particular discharge vs. the economic costs regulating it. While precipitation-driven overflows from on-channel impoundments may reach irrigated lands in a given drainage, discharges into such impoundments can themselves have no adverse effect on irrigation, whereas the treatment required to achieve irrigation-protective of - Tier I, II, III - in impounded water will impose a major cost burden and reduce the benefits conferred by CBM production on Wyoming and its citizens.</p> <p><b>Response:</b> <i>WDEQ is aware of very few cases where a tier 2 irrigation study has been completed, and treatment is still necessary for discharge into an on-channel reservoir. However, where a tier 2 study reveals that the EC of the discharge is, still too high for discharging untreated effluent into on-channel reservoirs above an irrigation use, the operator still has several alternate options: A tier 3 approach, an irrigation waiver, off-channel discharge, moving the outfall to a location downstream of the irrigation use, or treatment. Whether or not to employ treatment is a decision made by the operator. In no case does WDEQ establish a pre-emptive requirement for treatment in order to discharge.</i></p> <p><u>Definitions / Provisions</u></p>
WOC / WWP	<p>79. <b>Comment:</b> The DEQ now only recognizes areas of streams that support native grasses that are at least 20 acres in aerial extent (or nearly contiguous areas that total at least 20 acres) and 50 feet wide, adjacent to a stream. Below this threshold, the DEQ does not require discharge limits for EC and SAR necessary to protect native grasses. The EQC via the Willow Creek and Pumpkin Creek Watershed General Permit hearing ruling has now gone beyond that policy and has required that all of the watersheds for both Willow and Pumpkin Creek, which were found to contain native grasses and riparian areas, must be protected so that the water quality of the CBM produced water is sufficient to protect those native grasses. The 20 acre/50 feet threshold was eliminated in favor of this broader protection. The drainages of Willow Creek and Pumpkin Creek were thus protected for native grasses - without regard for this 20 acre threshold requirement - from the headwaters to the mouth of the creek.</p> <p><b>Response:</b> <i>The EQC did not significantly endorse or reject the 20 acre/50 foot threshold for bottomlands in the Willow/Pumpkin Creek hearing. They were presented with testimony that indicated that bottomlands significant to agriculture existed in the drainage and concluded that the associated EC and SAR limits (calculated according to the Tier 1 procedure) should be applied.</i></p>



WOC /  
WWP

**80. Comment:** The idea that a 50 feet / 20 acre threshold limit, should be arbitrarily imposed upon the protection of native grasses is not tenable. The better approach is to set effluent limits that will be protective of all native grasses that grow in riparian areas. Most streams in Wyoming have riparian areas that support native grasses. Frequently these riparian areas are found close to the mouth of the streams, where they flow into larger rivers, such as the Powder River. Therefore, the entire length of most Class 3 (intermittent and ephemeral streams) as well as Class 2 streams will need protection for riparian areas throughout the entire length. Basically, this means that all streams should have a protection level of 2200 for EC and 10 for SAR.

**Response:** *The threshold for determining agricultural significance is not arbitrary. The 50 feet / 20 acre threshold for naturally irrigated lands was arrived at by an interpretation of infra-red photography of a number of watersheds where the protection of naturally irrigated bottomlands was raised as an issue in the past and DEQ included such protection in the permits that were issued. Through an analysis of aerial photography, the presence of 20-acre parcels was identified as a common occurrence in all of those watersheds and it appears to be a simple, easily measured criterion for determining which watersheds contain an agriculturally significant amount of naturally irrigated lands.*

*Regarding the portion of the comment about suggested EC and SAR limits, The determination of appropriate EC and SAR limits are based on site specific conditions using the tiered approach described in Section (c). DEQ does not agree with setting arbitrary limits for all Wyoming surface waters when site specific data will provide protective limits and maximum use of produced water for agricultural purposes.*

MEW / BR  
/ BB / NRS  
/ NJM

**81. Comment:** Water quality limits for SAR and EC must be applied to ALL "Naturally Irrigated Lands" whether there is an established stream channel present or not. Bottomlands are critically important to our livestock and wildlife use. Limits on size should not be imposed. BB adds that many small, unchanneled draws collectively compose a grazing system for operations across the state. To place an irrational and unrealistic 20 acre limit to define significance is not in accord with how ranches operate in Wyoming. PRBRC adds, measurable decrease in productivity and forage production continue to occur in these critically important grazing lowlands where effluent discharges are often conveyed. We urge the following language change:

*"All draws and bottomlands that provide forage yields that are greater than that of surrounding natural upland sites must be protected."*

**Response:** *DEQ agrees that small bottomlands are important for livestock and wildlife use within the context of the response to comment # 80. When making the 20 acre size determinations, the presence of smaller bottomlands are included in*

*the calculation for the entire drainage affected by the discharge. It is rare that one 20 acre parcel of land drives the determination, but rather several areas of smaller dispersed parcels along the stream channel. DEQ does not support the suggested language.*

PRBRC

**82. Comment:** The definition of "naturally irrigated lands" should delete the requirement that the channel be "underlain by unconsolidated material and on which the combination of stream flow and channel geometry," and which are the only elements considered for definition of enhanced productivity. Range bottomlands may not fall within this overly strict definition, yet they are significant contributions to cattle and wildlife production.

**Response:** *DEQ suggests revising the second sentence in Section (c)(i)(B) as described below (remove strike through language):*

*"Naturally irrigated lands are those lands where a natural stream channel is underlain by unconsolidated material and on which the combination of stream flow and channel geometry provides for enhanced productivity of plants used for agricultural purposes."*

*In practice, DEQ evaluates all bottomlands and riparian areas situated along a stream channel affected by a potential discharge through an evaluation of infrared aerial photography or other methods. Although the criteria above which has been struck are almost always attributable to naturally irrigated lands being targeted, there are areas where a channel may empty into a flood plain and then collect back into a stream channel at lower elevations. In these instances DEQ would evaluate the entire drainage area regardless of channel geometry and the presence of a stream channel if affected by a proposed discharge.*

PRBRC

**83. Comment:** Page H-2 (iv) cites permit limits set only for other relevant water uses. This appears to ignore language under (B) which defines "Naturally Irrigated Lands." The language should read as follows: "(iv) *If there are no pre-existing diversions or naturally irrigated lands within reach of a discharge...*" Areas of consideration need to be restated here.

