United States Department of Energy

DOE Responses to CDH October 1993 Comments on the Remedial Action Plan for the Naturita, Colorado, UMTRA Site

October 1996

Uranium Mill Tailings Remedial Action Project

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UMTRA DOCUMENT REVIEW FORM

COMMENT 1

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Information for Reviewers**
COMMENTOR:	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

There seems to be some confusion regarding the temporary facilities at the processing site. Some of the text within this and other documents indicates that a retention basin will not be needed (PP 2-13, 2-14, 3-6, as well as Calculation 17-717-01-00, pg 1). However, other parts of the text (pp 2-19, 2-20, along with Calculation 17-717-01-00, pg 5) and a construction drawing (NAT-PS-10-1712) show a retention basin. While we agree with the logic that by backfilling areas in sequence, the retention basin may not be necessary, we are concerned that a retention basin may be necessary to contain water from dewatering activities in a few locations. In areas where 5 to 10 feet of excavation is needed (and the water table is between 3 and 18 feet below the surface), excavation below the water table may be necessary. We believe that this should be further evaluated, as to the expected water table depth, contaminant concentrations at that depth, the amount of dewatering that might be necessary, and size the retention basin accordingly.

RESPONSE

RESPONSE BY:	**Wei Y. Lin**
DATE:	**November 3, 1993 and October 16, 1996**

During Phase I a wastewater retention basin will be provided as indicated in the text and as shown on the drawing mentioned above to capture stormwater runoff from the millyard demolition work. However, the basin will not be necessary during the Phase II cleanup because of the planned sequencing and backfilling operation at the processing site. The basin will be removed at the conclusion of the Phase I work, which will overlap the commencement of Phase II by a couple of months.

It was found from our previous investigations that the subgrade at the processing site had a low seepage rate and most of the cleanup work will be above the groundwater table. Therefore, the amount of dewatering will be very small and will be used for dust control on contaminated areas. An unlined detention pond may be needed temporarily to capture and re-use this water but a lined retention basin is not warranted.

UMTRA DOCUMENT REVIEW FORM

COMMENT 2

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Remedial Action Selection Report, page 6-8**
COMMENTOR:	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

The section concerning the cleanup standards states:

> "Uranium concentrations in subsoil encountered after radium-226 and thorium-230 have been removed to the EPA standards will be assessed, if necessary, using a pathway analysis approach to evaluate potential environmental, groundwater, and public health impacts."

First, we prefer that an assessment of the mobility of the uranium be performed. Second, it appears that no uranium data will be collected during verification, and therefore, no information will be available for the "pathway analysis." We believe that uranium poses a significant toxicity hazard which also must be assessed as a secondary source contributing to the groundwater contamination. As with Gunnison, we believe that it is prudent to remove potentially mobile uranium sources during the surface phase, thus, improving the ability to reach compliance during the Phase II groundwater program. Thus, we request that the uranium concentrations at the site be assessed, as well as the mobility of the uranium encountered and that appropriate clean-up and verification procedures be initiated based on these results.

RESPONSE

RESPONSE BY:	Richard Heydenburg
DATE:	October 15, 1996

Further uranium characterization, which included mobility studies, was performed during the site cobbles-to-fines study test-pitting prior to final excavation. Verification efforts to address this are being implemented.

UMTRA DOCUMENT REVIEW FORM

COMMENT 3

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Attachment 3, pages 3-19 through 3-21**
COMMENTOR:	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

The discussion concerning the geochemical testing was changed based on our previous comments. However, we still find this discussion a bit confusing. This may be the result of mis-referencing data tables. For example, in the first paragraph, it is stated that "The residual radioactive material samples were composite to form a representative sample to make a leachate solution for the batch leach tests (Table 3.25)." However, Table 3.25 shows the chemical characterization of the core samples. Subsequent references to the tables are similarly in error. In addition, Table 3.27 shows pH values in the range of 1040, which probably have been switched with the Eh values on the table. It is also stated (on page 3.12) that the pH of the leached core samples is more alkaline relative to the initial leachate solution, a conclusion that does not appear to be supported by the data (initial pH as indicated on Table 3.26 is 8.07, while final pH is 8.03-8.04, as indicated under Eh on Table 3.27). We suggested that the geochemical discussion and corresponding tables be carefully reviewed to correct these errors.

RESPONSE

RESPONSE BY:	**Richard Heydenburg**
DATE:	**October 15, 1996**

This comment refers to the proposed Dry Flats disposal site and is no longer applicable.

