Compilation of Mineral Resource Data for Mississippi Valley-Type and Clastic-Dominated Sediment-Hosted Lead-Zinc Deposits

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Open-File Report 2009–1297

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
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Suggested citation:
Taylor, R.D., Leach, D.L., Bradley, D.C., and Pisarevsky, S.A., 2009, Compilation of mineral resource data for Mississippi Valley-type and clastic-dominated sediment-hosted lead-zinc deposits: U.S. Geological Survey Open-File Report 2009–1297, 42 p.

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Introduction

This report contains a global compilation of the mineral resource data for sediment-hosted lead-zinc (SH Pb-Zn) deposits. Sediment-hosted lead-zinc deposits are historically the most significant sources of lead and zinc, and are mined throughout the world. The most important SH Pb-Zn deposits are hosted in clastic-dominated sedimentary rock sequences (CD Pb-Zn) that are traditionally called sedimentary exhalative (SEDEX) deposits, and those in carbonate-dominated sequences that are known as Mississippi Valley-type (MVT) Pb-Zn deposits. In this report, we do not include sandstone-Pb, sandstone-hosted Pb, or Pb-Zn vein districts such as those in Freiberg, Germany, or Coeur d'Alene, Idaho, because these deposits probably represent different deposit types (Leach and others, 2005). We do not include fracture-controlled deposits in which fluorite is dominant and barite typically abundant (for example, Central Kentucky; Hansonburg, N. Mex.) or the stratabound fluorite-rich, but also lead- and zinc-bearing deposits, such as those in southern Illinois, which are considered a genetic variant of carbonate-hosted Pb-Zn deposits (Leach and Sangster, 1993).

This report updates the Pb, Zn, copper (Cu), and silver (Ag) grade and tonnage data in Leach and others (2005), which itself was based on efforts in the Canadian Geological Survey World Minerals Geoscience Database Project (contributions of D.F. Sangster to Sinclair and others, 1999). New geological or geochronological data, classifications of the tectonic environment in which the deposits formed, and key references to the geology of the deposits are presented in our report. Data for 121 CD deposits, 113 MVT deposits, and 6 unclassified deposits that were previously classified as either SEDEX or MVT in the Leach and others (2005) compilation, are given in appendix table A1. In some cases, mineral resource data were available only for total district resources, but not for individual mines within the district. For these districts, the resource data are presented in appendix table A2. In addition, numerous figures (appendix figures B1–B9) displaying important grade-tonnage and geologic features are included.

These mineral deposit resource data are important for exploration targeting and mineral resource assessments. There is significant variability in the resource data for these deposit types, and ore controls vary from one region to another. Therefore, grade-tonnage estimations are best evaluated as subsets of the data in appendix table A1 where local mineralization styles and ore controls characterize the region being evaluated for grade-tonnage relations. Furthermore, consideration should also be given to the tendency for MVT resources to occur in large mineralized regions.

Clastic-Dominated and Mississippi Valley-Type Lead-Zinc Deposits

Classifications of the SH Pb-Zn ores in Leach and others (2005) were organized around traditional subgroups—MVT and SEDEX deposits—and were further subdivided based on classifications in the literature. A fundamental concern with the genetic-model-based classification of "SEDEX" is that it imparts an inherent "exhalative" genetic component to deposits. Most deposits classified as SEDEX lack unequivocal evidence of an exhalite in the ore or alteration component. Consequently, the presence of laminated sulfides parallel to bedding is commonly accepted to be permissive evidence for exhalative ore. However, some deposits traditionally classified as SEDEX did not form from sulfide exhalites. In this report, we avoid process-related, interpretive- and model-driven features to classify the deposits. Deposits are instead characterized by the nature of the sedimentary sequences and their interpreted tectonic environment within which the ores formed. This approach uses the relation that ores classified as SEDEX in Leach and others (2005) are hosted in clastic-dominated sedimentary rock sequences in mainly passive margin, continental rifts and sag basins. We use the term "clastic-dominated lead-zinc" (CD Pb-Zn) for these deposits and avoid genetic and temporal (for example, syngenetic, diagenetic, syn-diagenetic) attributes to the deposits. The ores can be hosted in shale, sandstone, siltstone, mixed clastic units, or as carbonate replacement ores within a clastic dominated sedimentary rock sequence. The CD deposits may be further subdivided based upon specific tectonic or geologic settings in which the deposit formed, which include passive margins (PM), continental rifts (RF), continental sag basins (CS), and back-arc basins (BA). An alternative classification of BHT (Broken Hill-type) is listed for some deposits, a subtype with unique characteristics similar to the Broken Hill, Australia, deposit (Leach and others, 2005).

We retain the traditional term of MVT Pb-Zn for sediment-hosted Pb-Zn deposits in carbonate-dominated platform sequences because this terminology does not include a genetic component. Although the traditional use of the term MVT does imply a broad time component of simply being epigenetic with respect to its host rocks, we recognize that some MVT ores may have a syngenetic, diagenetic, or burial metamorphic temporal component to deposit or ore district formation. The most important characteristic of MVT deposits is their location, mainly hosted in dolostone and limestone in platform carbonate sequences and typically located at flanks of basins, orogenic forelands, or foreland thrust belts inboard of the clastic rock-dominated passive margin sequences. They have no spatial or temporal relations to igneous processes, which sets them apart from skarn or other magmatic Pb-Zn ores.

Many subtypes or alternative classifications have been applied to MVT deposits since their inception as a distinct ore type by Bastin (1939). These alternative classifications reflect geographic and/or specific geological features that some workers believe set them apart as unique (for example, Appalachian-, Alpine-, Reocin-, Irish-, and Viburnum Trend-types). However, we do not consider these alternative classifications or subtypes to be sufficiently distinct to warrant using them in this report.

Limitations of the Data Compilation

Criteria used to classify the deposits and districts as MVT versus CD in appendixes A and B were based on the classifications assigned to the deposits in the literature and the opinions of the authors that relied on personal observations of the deposits or, in many cases, on descriptions of the geological setting and lithology of the ore-hosting sedimentary rock sequences. Six deposits are included in appendix A as “Unclassified” because the descriptions of the tectonic setting and host rock sequences were insufficient to allow confident discrimination between the two major types of Pb-Zn deposits.

The resource information for the deposits is limited to publicly accessible resource information from sources cited in appendix tables A1 and A2. Some deposits and districts are not presented in the compilation (for example, Central Missouri and Northern Arkansas districts, U.S.A.), because publicly accessible resource information was not available for a variety of reasons. It should be noted that many factors (for example, metal prices, location, corporate policies, national politics, and so forth) influence the determination of the resource data in appendix tables A1 and A2. Furthermore, publicly available data (on which table A1 is based) are not necessarily the most recent. Therefore, the data in table A1, although considered to be the best currently available, do not necessarily reflect the true nature of mineralization in the ground.

Care must be taken with the usage of this data compilation because there are limitations to the data. Some resource data are old and have not been recently updated. Different deposits listed will be characterized by different metal cut-off grades in their definition of ore tonnages. Some deposits are still in the exploration phase and in the future are likely to have more accurate mineral resource estimates.

Many of the deposits do not have absolute mineralization ages listed, because of the difficulty of directly dating the ore minerals. Numerous papers have been published presenting dates of ore deposition, and careful consideration went into determining if the methods shown accurately reflect the age of ore formation, or something else. Dates deemed unreliable by the authors of this report have been excluded from this data compilation. Some deposits also have ambiguous or conflicting classifications reported in the literature. Caution was exercised in determining the correct deposit-type classification. Because this is a global compilation, aspects such as location, metal prices at the time of resource estimation, and regional politics all play roles in the resource estimates. Lastly, reporting of resource estimates is not as strictly controlled in some countries relative to others; therefore, overestimation of metal tonnages may characterize some deposits hosted in certain countries.

