Noel Declaration
EXHIBIT 8

MONTANA BOARD OF ENVIRONMENTAL REVIEW

IN THE MATTER OF:	)	
APPEAL AMENDMENT AM4	)	
WESTERN ENERGY	)	
COMPANY, ROSEBUD STRIP	)	**CAUSE NO. BER 2016-03 SM**
MINE AREA B	)	
PERMIT NO. C1984003B	)	
_____	)	

DECLARATION OF JESSE NOEL IN SUPPORT OF RESPONDENT-INTERVENORS' OPPOSITION TO PETITIONERS' MOTION FOR SUMMARY JUDGMENT

I, Jesse Noel, P.E., declare under the penalty of perjury as follows:

Background

1. I, Jesse Noel, am a Registered Professional Engineer with 21 years of professional experiencing in mining engineering and environmental engineering, including hydrology. I have a B.S. in Environmental Engineering and a M.S. in Mining Engineering, with a focus on mine waste management. I am registered with the State of Montana as both a Professional Engineer and a Surface Mine Foreman.

2. Since October of 2013, I have been employed by Westmoreland Resources, Inc. as an Engineering Manager at the Absaloka Mine. In this position, I manage the environmental and engineering departments, which together are responsible for the design and permitting of all phases of the mining life. Prior to starting in my current position, between December 2012 and October of 2013, I worked at the Absaloka Mine as the Production Manager.

3. Between July of 2009 and December of 2012, I was employed as an Engineering Manager by Western Energy Company ("Western Energy"), a subsidiary of Westmoreland Resources, Inc., at the Rosebud Mine. In this position, I was responsible for the engineering and

environmental departments, which included responsibility for obtaining and complying with all required permits and ensuring the environmental and safety goals of the mine were met.

4. Prior to serving as the Engineering Manager at the Rosebud Mine, I had previously worked at the mine between 1997 and 2004 as a Mining Engineer and Surveying Supervisor. In this position, my projects included hydrologic design, mine plan design, and Post-Mining Topographical (PMT) design. In 2005, one of my PMT designs received a reclamation award from the Montana Office of Surface Mining.

June 13, 2012, Comment Letter to the Department of Environmental Quality

5. On June 13, 2012, I submitted a comment letter on behalf of Western Energy to the Montana Department of Environmental Quality (DEQ) ("Comment Letter"). I certify that a true and correct copy of the Comment Letter is attached as Exhibit A.

6. The Comment Letter was submitted in response to the DEQ's solicitation for public comments on its draft Montana Pollutant Discharge Elimination System (MPDES) Individual Permit to Western Energy Company for the Rosebud Mine ("Draft MPDES Permit").

7. Over the course of my career, I have had occasion to submit comments to state and federal agencies on numerous draft permits, including other discharge elimination system permits. Public comments are an important piece of the permitting process insofar as they provide an avenue for the project proponent, as well as any other interested parties, to provide relevant information to inform the agency prior to a final agency action.

8. The Draft MPDES Permit was prepared to provide coverage for all discharges associated with the Rosebud Mine, and was not specific to Western Energy's application for a fourth amendment to the Rosebud Strip Mine Area B Permit ("AM4 Permit"), which had not yet been

deemed "acceptable" by DEQ. For this reason, the Comment Letter was not specific to the AM4 Permit area, nor was it fully known at the time the extent to which the proposed operations in the AM4 Permit area would have an interaction with the surface waters covered by the Draft MPDES Permit.

9. The Comment Letter was based on my technical review of the Draft MPDES Permit, my understanding of hydrology and principles of environmental and mining engineering, and my knowledge of the Rosebud Mine and its surrounding environment. Additionally, as noted in the comment letter, my review was supported by third-party technical analyses of the Draft MPDES Permit by Dr. William Hartsog, a specialist in surface water hydraulics and sediment transport, Michael Nicklin, of Nicklin Earth & Water, Inc. and KC Harvey Environmental, LLC.

10. One of the issues raised in the Comment Letter related to the effluent limitations in the Draft MPDES Permit for Electrical Conductivity (EC). EC means the ability of water to conduct an electrical current at 25° C. The EC of water is a function of the amount of total dissolved solids (TDS) in the water and is expressed as microSeimens/centimeter (µS/cm) or microhos/centimeter (µmhos/cm). Given the relationship between EC and TDS, correlations are commonly used to relate the two parameters. For example, one 1999 study calculated the correlation as EC = 1000*TDS/640 (Hanson et. al., 1999).

11. In the Comment Letter, Western Energy noted that the effluent limitation was not consistent with the effluent limitation in the Draft MPDES Permit for TDS. Had the DEQ calculated the EC limit for the Draft MPDES Permit based on the TDS effluent limit, the EC limit would have been nearly ten times higher. Instead of calculating the EC limit based on the TDS effluent limit, the DEQ incorporated EC limits from ARM 17.30.670, which set numeric Water Quality Standards (WQS) for EC for the mainstems of Rosebud Creek, the Tongue,

Powder, and Little Powder rivers, and all tributaries and surface waters within the watersheds of these rivers and creeks.

12. Also noted in the Comment Letter, was that the Draft MPDES Permit effluent limitation for EC was lower than the naturally occurring EC levels found in effluent samples from some of the receiving waters subject to the permit. This was problematic, given Western Energy's understanding at the time, based on Montana Code 75-5-306(1), that it would not be required to treat discharges to a purer condition than that which was naturally occurring in the receiving water.

13. Based on these issues, I stated in the Comment Letter that "[g]iven these factors, it would not be likely that [Western Energy] could comply with the proposed limits using the proposed [Best Practicable Control Technology Currently Available (BPCTCA)]."

