

wm-39

SUPPLEMENTAL STANDARDS

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-97001-OT
ADDRESS: NORTH AVENUE RIGHT-OF-WAY 28 ROAD to 29 ROAD
(NORTH SIDE)

MARCH 1988

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

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1.0 INTRODUCTION

The purpose of this assessment is to evaluate the extent of uranium millsite contamination at this property in accordance with UMTRCA Public Law 95-604 (EPA Standards, 40 Code of Federal Regulations 192). This assessment presents three remedial action alternatives with health risk assessments, volume estimates of materials that would be removed, cost estimates to perform remedial action, and the recommended action.

1.1 General Description

Property GJ-97001-OT is a City of Grand Junction municipal supply waterline located in the right-of-way (R.O.W.) along a one-mile section of Colorado State Highway 6. Colorado State Highway 6 is a major east-west thoroughfare known locally as North Avenue. The one-mile section is located within the Grand Junction city limits between 28 Road and 29 Road.

The UMTRA program has complete radiologic assessment surveys for 18 of the 30 properties located along the north side of North Avenue for this one mile. All 18 properties have tailings contamination within the R.O.W. The radiologic information presented represents surface gamma readings and borehole data that were collected on these 18 UMTRA properties adjacent to North Avenue. The attached maps were generated from a compilation of these UMTRA property radiologic assessments as well as conversations with water and sewer utility personnel who verified that a sandy material is present around the waterline. Based on available radiologic data and conversations with utility personnel, the waterline was probably bedded and backfilled with uranium millsite tailings, which were available for construction materials from the Climax millsite until 1965.

The subject waterline originates at a 24-inch diameter steel transmission line at the intersection of 28 Road and North Avenue and proceeds east one mile along North Avenue to where it ends at the intersection of 29 Road. This section of waterline serves the commercial and residential sectors north of North Avenue along the entire one-mile length with service taps and fire protection. The waterline is about 38 feet north of the centerline of North Avenue and typically has 4 feet of cover. This location varies from 4 to 6 feet north of the north curb and gutter and is generally beneath the path of pedestrian and vehicle traffic. The attached maps and cross sections show the waterline beneath sidewalks and driveway entrances.

This one-mile section of waterline is a combination of 10- and 12-inch diameter cast iron pipe and was installed in 1964. The operating pressure of the waterline is 80 to 100 pounds-per-square-inch (psi) and has had five repairs made to it since 1976, according to city records.

The west one-half mile consists of 12-inch diameter cast iron pipe with:

- 14 service taps
- four 6-inch connections to fire hydrants
- three 6-inch cast iron supply line connections at the intersections of Court Road, 28 1/4 Road, and 28 1/2 Road

The east one-half mile is a 10-inch diameter cast iron pipe with:

- 18 service taps
- one 6-inch connection to a fire hydrant
- four 6-inch cast iron supply line connections at the intersections of 28 3/4 Road, Pear Road, Melody Lane, and 29 Road

The eastern one-half mile also is congested with 17 public service power poles with overhead electrical service. These power poles are generally 1 to 2 feet north of the waterline and buried a minimum of 6 feet.

A combination storm drain and irrigation water conduit system serpentine along the entire length varying from 2 to 18 feet north and above the waterline. Since the primary function of this conduit is to transport irrigation water, it conveys water annually during the April through October growing season. Landscape features along the mile are fairly minimal. Construction would involve two masonry planters, some sod and decorative rock, and a couple dozen shrubs.

Excavation of the contaminated material would require partial closure of the north lane of westbound traffic on North Avenue for construction access, which would cause interruptions to entrances to local commercial properties and to traffic. Colorado Highway Department data collected in 1983 at the intersection of 29 Road on North Avenue indicate the average daily traffic is 18,900 vehicles per day (vpd) total for both directions.

1.2 Location

The following description is not intended as a legal description for the waterline but more as a general location generated from state highway right-of-way drawings and schematic drawings provided by the city. The waterline has not been surveyed by the Department of Energy (DOE) to date but would be if final design drawings are required.

The subject waterline starts at a point on the Ute Prime Meridian (Ute P.M.) line approximately 38 feet north of the SW 1/4 corner Section 7, T.1 S., R.1 E., Ute P.M. and thence east one mile approximately 38 feet north of the south section line of Section 7, T.1 S., R.1 E., Ute P.M. to a point of ending at a point 38 feet north of the SE 1/4 corner on the east section line of Section 7, T.1 S., R.1 E., Ute P.M. Centerline of North Avenue for this one mile is coincidental with the south section line of Section 7, T.1 S., R.1 E., Ute P.M.

