

# **Problem Statement:**

## **Monitoring and Disposal requirements for water treatment plant residuals containing TENORM**

### **Background:**

Natural radioactivity is present in trace concentrations in rocks, soils, surface water and groundwater. Sources of drinking water therefore may contain these naturally occurring radioactive elements, sometimes in concentrations such that long-term exposure may pose an increase in the probability of detrimental health-effects (e.g., cancer). Drinking water is treated to remove a variety of contaminants, including radionuclides. Treatment processes can remove and concentrate some of these radionuclides, even if the purpose of the treatment was to remove a different contaminant. The radioactivity consists mostly of radium, uranium, thorium and its decay products (called progeny), and potassium. Exposure from and disposal of drinking water treatment residuals from community water supplies has been receiving increased attention and concern, particularly due to new Federal and State regulations limiting radioactivity in drinking water. These residuals are wastes and are categorized as technologically enhanced naturally occurring radioactive materials, or TENORM for short. Regulation of TENORM in drinking water residuals is not clearly spelled out in Federal or State regulations, yet is required to some extent in certain situations to protect public, worker, and environmental safety. In the past, handling of drinking water treatment residuals has been on a case-by-case basis. The intent of this project is to provide a more efficient means for the disposal of water treatment residuals containing TENORM.

### **Problem Statement:**

The Colorado Department of Public Health and Environment (CDPHE) needs to develop guidance to help utilities and disposal contractors develop best practices for protection of workers, the public and the environment from natural radioactivity concentrated because of drinking water treatment. A wide range of radium and uranium concentrations may be seen depending on water source and the type of treatment chosen. Treatment technologies recommended by the Environmental Protection Agency (EPA), new technologies, basic radiation safety principles, effluent-sampling frequencies and methods, potential licensing or permitting, and waste treatment and disposal options need to be addressed.

Disposal of these materials come with logistical, political, and economic challenges. Disposal options for liquid and solid residuals are limited, and have regulatory and social impacts, and in some cases, there are no easy answers for safe, economical disposition. Whereas many residuals containing TENORM can be safely disposed of as solid waste, others may require specific licensing by the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, and disposal at hazardous waste disposal facilities or licensed radioactive waste facilities. As a liquid, such that is found in reverse osmosis concentrate or water treatment plant backwash water, can be discharged to surface or groundwater under CDPH&E, Water Quality Control Division's ("WQCD") Colorado Discharge Permit System ("CDPS"), as long as

the water quality standard(s) are not exceeded. The final disposition of wastes containing TENORM depends on the amount of radioactivity in the waste. The goal of the guidance development is to make the handling and disposal process as simple and cost effective as possible.

A number of Federal and State statutes, regulations and guidance documents will be the basis for the criteria and recommended practices in this guidance. Disposal of residuals containing TENORM safely and economically is the biggest challenge for utilities. Modification of existing statutes and regulations may be desired to more effectively accommodate safe disposition of these materials. About a dozen states already have specific regulations addressing the handling of TENORM. Stakeholder and public input are crucial to such an effort.

### **Proposed Process to develop Guidance Document:**

CDPHE draft Problem Statement: September 30.

E-mail draft Problem Statement to Water Utility Council (CWUC) for review: October 1.

CDPHE discuss draft Problem Statement with CWUC at October CWUC meeting: October 8.

Expand draft Problem Statement based on CWUC suggestions: October

Identify Stakeholders: October

Schedule Workshop with all Stakeholders: October

Workshop: March 31, 2005

Purpose of the workshop is to collect as many of the issues associated with the disposal of residuals w/TENORM

Segregate issues into categories for Stakeholder process: 2<sup>nd</sup> quarter 2005

Begin Stakeholder process: As soon as category work is completed

Develop Guidance: on-going

Schedule 2<sup>nd</sup> Seminar to introduce Guidance Manual: when completed