Garness Engineering Group, Ltd

See attached comments

The existing version of 18 AAC-72 is significantly flawed and desperately needs to be revised. Although some of the proposed changes are good, there are some changes that are going to restrict/prohibit development and increase the cost of doing business in Alaska. A regulatory change of this magnitude should seek to fix what has been problematic in the past, so as to minimize arbitrary design reviews and prevent imposing unnecessary costs on the residents of Alaska, in terms of both engineering fees and construction costs. Unfortunately, much of the problematic language in the current regulation has been carried forward into the proposed regulation. The assertion that the proposed changes reflect the Steering Committee findings of five (5) years ago is not obvious to this person who served on that Steering Committee. It appears that this regulation was written in somewhat of a regulatory vacuum with little consideration given to the engineers that have been subject to the plan review process. My comments are meant to provide insight from the perspective of a practicing engineer that has been licensed for 32 years in the State of Alaska and has specialized in the fields of onsite water and wastewater treatment. I am sure there are portions of the proposed regulation that I have misinterpreted, and if so it only proves the need for better clarification in the verbiage. With that said, the following are my limited comments:

1. 72.005 (a)(1) and (b)(2) are inconsistent. The first fails to address "collection" and "storage"
2. 72.005 continued: In the 2012 version of 18 AAC 80 (Drinking Water Regulations) a "private water system" was defined as a potable water system serving **one single-family residence or a duplex**". In the 2017 version of 18 AAC 80 (Drinking Water Regulations) the definition of a "private water system" was changed to "a potable water system that is not a public water system". A "public water system" is essentially a system that serves greater than 25 people per day for more than 60 days per year. This becomes significant because the proposed amendments to 18 AAC 72, paragraph 72.005 increases the scope of the chapter (18 AAC 72) to regulate the "minimum separation distance requirements and construction standards for private water systems. **In short, the proposed change to 72.005 will increase State of Alaska regulatory authority to a category of wells (old Class C wells) that are currently not regulated by ADEC.** If ADEC regulates the construction of "private water systems", there will be an increased cost to the department (that is currently not staffed to handle the current workload) and the public.
3. 72.007: A technical committee that includes industry is desperately needed.
4. 72.015(a) prohibits the use of log cribs (seepage pits made out of wood). There are many (perhaps hundreds) of "log cribs" in use just in the Municipality of Anchorage. The installations were approved and fully in compliance with the regulations in place at the time of construction. The proposed wording will force many residents to unnecessarily install new septic systems at a significant cost. In short, in order to avoid significant cost to the public, this paragraph needs to be amended to allow for previously approved "log cribs" to be used and maintained.
5. 72.060 requires than a waiver request (report) be sealed by a **registered engineer**, implying that the subject work is "engineering"; however, Paragraph 72.540 (b)(1)(B) allows for an unlicensed individual (under certain conditions) to perform "engineering work". It needs to be determined if such an exemption exists within AELS Statute 08.48.331, particularly in regard to commercial systems.