UMTRA DOCUMENT REVIEW FORM

COMMENT 4

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Attachment 3, Figure 3-9, page 3-31**
COMMENTOR	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

The uranium plume at the Naturita processing site is fairly significant, in that concentrations occur that greatly exceed the proposed MCL. One would expect that since the assumed primary contaminant source (tailings) has been absent for over 13 years, that natural flushing would result in reductions in the uranium plume. Since the uranium concentrations do not appear to be decreasing, we believe that it is possible that a significant uranium source remains on the site. Our concern is that by using clean-up standards based on Radium-226 (and possibly Thorium-230) we may not remove all of the uranium source. We believe that some type of verification sampling should be conducted to determine that the uranium source is being remediated. Please see our related comment regarding verification sampling for uranium in the RAS, page 6-8.

RESPONSE

RESPONSE BY:	**Beth Pomatto and Dave Ward**
DATE:	**October 15, 1996**

The uranium source at the Naturita processing site has been further studied and the results are in the February 23, 1996 "Calculation of Groundwater Residence Times and the Uranium Source Required to Produce Observed Uranium in Naturita Groundwater"; and February 23, 1996 "Uranium Mass Balance Calculation (Estimated Quantity of Uranium Remaining On-site)" Memoranda. These geochemical and radiological reports results supported a conclusion that the amount of tailings onsite would justify the uranium concentrations observed in ground water.

In addition to the uranium mass balance calculations, existing uranium data were studied in order to determine whether or not uranium had become preferentially mobile. The available data did not support a conclusion that elevated levels of uranium exist in the absence of radium; however, the quantity of uranium data was limited such that determination could not be made for all of the site. For this reason, the remedial action contractor is conducting uranium analysis on 10% of the verification samples collected at the processing site using a uranium cleanup criteria of 35 picoCuries per gram based on the NRC Branch Technical Position Paper.

UMTRA DOCUMENT REVIEW FORM

COMMENT 5

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Attachment 3, Figure 3-36, page 3-14
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

We noted that several of the wells at the Dry Flats site have experienced water level fluctuations of over 10 feet. A discussion as to why this occurs should be included in the text, which may assist in substantiating the argument that the aquifer cannot yield 150 gpd (See our related comment regarding Attachment 4, page 3-5.)

RESPONSE

RESPONSE BY:	Richard Heydenburg
DATE:	October 15, 1996

This comment refers to the proposed Dry Flats disposal site and is no longer applicable.

UMTRA DOCUMENT REVIEW FORM

COMMENT 6

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Attachment 3, Page 3-119, Table 3.12
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

Table 3.12 is confusing as no units are indicated for the data presented and it is not clear which columns pertain to tailings, and which to natural soils. We suggest that appropriate titles and notes be added to help clarify this information.

RESPONSE

RESPONSE BY:	Richard Heydenburg
DATE:	October 15, 1996

Comment acknowledged. Table deleted.

UMTRA DOCUMENT REVIEW FORM

COMMENT 7

SITE: Naturita, Colorado
DOCUMENT: Preliminary Final Remedial Action Plan (RAP)
COMMENT: Attachment 3, Page 3-130, Table 3.13
COMMENTOR: Colorado Department of Health (CDH)
DATE: August, 1993

Batch leach tests indicate that a mobile uranium source may be present at those locations where samples 806, 807 and 808 were collected. However, we were unable to find a map indicating where these samples were collected, and the depth of the contamination in those areas. This information may prove to be useful in addressing our previous comments regarding uranium at the process site. We would appreciate being supplied with information regarding the sample locations.

RESPONSE

RESPONSE BY: Richard Heydenburg
DATE: October 1, 1993

Samples 806-808 that were used in the batch leach tests were collected from 0-4 feet in Test Pit 650 at the processing site. This information is in the fourth paragraph on page 3-7 in Section 3.1.5 of Attachment 3 of the RAP. The locations of the Test Pit is shown on Figure 3.2 on page 3-24.

UMTRA DOCUMENT REVIEW FORM

COMMENT 8

SITE: Naturita, Colorado
DOCUMENT: Preliminary Final Remedial Action Plan
COMMENT NO.: Attachment 3, page 3-316, Table 3.26
COMMENTOR: Colorado Department of Health (CDH)
DATE: August, 1993

As mentioned in our comments concerning Table 3.13, three batch leach test samples showed high concentrations of leachable uranium. In contrast, the composite samples did not produce any leachable uranium, as shown on Table 3.26. Since uranium is the primary contaminant in the plume at the processing site, it would seem that uranium will most likely be present in the leachate that will be generated as the disposal cell. Correspondingly, the leach tests should evaluate the reactions between a uranium-bearing leachate and the native material at the disposal cell. Since the composite samples did not yield detectable concentrations of uranium, these reactions were not evaluated. We are concerned about how the sample locations were selected for the composite samples, and feel that it is necessary to provide documentation to substantiate that these samples were representative of the overall conditions at the site.

