Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque New Mexico 87115

DEC 1 6 1992

Mr. John J. Surmeier
Chief, Uranium Recovery Branch
Division of Low-Level Waste
Management & Decommissioning
Office of Nuclear Materials Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop 5E-4 OWFN
Washington, DC 20555

Dear Mr. Surmeier,

Enclosed is the newly revised copy of the Project Interface Document (PID 05-S-47, Rev. 2) for your review and approval. The PID has been revised in accordance with technical discussions held between MK-Engineering and our staffs to better explain the justification and requirements for the placement of oversized Type B and Type C riprap at the Grand Junction Disposal Site.

Please forward your concurrence and/or comments to Jolene Stelmach. She may be reached at 505-845-6146.

Sincerely,

Albert R. Chernoff
Project Manager
Uranium Mill Tailings Remedial Action
Project Office

Enclosure

cc w/enclosure:
D. Rom, NRC
T. Johnson, NRC
D. Leske, UMTRA/GJPO
C. Watson, TAC
R. Waddington, MK-F

280055

WM-54
NL04

ENGINEERS
AND
CONSTRUCTORS

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

HEADQUARTERS OFFICE
ONE ERIEVIEW PLAZA
CLEVELAND, OHIO U.S.A. 44114
PHONE: (216) 523-5600/TELEX: 985542

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

November 30, 1992 92-3050-884

Mr. Don Leske
Site Manager
U.S. Department of Energy
Uranium Mill Tailings Remedial Action Project Office
2597 B 3/4 Road
Grand Junction, CO 81503

SUBJECT: PID 05-S-47, Rev. 2 Oversize Material in B & C Riprap
Grand Junction, CO - Wetlands Mitigation Plan

REFERENCE: Contract No. DE-AC04-83AL18796

Dear Mr. Leske:

Enclosed is a copy of the subject PID which has been executed by the RAC following extensive discussions with the NRC. Please forward a copy to the NRC for their formal review and concurrence. The original is being sent to the DOE APO for signature following your review and concurrence.

Should you have any questions, please contact the undersigned at 1-800-443-4379.

Sincerely,

MK-FERGUSON COMPANY

C. R. Spencer
Acting Construction Engineering Manager

CRS/REW/mno

Enclosures:
cc: w/enclosures:
J. Stelmach, DOE/UMTRA
C. Watson, TAC/UMTRA
w/o enclosures:
C. Smythe, DOE/UMTRA

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MORRISON KNUDSEN

UMTRA PROJECT OFFICE
PROJECT INTERFACE DOCUMENT

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111292

Site	Date	PID No.	Site No.	Vic Pro No.
Grand Junction	11/12/92	05-S-47 Rev. 2	05	
Originator and Location	**Phone**	**Organization**	**Answer By:**	**References:**
D. Bolton, SE	415/442-7586	MKES		**Subcontract:**
Subject				**Subcontract No:**
Oversize Material in the Type B and C Riprap				

Description of Problem and Recommended Solution ☐ Clarification ☒ Change

PROBLEM: As of the end of September 1992, 100% of the volume for final construction for the Type B and C Riprap has been produced. Gradation tests taken of the Type B and C Riprap material as specified in PID 41 reveal approximately 3% to 11.5% oversize (+12") in the Type B Riprap and approximately 4% to 30% oversize (+28") in the Type C Riprap. The oversize material in the Type B Riprap was caused by a common construction screening practice of using a one-dimensional grizzly set at 11 to 12 inches to separate materials. Slightly oversized rock with one dimension less than 12 inches and with all other dimensions over 12 inches, slip through into the Type B material. The oversize material in the Type C Riprap is caused by greater quantities of larger rock (+28") separating off of the 12-inch grizzly than originally estimated. The oversized material in both riprap types has been considered acceptable provided that slightly oversized Type B Riprap shall be placed with the largest dimension along the bedding plane and provided that +28-inch rock in the Type C Riprap is evenly distributed in those locations having sufficient depth to accommodate this large rock (ditch outlet toe protection and embankment apron). A detailed explanation of the development of erosion protection material (Types B and C), an evaluation of gradation test results and their impact on the design are presented in Attachment A. As a result of the evaluation, the oversize Type B and Type C riprap is considered acceptable subject to the placement restrictions discussed above.

