

**Subsidence Inspection Report  
SUFCO Mine Box Canyon Area  
Manti-La Sal National Forest  
January 2000**

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Price/Ferron & Ironing  
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(2-sided)

In August 1999 the Price/Ferron District Office in Ferron, Utah received a verbal report from a livestock permittee that he observed several cracks in Box Canyon that start on one side of the canyon and continue across the canyon to the other side.

Jeff DeFreest (Ferron/Price District Geologist) and I (Carter Reed, Forest Geologist) inspected Box Canyon on August 25, 1999. We inspected the west rim of Box Canyon and portions of the intermittent stream channel bottom. While in the canyon bottom, we experienced a subsidence bounce or seismic event that indicated that it was probably not safe to continue further up canyon in the drainage bottom for fear of additional escarpment failures. There were numerous cracks perpendicular and parallel to both the drainage channel and long axis of the north-south trending longwall panels (digital photographs available).

We noticed that the cracks that are perpendicular to the drainage and long axis of the longwall panels are numerous and several are continuous between the canyon rims and the stream channel. Most of these cracks were less than 2 inches wide, but there was often considerable disruption of the rock in the bottom of the drainage channel. Even in places where there was considerable alluvium in the stream bottom, cracks extended up to the surface through the alluvial materials. These cracks at the surface of the alluvium will probably not be visible following the first snow runoff event next spring when the alluvium is again manipulated by the high spring flows.

The larger cracks were the parallel cracks which lie on the canyon rims and benches below. Some of these cracks were as much as 12 inches wide

There were two locations along the escarpments that failed. Considerable rock debris and sediment were deposited in the stream channel. Several large trees were knocked over.

We noticed on this day that all of the potholes in the subsidence area that normally hold water for long periods after rainstorms were dry. Immediately below the subsidence area, the potholes held water, as expected. The soils in the area were still wet from a rainstorm a few days earlier. Many of the potholes on the plateau top away from the Box Canyon area were filled with water.

We decided to invite all involved to visit the site in a joint field trip/inspection at a later date.

A joint inspection was conducted on September 13, 1999 including participants from the Manti-La Sal National Forest, Bureau of Land Management, Utah Division of Oil, Gas

and Mining, and Utah State Institutional Trust Lands Administration. The group inspected the west rim of the canyon and canyon bottom. We noticed cracks along the west canyon rim and lower benches of the canyon, parallel to the drainage, that were approx. 12 inches wide, 20 feet deep, and continuous for several hundred feet. Conditions were pretty much the same as during our previous visit. We again noted that there was no water in any of the potholes of the stream channel in the subsidence area, but there was immediately downstream of the subsidence area above the perennial stream segment. I did not take any additional photographs but several members of the inspection team took pictures.

On November 4, 1999 I inspected the subsided Box Canyon area again as a follow-up. I walked down the stream channel from the Crazy Bird shelter then climbed out of the canyon on the east rim. I walked the east rim back to Crazy Bird shelter. I noticed that there were several new escarpment failure areas in the canyon that deposited considerable debris in the channel bottom. In addition, there were failures of the alcoves in the channel bottom where the stream channel eroded into and under the canyon walls. I was surprised at how much rotational failure took place and how much rock was moved into the channel. Several of the hanging garden vegetation areas were destroyed at these failures. There was considerable spalling of rock in the channel bottom and disruption of the channel at these locations.

I again observed that there was still water in the potholes below the subsidence area but not in the subsidence area. Also the cracks on the east rim that are parallel to the stream had opened up more than on my previous visit and vertical displacement of two to three inches had occurred with relative drop on the stream channel side. I took several digital photographs of the new disruption areas discussed.

On December 20, 1999, I visited the Box Canyon subsidence area again with Dave Darby of the Utah Division of Oil, Gas and Mining. We walked down the canyon from the Crazy Bird shelter then climbed out of the canyon bottom a short way down, then walked the east rim. Conditions at the canyon bottom were mostly the same as during my last visit, however the cracks along the east rim were greater in both length and width. In addition, there were more splinter cracks than during my previous visit. I took two digital photographs of one of the major cracks on the east rim that has opened up more since my last visit.