Data Fields

The attributes within the tables are defined below.

District and Deposit

The most commonly used names are provided in appendix table A1. Mississippi Valley-type deposits are characteristically distributed throughout larger districts. Many of these districts do not have resources defined for individual deposits; therefore, these are summarized in appendix table A2.

Location

The country and geographic location (latitude-longitude) for each deposit is listed. Latitude and longitude coordinates are provided in decimal format that were calculated using degrees, minutes, and seconds. Southern latitudes and western longitudes are listed as negative values.

Classification

Every deposit is identified as CD, MVT, or UN (unclassified). Alternative classifications (Alt. Class.) are supplied for select deposits as BHT (Broken Hill-type), carbonate-hosted/replacement, or sh-

(shale) or cc- (coarse clastic) hosted. Also listed in the last three columns are the deposit-type classifications as cataloged in Leach and others (2005).

Tectonic Setting

When known, the tectonic settings (Tect. Setting) are listed as PM (passive margin), UN (unclassified), BA (back arc basin), CS (continental sag), or RF (rift).

Grades and Tonnage

The data listed include average grades and tonnage. If multiple cut-off grades were provided, our reported values are based on the lowest cut-off grade. Lead, zinc, and copper grades are shown as percentages. Silver and some other listed commodities are shown as grams per tonne (g/t). Deposit size and amount of metal are listed as Mt (million metric tonnes).

Age Determinations

Mineralization ages are all listed as Ma (million years ago). The method of age determination is listed. Host rock ages are listed using the geologic time scale (Walker and Geissman, 2009). Mineralization ages of CD deposits are typically coeval with host rock age.

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Table A1. Global compilation of geologic and resource information for sediment-hosted lead-zinc deposits

