

Comments On Advanced Water Purification Proposed Roadmap

Comments by Flagstaff Water Group

November 30, 2023

Note: The Flagstaff Water Group (FWG) is a team of five retired scientists and engineers who have been involved in promoting a sustainable water future for Flagstaff for over ten years. Two members of the Group have served on the Flagstaff Water Commission and all members have provided extensive inputs to Flagstaff Water Services and to the Flagstaff City Council. FWG promotes and develops sustainable plans and technologies in the areas of water supply, water conservation, rate studies, and the identification, removal, and destruction of non-regulated contaminants of concern (COC's) and their effects on human and environmental health.

Comment 1: Pilot Testing (3.2.1.2)

- a. We believe the requirement that each proposed AWP location has a site-specific pilot study is excessive and imposes unacceptable burdens of cost, time, and land requirements on communities without a technical benefit.
- b. Individual locations typically will not experience the range of wastewater inputs to gauge the effectiveness and response of individual process steps to various wastewater perturbations.
- c. We believe a better approach is to establish a central pilot plant that serves as a flexible test bed where treatment trains and individual treatment processes can be tested and developed with controlled dosing experiments. The plant can also serve as a training ground for operators.
- d. In such a pilot plant, dosing experiments may be used to impose a wide range of perturbations on the inputs to the treatment train in order to measure the responses of the entire treatment train and individual treatment steps. The results may be used in process and controls designs and to understand the robustness of the entire system to a wide variety of inputs. Chemical engineers can provide guidance.
- e. Note, if treatment trains are proven to be sufficiently robust, they may reduce the cost and stringency of requirements on local limits studies (point sources).
- f. Funding for a central pilot plant might come in part from the host community but also from State funds, given the vested interest of ADEQ and the State in the success of AWP technologies and AWP installations. Communities other than the host community might also pay fees for operator training time and test results, etc.
- g. We recommend that ADEQ considers a cooperative arrangement with one or more of the State Universities or research institutes in the areas of environmental science, chemistry, biology, microbiology, and engineering, for pilot plant test design and laboratory analysis.
- h. An additional comment on 3.2.1.2 is that it doesn't specify the acceptable capacity range for pilot plants.

Comment 2: Tier 2: AWP Specific Contaminants (3.1.2.v.ii)

- a. We believe the proposed process for each community to identify and determine which chemicals warrant Tier 2 listing is vague and unrealistic.
- b. The assessment of which chemicals may pose human and environmental health risks is beyond the capability of individual communities. This is the province of the Federal EPA and ADEQ, and ADEQ needs to maintain such lists for reference by communities.
- c. The list of potentially harmful chemical contaminants should be maintained by ADEQ so that each AWPRA does not need to evaluate the thousands of chemicals in their sewershed, only the ones that are of concern. Trying to find and evaluate ALL of the potentially harmful contaminants in a sewershed would require documenting thousands of synthetic organic chemicals resulting from modern society, an impossible task for individual communities, especially mid-size and smaller communities. ADEQ should maintain a list of possible COCs and AWPRA's should be able to request chemicals to be added to that list.
- d. We believe that human health impacts must not be the only factor in assessing hazardous chemicals. Environmental impacts on other organisms must be considered, too.
- e. We believe there is a major gap in the proposed Tier 2 identification process. As written, the process focuses exclusively on commercial and industrial point sources. We believe domestic sources of COC's must be included in the evaluation (e.g., personal care products, pharmaceuticals).

Comment 3: General Comment Relating to Pathogens and Chemicals

- a. We believe the AWP plan needs to include an additional requirement that all removed pathogens and chemicals must be destroyed or rendered harmless before being returned to the environment. For instance, this is a concern with all filtration processes, including RO, in which contaminants are filtered but not necessarily destroyed.

Comment 4: ADEQ Program Staff (3.iii)

- a. There is no acknowledgement of ADEQ resources that may be needed to evaluate and monitor pilot plants.

Comment 5: Public Communications (3.6)

- a. We believe there needs to be a State role in educating the public about AWP. This is because of the need for consistent messaging to the public and the fact that the financial and/or human resources requirements of a comprehensive outreach campaign may be beyond the reach of many communities. Based on early examples in California, we know the dangers if public outreach isn't handled effectively, e.g., we need to get ahead of any toilet-to-tap controversy.

Comment 6: Verification Testing (3.3.1)

- a. We believe the requirement for a full year of verification testing prior to public sale of water is excessive and would create a huge financial hurdle for

communities considering AWP. This requirement adds a full year of operating costs prior to any return on what will be an investment of tens or hundreds of millions of dollars. It will require communities to provide duplicate staffing of existing DWP's and the AWP plants at a time when trained personnel are in short supply (i.e., scarce resources). Verification testing is absolutely vital, but we recommend re-evaluating the time requirement.

Comment 7: Public Notice of Exceedances (3.1.2.v.ii)

- a. We believe public notification within 30 days is unacceptably slow and will reduce public confidence in AWP operation. If public notification is required anyway, why not do it more promptly?

Comment 8: Response Plan for Enhanced Source Control (3.2.1.1.7)

- a. We believe the example provided for the process for responding to exceedances is badly flawed. The example suggests that the initial response is to assume that the instrumentation is inaccurate. For public confidence, we should assume instrumentation is accurate until proven otherwise.

Comment 9: Water Reclamation Facility (3.2.1.3)

- a. This section provides extensive discussion of requirements for WRF's supplying the feedwater for AWP facilities. While this is likely to be the most common situation in early years, we believe there needs to be thought and discussion of "greenfield" AWP facilities in which there is no distinct boundary between the WRF and the AWP facility.

Comment 10: Acronyms and Abbreviations (6.)

- a. "AWPRA" is used frequently in the AWP Proposed Roadmap but is not included in the list of acronyms. Please add it to the list of acronyms.

Sincerely,

Flagstaff Water Group

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