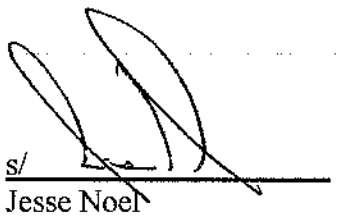
14. At the time I wrote the Comment Letter, Western Energy had not evaluated whether technology other than BPCTCA could facilitate compliance with the proposed EC limitation. Western Energy had also not evaluated whether, to the extent that its effluents had lower EC values than the receiving waters, its effluents would "clean-up" the receiving waters such that they met the EC value of 500 µS/cm set forth in ARM 17.30.670.

15. Additionally, my theorizing regarding this potential compliance issue was not specific to discharges associated with the AM4 Permit. At the time the Comment Letter was submitted, it was not fully known the extent to which outfalls covered by the AM4 Permit would interact with the receiving waters covered by the Draft MPDES Permit and be subject to the EC effluent limitation.

16. The hydrological consequences of the AM4 Permit continued to be evaluated and assessed between the time Western Energy submitted its application for the AM4 Permit in July of 2009, and the time that its application was deemed complete by DEQ in July of 2015. DEQ required Western Energy to submit a significant quantity of additional data, studies and analyses relating to the potential impacts of the AM4 Permit. DEQ approved the AM4 Permit in December 2015.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on Sept 21, 2016.



s/
Jesse Noel

NOEL DECLARATION
EXHIBIT A

WESTERN ENERGY COMPANY

A Westmoreland Mining LLC Company
138 ROSEBUD LANE • P.O. BOX 99 • COLSTRIP, MT 59323
(406) 748-5100

June 13, 2012

Ms. Jenny Chambers
Water Protection Bureau
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Permit ID: MPDES Permit MT0023965
Revision Type:
Permitting Action:
Subject: MPDES Proposed Permit – Public Comments

Dear Ms. Chambers:

Nicklin Earth & Water, Inc. (NE&W) and KC Harvey Environmental, LLC (KCH) have been recently retained by Western Energy Company (WECo) to assist with the review of the draft proposed permit MT0023965 prepared by the Montana Department of Environmental Quality (DEQ) Permitting and Compliance Division Montana Pollutant Discharge Elimination System (MPDES) Permit Fact Sheet for Permit No. MT0023965. WECo have also retained the services of Dr. William Hartsog, a specialist in surface water hydraulics and sediment transport to assist in this review.

WET Testing for Planned Discharge

WECo's Rosebud Mine has 151 outfalls that drain into the following receiving waters: East Fork Armells, West Fork Armells, Stocker, Black Hank, Cow, Pony, Lee, and Spring Creeks and Lee Coulee. These are classified as ephemeral streams.

The Whole Effluent Toxicity test that is proposed in the draft MPDES Permit # MT0023965 has been proven effective by the EPA in the variability study entitled "Final Report: Interlaboratory Variability Study of EPA Short-term Chronic and Acute Whole Effluent Toxicity Test Methods, Vol. 1[WECo1]" using the following sample preparation (Section 2.2.4):

"For each test method, four test sample types were prepared in bulk by the referee laboratory, divided, and distributed to participant laboratories for testing. The four sample types included: 1) blank sample, 2) reference toxicant sample, 3) effluent sample, and 4) receiving water sample. Blank and reference toxicant samples were distributed to participant laboratories as liquid ampule samples (to mix and dilute to the required volume at the participant laboratory), while effluent and receiving water samples were distributed as whole-volume samples (consisting of the full volume necessary to conduct the test). The blank sample was a non-toxic sample prepared as the typical synthetic control dilution water for each test method. Testing of the blank sample provided a means of determining the false positive rate for each test method. Interlaboratory precision was evaluated through testing of the reference toxicant, effluent, and receiving water sample types."

As is evident the test requires a sample of the receiving water to determine degradation of the natural chemistry. As was afore mentioned, the receiving waters of WECo's mine are ephemeral and do not facilitate a sample unless ample runoff has caused the stream to flow. Therefore a sample from any planned discharge from the mine would not include a sample of receiving water. C.3.a.i of the draft permit states "If a sample of the receiving water is unavailable, because of its ephemeral nature, standard synthetic water may be used." This is of concern due to the introduction of uncertainty in the accuracy of the test. Cindy Rohrer, a representative from Energy Labs in Billings stated "It's difficult to speculate on the uncertainty of using laboratory prepared receiving water versus the actual stream receiving water. However, the test would give a good indication of the effect of the effluent on aquatic life prior to being discharged into the receiving water." FS-10 and FS-11 (pg 19 and 20) of the Permit Fact Sheet show that East Fork Armells and its Tributaries and Rosebud Creek Tributaries sustain no salmonid fish or fish in early life stages. This means that the water that WECo discharges will be in contact with no fish life until it reaches either Rosebud Creek (approximately 15 miles away) or the Yellowstone River (approximately 30 miles away). Due to the uncertainty of accuracy and the remoteness of the mine to aquatic life WECo proposes that WET testing not be required for planned discharges to ephemeral streams.