6. 72.100 and the Definitions of 18 AAC 72 do not appear to address subsurface drains and separation distances between subsurface drains (like curtain drains) and private wells.
7. 72.100 – The proposed definition of "sewer line" would include dry road ditches and street curbs/gutters that periodically carry "nondomestic wastewater (stormwater runoff)". The EPA definition of an MS4 storm sewer includes road ditches. In short, the use of "sewer line" in this paragraph is not suitable, unless the intent is to also establish a separation distance between a road ditch (that periodically carries stormwater) and a private well.
8. 72.100: It appears that one of the intents of this paragraph is to create a regulated separation between a private well and stormwater collection system components by using the term "**sewer line**" rather than "private sewer line" or "community sewer line"; and changing the definition of term "**cleanout**". The Municipality of Anchorage Onsite Department has never deemed a stormwater collection system to be a potential source of contamination in regard to private wells. This has the potential to be a significant regulatory change that will limit development of some properties and increase the regulatory costs (waiver fees and plan review fees) associated with private wells encroaching of stormwater collection system components. It is arguable that the current ADEC drinking water regulations (18 AAC 80) do not have a regulated separation distance between a public well and "stormwater collection system" components. Page 114 of 116 of the proposed regulations changes 18 AAC 80, Table A to create a regulatory separation distance to "sewer lines", "sewer mains", and "drains" (piping below grade within the building envelope). The ADEC "list of potential sources of contamination", used in the past to perform "source water assessments", makes no reference to stormwater collection system components, and the list is very comprehensive.
9. 72.100 (a)(3) – The separation distance to a "Sump" is problematic because the term "Sump" is not defined in regulation. Is the intent to regulate the separation distance to sumps discharging water from crawlspaces or sumps discharging domestic wastewater.....or both?
10. 72.200(b) - the verbiage "other requirements" is undefined. If there are specific regulations they should be referenced. Otherwise, the term allows for arbitrary and open-end demands by the Department during the plan review process.
11. 72.511(a) – If there is a design component to the installation, then the installation of a of commercial septic system by "certified installers" would appear to be in conflict with AELS Statute 08.48.331.
12. 72.515(b)(1)(F) – Why would "information on conduit velocity" be required if minimum pipe slopes are maintained?
13. 72.515 (4)(B) – The criteria for establishing when a nitrate analysis is required should not be based solely on daily flow. The paragraph should instead address the pounds per year of Total Nitrogen discharged per acre (or some other measurement of area) that will trigger a nitrate study. The proposed verbiage will result in the performance of unnecessary nitrate studies and an unjustifiable cost to residents of Alaska (to pay for unnecessary engineering services, monitoring wells, and/or aquifer studies) and will, in some cases, result in a waste of ADEC's limited plan review resources

14. 72.515 (4)(B) – The seasonal nature of a facility will impact the pounds of Total Nitrogen introduced. Facilities that only discharge during summer months will have a reduced impact. Designers should be able to calculate the annual nitrogen load per acre (or some other measurement) and prove that the proposed discharge will not reach the threshold required to trigger a Nitrate impact analysis.
15. 72.515 (4)(B) and 72.615(c)(6) – Drainfields that receive effluent from Advanced Wastewater Treatment Systems receive significantly lower Total Nitrogen concentrations than effluent from a conventional septic tank. Such systems should be able to discharge a larger volume of effluent annually before triggering a Nitrate impact analysis.
16. 72.515 (4)(B) - The regulations should waive the nitrate analysis if the aquifer of concern is confined (protected). The nitrate analysis should also be waived if the facility is rural, and the aquifer is not used as a source for potable water. In many cases the source for potable water is a surface water source; therefore, the nitrate impact to the aquifer may be moot.
17. 72.515 (5) has the potential to create and arbitrary and open-ended list of reviewer requirements that can cause an unreasonable cost to Alaska residents.
18. 72.520 (c) – The Municipality of Anchorage has a Steep Slope code provision that allows for trench type drainfields to be installed on slopes as steep at 45%. It was modeled after the State of Idaho code. If the State of Alaska were to incorporate such a provision into 18 AAC 72 it would allow for the development of more properties and provide a cost-benefit to the residents of Alaska.
19. 72.520 (f) – Separation distance between septic tank and drainfield - The 2018 Uniform Plumbing Code (UPC) allows for a separation distance of 5 feet. The Municipality of Anchorage has allowed a 5-feet separation distance for at least 30 years; ADEC should consider a less restrictive separation distance.
20. Paragraph 72.530 – The peak design flow requirement of 150 gpd/bedroom for a new residential dwelling is arguably archaic. Homes that were built after 1994 and use modern appliances are expected to generate 40-60 gpdc (EPA Onsite Wastewater Treatment Systems Manual, 2002, page 3-3). I believe the State of Oregon uses 62.5 gpdc. Allowing a reduced design flow for new homes (built after a specific date) would save Alaska residents money by reducing septic tank size requirements and possibly drainfield sizes. It is recommended that the State of Alaska consider adopting a more progressive code in regard to design flows when systems are engineered for new homes.
21. 72.530(d)(1) – Sewer Line Slopes - To the best of my knowledge, neither the MOA, UPC, AWWU, or Ten State Standards restrict the slope of sewer lines to 20%. The Ten State Standards do have pipe anchoring requirement for sewer mains installed on slopes of 20-35%, 35-50%, and over 50%. In short, they are installing sewer mains on slopes greater than 50%. If I had to guess, there are thousands of private sewer lines installed in Anchorage at over 20% slope. Some over 100% slope. I have never seen a problem associated with running a private sewer line at a slope of over 20%. If you look at the sewer collection systems in downtown Seattle and San Francisco (where the streets are steep), they are not installing drop connects every 20 feet. In short, ADEC keeps making this restrictive slope requirement, without any real justification that I am aware of. If the collection system is transferring quantities of **sand/grit** that could contribute to pipe scouring (and if liquid velocities exceed 10