(Continued on following sheet)

Originator D Bolton 11-23-92
Signature Date

Disposition ☐ Approved ☐ Disapproved ☐ Approved as Noted

Criteria Change? ☒ Yes ☐ No
(If Yes, DOE approval required)

Class I

DOE Site Manager Approval Date

RAC Site Manager Robert C. Hunsinger 11-25-92
RAC Project Control Liz Van Why for BJ. 11/25/92
RAC Engineering/Design [illegible] 11-23-92
RAC Construction Engineer [illegible] 11/24/92
Reviewed for Quality Requirements Steven D. Marks 11/24/92
Signature Date

Distribution	Name	Location	Name	Location
RAC Site Mgr.			RAC Constr. Engr. Mgr.	
DOE Proj Engr.			RAC Qual. Mgr.	
TAC Site Mgr.			Other	
RAC Site Qual. Engr.				
RAC HS&E Mgr.				

Cost/Time Est.
☐ Attached
☐ Not Required
☐ DOE Approval Req.

0104C

MK-067-MM(10/84)
Revision 1

SOLUTION:

1. Revise Specification No. 02278, Erosion Protection, as follows:

   - Article 2.1.A.1.b: After the given gradation add, "NOTE: Oversize (+12 inch) material shall be allowed, subject to the approval of the Contractor, provided that such oversize material is placed as specified in Article 3.2.F.

   - Article 2.1.A.1.c: After the given gradation add, "NOTE: Oversize (+28 inch) material shall be allowed, subject to the approval of the Contractor, provided that such oversize material is placed as specified in Article 3.2.G.

   - Article 3.2: Insert new Paragraphs F and G as follows:

     "F. Oversize material in the Type B riprap shall be allowed, subject to the approval of the Contractor, provided that such oversize material is placed with the largest dimension along the bedding plane and provided that Article 3.3.A.4 is adhered to.

     G. Oversize material in the Type C riprap shall be allowed subject to the approval of the Contractor, provided that Type C oversize rock (greater than 28 inches) shall be placed only in the ditch outlet toe protection and in the embankment apron where riprap depth requirements allow and provided that Article 3.3.A.4 is adhered to. The surface of the embankment apron and ditch outlet shall consist of well keyed rocks and a uniform slope gradient shall be maintained to meet design grade tolerances."

   - Article 3.2: Change designation of existing Paragraphs "F and G" to Paragraphs "H and I" respectively.

   - Article 3.4.C.1: Insert new Paragraphs c and d as follows:

     "c. The gradation tests for the Type B riprap with oversize rock shall exclude rock sizes greater than 12 inches.

     d. The gradation tests for the Type C riprap with oversize rock shall exclude rock sizes greater than 28 inches."

UMTRA PROJECT
GRAND JUNCTION, COLORADO
ATTACHMENT A

I. DEVELOPMENT OF EROSION PROTECTION MATERIAL

At the initiation of the construction subcontract for the Grand Junction site, four rock sizes were included in the specifications. These rock sizes were to be used primarily on the apron and ditches of the disposal cell cover, with a layer of choked rock included for the vegetative earth cover. The rock sizes were estimated to be available in the stockpile produced during excavation for the disposal cell. Only preliminary estimates of actual rock sizes or quantities were available.

In August 1990, discovery of a paleochannel at the Cheney site resulted in the relocation of the disposal cell. This change was accomplished by means of PID 17, Rev. 1 and the clean fill dike concept was also added to the subcontract at this time. The below-ground dikes were to be constructed of Mancos Shale and the above-ground portions from stockpiled radon barrier material. The cover design was modified slightly and provided for production of erosion protection material onsite from the materials obtained from the disposal cell excavation.

