"not detected" results.

#### Construction report

Burks said that the new total phosphorus (TP) chemical removal clarifier expansion, which was supposed to be done by now, was still waiting on Aslan





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Construction to finish up a few loose ends and also waiting on a final fire inspection from the Tri-Lakes Monument Fire Protection District.

Orcutt expressed concern that the construction and the associated final payment might not be finalized before the end of 2016 at this rate. "We will be in a bit of a pickle (with our budgets) if this goes into next year," she said. Burks said he hoped to have a final Aslan invoice by the end of November.

## Concerns about radium discussed again

Wicklund clarified the concerns he had voiced at the Oct. 11 meeting about the treatment procedure option the town of Monument seems to be planning to use to remove radium from its drinking water, starting next summer. He said if the radium,

a Naturally Occurring Radioactive Material (NORM), is treated by the town using the Hydrous Manganese Oxide (HMO) filtration process proposed by the town's engineering consultant firm Forsgren Associates, it changes these radionuclides from NORM to Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), which must be dealt with very carefully.

**Note:** TENORM is created when material containing radionuclides that are naturally present in rocks, soils, water, and minerals become concentrated and/or exposed to the accessible environment as a result of human activities such as manufacturing, water treatment, or mining operations.

Currently there are no federal regulations specifically controlling TENORM. The EPA has only issued guidance that recommends that radioactively contaminated soils should be cleaned up so remnant radium concentrations are 5 picocuries per liter or less, or 5 picocuries per gram or less for soils. The radionuclide Radium-226, a decay product of uranium and thorium with a radiation decay half-life of 1,600 years, is the

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principal source of radiation doses to humans from natural surroundings. Radium-226 in TENORM materials can occur in concentrations ranging from undetectable amounts to as much as several hundred thousand picocuries per gram. Also, relatively few landfills or other licensed disposal locations can accept radioactive waste. See www.epa.gov/sites/production/ files/2015-04/documents/402r-00-001.pdf and www.epa. gov/radiation/technologicallyenhanced-naturally-occurringradioactive-materials-tenorm

The federal EPA has not delegated any of its authority to protect the public health and environment from adverse effects of exposure to ionizing radiation, including its NORM or TENORM authority, to the state CDPHE, as it has for much of its other clean water and drinking water regulatory authority.

MSD Environmental Compliance Coordinator Jim Kendrick said there is a profound difference between NORM and TENORM and that the three owner districts of TLWWTF could be sued for this issue in perpetuity if there were to be any issue downstream, or if TLWWTF sludge containing TENORM were to be inadvertently or incorrectly land-applied. See www.ocn.me/v16n11. htm#tlwwjuf.

This HMO process would create a higher radium concentration in the filtration byproducts in the town water treatment plant. This residual HMO filtration TENORM hazardous material would then be directly discharged to the MSD collection system as a constituent in the town's water treatment plant filter periodic backwash water discharge.

Burks asked if the backwash from the town's wells or the TLWWTF sludge had been tested to see what the NORM levels of radium concentration were now. Gillette said they are not required to test unless they are actually "treating 'for' radium" in addition to using dilution, the first recommended choice for handling radium in drinking water.

MSD board member (and recent former Town of Monument board trustee) John Howe voiced a concern after attending the Nov. 7 Monument Board of Trustees meeting where the trustees approved a resolution for a loan application with the National Rural Water Association to help pay for the HMO process the town plans to use to resolve the radium violation for Town Well 9.

He said one of the disadvantages discussed in the memo from Tharnish explaining the loan application in the Nov. 7 trustee board packet said, "HMO removes the radium from the treated water and puts it into the backwash water which flows to the waste water facility which has more than adequate dilution available. It is a new maintenance item with additional chemical feed and handling which will require additional monitoring at appropriate times." Howe said he was concerned whether the town "had contacted Mike or anybody."

Wicklund told the JUC members that MSD had not been notified about the current radium situation in Well 9 by the town Water Department, any town staff, or any of the town politicians. "The last time the town's Forsgren engineer contacted me, it was about treating radium in Well 6 in the mobile home park and at that time I told him no, and my board of directors also was in agreement with that. We didn't want anything to do with this. They were talking about a different type of removal on that" well. Burks said that he had not heard anything from the Town of Monument either.

Wicklund also said that typically it is the applicant proposing a new treatment process who comes forward with what they propose. Orcutt said, "They don't have you in the loop." Burks said it did not make any sense.

Kendrick distributed a copy of the technical letter Forsgren gave to the town's Board of Trustees on Oct. 17. The letter stated that, with regard to Forsgren's recommended HMO filtration process, "a large portion of the radium will end up in the biosolids at the wastewater treatment plant. If there are restrictions on radium in the biosolids, it may be possible to ... bring the radium back into solution ... and exit the system through the wastewater treatment discharge and not in the biosolids. The WWTF discharge permit does not include limits for radium."

Kendrick and Wicklund said this technical memo did not distinguish between NORM and TENORM, and this is opposite of what they learned at the Oct. 26, 2016 Water Quality Management Committee (WQMC) and various AFCURE meetings from Dave Stanford, president of H2O Consultants Ltd. Stanford, who is licensed to treat and handle radionuclide waste

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