feet per second) then mitigation should be proposed (ductile iron pipe, thicker wall plastic pipe, ect). There are few situations where such mitigation would be necessary for a small residential collection system handling domestic wastewater. The ADEC requirement for drop-connects (to reduce pipe slopes) imposes an unnecessary construction cost to Alaska residents. It is also arguable that drop-connects are more likely to result in a construction deficiency, versus installing a straight run of pipe at a steeper slope, and that they are localized points of accelerated velocity and potential pipe erosion.

22. 72.530 (d)(2) – The Municipality of Anchorage imposes no such restriction, and I am unaware of any adverse consequences. What is driving ADEC to impose the subject slope restriction? If there is no reasonable justification for the requirement, it is recommended that it be removed from regulation.
23. 72.530 (e)(2). See comment #20 above regarding reduced design flows.
24. 72.530 (f)(1) (A, B, & D) - When referencing drainrock thickness, it is not specified whether it includes the drainrock over the top of the pipe, or only the drainrock below the invert of the pipe. It is standard to utilize the drainrock depth below the invert.
25. 72.530 (f)(1)(B) – Why is a deep trench limited to an effective drainrock depth of 12 feet? This restriction seems arbitrary and unnecessary, potentially increasing the cost of an installation.
26. 72.530 (f)(3) – Here, or elsewhere in the regulation, soil application rates for drainfields receiving effluent (treated to secondary standards) from Advanced Wastewater Treatment Systems (AWWTS) needs to be addressed. This has been a long-disputed issue with ADEC reviewers because the regulation has not addressed it. The Municipality of Anchorage has codified AWWTS effluent soil application rates and have been successfully applying them for over 20 years. The MOA has roughly 1000 AWWTS systems in operation and decades of data to support the subject soil application rates. Failure to address this issue in 18 AAC 72 will result in the current practice of ADEC reviewers overriding the application rate/s proposed by the professional engineer and arbitrarily establishing rates that in some cases cause property owners to install over-sized drainfields.....sometimes at significant cost. In short, failure to address this will result in continued adverse economic impact to the residents of Alaska.
27. 27.530 (f)(3) – Table 4 does not address soils that are dual classified soils like GW-GM, GP-GM, GW-GC, and GP-GC. These soils can have percolation rates faster than 1 minute/inch (much like ADEC sand filter material) but contain interstitial silt/clay that would negate the need for a sand filter. If a sieve analysis proves a soil to be one of the above soils, it is arguable that the installation of a sand filter is unnecessary. Many insitu sands (and imported ADEC sand) "perk" faster than 1 minute per inch, so percolation rate alone should not trigger the need for a sand filter. If a laboratory soil analysis indicated the soil is one of the above dual classifications, I would argue that a sand filter is not required. Please confirm that Table 4 only requires a sand filter for GW or GP soils.
28. 27.530 (f)(3) – Table 4, subparagraph b – Sand Filters – The ADEC/MOA standard method for installing sand filters only provides limited benefit until the sand/drainrock interface biomats and inhibits the downward absorption of wastewater. At that point, the effluent flow laterally out the sidewalls of the shallow trench, into the GW/GP soils, **likely for years**, essentially negating the benefit of the sand filter. The State