WET Testing for Unplanned Discharge

Unplanned discharges from the mine are usually a result of runoff overtopping sediment control structures. Per MCA 17.24.639(2) WECo's sedimentation ponds are designed to contain the runoff from a 10-year 24-hour precipitation event for the worst case drainage scenario. Therefore most overtopping is due to a precipitation event greater than a 10-year 24-hour event. As one might expect, this cannot be predicted or planned for. Cindy Rohrer, a representative from Energy Labs in Billings, stated "Energy Labs needs 1 week prior notice to perform the Acute WET test in order to ensure sufficient incubator space for the test, sufficient organisms, and staff to perform the test. Additionally, the time the sample spends in the process of shipping tends to eat up a lot of the 36 hour hold time. Scheduling the tests ahead of time allows us to get as much of it set up as possible in order to meet the hold time." This also brings to light the fact that the lab is not available on weekends and holidays. This issue is compounded by the approximate 2-hour drive to Billings to submit a competent sample and the issues discussed in the previous section. It is not feasible to perform the WET test during an unplanned discharge due to the holding time and inaccessibility of the laboratory. Due to theses issues WECo proposes that WET testing not be required for unplanned discharges.

Effluent Requirements for Unplanned Discharges Resulting from >10-Year 24-Hour Precipitation Events

Tables 9-15 of the draft permit indicate that the limitation for Settleable Solids is the only effluent limitation that is not required for discharges resulting from a precipitation event greater than or equal to the 10-year 24-hour event. MCA 17.24.639(2) only requires the containment of runoff from the 10-year 24-hour precipitation event. These seem to contradict each other in basis. How is WECo to be held accountable for the quality of runoff if the precipitation event exceeds that which we are required to contain? WECo proposes that effluent limitations be required for discharges resulting from precipitation events less than or equal to the 10-year 24-hour event.

Mislabeled Outfalls

Table 1 of the draft permit shows the incorrect receiving waters for the following outfalls:

- 039 – Receiving water is Stocker Creek
- 040 – Receiving water is Stocker Creek
- 041 – Receiving water is Stocker Creek
- 075 – Receiving water is Castle Rock Lake

Nondegredation of Receiving Waters

ARM 17.30.629(2)(k) states "it is not necessary that wastes be treated to a purer condition than the natural condition of the receiving water...". Due to the ephemeral nature of the receiving

waters, how can this rule be enforced? What type of data does WECo need to present in order to satisfy a discharge of this nature?

Representative Outfalls

Representative outfalls are vaguely defined in the permit and leave considerable room for personal interpretation. The following questions need to be addressed before the permit becomes a legal document:

- Does a representative outfall represent a defined number of non-representative outfalls? If so, which representative outfall represents which non-representative outfall?
- What is the relationship between representative and non-representative outfalls?
- If a representative outfall discharges during a precipitation event is it assumed that all the outfalls that it represents discharged as well?
- Will non-representative outfalls need to be inspected during/after a precipitation event?
- Will the non-representative outfalls be held to the sample taken at the representative outfall?
- If a non-representative outfall, which is inaccessible during a precipitation event, is accessed after the precipitation event and is found to be discharging does a sample need to be taken? Or does the representative outfalls sample over-rule?
- If a non-representative outfall discharges and its representative outfall does not discharge during the same precipitation event, is it considered a discharge or not?
- What if a sample cannot be taken due to inaccessibility? (Ex. Outfall 083 is very inaccessible during precipitation events)
- If a representative outfall and at least one of the non-representative outfalls that it represents discharges during a precipitation event and a violation occurs because of the sample at a representative outfall, what are our options of contesting the violation for the non-representative outfall?
- What is the relationship between representative outfalls and "New Outfalls"?
- As "New Outfalls" have more stringent standards are they to be considered individually and not included in any representative outfall discussion?
- If both a representative outfall and a "New Outfall" discharge during a precipitation event and a sample is taken at a representative outfall and not at a "New Outfall" then the intent of the New Source Performance Standards would not be met because the sample was not taken at the new source. How is this justified?

Cost-Effectiveness of Continuous Flow Measurement and Automatic Sampling

There are 23 outfalls classified as representative outfalls. I.B.1.a states "Sampling equipment must be installed at representative monitoring locations to ensure flow measurement and automatic sample collection regardless of weather and/or site conditions" due to a precipitation event. During the past 20 years (June 1992 to June 2012) the 23 outfalls had 43 unplanned

discharges (including precipitation events less than and greater than the 10-year 24-hour event) reported on the monthly Discharge Monitoring Report (DMR) at the representative outfall locations. If the extent of each discharge was conservatively assumed at 7 days then there were 301 discharge days. To put this number in perspective, if all 23 outfalls would have discharged each day of the last 20 years there would have been 168,015 discharge days. This means that, conservatively, these automatic samplers and continuous flow measuring devices are only going to operate less than 0.2% of the time they are installed. Also, 33 out of the 43 discharges were sampled and results are contained in the respective DMR reports. WECo retains that the small increase of data from that which is already being reported is not worth the upfront cost (which is in the tens of thousands per outfall) plus the resources for regular calibration and maintenance/replacement costs.

Prevention of discharge is one of WECo's main goals. WECo proposes that a more frequent monitoring plan for the ponds and sediment traps be implemented in place of installation of automatic samplers and continuous flow measuring devices. Current monitoring for the ponds and sediment traps is as follows: quarterly for ponds and annually for the sediment traps. WECo proposes monitoring frequency be increased to monthly for all sediment control devices to ensure that their capacity will adequately contain the 10-year 24-hour event or be dewatered in a timely manner to achieve such capacity. As a preventative measure it would implement the best practicable method to remain compliant. Sampling of unplanned discharges would remain the same as it has for the previous permit.