In March 1991, following considerable discussion between TAC and MKES, NRC comments led to changing the cover design from vegetative earth to rock and PID 25 was issued. PID 25 provided for adjusting the Type A rock to 4-inch minus and added a fifth type, E, which included gradations from 6 inches to 19 inches. At this time, the amount and extent of each rock type was still unknown.

PID 28 was issued in April 1991, and revised Type D to a 10-inch to 27-inch material and added a sixth type, F, covering a range of 14 inches to 34 inches. These changes were made following a change in the embankment apron and drainage swale design. An increase in flow velocity in the swale design led to the need for larger rock.

During the months of July and August 1991, MKES and MKF analyzed the six rock types called for in the specifications and determined that consolidation of the six types was possible, considering the amount of overlap between some of the types and the potential for modifying the slope of the cover and the use of the 1-inch minus material for the clean fill dike. The Subcontractor was then directed to begin production of clean fill dike material from the stockpiled excavated material and started the screening plant in September 1991. The production of the plant was divided into four material sizes - the 1-inch minus clean fill product and three types of rock.

Between September and November 1991, MKES and MKF completed the revised design and submitted it to DOE for NRC's approval. However the issue of PID 41, which provided the change in gradations for the subcontract documents, was not made until February 1992. During this interim, more than 50 percent of the required rock products were screened using the gradations proposed in PID 41. During this period, QC was using testing parameters that contained sieve sizes defined in the original and modified specifications (PID 25 and PID 28). While these trials were being made, the UMTRA Project failed to advise the NRC in a timely manner that tests were not meeting the design parameters originally reviewed by the NRC.

In February 1992, PID 41 was issued revising the number of rock gradation types to three. The original Type A was retained (4" minus) and B and C were combined into a new Type B (12" minus). The remaining three types were combined into a new Type C (28" minus) to provide the necessary large rock for the apron and swale. After issuing the gradations that more nearly matched the materials being produced, the material generally passed the gradation testing. One exception is Type B specification which excludes any rock retained on a 12-inch square sieve. Some rock with a minor dimension just under 12 inches but a major dimension greater than 12 inches has been observed not to pass the 12-inch square sieve. This is due to the characteristics of the mechanical separating device being used, a stationary rail grizzly with spacing set at approximately 10 to 11 inches.

II. EVALUATION OF GRADATION TEST RESULTS

A minimum of one gradation test has been performed per 2000 cu yds of each type (B or C) of erosion protection material during production on site (Specification Section 02278, Article 3.4.C.1.a). A summary of test results is presented in Tables 1 and 2 for riprap Types B and C respectively. As stated in Part I above, PID 41 was not issued until February 1992. Therefore, tests performed prior to issue of PID 41 used test parameters that contained sieve sizes defined in the original gradation specifications (PID 25). To use these gradation test data to check against the sieve sizes defined in the modified specification (PID 41), graphic interpolations were made. For Type B riprap, interpolation of the 12-inch top size was obtained by estimating the amount of oversize from the 11-inch screen to be 5% to 10%.

Based on the two tables, in the case of the Type C, the presence of oversize rock existed for each test and the percentage of oversize rock is presented in Table 2. In the case of Type B, the presence of oversize rock existed for about one third of the test results and the percentage of oversize rock, if any, is presented in Table 1. However, for both Types B and C, the gradation tests met the modified specifications (PID 41) in all tests when oversize rock sizes were excluded.

