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The Authoritative Resource on Safe Water

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**Statement  
of Dr. Shane Snyder, Southern Nevada Water Authority  
before the  
Senate Subcommittee on Transportation Safety, Infrastructure Security,  
and Water Quality  
on  
Pharmaceuticals in the Nation's Water:  
Assessing Potential Risks and Actions to Address the Issue**

**April 15, 2008**

Good afternoon. My name is Dr. Shane Snyder and I am the Research and Development Project Manager for the Southern Nevada Water Authority. I have conducted research related to trace contaminants in water, including pharmaceuticals, for nearly 15 years. I have served as principal investigator for numerous research projects related to the trace-level detection, removal, and toxicology of pharmaceuticals in water supplies, and have published approximately 50 peer-reviewed articles and book chapters on this topic. I would like to make it perfectly clear that I am a scientist, not a policy maker. While I am honored to share some of my findings with you today, please keep in mind that I do not establish, suggest, or enforce policy decisions. I am appearing today on behalf of the American Water Works Association (AWWA). AWWA is the world's oldest and largest association dedicated to safe water. Our utility members serve safe and affordable drinking water to over 80 percent of the American people.

Contrary to recent reports that characterize pharmaceuticals in water as an entirely new issue, pharmaceuticals were first reported in US waters by the EPA in 1975. The fact that more pharmaceuticals are detected today is not due to greater contamination of our nation's water, but a reflection of the increasingly sensitive analytical technology that allows us to identify and quantify diminishingly minute concentrations of these chemicals in water.

My research related to trace pharmaceuticals in drinking water has been conducted entirely without federal mandate through the volunteer efforts of our nation's water utilities. The fact is, the cities that participated in my current study by submitting water samples for analysis, did so in the absence of any regulatory requirement, going well above and beyond the regulations in the interest of furthering understanding of this issue.

My previous studies have been transparent, and have been published in open literature and frequently presented in public forums. I will do that again when my current research is complete. However, as a scientist, I would strongly caution against presenting preliminary findings of partially completed studies. In order to provide meaningful information on pharmaceutical compounds and other substances in water, scientists

need both occurrence data and human health effects information. It is scientifically inadequate to communicate solely on what we can measure at any level without a frame of reference for what that means.

I have frequently been asked about the sources of these products in our waters. I will not go into it here in detail, but will note that both nonpoint source runoff and sewage effluent from properly operated waste treatment plants may contain minute traces of these compounds. Some minute quantities of these products will pass through animals and humans who use them, and enter the waste stream. They are typically not completely destroyed or removed by waste water treatment processes.

A more central point about our studies is that the few pharmaceuticals we did detect in US drinking waters occurred at unfathomably low concentrations. To illustrate that point, consider this: If our study had been constrained by the ability to find these compounds at parts-per-billion levels instead of delving into the parts-per-trillion range, none of them—not a single one—would have been found.

This raises a critical question. Are we going to make decisions based upon our ability to find contaminants, or based upon protection of public health? I am not a policy-maker; I am a scientist. However, I can tell you with absolute certainty that, if we regulate contaminants based upon detection rather than health effects, we are embarking on a futile journey without end. The reason is simple: Decades ago, we could only detect contaminants at parts per million levels. Years ago, we advanced to parts per billion. We are now able to detect compounds at the parts-per-trillion level, and are breaching the parts-per-quadrillion boundary in some cases. The truth is that the concentrations of pharmaceuticals found in water supplies are millions of times lower than a medical dose. Consider that the highest concentration of any pharmaceutical we detected in US drinking waters is approximately 5,000,000 times lower than the therapeutic dose. This concentration is difficult to perceive, so consider these analogies. This concentration is roughly equivalent to  $\frac{1}{2}$  of an inch in the distance between the earth and the moon, or in terms of time, this concentration would be equivalent to approximately one second in approximately 750 years. Based upon our four-year study of the health relevance of trace pharmaceuticals, using the highest concentrations found and the most conservative safety factors to protect susceptible populations such as infants and pregnant women, our report will demonstrate that one could safely consume more than 50,000 eight-ounce glasses of this water per day without any health effects. While the report will not be published until later this year, I can tell you that the bottom-line conclusion is that the concentrations of pharmaceuticals we studied are orders of magnitude lower than would pose a public health threat. I am not suggesting that this is the final, definitive study on this issue; in fact, I urge you to support further health effects research.

That said, the Safe Drinking Water Act already has established processes for identifying and regulating drinking water contaminants to protect human health. The Candidate Contaminant List and the Unregulated Contaminant Monitoring Rule are appropriate processes that entail great scientific rigor. As a scientist, I would caution against regulating pharmaceuticals any differently than the scores of contaminants currently covered by the Safe Drinking Water Act, because in reality they are no different. Our decision as humans to improve and extend our lives by using pharmaceuticals dictates that some infinitely small amount of these products can and will make their way into the environment. The fact that we can detect trace contaminants does not alone imply risk.

