February 20, 2023 (hearing date: February 21, 2023)  
TO: Board of Commissioners, Albany County  
FROM: Albany County Clean Water Advocates (ACCWA)  
  
COMMENTS ON PROPOSED AQUIFER PROTECTION REGULATIONS  
  
As you know, a November 2022 district court decision invalidated the aquifer protection regulations adopted by the Albany County Commissioners in November 2021. The court directed a different process to follow for adopting the regulations generally, and for making changes to the western boundary of the Aquifer Protection Overlay Zone (APOZ) specifically. The regulations before you today are substantially the same as those adopted in November 2021, minus the western boundary adjustment.  
  
Albany County Clean Water Advocates (ACCWA) supported these regulations in 2021 and we continue to do so. We respectfully request that you adopt the regulations as proposed to you by the Albany County Planning and Zoning Commission in January 2023. We also encourage you, as part of the process of approving these proposed regulations, to make a record that includes references to the studies pertaining to the Casper Aquifer, along with criticisms of those studies and the refutations of those criticisms. It’s no secret that additional litigation may be in the offing and a complete record will demonstrate that the proposed regulations are reasonable and appropriate.  
  
For example, the water sampling documented in the 2009-2010 studies conducted by the City of Laramie shows that pollution from septic effluent already exists in the developed areas of the APOZ. These results are consistent with the 2019 Wenck Associates study of an individual system. The 2021 Wenck Associates study applied these conclusions to different build-out scenarios within the APOZ and supports the proposed requirement for a large minimum lot size. Sampling from one of our community’s few monitoring wells (that is, a well constructed to specifications as a monitoring well) has shown nitrate concentrations as high as 9.3 mg/l in the East Grand area (the public drinking water standard is 10 mg/l).  
  
While the Casper Aquifer geology is complicated and we can wish that we had more studies and more data about our critical community resource, local officials have more than enough information on which to reasonably base protective measures.  
  
Some opponents of the proposed regulations have raised the issue of “takings.” However, retaining agricultural zoning and requiring large lot sizes to reduce development pressure on the aquifer and thereby safeguard a public water supply is not a taking. In this instance, such action may even enhance property values. In a recent (and as yet unsuccessful) proposal for a subdivision within the portion of the APOZ administered by the City of Laramie, a developer mentioned the desirability of properties east of Laramie because of proximity to the Pilot Hill open space (itself an effort to protect the aquifer). The existing county Casper Aquifer Protection Plan (CAPP) points to large lot zoning as an appropriate management tool to reduce pollution from septic systems, as well as road runoff, pesticides, herbicides, and fertilizers within the aquifer protection area.  
  
ACCWA also wishes to address some of the opponents’ criticisms of studies of the Casper Aquifer. Our members are not professional geologists, but we have invested many hours in studying the CAPP and numerous reports from the perspective of interested citizens. We have a conceptual understanding of the geology of the aquifer and what is known about it. We have consistently advocated for more studies and data gathering to expand our community’s understanding of this essential resource and how best to implement good stewardship.  
  
According to the CAPP, the APOZ is the area where the Casper Formation is exposed at the surface, where rain and snowmelt infiltrate the surface to recharge the aquifer. The APOZ extends further westward than just the exposed Casper Formation, however, to a point where 75 feet of Satanka Formation overlies the Casper and protects it from surface contamination.  
  
It is important in this context to point out that five Wyoming registered professional geologists, along with one Wyoming registered professional engineer and one individual with both Wyoming professional geologist and professional engineer registrations, signed and stamped the “Technical Review Subcommittee of the Environmental Advisory Committee” report that laid out the geology for the first version of the Casper Aquifer Protection Plan.  
  
The initial interpretation provided by the Technical Review Subcommittee has been refined – but not contradicted - over the subsequent two decades by other Wyoming registered professional geologists conducting work for the City of Laramie, Albany County, the Wyoming Water Development Commission, and private clients needing Site-Specific Investigations.  
  
