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Geodynamic conditions in the formation of large-scale gold deposits in the Siberian craton margin.

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We have considered the geodynamic setting of stratigraphic units with significant gold resources over the broad age range from the Paleoproterozoic (Baikal-Patom Highlands) to the Mesozoic (Verkhoyansk and Yano-Kolyma belt) for the southern and eastern sectors of the Siberian craton margin. There are more than one dozen stratigraphic levels and horizons that are enriched in gold and a number of major gold deposits (e.g., Chertovo Koryto, Sukhoi Log, Nezhdaninskoe, Degdekan, Natalka, Pavlik). This large-scale economic mineralization is localized in the Paleoproterozoic Kevaktin (Chertovo Koryto), Neoproterozoic Dalnetayginsk (Sukhoi Log), and the Permian (Nezhdaninskoe, Degdekan, Natalka, Pavlik) stratigraphic levels. The broad significant feature of these levels is the enrichment of organic material and precious metals. Petrochemical and mineralogical features of the ore host rocks indicate the formation of favorable horizons in passive continental margin environments. An additional supply of juvenile material may be contributed from rifting processes (Paleoproterozoic and late Paleozoic) or from back-arc basin spreading and exhalative hydrothermal activity zones in the spreading area (Neoproterozoic and late Paleozoic). Formation of large deposits occurred in distinct stages in the Paleozoic (Chertovo Koryto, Sukhoi Log) and the late Mesozoic (Nezhdaninskoe, Degdekan, Natalka) during orogenic events that led to a redistribution of precious metals from stratigraphic horizons to the orebodies.

