

6/10/2014

INTERUPTION OF FLOW – SOUTH FORK OF QUITCHUPAH CREEK

Area Undermined: Dec 2013 - Jan 2014

Flow was observed on May 2, 2014 during bi-weekly monitoring at stream monitoring point 006A and from the canyon rim below point 006C. Due to a snow storm the stream flow was only observed on May 7 from 006A to 006B, as the monitoring personnel was driven off the mountain by the storm. Because of continued snow storms preventing access the stream channel was not monitored again until May 16.







Water
flowing
fine

Per commitments in Sufco's approved "Monitoring and Mitigation Plan for Undermining the South Fork of Quitchupah 2R2S Block "A" and 3R2S Block "B". We have prepared a summary report describing recent monitoring and subsequent mitigation activities.

On May 16, 2014 during bi-weekly monitoring of the South Fork of Quitchupah Creek it was noted that flowing water could not be observed from a rim monitoring location, but was observed running downstream. The canyon rim between the two locations was walked to determine why and exactly where the flow stopped and where it returned to the stream channel. Approximate locations were marked, however to determine exact location would require hiking into the canyon. Hiking into the canyon by a single individual is not considered safe, so plans were made to hike into the canyon the following Monday, May 19th.



On May 19, 2014 mine personnel hiked into the canyon to determine the cause for the lack of flow. Water was seen running into a cracks beneath a rock overhang. Mine personnel shoveled native material into the cracks which forced the water to flow downstream. Bentonite was ordered and equipment was gathered following the hike to facilitate a more permanent repair the following day.



-Cracks
-flow had
stopped
at this point



May 20 - The water was bypassing the area where the cracks had been repaired (with native material) and proceeding downstream.



May 21 & 22 - Bentonite was placed in the first three cracks and in addition two cracks approximately 50 feet downstream. Nineteen (19) 50# Bags of bentonite were used to fill the five cracks. Water was observed to be flowing to below stream monitoring location 006C on the 22nd.



Downstream location of two additional cracks



May 23 - Flow was observed to be consistent from stream monitoring locations 006A to below 006C. Heavy rains prevented access to lowest stream monitoring location.



May 27 - A DOGM inspector and mine personnel observed uninterrupted flow in the South Fork of Quitchupah Creek, from above the location of the repaired crack to the area of 006D.







May 29 - The creek was observed to be flowing from monitoring point 006A to the confluence of the North and South Forks of Quitcupah Creek. Estimated flow was +/- 300 gpm at about 200 yards downstream from monitoring point 006A. On May 28th flow at 006C was measured at 276 gpm and at 006D was 321 gpm. Additional flow measurements by Petersen Hydrologic, LLC are scheduled for June 10th.







June 3 - A DOGM inspector and mine personnel hiked into the canyon, flow appeared similar at locations from 006A to Wedge Spring. Monitoring point 006D and the confluence of the North and South Forks of Quitchupah Creek was observed to be flowing from the canyon rim.





COMMITMENTS IN MONITORING AND MITIGATION PLAN

Monitoring

While mining under the channel, promptly identify subsidence-induced fractures, dewatering, diminution of water quality, and movement of the stream channel.

Semi-weekly visual monitoring's for fractures, stream channel and flow observations while mining within the angle-of-draw of the stream channel.

Monitor surface water flow twice a month while mining within the angle-of-draw of the stream channel.

Provide a bi-weekly (once every two weeks) report to DOGM and the Fishlake National Forest via e-mail. Identify any changes in surface expression, dates, any fracturing of surface (location, width, spacing, etc.), any repairs, and location of longwall.

Mitigation

Mitigate subsidence cracks and fractures identified within the stream channel wet bank. Access must be limited to methods that would not cause additional effects to the aquatic ecosystem.

Mitigation of cracks that interrupt or divert flows from the stream channel will be sealed immediately with an appropriate impermeable grout or, in some cases, native materials. Sufco will attempt to seal cracks with the least intrusive methods (typically hand placement of grout or native materials) first. The sealing material may be placed by pouring it directly into the crack or, if cracks occur in an actively flowing portion of the stream, the stream may be temporarily diverted using native materials (or a designed flume if necessary to maintain the flow) until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks may be hand filled using a native soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc.

As a backup plan, in the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the channel for an extended period of time, the stream will be temporarily diverted using native materials and a pipe to carry the flow over the crack to maintain the channel flow. Arrangements will be made to get a contractor to the site as soon as possible to repair the crack after consultation with the Forest Service.

A stream alteration permit is required by Utah Division of Water Rights for any stream channel construction activities. The mine will obtain a stream alteration permit prior to construction activities within the stream channel.