of Washington mandates that the vertical sidewalls of the trench (drainrock above the sand) be lined with a visqueen type barrier to prevent the lateral migration of effluent into the GW/GP soil. Placement of the visqueen barrier is very inexpensive and will help to prevent short-circuiting of effluent laterally into the GW/GP soil and bypassing of the sand filter. ADEC should strongly consider implementing this into regulation.

29. 27.530 (g)(3). The requirement for a 350-gallon lift station seems excessive. Most of the AWWTS in Anchorage use a 24-inch diameter PVC pump vault after the treatment tank. If there is a pump failure, the remaining volume in the pump vault (above the high-level alarm float) along with the volume it takes to surcharge the septic tank, is typically in the range of 125-150 gallons. With moderated water usage, this volume is enough to allow for the property owners to get the pump replaced or install a temporary bypass pump. I do not believe there is a commercially available 350-gallon pump vault, which means that most installations will be standard, and expensive, 500-gallon steel lift-stations with an insulated MH riser. Steel lift-stations are prone to corrosion (failure) and resulting groundwater contamination. The cost to Alaska residents in mandating a 350-gallon pump vault is difficult to justify and will likely result in greater potential for groundwater contamination in the future (when the steel tank fails).
30. 72.540 (b)(1)(B) – It is arguable that AELS Statute 08.48.331 does not provide an exemption that would allow for non-licensed persons to prepare the subject report for commercial systems.
31. 72.540 (d) – The use of the word "design" in the last paragraph implies that a certified installer is performing design work, when in some cases they are merely installing a system using a prescriptive "installation manual". Perhaps changing the word "design" to "configuration" will resolve this issue.
32. 72.550 – The wording is confusing because the "person" responsible for the installation and the "person" responsible for documentation of the construction could be two separate "persons". This is the case when the property owner hires an engineer to design the system and inspect/document the installation, instead of utilizing the services of a "certified installer" to perform all of the subject services. In such cases, who is responsible for notifying ADEC? The engineer is responsible for inspecting the installation and preparing documentation of the system, but they are not responsible for construction of the system.
33. 72.611 – General comment. This section includes **small commercial facilities**; however, the requirement for NSF 40 certification referenced in 72.630 will never apply because NSF-40 certification only applies to **residential systems** serving 400-1500 gpd. Although the subject treatment system may perform adequately, it needs to be understood that the system is not NSF-40 certified for such an application.
34. 72.611(a)(6) – In most situations, the engineer does not have supervisory authority over the contractor. All the registered engineer can do is perform inspections as necessary to document that the system was installed in compliance with the design documents.
35. 72.615 (b)(1 & 2) – Any system designed/sized to treat greater than 1500-gpd is not NSF-40 certified. This section fails to acknowledge AWWTS systems that already have been tested and used extensively in Anchorage but are not NSF 40 certified. One such system is Intermittent Dosing Sand Filters.