District	Deposit	Country	Latitude	Longitude	Classification	Alt. Class.	Tect. Setting	Host Rocks	Size (Mt)	Pb (Mt)	Zn (Mt)	Pb+Zn (Mt)	Pb (%)	Zn (%)	(Pb+Zn) (%)	Cu (%)	Ag (g/t)	Other Commodities
Irish Midlands	Abbeytown	Ireland	54.22	-8.53	MVT			limestone	2.2	0.0	0.1	0.1	1.5	3.8	5.3		40.0	
	Abu Samar	Sudan	17.98	36.38	CD			garnet-biotite-cordierite-sillimanite gneiss	3.6	0.0	0.2	0.2		4.9	4.9	0.60	72.0	
	Admiral Bay	Australia	-19.23	122.28	MVT			limestone	120.0	2.8	7.7	10.4	2.3	6.4	8.7		32.0	
Aguilar	Aguilar	Argentina	-23.20	-65.70	UN			arkosic quartzite, calcareous quartzite, sandstone breccia	30.0	1.7	1.9	3.5	5.5	6.2	11.7		110.0	
	Ain Khala	Algeria	35.43	5.29	MVT			dolomite	7.1	0.1	0.1	0.2	1.2	1.9	3.1			
Kildare	Allenwood West	Ireland	53.29	6.90	MVT			limestone	10.1	0.0	0.2	0.2	0.4	1.6	2.0			
	Ambaji	India	24.33	72.85	CD		PM	chloritic hornfels, biotite-quartz schist	14.2	0.5	0.6	1.1	3.2	4.4	7.6	1.66		
Red Dog	Anarraaq	United States	68.16	-162.96	CD		PM	carbonate/siliceous mudstone	18.0	1.0	3.2	4.2	5.4	18.0	23.4		85.0	
	Angas	Australia	-34.67	138.91	CD		UN	metagraywacke	2.3	0.1	0.2	0.3	3.1	8.1	11.2	0.3	33.0	.5 g/t Au
Sanandaj - Sirjan	Anjireh-Vejin	Iran	32.71	51.15	MVT			limestone, shale	1.2			0.1			8.3			
	Arrens	France	42.95	-0.22	CD		PM	limestone, siltstone	4.0			0.3			7.0			
Qinling	Bafangshan	China	33.59	106.88	CD		PM	reefal limestone, pyllite	9.4	0.5	0.1	0.6	5.1	1.6	6.7		10.0	
	Bajta Central	India	25.83	75.27	CD		PM	marble	0.6	0.0	0.0	0.0	1.5	3.4	4.9			
	Ballaria	India	24.35	73.73	CD		PM	dolostone	16.0	0.2	0.9	1.1	1.2	5.9	7.0			
Irish Midlands	Ballinalack	Ireland	53.65	-7.47	MVT			limestone(dolo),quartz sandstone, conglomerate	3.5	0.0	0.2	0.2	1.1	5.9	7.0		27.0	
	Balmat	United States	44.25	-75.40	CD	MVT/carbonate hosted CD	BA	siliceous dolomitic marble, marble, anhydrite	31.7	0.0	2.8	2.8		8.9	8.9			
	Bamnia Kalan	India	25.04	74.18	CD		PM	calc-silicate, dolomite	5.1	0.2	0.2	0.4	3.1	4.9	8.0		100.0	
	Baroi	India	24.32	73.68	CD		PM	dolostone	7.0	0.3	0.1	0.4	4.6	1.7	6.3			
Menderes Massif	Bayindir	Turkey	38.17	27.35	CD		PM	metapelite, metaturbidite	0.9	0.0	0.1	0.1	1.5	7.5	9.0			
	Bear-Twit	Canada	64.03	-129.42	MVT			dolostone	7.3	0.2	0.4	0.6	2.6	5.4	8.0			
Nanling	Beishan	China	25.20	108.10	CD		UN	dolomitic bioclastic limestone	23.9	0.2	1.1	1.2	0.7	4.5	5.2		11.4	
	Berg Aukas	Namibia	-19.57	18.26	MVT			dolostone	3.2	0.1	0.5	0.7	4.0	17.0	21.0			
	Bethumni	India	25.07	74.18	CD		PM	tuffaceous schist, calc-silicate, metachert	0.2	0.0	0.0	0.0	1.6	1.0	2.6			
	Big Ledge	Canada	49.50	-118.15	CD			graphitic schist	6.5	0.0	0.3	0.3		4.0	4.0			
	Big Syncline	South Africa	-29.20	18.83	CD		CS	quartzite, gray gneiss	101.0	1.0	2.5	3.5	1.0	2.5	3.5	0.09	12.9	
	Bijiashan	China	33.92	105.46	CD			marble, metapelite	10.5	0.5	0.6	1.1	5.2	5.2	10.5	0.65	5.0	
	Black Angel	Greenland	71.17	-51.75	MVT			calcitic marble	13.6	0.5	1.7	2.2	4.0	12.3	16.3		32.0	
Aggeneys	Black Mountain	South Africa	-29.23	18.73	CD	BHT	CS	quartzite, schist, marble	81.6	2.2	0.5	2.7	2.7	0.6	3.3	0.75	29.8	
Alpine	Bleiberg	Austria	46.67	13.67	MVT			dolostone	43.0	0.5	2.5	3.0	1.1	5.9	7.0			
	Bleikvassli	Norway	65.83	13.83	CD		PM	biotite schist, muscovite schist	11.5	0.3	0.5	0.8	2.3	4.2	6.5	0.23		
	Blende	Canada	64.40	-134.67	UN			siliceous dolostone	19.6	0.5	0.6	1.1	2.8	3.0	5.8		55.9	
Jameson Land	Blyklippen	Greenland	72.10	-24.00	MVT			sandstone, conglomerate	0.4	0.0	0.0	0.1	9.0	12.0	21.0			
Kildare	Boston Hill	Ireland	53.22	6.94	MVT			limestone	0.8	0.0	0.0	0.0	1.1	2.7	3.8			
	Bou Grine	Tunisia	36.11	8.94	MVT			limestone, black shales	5.5	0.1	0.7	0.8	2.5	12.0	14.5			
	Bou Jabeur	Tunisia	35.78	8.28	MVT			limestone	8.8	0.1	0.2	0.3	1.0	2.2	3.2			
Guergour	Boukdema-Kef Semmah	Algeria	36.21	4.89	MVT			limestone,marl	12.0	0.2	0.8	1.0	2.1	6.5	8.6			
	Broken Hill	Australia	-31.97	141.47	CD		RF	quartzitic gneiss, sillimanite gneiss	280.0	28.0	23.8	51.8	10.0	8.5	18.5	0.10	148.0	0.47 g/t Au
Aggeneys	Broken Hill	South Africa	-29.23	18.78	CD	BHT	CS	quartzite, quartz-biotite schist	85.0	3.0	1.5	4.5	3.6	1.8	5.3	0.34	48.1	
Viburnum Trend	Buick	United States	37.58	-91.13	MVT			dolostone	59.9	4.9	1.3	6.3	8.2	2.2	10.5			
	Bulman	Australia	-13.42	134.41	MVT			dolomite, limestone,chert	0.4	0.0	0.1	0.1	2.0	15.0	17.0			
	Bushy Park	South Africa	-28.88	23.60	MVT			dolostone	10.0	0.1	0.5	0.6	0.6	5.0	5.6			
	Cadieux	Canada	45.41	-76.71	CD		PM	calcitic marble	0.8	0.0	0.1	0.1	1.0	10.0	11.0			
Lennard Shelf	Cadjebut Trend	Australia	-18.71	125.96	MVT			dolostone	16.4	0.8	1.5	2.3	5.0	8.9	13.9			
Cloncurry-Selwyn Zone	Cannington	Australia	-21.87	140.92	CD		RF	migmatitic gneiss, sillimanite schist	43.8	5.1	1.9	7.0	11.6	4.4	16.0		538.0	
	Canoas	Brazil	-24.83	-48.95	CD		PM	calc-silicate	1.3	0.0	0.0	0.1	3.0	3.3	6.3		62.5	
Irish Midlands	Carrickittle	Ireland	52.51	-8.37	MVT			dolomitized micrite, oolitic grainstone	0.2	0.0	0.0	0.0	1.5	6.1	7.6			
	Castellanos	Cuba	22.72	-84.05	CD		PM	shale, sandstone	12.0	0.4	0.3	0.7	3.2	2.4	5.6		43.0	
Carpentaria Zinc Belt	Century	Australia	-18.75	138.63	CD		CS	siltstone, shale	94.6	1.7	12.4	14.1	1.8	13.1	14.9		46.0	
Qinling	Changba-Lijiagou	China	34.00	105.50	CD		PM	metaseds (schist, quartzite), marble	142.5	1.9	10.0	11.9	1.3	7.0	8.4			Ag, Cd
Kechika Trough	Cirque	Canada	57.51	-125.15	CD		PM	siliceous shale	24.7	0.6	2.1	2.7	2.3	8.5	10.8		50.8	
	Citronen Fjord	Greenland	83.08	-28.25	CD		PM	calcareous shale, calcareous siltstone, graphitic shale, siltstone, carbonate debris flow	20.0	0.0	1.4	1.4		7.0	7.0			
Selwyn Basin	Clear Lake	Canada	62.78	-135.14	CD		PM	shale	5.6	0.1	0.6	0.7	2.0	11.4	13.4		38.0	
	Colby	Canada	50.73	-118.73	CD		PM	marble, quartzite, calc-silicate	1.0			0.1			10.0			
	Cottonbelt	Canada	51.45	-118.82	CD		PM	calc-silicate, gneiss, marble	1.0	0.1	0.0	0.1	6.0	2.0	8.0		50.0	
