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Root Zones and Diatremes in the Cerro Chivo Volcanic Field (CCVF), Chubut Province, Argentina

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The underground portion of a maar volcano is called a diatreme, and the transition from diatreme to underlying feeder dike is the root zone. Very few root zones have been documented on outcrop worldwide. Yet this is where at least some of the phreatomagmatic fragmentation happens. Preliminary exploration of the Tertiary Cerro Chivo Volcanic Field, Chubut Province, Argentina, has revealed the presence of several beautifully exposed root zones, adjacent to both diatremes and unfragmented basaltic dikes. We provide an overview of two root zones.
Cerro Raiz is an elongate structure exposed over about 100 m by 20 m. It lines up with La Hoyada diatreme further west. A common rock type at Cerro Raiz is well-mixed blocks of muddy to silty sedimentary country rock in a matrix of gravelly sand with sparse juvenile fragments. Locally, large domains of country rocks start to disaggregate and are locally injected by other sediments. These rocks are cut by coherent basalt dikes and pods with marginal peperites.
Cerro 117 is a 900 m-long structure which comprises mostly dikes about 1.5 m-thick. Some segments widen to up to 60 m thick and contain rocks partly similar to those at Cerro Raiz. In addition, Cerro 117 includes moderately to vertically dipping, dm-thick beds of tuff, lapilli tuff and tuff breccia which are similar in appearance to the main infill of La Hoyada diatreme. This confirms that Cerro 117 is a true diatreme root zone.