

February 8, 2001

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

SUBJECT: ACCEPTANCE OF THE FINAL SITE OBSERVATIONAL WORK PLAN FOR
THE URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT SITE AT
GRAND JUNCTION, COLORADO

Dear Ms. Bergman-Tabbert:

By letter dated June 25, 1999, the U.S. Department of Energy (DOE) submitted the Final Site Observational Work Plan (SOWP) for the Uranium Mill Tailings Remedial Action Project at Grand Junction, Colorado. The staff has completed its review of the Grand Junction SOWP and concludes that it is generally acceptable as DOE's proposed strategy for compliance with the U.S. Environmental Protection Agency groundwater protection standards in 40 CFR Part 192. The staff's detailed review of the Grand Junction SOWP is documented in the enclosed Technical Evaluation Report.

While the Grand Junction SOWP is generally acceptable, the staff's review identified issues related to the proposed use of institutional controls which must be resolved to complete the review of the Grand Junction Groundwater Compliance Action Plan (GCAP) and enable the staff to make its findings regarding the acceptability of the GCAP. The Grand Junction GCAP was submitted by DOE letter dated April 8, 1999, for staff review.

To complete the review of the GCAP, DOE needs to enhance its description of the institutional control program for controlling or inhibiting access to contaminated groundwater at Grand Junction. Specifically, DOE should describe all elements of the institutional control program to be implemented by the responsible governing entity (City of Grand Junction), including any planned periodic surveillance or monitoring and use of physical barriers (e.g., fencing), markers, or signs as supplemental features to the administrative on-site and off-site controls described in the SOWP and GCAP. DOE should provide a map indicating the mill-site boundary and the location of all on-site and off-site supplemental features (fences, signs, markers).

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.

February 8, 2001

Ms. D. Bergman-Tabbert

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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/

Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards
Office of Nuclear Material Safety and Safeguards

Docket No.: WM-54

Enclosures: Technical Evaluation Report for the
Final Site Observational Work Plan for
the Grand Junction UMTRA Project Site

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

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DATE	2/6/01		2/7/01		N/A		2/8/01	

TECHNICAL EVALUATION REPORT

FINAL SITE OBSERVATIONAL WORK PLAN FOR THE GRAND JUNCTION, COLORADO, URANIUM MILL TAILINGS REMEDIAL ACTION (UMTRA) PROJECT SITE

FACILITY: Grand Junction UMTRA Project Site

TECHNICAL REVIEWER: William von Till

PROJECT MANAGER: Rick Weller

SUMMARY AND CONCLUSIONS:

The U.S. Department of Energy (DOE) submitted a Final Site Observational Work Plan (SOWP) for the Grand Junction, Colorado, UMTRA Project Site by cover letter dated June 25, 1999. The compliance strategy proposed in the SOWP 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 Colorado Department of Public Health and Environment (CDPHE) agrees 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. Based on the reviewed information, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that the Grand Junction SOWP is generally acceptable as DOE's proposed strategy for compliance with the U.S. Environmental Protection Agency Groundwater Protection Standards (40 CFR Part 192). However, the staff's review of the Grand Junction SOWP identified issues related to the proposed use of institutional controls which must be resolved to complete the review of the Grand Junction Groundwater Compliance Action Plan (GCAP) submitted by DOE letter dated April 8, 1999.

BACKGROUND:

Regulatory Framework:

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

Criteria for applying supplemental standards are detailed in 40 CFR Part 192.21 and 192.22. Supplemental standards can be requested if the groundwater meets the criteria for *limited use groundwater* in 40 CFR Part 192.11(e). *Limited use groundwater* is defined in 40 CFR Part 192.11(e) 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 mill 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:

Groundwater:

Utilizing the groundwater compliance strategy described in the Programmatic Environmental Impact Statement (PEIS) for Uranium Mill Tailings Remedial Action Groundwater Project (DOE, 1996), DOE has proposed no remediation in conjunction with the application of supplemental standards based on 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 Grand Junction alluvial aquifer is not used for drinking water purposes and with institutional controls (groundwater restrictions), the probability of this pathway occurring will be reduced.

The CDPHE agrees with DOE's characterization of the aquifer as *limited use groundwater* (DPHE, 2000). The NRC relies on the state to classify their groundwater, therefore, 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 is in the alluvial aquifer. Groundwater from the alluvial aquifer is not currently or a potential source of drinking water. Potable water is available from a municipal water system in the area. DOE also concluded that, to treat the water for a drinking water source, it would be more costly (\$680 per household) than the Environmental Protection Agency threshold value of \$300 per household for cost effective treatment (EPA, 1988), further supporting the criteria as a *limited use groundwater* under 40 CFR Part 192.11(e)(2).

Institutional Controls:

On-Site 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 of construction plans, designs and specifications is given by the Grantor and the U.S. Department of Energy.”

Off-Site Controls:

For private landowners downgradient of the mill-site, the City of Grand Junction requires its residents to hook up to municipal water lines for potable water.

The descriptions above of the on-site and off-site controls do not adequately describe the institutional control program for controlling access to contaminated ground water at Grand Junction and these issues must be resolved to complete the review of the Grand Junction GCAP. Specifically, DOE should describe all elements of the institutional control program to be implemented by the responsible governing entity (City of Grand Junction), including any planned periodic surveillance or monitoring and use of physical barriers (e.g., fencing), markers, or signs as supplemental features to the administrative on-site and off-site controls described above. DOE should provide a map indicating the site boundary and the location of all on-site and off-site supplemental features (fences, signs, markers).

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.