Representative Monitoring Outfalls

The following is a summary of the travel time to each representative outfall from the engineering office:

Representative Outfall	Travel Time (min:sec)
009	13:35
09A	11:30
10C	12:08
011	10:48
16A	9:00
021	9:33
035	2:27
043	6:22
046	7:20
058	9:15
075	25:31
095	7:07
096	9:48
105	5:41
109	5:26
128	12:00
133	8:45
139	7:00
143	18:51
144	17:58
151	17:50
083	26:02
194	16:48

WECo proposes that the representative outfalls be re-examined to determine accessibility and that the "grab samples should be taken during the first 30 minutes of discharge" be replaced by "representative outfalls should be inspected during or immediately following a precipitation event that may produce runoff and grab samples shall be taken at that time, if discharging." This would be feasible because there is, at minimum, a supervisor on the mine site 24 hours a day 7 days a week 365 days a year.

References

WECo1 – Final Report: Interlaboratory Variability Study of EPA Short-term Chronic and Acute Whole Effluent Toxicity Test Methods, Vol. 1,
http://water.epa.gov/scitech/methods/cwa/wet/upload/2007_08_06_methods_wet_finalwetv1.pdf
September 2001

Representative Monitoring Outfalls

Table 16 includes 23 locations designated as representative monitoring outfalls, (Section I.B.1.a). Per I.B.1.b grab samples should be taken during the first 30 minutes of discharge. This would be

feasible if the discharge was controlled during discharge from the outfall, but sampling at the 23 locations (during the first 30 minutes) identified in Table 16 would be problematic during a site wide precipitation event. Due to the accessibility of the various outfalls, time required for sampling and timing of the discharge at each location, it would be logistically impossible to sample all 23 locations within the first 30 minutes of discharge during significant rainfall or snowmelt events. WECO proposes that fewer outfalls be selected as representative outfalls. Many of the outfalls could be considered "substantially identical outfalls" based on the similarities of the general mining and reclamation activities, control measures, and runoff coefficients of their drainage areas. WECO requests a reduction in the number of outfalls sampled, considering that substantially identical outfalls exists for the active mine areas, reclaimed mine areas, and coal preparation plants and associated areas. The draft permit should be revised to identify representative outfalls that fall within either 40 CFR 434 subparts B, D and H. The permit should emphasize the use of representative outfalls for Subpart H where reclamation activities have been completed and past monitoring indicates compliance.

The draft permit includes 14 different tables that outline effluent limits and monitoring frequency and Table 16 describes representative monitoring outfalls for precipitation driven events. The detail provided in the tables is vague and confusing, and does not provide a concise description of the required monitoring. WECO requests that the final permit be specific in defining the monitoring requirements, number of outfalls and frequency of sampling required.

TBELs

Technology Based Effluent Limits (TBELs) are included in fourteen separate tables and are applicable to the seven different site areas associated with the different drainage basins. TBELs have been defined by the USEPA and are found in 40 CFR Part 434. Subpart B, addresses coal preparation plants and coal preparation plant associated areas. Subpart D addresses alkaline mine drainage from an active mining area resulting from the mining of coal. Subpart H addresses western alkaline coal mining and applies to alkaline mine drainage at western coal mining operations from reclamation areas, brushing and grubbing areas, topsoil stockpiling areas, and regraded areas. Subpart F addresses miscellaneous provisions including effluent limitations for precipitation events. The following TBELs are applicable to each 40 CFR 434 subpart:

Subpart	TBELs	Reference
B	Iron (total), TSS, pH	§ 434.22.b **Coal Preparation Plants and Coal Preparation Plant Associated Areas,** from such point sources normally exhibit a pH equal to or greater than 6.0 prior to treatment
D	Iron (total), TSS, pH	§ 434.42 **Alkaline Mine Drainage** applicable to alkaline mine drainage from an active mining area resulting from the mining of coal of any rank including, but not limited to, bituminous, lignite, and anthracite.
H	Sediment control plan with BMPs	§ 434.81 **Western Alkaline Coal Mining.** This subpart applies to alkaline mine drainage at western coal mining operations from reclamation areas, brushing and grubbing areas, topsoil stockpiling areas, and regraded areas. (a) The operator must submit a site-specific Sediment Control Plan to the permitting authority that is designed to prevent an increase in the average annual sediment yield from pre-mined, undisturbed conditions. The Sediment Control Plan must be approved by the permitting authority and be incorporated into the permit as an effluent limitation. The Sediment Control Plan must identify best management practices (BMPs) and also must describe design specifications, construction specifications, maintenance schedules, criteria for inspection, as well as expected performance and longevity of the best management practices. (b) Using watershed models, the operator must demonstrate that implementation of the Sediment Control Plan will result in average annual sediment yields that will not be greater than the sediment yield levels from pre-mined, undisturbed conditions. The operator must use the same watershed model that was, or will be, used to acquire the SMCRA permit. (c) The operator must design, implement, and maintain BMPs in the manner specified in the Sediment Control Plan.

F	Alternate Limitations	**§ 434.63 Effluent limitations for precipitation events.** The provisions of this subpart F apply to subparts **B**, C, **D**, E and G.
	pH, SS	Discharge caused by precipitation within any 24 hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume)
	pH	Discharge caused by precipitation within any 24 hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume)

Application of TBELs provided in the draft permit is not consistent with the requirements of 40 CFR 434. The draft permit provides effluent limits and monitoring requirements for seven different areas consisting of different drainage basins in the mine area. The area within each of these basins may include areas where requirements for Subparts B, D and H are applicable. By organizing the effluent limits and monitoring requirements in this fashion the most rigorous requirements are applied to all of the outfalls in the drainage basin. This approach increases the required monitoring in cases where outfalls regulated under Subpart H (reclaimed areas) are located in the same drainage as outfalls regulated under Subparts B and D. WECO believes that the permit should be reorganized to eliminate the excessive effluent limits and monitoring requirements resulting from this factor. The effluent limits and monitoring requirements in tables 3-15 need to be consolidated with respect to the applicable 40 CFR 434 subparts. WECO believes that the increased level of monitoring required by the draft permit is not justified for reclaimed mine areas where successful reclamation has occurred and continued use of BMPs in accordance with subpart H is occurring.

