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Trip Report

May 20, 1980

U.S. Nuclear Regulatory Commission
Inspection of Embankment Foundation
Shooting Canyon Project
Plateau Resources Limited, Utah

REMARKS: On 29 April 80, a site visit and inspection of the embankment foundation and impoundment area of the Shooting Canyon Project, Plateau Resources Limited, was performed. Specific comments are as follows:

Key Trench

The key trench had been excavated approximately five feet into cemented sandstone. The loose, non-cemented material had been removed. The trench averaged 30 feet in width, necking down to approximately 15 feet wide at the narrowest point. Observation of the stratigraphy noted that two small seams of clay (=12-18 inches in thickness) and a seam of shale (=2 inches in thickness) were layered between the predominantly sandstone formation.

The trench had been excavated with a D-9 dozer, eliminating the need for blasting any portion of the trench. However, the contractor ripped several deep grooves (6-15 inches deep) into the foundation. The foundation had been swept and washed clear. A vertical, overhanging joint was noted in the key trench along the east side of the primary embankment area disrupting the otherwise continuous trench. The overhang was approximately two feet high. It was noted that because of the overhang joint and deep grooves, conventional compaction equipment would not yield a tight seal between the initial clay layer (Zone 1 material) and the sandstone trench.

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General Observations

It was observed that the exposed sandstone surface weathered very quickly. Recent rain and winds easily loosened the sand particles along the key trench surface. Also, the impoundment area upstream of the embankment had been stripped and shaped with all top soil removed from the impoundment area.

Recommendations

- 1) Inspection of the embankment foundation and key trench indicated that Plateau Resources Limited has complied with license conditions and specifications. It is therefore recommended that Plateau Resources Limited be allowed to continue construction of the embankment.
- 2) It is recommended that Plateau Resources Limited formulate and implement a design for insuring that a tight seal is formed between Zone 1 material and the deep grooves and overhang joint in the trench.
- 3) It is recommended that loose and weathered material be removed before initiating placement of Zone 1 material.
- 4) It was recommended to Plateau Resources Limited and the Woodward-Clyde Consultant that all work be well documented and certified by a Registered Professional Engineer.
- 5) Attached is a copy of the consultant's recommendation to Plateau Resources Limited subsequent to and as a result of the 29 April 80 inspection.

Plateau Resources Limited has subcontracted all aspects of the embankment and impoundment construction except for on-site performance inspections. Subcontractors as of the inspection are as follows:

Contractor	Mountain States Engineering
Subcontractor	Stafford Construction Co.
Consulting Engineer	Woodward-Clyde Consultants
Soil Testing	Garco Testing Laboratory

Site and subcontractor coordination is performed by Plateau Resources Limited.

Individuals in attendance during portions of this inspection are as follows:

Steven R. Abt	CSU/USNRC
Robert Morgan	Inspector, Utah State Engineer's Office
Pam Newman	License Coordinator, Plateau Resources Limited
Don Poulter	Soils Engineer, Woodward-Clyde Consultants
Ken Weaver	Senior Project Geologist, Woodward-Clyde Consultants
Jim Thompson	Project Manager, Mountain State Engineering
Harold Stafford	Stafford Construction Company
Ed Minor	Inspector, Plateau Resources Limited

Respectfully submitted,



Steven R. Abt, Ph.D., P.E.
Civil Engineering Department

cc: Mr. Glen Brown
Mr. Dan Gillian ✓
Dr. J. D. Nelson
Mr. William Staab

May 2, 1980
Project: 60255N

Plateau Resources Limited
772 Horizon Drive
Grand Junction, Colorado 81501

Attention: Mr. Thomas D. Riether

Gentlemen:

STAGE 1 TAILINGS IMPOUNDMENT DAM
KEY TRENCH INSPECTION
SHOOTING CANYON URANIUM PROJECT
Garfield County, Utah

On April 29, 1980, representatives for the Nuclear Regulatory Agency and the State of Utah were at the construction site for the purpose of inspecting the key trench for the Zone 1 core of the tailing impoundment dam. On behalf of Plateau Resources Limited, Woodward-Clyde Consultants accompanied the inspectors to answer questions they might have had concerning the dam and impoundment area. The party included Mr. Steve Abt (NRC); Mr. Bob Morgan (Utah); Ms. Pam Newman and Mr. Ed Minion (PRL); and Mr. Ken Weaver and Mr. Don Poulter (WCC). After the inspection had begun, Mr. J. R. Thompson (MSE) and Mr. Harold Stafford (Stafford Construction Co.) arrived at the dam site and joined the group.

