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Three-Dimensional spatial relations between intrusions and gold bearing ore deposit within the Inata mine pit, Northern Burkina Faso (West Africa)

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The Inata gold mine is located in northerm Burkina Faso close Mali border and at about 220 kilometers to the NNE of Ouagadougou. The deposit belongs to the Djibo green stone belt and the gold is mined open pit by Avocet Mining since April, 2010. Aeromagnetic signature trending NS is conformable with gold anomaly. Following this signature, several pits (namely north pit, central pit, south pit, southern area pit, sayouba and Minfo) opened along strike have been continuously mined since the beginning. The main pit actually slowly mined comprises a predominantly steeply deeping volcano-sediment schist accommodating numerous quartz veins and associated intrusions. The overall superimposed by supergene alteration.

Figure 1: Relation between intrusion and ore

Different types of intrusions compositionally ranging from mafic-intermediate to felsic appears systematically associated to the ore. Spatially, intrusions are syn to post-tectonic and discriminable by the texture, structure and colour.

According to the spatial organisation between intrusions and ore, the following magmatic emplacement chronology is proposed at 50 m depth:

- Emplacement of volcano-sediment sheared and mineralized. The mineralization is deformed, with commonly hematite ± sericite, minor chlorite near the contact to intrusion.
- Emplacement of porphyritic diorite intrusion strongly to moderately epidotized and chloritised. This intrusion cross cut the ore.
- Emplacement of gabbro composition strongly altered into yellow colour associating syntectonic fine grain granite sill.
- Emplacement of fine grain diorite dyke that cross cut the overall unit.