An Arc/Info Point Coverage of Mineral Resource Data System (MRDS) Locations in Eleven Western States

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* Access 97 is a product of Microsoft
** Arc View is product of ESRI

Abstract

This ARC/Info coverage, derived from the USGS Mineral Resource Data System (MRDS), contains 60,490 records that fall within the states of Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming. The dataset has 13 fields containing information on record identification, location, commodity, geology, and deposit type. The data for this report was retrieved from the master database as a tab text file and imported into a Microsoft Access database. The data was then imported into ESRI's ArcView where shape files were created. These shape files were then converted into an ARC/INFO coverage.

Acknowledgments

MRDS Database Description

The Mineral Resources Data System (MRDS) is a computerized information file containing mineral resource sites for the United States and selected countries of the world. MRDS serves as one archive and retrieval system for USGS metallic and industrial mineral commodity data. The data for MRDS has been derived from a variety of sources, including literature, assessment studies, USGS commodity specialists and geologists, other Federal and State agencies under various types of agreements, and through arrangements with foreign countries. Output formats from MRDS include digital downloads (ASCII, dBase, Tab Text, 4th Dimension), plots (with adjustable scale/projection) or plot files (in hpgl or postscript formats), and abbreviated (tabular) or complete record printouts. More information about the Mineral Resource Data System (MRDS) can be found at http://minerals.er.usgs.gov/fact-sheets/MRDS_Broch.html.

WESTMRDS Coverage Description

The purpose of this project was to create an interim product that could be used either by itself or combined with other GIS coverages to perform analysis related to mineral resource issues. This coverage is not intended to replace or duplicate the original database, but to provide an easy means to analyze data from the database, in a geographic information system. Thirteen (13) fields (See Table 2.) and the area including the States of AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, or WY were chosen. The master database was queried to include records containing US in the country_code field; greater than 0 in the

lat_decima field; less than 0 (longitude is a negative number in the western hemisphere) in the long_decim field. The location of these sites is shown on Figure 1.

Because ArcView shape files limit field name lengths to ten characters, the following abbreviations were used for field names in the coverage (complete MRDS field name followed by abbreviation used in coverage):

Name of reporter - Rep name
Type of reporter - Rep type
Affiliation of reporter - Rep affiliation
Date of report - Rep date
Latitude - Lat DMS (for degree minute second)
Longitude - long DMS
Long decimal (for decimal degree, created in Access)
Lat decimal (for decimal degree, created in Access)
Commodity type - Comm type
Commodity present - Comm present
Host rock type name - Hrock name
Host rock type age - Hrock age
Host rock type unit name - HR unit name
Host rock type unit age - HR unit age
Associated rock type name - AR type name
Associated rock type age - AR type age
Deposit size - Dep size
Deposit type - Dep type
Physiographic province - Physio province
Hydrologic unit code - Hydro unit code
Development status - Devel status
Production size - Prod size
Present or last owner - Owner present or last

Several look-up tables (see tables 1-5.) were created to assist the user in searching, sorting, and analyzing the data.

MRDS Database Limitations

Records in the MRDS database were obtained from the pre-existing CRIB (Computerized Resource Information Bank) database, USGS projects and programs, literature, International, Federal, and State agencies, and private sources. Approximately 40% of the data was acquired prior to 1972, when the database contained less than 200 fields. The type and amount of information entered into the database was dependent upon the source information detail and the record input type. Some records were manually entered into the database from literature. This allowed for more complete filling-in of information, especially in the text fields. Some records were brought in

digitally from other databases/files. The information contained in these records may be limited by the original data structure, output formats, transfer process, or type and amount of information in the original database. Duplicate records or multiple records for a single site exist. These records may or may not have the same latitude and longitude, depending on data entry accuracy.

