

DESCRIPTIVE MODEL OF UPWELLING TYPE PHOSPHATE DEPOSITS

By Dan L. Mosier

DESCRIPTION Phosphorite sediments form a major stratigraphic unit within a sequence of marine sediments in upwelling areas in basins with good connection to the open sea.

GENERAL REFERENCES Slansky (1980), Sheldon (1964).

GEOLOGICAL ENVIRONMENT

Rock Types Phosphorite, marl, shale, chert, limestone, dolomite, and volcanic materials.

Age Range Precambrian through Miocene.

Depositional Environment Marine sedimentary basins with good connection to the open sea and upwelling, areas highly productive of plankton. Deposition occurs mostly in warm latitudes, mostly between the 40th parallels.

Tectonic Setting(s) Intra-plate shelf, platform, miogeosynclines, and eugeosynclines.

Associated Deposit Types Sedimentary manganese.

DEPOSIT DESCRIPTION

Mineralogy Apatite + fluorapatite + dolomite + calcite + quartz + clays (montmorillonite or illite) ± halite ± gypsum ± iron oxides ± siderite ± pyrite ± carnotite.

Texture/Structure Pellets, nodules, phosphatized shell and bone material.

Alteration None related to ore.

Ore Controls Basins, or parts of basins, favorable for the accumulation of organic rich sediments and for their evolution into phosphorites. Individual beds may be a meter thick or more and may extend over hundreds of square kilometers.

Weathering Limonite and goethite.

Geochemical Signature P, N, F, C, and U. Anomalously radioactive.

EXAMPLES

Southeast, USID	(Gulbrandsen and Krier, 1980)
Meskala, MRCO	(British Sulphur Corp. Ltd., 1980)
Stra Quertane, TUNS	(British Sulphur Corp. Ltd., 1980)

GRADE AND TONNAGE MODEL OF UPWELLING TYPE PHOSPHATE DEPOSITS

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COMMENTS See figs. 178-179.

DATA REFERENCE Krauss and others (1984).

DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Abu Tartur	EGPT	Mdilla	TUNS
Akashat	IRAQ	Meskala	MRCO
Aktyubinsk	URRS	Metalaoui	TUNS
Al-Hasa/Oatrana	JRDN	Montana	USMT
Arad	ISRL	Moulares	TUNS
Beersheva	ISRL	Mrata	TUNS
Bu Craa	MRCO	Mzaita	ALGR
Brooks Range	USAK	Nahal-Zin	ISRL
Chilisai	URRS	New Cuyama	USCA
Djebel Onk	ALGR	Oronta	ISRL
D-Tree	AUQL	Oulad-Abdoun	MRCO
Duchess	AUQL	Pates de Minas	BRZL
Eastern A&B	SYRA	Qusseir	EGPT
El Hamrawein	EGPT	Redeyef	TUNS
Ganntour	MRCO	Ruseifa	JRDN
Hahotoe	TOGO	Safagar	EGPT
Haikou	CINA	San Juan de la Costa	MXCO
Hubsugul	MNGL	Sechura	PERU
Idfu-Qena	EGPT	Sehib	TUNS
Kalaa Khasba	TUNS	S.E. Idaho	USID
Kara Tau	URRS	Shediyah	JRDN
Khneifiss	SYRA	Sherrin Creek	AUQL
Kondonakasi	ANGL	Stra Quertane	TUNS
Kun Ming	CINA	Taiba	SNGL
Lady Annie	AUQL	Thamar-Kotra	INDA
Lee Creek	USNC	Thies	SNGL
Le Kouif	ALGR	Uinta Mtns	USUT
Lily Creek	AUQL	Vernal	USUT
Makhtesh	USRL	Warm Springs	USMT
Mazidagi	TRKY	Wyoming	USWY