RESPONSE

RESPONSE BY: Richard Heydenburg
DATE: October 15, 1996

This comment refers to the proposed Dry Flats disposal site and is no longer applicable.

UMTRA DOCUMENT REVIEW FORM

COMMENT 9

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Attachment 4, page 1-1
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

The Water Resources Protection Strategy is in part based upon the following:

> The seepage flux from the disposal cell will be sufficiently low that it not affect the flow regimen in the groundwater system of the uppermost aquifer or create points of exposure to surface water or hydraulic connection to other aquifers. The low flux through the radon/infiltration barrier and the low transient drainage of the contaminated material fluids will occur as unsaturated flow and can be accepted into storage in the unsaturated zone by the underlying Cretaceous stratigraphic unit. This will ensure that a phreatic surface does not develop within the disposal cell that could create a surface seep."

While we agree that the packer tests indicate a high hydraulic conductivity of the upper 60 feet of material, we do not believe that these arguments have been fully substantiated. First, we could not find calculations that show the expected transient drainage, which could potentially exceed recharge that has occurred historically at the site. Thus, a calculation should be presented that shows that this flux can be accepted into the material without causing surface seeps. Also, it appears that the high permeability of the upper layers of the Dakota/Burro Canyon formation is the result of fracturing in the formation. Further discussion of the fracturing is warranted, and supporting documentation that seepage generated from transient drainage, will not daylight due to the fracturing patterns should be provided.

RESPONSE

RESPONSE BY:	Richard Heydenburg
DATE:	October 15, 1996

This comment refers to the proposed Dry Flats disposal site and is no longer applicable.

UMTRA DOCUMENT REVIEW FORM

COMMENT 10

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Attachment 4, page 3-5
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

There appears to be no documentation or calculations to support the conclusion that the aquifer yields less than 150 gpd. It is not sufficient to base this demonstration on hydraulic conductivity alone, especially if only slug tests were used to determine hydraulic conductivity. We would like to see a calculation, or further information to support this claim. Perhaps more information from the well samplers could be included that details how long it takes the wells to recharge after being bailed, etc. Or, a pumping test should be conducted to verify that the aquifer has insufficient yield.

RESPONSE

RESPONSE BY:	Richard Heydenburg
DATE:	October 15, 1996

This comment refers to the proposed Dry Flats disposal site and is no longer applicable.

UMTRA DOCUMENT REVIEW FORM

COMMENT 11

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Calculation 17-730-01, Sheet 30
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

This table shows that based on concentrations of Radium-226 in the ore storage area, concentrations of Ra-226 exceed the EPA standards at the 0.5' depth. Thus, it appears that further excavation may be required to meet the standards, yet the excavation drawings show only 0.5' of excavation.

RESPONSE

RESPONSE BY:	Wei Y. Lin
DATE:	November 3, 1993, October 16, 1996

We have reviewed the available Ra-226 concentration data in the former ore storage area, and we agree with the comment that the Ra-226 concentrations exceed the EPA standards at the 0.5 ft. depth. The excavation plan in the former ore storage area was developed based on limited data available for the 0 to 6-in depth only. However, during construction the depths of contamination will be verified in order to meet the EPA Standards.

UMTRA DOCUMENT REVIEW FORM

COMMENT 12

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Calculation 17-730-02-00, Proposed Supplemental Standards**
COMMENTOR:	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

This calculation describes in general terms the areas where Supplemental Standards are proposed. Although we conceptually agree with the proposed areas shown in the calculation, we are concerned that the lack of details in the calculation may generate two undesirable results. First, from a technical point of view, the drawing on Sheet 3 indicates that all land within the cross-hatched areas are proposed for Supplemental Standards, which we do not agree. Second, it has been our experience at other UMTRA sites within Colorado that any deviation from project plans after a subcontract is awarded will undoubtedly cost additional money, whether the change involves adding scope of work or deleting work.

