



THE FALKIRK MINING COMPANY
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April 14, 2009

Mr. James R. Deutsch
Director, Reclamation Division
ND Public Service Commission
600 East Boulevard Avenue, Dept. 408
Bismarck, ND 58505-0480

RE: NOV 0901 Investigation Report for Impoundment P-E13-01

Dear Mr. Deutsch:

The Falkirk Mining Company has conducted an investigation into the probable cause of the piping feature that developed adjacent to the barrel of the emergency spillway buried in the embankment of Impoundment P-E13-01. The results of our investigation are summarized in the following paragraphs. Initially, it should be noted that the impoundment was constructed pursuant to the requirements of the State Engineer as directed in North Dakota Administrative Code Section 69-05.2-16-03.

The exact cause of the piping feature is difficult to discern, as we have not been able to clearly link the failure with some obvious shortcoming of construction or the materials utilized. The failure likely can be attributed to either the properties of the fill material that was placed along one side of the spillway barrel, the degree of compaction of the fill material, or a combination of both.

The construction of Impoundment P-E13-01 was completed on November 27, 2007. The embankment was constructed of subsoil excavated from the pond containment area. A field technician from Midwest Testing Laboratory, Inc. was on-site performing compaction testing on the embankment fill material as it was placed. The compaction tests performed met or exceeded the requirements set forth and approved under the impoundment construction guidelines in Permit NAFK-8405.

The subsoil material used as embankment fill was classified as sandy lean clay which is a common material used to construct pond embankments. The subsoil material placed along the barrel of the emergency spillway may have had a higher content of sand and gravel than normal which could have contributed to the development of the piping feature. It is not uncommon to periodically find sand and gravel lenses within subsoil borrow areas, but this type of material is usually placed on a subsoil stockpile. If this type of fill material was visually similar to surrounding borrow material and compacted in a similar manner, it is possible that a fill material

having a higher content of sand and gravel could find its way into an embankment fill or along a spillway barrel.

A second factor is the degree of compaction of the subsoil material along and under the haunch of the spillway barrel. Emergency spillway barrels present a challenge in regards to achieving a similar level of compaction as compared to the embankment. If backfill material is not placed under the haunches and adjacent to the barrel and compacted to the same degree as the remainder of the embankment, this can result in a potentially weak zone of fill that can be more susceptible to erosion. This may have been another factor contributing to the development of the piping feature.

The riser and barrel of the emergency spillway were placed on virgin ground after the topsoil was stripped. The base of the piping feature follows the virgin ground adjacent to the barrel. The piping feature is approximately 2.5 feet in diameter as shown in Photo #1. Water tight bands were used at each barrel joint to prevent seepage at each joint. This was not a factor in the failure as no discharge occurred through the spillway before the development of the piping feature. The piping feature developed on the upstream face of the embankment as the pond filled within four inches of discharging through the emergency spillway.



Photo #1- Piping feature on upstream slope of embankment.

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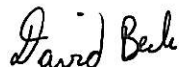
Falkirk's impoundment construction guidelines address compaction requirements of embankments and associated pipes through embankments and no changes to the current construction guidelines are necessary. The compaction achieved during construction of the embankment appeared to limit the size of the piping feature that developed. In the future during construction of embankments, renewed emphasis will be placed on inspecting fill material and placement and compaction of fill material adjacent to structures and pipe conduits through an embankment.

The Falkirk Mining Company requests an extension to repair the pond embankment from 45 days to 90 days. This request is being made considering the current conditions of the mine-site. With a late spring, wet conditions, and frost still in the ground, suitable fill material isn't readily available to repair the embankment. Falkirk will repair the embankment as soon as conditions allow. During the repair of the embankment, the impoundment construction guidelines will apply and Midwest Testing Laboratory, Inc. will be onsite to perform compaction testing.

If you have any questions regarding this investigation report on Impoundment P-E13-01, feel free to contact me at 701-250-2495 or Joe Clarke at 701-250-2463.

Sincerely,

THE FALKIRK MINING COMPANY



David Beck, PE
Senior Civil Engineer