**Response:** *Section (iv) referred to in the comment was intended to address issues directly related to "Artificially Irrigated Lands." DEQ agrees that the language should include "naturally irrigated lands" because of the way the document is formatted. This section can and does apply to naturally irrigated land as well as artificially irrigated lands. DEQ suggests the EQC approve the following changes to Section (c)(iv) (insert italics):*

*"(iv) if there are no pre-existing diversions or naturally irrigated lands within the reach of a discharge, if the water will be impounded or managed so as not to reach a diversion or naturally irrigated lands during the irrigation season, or if the discharge will not reach an irrigated field, either because of natural conditions*

<p>MCD</p>	<p><u>or water management techniques, then permit limits will be established to protect other relevant water uses (e.g. livestock watering, wildlife, aquatic life, etc.)”</u></p> <p>84. <b>Comment:</b> Local soil and vegetative conditions, coupled with the ambiguity and subjectivity of determining and defining measurable decrease in crop production on “naturally irrigated lands” will lead to a myriad of lawsuits, a game of controlling watersheds through control of strategic land parcels, and will be exacerbated by the ability of unaffected third parties to sue on behalf or against public land management agencies.</p> <p>Recognizing the potential of harm to naturally irrigated lands, it is important that the EQC balance the environmental and agricultural benefits of having water for livestock. Effects on “naturally irrigated lands” must be determined in some other manner with the ability for local considerations including livestock production. Therefore, the MCD asserts that the land classification for “naturally irrigated lands” must be removed from Chapter 1, including Appendix H.</p> <p><b>Response:</b> <i>The protection of naturally irrigated lands (bottomlands) is one of the more controversial issues in the proposed rule. During the development of the approach, some commented that bottomlands should not be protected at all. The opposing viewpoint is that all stream channels should have the same EC and SAR limits as artificially irrigated lands. Both of these positions are at the extreme ends of the issue and neither would produce a practical or reasonable water quality regulatory procedure.</i></p> <p><i>We continue to believe that naturally irrigated lands produce a significant amount of forage for both livestock and wildlife. The enhanced vegetative productivity found may be adversely affected by increases in EC and SAR the same as artificially irrigated lands and, therefore, the DEQ needs to identify where significant naturally irrigated vegetation occurs and apply appropriate water quality limits on produced water discharges.</i></p> <p><i>We believe the proposed Appendix H appropriately balances the two competing perspectives by providing a practical and clearly understandable procedure for identifying which bottomlands will receive protection and the flexibility to establish the appropriate effluent limits in each circumstance.</i></p>
<p>MCD / YPC / PAW</p>	<p>85. <b>Comment:</b> Comment # 84 notwithstanding, if a landowner represents to the DEQ/WQD that the landowner does not have naturally irrigated lands in need of protection then DEQ should accept the landowner’s statement. PAW adds that DEQ should be required to accept the landowner’s statement.</p> <p><b>Response:</b> <i>DEQ evaluates all available sources of information to make a determination about the presence and area of naturally irrigated lands to determine the need for effluent limits.</i></p>

MCD	<p>86. <b>Comment:</b> Comment # 84 notwithstanding, the MCD requests that the definition of "naturally irrigated lands" be changed as follows, with the additional italicized qualifying statement:</p> <p><i>"Naturally Irrigated Lands" means lands along stream channels that have enhanced vegetative production due to periodic natural flooding or sub-irrigation from the stream receiving the permitted discharge."</i></p> <p>Rationale: the water creating the "naturally irrigated lands" must be demonstrated to be inclusive of the effluent and not from unrelated springs, aquifers, or tributaries.</p> <p><b>Response:</b> <i>The suggested language and rationale is not supported nor clearly understood by DEQ. The proposed protections are in place to ensure that those already established naturally irrigated lands, whether due to appreciable flow or springs, will not be impacted by the water quality of the added discharge. DEQ will only evaluate the need for effluent limits on streams affected by the discharge. The criteria used to make that determination is stipulated in Section (c)(iii).</i></p>
JBH	<p>87. <b>Comment:</b> "Naturally irrigated lands" should be limited to lands which are irrigated at least once a year and that the plants grown on "naturally irrigated lands" are cropped or otherwise managed to improve yields of desirable species. The term should also require the "naturally irrigated lands" consist of plants which are present in such quantity to provide significant economic value or animal nutritive value <i>and are actually used for such purposes.</i></p> <p><b>Response:</b> <i>DEQ believes that naturally irrigated lands are appropriately characterized in the draft rule, as written. DEQ would not require that lands be specially managed in order to protect them as irrigated areas. If the lands meet the description of naturally irrigated lands contained in the draft rule, then they are agricultural lands potentially affected by the water quality of the supplying stream. Therefore, they should be protected accordingly.</i></p>
YPC	<p>88. <b>Comment:</b> Yates supports the Advisory Board's decision to include the size requirements set forth in the current draft's definition of "naturally irrigated lands" in Appendix H (c)(iii).</p> <p><b>Response:</b> <i>Comment noted.</i></p>
YPC / PEI	<p>89. <b>Comment:</b> Regarding the above comment, while some have taken the position that a recent decision in a permit appeal requires the elimination of this size requirement, the precedential effect of that decision is limited. The Findings of Fact set forth in the final order for the Pumpkin Creek and Willow Creek General permits appeal stated that only that "the size (area) of naturally irrigated bottomlands protected by effluent limits under the Pumpkin Creek and Willow Creek General Permits will vary by size." Moreover, the EQC's decision in that</p>

appeal was based on questionable testimony that such lands existed in some reaches of the drainages but there was little or no testimony regarding the actual size of the lands. Appendix H already has a mechanism for determining whether "naturally irrigated lands" are present.

It is hard to believe that insignificant areas (those smaller than set forth in Appendix H) would be considered as having agricultural value. This position requires protection of insignificant areas at the expense of other benefits. A natural extension of this line of thinking would be that an area of ten square feet of alfalfa must be protected at the expense of all other uses of the water.

PEI also contends that the assertions made by WOC / WWP are taken out of context as to how the decisions made by the EQC are relevant to the proposed Appendix H.

**Response:** *We agree and continue to support the use of the threshold size criteria for determining agricultural significance.*

DC

90. **Comment:** Please explain why bottomlands are not protected in this policy if they are below 20 acres or 50 feet wide? These bottomlands are the most productive on my place and should be protected regardless of size. How did DEQ arrive at this arbitrary size?