Irish Midlands	Courtbrown	Ireland	52.64	-8.98	MVT			dolomitized micrite, argillaceous calcarenite	1.0	0.0	0.0	0.1	2.0	3.5	5.5		14.0	
	Dairi (Sopokomil)	Indonesia	2.83	98.17	CD			carbonaceous shales	17.9	1.3	2.3	3.6	7.3	12.6	19.9			
	Daliangzi	China	26.63	102.88	MVT			algal dolomite	40.0	0.3	4.2	4.5	0.8	10.4	11.2		43.0	
	Dengjiashan	China	33.91	105.75	CD		UN	limestone	25.0	0.3	1.2	1.5	1.3	4.8	6.0		14.0	Cd, Hg
	Deri	India	24.38	72.83	CD		PM	biotite-quartz schist, chloritic hornfels	1.0	0.1	0.1	0.2	8.0	10.2	18.2		15.0	
	Devpura	India	25.45	74.63	CD		PM	garnet-quartz-mica schist, calc-gneiss, quartz-amphibole-magnetite	17.5	0.1	0.3	0.4	0.4	1.8	2.3			
	Djebba	Tunisia	36.47	9.09	MVT			detritus	4.0	0.2	0.2	0.4	4.0	6.0	10.0			
	Dongjiahe	China	28.41	109.41	CD		PM	carbonate	20.0	0.2	0.5	0.7	0.8	2.6	3.4		3.6	
Qinling	Dongshengmiao	China	41.65	106.72	CD		PM	siliceous dolomite	238.0	1.9	7.4	9.3	0.8	3.1	3.9			
Kechika Trough	Driftpile	Canada	58.05	-125.95	CD			siliceous shale	2.4	0.1	0.3	0.4	3.1	11.9	15.0			
	Duddar	Pakistan	26.09	66.82	CD			carbonaceous shale	12.9	0.2	1.2	1.4	1.7	9.1	10.8			
Kalkadoon-Leichardt Belt	Dugald River	Australia	-20.25	140.15	CD		CS	graphitic limey slate, slate	53.8	1.1	6.8	7.9	2.0	12.7	14.7		39.0	
Kootenay Arc	Duncan	Canada	50.37	-116.95	CD			siliceous dolomite, dolostone	2.8	0.1	0.1	0.2	3.3	3.1	6.4			
Anvil Range	Dy	Canada	62.23	-133.14	CD		PM	calcareous phyllite, phyllite	20.3	1.2	1.4	2.6	5.7	7.0	12.7		82.0	
Cornwallis	Eclipse	Canada	75.57	-96.20	MVT			dolomitized limestone	0.9	0.0	0.1	0.1	0.7	11.3	12.1			
	Ediacara	Australia	-30.80	138.13	MVT			dolomite	29.0	0.3		0.3	1.1		1.1			
	Edwards	United States	44.34	-75.26	CD	carbonate-hosted	BA	siliceous dolomitic marble, limestone, anhydrite	6.0	0.0	0.6	0.6		10.8	10.8			
Touissit-El Abed	El Abed	Algeria	34.32	-1.44	MVT			dolomite	38.0	0.9	1.3	2.2	2.3	3.5	5.9			
	Elura	Australia	-31.17	145.65	MVT			limestone, turbidites	45.0	2.4	3.8	6.2	5.3	8.5	13.8		69.0	
Sanandaj - Sirjan	Emarat	Iran	33.75	49.61	MVT			limestone, marl, shale	26.3	0.8	0.6	1.4	3.1	2.1	5.2			
	Esker	Canada	66.97	-113.43	MVT			dolostone	1.9	0.0	0.1	0.1	1.2	3.5	4.7			
Bambui	Fagundes	Brazil	-16.87	-46.52	MVT			dolarenite, dolomite breccia	3.0	0.0	0.1	0.1		4.5	4.5			
Nanling	Fankou	China	25.10	113.62	MVT			dolomitic limestone	51.7	2.5	5.2	7.7	4.9	10.0	14.9		102.0	
Anvil Range	Faro	Canada	62.36	-133.37	CD		PM	phyllite	57.6	2.0	2.7	4.7	3.4	4.7	8.1		36.0	
	Fedj-el Adoum	Tunisia	36.37	9.10	MVT			limestone, black shales	3.0	0.1	0.2	0.2	2.0	6.0	8.0			
	Filizchai	Azerbaijan	41.79	46.47	CD		PM	argillite	100.0	2.0	4.5	6.5	2.0	4.5	6.5	0.64	54.0	
Bongara	Florida Canyon	Peru	-5.92	-78.06	MVT			dolomitized limestone	7.0			0.5			7.0			
Lennard Shelf	Fossil Downs	Australia	-18.19	125.77	MVT			limestone	2.2	0.0	0.2	0.2	2.1	9.5	11.6		50.0	
	Friedensville	United States	40.56	-75.38	MVT			dolostone	2.6	0.0	0.2	0.2		6.5	6.5			
Irish Midlands	Galmoy	Ireland	52.80	-7.59	MVT			micrite, argillaceous biomicrite	10.9	0.2	1.4	1.5	1.6	12.4	14.0			
Aggeneys	Gamsberg	South Africa	-29.25	18.97	CD	BHT	CS	schist, marble, calc-silicate hornfels	150.0	0.8	10.7	11.5	0.6	7.1	7.7			
	Ganesh Himal	Nepal	28.07	85.18	CD		PM	crystalline dolomite, graphitic schist	1.0	0.0	0.2	0.2	2.5	16.4	18.9		32.0	
	Ganeshpura	India	25.80	75.25	CD		PM	marble	0.8	0.0	0.0	0.0	1.2	4.6	5.8			
	Gaobanhe	China	40.45	117.90	CD		RF	shale, dolostone	38.8	0.1	0.8	0.9	0.2	2.0	2.2			
Irish Midlands	Garrycam	Ireland	53.65	-7.72	MVT			limestone	1.4	0.0	0.0	0.0	0.2	2.7	2.9		10.0	
	Gayna River	Canada	64.93	-130.68	MVT			dolostone	50.0	0.2	2.4	2.5	0.3	4.7	5.0			
	Gays River	Canada	45.03	-63.36	MVT			dolostone	12.7			0.9			6.8			
Lennard Shelf	Goongewa (Twelve Mile Bore)	Australia	-18.63	125.88	MVT			dolostone	2.4	0.1	0.2	0.3	2.7	10.1	12.8			
	Gorevsk	Russia	58.08	93.31	UN		PM	marble	300.0	19.5	4.1	23.6	6.5	1.4	7.9			
	Gorno	Italy	45.52	9.50	MVT			limestone	6.2	0.1	0.7	0.9	2.3	11.5	13.7			
	Gorubathan	India	26.97	88.65	CD		RF	sericite chlorite schist, quartz garnet schist	2.8	0.1	0.1	0.2	4.0	4.2	8.2	0.10	62.0	
	Goz Creek	Canada	64.43	-132.52	MVT			dolostone, quartz sandstone	2.5		0.3			11.0				
Anvil Range	Grum	Canada	62.27	-133.22	CD		PM	phyllite	30.8	1.0	1.5	2.5	3.1	4.9	8.0		49.0	
	Guanmenshan	China	42.66	124.32	UN			dolostone	3.8	0.2	0.4	0.6	4.2	11.0	15.2		98.0	
	Gunga	Pakistan	27.73	66.48	UN	carb-replacement		calcareous shale, limestone	6.9	0.1	0.3	0.3	0.7	4.0	4.7			
Kootenay Arc	H.B.	Canada	49.15	-117.20	CD		RF	dolostone	6.45	0.0	0.3	0.3	0.8	4.1	4.9		4.8	
Kildare	Harberton Bridge	Ireland	53.27	-6.86	MVT			micrite, quartz sandstone	3.9	0.0	0.3	0.4	1.2	8.1	9.3		10.0	
Carpentaria Zinc Belt	Hilton-George Fisher	Australia	-20.57	139.47	CD		CS	dolomitic siltstone-mudstones	227.0	12.3	25.7	37.9	5.4	11.3	16.7		96.7	
Hunan	Houhongqiao	China	25.30	111.72	MVT			carbonates	32.0	0.2	0.5	0.6	0.5	1.5	1.9		5.1	
Selwyn Basin	Howards Pass	Canada	62.45	-129.18	CD		PM	carbonaceous chert, siliceous limestone, limestone	388.5	6.2	19.0	25.3	1.6	4.9	6.5			
	Huayuan	China	28.41	109.41	MVT		PM	limestone	50.0	0.0	1.7	1.7		3.4	3.4			
Nei Mongol	Huogeqi	China	41.28	106.68	CD		PM	carbonaceous quartzite	67.8	0.9	0.7	1.7	1.4	1.1	2.5		1.1	
	Hyatt	United States	44.30	-75.33	CD		BA	meta-siliceous dolomitic marble, marble	0.9	0.0	0.1	0.1		8.6	8.6			
Carpentaria Zinc Belt	HYC	Australia	-16.43	136.10	CD		CS	dolomitic carbonaceous siltstones	227.0	9.3	21.0	30.3	4.1	9.3	13.4	0.2	92.0	0.005 g/t Au
Mascot-Jefferson City	Idol	United States	36.37	-83.41	MVT			dolostone	6.8	0.0	0.2	0.2		3.0	3.0			
Viburnum Trend	Indian Creek	United States	38.08	-90.88	MVT			dolostone, sandstone	12.7	0.3	0.0	0.3	2.5		2.5			
Sanandaj - Sirjan	Irankuh	Iran	32.55	51.68	MVT			limestone, shale	10.0	0.2	0.7	1.0	2.4	7.4	9.8			
Red Sea	Jabal Dhaylan	Saudi Arabia	25.50	37.25	MVT			dolomitized limestones	1.2	0.0	0.1	0.1	1.4	5.6	7.0			
