

January 3, 2002

Ms. Donna Bergman-Tabbert, Manager
U.S. Department of Energy
Grand Junction Office
2597 B3/4 Road
Grand Junction, CO 81503

SUBJECT: CONCURRENCE WITH THE GROUND WATER COMPLIANCE ACTION PLAN
FOR THE URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT SITE AT
GRAND JUNCTION, COLORADO

Dear Ms. Bergman-Tabbert:

In separate letters dated April 8, 1999, and June 25, 1999, respectively, the U. S. Department of Energy (DOE) submitted the Ground Water Compliance Action Plan (GCAP) and Final Site Observational Work Plan (SOWP) for the Uranium Mill Tailings Remedial Action Project at Grand Junction, Colorado. In a letter dated February 8, 2001, the U. S. Nuclear Regulatory Commission (NRC) staff provided its acceptance of the Grand Junction SOWP, however, the staff also identified several issues which required resolution to complete the review of the GCAP. These issues were in relation to the use of institutional controls as part of DOE's strategy for ground water protection. To address these issues, DOE submitted a revised GCAP by letter dated May 9, 2001.

The Staff has completed its detailed review of the revised GCAP as documented in the enclosed (Enclosure) Technical Evaluation Report (TER). As discussed in the TER, the staff finds that the Grand Junction site GCAP satisfies the requirements of the Uranium Mill Tailings Radiation Control Act of 1978, as amended, and the groundwater protection standards in 40 CFR Part 192. Accordingly, the staff concurs with the GCAP.

If you have any questions regarding this letter, please contact Rick Weller, the Project Manager for Grand Junction, at (301) 415-7287 or by e-mail to RMW2@nrc.gov.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Melvyn Leach, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety and Safeguards

Docket No.: WM-54

Enclosure: Technical Evaluation Report for the
Ground Water Compliance Action Plan
For the Grand Junction UMTRA Project Site

cc: D. Metzler, DOE GJO
R. Plieness, DOE GJO
J. Jacobi, CDPHE Den

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**TECHNICAL EVALUATION REPORT
FINAL GROUND WATER COMPLIANCE ACTION PLAN FOR THE GRAND
JUNCTION, COLORADO UMTRA PROJECT SITE**

FACILITY: Grand Junction, Colorado

TECHNICAL REVIEWER: William von Till

PROJECT MANAGER: Rick Weller

SUMMARY AND CONCLUSIONS:

The U. S. Department of Energy (DOE) submitted a Final Ground Water Compliance Action Plan (GCAP) for the Grand Junction, Colorado, UMTRA Project Site by cover letter dated May 9, 2001. The compliance strategy proposed in the GCAP is no remediation, based on the application of supplemental standards. This is based on DOE's assertion that the contamination is confined to *limited use groundwater*. The U. S. Nuclear Regulatory Commission (NRC) and Colorado Department of Public Health and Environment (CDPHE) agree with DOE's characterization of the aquifer as a *limited use groundwater*. Therefore, the criteria for supplemental standards, on the basis of *limited use groundwater*, has been met. In addition, DOE is implementing institutional controls to assure that the compliance strategy is protective of human health and the environment. Based on the reviewed information, the staff finds that the Grand Junction site GCAP satisfies the requirements of the Uranium Mill Tailings Radiation Control Act of 1978, as amended, and the groundwater protection standards in 40 CFR Part 192. Accordingly, the staff concurs with the GCAP.

BACKGROUND:

In separate letters dated April 8, 1999, and June 25, 1999, respectively, the U. S. Department of Energy (DOE) submitted the Ground Water Compliance Action Plan (GCAP) and Final Site Observational Work Plan (SOWP) for the Uranium Mill Tailings Remedial Action Project at Grand Junction, Colorado. In a letter dated February 8, 2001, the U. S. Nuclear Regulatory Commission (NRC) staff provided its acceptance of the Grand Junction SOWP, however, the staff also identified several issues which required resolution to complete the review of the GCAP. These issues were in relation to the use of institutional controls as part of DOE's strategy for ground water protection. To address these issues, DOE submitted a revised GCAP by letter dated May 9, 2001.

Regulatory Framework:

The UMTRA Project regulations provide several ways to comply with the groundwater protection standards in 40 CFR Part 192.12(c) of Subpart B. These include meeting the provisions of 40 CFR Part 192.02(c)(3) of Subpart A or supplemental standards established under 40 CFR Parts 192.21 and 192.22 of Subpart C.

Criteria for applying supplemental standards is detailed in 40 CFR Parts 192.21 and 192.22. Supplemental standards can be requested if the groundwater meets the criteria of 40 CFR Part 192.11(e) for *limited use groundwater*. The definition of *limited use groundwater*, per 40 CFR Part 192.11(e), is provided as:

groundwater that is not a current or potential source of drinking water because (1) the concentration of total dissolved solids is in excess of 10,000 mg/l, or (2) widespread, ambient contamination not due to activities involving residual radioactive materials from a designated processing site exists that cannot be cleaned up using treatment methods reasonably employed in public water systems, or (3) the quantity of water reasonably available for sustained continuous use is less than 150 gallons per day. The parameters for determining the quantity of water reasonably available shall be determined by the Secretary with the concurrence of the Commission.

