

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
OF THE STATE OF WYOMING

FILED

JUL 16 2009

Jim Ruby, Executive Secretary
Environmental Quality Council

IN THE MATTER OF THE APPEAL)
OF CLABAUGH RANCH, INC.)
FROM WYPDES PERMIT NO.)
WY0049697)

Docket No. 08-3802

CLABAUGH RANCH, INC.'S MOTION FOR SUMMARY JUDGMENT

Clabaugh Ranch, Inc. moves for summary judgment revoking WYPDES Permit No. WY0049697 and remanding Lance's application to the DEQ for further review on the following grounds:

(1) The DEQ used an incorrect formula to determine the sodium adsorption ratio (SAR) effluent limit;

(2) The DEQ used a Tier 2 methodology to determine the SAR and electrical conductivity (EC) limits, and this methodology is scientifically invalid;

(3) The DEQ's use of the Tier 2 methodology in this situation violated the DEQ's own agricultural use protection policy because Tier 2 is to be used only when the background EC and SAR is worse than the effluent quality;

(4) The permit establishes no SAR limits for water discharged out of Lance's containment reservoirs, and

(5) The DEQ's methodology of using the average EC from 12 fields to set the EC effluent limit necessarily means that there will be a measurable decrease in forage crop production in those fields in the drainage which have less than average salinity.

The DEQ used the incorrect formula for the relationship between SAR and EC in order to set the SAR effluent limit.

The DEQ granted a renewal of Permit No. WY0049697 ("the Echeta Road Permit") on March 26, 2008. This permit allows Lance to discharge directly into Wild Horse Creek from Outfall No. 13, located approximately 300 feet up the drainage from Clabaugh Ranch, Inc.'s property line. The EC effluent limit for this permit is 2560 micromhos/cm. The SAR effluent limit is defined by a formula: $SAR = 7.10 \times EC - 2.48$. (Dep. Ex. 1, Permit pp. 2,3)

In other words, if the EC of the produced water is at the limit of 2560, the SAR limit of the produced water is 15.7 $[(7.10 \times 2.56) - 2.48]$. (Dep. Ex. 1, Statement of Basis, p. 4). The first and most obvious problem with this permit is that the DEQ used the wrong formula to calculate the SAR limit. The DEQ's Agricultural Use Protection Policy recognizes this error and now states that the proper formula is: $SAR = (EC \times 6.67) - 3.33$. (Dep. Ex. 17, p. 1). Using this formula, at the maximum EC of 2560, the SAR limit would be 13.75 $[(2.56 \times 6.67) - 3.33]$.

The formula was derived by the DEQ from a 1999 publication containing a graph showing the relationship between SAR and EC and the effect on infiltration rates. The graph had been incorrectly published and was corrected in a 2006 publication. (Wagner Dep. Pp. 17-18). Jason Thomas of the DEQ admitted that better information now indicates that the formula which the DEQ used in the Echeta Road Permit is not correct. (Thomas Dep. p. 66).

Simply put the formula used in the Echeta Road Permit is based on an incorrect publication of a graph. This led the DEQ to adopt an incorrect formula for the relationship between SAR and EC. Using an incorrect formula necessarily leads to an invalid effluent

limit for SAR.

The DEQ used an unreasonable and scientifically invalid method for determining the EC and SAR permit limits.

The DEQ established the EC limit of 2560 using a Tier 2 analysis based on soil studies conducted by coalbed methane industry consultant Kevin Harvey. (Dep. Ex. 1, Statement of Basis pp. 1, 4). Dr. Hendrickx and Dr. Buchanan, the consultants employed by the Environmental Quality Council, have determined that (1) the Tier 2 methodology which the DEQ used to set these permit limits is “not reasonable nor scientifically valid for determining the EC and SAR of water that can be discharged into ephemeral drainages in Wyoming so that degradation of the receiving water will not be of such an extent to cause a measurable decrease in crop production” and (2) the method the DEQ used for determining EC and SAR for permitting the discharge of produced water “is not reasonable nor sufficiently defined nor scientifically defensible for the conditions in Wyoming.” (Dep. Ex. 14, pp. iii, 21, 22).