Bambui	Januaria	Brazil	-15.05	-44.75	MVT			dolomitic limestone	0.1	0.0	0.0	0.0	7.5	4.0	11.5			
Selwyn Basin	Jason	Canada	63.15	-130.26	CD		PM	siliceous shale and siltstone	12.5	0.5	0.8	1.4	4.4	6.6	11.0		42.4	
Kootenay Arc	Jersey	Canada	49.10	-117.22	CD			dolostone	7.9	0.1	0.3	0.4	1.6	3.5	5.1		3.0	
Langshan	Jiashengpan	China	41.23	109.25	CD		PM	slate and carbonate	41.6	0.5	1.6	2.1	1.3	3.8	5.1		1.2	
	Jubilee	Canada	45.98	-60.96	MVT			limestone	0.8	0.0	0.0	0.1	1.4	5.2	6.6			
	Kamarga	Australia	-18.57	138.84	MVT			algal dolostone	50.0			1.5			3.0			
	Kankariya	India	26.51	74.65	CD		PM	calc-silicate	9.0	0.2	0.3	0.5	2.6	3.2	5.8			
Lennard Shelf	Kapok	Australia	-18.73	126.01	MVT			limestone	5.9	0.5	0.5	1.0	8.7	7.8	16.5		10-15	
	Kayar	India	26.53	74.69	CD		PM	calc-silicate	10.0	0.2	1.3	1.5	2.2	13.1	15.3			
Irish Midlands	Keel	Ireland	53.65	-7.73	MVT			calcareous mudstone, sandstone, in shear	1.9	0.0	0.1	0.2	1.0	7.7	8.8		39.6	
	Kherzet Youcef	Algeria	35.46	5.28	MVT			dolomite	1.6	0.1	0.3	0.4	3.6	18.4	22.0			
	Kholodninskoye	Russia (Buryatia Republic)	55.85	109.80	CD	sh-hosted	PM	carbonaceous shale	340.0	3.1	20.4	23.5	0.9	6.0	6.9		28.0	
	Komdok	North Korea	41.00	129.65	UN			dolomite, limestone	300.0	1.0	4.1	5.1	0.3	1.4	1.7			
Sullivan	Kootenay King	Canada	49.74	-115.61	CD	cc-hosted	RF	dolomitic argillite/siltstone	0.0	0.0	0.0	0.0	5.4	15.6	21.0		66.5	
Huize	Kuangshanchang	China	26.60	103.98	MVT			dolomite, bioclastic limestone	4.6	0.2	0.4	0.6	3.4	9.5	12.9			
	Kuh-e-Surmeh	Iran	28.50	52.50	MVT			dolostone	0.9	0.0	0.1	0.2	5.4	12.1	17.5			
	Kushk	Iran	31.75	55.75	CD			shale, dolostone	4.0	0.1	0.4	0.5	3.0	10.0	13.0			
Carpentaria Zinc Belt	Lady Loretta	Australia	-19.77	139.07	CD		CS	dolomitic siltstone, sideritic siltstone, sideritic sandstone	13.7	0.8	2.3	3.1	5.8	17.0	22.8		95.7	
	Lafatsch	Austria	47.36	11.45	MVT			limestone	1.0	0.0	0.1	0.1	1.0	6.0	7.0			
Cevennes	Les Malines	France	43.89	4.28	MVT			dolostone	12.5	0.1	0.8	0.9	1.0	6.2	7.2			
Red Dog	Lik	United States	68.17	-163.20	CD		PM	carbonaceous shale, siliceous shale, chert	23.9	2.0	0.7	2.7	8.4	2.8	11.2		52.3	
Irish Midlands	Lisheen	Ireland	52.75	-7.75	MVT			dolomitized micrite	22.0	0.4	2.5	2.9	1.9	11.5	13.4		26.0	
	Luoba	China	34.00	105.07	CD		PM	bioclastic limestone, phyllite	17.4	0.3	0.8	1.1	1.4	4.6	6.1		30.0	
	Madarpura	India	26.50	74.67	CD		PM	calc-silicate	6.6	0.0	0.4	0.4		5.5	5.5			
Viburnum Trend	Magmont	United States	37.63	-91.08	MVT			dolostone	23.4	1.7	0.2	1.9	7.3	1.0	8.3	0.26	10.6	
	Maozu	China	27.38	103.05	CD		UN	dolomite, limestone	10.0	0.2	0.6	0.8	1.9	5.7	7.6		13.3	
	Maramungee	Australia	-21.58	140.92	CD		RF	quartzo-feldspathic gneiss	1.8	0.0	0.1	0.1		4.4	4.4			
	Matahambre	Cuba	22.43	-83.43	CD		PM	shale, sandstone	14.8	0.0	0.1	0.1	0.2	0.5	0.8	4.39		
	Meggen	Germany	51.13	8.08	CD		PM	argillaceous limestone, carbonaceous shale	50.0	1.0	3.5	4.5	2.0	7.0	9.0	0.10	14.0	
Sanandaj - Sirjan	Mehdiabad	Iran	31.73	54.99	MVT	CD		dolostone	394.0	6.3	16.5	22.9	1.6	4.2	5.8		51.0	
	Mel	Canada	60.35	-127.40	CD		UN	limestone	6.8	0.1	0.5	0.6	2.1	7.1	9.2			
Alpine	Mezica	Slovenia	46.30	14.52	MVT			limestone	16.2	0.8	0.4	1.2	4.9	2.5	7.4			
	Mochia	India	24.36	73.72	CD		PM	arkosic dolomite, siliceous dolomite, dolomite	17.0	0.3	0.7	1.0	1.8	4.3	6.0			
	Mofjellet	Norway	66.28	14.12	CD		PM	feldspathic gneiss	5.0	0.0	0.2	0.2	0.7	3.5	4.2	0.28	10.0	.3g/t Au
	Mokanpura North	India	25.00	74.13	CD		PM	dolomitic chert, graphitic schist	63.0	0.4	1.4	1.8	0.7	2.2	2.9		10.0	
	Monarch-Kicking Horse	Canada	51.43	-116.45	MVT			dolostone	0.8	0.0	0.1	0.1	5.6	8.6	14.2		30.4	
Bambui	Morro Agudo	Brazil	-17.32	-46.80	MVT			dolomite	17.0	0.3	0.9	1.1	1.5	5.1	6.7			
Carpentaria Zinc Belt	Mount Isa	Australia	-20.73	139.48	CD		CS	dolomitic siltstone-mudstones	150.0	9.0	10.5	19.5	6.0	7.0	13.0		150.0	
	Mount Torrens	Australia	-34.88	139.30	CD		UN	siltstone	0.7	0.0	0.0	0.1	6.4	1.6	8.0		41.0	
Irish Midlands	Moyvoughly	Ireland	53.45	-7.68	MVT			micrite, limestone	0.1	0.0	0.0	0.0	1.1	6.9	8.0			
	Nanisivik	Canada	73.06	-84.51	MVT			dolostone	19.0	0.1	1.7	1.8	0.7	8.7	9.4		41.0	
Lennard Shelf	Napier Range (Narlarla)	Australia	-17.26	124.73	MVT			limestone (dolomitic)	0.6	0.0	0.1	0.1	8.0	8.5	16.5		75.0	
Irish Midlands	Navan	Ireland	53.66	-6.68	MVT			micrite	95.3	2.0	7.9	9.9	2.1	8.3	10.4			244 t Ag produced
	Newfoundland Zinc	Canada	50.28	-57.47	MVT			dolostone	6.5	0.0	0.5	0.5		8.0	8.0			
	Niujiaotang	China	26.24	107.66	CD		UN	algal limestone	3.8	0.0	0.2	0.2		6.0	6.0			
	North Park	United States	40.98	-106.49	CD		PM	garnet-sillimanite-gahnite gneiss, biotite gneiss	0.8			0.1			7.9			
Una Basin	Nova Redencao	Brazil	-13.00	-43.50	MVT			silicified dolarenite	2.5	0.2	0.0	0.2	6.3	0.5	6.8		33.0	
	Nunngarut	Greenland	71.13	-51.70	MVT			calcitic marble	0.4	0.0	0.0	0.0	3.9	8.8	12.7		34.0	
Irish Midlands	Oldcastle	Ireland	53.77	-7.13	MVT			calcareous mudstone, micrite, calcareous sandstone	3.0	0.0	0.1	0.1	0.6	4.3	4.9			
	Paduna North Block	India	24.27	73.69	CD		PM	dolostone	3.1	0.0	0.1	0.1	0.7	3.3	3.9			
Pavlovskoye	Pavlovskoye	Russia	72.92	55.17	MVT			black argillite, brecciated limestone and dolomite	128.0	2.0	5.0	7.0	1.5	3.9	5.4			
Cloncurry-Selwyn Zone	Pegmont	Australia	-21.84	140.68	CD		RF	biotite-muscovite quartzite, quartz-feldspar-mica schist	8.6	0.7	0.3	1.0	7.7	3.4	11.1		10.0	
Kootenay Arc	Pend Oreille-Yellowhead	United States	48.90	-117.30	MVT			dolomite	8.8	0.1	0.6	0.7	1.3	6.8	8.1			
Vale de Ribeira	Perau	Brazil	-24.85	-49.00	CD	UN	PM	calc-silicate	3.3	0.1	0.1	0.2	4.1	1.9	6.0		60.4	
	Pering	South Africa	-27.43	24.27	MVT			dolostone	18.0	0.1	0.6	0.8	0.6	3.6	4.2			
	Picos de Europa	Spain	43.10	-4.56	MVT			dolostone	0.6	0.0	0.1	0.1	2.0	13.0	15.0			
	Pierrepont	United States	44.50	-75.02	CD		BA	marble	2.3	0.0	0.4	0.4		16.4	16.4			
Lennard Shelf	Pillara (Blendevale)	Australia	-18.32	125.77	MVT			limestone	19.3	0.5	1.5	2.0	2.6	7.8	10.4		17.0	