**Response:** *Bottomlands are protected within the context of Section (c)(iii), which includes the 20 acre / 50 feet threshold. When evaluating a drainage against the 20 acre / 50 feet threshold, all naturally irrigated lands (bottomlands), affected by a discharge are assessed. If the cumulative acreage of those smaller parcels is 20 acres or more than EC and SAR limits are added to a permit. For the reason why these threshold values were chosen see response to comment # 80.*

WPT

91. **Comment:** How far downstream from the discharge will these rules apply? Page H-3 (Sections ii and iii): the statement that WYPDES effluent limits for EC and SAR will be applied in all instances "where the produced water may reach irrigated lands" should be changed to state "where the produced water discharge may compose a significant portion of the irrigation water supply for naturally or artificially irrigated lands."

**Response:** *The proportion of effluent in the irrigation water supply can be factored into the calculation of appropriate effluent limits for the contributing outfall(s). For example, discharges into perennial water irrigation supplies will receive consideration for the dilution that will take place prior to reaching the location of irrigation use. This is a more precise approach than attempting to guess what constitutes a "significant portion."*

WPT

92. **Comment:** There are historic but unused or non-maintained irrigation structures that exist in Wyoming. If a discharge is sent to this historic irrigation

	<p>feature, must the waters meet the requirement of this standard at this structure?</p> <p><b>Response:</b> <i>DEQ will protect existing irrigation uses, where they occur on the ground. If an irrigation structure is no longer functioning, and the associated lands are neither naturally nor artificially irrigated, then there would be no need for irrigation protection on those lands.</i></p>
EPA	<p>93. <b>Comment:</b> Does paragraph (c)(vi) only address proposed discharges, or does it also include current discharges?</p> <p><b>Response:</b> <i>DEQ will establish effluent limits when a discharger applies for a WYPDES permit or WYPDES permit renewal.</i></p>
WPR	<p>94. <b>Comment:</b> Williams remains concerned about the broad presumption of naturally irrigated lands. Appendix H states that infra-red imagery, surficial geologic maps, wetland mapping, landowner testimony, site-specific assessment or any combination of these sources may be used to establish that lands are naturally irrigated. Each of these information sources presents a snapshot of conditions at a specific time, and conditions may have changed e.g., wetlands mapping. In addition, a permit applicant has no method by which it could disprove the presumption of sub-irrigation presented in Appendix H. The application of EC and SAR effluent limits should not be applied unless there is some presence and evidence of the ability to irrigate with a surficial flow. Williams strongly encourages DEQ to evaluate multiple sources of information rather than one source when confirming the existence of naturally irrigated lands. Furthermore, the DEQ should not be able to rely solely upon landowner testimony which is inherently biased to establish the existence of naturally irrigated lands.</p> <p><b>Response:</b> <i>DEQ makes determinations about the presence and extent of naturally irrigated lands by those resources available when developing permit limits for discharges. Infra-red aerial photography is a good way for making these determinations due to the fact that an entire drainage can be evaluated for the presence of bottomlands and riparian areas. The original set of photographs that have been available to the DEQ were taken in 2002. Although only a snapshot in time, these photos were taken during a drought period and should indicate those areas where naturally irrigated lands are able to persist under harsh conditions. DEQ now has photos taken in 2006 and will have another set of photos available in 2010. The combination of aerial photo review and other resources such as ground truthing, or other GIS layers such as the USGS National Wetlands Inventory, provide DEQ with the needed tools to make determinations with confidence that they are reflective of on the ground conditions.</i></p>
DEP	<p>95. <b>Comment:</b> The CWA and the NPDES program acknowledge the beneficial value of the surface discharge of produced water in high plain, semi-arid states</p>

like Wyoming. The source and supply of surface water are extremely scarce and in many areas of the state produced water is vital to livestock and wildlife. The agricultural and environmental benefits from the flow of stock water far outweigh any potential harm to vegetation in the stream channel. The imposition of crop effluent limits for "naturally irrigated lands" has the practical effect of prohibiting the discharge of water that meets livestock standards.

*Response: DEQ has developed the proposed Appendix H to be protective of both livestock watering use and crop irrigation. Both of these components work together to ensure discharges are only approved when all agricultural uses are protected as required by the narrative standard in Chapter 1, Section 20. There is no priority system of uses in Section 20 nor does the DEQ suggest there should be. Both uses must be protected while offering every opportunity for beneficial use of the discharge water which is understood to be a valuable and wanted resource.*

DEP / PEI

**96. Comment:** We oppose the imposition of water quality standards for naturally irrigated lands. Chapter 1, Section 20 specifically refers to "crop" production and we believe this includes only tilled, mechanically irrigated, and harvested crops. "Naturally irrigated lands" do not produce a "crop", are inadvertent, naturally occurring stretches along ephemeral channels that may appear and disappear from season to season and over time, and therefore are beyond the scope of the Section 20 rule as well as the Section 20 rule as well as the Environmental Quality Act (DEP). The term "crop production" clearly implies active management of land, including irrigation, in order to "produce" on or more "crops" (PEI).

*Response: The protection of naturally irrigated lands (bottomlands) is one of the more controversial issues in the proposed rule. During the development of the approach, some commented that bottomlands should not be protected at all. The opposing viewpoint is that all stream channels should have the same EC and SAR limits as artificially irrigated lands. Both of these positions are at the extreme ends of the issue and neither would produce a practical or reasonable water quality regulatory procedure.*

*We continue to believe that naturally irrigated lands produce a significant amount of forage for both livestock and wildlife. The enhanced vegetative productivity found may be adversely affected by increases in EC and SAR the same as artificially irrigated lands and, therefore, the DEQ needs to identify where significant naturally irrigated vegetation occurs and apply appropriate water quality limits on produced water discharges.*

*We believe that Appendix H appropriately balances the two competing perspectives by providing a practical and clearly understandable procedure for identifying which bottomlands will receive protection and the flexibility to establish the appropriate effluent limits in each circumstance.*