Alternative TBELs are provided in Tables 9 through 15. The alternative limits are applicable to precipitation and snowmelt driven runoff events. I.B indicates that the final limits in Tables 2 through 8 are applicable were effluent "discharges as overflow". Given this factor it is not clear if the intent is to use the alternative limits for all runoff events or runoff events that result in overflow. Footnotes 2 and 3 of Table FS-36 indicate variable effluent limits for discharges less or greater than the 10-year 24-hour precipitation event (although the footnotes are not cited in the table). This approach would be consistent with the requirements in 40 CFR 434.63 as summarized in the table above. This would also be consistent with the previous permit (November 8, 1999) where:

- Less than the 10-year, 24-hour storm: monitor for settleable solids instead of TSS.
- Greater than the 10-year, 24-hour storm: monitor for TDS

This issue requires more attention and clarification in the permit. The alternative numeric effluent limits and monitoring requirements tables also should be organized with respect to the applicable 40 CFR 434 subparts. The tables need to clarify TBELs required for different runoff events to be consistent with 40 CFR 434. The alternative TBELs included in Tables 9 through 15 have included outfalls consisting of reclaimed areas regulated under 40 CFR 434 subpart H. The requirements in subpart F are not applicable to subpart H and WECO requests that the draft permit be revised to remove the requirement for alternative limits for reclaimed areas.

WQBELs

The draft permit includes Water Quality Based Effluent Limits (WQBELs) for Aluminum (dissolved), Copper (total recoverable), and Selenium (total recoverable). Monitoring of these parameters was not included in the previous permit and limited data was available (only two samples) that were used to complete the Reasonable Potential Analysis (RPA). WECO is concerned that this data set may not be adequate for completing the RPA. The following table provides a summary of monitoring data for the parameter used in the RPA and development of WQBELs:

Parameter (WQBEL)	Min. Value	Max Value	Number Samples	Average Value	Min. Value	Max Value	Number Samples	Average Value
	Effluent Data µg/L				Receiving Water[1] µg/L			
Aluminum, dissolved (63/127)	<30	600	2	300	<30	12,000	24	2,000
Copper, total (4.4/8.8)	<1	4	2	3	4	300	24	60
Selenium, total Rec. (3.6/7.3)	<2	15	2	9	<1	5	23	2

[1] Data for W. Fork Armells, Stocker, Donley and Blank Hank Creeks.

As illustrated in the above table, the receiving water quality exhibits average aluminum and copper concentrations in excess of the maximum daily limit provided in the draft permit. The maximum effluent concentration for selenium (one sample) exceeded the maximum selenium WQBEL. In accordance with 75-5-306 (1) , MCA, it is not necessary that wastes be treated to a purer condition than the natural condition of the receiving water as long as the minimum treatment requirements, adopted pursuant to 75-5-305 , MCA, are met. As illustrated by the

effluent and receiving water quality data this may be the case for aluminum, copper and selenium. WECO request that the DEQ delay the inclusion of WQBELs for these parameters until additional monitoring is completed to determine if the effluent loading exceeds the naturally occurring levels, and if necessary to support a rigorous RPA.

The receiving waters are classified as C-3 streams. ARM 17.30.629 defines the water quality standards for streams classified as C-3. Since the discharges will be to ephemeral streams they are not subject to the specific water quality standards of ARM 17.30.629 in accordance with ARM 17.30.637.6. Industrial waste must receive, as a minimum, treatment equivalent to the Best Practicable Control Technology Currently Available (BPCTCA) as defined in 40 CFR Chapter I, Subchapter N.

WECO did not anticipate that WQBELs would be needed for aluminum, copper and selenium and therefore did not request a mixing zone for these parameters. Given the outcome that WQBELs are required, WECO requests an opportunity to reconsider a request for mixing zones for these parameters. It must be noted however, in accordance with 75-5-306 , MCA, it is not necessary that industrial wastes, sewage, or other wastes, as defined in 75-5-103 , MCA, be treated to a purer condition than the natural condition of the receiving water as long as the minimum treatment requirements are met and provided all reasonable land, soil, and water conservation practices have been applied. This factor further negates the requirement for the WQBELs included in the draft permit.

Effluent Limitations for EC

The draft permit includes an effluent limitation for Electrical Conductivity (EC). EC means the ability of water to conduct an electrical current at 25 ^{0}C. The electrical conductivity of water represents the amount of total dissolved solids (TDS) in the water and is expressed as microSiemens/centimeter (µS/cm) or micromhos/centimeter (µmhos/cm) or equivalent units and is corrected to 25 ^{0}C. Since EC and TDS are closely related, correlations are commonly used between the two parameters. One such correlation EC = 1000*TDS/640 (Hanson et.al., 1999). In order to evaluate the reasonableness of the TDS and EC limits in the draft permit, EC can be calculated from the TDS limits as presented below:

