

Sand Lake Dam-Break Analysis Arlington, Wyoming

Client: Mr. Steve Moldt
Inberg-Miller Engineers
1120 East C Street
Casper, WY 82601
(307) 577-0806



ANDERSON CONSULTING ENGINEERS, INC.
Civil • Water Resources • Environmental

Sand Lake is located in the Medicine Bow Mountains near the Town of Arlington, Wyoming. During the spring runoff period in May of 1995, the dam embankment was breached when the emergency spillway remained obstructed with snow and ice. Due to the remote location of the structure, efforts to release the flood flows through the principal spillway were not successful. The Wheatland Irrigation District, owner of the structure, applied to the Wyoming Water Development Commission for funding to rehabilitate the existing dam embankment. The staff of Anderson Consulting Engineers, Inc. (ACE) investigated alternative improvements to the existing structure and provided recommendations to mitigate the dam breach.

Alternative improvements to the existing structure that were evaluated included: (a) rehabilitation of the existing dam, and principal and emergency spillways in accordance with the original configuration; (b) placement of an additional emergency spillway in the dam embankment; and (c) enlargement of the principal spillway along with installation of a remote telemetry system to control the lake level. The original structure was capable of conveying 70% of the Probable Maximum Flood (PMF). As part of the work effort, revisions and updates were made to the PMF analysis based on HMR #55 and a dam-break analysis was conducted to determine the incremental damages associated with the proposed improvements. The Corps of Engineers HEC-1 model was utilized to conduct both the PMF and dam break analyses. Inundation limits were determined for both the existing dam embankment and all proposed improvement alternatives. Incremental damages to downstream properties were also estimated. Based on the results of the analyses, recommendations regarding the dam hazard classification and improvements to pass 100% of the PMF were provided.



Breach in Sand Lake Dam