	Pinnacles	Australia	-32.09	141.39	CD		RF	pelite, psammopelite	0.8	0.1	0.0	0.1	11.0	2.5	13.5		400.0	
Cornwallis	Polaris	Canada	75.38	-96.95	MVT			dolostone	22.0	0.9	3.1	4.0	4.0	14.0	18.0			
	Prairie Creek	Canada	61.58	-124.83	MVT			dolostone	11.9	1.2	1.5	2.7	10.1	12.5	22.6	0.40	161.0	
	Qiandongshan	China	33.59	110.79	CD		UN	unstated	12.2	0.2	1.0	1.2	1.7	7.9	9.6		22.0	
Huize	Qilinchang	China	26.60	103.80	MVT			dolostone	3.3	0.2	0.6	0.8	6.6	17.5	24.1			
Nanling	Qixiashan	China	32.14	118.98	CD		UN	carbonate	13.7	0.4	0.7	1.0	2.6	4.9	7.5		75.0	
Alpine	Raibl	Austria	46.44	13.60	MVT			limestone	18.1	0.2	1.1	1.3	1.2	6.0	7.2			
	Rajpura-Dariba	India	24.98	74.13	CD		PM	graphitic schist, calc-silicate	45.0	1.1	2.9	4.0	2.4	6.5	8.9		125.0	
	Rammelsberg	Germany	51.88	10.42	CD		PM	graphitic shale	30.0	1.8	4.2	6.0	6.0	14.0	20.0	2.00	140.0	20% barite
	Rampura-Agucha	India	25.83	74.73	CD		PM	graphitic meta-pelite, garnet-biotite-sillimanite gneiss	107.4	2.1	15.0	17.1	2.0	13.9	15.9			
	Rangpo	India	27.17	88.53	CD		RF	carbonaceous phyllite, chloritic quartzite	0.6	0.0	0.0	0.0	1.1	2.6	3.7	1.10		
Red Dog	Red Dog	United States	68.07	-162.80	CD		PM	siliceous shale, chert	165.0	7.6	27.4	35.0	4.6	16.6	21.2			
	Reef Ridge	United States	63.41	-154.25	MVT			dolostone	11.8	0.0	0.1	0.1		1.0	1.0			
Kootenay Arc	Remac	Canada	49.02	-117.37	MVT			dolostone, limestone	5.8	0.1	0.2	0.3	1.0	3.4	4.4		3.4	
	Reocin	Spain	43.28	-4.41	MVT			ankeritic dolostone	62.0	0.9	6.8	7.7	1.4	11.0	12.4			
	Rewara	India	25.10	74.37	CD		PM	biotite schist	1.2	0.1	0.0	0.1	5.4	0.4	5.8	0.70		
Kildare	Rickardstown	Ireland	53.90	6.82	MVT			limestone	3.5	0.0	0.1	0.1	1.1	2.2	3.3			
	River Jordan	Canada	51.13	-118.41	CD			impure quartzite, calc-silicate	2.6	0.1	0.1	0.3	5.1	5.6	10.7		35.0	
	Robb Lake	Canada	56.93	-123.72	MVT			dolostone	7.1	0.1	0.3	0.4	1.5	4.7	6.2			
	Rosh Pinah	Namibia	-27.95	16.77	CD		PM	feldspathic quartzite, arkose	25.5	0.5	2.0	2.5	2.0	7.7	9.7	0.10		
	Ruddock Creek	Canada	51.27	-118.98	CD			biotite schist, calc-silicate, quartzite, marble	5.0	0.1	0.4	0.5	2.5	7.5	10.0			
	Saladipura	India	27.65	75.53	CD		PM	quartz-mica schist, amphibolite	115.0	0.0	1.2	1.2		1.0	1.0			
Alpine	Salafossa	Italy	46.34	12.40	MVT			dolostone	11.0	0.1	0.5	0.7	1.0	5.0	6.0			
	Samodi	India	25.35	74.55	CD		PM	quartz-amphibole-magnetite	3.7	0.1	0.1	0.1	1.4	1.9	3.2			
	San Vicente	Peru	-11.23	-75.35	MVT			dolostone, limestone (dolomitic), dolostone	20.0	0.2	2.4	2.6	0.9	12.0	12.9			
	Santa Lucia	Cuba	22.65	-83.98	CD		PM	shale	19.4	0.4	1.1	1.5	1.8	5.7	7.5			
SE Siberian Craton	Sardana	Russia	60.19	136.48	MVT			limestone, dolomite	10.0	0.3	0.6	0.9	3.0	6.0	9.0			
	Sawar	India	25.75	75.22	CD		PM	dolostone	0.9	0.0	0.0	0.0	2.5	1.5	4.0			
	Schmalgraf	Belgium	50.42	6.02	MVT			dolomite,calcareous shale	0.7	0.0	0.2	0.2	2.1	24.0	26.1			
Vratsa	Sedmochislenitsi	Bulgaria	43.15	23.54	MVT			limestone	16.7	0.2	0.2	0.4	1.4	1.1	2.5	0.30		
Leadville	Sherman	United States	39.14	-106.17	MVT			dolomite	0.7	0.0	0.0	0.0	0.8	4.0	4.8	0.10	485.0	
	Siding	China	25.07	109.53	CD		UN	bituminous limestone, dolomite	4.5	0.1	0.4	0.5	1.8	9.7	11.5			
Irish Midlands	Silvermines	Ireland	52.79	-8.27	MVT			limestone-dolomitized limestone, sandstone-conglomerate	17.7	0.4	1.1	1.6	2.5	6.4	9.0		24.2	
	Sindesar Kalan East	India	25.00	74.17	CD		PM	graphitic schist	94.0	0.6	2.0	2.5	0.6	2.1	2.7		20.0	
	Sindesar Khurd	India	24.01	74.23	CD		PM	calc-silicate, dolomite	37.2	1.4	2.2	3.6	3.8	5.8	9.6			
	Sorby Hills	Australia	-15.45	128.97	MVT			dolostone	16.2	0.9	0.1	1.0	5.3	0.6	5.9		56.0	
Kechika Trough	South Cirque	Canada	57.51	-125.15	CD		PM	siliceous shale	15.5	0.2	1.1	1.3	1.4	6.9	8.3		32.0	
	South Dedwas	India	25.35	74.57	CD		PM	quartz-amphibole-magnetite	18.4	0.1	0.2	0.4	0.8	1.3	2.1		21.0	
Red Dog	Su (Lik south)	United States	68.16	-163.21	CD		PM	black shales	20.1	0.5	1.6	2.1	2.6	7.9	10.5		46.9	
Sullivan	Sullivan	Canada	49.71	-116.01	CD		RF	graywacke	162.0	9.8	9.5	19.3	6.1	5.9	11.9		67.4	
	Sumsar	Kirghistan	41.22	71.34	MVT			dolomitic limestone	30.0	1.5	0.9	2.4	5.0	3.0	8.0			
Anvil Range	Swim	Canada	62.21	-133.03	CD		PM	phyllite	4.3	0.2	0.2	0.4	3.8	4.7	8.5		51.0	
Langshan	Tanyaokou	China	40.93	106.73	CD		PM	slate and dolomite	43.4	0.1	1.4	1.5	0.2	3.3	3.5	0.70		
Irish Midlands	Tatestown	Ireland	53.69	-6.74	MVT			biosparite, reef limestone, chert	3.6	0.1	0.2	0.2	1.5	5.3	6.8		37.0	
	Tianbaoshan	China	26.95	102.20	MVT			siliceous dolostone	20.0	0.3	2.1	2.4	1.4	10.4	11.8		93.6	
	Tikhi	India	25.76	75.24	CD		PM	dolostone	1.5	0.0	0.0	0.1	1.9	2.6	4.5			
	Tiranga	India	25.34	74.54	CD		PM	iron formation, garnet-mica schist	1.2	0.0	0.0	0.0	1.8	1.1	2.9			
Selwyn Basin	Tom	Canada	63.17	-130.14	CD		PM	carbonaceous shale	18.5	0.6	1.2	1.9	3.4	6.7	10.1		36.1	
Qinling	Tongmugou	China	34.62	109.98	CD		PM	limestone, phyllite, dolomite	2.3	0.0	0.5	0.6	2.0	21.7	23.7		42.0	
	Touissit-Bou Beker	Morocco	34.30	-1.48	MVT			dolostone	29.0	3.8	0.7	4.4	13.0	2.3	15.3			
Irece Basin	Tres Irmas	Brazil	-12.33	-41.80	MVT			limestone, dolomite	7.0	0.1	0.5	0.6	1.4	7.6	9.0			
Cevennes	Treves	France	44.13	3.39	MVT			dolostone	0.1	0.0	0.0	0.0	1.4	6.0	7.4		20.0	
	Triumph	United States	44.67	-114.25	CD		PM	quartzite	1.8			0.2			11.0		224.0	
	Troya	Spain	42.77	-2.28	MVT			limestone	3.5	0.0	0.5	0.5	1.0	13.1	14.1	0.20		
Kaokoland	Tsongoari	Namibia	-18.78	13.41	CD		PM	dolomite, carbonaceous shale	5.8	0.4	0.0	0.4	6.4	0.8	7.2	0.40	47.0	
Irish Midlands	Tynagh	Ireland	53.16	-8.34	MVT			micrite, limestone conglomerate	9.2	0.6	0.5	1.0	6.2	5.0	11.2	0.52	66.0	
Red Sea	Umm Gheig	Egypt	25.63	34.45	MVT			sandy limestones, evaporites	1.5	0.0	0.2	0.2	1.3	11.0	12.3			
	Upton	Canada	45.68	-72.67	MVT			limestone	1.0	0.0	0.0	0.0	1.9	0.6	2.5	0.15	13.5	
	Urultun	Russia	63.48	148.42	MVT			dolomite	23.0	0.7	1.6	2.2	2.9	6.7	9.6			

