3. MINERAL AND ROCK ASSEMBLAGES OF THE DEPOSIT

Several alternative genetic types of mineral assemblages are identified at the Saranovskoe deposit. These are assemblages of host rocks, layered gabbro-ultramafic intrusion, products of its early alteration, picrite dikes, subalkali and gabbro-dolerite dikes, products of their effect upon ultramafics and gabbro, hydrothermal vein mineralization, and supergene and anthropogenic assemblages.

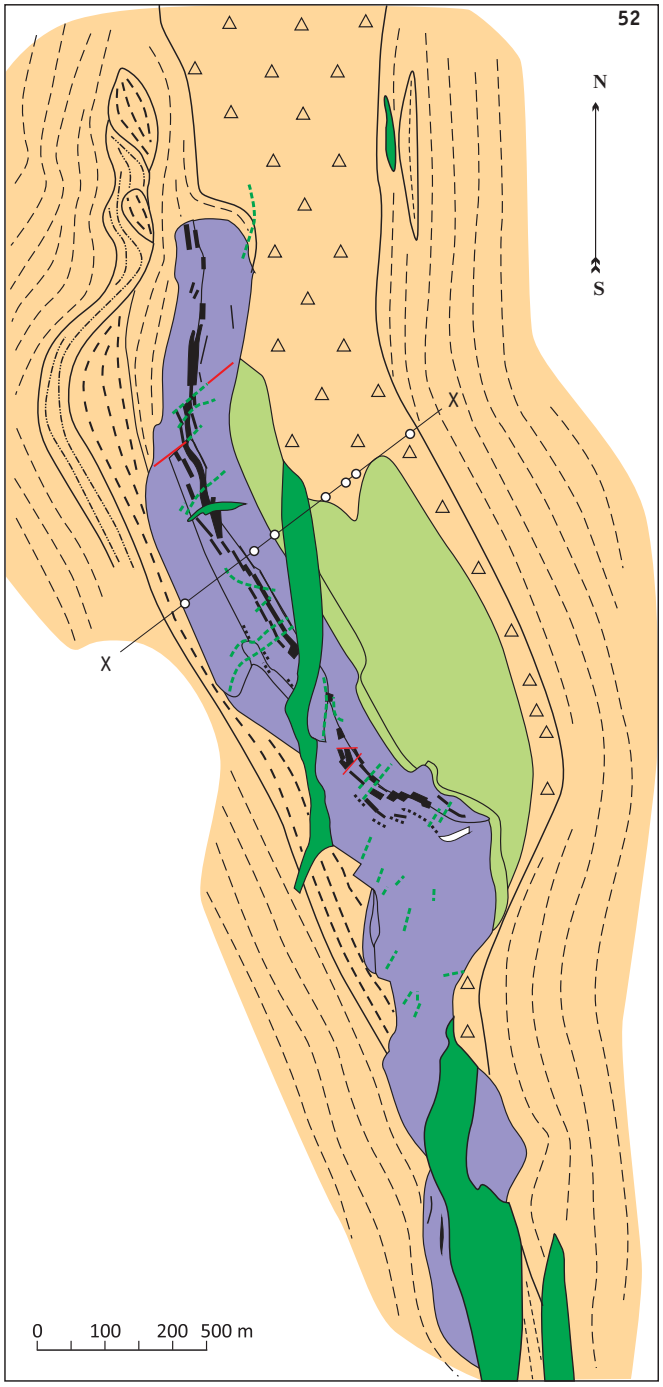
3.1. Host Rocks

The Saranovskoe layered complex and Saranovskoe chromite deposit are hosted in weakly metamorphosed greenschist and pumpellyite facies terrigenous rocks, which are green chlorite, white sericite, and black carbonaceous-sericite schists, a sequence of sedimentary tillite breccia with intercalations of limestone, pyrite and hematite-magnetite rocks, and quartzitic sandstone (Figures 52, 53). Three mineral assemblages are identified among them: terrigenous and diagenetic minerals, their metamorphic products, and vein assemblages.