Draft Permit Table No.	Drainage Basin	Permit Limit Average TDS	Permit Limit Maximum TDS	Calculated Average EC	Calculated Maximum EC	Permit Limit EC
		mg/L	mg/L	µS/cm	µS/cm	µS/cm
Final Numeric Effluent Limits						
2	E. Fork Armells Ck.	3000	4500	4688	7031	Report
3	W. Fork Armells, Black Hank, and Donley Cks.	2600	3900	4063	6094	Report
4	Stocker Ck.	3950	5925	6172	9258	Report
5	Lee Coulee	2600	3900	4063	6094	500
6	Pony Ck.	2550	3825	3984	5977	500
7	Cow Crk.	3650	5475	5703	8555	500
8	Spring Ck.	2200	3300	3438	5156	500
Alternate Numeric Effluent Limitations (runoff events)						
9	E. Fork Armells Ck.	-	4500	-	7031	Report
10	W. Fork Armells, Black Hank, and Donley Cks.	-	3900	-	6094	Report
11	Stocker Ck.	-	5925	-	9258	Report
12	Lee Coulee	-	3900	-	6094	500
13	Pony Ck.	-	3825	-	5977	500
14	Cow Crk.	-	5475	-	8555	500
15	Spring Ck.	-	3300	-	5156	500

This comparison indicates that the corresponding EC calculated from the final TDS effluent limit would be in the range of approximately 5,200 to 9,200 µS/cm given the maximum daily limits provided in the draft permit. The EC limit provided in the draft permit is 500 µS/cm (less than 10 percent of the maximum calculated values above). This factor demonstrates that the proposed EC limit is not compatible with the existing limits for TDS. The permit fact sheet indicated that the basis for the EC limit is ARM 17.30.670. This rule was developed to provide an instream water quality standard for the mainstems of Rosebud Creek, the Tongue, Powder, and Little Powder rivers and related tributaries. These standards were adopted to address the potential impacts from coal bed natural gas produced water discharge on crop irrigation. DEQ has incorrectly applied these rules as effluent limits in the draft permit. WECO request that the proposed EC limits be removed from the draft permit since the basis for applying the instream criteria as an effluent limit is flawed. The current TDS limits are adequate for managing EC within the receiving water. This is demonstrated by the TDS measurements in the receiving water where an average (1289) and maximum (5340) TDS mg/L were observed in E. Fork Armells, W. Fork Armells, Stocker, Donley, and Black Hank Creeks. Likewise, monitoring in Spring, Pony and Cow Creeks, and Lee Coulee indicate an average (703) and maximum (4810) TDS mg/L. This factor indicates that the current TSD limits are more in line with the naturally occurring levels in the receiving waters. An average EC value (900 µS/cm) was observed for the two samples of effluent previously tested. The proposed EC limits would not be attainable given the observed effluent concentrations that appear to be below naturally occurring levels. Given these factors, it would not be likely that WECO could comply with the proposed limits using the proposed BPCTCA. In accordance with 75-5-306 (1) , MCA, it is not necessary that wastes be treated to a

purer condition than the natural condition of the receiving water as would be required by inclusion of the proposed EC limit.

Effluent Limitations for SAR

The draft permit includes effluent limits for Sodium Adsorption Ratio (SAR). As was the case for EC, the basis for this limit is ARM 17.30.670. Two limits are provided for different periods during the year. This rule was developed to provide an instream water quality standard for the mainstems of Rosebud Creek, the Tongue, Powder, and Little Powder rivers and related tributaries. DEQ has incorrectly applied these rules as effluent limits. WECO request that the proposed SAR limits be removed from the draft permit since the basis for applying the instream criteria as an effluent limit is flawed. The existing permit did not include a requirement to monitor SAR, although test data from two samples indicate an average value of 0.3 and a maximum value of 0.36. These values are well below the proposed limit and do not indicate a reasonable potential to exceed the standards in ARM 17.30.670, or justify the need for an SAR permit limit.

Whole Effluent Toxicity (WET) Testing

WET testing is specified on Tables 2 through 8. The location of the proposed WET testing is at outfalls regulated under 40 CFR 434 subpart B. Appendix I of the Fact Sheet indicates that subpart B applies to outfalls 009, 09A, 16A, 021, 043, and 094. These outfalls are all located within the East Fork of Armells Creek (Table 2). WET test requirements are also listed on Tables 3 through 8. These drainage areas do not include any currently regulated subpart B facilities. It is not clear where the proposed WET testing is required given the current organization of the draft permit. This issue would be eliminated if the effluent limits and monitoring requirements were organized by the categories under 40 CFR 434 as opposed to drainage basins.

Wet testing is also indicated in Tables 9 through 15 as part of the alternative effluent limits that are used for discharges related to precipitation and snowmelt events. Sampling for WET testing during storm/runoff events may not be practical given the number of outfalls where sampling is required using the alternative limits.

The previous permit (November 8, 1999) did not include WET testing nor did it include WQBELs for Aluminum, Copper, or Selenium. Additional monitoring of these parameters was also not included in the permit. These factors do not support the determination by the DEQ to include such an extensive WET testing program in the permit. WECO proposes that the WET testing requirement be removed from the draft permit since observational monitoring will be completed for any potentially toxic parameters associated with facilities regulated under subpart B. The observational monitoring will support future RPA for these parameters to determine the need for WQBELs and WET testing. The RPA for aluminum, copper and selenium presented in the fact sheet was based on two test results. Variability in these data and the small sample size has resulted in a large factor of safety in the reasonable potential analysis (RPA).

Additional observational monitoring is required to develop a better dataset to support the RPA and determining the need for WET testing.

Miscellaneous Comments

Tables 2, 4, 10 – Under existing outfalls, (typo) Iron should be Iron, total. The minimum monitoring frequencies indicated in Table 9 are not consistent with the values indicated in Table FS-36 and requires clarification. The maximum daily limitation for dissolved aluminum in Table 4 is not consistent with Table 11 or Table FS-30 and requires clarification.