Site Description:

The site is located in Grand Junction, Colorado along the banks of the Colorado River. The site was used as a uranium-ore processing facility from 1950 to 1970 with a total of 2,281,614 tons of ore processed. The mill also had a side-stream vanadium circuit. By 1994, all of the contaminated materials from the old processing site and vicinity property materials were transported to the Cheney Disposal Cell, located about 15 miles southeast of Grand Junction. Groundwater contamination at the site resulted from the leaching of uranium and other milling constituents from mill tailings, settling ponds, and evaporation ponds. The alluvial aquifer is composed of unconsolidated clays, silts, sands, gravels, and cobbles. Groundwater is unconfined in this aquifer and depth to water ranges from 0-20 feet. Groundwater from the aquifer flushes into the Colorado River. Groundwater table fluctuations occur as a result of River level fluctuations. Underlying the alluvial aquifer is a shale "aquitard" composed of low-permeability shale units in the Dakota Sandstone. The confined Dakota Sandstone aquifer underlies the shale unit.

Selenium and uranium background values are high and thought to be from the dark marine shales of the Mancos Shale, which is found throughout the valley. Iron, chloride, manganese, sulfate, and total dissolved solids (TDS) are also high as background concentrations, further indicating the poor water quality of the alluvial aquifer.

TECHNICAL EVALUATION:

Based on the *Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Groundwater Project* (PEIS, DOE, 1996), DOE has proposed no remediation in conjunction with the application of supplemental standards and the criteria for limited use groundwater. Groundwater in the uppermost aquifer is not a current or potential source of drinking water because widespread, ambient contamination, not due to activities involving radioactive materials from the designated processing site, exists that cannot be cleaned up using treatment methods reasonably employed in public water systems.

DOE evaluated uranium, arsenic, cadmium, fluoride, nickel, radium 226, strontium, sulfate, vanadium, zinc, ammonia, iron, manganese, molybdenum, and vanadium as chemicals of potential concern. The Baseline Risk Assessment of 1995, conducted by DOE, indicated that residential use of groundwater, mainly as drinking water, presents the only unacceptable pathway for exposure to groundwater at the site. Since the aquifer is not used for drinking water purposes and with current and future application of institutional controls (groundwater restrictions), the probability of this pathway occurring is acceptably small.

The NRC and CDPHE agree with DOE's characterization of the aquifer as *limited use groundwater* (CDPHE, 2000). In making this determination, the staff relied heavily on CDPHE's extensive knowledge of the character of the aquifer and its classification for limited use.

Since the aquifer has been classified as *limited use groundwater*, the criteria for supplemental standards has been satisfied. The background data for uranium and selenium support DOE's case that widespread ambient contamination exists in the alluvial aquifer. Groundwater from the alluvial aquifer is not a current or potential source of drinking water. Potable water is available from a municipal water system in the area. DOE also concluded that treating the water for a drinking water source would be more costly (\$680 per household) than the Environmental Protection Agency threshold value of \$300 per household (EPA, 1988), further supporting the criteria for *limited use groundwater* under 40 CFR Part 192.11(e)(2).

Institutional Controls:

The State of Colorado, through the CDPHE (the Grantor), transferred the mill-site property to the City of Grand Junction (the Grantee) via two quitclaim deeds recorded in the Mesa County Courthouse, Book 2320, pages 882 to 886, on March 29, 1997. As part of the agreement, the City agrees "not to use ground water from the site for any purpose, and not to construct wells or any means of exposing ground water on the property unless prior written approval is given by the Grantor and the U.S. Department of Energy."

In addition, for the off-site contamination, in July 1989, the Grand Junction City Council passed Ordinance 2432 of the Grand Junction Zoning and Development Code, which applies to all areas within the city limits. Section 5-4-4 of this Ordinance refers to Potable Water Systems. Paragraph B of Section 5-4-4 states that;

"All developments shall be served by the City water treatment and distribution system, unless such requirement is deemed unreasonable or impracticable, as determined by the Utilities Director. All water lines shall be designed to connect to each parcel, as set forth in the previous sentence, with City mains in accordance with applicable engineering standards, unless exempted by the Utilities Manager."

DOE stated that searches of the City of Grand Junction water service records showed no evidence of domestic water use from wells within the affected area. Contaminated groundwater as a result of processing operations is confined within the City limits, and with the City ordinance in place, domestic water supply wells should not be installed, thereby making the groundwater ingestion risk scenario extremely low.

REFERENCES:

Colorado Department of Public Health and Environment (CDPHE), 2000. Electronic mail (e-mail) from W. Naugle, CDPHE, to W. von Till, NRC, stating that the CDPHE agrees with DOE's characterization of the aquifer as a *limited use groundwater*, January 11, 2000.

U. S. Department of Energy (DOE), 1996. Final Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project, DOE/EIS-0198, October, 1996.

U.S. Environmental Protection Agency (EPA), 1988. Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy, Office of Ground Water Protection, June 1988.

