

October 20, 1958

A. Zulian

Materials Laboratory

Proposed Tunnel Sta. 171 - 160.

This site was first visited August 7, 1958 by our engineering geologist in company with A. Zulian and L. Olson who requested our opinion as to any adverse geological conditions that might arise during construction of this tunnel. Another visit was made to this site by our geologist who made a geological reconnaissance, the results of which are given herein. This is not to be construed as a thorough geological investigation.

The proposed tunnel will be constructed on tangent through a steep-sided ridge located approximately one mile downstream from Idaho Springs and will extend from Sta. 171 to 160+ along proposed improvement.

The bedrock consists of mica schist and gneiss which geologically is termed the Idaho Springs Formation. This formation shows a distinct stratification dipping 30 to 45 degrees to the north. Joint planes intersect this stratification at right angles. This rock structure will produce some overbreak during excavation. Otherwise the bedrock appears quite sound and should need little or no support except possibly

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near the west portal.

The west portal will be near the contact of loose rock talus and faulted bedrock schist and gneiss. The bedrock shows the effect of faulting along the existing road opposite Sta. 170<sup>+</sup>. Here the rocks are highly fractured, folded and exhibit fault gouge where they have been completely ground to a clayey mass. The bedrock is covered by talus near the west portal and it will be difficult to predict how much of the tunnel will be affected by this fault. The following observations may throw some light on this matter:

1. There is a fault that runs through the topographic saddle now occupied by a transmission line tower approximately 350 ft southerly of the proposed tunnel.
2. There is a fault exposed in the road cut 200 ft northeasterly of the bridge across Clear Creek. This fault appears to be the easterly continuation of the fault through the saddle described above.
3. There is a fault exposed in the road cut opposite Sta. 170<sup>+</sup> near the west portal of the tunnel previously described. This fault appears to be the westerly continuation of the fault through the saddle.
4. The above three fault exposures have been plotted as the same fault and the dip and strike of the fault calculated by the three-point method.
5. A geological section has been drawn at right angles to the tunnel through Sta. 177<sup>+</sup>10. This section follows

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closely the top of the ridge and shows the topographic saddle through which the fault runs. The general attitude of the bedding in the schist and gneiss is indicated on this section. Note the abrupt change of this bedding at the fault contact.

Conclusion: If the above interpretation of the three fault exposures is correct then the fault dips steeply to the west as shown in the section. It will dip rapidly below the tunnel grade except for a very short section near the west portal.

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