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## J. J. JOEL FARBER

461 LINDSEY LANE, THERMOPOLIS, WY 82443

**July 5, 2019**

Mr. Kevin Frederick, PG  
Administrator, Water Quality Division  
Wyoming Department of Environmental Quality  
200 West 17<sup>th</sup> Street  
Cheyenne, Wyoming 82002

Transmitted electronically via email to [kevin.frederick@wyo.gov](mailto:kevin.frederick@wyo.gov) and followed by regular mail to the address above

**Subject: Comment on the Aethon Energy Operating, LLC Draft Renewal of WYPDES Permit Number WY0002062**

**Dear Mr. Frederick:**

This letter along, with the referenced attachments and my public comments during the public meeting you held in Thermopolis on May 21, 2019, together comprise my comment on the subject Aethon Energy draft renewal WYPDES permit.

I first became aware of the scope of this permit renewal from reading an article in the Thermopolis Independent Record. Based on the information in the article and subsequent inquiry, I attended the public meetings held in Riverton on May 20<sup>th</sup> and in Thermopolis on the 21<sup>st</sup>. Three questions were asked during those two meetings that particularly inform my comments and actions. The three questions and the responses that WDEQ provided are briefly summarized below:

1. A physician who works at the hospital in Riverton asked about the risk to human health in association with recreation at Boysen State Park during the public meeting you officiated over in Riverton.

*Your staff responded that although the model developed by ERM (Environmental Resources Management) on behalf of Aethon Energy does not directly address risk to human health, WDEQ does not believe the discharges represent a risk to recreation users of the reservoir as long as people do not come into contact with the waters*

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*within the "mixing zone" established in ERM's model. A slide depicting an area of Boysen Reservoir at the outfall of Badwater Creek was referenced during the response in order to show the "mixing zone" in the reservoir and your staff also provided a caution that the mixing zone area would fluctuate or change in concert with the pool elevation in the reservoir. A human health risk assessment has not been performed as part of the technical assessment of the impacts to water quality that WDEQ is relying on to support the draft renewal permit.*

2. After listening to the response your staff provided to the physician's question, I asked if the ERM modeling was performed by or under the oversight of a Wyoming Professional Engineer and/or Professional Geologist.

*You opted to respond directly to my question without support from your staff. You told me that oversight of Wyoming licensed professionals is not required under the regulations governing the WYPDES permit program but that you would consider consulting the licensing boards for professional engineers and geologists as part of WDEQ's decision-making process at the conclusion of the public input period.*

3. The next evening a member of the audience at the public meeting held in Thermopolis asked how the Town of Thermopolis water supply would be affected if Boysen Dam failed. This question was asked in context of WDEQ's assessment (based on ERM's model analysis) that water quality in the Wind River at the outfall of Boysen Dam would not be adversely affected statistically.

*Your staff responded reasonably that it is very, very unlikely that Boysen Dam would ever fail but that if the dam failed such that storage in Boysen Reservoir could not be maintained, the water quality downstream from Boysen Dam would be adversely impacted by the discharges proposed by Aethon under the draft WYPDES permit renewal.*

My concern regarding the threat to human health and the environment should Aethon Energy's draft permit renewal be approved is also informed by my past work as a consulting engineer and geologist in Wyoming. In part, my consulting work addressed environmental issues associated with development and production of hydrocarbons in most areas of Wyoming, including the Wind River Basin and the Moneta Divide area.

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I have two concerns. The first concern comes from my experience working on water resource issues in the Wind River, Green River and Great Divide basins, and it regards the fate and transport of the contaminants discharged to Badwater Creek (both organic and inorganic) during the winter season. One of the means that has been used to dispose of produced water in Wyoming, including the fluids that flowback from hydraulic fracture completions, is at treatment facilities that employ the “freeze-thaw evaporation process.” One example of this type of treatment facility is the Polar Bear Water Treatment Facility (PBWT) west of Rawlins, Wyoming. I reference this facility only because it has a website for easy access to understand this wastewater treatment process: <http://polarbearwater.net> You and your staff are no doubt already aware of these facilities, as WDEQ regulates the PBWT and other similar facilities that operate in Wyoming.