Table A1. Compilation of Data from Global MVT and SEDEX Deposits

District	Deposit	Country	Latitude	Longitude	Classification	Alt. Class.	Tect. Setting	Host Rocks	Size (Mt)	Pb (Mt)	Zn (Mt)	Pb+Zn (Mt)	Pb (%)	Zn (%)	(Pb+Zn) (%)	Cu (%)	Ag (g/t)	Other Commodities
Kootenay Arc	Van Stone	United States	48.76	-117.76	MVT			dolomite	6.2	0.0	0.3	0.3	0.7	4.2	4.8			
Anvil Range	Vangorda	Canada	62.25	-133.18	CD		PM	phyllite	7.5	0.3	0.4	0.7	3.8	4.9	8.7		54.0	0.79 g/t Au
Viburnum Trend	Viburnum #27	United States	37.73	-91.13	MVT			dolostone	7.4	0.2	0.0	0.2	2.9	0.2	3.1	0.17		
Cevennes	Villemagne	France	44.13	3.45	MVT			dolostone	0.6	0.0	0.0	0.1	3.3	6.3	9.6		71.0	
Lennard Shelf	Wagon Pass	Australia	-17.18	124.63	MVT			dolostone	0.5			0.1			14.0			
Maritimes Basin	Walton	Canada	45.21	-64.04	MVT			carbonates	4.9	0.0	0.0	0.0	0.3	0.1	0.4		27.7	
Viburnum Trend	West Fork	United States	37.51	-91.12	MVT			dolostone	7.0	0.4	0.1	0.6	6.3	1.9	8.1			
Qinling	Xidinggou	China	33.10	109.15	CD		PM	limestone, phyllite, dolomite	22.5	0.2	0.8	1.0	0.9	3.3	4.2			
	Yahyali	Turkey	38.33	36.32	MVT			dolomite	2.0	0.0	0.4	0.4		20.0	20.0			
Qinling	Yindongliang	China	33.75	106.84	CD		PM	black shale, limestone	4.4	0.1	0.3	0.4	2.0	7.4	9.4		21.0	
	Zawarmala	India	24.33	73.68	CD		PM	dolomite	18.0	0.4	0.7	1.1	2.2	3.7	5.9		40.0	