The DEQ obviously now recognizes that Dr. Hendrickx and Dr. Buchanan are qualified, reliable scientist because the DEQ entered into a Services Contract with them in June of 2009. This contract states that Dr. Hendrickx and Dr. Buchanan will provide clarification of their report to the EQC and discuss in more detail the DEQ program as it pertains to agricultural use protection and provide advice to the DEQ as to whether and how the findings and recommendations in their report to the EQC can be used to revise DEQ’s approach to permitting surface discharges of produced water.

Indeed, John Wagner, the administrator of the Water Quality Division of the DEQ, stated that he “tended to agree” with the conclusion reached by the EQC’s consultants that

one cannot use soil quality to back-calculate water quality. (Wagner Dep. Pp. 12-13).

Of course, that is exactly what the Tier 2 does and is designed to do. The policy makes that clear. Under the heading "Tier 2-Background Water Quality" the Agricultural Use Protection Policy states, "(2) Calculated Background: On intermittent and ephemeral stream channels, pre-discharge water quality data is usually scarce or non-existent and very difficult to collect. In these circumstances, background water quality can be estimated by conducting soil surveys on land that has been historically irrigated from the subject stream. In the event that soil studies are used as a means to estimate baseline water quality for a given drainage, the following requirements apply . . ." (Dep Ex. 17, p. 59)

The EQC's consultants concluded that "it is not scientifically defensible to use Tier 2." (Dep. Ex. 14, pp. iii, 22). They recommended that Tier 1 can continue to be used. The DEQ has done a Tier 1 analysis on Wild Horse Creek and concluded that under that analysis the EC limit should be **1500**, not the 2560 allowed by this permit, and that the maximum allowable SAR would be **8**, not 15.7 as allowed by this permit. (Dep. Ex. 3, p. 1).

The DEQ violated its own policy by using Tier 2 methodology to set the effluent limits for this permit.

Even if one ignored the fact that the Tier 2 methodology used by the DEQ is not scientifically valid or scientifically defensible, the DEQ violated its own Agricultural Use Protection Policy when it used Tier 2 to establish effluent limits on Wild Horse Creek. The Agricultural Use Protection Policy states, "Tier 2 refers to a process whereby the default limits may be refined to equal background water quality conditions and **is intended to be used where the background EC and SAR is worse than the effluent quality.**" (Dep.

Ex. 17, p. 57).

The DEQ determined in 2006 that the soil data it received indicated "a mean **background SAR of 5**" within the downstream irrigated areas on Wild Horse Creek. (Dep. Ex. 3, p. 1). On August 20, 2007, Lance's consultants sent the DEQ water quality samples and said, "Lance feels that the attached samples more accurately represent the water quality produced at its Echeta Road Unit." This water sample showed an SAR of **13.8** and an EC of **2260**. (Dep. Ex. 2).

The DEQ admitted that the background SAR was better, not worse, than the effluent SAR. The following is testimony of Jason Thomas, the DEQ's coalbed methane permitting manager:

Q. But when you did the Echeta Road Permit, you applied Tier 2 even though the background SAR was better than the effluent quality?

A. That's correct.

(Thomas Dep. pp. 77-78).

The SAR of the effluent is worse than the background SAR. The Agricultural Use Protection Policy states that Tier 2 is not to be applied in that situation, but the DEQ applied the Tier 2 methodology anyway. As a result, the DEQ set an effluent limit for SAR that could be as high as 15.7, which is **triple** the background SAR in the drainage.

The DEQ establishes no SAR effluent limit on discharges from the 12 reservoirs.

The DEQ sets no SAR limits for discharges from any of the 12 reservoirs covered by the permit. The permit sets an EC limit of 2560 for these reservoirs but no SAR limit. The permit requires Lance to contain water discharged into these reservoirs except in two

situations: (1) the DEQ allows Lance to release water in association with assimilative capacity credits in the Powder River or (2) during periods of natural precipitation which cause the reservoirs to spill.

The DEQ can allow Lance to release water at any time, and there is no limit in the permit on the SAR of that released water. The DEQ is concerned about the salt load to the Powder River in the assimilative capacity program, but the problem is that the Clabaugh Ranch lies between Lance's discharge point and the Powder River.

This permit does not prevent Lance from discharging water with an SAR that will cause infiltration problems. Unlike the direct discharge for outfall no. 13, there is nothing in the permit that restricts the SAR of the water discharged from the reservoirs. This is the case even though the direct discharge water and the water discharged from the containment reservoirs will flow in the same drainage. Obviously, if an SAR effluent limit is necessary for the direct discharge outfall, as the DEQ clearly determined it was, then it is also necessary for water coming out of the reservoirs.

