RECLAMATION

Geology of Salazar Pit Area

Prepared by Tamara Massong

The Salazar Pit project area is surrounded by Quaternary landslides (Figure 1) that originated in an extrusive igneous formation that caps sedimentary rocks (Anderson et al., 1997 and Kelley, 1978). Two geologic maps were reviewed to compile the geology of the Salazar Pit area: Geology of the Espanola Basin, NM (Kelley, 1978) and The Geologic Map of New Mexico (Anderson et al., 1997), released in digital form (Figure 1).

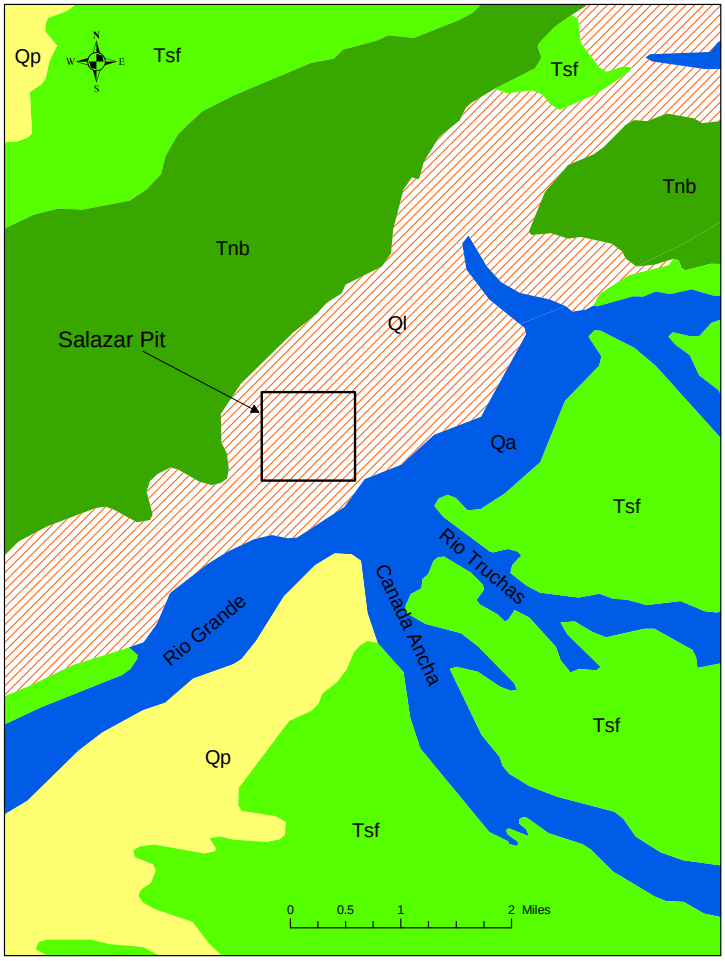

Figure 1: Enlarged section of the Geologic Map of New Mexico (Anderson et al., 1997). Qa – Quaternary alluvium (upper and middle); Ql – Quaternary landslide deposits or colluvium; Qp – Quaternary, Piedmont alluvial deposits, upper and middle quaternary; Tnb – basalt and andesite flows; Neogene - includes flows interbedded with Santa Fe and Gila Groups; Tsf – Lower and Middle Santa Fe Group - Miocene and upper most Oligocene in age.

The geology map created by Kelley (1978) shows that the Salazar Pit area is within a wide band of deep-seated landslides. The landslides originated on a basalt-capped landform

(Cisneros Basalt) that is underlain by a sedimentary formation (Tesuque Formation). The Cisneros Basalt formation is described as basalt flows of the Hinsdale Series on Black Mesa, Comanche Rim and Taos Plateau and was estimated as Quaternary in age (Kelley 1978). The Tesuque Formation is described as sandstones, mudstones, fan-conglomerate and numerous ash beds. This formation was estimated as Tertiary in age. Gravel found in this formation is estimated to be "Precambrian fragments" (Kelley 1978). The Geologic Map of New Mexico (Anderson et al., 1997) is not as detailed as Kelley's 1978 map but encompasses more updated information. The igneous capping rock is described by Anderson et al. as both basalt and andesite with an age in the Tertiary Period (Neogene) rather than Quaternary. They describe the formation as including sedimentary interbeds from the Santa Fe and Gila Groups. Regardless of which set of maps are used, both describe an erupted igneous capping rock on top of an older sedimentary formation that contains sediments ranging in size from mudstone to conglomerates with gravel. Both formations were disturbed by the deep-seated landslides along the southeastern border of the formations.