The clastic part of the rocks consists of rounded sand grains and silty angular grains of quartz, zircon, leucoxene, ilmenite, allanite, magnetite, cordierite and apatite. The rock matrix is predominantly composed of fine to very fine-grained aggregate of quartz and albite (up to 60%), flakes of sericite similar in composition to phengite, pennite and clinochlore[2]. Cubic pyrite, porphyroblasts of ankerite, needles of tourmaline and rutile, barite, and apatite are diagenetic minerals. The Vendian sequence of tillite breccia consists of carbonate, clay, and volcanic fragments embedded in polymictic silty matrix. The proportion between clastic material and matrix is strongly variable. Tillite conglomerate with boulders and pebbles of limestone, dolomite, quartzitic sandstone, chromitite, talcized phlogopite dunite, porphyry syenite, and metadolerite were found to the east and southeast of the massif (Syslov and Teterin, 1997).

Vein mineralization in Host Rocks. Metamorphic quartz, quartz-carbonate, and carbonate veins are abundant in schists and carbonate rocks; these veins the most abundant in greenschists and at their contacts with carbonaceous schist they frequently follow the tectonized contact with serpentinite. The irregular-shaped and lenticular veins up to 30 cm in thickness contain ragged xenoliths of schists. The veins are composed of massive gray quartz with druzy cavities filled by crystals of rock crystal up to 7 cm. Light green fine-flake prochlorite and dark green ripidolite as aggregates up to 5 cm are typical of the veins hosted in chlorite schist. Ankerite and calcite are common; albite crystals are occasional. Disseminated

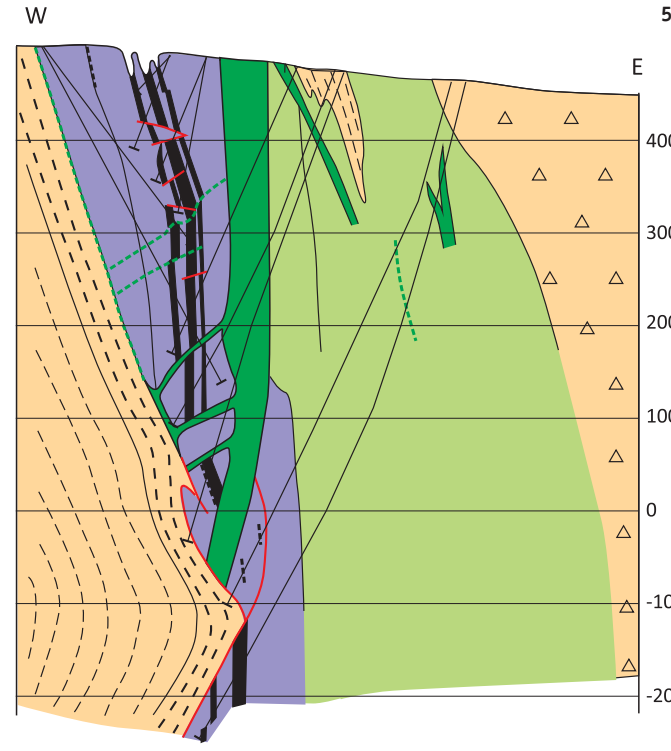
[2] – The nomenclature of chlorites used in this study is described in section *Chlorites*.



52. Geological map of the Northern block of the Saranovskoe massif and Glavnoe (Main) Saranovskoe deposit.

Legend to the schemes (Figs. 52 and 53) on this page 21:

- green quartz-albite-chlorite schists;
- white sericite schists;
- black carbonaceous quartz-sericite schists;
- sedimentary breccia;
- apodunite lizardite serpentinites;
- serpentinites after bronzite and bronzite-bearing dunites;
- serpentinites after pegmatites of harzburgite composition;
- serpentinites after chromite-bearing dunites;
- serpentinites after dunite-harzburgites, harzburgites and plagioclase lherzolites;
- saranovite;
- chromitite;
- apoanorthosite saussurite and pumpellyite rocks;
- altered gabbro saussurite-tremolite rocks;
- dolerites and gabbro-dolerites;
- faults.



53. Cross-section X-X along middle part of the Glavnoe (Main) Saranovskoe deposit.