DEP	<p>97. <b>Comment:</b> The protection of “naturally irrigated lands” with irrigation water quality standards injures existing water rights and interferes with the state’s right to flow waters down watercourses. The Constitution provides that the State Engineers and Advisory Board of Control have the sole authority to regulate the quantity and flow of water. The courts are the proper authority to address claims that a use of water causes property damage or constitutes a nuisance to a property owner. We believe the formal opinion issued by the Attorney General on April 12, 2006, as well as the Attorney General’s informal opinion to the EQC dated July 12, 2006, prohibit the protection of “naturally irrigated lands” at the expense of the flow of livestock water.</p> <p><i>Response: Crop and forage production on agriculturally significant bottomlands is an agricultural use that may be adversely affected by the discharge of pollution into the associated stream channels. The establishment of appropriate water quality limits on those discharges of pollution does not interfere with the authorities or jurisdiction of the State Engineer.</i></p> <p><u>Tier 1</u></p>
BLM	<p>98. <b>Comment:</b> The Hanson Chart on page H-7 is range limited. A listing of the formulas and or an additional projection of the chart over a larger range would be helpful. A second scale on the X axis for TDS as well as conductivity would also be helpful.</p> <p><i>Response: The Hanson chart is provided for general reference only. When setting limits on SAR, the agency uses the mathematical formula which is the basis of the Hanson chart. While there is a somewhat close relationship between EC and TDS, it is not consistent in all circumstances. For that reason, the agency believes it should not confuse the issue by including a separate TDS line on the x axis of the Hanson chart.</i></p>
WOC / WWP	<p>99. <b>Comment:</b> The DEQ should have taken the Willow Creek and Pumpkin Creek Watershed General Permit hearing ruling by the EQC into account before it went to public notice on Appendix H. The ruling which was based on an appeal related to the discharge of coal bed methane water, required DEQ to amend the two general permits. The EQC decided that more water quality protection was needed for the agricultural uses of these two watersheds. It was determined that an EC of 1330 and SAR of 7 was sufficient quality to allow for the production of alfalfa. Areas where alfalfa was not being grown, the EC levels were set at 2200, and SAR at 10, allowing sustainable growth of meadow grass and other native grasses. This eliminated the limits set by DEQ for all non-irrigated lands of 7500 for EC and no limits for SAR. The DEQ had only set the EC and SAR limits to protect livestock and wildlife from ingesting CBM produced water. The EQC decision recognizes the importance of native grasses</p>



to ranchers, as an agricultural use, as forage for livestock, which ranchers depend on for their livelihoods.

**Response:** *WQD has taken into consideration the rulings of the EQC related to the Willow Creek and Pumpkin Creek Watershed appeal. The essence of the EQC decision in the Willow and Pumpkin Creek case was to uphold the provisions of the Ag policy as it now reads. The issue in the appeal was that the bottomland provisions in the Ag policy were not used to set limits in the Pumpkin and Willow Creek permits because those permits were issued before the bottomland protections were adopted. The limits ordered by the Council represent an application of the Ag Policy, not a revision to it.*

WOC /  
WWP

100. **Comment:** The WOC and WWP believe that the Powder River Basin should be protected for the most sensitive crop that can be grown in the area – alfalfa. The EQC should therefore protect all streams in the Powder River Basin at a limit of 1330 for EC and 7 for SAR. Furthermore, the WOC advocates that all streams in Wyoming be protected for the raising of alfalfa, and be required to meet a maximum effluent limit of 1330 for EC and 7 for SAR.

**Response:** *The irrigation standard that Appendix H interprets is "no measurable decrease in crop production". As proposed, the application of Tier 1 would result in a 1330 EC limit and an SAR limit of 7. A Tier 2 limit would be based on background water quality or background soil salinity. Both achieve the standard.*

MEW / BR  
/ BB /  
PRBRC /  
NRS / NJM

101. **Comment:** Any and all limits for CBM water discharges, in order to protect our lands, should not exceed an EC of 1330 or an SAR of 5. (MEW / BR / PRBRC / NRS). BB states an EC not to exceed 1,500 and SAR no greater than 5 should be the uppermost limits to functionally protect soils, vegetation and productive capacity (BB). Keep it simple and limit industry to an SAR of 4 and an EC of 1500. We should follow the example of Montana where ephemeral and perennial drainages are protected with low EC and SAR numbers (DC). PRBRC / NJM asserts that these limits are necessary (EC 1330 / SAR 5), based on scientific literature that demonstrates the need for these more protective limits for current and existing agricultural uses. PRBRC cites Suárez, Wood, and Lesch – Salinity Laboratory USDA-ARS report to EPA, June 30, 2006 that describes significant increases in infiltration time in various soil types at SAR increases from SAR 2 to SAR 4, SAR 5, and SAR 6. PRBRC further request that DEQ make this entire study available to the EQC.

**Response:** *The DEQ believes the current approach for developing permit limits is appropriate for protecting irrigation uses. During the development of the tiered approach it became apparent that there was vastly differing opinions as to what type of EC and SAR limits should be applied to discharge permits. To address the science behind the proposed approaches, DEQ invited a panel of professional scientists to discuss the merits of setting effluent limits as proposed.*

<p>MEW / BR / MLM / BB / PRBRC / NRS / NJM</p>	<p><i>The results of that meeting plus the years of public meetings have resulted in refinements to current procedures that allow the use of produced waster while ensuring protection of artificially and naturally irrigated lands.</i></p> <p>102. <b>Comment:</b> Limits should be applied “year-round” to protect artificially and naturally irrigated lands. (BR / MLM / NRS). Water is retained in soils and in mass bank storage along drainages during the non-growing season. The impacts of low quality water on soils and plants will be obvious during the following growing periods (BB). Salts and sodium applied during non-irrigation seasons are still absorbed and remain in the soil profile, causing the same level of problems during subsequent growing seasons (PRBRC).</p> <p><b>Response:</b> <i>DEQ agrees that year-round water quality protection is appropriate for naturally irrigated lands. However, artificially irrigated land may have a non-irrigation season, where water in the stream does not make contact with irrigated fields and naturally irrigated lands are not present.</i></p>
<p>JBH / PEI</p>	<p>103. <b>Comment:</b> The scientific evidence demonstrates that default effluent limits for irrigation should be based on more state-specific data (such as the Bridger Plant Material Center study) and not generalized studies that do not take into account Wyoming soil characteristics. Appendix H relies on the Salt Tolerance Database by the WSDA Agricultural Service for establishing Tier 1 “default” limits. This is inconsistent with the Advisory Board’s recommendation that limits be adopted pursuant to Kevin Harvey’s proposed limits of EC 2700 and an SAR limit of 16 (JBH). DEQ has not mentioned that Mr. Harvey’s recommendation that the default EC limit to protect alfalfa should be set at 2200 <math>\mu\text{S}/\text{cm}</math> based on research in the North Great Plains and on historical alfalfa yield data. The Advisory Board has not rescinded its recommendation of Mr. Harvey’s recommended EC limit of 2700 and EC cap of 16 since the previous proposed version which was sent to the EQC in February 2007 (PEI).</p> <p><b>Response:</b> <i>The use of the USDA salt tolerance database as the primary reference for establishing default EC limits has been the subject of much discussion during the development of the policy that is now proposed as a rule. It is an accepted reference and its use in this rule was approved by the Water and Waste Advisory Board on March 28, 2008.</i></p>
<p>LCM</p>	<p>104. <b>Comment:</b> I believe Tier 1 to be appropriate.</p> <p><b>Response:</b> <i>Comment noted.</i></p>
<p>PRBRC / NJM</p>	<p>105. <b>Comment:</b> Where “Default limits for EC and SAR <u>may</u> be used where the quality of the water...” Use of the permissive “may” is not a protective measure that assures maintenance of the existing condition. The word “shall” must be substituted to avoid harm and reduce risk.</p>

