

Role of Real Geologic Data in Search for Sub-surface Chrome-Ore Deposits in Highly Complicated Geologic Milieu Developed in the Southwestern Part of the Sukinda Ultramafic Belt (Orissa), India

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The paper highlights the role of geologic data in one of the most successful integrated exploration programs for search of concealed chromite orebodies under a thick cover of regolith, stretching over a small-sized mining property (1.2 km²), named as Kathpal mine, in the southwestern fringes of the famous Sukinda ultramafic belt in the State of Orissa, India. The mining activity in the property had almost ceased in late 1980s, but - resorting to a well-planned geo-exploration model backed by strong and tacit support of geologic data in the real terms could revive the mine production till date.

In this belt chrome-ore bodies, as pseudo-stratified layers, occur enclosed in highly altered ultramafic lithologies along with relatively fresh bodies of orthopyroxenites (devoid of chrome ore); the entire sequence of igneous rocks being emplaced in the south-westerly plunging doubly-folded regional syncline of rocks of Precambrian Iron Ore Super Group (2950-3200 Ma). They are, in addition, severely faulted, sheared and intensely silicified & weathered into laterite and soil. In the mine area, in particular, the group, as a whole, has been devastated by the intrusions of granophyre and dolerite dykes accompanied by repeated faulting, shearing, fragmentation and body transport of large masses of u.m. rocks along with the enclosed orebodies so much so that tracing continuity of the deposits by simple geologic methods has become too difficult to follow in this kind of highly complicated geologic milieu.

Data from magnetic and gravity surveys along with anomalies obtained from geochemical investigations of secondary geochemical patterns were synthesised and interpolated with strong structural data to pinpoint favourable targets for drilling to success for the revival of the mine production. Importance of the program sequence of the exploration procedure is discussed in the contribution.