There is no rule or regulation or written policy that requires DEQ to assure that water released under the assimilative capacity program meets the effluent limits applicable to direct discharges into the drainage. The DEQ just claims that it has an unwritten policy under which it will not authorize release under the assimilative capacity program unless the discharged water meets the effluent standards of the drainage. In fact the permit states that the "authorization for release will specify the release volume, duration and the individual reservoir(s) covered." The permit does **not** state that the authorization for release will require the released water to meet any SAR effluent limit. (Dep. Ex. 1, Permit p. 2).

The hard fact is that there is no condition in the permit requiring water released from the containment reservoirs to meet any SAR standard. Because it is not a condition of the permit, the DEQ is free to change or simply ignore its unwritten policy, and Clabaugh Ranch would have no recourse. If the DEQ actually intends to impose a restriction that reservoir releases will be authorized only if the water discharged from the reservoirs will meet the effluent standards for direct discharges into the drainage, then the obvious questions are : (a) why is that restriction not in the permit and (b) why does the permit say that the authorization for release will state only the volume and duration of the release and identify the reservoir from which the release can be made and not say that the authorization for release will also limit the SAR of the released water.

The DEQ's methodology of using the average EC from 12 fields to set the EC effluent limit necessarily means that there will be a measurable decrease in forage crop production in those fields with less than average salinity.

In order to derive the EC limit in this permit, the DEQ took the EC readings on soil samples that Kevin Harvey obtained from 12 fields upstream of the Clabaugh Ranch, tossed out a few outliers, totaled the numbers, divided that sum by the number of samples, and concluded that the **average** EC of the soil in the twelve fields was 4220. (Thomas Dep. p. 54; Dep. Ex. 1, Statement of Basis pp. 3-4). The DEQ then concluded that the "mean soil EC for all fields" likely fell between 3851 and 4589. The DEQ used a soil EC of the soil of 3851 and divided that number by a 1.5 concentration factor [EC (applied water) = 1.5 x EC (soil)] to derive the EC effluent limit of 2560.

The "averaging" technique allowed the DEQ to set effluent limits which protect only those fields with average or worse than average salinity. All other fields can now be

exposed to water higher in salinity than the historic background flows on those fields. (Thomas Dep. p. 55). For example, Harvey's data on the Lower Smith Field showed a soil EC of 3000. If 3000 is divided by the 1.5 concentration factor that the DEQ chose to use in this case, then the allowable EC limit of the water on the Lower Smith Field would be 2000, not 2560 set by the permit. (Thomas Dep. p. 54). The point is that this permit allows Lance to make any fields with less than average salinity more saline and degrade those fields.

The consequence of this is clear. Smooth brome is a moderately salt sensitive plant species in the Wild Horse Creek drainage, and the scientific references recognized by the DEQ say that at a soil salinity in excess of 3000, moderately sensitive plant species will experience a measurable yield loss. (Thomas Dep. pp. 10-16). Specifically, Mr. Thomas testified:

Q. ... But my question is: The authorities that we have cited and that you used when you did your Tier 1 analysis says that you will experience yield loss when the soil salinity is above 3,000, correct?

A. Correct.

(Thomas Dep. pp. 16). Despite this, the DEQ has set an effluent limit which it projects will result in soil salinity of 3851. According to the references relied on by the DEQ, a soil salinity of 3851 will result in a loss of crop yield for "moderately sensitive" crop species and the loss could be in the range of 15 to 20%. (Thomas Dep. pp. 18-19). In fact, these same references indicate that even plants which are "moderately tolerant" of salinity, such as crested wheat grass, would start experiencing yield loss when soil salinity reaches an EC of 3851, which is this permit's target. (Thomas Dep. P. 32-33).

This averaging technique is seriously flawed. Even using the DEQ's methodology and assumptions, it is clear that there are fields in Wild Horse Creek that have not been exposed to natural flows with an EC of 2560 which, according to the concentration factor applied by the DEQ, would have resulted in a soil EC of 3581. It is also clear that measurable decrease in yield loss of moderately sensitive plant species when soil salinity reaches 3581. Therefore, the effluent limits set in this permit are not protective of agricultural use.

Rule 56.1 Statement

Clabaugh Ranch's 56.1 statement is attached.