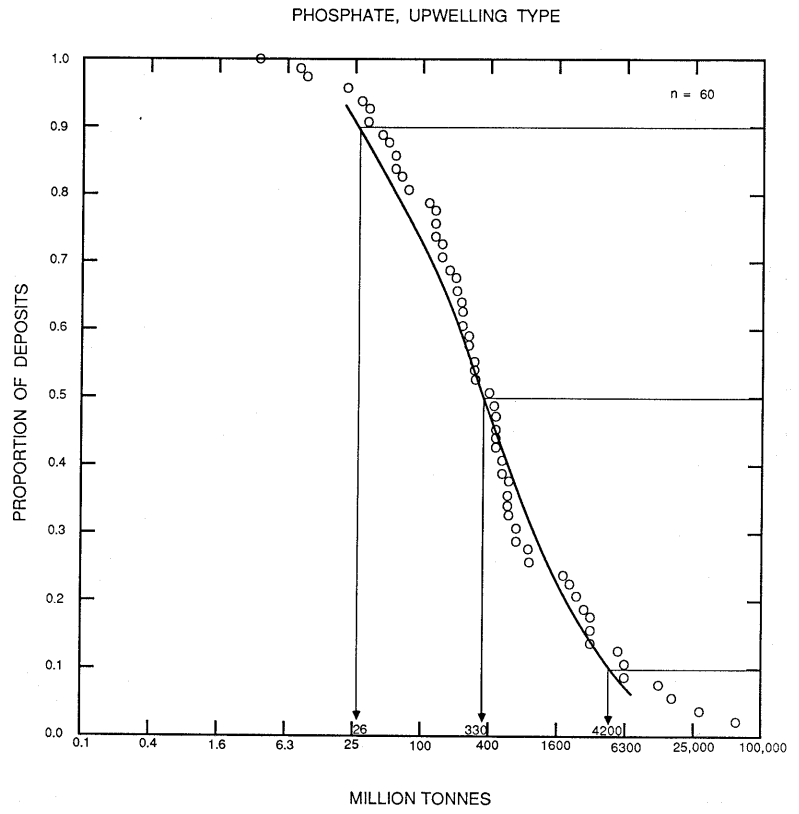


Figure 178. Tonnages of upwelling-type phosphate deposits.

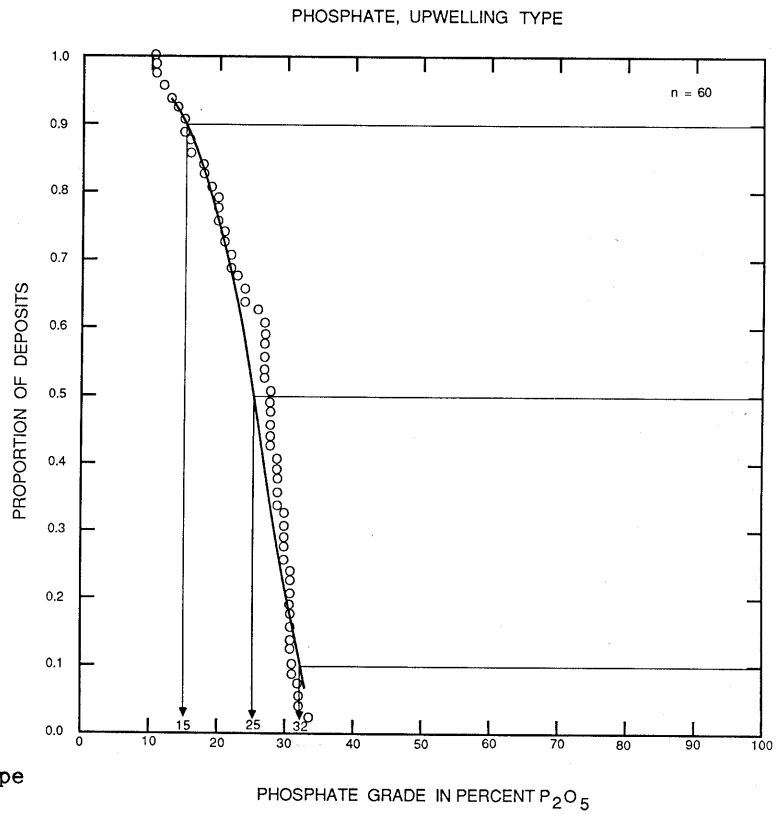


Figure 179. P₂O₅ grades of upwelling-type phosphate deposits.