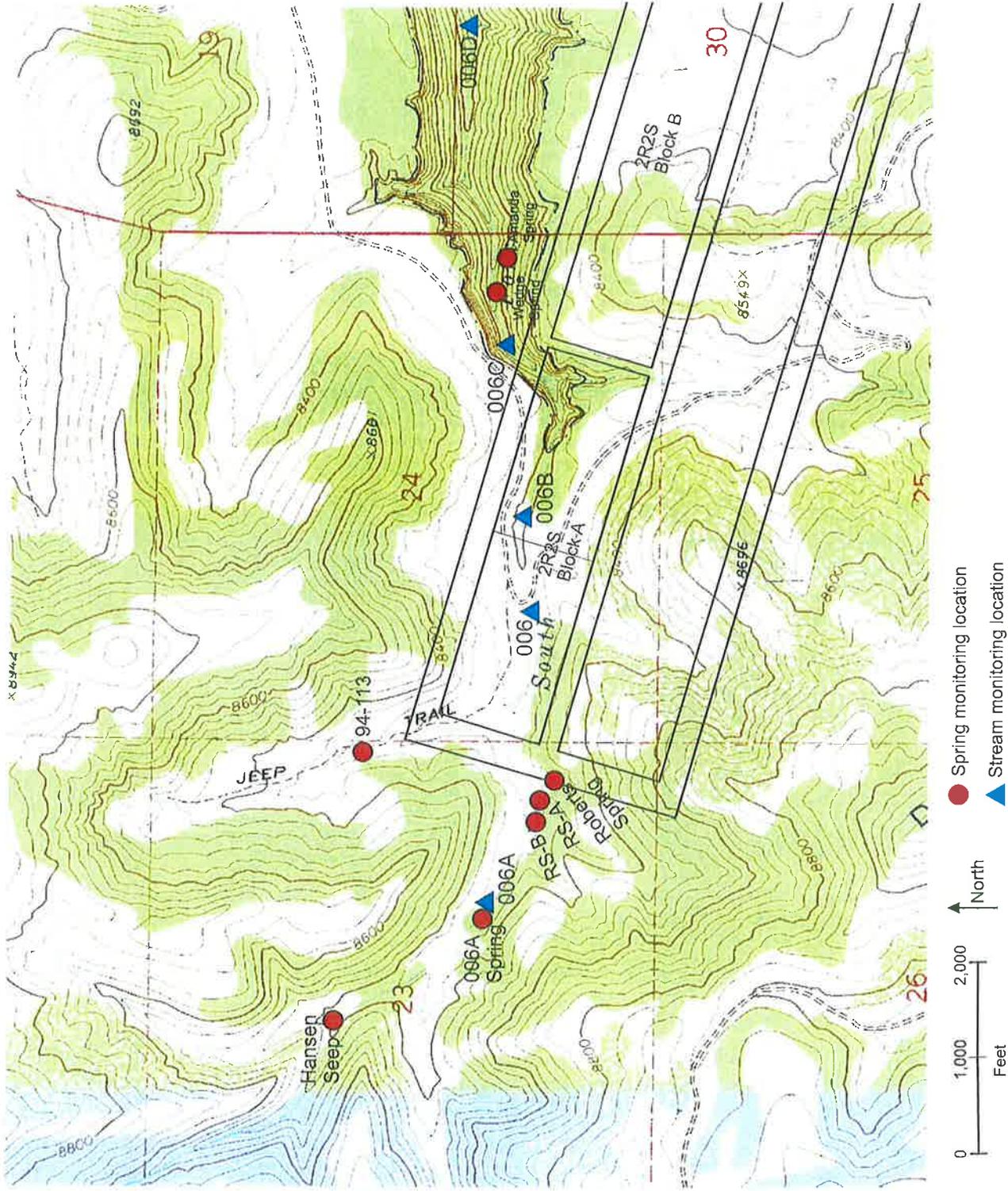


Figure 1 South Fork Quitcupah Creek hydrologic monitoring locations.

Jason Christensen 5/9/2014 2:10 PM



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2 RIGHT 2 SOUTH

SUBSIDENCE MONITORING POINTS

SCALE: 1" = 500' DATE: 6/9/2014 DRAWN BY: J.G.C. ENGINEER: CHECKED BY:
 FILE NAME: H:\SURVEY\N\SURFACE\SUBSID\2R2S-MONITORING-2013\dwg\2R2S-MONITORING-2013-JUNE2014.dwg BRGJ: ###

REVISIONS				
NO.	DATE	REQ. BY	DWG. BY	REMARKS

SHEET NO.

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