**Response:** *If a discharge is able to meet Tier 1 default limits then it is likely that those limits will be placed in the permit. However, all three approaches for setting limits (Tier 1 -3) are considered protective of irrigation uses: Tier 1, associated with protection of the most sensitive crop affected by the discharge, Tier 2 and Tier 3 accounting for the background surface water quality of the affected lands. Use of the word "shall" does not allow the needed flexibility to address site specific conditions.*

PRBRC

106. **Comment:** The Chapter 1, Section 20 standard is to allow "no measurable decrease in crop or livestock production." If, as DEQ has determined, the default limits are protective and will prevent such a measurable decrease, then those limits should be standard and not the exception that in practice only apply where permitted discharges are of exceptionally high quality. The rule recognizes scientifically defensible Tier 1 default limits deemed to be protective of agriculture, and then defeats their purpose by allowing Tier 2 and Tier 3 mechanisms for avoiding the limits.

**Response:** *All three tiers (Tier 1 - 3) have been developed to meet the "no measurable decrease" threshold of Section 20. There are two fundamental approaches for ensuring protection of irrigation uses. Tier 1 addresses the most sensitive crop affected by the discharge while Tier 2 and Tier 3 account for the background surface water quality of the affected lands. The Tier 1 option can be applied state wide with a minimum amount of information but will most often result in more stringent limits due to the uncertainty of site specific conditions. Tier 2 and Tier 3 take into consideration site specific conditions by requiring site specific data and being more reflective of the affected lands, and will most often be less stringent than Tier 1 default limits.*

WPR /  
DEP

107. **Comment:** The proposed rule states that Tier 1 default EC limits will be based upon 100% yield threshold values for soil EC as reported by the USDA Agriculture Research Service Salt Tolerant Database. Williams does not believe that the use of default EC limits should be based on tolerance values for the most sensitive crop or upon 100% yield threshold values. The assumption of 100% crop yields is faulty, given the growing conditions in the PRB e.g., a lack of precipitation, poor alkaline and saline soils and intermittent flows. To the extent such criteria are used, calculated values should be based on data which more accurately reflects soil chemistry and crop production in the PRB and Wyoming, not California, which is the source of the USDA Database (WPR).

It is widely recognized that land in Wyoming does not produce 100% yield, which is why agricultural land sales and leases are based on animal carrying capacity. The Chapter 1, Section 20 rule protects against a measurable decrease in actual existing crop production and requires consideration of actual, site specific crop production and management practices. There is no practical scientific basis for protecting a "theoretical 100% yield", and the Tier 1 default limits for EC and SAR are unreasonable, technically impracticable, and represent

	<p>a complete departure from the site-specific narrative standard in Section 20 (DEP).</p> <p><b>Response:</b> <i>Identifying site-specific irrigation conditions would be the purpose of conducting a tier 2 study, as outlined in the draft rule. The Tier 1 default limit is simply a conservative approach to be used in the absence of a Tier 2 study. In addition, DEQ does not assume that crops in Wyoming are realizing 100% yield. Where employed, what the Tier 1 default limit provides is an assurance that any reduction experienced in crop yield (from the 100% optimum) is not the result of salt in the upstream discharges.</i></p>
WPR	<p>108. <b>Comment:</b> The definition of irrigation season is overly broad. It is not reasonable to assume that the irrigation season in Wyoming is year-round for passively irrigated lands, given the variation and intensity of storm events supplying water to ephemeral or intermittent drainages used for irrigation purposes.</p> <p><b>Response:</b> <i>Naturally (passively) irrigated lands are provided protections year-round because there are no controls in place that regulate the flow of water to the affected land. In these locations, DEQ believes the areas should be protected throughout the entire year. Where controls are in place or there is a set time frame when crop production is likely to occur, then the time frame associated with those limits can be adjusted.</i></p>
WPR	<p>109. <b>Comment:</b> Williams believes that the tiered approach for determining irrigation limits is essential for address a variety of background water quality conditions and quality of discharges in different drainages throughout Wyoming, and particularly in the Powder River Basin. In certain but not all circumstances, a proposed discharge of produced water may be deemed relatively good quality or the irrigated crops potentially affected are salt tolerant. In these cases, the Tier 1 default EC and SAR limits, although overly conservative and without sufficient supporting credible evidence, may be achievable.</p> <p><b>Response:</b> <i>Comment noted.</i></p> <p><u>Tier 2 and Tier 3</u></p>
MEW / BR / MLM / BB / DC / NJM	<p>110. <b>Comment:</b> Please eliminate the implementation of Tier 2 and Tier 3 studies proposed in Appendix H. This is merely a ploy by the CBM industry to allow the discharge of higher levels of sodium and salt. These high levels allowed by Tier 2 soil sampling has polluted and impacted drainages and soils (MEW / BR / MLM). Tier 2 studies should be applied infrequently and with much more scientific credibility (BB). The proposed Tier 2 soil analysis opens the door for all sorts of manipulation of data and will result in high EC and SAR numbers (DC). The Tier 2 concept involves arbitrary and scientific invalid soil</p>

sampling, the incorrect application of the Hanson diagram (which was never intended for use on such discharges), the use of an incorrect equation to establish SAR and the misapplication of that incorrect equation. Soils tested this way for a Tier 2 analysis by industry consultant K.C. Harvey have resulted in EC's as high as 6,000 and SAR's over 25 (PRBRC).