The “technology” that freeze-thaw water treatment facilities employs is driven by the long periods of below freezing ambient temperatures during Wyoming's winter season. Produced water is dispersed, ideally in a spray, that freezes into “clean” ice. A smaller fraction of the produced water effluent, that is a high-salinity brine laden with organic contaminants, drains from the purified water that is frozen. The brine with elevated contaminant concentrations is separated from the clean ice, and is responsibly disposed or put to beneficial use.

The same physical process happens in Badwater Creek during the winter months. Granted the freeze-thaw process along Badwater Creek is not quite as well defined in space and time as at the engineered treatment facilities that WDEQ regulates. And yes, the produced water that is being discharged has some thermal energy, so it takes some time and distance for the effluent to freeze. But the freeze-thaw process still works really well because it has a long way to travel. Your staff made a point of calling the public's attention to the significant distance between the end of pipe discharge locations, downstream along Badwater Creek to Boysen Reservoir, as a way of assuring the efficacy of approving Aethon Energy's permit. To the contrary, the long conveyance distance in Badwater Creek serves to enhance the freeze-thaw process and concentrate the contaminant load.

The key differences between a facility like PBWT and Badwater Creek is that the Badwater Creek channel is not lined with HDPE material and the fate and transport of the high-salinity brine (liquid stream) that separates from the channel ice is not defined in anyway.

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The second concern derives from my experience working in the Wind River basin, both in the Pavillion area and Lysite-Moneta area. The surficial geology of much this area is comprised of the Wind River Formation. The formation is non-homogeneous and hosts an unconfined aquifer named after it. The Wind River aquifer is recharged through direct hydraulic communication with streams in the area, including Badwater Creek. Wells completed in the Wind River aquifer provide for stock and domestic use. Moreover, WDEQ's investigations in response to the contamination of the groundwater supply in the Pavillion area indicates the Wind River aquifer is highly sensitivity to sources of potential contamination. Given the lessons and economic costs Wyoming incurred trying to replace water supply wells completed in the Wind River aquifer in the Pavillion area, potential degradation of the Wind River aquifer should also be considered as part WDEQ's analysis of this WYPDES permit.

With the above introduction and background for context, I offer the following opinions and comments:

1. The WDEQ should deny renewal of WYPDES Permit WY0002062 because the proposed discharges to Boysen Reservoir threaten human health and the environment.

Threats to the environment include degradation of groundwater in the water table aquifer that is in direct communication with Badwater Creek and its tributaries, as well as loss of aquatic life in the creek and downstream in Boysen Reservoir. Boysen Reservoir is located in a State Park that highlights water-based recreation. Human contact with the water stored in Boysen, including the part of the reservoir where Badwater Creek enters is allowed and does happen. People consume the game fish harvested from Boysen Reservoir, including the area of the reservoir identified for use to treat the wastewater effluent from Badwater Creek.

2. The WDEQ should not rely on the modeling work and work products prepared by ERM because ERM nor any of the individuals responsible for the environmental engineering model design and analysis described in the report titled "Water Quality Compliance Analysis for the Long Range Development Plan at Moneta Divide, Wyoming" are licensed to practice engineering and geology before the public in Wyoming. Attached please find a letter of complaint I am filing with the Wyoming Board of Professional Engineers and Surveyors, and the Wyoming Board of Professional Geologists as part of this comment.

