STATE OF COLORADO

Eschberger - DNR, Amy <amy.eschberger@state.co.us>

Pipe Segment Risk Analysis_Signed_JMB_05-15-19[11631]

1 message

Mark Steen via Adobe Document Cloud <noreply@acrobat.com> Wed, May 15, 2019 at 3:54 PM
Reply-To: goldhillbooks@yahoo.com
To: amy.eschberger@state.co.us

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Mark Steen has shared Pipe Segment Risk Analysis_Signed_JMB_05-15-19[11631].pdf

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SENT BY

Mark Steen

MESSAGE FROM SENDER

Please view this document. This one is for the Mammoth Millsite.

SHARED ON

None

MEMORANDUM

To: Mark Steen – Colorado Milling Company
From: James M. Beck, P.E.
Date: May 15, 2019
Subject: Evaluation of Risk Potential – Intake Pipeline

In response to your request for an evaluation of the risk and/or damage potential associated with a proposed water line intake conduit (serving the proposed Times Mine pump station), and more specifically, as pertaining to the damage potential at three (3) permanent, man-made structures proximal to the pipeline feature, I provide the following:

You have indicated that there are four (4) privately-owned (by others) wood-framed structures, or "outbuildings", present on the subject Mammoth Millsite claim, three (3) of which are situated within 200 feet of the proposed waterline, with one of those three being within approximately 100 feet of the pipeline. These structures are stated to be owned by Mr. James K. McCumber and Ms. Amy Fortunato, and are described as being a bunkhouse, music/art studio, and outhouse/privy, respectively (with the outhouse/privy being the structure that is closest to the pipeline, at a separation distance of approximately 100 feet). None of the structures are known to possess valid Certificates of Occupancy issued by Boulder County.

You have further indicated that a two (2) inch diameter line will be extended from a point commencing at or in Left Hand Creek to an approximately 275-feet distant and up gradient pump station. Preliminary design considerations suggest that this line would commence as a "flat hose" (that is, a woven, collapsible hose), extending upslope for a distance of approximately 100 feet, at which point it would transition to a HDPE (or equivalent) rigid pipe material, extending over the remaining approximately 175 feet to the intake pump inlet, which is to be situated interior to a permanent structure characterized as a "connex" box, or equivalent)

Based on the parameters of a 275 feet long pipeline of 2-inch ID (inside diameter), the maximum volume of water that could be present within the entire pipeline segment would be the equivalent of 44.88 gallons, or approximately forty-five (45) gallons.

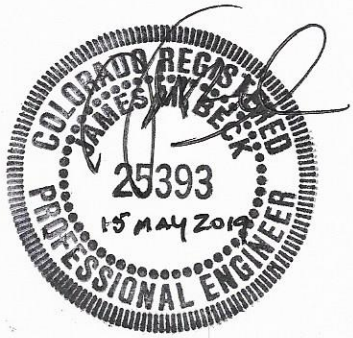
My review of the provided Exhibit E-1 Mine Plan and the aerial base map entitled "Floodplain – FEMA – Colorado Milling Co. – Gold Hill Mill Waterline" suggests that greater than 95% of the pipeline's length (e.g., likely in excess of 265 of its overall 275 feet length) is situated (on-ground, as a temporary feature) to the east of the structures, and within and along the western edge of the FEMA designated 500-year floodplain extending southwesterly from Left Hand Creek at that location.

It is my opinion that a "worst-case" pump failure and/or pipeline rupture scenario would likely be a rupture at the approximate mid-point of the pipeline (as opposed to where the pipeline connects to the pump). In such a scenario, roughly one-half of the contained volume would be released to the ground surface, whereas the remainder would likely "backflow" to the creek due to gravitational forces and/or elevation differential. The mid-point of the pipeline would appear to be roughly cross-gradient of the elevation of the structure(s), so only that water in the line above that point could theoretically affect the structure(s). While fluids could theoretically reach the structure(s), assuming a positive flow gradient in that direction, the pump feature's location (immediately upslope) of the 500-year floodplain demarcation) and the pipeline's location (fully within the 500-year floodplain demarcation) would suggest that virtually all fluid loss (at the pipeline mid-point) would likely be contained within and dispersed along the natural flow course present within the

defined floodplain area, most likely as overland flow (assuming no infiltration), and in a general northeasterly direction (i.e., away from the structure(s) of concern).

In such a hypothetical "worst-case" scenario, approximately 22 to 27 gallons of fluid (roughly 50 to 60% of the total pipeline capacity) would likely be released to the ground surface. For the sake of conservatism, assume a 30 gallon release. At 7.48 gallons per cubic foot, this represents approximately 4 cubic feet of water. This volume, if it reports in entirety to the structure of concern, would result in a pool depth of slightly less than 0.5 inches over a nominal 10-feet by 10-feet area (absent representative measured dimensions, I have used this as an assumed representative structure footprint area). However, that theoretical maximum exposure potential of less than 0.5 inches of water would in most instances be significantly reduced by the effects of infiltration (stream banks above bedrock generally are comprised of fluvial materials), soil absorption, evaporation effects, flow course dispersal/deviation, localized elevational characteristics at and around the structure, and any super-elevation of the structure above grade (i.e., it is likely that the structure floor(s) are at or above grade).

Based on the foregoing, it is my opinion that the presence of the pump house inlet line serving the Times Mine pipeline does not pose any significant or meaningful risk of damage potential with respect to the subject permanent structure(s) present proximal to the pipeline, as described. This opinion is based on the above-stated pipeline design parameters and other information, to include aerial and survey mapping, as provided by Colorado Milling Company. No design drawings or improvement location survey(s) as pertaining to the subject structure(s) have been provided or reviewed. No onsite inspection specific to the subject evaluation has been conducted; however, the signatory below is familiar with the location and features thereon through multiple site visits conducted since 1998.



James M. Beck, P.E.
Colorado Registered Professional Engineer No. 25393