36. 72.615 (c)(3) – This issue (sizing of absorption fields receiving AWWTS effluent) has been a long-disputed issue between ADEC and the engineering community. See comment #25 above. The soil application rates need to be codified ASAP. In some cases, Alaska residents are being forced by ADEC reviewers to use unreasonably conservative soil application rates, resulting in needlessly oversized drainfields and increased construction costs. I have designed approximately 400 AWWTS systems in Alaska over the last 25 years.
37. 72.615 (c)(6) – This needs to be modified to take into consideration the reduced Total Nitrogen (TN) levels in AWWTS effluent. See comments #12, #13, #14, and #15. Failure to amend this will result in Alaska residents being subject to the increased costs associated with unnecessary engineering fees and studies.
38. 72.630 (b)(1) – See comment #20 regarding design flows
39. 72.630 ((d)(1) – See comment #21 regarding pipe slopes.
40. 72.630 (e)(1) – It is important to note that NSF 40 does not apply AWWTS systems handling more 1500 gpd, or those serving commercial facilities.
41. 76.650 (a)(2) – The engineer is not responsible for the system installation. That is the responsibility of the owner and/or their contractor. The engineer is responsible for inspection of the installation and documentation of the installation.
42. 76.650 (c) - The engineer is not responsible for the construction of the system. That is responsibility of the owner and/or their contractor. The engineer is responsible for inspection of the installation and documentation of the installation.
43. 76.650 (c)(4) – ADEC should not be regulating what photographs the engineer has to take during the construction process.
44. 72.990 (1) – The definition of a 5-wide and a shallow trench (definition #90) need to be combined into a single definition. The effective depth of a 5-wide trench used in conjunction with a sand filter should have an effective depth below the invert of less than 12 inches.
45. 72.990 (59) – "Observed Percolation Rate – The definition implies that ADEC is proposing to allow "Certified Installers" to perform percolation tests. Historically in ADEC regulations, percolation tests and/or interpretation of the data have been deemed "engineering". The AELS board has previously determined (in a 2017 letter) that interpretation of percolation test data is in the realm of "engineering".
46. 72.990 GENERAL COMMENT: The definitions section, is very confusing. In order to provide clarity, an effort should be made to eliminate any term that is not used in the regulation and to eliminate all terms that are now obsolete. For example, is there a need to use all of the following terms: domestic waster disposal system, domestic wastewater treatment works, non-domestic wastewater disposal system, non-domestic wastewater treatment works, "treatment works with individual marine outfall", "supervising construction", "observing construction", "landsurface disposal system", graywater, disposal sewer, "private residence".....and possibly more
47. 72.990 (34) – The term "drain" should be replaced with "Building Drain" to remain consistent with the UPC.

Page 115 of 116 – The revisions to 18 AAC Table A are not minor and reflect several new regulated separation distances. Is inclusion of the term "disposal sewer" really necessary? The inclusion of the term "drain" establishes a separation distance between a public well and the build drain pipes under the concrete slab inside a building. This will make placement of a well more challenging because it will often be necessary to place the well much further from the building. This will increase the cost of running a water service line to the building. The Uniform Plumbing Code appears to call for a separation of 50 feet, and as little as 25 feet (see UPC 2018, Table 721.1, footnote 3). This change will increase the cost of development and make it more difficult to develop properties. The term newly added term "sewer line" includes collection systems transporting stormwater (even if they only carry water during a runoff event). This is arguably a newly regulated separation distance that will make some properties more difficult and more costly to develop.

Unless I missed it, nowhere in the proposed code does there appear to be a required separation distance between a subsurface drain and an absorption field. If so, an absorption field could be placed immediately adjacent to a curtain drain, allowing untreated wastewater to migrate through the drainage system and daylight downgradient via the drain outlet.

It is arguable that AELS Statue 08.48.331 does not provide an exemption that would allow "certified installers" to prepare waiver reports, interpret percolation test data, or perform design services associated with any commercial septic systems, regardless of size. If that proves to be the case, one avenue ADEC should investigate as a means for reducing the cost of commercial septic system installations would be to see if there is a statutory path (via AELS Statute 08.48.331(7)) for "specialty contractors" to install and document the installation of commercial septic system that are designed by engineers. Although this would not provide as much latitude for Certified Installers as called for in the proposed regulation, it would still provide a cost savings for the residents of Alaska.

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