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3. The model and technical report prepared and submitted by ERM to WDEQ on behalf of Aethon Energy is incomplete and technically inadequate to support renewal of WYPDES permit WY0002062.
- a. A human health risk assessment is necessary to responsibly estimate the nature and probability of adverse health effects in humans who come into contact with produced water effluent discharged to Badwater Creek and Boysen Reservoir from Moneta Divide. The likelihood of human contact with contaminated media is significant, particularly given the fact that Boysen Reservoir is located in a Wyoming State Park that is a prized water-based recreation area frequented by the public. People from all across Wyoming and the world, including children and the elderly, find occasion to swim, boat, hunt and fish in and around Boysen Reservoir, including the bay where Badwater Creek enters. In this regard, WDEQ and ERM have not provided the public complete and technically adequate information regarding the risk to human health posed by approval of the draft WYPDES permit WY0002062 renewal.
  - b. An ecological risk assessment is necessary to reasonably estimate adverse impacts, if any, to the environment from Aethon Energy proposed discharge. Such an assessment would entail an analysis of what plants and animals will be exposed, the nature of the exposure (e.g. chemical, thermal, etc) and a risk characterization of the potential harmful effects. Given that Boysen Reservoir is a popular fishery, and that many of the fish harvested from the reservoir are consumed, an ecological risk assessment of a scope needed to support a human health risk assessment is of highest importance. In this regard, WDEQ and ERM have not provided complete and technically adequate information about the risk to the environment posed by approval of the draft WYPDES permit WY0002062 renewal.
  - c. Yesterday I received and studied copies of two documents addressing independent reviews of the work products submitted by ERM to WDEQ on behalf of Aethon Energy's permit renewal. I understand that these documents are already being provided to WDEQ by others, but I will provide copies if requested in order to clarify my comment. The first document is a memorandum from Messrs. Harold Bergman and Joseph Meyer who are experts in the fields of

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- water chemistry and aquatic toxicity. It is dated June 27, 2019. They recommend Aethon Energy's permit renewal not be approved because the "permit renewal application and draft permit, together are severely inadequate and missing crucial information." This independent review by technical experts shows that WDEQ and ERM have not provided complete and technically adequate information about the risk to the environment necessary to support approval of the draft WYPDES permit WY0002062 renewal.
- d. The second document is a memorandum from Ms. Jean Marie Boyer with Hydros Consulting that is dated July 1, 2019. Hydros' reviewed the ERM modeling study and their review comments regarding ERMs analysis and lack of transparency are disturbing to read. I am particularly concerned about Hydros' review findings regarding "Removal of Winter Data" beginning on page 11 of Ms. Boyer's memorandum. Her conclusion is consistent with my experience, that an analysis of the winter months when the natural freeze-thaw process affects water quality is critically important. Exclusion of winter data in the model analysis is wrong. Hydros' independent expert analysis provides further reason to conclude that WDEQ and ERM have not provided complete and technically adequate information about the risk to human health and the environment necessary to approve renewal of the draft WYPDES permit WY0002062 renewal.
4. WDEQ's draft WYPDES permit WY0002062 provides for a new beneficial use of water stored in Boysen Reservoir for mixing and dilution of wastewater effluent. Currently, the existing beneficial uses of water stored in Boysen Reservoir have been adjudicated (Bighorn General Stream Adjudication) and are administered by the Wyoming Board of Control. As we discussed by phone recently, I request WDEQ consult with the Board of Control as part of your decision process. Attached please reference a letter to Mr. Loren Smith, Division 3 Superintendent with the Board of Control, requesting the Board's assistance. This letter presents the basis for my request, along with a brief summary of my concerns and comment with respect to WDEQ permitting a new beneficial use of storage in Boysen Reservoir, if the draft WYPDES permit WY0002062 renewal is approved.

In closing I want to reiterate a couple of the public comments I made during the meeting WDEQ held in Thermopolis. I support responsible Energy development in Wyoming. I

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understand what a difficult job you have, and I very much appreciate you holding public meetings on this issue and giving me the opportunity to provide this input.

Respectfully,



**J. JOEL FARBER**

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## **J. JOEL FARBER**

461 LINDSEY LANE, THERMOPOLIS, WY 82443

**July 5, 2019**

Ms. Shannon Stanfill  
Executive Director  
Wyoming Board of Professional Engineers and Surveyors  
6920 Yellowtail Rd, Suite 100  
Cheyenne, Wyoming 82501

Ms. Pamela Girt  
Executive Director  
Wyoming Board of Professional Geologists  
2617 E. Lincolnway, Suite I  
Cheyenne, Wyoming 82001

Transmitted electronically via email to [wyopepls@wyo.gov](mailto:wyopepls@wyo.gov) , [prof.geo@wyo.gov](mailto:prof.geo@wyo.gov) and [kevin.frederick@wyo.gov](mailto:kevin.frederick@wyo.gov) , and followed by regular mail to the addresses above

**Subject: Complaint regarding unlicensed professional practice in Wyoming**

**Dear Ms. Stanfill and Ms. Girt:**

I am writing this letter to file a complaint with both the Wyoming Board of Professional Engineer's and Professional Land Surveyors, and the Wyoming Board of Professional Geologists. I am filing one complaint jointly to both licensing boards inasmuch as my complaint regards unlicensed engineering practice that includes the practice of geology, as defined in the Wyoming Geologists Practice Act.

