

Technological Structures of Marine Dressing Complexes for Mining the Deposits of the Far-Eastern and Arctic Seas Shelf

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ABSTRACT

Solid mineral resources cadastre of the Far-Eastern and Arctic seas shelf deposits is considered in this paper. The information, provided by the cadastre, is differentiated according to each considered deposit with distinguishing on-shore (beach) zone, tidal zone (up to 20 m deep) and off-shore zone (up to 50 m deep).

The cadastre includes several information blocks:

- mining-geological characteristic of the deposit;
- hydro-meteorological conditions and aerodynamic local mode of occurrence of a placer;
- ice conditions of the sea (thickness of ice, periods of drifting and freezing and etc.);
- technological parameters of the placers;
- geographic, technical-economical and ecological descriptions of the area of the placers.

To be considered in the cadastre groups of deposits modeling and substantiation of the technological structure parameters of marine dressing complexes, optional mining patterns, concentration, dumping and transportation of mineral raw materials were added. A classification of the technological structures of marine dressing complexes, elaborated by the authors of this paper, is presented in mould form. In the classification fields of boundary values of technical and technological parameters of mining, concentrating and transporting equipment from those, requiring additional planning-design and patent-licence study are distinguished.

KEY WORDS: cadastre, solid mineral resources, Rucharskoye deposit, classification, technological structures, marine dressing complexes.

CADASTRE OF MINERAL RESOURCES

Some initial data from the cadastre of mineral resources of Rucharskoye titanium-magnetite deposit (Iturup island, Sakhalinskaya region). The cadastre structure provides a differentiation of indices, parameters, calculations and their division into some classes, characteristic of not only geological-mineralogical and mining-technical features of ore or rock component of a deposit or ore province, but other information, which makes optimum design both technological structures, mining, concentrating and transporting modules and rational parameters of future marine dressing complexes possible.

It's necessary to receive the following information to each deposit:
 - mining-geological characteristic (total volume of the explored reserves and the predicted mineral resources, reserves of metal-
 Table 1

| Cadastre | | |
|---|--|--|
| N | Initial data and parameters (existing and adopted) for developing technological structures of marine dressing complexes | Rucharskoye and (Reidovskoye) deposits |
| Mining-geological characteristic | | |
| 1 | Brief information of the deposit (placer) genesis | Sediments of modern beach, coastal and eolian sands |
| 2 | Total volume of the explored reserves and predicted resources the productive sands of the titanium-magnetite placers B+C ₁ +C ₂ (on land), mln.t Apparent increase of sand resources on the shelf, mln.t | 48,8 200-300 |
| 3 | Output of concentrate, % on land, % on shelf, % | 11,7-54,0 15,0-20,0 10,0-15,0 |
| 4 | Reserves of metal-containing components on land, mln.t on shelf, mln.t at depths up to 20 m, mln.t at depths up to 50 m, mln.t | 9,0-10,0 25,0-30,0 15,0-18,0 10,0-12,0 |
| 5 | Geometry of ore-bearing placer bodies: -total length of the deposit, km -total length of the placer, km -width of ore-bearing sands, on land, m -thickness of the productive ore-bearing sand stratum: maximum (land/shelf), m minimum (land/shelf), m average (land/shelf), m -total area of the shelf, km ² -configuration of ore-bearing sand placer in plan -stratigraphy of ore-bearing sand thickness and stripping rocks in section along the length of axis | 15,5 28,0 250-600/2000-3000 25,0/4,0-6,0 1,0/0,5 6,7-12,3/2,0-3,0 95,0 stretching, lenslike deposit (placer) fine-grained sands with small amount of pebbles and fragments of pumice |
| 6 | | |
| 7 | | |