Conclusion

Clabaugh Ranch, Inc. asks that the Environmental Quality Council revoke the Echeta Road Permit and remand Lance's renewal application to the DEQ for further review in light of the errors pointed out in this motion. Any one of the five points raised by Clabaugh Ranch, Inc. would justify this relief, and there is certainly no reason for the parties and this Council to endure a five day contested case hearing to reach a result which necessarily follows from the DEQ's errors.

Dated this 15th day of July, 2009.

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Certificate of Service

I certify that on the 15th day of July, 2009, I served a true and correct copy of the foregoing by depositing the same in the U.S. Mail, postage prepaid and addressed to:

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CLABAUGH RANCH, INC. RULE 56.1 STATEMENT

1. Clabaugh Ranch, Inc. is the owner of a ranch located in the Wild Horse Creek drainage below the outfalls permitted under Lance Oil and Gas Company's Permit No. WY0049697 ("Echeta Road Permit.")

2. The Echeta Road Permit authorizes Lance to discharge water directly into Wild Horse Creek from Outfall No. 13. This outfall is approximately 300 feet from the Clabaugh Ranch, Inc. fence line. (Kalus Dep. p. 14, Dep. Ex. 38). The electrical conductivity (EC) effluent limit for discharges from Outfall No. 13 is 2560 micromhos/cm. The sodium adsorption (SAR) effluent limit for discharges from Outfall No. 13 is expressed by the following formula in the permit: $SAR < 7.10 \times EC - 2.48$. This means that if the effluent has an EC of 2560, then the SAR limit is 15.7. The permit does not limit the quantity of water that Lance can discharge from Outfall No. 13. (Dep. Ex. 1, Permit p. 3)

3. The Echeta Road Permit also authorizes Lance to discharge water directly into twelve reservoirs at Outfalls Nos. 1-12. The EC effluent limit for discharges from these outfalls is 2560 micromhos/cm. There is no SAR effluent limit set for discharges into these reservoirs or discharges from these reservoirs. The permit provides that Lance is required to contain all effluent from Outfalls Nos. 1-12 in the on-channel reservoirs during "dry operating conditions" unless prior written authorization is granted by the DEQ for a reservoir release in association with use of assimilative capacity credits for the Powder River Basin. While the permit states that the authorization release will specify the release volume, duration and the individual reservoir covered, the permit has no requirement that reservoir releases are subject to any SAR effluent limit and does not state that the authorization release will require the released water to meet any SAR effluent limit. (Dep.

Ex. 1, Permit p. 2).

4. The permit authorizes Lance to discharge within 300 feet of the Clabaugh Ranch fence line 750,936 pounds of dissolved sodium and 5,799,902 pounds of total dissolved solids every year for the life of the permit. (Dep. Ex. 1, Permit pp. 3-4).

5. The DEQ used the incorrect formula for calculation of the SAR effluent limit. The DEQ's Agricultural Use Protection Policy recognizes this error and now states that the proper formula is: $SAR < (EC \times 6.67) - 3.33$. (Dep. Ex. 17, p. 1).

6. The formula which the DEQ used in the Echeta Road Permit is not correct. (Wagner Dep. Pp. 17-18; Thomas Dep. p. 66).

7. The DEQ established the EC limit of 2560 using a Tier 2 analysis based on soil studies conducted by coalbed methane industry consultant Kevin Harvey. (Dep. Ex. 1, Statement of Basis p. 1).

8. The consultants employed by the Environmental Quality Council have determined that (1) the Tier 2 methodology which the DEQ used to set these permit limits is "not reasonable nor scientifically valid for determining the EC and SAR of water that can be discharged into ephemeral drainages in Wyoming so that degradation of the receiving water will not be of such an extent to cause a measurable decrease in crop production" and (2) the method the DEQ used for determining EC and SAR for permitting the discharge of produced water "is not reasonable nor sufficiently defined nor scientifically defensible for the conditions in Wyoming." (Dep. Ex. 14, pp. iii, 21, 22).

9. DEQ entered into a Services Contract with the Environmental Quality Council's consultants in June of 2009. This contract requires the consultants to provide clarification of their report to the EQC and to discuss in more detail the DEQ program as

it pertains to agricultural use protection and to provide advice to the DEQ as to whether and how the findings and recommendations in their report can be used to revise DEQ's approach to permitting surface discharges of produced water.

