tical extent of the ultramafic concentration in Reid's pit is not known, but test drilling indicated a minimum thickness of 15 m (H. E. Hunter, personal communication, 1974).

The high Mg values from amphibole, phlogopite, pyroxene, and olivine in the ultramafic segregations are considered to represent magmatic compositions and are attributed to locally elevated fO_2. Virtually identical plagioclase compositions suggest that liquidus temperatures were similar in the two contrasted rock types. In contrast to the silicates, the coexisting ilmenite and magnetite (determined by microprobe) have equilibrated to subsolidus temperatures (700°–800° C) and fO_2 values near the fayalite–magnetite–quartz buffer curve (modified Buddington–Lindsley fO_2–T thermobarometer), thus eliminating any oxide "fingerprint" of initial heterogeneities in magmatic fO_2 values (see fig. 97).

Mechanical aspects of the crystallization environment probably played some role in the formation of the ultramafic masses. The form and distribution of the olivine–oxide concentrations suggest flow segregation rather than simple gravitational accumulation under quiescent conditions. The concentration process was substantially influenced by

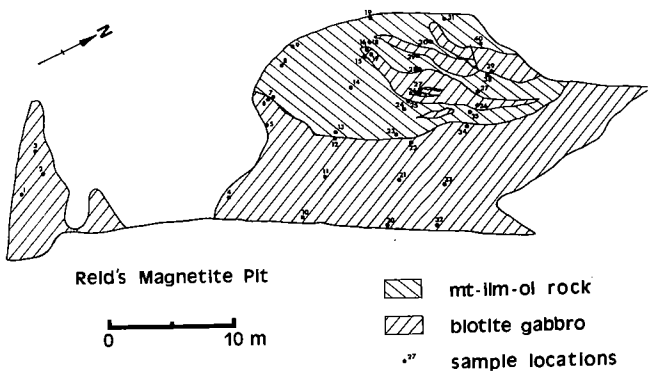

Figure 96. Map of Glen Creek Gabbro exposures in Reid's magnetite pit, NE¼SW¼ sec. 14, T. 4 N., R. 17 W., Kiowa County, illustrating relationship of ultramafic segregations and gabbro. (Glen Creek Gabbro is exposed over a much wider area than shown here.) Unpatterned areas are surficial cover. Rock type labeled "biotite gabbro" contains amphibole and phlogopite (not biotite) and refers to average Glen Creek Gabbro (see text for variations); ultramafic segregations within gabbro are labeled "*mt–ilm–ol* rock" (see text for petrographic description). Note interfingering of the two rock types, which are gradational (over distances of a few inches or less) across indicated "contacts." Map and sampling by C. L. Hanks. (All sample numbers are prefaced with *MP*.)

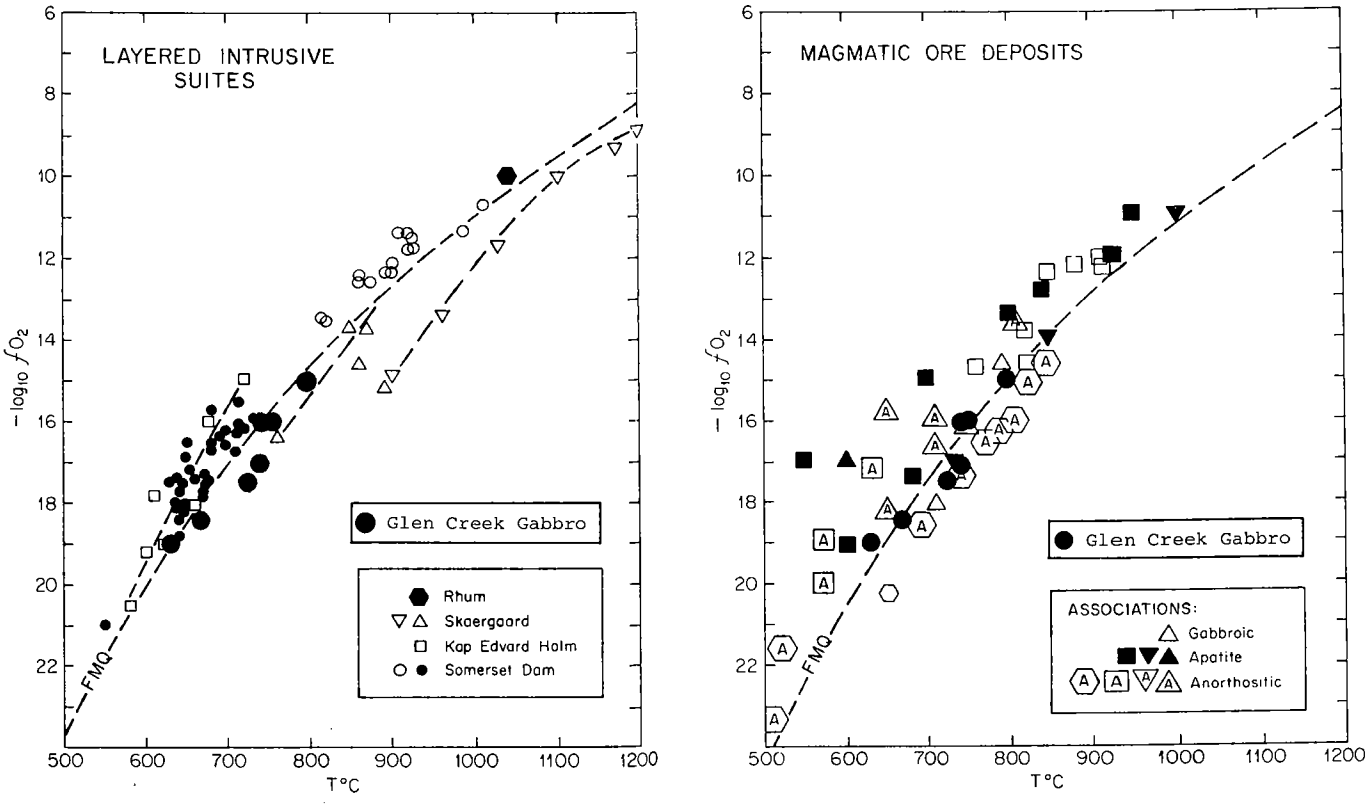

Figure 97. Temperature fO_2 determinations of Glen Creek Gabbro and its ultramafic segregations (both shown as large solid circles), using modified Buddington–Lindsley ilmenite–magnetite thermobarometer. Diagrams are after Haggerty (1976, figs. Hg–44c, Hg–45). Oxides in the two types of Glen Creek Gabbro have equilibrated to a similar range of subsolidus T–fO_2 values near the fayalite–magnetite–quartz *(FMQ)* buffer curve, not unlike Fe–Ti oxides in other basic intrusive rocks and associated ore deposits.