Data files

The following data files are included in this report:
Arc Info files- westmrds.e00, mrdsplot.aml
Look-up tables- westmrds.comtyplu, westmrds.commodlu, westmrds.depsizlu, westmrds.statelu
Plot files- westmrdsplot.eps, westmrdsplot.hp
Metadata- westmrds.met

Obtaining digital data

The digital files created for this report are available in Arc/Info GIS export format from the following USGS public access World Wide Web site on the internet:

    **URL = http://wrgis.wr.usgs.gov/docs/ northwest_region/ofr99-
___.html**

or Anonymous FTP from:

    wrgis.wr.usgs.gov

from the directory: **pub/geologic/northwest_region/geology/ofr99-___**

These Internet sites contain the MRDS locations for eleven western states in GIS digital files in ARC/INFO export file format. Use of this data requires a GIS capable of reading ARC/INFO export formatted files and a computer capable of reading UNIX ASCII files.   To use these files on a DOS computer, the files must be modified with a UNIX-to-DOS filter.

References

Arndt, Raymond E., Editor, 1993 Mineral Resources Data System of the U.S. Geological Survey--Data and Related Software, [Chapter A. The MRDS Data Base by Raymond E. Arndt and Dan L. Mosier]

Mason, G.T., Jr., and Arndt, R.E., 1996, Mineral Resource Data System (MRDS), with retrieval software by Kim Buttleman: U.S. Geological Survey Digital Data Series DDS-20, Release 1 (June 1996)

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Scale 1:2500000
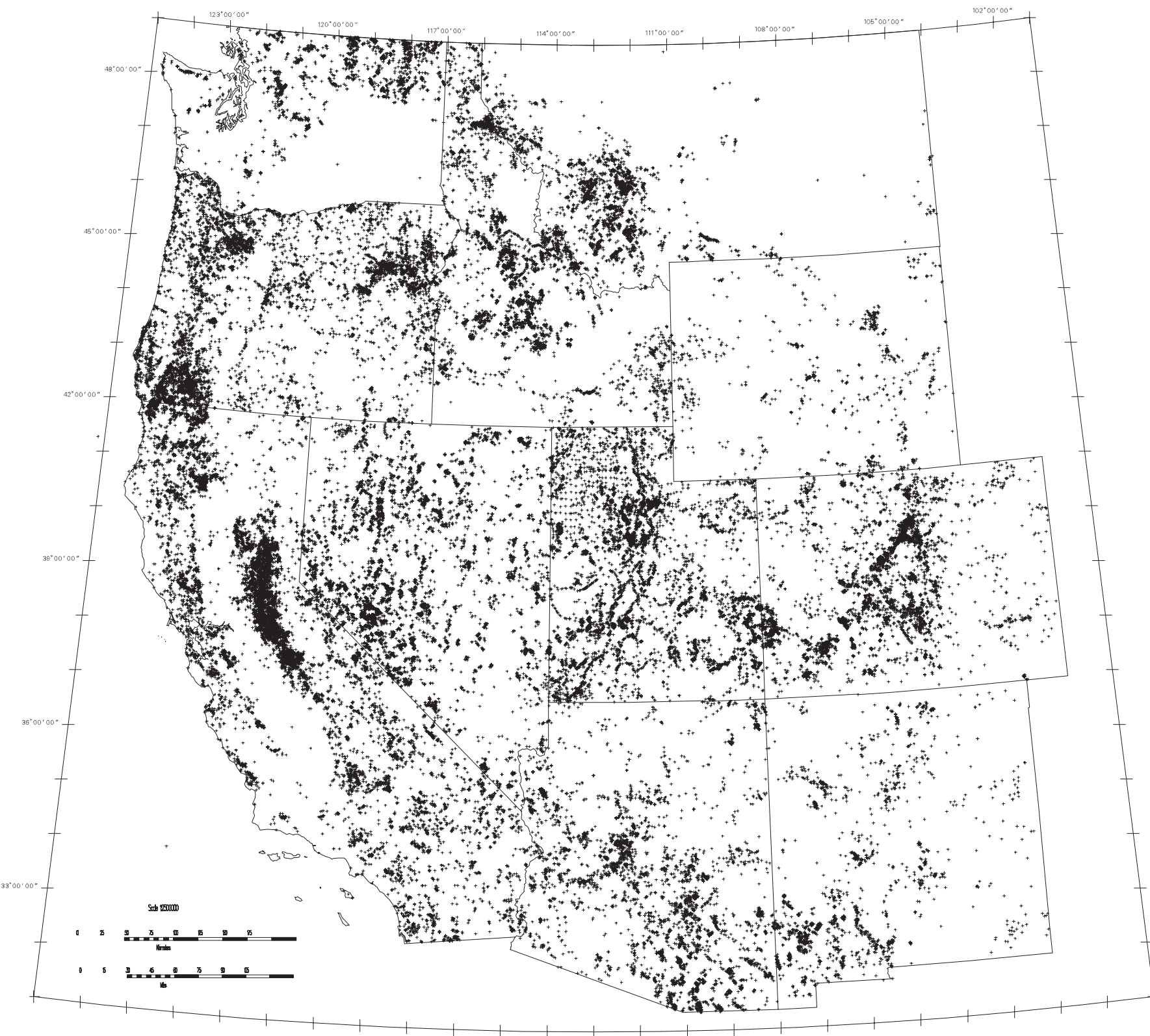
Map showing MRDS locations in the Western United States