10. John Wagner, the administrator of the Water Quality Division of the DEQ, stated that he "tended to agree" with the consultants' conclusion that you cannot use soil quality to back-calculate water quality. (Wagner Dep. Pp. 12-13).

11. Tier 2 is designed to back-calculate water quality from soil quality. The policy makes that clear. Under the heading "Tier 2-Background Water Quality" the Agricultural Use Protection Policy states, "(2) Calculated Background: On intermittent and ephemeral stream channels, pre-discharge water quality data is usually scarce or non-existent and very difficult to collect. In these circumstances, background water quality can be estimated by conducting soil surveys on land that has been historically irrigated from the subject stream. In the event that soil studies are used as a means to estimate baseline water quality for a given drainage, the following requirements apply . . ." (Dep Ex. 17, p. 59)

12. The EQC's consultants concluded that "it is not scientifically defensible to use Tier 2." (Dep. Ex. 14, pp. iii, 22). They recommended that Tier 1 can continue to be used. The DEQ has done a Tier 1 analysis on Wild Horse Creek and concluded that under that analysis the EC limit should be 1500, not the 2560 allowed by this permit, and that the maximum allowable SAR would be 8, not 15 as allowed by this permit. (Dep. Ex. 3, p. 1).

13. The DEQ violated its own Agricultural Use Protection Policy when it used Tier 2 to establish effluent limits on Wild Horse Creek. The Agricultural Use Protection Policy states, "Tier 2 refers to a process whereby the default limits may be refined to equal background water quality conditions and is intended to be used where the background EC

and SAR is worse than the effluent quality.” (Dep. Ex. 17, p. 57).

14. The DEQ determined in 2006 that the soil data it received indicated “a mean background SAR of 5” within the downstream irrigated areas on Wild Horse Creek. (Dep. Ex. 3, p. 1).

15. On August 20, 2007, Lance’s consultants sent the DEQ water quality samples and said, “Lance feels that the attached samples more accurately represent the water quality produced at its Echeta Road Unit.” This water sample showed an SAR of 13.8 and an EC of 2260. (Dep. Ex. 2).

16. The DEQ applied a Tier 2 methodology to set the effluent limits in the Echeta Road Permit even though the background SAR was better than the effluent quality. (Thomas Dep. pp. 77-78).

17. In order to derive the EC limit in this permit, the DEQ took the EC readings on soil samples that Kevin Harvey from 12 fields upstream of the Clabaugh Ranch, tossed out a few outliers, totaled the numbers, divided that sum by the number of samples, and concluded that the average EC of the soil in the twelve fields was 4220. (Thomas Dep. p. 54; Dep. Ex. 1, Statement of Basis pp. 3-4). The DEQ then concluded that the “mean soil EC for all fields” likely fell between 3851 and 4589. The DEQ used an EC of the soil of 3851 and divided that number by 1.5 concentration factor [EC (applied water) = 1.5 x EC (soil)] to derive the EC effluent limit of 2560.

18. The averaging technique allowed the DEQ to set effluent limits which might protect only those fields with average or worse than average salinity. All other fields can now be exposed to water higher in salinity than the historic background flows on those fields. (Thomas Dep. p. 55).

19. Harvey's data on the Lower Smith Field showed a soil EC of 3000. If 3000 is divided by the 1.5 concentration factor that the DEQ chose to use in this case, then the allowable EC of the water on the Lower Smith Field, the EC limit would be 2000, not 2560 set by the permit. (Thomas Dep. p. 54). The Echeta Road Permit allows Lance to make any fields with less than average salinity more saline and degrade those fields.

20. Smooth brome is a moderately salt sensitive plant species in the Wild Horse Creek drainage, and the scientific references recognized by the DEQ say that at a soil salinity in excess of 3000, moderately sensitive plant species will experience a measurable yield loss. (Thomas Dep. pp. 10-16). Despite this, the DEQ has set an effluent limit which it projects will result in soil salinity of 3851. According to the references relied on by the DEQ, a soil salinity of 3851 will result in a loss of crop yield for "moderately sensitive" crop species and the loss could be in the range of 15 to 20%. (Thomas Dep. pp. 18-19). In fact, these same references indicate that even plants which are "moderately tolerant" of salinity, such as crested wheat grass, would start experiencing yield loss when soil salinity reaches an EC of 3851. (Thomas Dep. P. 32-33).