**Response:** *DEQ believes the Tier 2 and Tier 3 methods are appropriate for setting effluent limits that reflect background conditions of the target drainages when the produced water is of poorer quality than the calculated Tier 1 levels. These two options were developed with the recognition that surface geology and surface water quality vary throughout the state and that Tier 1 default limits may be overprotective at many locations.*

*The Tier 2 concept is neither arbitrary nor invalid and will likely be apparent to the permit writer if collected data is manipulated. The method proposed requires taking a certain number of random samples at 12 inch increments, in varying terrain types, and compositing the incremental samples of each terrain type for EC analysis. An average is taken of the samples and assessed for statistical confidence. The result is a value that represents the natural background water quality for the entire area affected by the discharge regardless of higher or lower concentrations at any given sampling location.*

*The results of the Tier 2 analysis by K.C. Harvey if conducted correctly would be representative of the actual background conditions for that particular drainage. DEQ would set effluent limits to reflect the background water quality.*

*Regarding the use of the incorrect equation to establish an SAR limit, see response to comment # 112.*

LCM / BB

111. **Comment:** My greatest concerns with Tier 2 procedures are: One, the process of compositing individual depth increment samples before EC is measured ((H-5, line 14-17) which potentially will allow higher salinity levels to be applied if one sample or more is significantly higher than the sample for that terrain element. And two, the 1.5 value used to back calculate water quality from soil chemistry data is based on an assumption of a particular leaching fraction that may not be achieved and is generally also based on good irrigation practice which includes adding water only to meet plant requirements and to provide necessary leaching. If ephemeral channels are converted to essentially continuous flow, the salt balance will be totally different than this calculation will predict. (LCM). The use of averaging with soil samples, especially with deeper samples from the soil profile, arrives at the lowest common denominator for "representative" SAR and EC. High quality and productive soils are thus targeted for flooding by low quality discharge water. (BB)

**Response:** *These appear to be three separate comments. On the first comment regarding compositing of soil sub-samples across a field: DEQ agrees that*

compositing soil sub-samples results in the inability to identify outliers among those individual sub-samples. However, the need to find any individual outliers among the sub-samples is mitigated by DEQ's methods in calculating an effluent limit for EC. Rather than use a straight average for soil salinity when dividing by 1.5, DEQ first applies a 95% confidence interval test to the observed mean of the data set. We then use the lower bound of that confidence interval as the number to be used for dividing by 1.5. Thus, data sets which are small and/or highly variable (having a wide confidence interval), result in the calculation of a more stringent and conservative effluent limit.

On the second issue (back-calculating an effluent limit for EC, using the 1.5 conversion factor): Continuous flow within a stream would appear to increase leaching, not decrease it. Therefore, it would suggest a relationship between EC<sub>w</sub> and EC<sub>e</sub> approaching 1:1. DEQ thinks that the more conservative, and defensible approach is to use a conversion factor of 1.5, even in perennial flow situations.

On the third issue (sampling soils to 48 – 60 inches in Tier 2 studies): DEQ disagrees that sampling only the top 6 – 12 inches produces reliable information about the historically-applied water. The top 6 – 12 inches taken alone are more sensitive than the entire root zone, taken as a whole, to short-term fluctuations in salinity. For example, immediately following a rain event, the top 6 – 12 inches of soil may read relatively low in salinity. However, that same zone may re-experience a concentration of salts near the surface following a prolonged dry period with higher evapotranspiration rates. So the sample results from only the top 6 – 12 inches are more sensitive to skewing based on the timing of the sample collection. Therefore, DEQ believes it is more reliable to test the entire root zone when attempting to characterize long-term historical salinity of the applied water.

PRBRC

112. **Comment:** DEQ is using the incorrect equation to establish SAR, from an Ayers and Wescott diagram published in Hanson et. al in 1999:  $SAR < (7.10 \times EC) - 2.48$ . According to research by soil scientist Dr. George Vance and Dr. Jim Oster, this equation was published incorrectly in the 1999 Hanson version. The correct equation, provided by Dr. Vance is  $SAR < (6.75 \times EC) - 3.71$ .

**Response:** The equation  $SAR < (7.10 \times EC) - 2.48$  does not appear in the 1999 Hanson Salinity and Drainage Manual nor does the equation  $SAR < (6.75 \times EC) - 3.71$  appear in the 2006 version of the same manual. What does appear in both manuals is a slightly different representation of the Ayers and Westcott diagram. The formula used by DEQ was provided to the agency by the Ag Use Policy workgroup as a mathematical interpretation of the slope of the lowest line depicted on the 1999 diagram. Dr. Ginger Paige of the University of Wyoming was a member of that workgroup. In the years since DEQ began using the formula, there has been much scrutiny by agricultural professionals and researchers without this discrepancy ever being raised.

*DEQ may consider revising the diagram and formula if adequate documentation is provided that explains the errors that were allegedly made in the first publication, the derivation of the suggested new formula and an assessment of the actual significance of the differences. The DEQ has never been provided any such documentation nor have Drs. Vance or Oster commented on this rulemaking.*

PRBRC

**113. Comment:** We oppose the use of Tier 2 as nothing more than a mechanism devised by industry and DEQ to permit that application of salts that will damage our soils under false rationale. The depth of gathering soil samples and averaging as applied in these Tier 2 studies has skewed the true soil data on sites in favor of much higher EC and SAR ambient levels. Averaging is scientifically unacceptable, for it generates a false representation of the upper soils, which are less salt and sodium laden and therefore more productive and less tolerant to pollution.

We ask the EQC to provide us the opportunity to bring the expertise of Dr. George Vance to discuss these issues and concerns.

**Response:** See response to comment # 110 and #111.

PRBRC

**114. Comment:** We are not certain how Tier 3 would be implemented by DEQ. Please explain how Tier 3 would be in compliance with the Clean Water Act?

**Response:** *The Tier 3 option would be entertained by DEQ upon request by the applicant after it was determined that a discharge would be unable to meet either the Tier 1 or Tier 2 limits. The applicant would have to show in a comprehensive study no harm to agricultural uses. The Tier 3 option is in compliance with the Clean Water act as long as the provisions of Chapter 1, Section 20 are met.*

EPA

**115. Comment:** The ambient background provisions in section (c)(vi)(B) appear to be natural background provisions, i.e., as opposed to "background" provisions, as they seem to directly speak to ambient conditions. We suggest that the State modify this provision to reflect that requirements will be based on achieving the expected natural water quality condition. If this provision is intended to address something other than natural conditions, we suggest that the State include a definition of "background conditions" either in Chapter 1 or Appendix H.