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MRDS.PAT			
Item name	Item Type	Item length	Attribute Description
record_num	Character	7	MRDS record number as stored in the MRDS master database. Number is unique, however there may be multiple mrds_num identifiers for an individual deposit.
rep_date	Character	254	Date record was created and/or edited in the MRDS master database.
site_name	Character	254	First 255 characters from "site name" field in the MRDS master database.
state_code	Character	2	Code for state abbreviation from MRDS master database.
county_nam	Character	254	Name of county from MRDS master database.
comm_type	Character	2	Code for commodity type from MRDS master database. M=metallic, N=non-metallic, B=both.
quad_250k	Character	254	1:250,000 scale quadrangle name from MRDS master database.
district_nam	Character	254	Mining district name from MRDS master database.
lat_decima	Numeric	Double	Latitude, north of Equator, in decimal degrees.
long_decim	Numeric	Double	Longitude, west of Prime Meridian, in decimal degrees.
comm_prese	Character	254	First 255 characters from "commodities present" field in the MRDS master database. Commodities are listed from most important to least important. Most important can mean co-products; products of greatest economic significance; products most deliberately produced; etc. Identified by elemental abbreviation (AU=gold, AG=silver.)
dep_size	Character	2	Code for deposit size, from MRDS master database
dep_type	Character	254	Deposit type from MRDS master database

WESTMRDS.STATELU			
Item name	**Item Type**	**Item length**	**Attribute Description**
Code	Character	10	Alpha code used to identify State code. (This item also occurs in WESTMRDS.PAT.)
State	Character	10	This field contains the full State name.

Possible entries in the state code look-up table

WESTMRDS.STATELU	
State code	**State name**
AZ	Arizona
CA	California
CO	Colorado
ID	Idaho
MT	Montana
NM	New Mexico
NV	Nevada
OR	Oregon
UT	Utah
WA	Washington
WY	Wyoming

WESTMRDS.COMTYPLU			
Item name	**Item Type**	**Item length**	**Attribute Description**
commod_type	Character	11	Alpha code used to identify type of commodity. (This item also occurs in WESTMRDS.PAT.)
desc	Character	47	This field describes the site as having commodities that are metallic, non-metallic, both, or that the master database field had no information in it.

Possible entries in the WESTMRDS.COMTYPLU look-up table are as follows:

commod_type	desc
B	both metallic and non-metallic minerals are present
M	metallic mineral(s) are present
N	non-metallic mineral(s) are present
X	no entry was posted in the MRDS master database

TABLE 4. - DESCRIPTION OF ITEMS IN THE COMMODITIES PRESENT TABLE (WESTMRDS.COMMODLU)

WESTMRDS.COMMODLU			
Item name	**Item Type**	**Item length**	**Attribute Description**
Code	Character	10	Alphanumeric code used to identify commodities present (This item also occurs in WESTMRDS.PAT.)
Commodity	Character	76	This field contains the full commodity name.