The unlicensed practice was performed by individuals with the engineering consulting firm Environmental Resources Management (ERM) located at 75 Valley Stream Pkwy, Suite 200, Malvern, PA 19355. ERM is a consultant to Aethon Energy, who is requesting a WYPDES permit (#WY0002062) from Wyoming Department of Environmental Quality. ERM submitted a modeling report titled "Water Quality Compliance Analysis for the Long Range Development Plan at Moneta Divide, Wyoming – A Hydrologic, Hydrodynamic and Water Quality Study of the Boysen Reservoir Watershed." The proposed draft permit, permit application, and ERM's modeling study are available on WDEQ's website at:



I am also attaching copies of the title page and page 16 of ERM's report to this letter for your reference. As shown on page 16, the following individuals are identified to be responsible: Shwet Prakash, Michael Fichera, Kelli Kearns, Sandeep Rana and Divya Nayak. Additionally, two other people are identified to have reviewed the model design and report documentation: Venkat S. Kolluru and William A. Schew. All of these individuals are identified to be associated with ERM.

It does not appear that any of the individuals (or firm) are licensed professionals qualified to practice engineering or geology in Wyoming (or any other jurisdiction). The same page of the report that lists the responsible individuals also includes the waiver of accountability below:

#### **USE OF THIS REPORT**

ERM prepared this report for the sole and exclusive benefit and use by Aethon Energy Operating LLC. Notwithstanding delivery of this report by ERM or Aethon Energy to any third party, any copy of this report provided to a third party is provided for informational purposes only, without the right to rely.

This statement stands in stark contrast to a certification typically provided with an engineering design report prepared by a qualified professional.

WDEQ's rules and regulations under the WYPDES program do not require certification by a professional. WDEQ held meetings in Riverton and Thermopolis to present the draft permit to the public. The analysis, findings and conclusions from ERM's report were cited during the meetings, and WDEQ stated they were relying on the report as a basis for the conditions of the draft permit renewal being presented for consideration and comment by the public. The meetings were well attended because the draft permit provides for significant discharge of wastewater effluent into Boysen Reservoir. Boysen Reservoir is located in Boysen State Park, which is a popular recreation area in this part of Wyoming.

My complaint is based on the following concerns:

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1. Who is the professional responsible for holding the safety, health and welfare of the public paramount in this process?
  2. Are the individuals responsible for the model design report qualified to practice before the public in Wyoming?
  3. Do WDEQ's rules and regulations take precedence over Wyoming statutes regarding professional engineering and geology practice before the public?
  4. Is it lawful for WDEQ to expect the public to rely on the findings and results presented in ERM's report?
  5. Is ERM's model design and report documentation consistent with the standard of practice for professional engineers and professional geologist licensed in Wyoming?

I appreciate each Board's attention to this complaint. If you have any question or concern regarding this letter or the information that is referenced here, please contact me.

Sincerely,



**J. JOEL FARBER**

cc Mr. Kevin Frederick, PG Water Quality Division Administrator, WDEQ



## **Water Quality Compliance Analysis for the Long Range Development Plan at Moneta Divide, Wyoming**

**A Hydrologic, Hydrodynamic and Water Quality Study of the Boysen Reservoir  
Watershed**

**Aethon Energy**

April 23, 2018

Environmental Resources Management  
75 Valley Stream Pkwy  
Suite 200  
Malvern, PA 19355



## **RESPONSIBLE STAFF**

The model application and report were prepared by Shwet Prakash, Michael Fichera, Kelli Kearns, Sandeep Rana, and Divya Nayak from ERM. The model applications and report were reviewed by ERM's Venkat S. Kolluru and William A. Schew.