With regard to removing these compounds through treatment, my team has tested the effectiveness of a diverse array of water treatment technologies on removal of pharmaceutical compounds, and to be certain, some technologies are more effective than others. However, the pinnacle question is whether the use of these treatment technologies is warranted to protect public health, because there are environmental and societal costs associated with using them. In an age where we are concerned about greenhouse gas emissions and minimizing our nation's energy demands, is it wise to dictate energy-intensive water treatment systems when there is no evidence of public health benefits? Additionally, there is a looming crisis related to aging water infrastructure that will require a vast financial investment by utilities. Should that be set aside so they can chase down the last nanogram of a compound?

So what should we do? A couple of things make sense. This issue does highlight the need to better protect America's sources of drinking water from various sources of contamination. And clearly there is a pressing need for additional research on this issue. As a scientist, I recommend we focus on research related to health effects from trace pharmaceuticals with a lesser emphasis on occurrence, in order to determine whether there is in fact a problem to solve. The critical question we must address is not "Do they exist?" but rather, "At what concentration are these compounds harmful to human health?" Only then can we make intelligent, rational decisions that protect the health of this country's municipal water customers.

Our recommendations are spelled out in more detail below:

1. EPA should work with states, water and wastewater utilities, and the agricultural community to minimize contamination of source waters by pharmaceutical products as well as other contaminants.

It is imperative that the nation do a better job of protecting its waters, and especially sources of drinking water, from contamination. We have said previously that there is an imbalance between the enforceable controls on point sources, such as Publicly Owned Treatment Works, and the less rigorous programs used to limit nonpoint sources of pollution, such as agricultural runoff. Congress may wish to evaluate this issue to assure that all sources of pollution are equitably contributing to the protection of the nation's waters.

2. We urge support for proper pharmaceutical disposal programs to reduce the flushing of pharmaceutical products into sewage systems to the greatest degree possible, while recognizing that this addresses only a small part of the problem.

Although more research would be needed to accurately characterize this issue, we believe it is likely that more pharmaceuticals end up in the environment after passing through humans than after flushing unused products. However, some unused pharmaceutical products are undeniably flushed into waste streams, contributing to the problem but also offering an opportunity to make reductions in the pollutant loading through a "pollution prevention" approach. We urge support for pharmacy "take back" programs that make doing the right thing obvious and convenient for consumers.

3. Elevate EPA's drinking water health effects research budget at least equivalent to the air pollution health effects research budget. Even though this Subcommittee does not appropriate funds, we ask you to support this increase.

To date, no peer reviewed published research has found ill effects on humans from pharmaceuticals in the environment at the trace levels we have seen in drinking water. However, drinking water providers would like to see more research on this matter, so that we can either take appropriate action to address an actual health risk if there is one, or reassure the public that there is not one. Treatment to completely remove all traces of pharmaceuticals from drinking water will be very expensive, and our customers have a right to expect that we will only undertake the investment necessary to do this – and increase their utility bills to pay this expense - if doing so addresses an actual health risk.

We also specifically support 1) a dedicated authorization in the Research Title of the Agriculture Reauthorization bill for collaborative research between the drinking water community and the agriculture industry on ways to limit contaminants from entering water supplies; and 2) a dedicated research authorization to support decisions on contaminant listing and rulemaking by EPA's Office of Ground Water and Drinking Water. These funds should be used to focus research on priority drinking water areas of concern.

4. We should continue to rely upon EPA's science-driven Contaminant Candidate List (CCL) process to identify candidates for new drinking water standards.

Though at times this process appears to move slowly, a methodical, science-based process is necessary for determining which contaminants need to be regulated, so that we focus on actual risk and on the higher risks first. The standard setting process detailed in the Safe Drinking Water Act is sound, and setting standards through a science-driven process gives the public confidence that the regulations they pay for are necessary, reasonable, and protect public health. An increase in human health effects research, as mentioned in Item 3 above, would improve this process.

5. We should continue to rely upon the Unregulated Contaminant Monitoring Rule (UCMR) for decisions concerning testing and reporting to customers about contaminants that are not currently regulated.

EPA employs a comprehensive and science-based approach to determining which unregulated contaminants utilities should monitor for, and what utilities should say about these contaminants (if detected) to their customers. It is appropriate to use this kind of science-based process to determine which, if any, additional currently unregulated contaminants utilities should investigate.

Thank you for your time. I would be happy to answer any questions you may have.