As shown on Sheet 1 of the calculation, the Supplemental Standards areas have been divided into four categories. Specific comments to consider for each of the areas are the following:

a) Areas with Steep Slopes We agree that areas with steep slopes are appropriate candidates for application of Supplemental Standards. Some of the areas shown on Sheet 3 to be included in this category, however, contain areas which appear not steep enough to prevent selected removal of deposits. Relatively flat areas, due to either natural conditions or benches cut into the slopes, can be found along the west side of Highway 141. These modestly sloped areas should be shown in detail and designed for removal of contaminants.

b) San Miguel River Front Area We disagree with the continuous 50 foot setback from the river due to wetland considerations. There may be some areas where a 50 foot setback is appropriate, however, there are many areas within the 50' strip that are definitely not considered to be wetlands. In addition, remedial action at other sites, particularly Grand Junction, has been performed within wetlands right up to the edge of the river bank. Replacement of appropriate wetlands vegetation follows removal of contaminated materials. We suggest that a detailed drawing be generated from field mapping which clearly delineates those areas where wetlands exist. An evaluation can then be made concerning the extent and feasibility of remediating wetlands.

c) Dense Vegetation and Wetland Areas Similar to the comment for "b" above, dense vegetation and wetlands within Area E needs to be mapped in detail and evaluated more precisely.

d) High Pressure Gas Line Area The entire 35' right-of-way for the gas line does not need to have Supplemental Standards applied. We agree that performing remedial action on or near a gas line is potentially dangerous, however, precautions and techniques have been successfully utilized with similar situations at other UMTRA sites, particularly Grand Junction. During a field visit in February, 1993 with DOE and TAC, a plan was discussed and agreed upon to obtain additional information in the area near the gas line. This plan should be reviewed and executed as previously discussed.

We request that this calculation be reworked and additional details be included as discussed. We realize that subsequent discussions as well as site visits have probably clarified some of the issues discussed above.

RESPONSE

RESPONSE BY: Ralph Waddington
DATE: October 8, 1996

This comment pertains to a calculation referred to as 17-730-02-00. This calcuation has been revised at least twice and several of the factors referred to by CDPHE have been addressed, e.g., the width of the gas pipe right of way has been reduced and the 50 foot setback from the river for wetlands has been removed. In fact, the supplemental standards areas are constantly being discussed and revised by CDPHE, DOE, TAC and RAC. An addendum to the supplemental standards application has been prepared and is being reviewed by RAC.

UMTRA DOCUMENT REVIEW FORM

COMMENT 13

SITE:	**Naturita, Colorado**
DOCUMENT:	**Preliminary Final Remedial Action Plan (RAP)**
COMMENT:	**Subcontract Documents, Drawing No. NAT-PS-10-1715**
COMMENTOR:	**Colorado Department of Health (CDH)**
DATE:	**August, 1993**

Note 1, which discusses the revision of the drawing pending the status of supplemental standards, may be premature. We suggest either replacing the word "will" in the first sentence with "may", or, preferably, deleting this note altogether. It is our feeling that pointing out possible changes to the subcontract drawings sets up the unwanted system of subcontract change orders even prior to beginning the project. If this note is eliminated, Note 2, indicating that excavation depths are approximate and determined by the contractor, should be sufficient.

RESPONSE

RESPONSE BY:	**Ralph Waddington**
DATE:	**October 8, 1996**

There is no longer any drawing having this number. The drawing possibly referred to is now NAT-PS-10-1754 which shows the contaminated material excavation plan. It shows the areas proposed for supplemental standards and also clarifies the area proposed for supplemental standards around the gas pipeline.

UMTRA DOCUMENT REVIEW FORM

COMMENT 14

SITE:	Naturita, Colorado
DOCUMENT:	Preliminary Final Remedial Action Plan (RAP)
COMMENT:	Subcontract Documents, Drawing No. NAT-PS-10-1716
COMMENTOR:	Colorado Department of Health (CDH)
DATE:	August, 1993

We are concerned that the final grading plan shown has not taken into consideration the input from the local community. As you are aware, the community is planning on developing the site after remedial action is complete into a park or golf course. For the last several years, we have assured the community that their ideas will be incorporated into the site restoration plan where appropriate, and where it is at no additional cost to the government. Please explain what needs to be done at this time in order to deliver our promise to the community.

RESPONSE

RESPONSE BY:	Ralph Waddington
DATE:	October 8, 1996

There is no such drawing in the documents. The final grading plan drawing is NAT-PS-10-1755. This drawing will likely be revised in an as-built condition since the excavation in the old mill yard area is running much deeper than estimated. Rather than backfill to the elevations indicated, some adjustment may be made. The golf course proposal has been discussed with DOE and CDPHE but no formal direction has been given to the RAC for changes in the grading plan.