The inspectors pointed out specific areas that require additional work prior to placing the Zone 1 material, and discussed recommendations.

The areas discussed were:

1. Two clay shale seams about 12 to 18 inches thick and about two feet apart that cross through the left abutment, and one seam in the vicinity of Sta. 8+80.
2. Open joints in the sandstone, in the vicinity of station 7+80.
3. Irregular surfaces of the sides of the key trench.
4. Grooves from ripper teeth in the bottom of the trench.
5. Loose material still remaining in the trench, particularly in the grooves and joints mentioned above.



Based on the recommendations presented in the field by Mr. Morgan (State of Utah) and Mr. Abt (NRC) and observations made in the field by Mr. Weaver and Mr. Poulter (WCC), the following work items have been developed in order to complete the key trench under the Zone 1 core of the dam.

1. The loose, slaking material in the shale beds in the left abutment (particularly the upper one), at approximately Sta. 4+20, shall be cleaned and then slush-grouted to form a relatively smooth, tight surface against which to compact the fill. The clay shale seam at approximately Sta. 8+80 should also be cleaned and slush-grouted.
2. Open sheet joints and/or fissures (as in the vicinity of Sta. 7+80) shall be cleaned of loose material and then filled with slush-grout.
3. The irregular surface of the side walls of the trench can be handled by a) shotcreting the walls to form a smooth surface, or b) compacting the Zone 1 material such that it squeezes into and fills all the voids and overhangs. This can be accomplished in the following manner. The material placed against the sides shall be at least 1 percent wet of optimum. The foundation surface should be dampened before placing the first lift of fill. The material against the sides shall be advanced up the side approximately 1 foot above the fill being placed in the trench and be about 10 inches thick prior to compaction. The clay material against the side slopes shall be compacted by wheel rolling with rubber tired equipment. The equipment used for this purpose shall be heavy enough to achieve the required compaction and maneuverable enough to compact against the slope without damaging it.
4. Woodward-Clyde Consultants had visited the site from April 10 through April 11, 1980 and at that time the bottom of the key trench was generally smooth and prepared for final cleaning. No additional excavation or ripping was requested; therefore, it is our opinion that Plateau Resources Ltf. is not responsible for compensating the contractor for the time and materials required to remove or fill the ripper grooves now existing in the bottom of the trench. The grooves shall be either: a) excavated down to a generally smooth surface or b) filled with a grout which has been thickened with sand.

The particular areas of concern are listed below. The upstream and downstream designations are referenced to the centerline of the key trench.

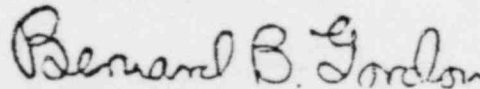
Vicinity of Station 4+30, upstream side
Vicinity of Station 4+50, upstream and downstream
Vicinity of Station 4+80, upstream and downstream
Vicinity of Station 5+00, upstream and downstream
Station 5+70 to about 6+30, throughout
Station 6+50 to about 7+00, throughout

Station 7+50 to 7+80, throughout
Vicinity of Station 8+00, downstream
Station 9+00 to about 11+00, throughout
Station 11+00 to about 11+80, upstream

5. A final foundation cleanup shall be performed to remove the granular material and debris left in the key trench.
6. The foundation rock shall be moistened prior to placement of the fill so that the dry sandstone will not tend to draw moisture out of the fill.
7. All work items shall be continually observed by your inspectors and documented in daily reports to assure good quality control. Pictures shall be taken of all phases of the work, including the grouted areas prior to covering them with fill and the placement of fill against the side slopes, particularly in the upstream area of Station 4+00 to Sta. 5+00.
8. The geotechnical engineer should be on site to observe a typically grouted area prior to placement of fill and to observe placement and compaction procedures of the Zone I material against the side walls of the trench.

If you have any questions concerning the contents of this letter, please contact Mr. Don Poulter or the undersigned.

Sincerely yours,



Bernard B. Gordon
Project Engineer

BBG:cm

cc: ~~Mr.~~ Steve Abt (NRC)
Mr. Bob Morgan (Utah)
Mr. U. K. Gupta (PRL)
PRL Field File (c/o Mel Cunningham)

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