The comments submitted during this public comment period from Dr. Robert Starkey, also a Wyoming registered professional geologist, challenge this broadly-held view of Casper Aquifer geology. In past hearings, Dr. Starkey has even questioned the integrity of the professionals who stamped the “Technical Review Subcommittee” report, suggesting (without proof) that they stamped a report they did not believe – a violation of professional practice acts and codes of ethics. Since Dr. Starkey lives in the APOZ and relies on a septic system, he himself is not a disinterested party.  
  
His comments on these proposed regulations include a number of unsubstantiated statements that can be summarized as: (1) the Casper Aquifer is confined (“pressurized”) and therefore contaminants cannot work their way down into the aquifer; (2) that recharge to the Casper Aquifer occurs primarily through snowmelt into drainages; and (3) that septic systems do not discharge into the Casper Aquifer because, again, the aquifer is “pressurized.”  
  
For the lay reader, these assertions beg some questions. First, how does recharge to the aquifer occur, if pressure within the aquifer repels infiltration? Second, if the recharge occurs through drainages, how is it that there are no repelling layers beneath these surface features? Third, if septic systems do not discharge into the aquifer, where do they discharge, and what explains the higher concentrations of nitrates in developed areas?  
  
It is safe to say that all the data available on the Casper Aquifer support the interpretation that the vast surface exposure of the Casper Formation, coupled with well-documented faults and fractures throughout the APOZ, demonstrate the recharge mechanism of infiltration by rain and snowmelt, and thus its vulnerability to surface and near-surface contamination. The numerous rock layers within the aquifer formation undoubtedly can and do create limited areas of confinement; but again, the available data - including downhole video and electromagnetic imaging - show this is not true of the aquifer as a whole.  
  
ACCWA believes that septic systems have their place in rural areas. We also know that septic system effluent is one of the major contributors to groundwater pollution across the United States (“Getting Up to Speed – Groundwater Contamination,” published by the United States Environmental Protection Agency, EPA/635/R-93/002). Although Laradise is a special place, it is not so special that septic systems operate differently here than elsewhere. Septic systems pollute. More septic systems result in more pollution. The question then becomes how to manage this reality.  
  
ACCWA has repeatedly criticized the Wyoming Department of Environmental Quality’s (WDEQ) practice of allowing real estate developers to submit modeling of septic effluent from proposed subdivisions within the APOZ as though each subdivision occurs in isolation and not within a context of other existing or planned subdivisions.  
  
A case in point occurred in 2021, when local officials made a specific request to the WDEQ for a cumulative analysis of the nitrate impacts of two subdivisions, one downgradient of the other, that were proposed in a rocky and fractured area of the APOZ. After considerable public pressure - including public records requests from ACCWA - the WDEQ was compelled to reveal that its cumulative analysis projected nitrate levels in the groundwater leaving the downgradient subdivision at 9.98 mg/l – just a hair below the public drinking water standard of 10 mg/l. While private well owners can drink whatever they want, it is not realistic to insist that septic effluent does not contaminate the aquifer, or that there is no cumulative effect from introducing additional sources of contamination.  
  
While Dr. Starkey correctly states that the City of Laramie’s 2009-2010 sampling program was a “snapshot,” it was a much more comprehensive program than the sampling network he recently made public. The City of Laramie’s 2009 program sampled 110 wells, with 50 samples showing nitrate concentrations higher than the acknowledged background level of 2 mg/l. Three wells exceeded the public drinking water standard of 10 mg/l.  
  
Sixty-two wells were re-sampled in the spring of 2010, with 29 showing nitrate concentrations of over 2 mg/l. At this point, opponents of aquifer protection regulations discouraged homeowners from participating in any city-sponsored sampling program. Dr. Starkey’s sampling program covered 17 wells over approximately a decade, with 129 samples out of 216 exceeding the background level of 2 mg/l of nitrate.  
  