Possible entries in the commodities present field are as follows:

N1	NO COMMODITY
AG	SILVER
AL	ALUMINUM (general)
AL1	BAUXITE
AL2	ALUMINUM (other)
AL3	ALUNITE
ALM	ALUM
AMB	AMBER
AS	ARSENIC
ASB	ASBESTOS
ASH	ASH (see also PUM, VOL)
AU	GOLD
B	BORON, BORATES
BA	BARIUM, BARITE
BE	BERYLLIUM
BI	BISMUTH
BIT	BITUMENS (ASPHALT)
BR	BROMINE
BRI	BRINES/SALINES
C	CARBON
CA	CALCIUM
CAR	CARBONATES
CD	CADMIUM
CE	CERIUM
CER	CEMENT ROCK (natural)

CHL	CHLORITE
CL	CHLORINE
CLY	CLAY (general)
CLY1	BENTONITE
CLY2	FULLERS EARTH
CLY3	KAOLIN OR KAOLINITIC CLAY (includes high alumina clay)
CLY4	BALL CLAY
CLY5	FIRE CLAY (refractory)
CLY6	BLOATING MATERIAL (includes clay, shale, slate)
CLY7	COMMON BRICK CLAY
CO	COBALT
COA	COAL
COA1	ANTHRACITE
COA2	BITUMINOUS COAL
COA3	SUB-BITUMINOUS COAL
COA4	LIGNITE
COLL	COLLECTABLE
CON	CONCENTRATE
COR	CORUNDUM
CR	CHROMIUM
CRY	CRYOLITE
CS	CESIUM
CU	COPPER
DIA	DIAMOND
DIT	DIATOMITE
DOL	DOLOMITE (general)
DOL1	ULTRA PURE DOLOMITE ($MgCO_3 + CaCO_3 > 97\%$)
DOL2	HIGH MAGNESIAN DOLOMITE ($MgCO_3 + CaCO_3 > 95\%$)
EMY	EMERY
EVA	EVAPORITES
F	FLUORINE, FLUORITE
FE	IRON
FLD	FELDSPAR
FLN	FLINT
GA	GALLIUM
GAR	GARNET
GAS	GAS (NATURAL)
GE	GERMANIUM
GEM	GEMSTONES
GEM1	PRECIOUS GEMS
GEM2	SEMI-PRECIOUS GEMS
GEO	GEOTHERMAL
GLA	GLAUCONITE

GRF	GRAPHITE
GRT	GRANITE, GRANITIC GNEISS
GYP	GYPSUM, ANHYDRITE
HAL	HALITE
HE	HELIUM
HF	HAFNIUM
HG	MERCURY
I	IODINE
IN	INDIUM
IR	IRIDIUM
K	POTASSIUM
KYN	KYANITE, SILLIMANITE, ANDALUSITE, DUMORTIERITE
LAT	LATERITE
LI	LITHIUM
LST	LIMESTONE (general)
LST1	ULTRA PURE LIMESTONE (CaCO3 > 97%)
LST2	HIGH CALCIUM LIMESTONE (CaCO3 > 95%)
LWA	LIGHTWEIGHT AGGREGATE
MBL	MARBLE
MG	BRUCITE (see MAGNESIUM)
MG	MAGNESIUM (includes BRUCITE)
MGS	MAGNESITE
MIC	MICA (general)
MIC1	SHEET MICA
MIC2	SCRAP MICA
MIC3	FLAKE MICA
MN	MANGANESE
MO	MOLYBDENUM
MON	MONAZITE
MPG	MINERAL PIGMENTS
N	NITROGEN - NITRATES
NA	SODIUM
NACO	SODIUM CARBONATE
NASO	SODIUM SULFATE
NB	COLUMBIUM (NIOBIUM)
NB	NIOBIUM (COLUMBIUM)
NI	NICKEL
OI	OSMIUM + IRIDIUM (OSMIRIDIUM)
OIL	PETROLEUM (OIL)
OLV	OLIVINE
ORE	ORE
OS	OSMIUM
OVB	OVERBURDEN