2.0 EVALUATION

The three remedial action alternatives, no action, partial removal, and complete removal are evaluated with health risk assessments and cost estimates. All calculations and costs are based on the attached drawings that give a general description of this right-of-way property and the locations of the contaminated material. The 18 individual UMTRA property radiologic assessments are assembled in Appendix A. Applicable radiologic data have been compiled onto full size drawings and the health risk calculations are in Appendix B.

The actual cost estimates are in Appendix B, they are "order-of-magnitude" and conceptual in nature. They are construction costs and are used for comparison purposes only. More detailed drawings and more accurate cost estimates would be prepared during final design if necessary. The estimates are based on the 1988 editions of R.S. Means cost estimating books and UNC Cost Estimating tables used for recent Remedial Action projects in the Grand Junction area. Also used were bid tabulation spreadsheets provided by the City of Grand Junction Engineering Department for recent waterline projects.

Remedial Alternatives

Alternative 1: No Action

This alternative would involve no remedial action on the R.O.W. based on the application of Supplemental Standards. If no action is taken, the health risk is estimated to be minimal. There is no cost estimate for this alternative because it requires no construction activity.

Taking into account the distance of the deposit from any habitable structure, and dilution of the radon with air, the radon exposure is not a problem. The main risk to the general public is the direct gamma exposure from the tailings. A typical dose rate for Colorado ranges from 150 to 200 mRem/yr (Environmental Radioactivity, M. Eisenbud, 1973, Academic Press, New York, New York). However, if no tailings are removed, the calculated dose rate over the utility trench would be effectively increased by 37 mRem/yr, which is a 19 to 25 percent increase over the typical dose rate. This calculation is based on an assumed two hour per day occupancy. This 37 mRem/yr increase in dose rate is well below an allowable 100 mRem/yr dose rate increase as established by the DOE (e.g. DOE Order No. 5480.1). The occupancy of two hours per day for 365 days per year is much greater than the average person would spend but accounts for utility personnel performing maintenance on the waterline.

Alternative 2: Partial Removal

The partial removal alternative includes excavating the top 30 inches of contaminated material over the waterline and backfilling with clean material, except at the intersections. This would essentially reduce the surface gamma exposure rate to background levels (see discussion in Appendix B). Supplemental Standards would be applied to the depths greater than 30 inches.

Because the location of the waterline is generally beneath the sidewalk, the construction sequence would start at the back of curb, allowing removal to proceed without excavating into the traffic lanes. However, excavation would require partial closure of the north lane of westbound traffic on North Avenue for safety of the public and remedial workers and for construction equipment access.

The city has expressed concern that the age and material of the pipe might make it susceptible to breakage with construction activity vibrations. A rupture in the line could easily inundate the entire north half of North Avenue causing a major traffic hazard. This would also transport contaminated material all along the flow path resulting in additional cleanup

measures. It is probable that contaminated material would be spread in both westbound traffic lanes and in the storm sewer system. Another safety concern is the location and depth of the gas main. Service connections to each property would have to be crossed. A rupture to any of these gas service lines, and the volume of traffic on North Avenue, could cause additional safety problems. Therefore, the potential exists for unsafe working conditions, unsafe traffic conditions, and disruptions to water service and fire protection.

This alternative would remove about 1,900 cubic yards of exterior contaminated material at an estimated cost of \$220,000. Table 2 in Appendix B is the detailed cost estimate for this alternative.

Alternative 3: Complete Removal

Complete removal would eliminate all health concerns with the contaminated material. The application of Supplemental Standards would not be required. This alternative requires a new line to be installed, pressure tested, disinfected, and accepted before removing the contaminated waterline.

The north one half of North Avenue (westbound traffic) is congested with buried telephone transmission lines (4 to 6, 3-inch diameter conduits), a 4-inch diameter gas main, a 10-inch diameter sanitary sewer line, and a combination storm drain/irrigation water conduit (see attached maps and cross sections). Therefore, the proposed location of the new line would be beneath the north gutter maintaining at least 10 horizontal feet from the sanitary sewer system and approximately 8 feet from the existing waterline (see cross section). Upon acceptance of the new line into the municipal system, a total of 32 service taps, five fire supply lines and eight 6-inch cast iron connections would be performed.