References:

Hanson B., Gratten S., and Fulton A. 1999. Agricultural Salinity and Drainage. Division of Agricultural and Natural Resource Publication 3375, University of California Irrigation Program, University of California, Davis.

Discussion on DEQ Rationale/Methodology used for Calculation of Effluent Limits and Whole Effluent Toxicity Testing.

- Table FS-12 (permit fact sheet) contains an error. The Projected Receiving Water Concentration for aluminum (dissolved) should be 2,300 ug/L (as opposed to 2.3 ug/L).

- Appendix II: Summary of discharge for flow data should be reevaluated by DEQ for accuracy. For instance, it is unclear how an average annual flow rate can be the same as the maximum daily flow rate for what is likely an episodic/short duration event as DEQ shows for year 2004. There appear to be other similar issues/problems shown by DEQ on the Appendix II table as well.

- In the Permit Fact Sheet the need for water quality based effluent limitations (WQBELs) is evaluated by comparing a projected receiving water concentration (Cr) to "the lowest applicable" numeric standard (C). In some instances the aquatic life standard is used for C. This does not appear to be an applicable standard since, in effect, all the streams receiving discharge are ephemeral in nature. Furthermore, the outfalls rarely exhibit discharge, except in the instances of major, low frequency, precipitation events. One primary reason for the low frequency of outfall events is that the sediment control ponds are designed to receive/store the 10-year 24-hour event flows. For instance, Table C-1 attached hereto provides an example as to how infrequent such outfall flows are in the instance of what DEQ defines as either "coal preparation plant" or "coal plant circuit" outfalls. Even flows in East Fork Armells Creek are fairly infrequent as shown in Figure C-1. In summary, the approach used by DEQ seems counterintuitive when considering the nature of streams and the lack of flow for these streams in the vicinity near the Rosebud Mine.

- The lack of outfall discharge events, and the lack of "receiving" water flow, demonstrates that the assumption that DEQ uses, leads to results which are not

realistic. Tables FS-12 and FS-13 show that in some instances, the lowest applicable numeric standards used are "chronic" aquatic life standards from circular DEQ-7. In effect, "How can application of a chronic standard be considered a realistic "applicable standard" when there is no chronic exposure to begin with?" This lack of chronic exposure also seems to be acknowledged by DEQ when it states "Monitoring for chronic toxicity is not required because the discharges are intermittent, not continuous, and therefore chronic effects from the discharges are not anticipated." (underlined for emphasis).

In summary, if aquatic life standards are used for this evaluation, the lowest applicable numeric standard in this evaluation should be the Acute Aquatic Life Standard (as opposed to the chronic standard). It can be argued that if there is no water in the stream channel (at outfalls) there can be no aquatic life affected by an outfall event. In this case the lowest applicable numeric standards could then be inferred to be the human health standards from circular DEQ-7.

- The Permit Fact Sheet shows that once the need for WQBEL was established, then WQBELs were calculated. WQBELs are calculated using the same dilution factor (zero=no receiving water) and three water quality standards. The Average Monthly Limitations (AML) and Maximum Daily Limitations (MDL) are calculated using the Chronic Aquatic Life Standards and Acute Aquatic Life Standards. Again, the use of a dilution factor of zero (no receiving water) contradicts the applicability of the use of chronic aquatic life standards for the calculation of Limitations.

- Appendix VI shows AML and MDL level calculations which provide results that are not intuitive, or, lack common sense. For instance, in some cases, AML values are less than 50% of the most stringent chronic aquatic life standards given in the DEQ-7 circular. The effluent MDL concentrations calculated are as low as about 1/700 times the maximum concentration actually measured in the receiving water. Table C-2 shows a comparison of the MDLs from Tables FS-21 and FS-23 with Receiving Water Characteristics reported in Appendix IV of the permit. For example the MDL level calculated for total iron is 1.61 mg/L. The maximum total iron concentration reported for receiving water is 326 mg/L. In this case, if effluent limitations are met, the iron concentration would be less than 1/200 of the maximum iron concentration measured in receiving water. It is obvious that such an effluent limitation is not realistic.

- The permit specifies that a WET test with 6 specific different effluent concentrations is needed (draft permit) as opposed to the general EPA recommendation of "a minimum of 5 effluent concentrations" (Source: Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition, October 2002.).

- EPA draft guidance for WET implementation under the NPDES Program (November 2004) was written with receiving waters in mind. Some statements to this effect are:

- Based on existing regulations, NPDES authorities must determine whether a discharge causes, has the reasonable potential to cause, or contributes to an ***in-stream*** excursion above a numeric criterion or a narrative criterion within an applicable State water quality standard and, where appropriate, establish permit limits on WET, for lethal and sub-lethal effects.

- Another advantage to using WET testing is that it enables prediction and avoidance of a toxic impact before the detrimental impact might occur (i.e., after the ***aquatic population in the receiving water*** has experienced ***prolonged exposure*** to such toxicity).

The site conditions clearly do not comport with the inferences of "in-stream incursion," "receiving water," and "prolonged exposure" that are made in this EPA guidance document.

In summary, DEQ should reassess, and then, recalculate or update the Final Numeric Limitations to values that are more directly in conformance with the conditions of the discharge and "receiving" streams in the vicinity of the Rosebud Mine.

- It is not practical to require the mine to submit water samples for WET analysis for precipitation driven flow events:

  - The laboratory requires the start of testing be within 36 hours from the time the effluent sample was taken.