**Response:** *DEQ does not agree with the suggested changes. The current language appropriately explains that DEQ will develop effluent limits protective of the background water quality observed through analysis of measured or calculated data regardless of whether the background surface water is observed to be ambient and/or natural. Also, it is doubtful that EPA has any legal*

	<p><i>authority on this issue since the Clean Water Act is limited to "fishable" and "swimmable" criteria only.</i></p>
EPA	<p>116. <b>Comment:</b> What type of analysis of measured data will be used to establish (natural) background conditions?</p> <p><b>Response:</b> <i>Please see response to comment #110 above, regarding DEQ's statistical analysis of Tier 2 soil salinity data.</i></p>
WPR	<p>117. <b>Comment:</b> There are multiple PRB drainages where the pre-existing background water quality at the point of diversion is worse than the effluent quality of the produced water discharged. In these instances, an operator should not be required to treat its discharges to reach the Tier 1 default limits which are higher than the quality of the water mother nature provided. Tier 2 is designed to provide an important alternative permitting option to address naturally occurring conditions.</p> <p><b>Response:</b> <i>If a discharger is unable to meet Tier 1 default limits then the Tier 2 option is available for developing alternative limits. The Tier 1 option will be used when it is determined that better quality discharge water can meet the default threshold of 100% crop production for the most sensitive crop.</i></p>
WPR	<p>118. <b>Comment:</b> Tier 3 provides a truly site-specific permitting option. The tiered approach provides the necessary flexibility for meeting the no measurable decrease standard while recognizing the reality of the background water quality and the discharged effluent quality.</p> <p><b>Response:</b> <i>DEQ agrees with the sentiment of this comment.</i></p>
PRBRC	<p>119. <b>Comment:</b> The nature of the ephemeral drainage system is to flush salts down, so typically ECs will be higher at depth than on the surface. The surface EC of native ecosystems tends to be representative of the natural water quality; while at depths the EC is concentrated. Using the numbers from samples taken at depth and averaging results in an inaccurately high calculated background.</p> <p><b>Response:</b> <i>Please see response to comment #111 above, pertaining to soil sampling depths for Tier 2 studies.</i></p>
PRBRC	<p>120. <b>Comment:</b> Both Tier 2 methods for determining background water quality are irreparably defective. The first method, using measured water quality data, has three fundamental flaws:</p> <p>A. It irresponsibly assumes that the pre-discharge historic water, regardless of its quality, was put to an irrigation use. If measured historic data is to be used to relax effluent limits set to protect irrigation, then DEQ must require a showing that the water represented by the pre-discharge data was actually applied to the</p>



**Response:** *DEQ does not assume that measured data is reflective of pre-discharge historic water quality, but rather makes a determination if that data is appropriate based on the location where the data is collected versus the location of the irrigated areas. DEQ must make those determinations on a case-by-case basis, and can often make these determinations using GIS data or through knowledge of the drainage system and locations where the data was collected.*

B. It fails to account for the dynamic nature of natural water quality in ephemeral and intermittent streams. Water quality in its natural state is hydrologically dependent. Natural stream flow in an ephemeral drainage is flashy and is characterized by sharply increasing and declining flow rates. DEQ's narrow focus and self-imposed constraint on controlling and limiting concentration alone means this vital connection between water quality and runoff quantity, rate and duration, is ignored to the detriment of uses in the stream. Additionally, a series of temporally dispersed single point samples cannot be representative of the overall water quality of natural, pre-discharge flows in an ephemeral drainage that exhibits high variability in quality at any given flow.

**Response:** *As is stated in the proposed rule, obtaining actual measurements of water flow and quality on ephemeral to intermittent streams is usually scarce or absent and hard to collect. That is why one option would be to use soil quality as a surrogate for estimating the long-term 'average' natural water quality of ephemeral and intermittent streams. The ambient quality of the soil in the drainage is a reflection of those dynamic flow and quality processes brought up by the commenter. The number of samples and semi-random nature of soil sampling also addresses spatial and in some cases temporal variation in the quality of water applied to the soils in the past (in effect accounting for that 'dynamic' nature the commenter presents by capturing the range of soil quality and henceforth an estimation of the range of long-term natural water quality in the drainage). Furthermore, there is nothing in the proposed rule that indicates that only this method can be used. If other methods of back calculating water quality are appropriate, then we could consider their use in establishing effluent limits.*

C. It fails to require that scientifically defensible, representative data are used to determine "background" water quality. The only requirement is that background water quality based on measured data be based upon "published pre-discharge historic data." First, "published" is undefined. DEQ must require more than just that the data are available. There should be a requirement that the data were collected and analyzed in a scientifically defensible manner. Second, there is nothing in the rule that requires the data to be representative. Representative data are especially important where they are to be used to determine water quality in highly variable ephemeral and intermittent streams.

**Response:** "Published pre-discharge historic data" refers to USGS gauging station data or other study data that may be available for a stream reach. USGS gauging data is considered to be scientifically defensible. Other sources would be reviewed for the appropriateness of using the data, thus the statement that background water quality "may" be established based on this data. This section of Appendix H also points out that "Actual measured data is the most reliable means of establishing background." All of these sources of information are assessed on a site or drainage specific basis depending on the data that is available. If it turns out that measured data is not appropriate for setting background then the use of calculated data, through soil sampling, may be used.

**Irrigation Waivers**

MEW / BR  
/ BB / NJM

121. **Comment:** If irrigation waivers are granted to allow the use of CBM discharge water for irrigation, this water must not be allowed to leave the property for which the waiver was granted. (MEW / BR): Further, if each and every landowner in a particular drainage does not agree to the conveyance and trespass of discharges covered by the waiver, no waiver should proceed. (BB)

**Response:** *The irrigation waiver requires an irrigation management plan that provides reasonable assurance that the lower quality water will be confined to target lands. The DEQ will not approve a waiver without consensus of all landowners affected by a proposed discharge.*

MCD /  
YPC / DEP  
/ PAW

122. **Comment:** If the landowner wishes to waive the irrigation limits for EC and SAR, then the DEQ/WQD should be required to accept the waiver. Therefore, the MCD requests the EQC amend the irrigation waiver provision in Chapter 1, Appendix H(c) to say that a waiver *shall* be granted when the affected landowner requests use of the water. This right should be incorporated into rule and should not merely be a policy.

DEP believes the following language should be substituted for the Irrigation waiver (italics added / strike through removed):

"Irrigation Waiver. An exception to EC or SAR limits established under the Tier 1, 2 or 3 procedures ~~may~~ *will* be made when affected landowners request use of the water and thereby accept any potential risk to crop production on their lands. Irrigation waivers will only be granted in association with an irrigation management plan that provides reasonable assurance that the lower quality water will be confined to the targeted lands."