Similar safety considerations would apply here also, with only 8 feet separating the new line from the existing one, construction activity could cause a rupture of the old line. At the estimated 72-inch depth, construction could possibly involve crossing sanitary sewer connections at each property as well as the gas service connections. Traffic control would be more extensive than partial removal because the new line would need to be operational prior to commencing removal of the contaminated line thus requiring construction to be performed in two phases.

Removal of the contaminated waterline would involve removal and replacement of the same surface features as partial removal with the major difference being the volume of contaminated material to be removed. This alternative would require temporary support for the 17 public service power poles along the eastern one half mile and for traffic signal control poles at four intersections.

This alternative would remove about 4,300 cubic yards of contaminated material at an estimated cost of \$704,000. The cost estimate for this alternative is shown on Table 3 in Appendix B, and is separated into two parts, 1) installation of new waterline (\$401,000) and 2) removal of old waterline (\$303,000).

3.0 RECOMMENDED ACTION

The recommended action is Alternative 1, No Action, because safety considerations for the general public and the workers and the excessive cost outweigh the health benefits. The application for Supplemental Standards is in Appendix B.

Given that the residual radioactive tailings would not pose a significant health hazard to the general public and the land use for this State-owned right-of-way is not expected to change, the benefit of removing the contamination is minimal. This recommendation of No Action is based on the following major points:

1. EPA Standards would be met (40 CFR 192).
2. Risk of injury to workers or the general public would be eliminated.
3. Disruptions to business and traffic would be eliminated.
4. Construction costs would be eliminated.

APPENDIX A

This appendix contains radiologic assessment information from 18 UMTRA properties located along the north side of North Avenue. All of these assessments indicate contamination along the right-of-way. Table A-1 lists all addresses along the one-mile section of North Avenue from 28 Road to 29 Road that have right-of-way and presents their status in the UMTRA program as of February 1988. The table also indicates which properties had radiologic survey information available at the time of preparing this document. The applicable information was extracted from UMTRA property folios and therefore do not appear as complete documents, however, additional information could be supplied from UNC Geotech by referencing the address and UMTRA number.

Table A-1
All Properties North of North Ave from 28 Road to 29 Road
That Have Right-of-way Along North Avenue

Address	UMTRA No.	Status	Radiologic Information
2800	GJ-04761-CS	owner refusal	none available
2808	GJ-11302-CS	engineering in process	radiologic survey
2812	GJ-04764-VL	no action	radiologic survey
2814	GJ-04763-CS	completion rept submitted	radiologic survey
2816	GJ-11298-CS	no action	radiologic survey
2820 *	GJ-04762-CS	REA/RAA owner approved	radiologic survey
	GJ-34205-CS		
2820 1/2	GJ-00050-CS	post const RDC in process	radiologic survey
2822	GJ-03074-CS	completion rept submitted	radiologic survey
2824	GJ-00051-HO	engineering in process	radiologic survey
2826	GJ-04761-CS	excluded	none available
2830	GJ-02957-CS	rad survey in process	data not compiled to date
2842	GJ-11254-CS	land survey backlog	no rad survey to date
2846	GJ-11256-CS	REA/RAA submitted	radiologic survey
2848 *	GJ-11257-CS	REA/RAA submitted	radiologic survey
	GJ-11210-CS		
2850	GJ-05380-CS	rad survey in process	data not compiled to date
2852 **	GJ-90025-OT	REA/RAA submitted	radiologic survey
2854 **	GJ-90025-OT	REA/RAA submitted	radiologic survey
2856 **	GJ-90025-OT	REA/RAA submitted	radiologic survey
2858	GJ-05039-HO	rad survey in process	data not compiled to date
2860	GJ-05039-HO	rad survey in process	data not compiled to date
2860 1/2		no information	
2862	GJ-05068-CS	REA/RAA returned	radiologic survey
2868	GJ-11258-CS	engineering backlog	data not compiled to date
2870	GJ-11270-CS	REA/RAA submitted	radiologic survey
2878	GJ-11271-	land survey backlog	no rad survey to date
2882	GJ-11272-CS	land survey backlog	no rad survey to date
2884	GJ-11273-CS	engineering backlog	radiologic survey
2886	GJ-11274-CS	engineering backlog	radiologic survey
2888	GJ-11269-	land survey backlog	no rad survey to date
2892	GJ-11242-CS	REA/RAA submitted	radiologic survey
2894	GJ-11243-CS	completion rept submitted	radiologic survey
2896	GJ-00052-CS	engineering in process	radiologic survey

* This property has two UMTRA unmbers

** These three addresses are on one property and therefore have been combined to one UMTRA No.