The movement of the landslides upslope from the project area appears to have been in two stages (Figure 2). The larger landslides (outlined in yellow in Figure 2) appear to have moved first and extend from the current day top of slope to the river valley. The secondary landslide (outlined in green) is likely a re-activated a portion of the larger landslide. Regardless, this landslide appears to 'sit' on top of the larger landslide is likely younger in age. The Salazar Pit project area is located almost immediately downslope from this secondary landslide.

As viewed on Figure 2, a drainage/arroyo forms along the northeastern edge of the secondary landslide which ultimately flows through the Salazar Pit area. The arroyo also appears to drain the secondary landslide deposit. Through the Salazar Pit area, the arroyo has a relatively steep slope at ~10% (pers. comm. K-I Smith, 2004); the channel margins are poorly formed; no distinct banklines or floodplains area have formed. Due to the steep channel slope, sediment transport appears to be dominated by hillslope processes that are enhanced by water runoff; as a result, the bed material is not sorted and the channel is not able to form fluvial features such as steps or riffles.

References

Anderson, O. J., Jones, G. E., and Green, G. N., 1997, Geology Map of New Mexico, U.S. Geologic Service Open File Report, OF-97-52 (digital data), Map Scale 1:500,000.

Kelley, V. C., 1978, Geology of the Espanola Basin, New Mexico, New Mexico Bureau of Mines and Mineral Resources, Division of New Mexico Institute of Mining and Technology, Map Scale 1:125,000.

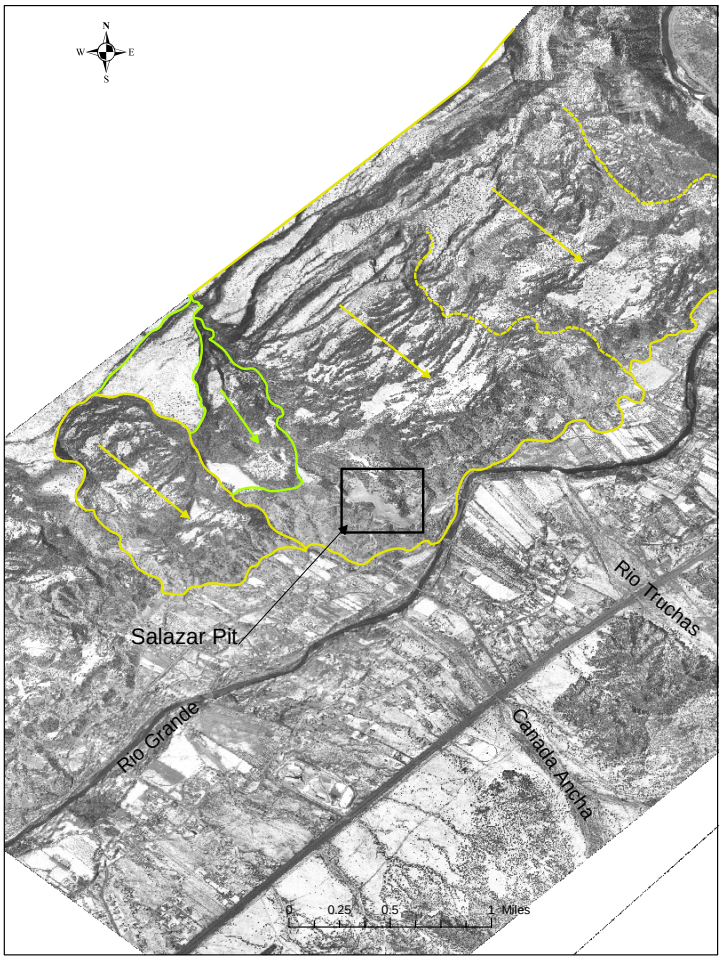

Figure 2: 2002 aerial photograph of the Salazar Pit area showing the large, Quaternary landslides in the immediate vicinity of the project; the yellow lines denote the larger primary landslides, while the green lines denote a landslide that appears to be a secondary landslide (younger than the larger landslides).