**Response:** *The WQD prefers to have the flexibility to make that decision on a case by case basis. There may be cases where downstream uses such as drinking water, fish and wildlife, recreation, etc. would be adversely affected by increasing the flow volume of poor quality down a tributary drainage.*

<p>PRBRC</p>	<p>123. <b>Comment:</b> We must object to the allowance for these waivers. We are very respectful of the property rights of those requesting waivers; however, they disregard the rights of those whose lands these waters may subsequently flow, including public lands. They open another door to the potential for very long-term damage to soils and vegetation and should be positively halted from entering another downstream landowner and non-target property and resources.</p> <p><b>Response:</b> See response to comment #121.</p>
<p>EPA</p>	<p>124. <b>Comment:</b> The waiver procedure in section (c)(vii) involving a landowner accepting additional risk appears to be a qualification or modification of the designated use, or a site-specific procedure for relaxing the degree of use protection, i.e., it allows the landowner instead of the State to make the risk management decision regarding the level of protection to be afforded for streams covered by these waivers. Does DEQ consider this process to result in use modifications, criteria adjustments, or discharger-specific variances as part of the WPDES permitting process? The Statement of Principal Reasons document states: "An exception to EC or SAR limits established under the Tier 1, 2 or 3 procedures may be made when affected landowners request use of the water and thereby accept any potential risk to crop production on their lands. Irrigation waivers will only be granted in association with an irrigation management plan that provides reasonable assurance that the lower quality water will be confined to the targeted lands. Irrigation waivers will also only be approved after all affected land owners approve of the conditions by which the produced water will be discharged, and the discharge will not result in any impairment of other designated uses downstream of the discharge."</p> <p>EPA is concerned that the waiver process creates a situation where the agricultural water supply uses are no longer fully protected, in that continued use of water discharged to a water body may cause the areas under irrigation to be substantially less productive, or to be unusable for crop growth in the future. Is the State's intent to adopt a variance for the Agricultural Water Supply use? If so, does the State plan to adopt these variances as revisions to State standards and submit them to EPA for review?</p> <p><b>Response:</b> <i>The standard for agricultural use protection is Section 20, which has already been approved by EPA and we are not proposing a change to that standard. The waiver procedure would result in modified effluent limits not a revision of the standard. These would not be submitted to EPA as revised standards. EPA does have review of the permits that would be issued with such modified effluent limits and may comment as to whether they believe any effluent limit is appropriate in light of the standard during their review of the associated permit. We believe that the proposed waiver procedures are appropriate in the context of the narrative standard.</i></p>

EPA	<p>125. <b>Comment:</b> Should the waiver process include conditions to limit the amount of risk that can be considered acceptable, e.g., to prevent practices that renders soils unusable for crop growth in the future? Are there any considerations that such an agreement for continued use of discharged water would be available only in situations where viable crop production is expected to continue? In other words, does the State expect that lands under irrigation will have a reasonable limit on crop production loss that would be assured prior to allowing a waiver?</p> <p><b>Response:</b> <i>The waiver provisions only apply when the produced water is confined to the targeted lands. There is no provision in the regulations that would prevent a landowner from irrigating his own lands or watering his livestock with any water that he can legally obtain and chooses to do so. In many circumstances, landowners are already watering their livestock and irrigating with water of a poorer quality than found in many CBM discharges.</i></p>
NRS	<p>126. <b>Comment:</b> We support the idea of "irrigation waivers" that will allow the use of CBM water effluent for irrigation provided the water is contained on those private lands where the waiver applies. Discharge downstream may be a violation of the Clean Water Act.</p> <p><b>Response:</b> <i>DEQ agrees the use of irrigation waivers is appropriate and must be confined to the private lands where lower quality water is requested, thus the requirement for an irrigation management plan which will provide reasonable assurance that the water will be confined to the target lands.</i></p>
PRBRC	<p>127. <b>Comment:</b> When faced with a potential discharge that cannot meet with either of the presumably reasonable and scientifically defensible Tier 1 and Tier 2 methods, DEQ gives the polluter another option – give us something, which we don't really define for you, that gives us some basis to permit your discharge without requiring that you treat it. The Tier 3 approach shows DEQ's topsy-turvy practice of permitting CBM discharges. Rather than asking what discharge limits are necessary to protect downstream irrigation, DEQ asks what is the quality of the water to be discharged and what is the minimal information we will accept from an applicant to justify its surface discharge.</p> <p><b>Response:</b> <i>The Tier 3 provisions allow further modifications to effluent limits based on site-specific geologies, soils and management practices. Tier 3 allows Tier 2 limits to be rebutted by a study or demonstration by the permit applicant that the lower water quality can be managed in a way that maintains crop productivity.</i></p> <p><b><u>Reasonable Access Requirement</u></b></p>
MEW / BR / NJM	<p>128. <b>Comment:</b> Please eliminate the "Reasonable Access Requirement" which denies landowners protection unless industry is allowed access to perform soil sampling which is being used to facilitate the implementation of Tier 2 and Tier 3</p>

	<p>studies, which are not even supported by scientific evidence (MEW / BR). The CBM industry should be held accountable. Do not let them make their profits at the expense of Wyoming landowners (NJM).</p> <p><b>Response:</b> <i>Landowner rights to deny access on to personal property are not infringed by the proposed language; however, DEQ does not intend to require Tier 1 default limits when access is denied. If access is denied, similar soil/surface water conditions in the same drainage or a representative drainage will often provide the appropriate data.</i></p>
DC / BB	<p>129. <b>Comment:</b> I as a property owner have the right to permit or deny access to my property for soil sampling. I should have the right to choose who I want to that sampling on my property and not be denied protection for my land for rejecting industry's choice of soil scientists.</p> <p><b>Response:</b> <i>The choice of who will conduct sampling to determine Tier 2 effluent limits is left to the industry applying for a discharge and the affected landowners to negotiate. In those instances where an agreement cannot be reached between the parties then alternate sampling locations where conditions are expected to be similar in nature to the inaccessible area will be sought.</i></p>
MLM	<p>130. <b>Comment:</b> Please eliminate the "Reasonable Access Requirement". This denies protections unless a rancher allows industry on his land to conduct soil sampling/testing which apparently is used to promote non-scientific Tier 2 and Tier 3 studies.</p> <p><b>Response:</b> <i>Effluent limits as proposed will be set to protect irrigation uses regardless of access being provided by an individual landowner. In those instances where an agreement cannot be reached between the parties then alternate sampling locations where conditions are expected to be similar in nature to the inaccessible area will be sought.</i></p>
PRBRC	<p>131. <b>Comment:</b> Landowners must be free to exercise their rights to refuse access without suffering harm for exercise of those rights. DEQ proposes to use the "best information." We urge DEQ to include in "best information" the testimony of landowners, and to use published limits to assure that the most sensitive crop grown in this area will not be harmed.</p> <p><b>Response:</b> <i>DEQ assumes that this comment refers to the use of the Tier 2 or Tier 3 option for setting effluent limits. Regarding development of Tier 2 effluent limits, only measured and calculated data will be considered in making those determinations. Tier 3 allows for the use of landowner testimony when choosing to pursue a "no harm analysis."</i></p>