Although the sampled wells are not subject to drinking water standards, the sampling results clearly show that higher nitrate concentrations are associated with developed areas. We may be at a point where contamination from existing development, which mostly occurred in the past when there was little or no awareness of the aquifer and its importance, has reached steady state at a relatively low level of contamination. If that is true, we are fortunate to have the opportunity to recognize the situation and take appropriate steps to prevent more serious pollution.  
  
We should also all keep in mind that there are many substances for which there are no drinking water standards. So-called “PPCPs” (pharmaceuticals and personal care products) also are found in septic system effluent. Development also brings road runoff, the use of outdoor chemicals such as fertilizers, herbicides and pesticides, and the probability of inappropriate disposal of all kinds of household and automotive chemicals. Nitrates are used as a marker because they are durable and cheap to sample for, but they are by no means the only potential concern for human and animal health.  
  
It has been demonstrated time and again – right here in Laramie, with septic systems formerly located in town, with the former Union Pacific tie plant, and with leaking underground storage tanks - that groundwater contamination is hazardous, expensive and difficult to remediate. In part, this is because a problem sometimes is not apparent until it is a big problem. That may explain why participants in the debate over aquifer regulation often seem to be talking past one another, because some do not see a “problem” until pollution levels exceed a drinking water standard. But by that time, there will be a substantial buildup of contaminants in the aquifer that cannot be made to disappear quickly or cheaply.  
  
ACCWA commends the county for its efforts to work with the Wyoming DEQ on clarifying septic system requirements for homeowners within the APOZ, and encourages the county to continue these efforts. Our research with local septic system installers indicates that an enhanced system with active components costs approximately $27,000 (for a three-bedroom house) – more than a conventional system, but far less than the overblown numbers that have been circulated and understandably have caused concern. WDEQ already has approved installation of less expensive, passive enhanced systems in other parts of the state. It seems like there is room here to move forward.  
  
ACCWA strongly supports the city and county cooperative effort to update the Casper Aquifer Protection Plan, along with further educational and regulatory efforts to implement its recommendations. In particular, it is imperative that the city and county implement the long-standing recommendations for the installation of a properly-constructed monitor well network to continually collect data on water quality and provide early warning of potential problems.  
  
No one has asserted that the APOZ is littered with the bodies of people who have died from drinking their well water. ACCWA has asserted that we should rely on available science and our common sense to reduce the introduction of pollutants from both city and county sources into our unique and valuable drinking water asset. Abundant clean water is a scarce commodity in today’s world and it will be scarcer in generations to come. Good stewardship requires action and not just lip service.  
  
Thank you for this opportunity to comment.  
  
  
Respectfully submitted,  
  
Sarah Gorin, Vice-President, for the Board of Directors  
Albany County Clean Water Advocates  
  
  
  
Suggested references for inclusion in a record of decision:  
  
Report on Summer/Fall 2009 Nitrate-Nitrogen Monitoring in the Casper Aquifer Protection Area, City of Laramie, Wyoming, 2010.  
  
Report on Spring 2010 Nitrate-Nitrogen Monitoring in the Casper Aquifer Protection Area, City of Laramie, Wyoming, 2010.  
  
East Laramie Waste Water Feasibility Study, WWC Engineering for the City of Laramie, April 2013.  
  
2015 Laramie Master Plan, Level 1, (including technical memoranda), Wyoming Water Development Commission, 2015.  
  
Phase II – Laramie Monitor Well Project Report (including Phase 1 Interim Technical Memorandum, Technical Memorandum on As-Built Construction, and Slide Presentation), Wyoming Groundwater LLC and Hinckley Consulting for the City of Laramie, October 2014-June 2015.  
  
Septic System Impact Analysis, Albany County, Wyoming. Wenck Associates Inc., May 2019.  
  
Laramie Boomerang Commentary Response, Wenck Associates Inc., December 2021 (pertaining to the Septic System Impact Analysis, above).  
  
Casper Aquifer Nitrate Loading Study, Laramie, Wyoming, including technical memo dated 10/1/2020 to Darren Parkin, Natural Resources Manager, City of Laramie, Wenck Associates, Inc., presented to City of Laramie, Wyoming, October 2020.