III. RELATIONSHIP BETWEEN OVERSIZE ROCK AND DESIGN

The design methods for determining the suitability of erosion protection riprap give minimum D_{50} for a given condition. The remaining gradation limits, D_{100} minimum, D_{100} maximum, D_{25} minimum and layer thickness are then determined using the Corps of Engineer's method. By excluding the oversize rock for both Types B and C, the D_{50} limit for each type meets the modified specifications (PID 41)

In an effort to provide a remedy for this small amount of oversize rock, PID 47 is now issued. The placement restrictions for the oversize rock and cat-walking of the rock to minimize any obvious protrusion will ensure that the lines of the design are adhered to. In the case of Type C, the

oversize rocks are visually obvious and will be excluded from the gradation tests and placed in locations having sufficient depth to accommodate them.

In addition, during final placement of each type of erosion protection material, gradation tests shall be performed at a minimum frequency of one test for each 10,000 cu yds. (Section 02278, Article 3.4.C.1.a).

TABLE 1
RESULTS OF GRADATION ANALYSIS
RIPRAP TYPE B

Dates of Test[1]	Test No.	Oversize (+12") Material Included: % Oversize	Oversize (+12") Material Included: D_{85}/D_{15} (inches)	Oversize (+12") Material Included: (P/NP)[2]	Oversize (+12") Material Excluded (P/NP)[2]
09/07/91 - 05/29/92	ITB-1	None	--	--	P
09/19/91 - 05/29/92	ITB-2	None	--	--	P
09/20/91 - 05/29/92	ITB-3	None	--	--	P*
09/25/91 - 05/29/92	ITB-4	None	--	--	P
10/01/91 - 05/29/92	ITB-	None	10/3.5	--	~~P~~ NP CRS 11/24/92
10/04/91 - 05/28/92	ITB-6	None	--	--	P
10/10/91 - 05/28/92	ITB-7	None	--	--	P*
10/17/91 - 05/28/92	ITB-8	None	--	--	P*
10/19/91 - 05/28/92	ITB-9	None	--	--	P*
10/22/91 - 05/28/92	ITB-10	None	7.5/3.5	--	NP
11/01/91 - 05/28/92	ITB-11	None	--	--	P*
11/06/91 - 05/28/92	ITB-12	None	--	--	P*
11/21/91 - 05/28/92	ITB-13	None	--	--	P
11/23/91 - 05/28/92	ITB-14	None	10.5/5	--	NP
12/04/91 - 05/28/92	ITB-15	None	--	--	P*
12/16/91 - 05/28/92	ITB-16	None	--	--	P*
12/18/91 - 05/28/92	ITB-17	None	12/6.5	--	NP
12/27/91 - 05/28/92	ITB-18	None	--	--	P*
01/15/92 - 05/28/92	ITB-19	None	11.5/5.5	--	NP
01/23/92 - 05/28/92	ITB-20	None	8.5/4.5	--	NP [marginal]
02/10/92 - 05/28/92	ITB-21	None	--	--	P*
02/13/92 - 05/28/92	ITB-22	None	--	--	P
02/19/92 - 05/28/92	ITB-23	None	--	--	P
03/04/92 - --	ITB-24	None	--	--	P
03/10/92 - --	ITB-25	None	6.5/4.5	--	NP

(1) 11/01/91 - 05/22/92: Testing date prior to issuance of PID No. 41 - interpolated test results based on gradation specified in PID No. 41.

(2) P : Meets gradation specified in PID No. 41.
NP: Does not meet gradation specified in PID No. 41.

* Interpolation of the 12-inch top size was obtained by estimating the amount of oversize from the 11-inch screen.