OXD	OXIDES
P	PHOSPHORUS - PHOSPHATES
PB	LEAD
PD	PALLADIUM
PEA	PEAT
PER	PERLITE
PGM	PLATINUM GROUP METALS
PT	PLATINUM
PUM	PUMICE
PYF	PYROPHYLLITE
PYR	PYRITE
PYR1	PYRRHOTITE
QTZ	QUARTZ
QTZ1	QUARTZITE/QUARTZOSE SANDSTONE
RA	RADIUM
RAM	RADIOACTIVE MATERIAL
RB	RUBIDIUM
RE	RHENIUM
REE	RARE EARTHS
REF	REFRACTORY MATERIAL
RH	RHODIUM
RU	RUTHENIUM
S	SULFUR
SAM	SAND, MOLDING
SAO	BITUMINOUS SANDSTONE (OIL SANDS)
SAP	SAPROLITE
SB	ANTIMONY
SC	SCANDIUM
SDG	SAND AND/OR GRAVEL
SE	SELENIUM
SEA	SEAWATER
SHL	SHALE
SHO	OIL SHALE
SIL	SILICA
SLA	SLATE
SLF	SULFURIC ACID
SN	TIN
SR	STRONTIUM
SST	SANDSTONE
STN	STONE
STN1	CRUSHED/BROKEN STONE MATERIAL (includes road metal, riprap, scoria, slag, clinker, baked clay, red dog)
STN2	DIMENSION OR BUILDING STONE

STN3	FLAGSTONE
SUL	SULFIDES
TA	TANTALUM
TE	TELLURIUM
TH	THORIUM
TI	TITANIUM
TL	THALLIUM
TLC	TALC, SOAPSTONE
TRA	TRAVERTINE
U	URANIUM
UNF	UNDEFINED
V	VANADIUM
VOL	VOLCANIC MATERIALS (ash, cinders)
VRM	VERMICULITE
W	TUNGSTEN
WOL	WOLLASTONITE
YT	YTTRIUM
ZEO	ZEOLITES
ZN	ZINC
ZN1	ZINC OXIDE
ZR	ZIRCONIUM

TABLE 5. - DESCRIPTION OF ITEMS IN THE DEPOSIT SIZE LOOK-UP TABLE (WESTMRDS.DEPSIZLU)

WESTMRDS.DEPSIZLU			
Item name	Item Type	Item length	Attribute Description
Dep_size	Character	2	Alpha code used to identify size of deposit. (This item also occurs in MRDS.PAT.)
desc	Character	2	This field describes the site as having sizes of small, medium, or large.

Possible entries in the deposit size look-up table are as follows:

Commodity	Large >	Medium >	Small
Aluminum (bauxite)	100,000,000		1,000,000
Antimony	50,000		5,000
Asbestos	10,000,000		100,000
Barite (BaSO4)	5,000,000		50,000
Beryllium (BeO)	1,000		10
Boron (B2O3)	10,000,000		100,000

Chromium (Cr2O3)	1,000,000		10,000
Cobalt	20,000		1,000
Copper	1,000,000		50,000
Diamond	10		1
Fluorite (CaF2)	5,000,000		50,000
Gold	500		25
Graphite	1,000,000		10,000
Gypsum-anhydrite	100,000,000		5,000,000
Iron (ore)	100,000,000		5,000,000
Kyanite group (Al2SiO5)	1,000,000		50,000
Lead	1,000,000		50,000
Lithium (LiO2)	100,000		10,000
Magnesium (MgCO3)	10,000,000		100,000
Manganese (tons of 40% Mn)	10,000,000		100,000
Mercury (flasks)	500,000		10,000
Molybdenum	500,000		5,000
Nickel	100,000		1,000
Niobium-Tantalum (R2O5)	100,000		1,000
Phosphate (P2O5)	200,000,000		200,000
Platinum group	500		25
Potassium (K20)	10,000,000		1,000,000
Pyrite (FeS2)	20,000,000		200,000
Pyrophyllite	10,000,000		1,000,000
Rare earths (RE2O3)	1,000,000		1,000
Silver	10,000		500
Sodium (salts)	10,000,000		1,000,000
Strontium (salts)	1,000,000		10,000
Sulfur	10,000,000		100,000
Talc	10,000,000		1,000,000
Thorium	10,000		1,000
Tin	100,000		5,000
Titanium (TiO2)	10,000,000		1,000,000
Tungsten	10,000		500
Uranium	10,000		100
Vanadium	10,000		500
Zinc	1,000,000		50,000