## **USE OF THIS REPORT**

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## J. JOEL FARBER

461 LINDSEY LANE, THERMOPOLIS, WY 82443

**July 5, 2019**

Mr. Loren Smith  
Division 3 Superintendent  
Wyoming State Engineers Office; Board of Control  
715 East Roosevelt  
Riverton, Wyoming 82501

Transmitted electronically via email to [loren.smith@wyo.gov](mailto:loren.smith@wyo.gov) , [rick.deuell@wyo.gov](mailto:rick.deuell@wyo.gov) and [kevin.frederick@wyo.gov](mailto:kevin.frederick@wyo.gov), and followed by regular mail to the address above

**Subject: Follow up on my inquiry to you regarding the Aethon Energy Operating, LLC Draft Renewal of WYPDES Permit Number WY0002062**

**Dear Mr. Smith:**

I am writing to follow-up with you regarding our recent telephone contact about the Aethon Energy WYPDES permit renewal. After I talked with you, I also spoke with Kevin Frederick at WDEQ and asked if WDEQ would consult with the Wyoming State Engineer and Board of Control during the decision-making phase of their permitting process. He indicated that WDEQ would consult with your office.

I believe the consultation I am requesting is appropriate, and required under Chapter 1, Section 8(a) of WDEQ's Water Quality Rules and Regulations. Accordingly, this letter is incorporated in my comments to WDEQ regarding Aethon Energy's WYPDES permit renewal. And consistent with my conversation with you, I am also copying Mr. Rick Deuell at the WSEO on this correspondence.

Firstly, I want to be clear that I am not shopping for a new "decision-maker" with this letter. To the contrary, I accept the division of authorities recognized by the WDEQ and the WSEO and I support WDEQ's decision authority. Rather my concern is that the basis for WDEQ's decision on the Aethon Energy's draft renewal permit is not fairly considering the existing permitted and adjudicated beneficial uses of water stored in Boysen Reservoir.

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During my effort to understand this permit renewal it became evident that WDEQ's evaluation is focused on whether or not water quality will be lowered below certain water quality criteria established in the rules and regulations WDEQ promulgates. However, under WDEQ's antidegradation implementation policy the Administrator is also required to determine if the proposed impairments to water quality potentially impair (i.e. harm) existing uses. And given that these existing beneficial uses have been established through the authority of the WSEO and are administered by the Board of Control, I believe this request is reasonable.

I am also concerned about the "process" that is being undertaken. The proposed new use of Boysen Reservoir is being undertaken under the provisions for renewal of an existing permit. The existing permit is established from a series of renewals of an original permit that predates the Clean Water Act and it does not make any provision for a mixing zone or other defined beneficial use of Boysen Reservoir. Subsequent permit renewals approved by WDEQ over the years are consistent in this regard. None of the past permit renewals provided for beneficial use of the water stored in Boysen Reservoir. My concern is how a new beneficial use of the reservoir can be established through renewal of an existing permit that never previously established a beneficial use of storage in the reservoir? And if WDEQ approves the renewal, what priority would the new beneficial use hold, should harm be asserted by an existing use? Likewise, how will the new use of the reservoir be quantified and administered in context with the existing adjudicated beneficial uses? Has the Bureau of Reclamation been consulted? What consultations have been undertaken with Wyoming Game and Fish and Wyoming State Parks? I think these are fair questions to consider about process, should a conflict ever arise over the administration of the water stored in Boysen Reservoir.

In summary I appreciate the Board of Control consulting with WDEQ to define the nature and physical extent of the existing beneficial uses under the Board's authority, and to what extent, if any, Aethon Energy's proposed new use of storage may harm existing beneficial uses of the water stored in Boysen Reservoir. Likewise, please address my questions and concerns regarding "process" as part of your coordination with WDEQ during the decision-making phase of the permit renewal.

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Thank you for your attention to this matter. Please contact me at any time if you have questions regarding this letter.

Best regards,



**J. JOEL FARBER**

cc Mr. Rick Deuell, PE  
Mr. Kevin Frederick, PG

Wyoming State Engineer's Office  
Wyoming Dept. of Environmental Quality