TABLE 1
RESULTS OF GRADATION ANALYSIS
RIPRAP TYPE B

Dates of Test[1]	Test No.	Oversize (+12") Material Included			Oversize (+12") Material Excluded (P/NP)[2]
		% Oversize	D_{85}/D_{15} (inches)	(P/NP)[2]	
03/12/92	ITB-26	None	7.5/4.5	--	NP
03/20/92	ITB-27	None	--	--	P
03/25/92	ITB-28	None	--	--	P
04/01/92	ITB-29	4	8.5/3.5	NP	P
04/10/92	ITB-30	None	--	--	P
04/15/92	ITB-31	3	10/5	NP	P
04/21/92	ITB-32	None	--	--	P
08/19/92	ITB-33	8.6	11/5	NP	P
08/26/92	ITB-34	6.3	10/4.5	NP	P
09/09/92	ITB-35	None	--	--	P
09/15/92	ITB-36	11	11/4	NP	P
09/23/92	ITB-37	None	--	--	P
09/30/92	ITB-38	10	11/5	NP	P
09/30/92	ITB-39	9	10.5/4.5	NP	P
10/05/92	ITB-40	None	--	--	P
10/13/92	ITB-41	None	--	--	P
10/20/92	ITB-42	None	10.5/6	--	NP
06/08/92	ITB-5R1	5.6	10/4.5	NP	P
06/08/92	ITB-26R1	None	--	--	P
06/08/92	ITB-14R1	7.7	11/5	NP	P
06/08/92	ITB-17R1	11.5	11.5/4.5	NP	P
10/22/92	ITB-42R1	None	--	--	P
10/22/92	ITB-42R2	None	--	--	P

(1) 11/01/91 - 05/22/92: Testing date prior to issuance of PID No. 41 - interpolated test results based on gradation specified in PID No. 41.

(2) P : Meets gradation specified in PID No. 41.
NP: Does not meet gradation specified in PID No. 41.

TABLE 2
RESULTS OF GRADATION ANALYSIS

RIPRAP TYPE C

Dates of Test[1]	Test No.	Oversize (+28") Material Included: % Oversize	Oversize (+28") Material Included: D_{85}/D_{15} (inches)	Oversize (+28") Material Included: (P/NP)[2]	Oversize (+28") Material Excluded (P/NP)[2]
11/01/91 - 05/27/92	ITC-1	12	27/15.5	NP	NP
11/12/91 - 05/27/92	ITC-2	15	28/13.5	NP	P
12/10/91 - 05/27/92	ITC-3	25	30/15	NP	P
01/03/92 - 05/27/92	ITC-4	39	32/13	NP	P
02/05/92 - 05/27/92	ITC-5	13	26/15.5	NP	NP [marginal]
02/21/92 - 05/27/92	ITC-6	29	31/14	NP	P
02/26/92 - 05/27/92	ITC-7	11.5	27/15.5	NP	NP
04/01/92 - 05/27/92	ITC-8	5.4	26/13	NP	P
04/24/92	ITC-9	18.6	30/13	NP	NP
04/27/92	ITC-10	9.6	26/14	NP	P
05/27/92	ITC-11	None	--	--	P
07/02/92	ITC-12	12.7	27/15	NP	~~P~~ NP CRS 11/24/92
06/26/92	ITC-13	None	--	--	P
06/26/92	ITC-14	None	--	--	P
06/26/92	ITC-15	23.8	30/14	NP	P
08/19/92	ITC-16	None	--	--	P
09/03/92	ITC-17	43.6	32/11	NP	NP
10/22/92	ITC-18	16	29/12	NP	P
10/02/92	ITC-19	12	27/12	NP	P
10/13/92	ITC-20	5	26/12	NP	P
10/13/92	ITC-21	4	26/13	NP	P
10/15/92	ITC-22	4	26/12	NP	P
10/13/92	RITC#1	2	24/12	NP	P
10/08/92	RITC#7	4	25/14	NP	P
10/08/92	RITC#9	4	26/17	NP	P
10/08/92	RITC#12	23	32/14	NP	P
10/06/92	RITC#17	29	34/13	NP	P

(1) 11/01/91 - 05/22/92: Testing date prior to issuance of PID No. 41 - interpolated test results based on gradation specified in PID No. 41.

(2) P : Meets gradation specified in PID No. 41.
NP: Does not meet gradation specified in PID No. 41.