  - "Energy Labs needs 1 week prior notice to perform the Acute WET test in order to ensure sufficient incubator space for the test, sufficient organisms, and staff to perform the test. Additionally, the time the sample spends in the process of shipping tends to eat up a lot of the 36 hour hold time. Scheduling the tests ahead of time allows us to get as much of it set up as possible in order to meet the hold time." (statement by Energy Labs to Western Energy).

  - Hence, it is an unrealistic expectation to require a WET test for precipitation driven flow events associated with the "coal preparation plant" or "coal plant circuit" outfalls.

- The non-exceedance EC standard for Lee Coulee, Pony Creek, Cow Creek, and Spring Creek is set at 500 uS/cm. The basis DEQ cites for this standard is ARM 17.30.670. It is noteworthy that actual/background EC values greatly exceed this standard. In effect, this non-exceedance standard is unrealistic.

Comments on DEQ Rationale/Requirements for Flow/Sampling Instrumentation.

- The language employed by DEQ in the draft MPDES permit is vague in terms of what the specific monitoring requirements are for measuring flow and collecting water quality samples. It could be interpreted by some that DEQ is requiring automatic and

continuous flow measurement and parameter sampling. If that is the case, then such a measurement program may not be that appropriate for the Rosebud Mine for the limited flow events that occur from the large number of outfalls at the mine. See example shown in Table C-1 provided hereto.

- As an illustration of practical issues, the following is a typical setup that would be required be employed to continually measure flows and also to collect the samples:
    - Flume structure
    - Pressure transducer
    - pH and conductivity probes
    - Pumping sampler; and
    - Programmable data recorder.

The capital/construction cost for this setup would be approximately $ 20,000 per location. This does not include the operation and maintenance cost at each location. Assuming this was applied to all outfalls, the capital/ construction cost would be approximately $ 3 million. If it were applied solely to the "representative" outfalls, the cost would be about $ 480,000. Again, these costs do not reflect the associated operation and maintenance, data collection and evaluation costs, which would be significant.

- There are other feasibility issues that would need to be overcome including, but are not necessarily limited to, the following specific conditions:
    - Outfalls with no pond structure. Automatic and continuous monitoring is not feasible at outfalls (with no detention pond) producing overland flow from areas of active mining and areas in various stages of reclamation and inactivity. Sediment transport and deposition cause the configuration of the drainage channels to change considerably during runoff events. Braided channels are an example of a channel resulting from excess sediment transport and deposition. This leads to uncertainty as to what the channel location and configuration will be over time as it changes during each runoff event. This factor, coupled with the sediment load issues, results in a very low probability/feasibility of proper measurements being collected using automated equipment.

Weir blades with crest gages have been suggested by some as a method of monitoring flow but these tend to be choked with sediment during the initial runoff. Weirs are more commonly than not choked by sediment which leads to flow measurement inaccuracies. In fact, the basic fundamental principle used to develop the weir equation is violated with this sediment choking. Finally, the channel cross section will change during a runoff event leading to additional flow measurement inaccuracies.

- Outfalls with pond structure. Automatic and continuous monitoring may be more feasible at outfalls with a detention pond discharging flow from areas of active mining and areas in various stages of reclamation and inactivity. It is feasible to collect samples at outfalls resulting from overland flows produced from areas of active mining and areas in various stages of reclamation if flow is from a detention pond with a discharge pipe.
    - The expense of automated sampling equipment is not justified for pond discharge pipes because there is a functional relationship between water level above the pipe and discharge flows. Collection of manual staff gage readings in the pond, coupled with details on exit piping physical parameters, can be used to calculate representative/accurate flow discharges. Pygmy flow meters could also be used at the pipe discharge. Effluent samples for various parameters can be collected via grab samples or other sampling methods.
    - One reason that automated sampling equipment is not justified is that many of the runoff events will not produce flow from the ponds because of the storage capacity of the pond or series of ponds. This greatly reduces the number of discharge events from these pond outfalls because the ponds are designed to retain a 10-year 24-hour runoff event. Another issue is that samples do not necessarily coincide with peak, or initial flows, because the pond levels, and hence storage (e.g., from prior events), will vary from empty to a full pond. This degree of storage will have a significant effect on the peak discharge exiting the pond. The existing storage will also affect the water quality of the effluent leaving the pond. It should also be noted that the frequency of runoff events is very low. Hence, the utility of such information, even if it were collected via automatic measurements, would likely be questionable.
    - For these reasons the returns on investment for the data produced from an automated data collection system is not justified.

- On average, about 6 flow events occur per year for the approximately 150 outfalls (based upon Appendix II of draft document). Hence, it seems that it would be more reasonable to collect samples at outfalls as flow occurs, and to focus on those locations where a flow event is more likely to be observed. The existing methods applied by the mine are to: 1) Collect grab samples (or use staged sample collection bottles set at outfall discharge points); and 2) Use pygmy flow meters to measure flow. This procedure is deemed to be a practical method for the environmental conditions that exist at the mine.

- One possible improvement to environmental monitoring at the mine is to include the existing four automated flow measurement sites, and the associated water quality sampling

locations, to track the overall long term flow discharge and water quality. Such information would provide an accurate overall indication of progress of the surface water hydrology and water quality for the mine over time. The flumes can be used to accurately monitor large areas of the mine and assure that the outfall data collection is reflective of the overall mine conditions. These same locations could provide for realistic baseline information for both flow conditions and for the water quality of the ephemeral streams in the area.

Please contact Wade Steere, Environmental Engineer, if you have any questions at (406) 748-5199.

Sincerely,

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