Table A1. Compilation of Data from Global MVT and SEDEX Deposits

of geologic and resource information for sediment-hosted lead-zinc deposits

Classification from Leach and others, 2005

Deposit	General References	Prod. or Res. References	Host-Rock Age	Mineralization Age and Method	Age Reference	Dep. type A	Dep. type B	Dep. type C
Abbeytown	Hitzman, 1986	Hitzman, 1986; Andrew, 1990	Early Mississippian			MVT	Irish	
Abu Samar	El Samani and others, 1986	El Samani and others, 1986	Mesoproterozoic			sedex	VMS	
Admiral Bay	Connor, 1990	McCracken and others, 1996	Early Ordovician			MVT		
Aguilar	Sureda and Martin, 1990; Gemmell and others, 1992	Sureda and Martin, 1990; Gemmell and others, 1992	Early Ordovician			sedex	cc-hst	
Ain Khala	Touahri, 1991	Touahri, B., 1991	Early Jurassic			MVT		
Allenwood West	Hitzman and Beaty, 1996	Hitzman and Beaty, 1996	Early Mississippian			MVT		
Ambaji	Deb, 1980	Golden Patriot Mining Inc, 2004	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	VMS	
Anarraaq	Cominco Ann. Rept. 2000	King and others, 2002	Late Mississippian			sedex	carb-hst	CR
Angas	Both and others, 1995	Geoscience Australia, 2007	Early Cambrian			sedex	cc-hst	
Anjireh-Vejin	Lisenbee, 1988	Lisenbee, 1988	Cretaceous			MVT		
Arrens	Escande and Majeste-Menjoulas, 1985; Pouit and Bois, 1986	Pouit and Bois, 1986	Late Devonian			sedex	carb-hst	
Bafangshan	CNNC, Song, 1994	CNNC	Middle-Late Devonian			sedex	carb-hst	
Bajta Central	Geological Survey of India, 1994	www.mecl.gov.in/SaleReportList.aspx	Paleoproterozoic			sedex	carb-hst	
Ballaria	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Haldar, 2001	Paleoproterozoic			sedex	carb-hst	
Ballinalack	Jones and Bradfer,1982; Jones and Brand, 1986	Johnston, 1999	Early Mississippian			MVT	Irish	
Balmat	Lea and others, 1968; De Lorraine and others, 1993; De Lorraine and Dill, 1982; Whelan and others, 1984	Steers, 2003	Mesoproterozoic	1305-1284 Ma (geological relations)	McLelland & Chiarenzelli, 1990	sedex	carb-hst	unclassified
Bamnia Kalan	Haldar and Deb, 2001	Haldar and Deb, 2001; Vedanta Resources plc, 2008	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	
Baroi	Geological Survey of India, 1994; Raghu Nandan and others, 1989	Haldar, 2001	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	
Bayindir	Laznicka, 1981	Kocer and Sarac, 2001	Ordovician-Silurian			sedex	cc-hst	
Bear-Twit	Murphy, 1973; Brock, 1973	Paradis and others, 2007 (references cited within)	Late Silurian to Early Devonian			MVT		
Beishan	Metals Economics Group, 1995	Metals Economics Group, 1995	Middle Devonian			MVT		
Berg Aukas	Melcher and others, 2003; Schneider and others, 2008	Melcher and others, 2003	Neoproterozoic	750 Ma (geological relations)	Frimmel and others, 1996	N/A		
Bethumni	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Big Ledge	Hoy, 1977a	Hoy, 1987	Neoproterozoic			sedex	cc-hst	
Big Syncline	Ryan and others, 1986	Ryan and others, 1986	Early Mesoproterozoic			sedex	BHT	
Bijiashan	Cook and others, 1991	Metals Economics Group, 1995	Middle Devonian			sedex	carb-hst	unclassified
Black Angel	Pedersen, 1980; Thomassen, 1991; Carmichael, 1988; Thomassen, 2003	Carmichael, 1988; Thomassen, 2003	Paleoproterozoic			sedex	carb-hst	MVT/Irish
Black Mountain	Ryan and others, 1986; Bailie and others, 2007; McClung and others, 2008	Ryan and others, 1986	Mesoproterozoic	1285-1198 Ma (geological relations)	Cornell and others, 2009	sedex	BHT	
Bleiberg	Schroll and others, 1994; Brigo and others, 1977; Zeeh and Bechstadt, 1994	Cerny, 1989; Klau and Mostler, 1983	Middle to Late Triassic			MVT		
Bleikvassli	Bugge, 1989; Skauli and others, 1992	Bjorlykke and others, 1980; Spry and others, 1995	Neoproterozoic			sedex	cc-hst	
Blende	Robinson and Godwin, 1995	Paradis and others, 2007 (references cited within)	Mesoproterozoic			MVT		
Blyklippen	Pedersen, 1997	Nielsen, 1976	Pennsylvanian			MVT		
Boston Hill	Hitzman and Beaty, 1996	Hitzman and Beaty, 1996	Early Mississippian			MVT		
Bou Grine	Clayton and Baird, 1997; Orgeval,1994	Sheppard and others, 1996; Schmidt, 1999	Late Cretaceous			MVT	salt dome	
Bou Jabeur	Clayton and Baird, 1997; Orgeval,1994	Maghreb Minerals, 2007	Cretaceous			MVT	salt dome	
Boukdema-Kef Semmah	Touahri, 1991	Touahri, 1991	Late Jurassic-Early Cretaceous			MVT		
Broken Hill	Mackenzie and Davies, 1990; Haydon and McConachy, 1987; Van Der Heyden and Edgecombe, 1990; Wright and others, 1987; Johnson and Klingner, 1975; Stevens and others, 1980	Walters, 1996; D. Huston Geoscience Australia	Paleoproterozoic	1685 Ma (Pb-Pb model age)	Parr and others, 2004	sedex	BHT	
Broken Hill	Ryan and others, 1986; Lipson, 1990; Bailie and others, 2007; McClung and others, 2008	Ryan and others, 1986	Mesoproterozoic	1285-1198 Ma (geological relations)	Cornell and others, 2009	sedex	BHT	
Buick	Rogers and Davis, 1977; Hagni, 1995; Paarlberg, 1995	Rogers and Davis, 1977	Late Cambrian			MVT		
Bulman	Plumb and others, 1998	Admiralty Resources	Mesoproterozoic			MVT		
Bushy Park	Wheatley and others, 1986a	Wheatley and others, 1986a	Neoarchean	2038±40, 2059±41 Ma (K-Ar on illite)	Gutzmer and others, 2007	MVT		
Cadieux	Soever and Meusy, 1986; Quinn, 1952	Soever and Meusy, 1986	Mesoproterozoic			sedex	carb-hst	
Cadjebut Trend	Vearncombe and others, 1996; Vearncombe and others, 1995a; Tompkins and others, 1994	Tompkins and others, 1997	Middle Devonian			MVT		
Cannington	Wallis and others, 1998; Bailey, 1998	Bailey, 1998	Paleoproterozoic	1675 Ma (Pb-Pb model age)	Carr and others, 2001	sedex	BHT	
Canoas	Daitx, 1998	Daitx, 1998	Mesoproterozoic			sedex	unclassified	
Carrickittle	Brown and Romer, 1986	Andrew, 1990	Early Mississippian			MVT	Irish	
Castellanos	Valdes-Nodarse and Diaz-Carmona, 1993	Whitehead and others, 1996	Jurassic			sedex	sh-hst	
Century	Wallis and others, 1998; Waltho and Andrews, 1993; Hamilton and Woodcock, 1993; Broadbent and Waltho, 1998	Pasminco Limited, 2000; 2001; 2002; Waltho and other	Mesoproterozoic	1575 Ma (Pb-Pb model age)	Carr and others, 2001	sedex	cc-hst	CR
Changba-Lijiagou	Cook and others, 1991; Ma, 2000; Ma and others, 2004	Ma, 2000	Middle Devonian			sedex	carb-hst	sh-hst
Cirque	MacIntyre, 1992; Pigage, 1987; Jefferson and others, 1983; MacIntyre, 1983	Schroeter, 1994	Late Devonian			sedex	sh-hst	
Citronen Fjord	Van Der Stijl and Mosher, 1998	Van Der Stijl and Mosher, 1998	Ordovician			sedex	sh-hst	
Clear Lake	Goodfellow and Lydon, 2007; Copper Ridge Explorations Inc.	Goodfellow and Lydon, 2007 (reference cited within)	Devonian			N/A		
Colby	Hoy, 1977b	Hoy, 1982	Proterozoic			sedex	unclassified	
Cottonbelt	Hoy, 1987	Hoy, 1982	Proterozoic			sedex	unclassified	
Courtbrown	Grennan, 1986	Grennan, 1986	Early Mississippian			MVT	Irish	
Dairi (Sopokomil)	Herald Resources	Herald Resources	Pennsylvanian			sedex	sh-hst	
Daliangzi	Cromie and others, 1996; Zheng and Wang, 1991	Cromie and others, 1996	Neoproterozoic			MVT		
Dengjiashan	Ma, 2000	Ma, 2000	Middle Devonian			sedex	carb-hst	
Deri	Tiwary and Deb, 1997; Deb, 1980	Haldar, 2001	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	VMS	
Devpura	Raghu Nandan and others, 1989	http://www.mecl.gov.in/SaleReportList.aspx	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Djebba	Clayton and Baird, 1997; Orgeval,1994	www.maghrebminerals.co.uk/web/maghreb/index.cfm	Neogene			MVT	salt dome	
Dongjiahe	Metals Economic Group, 1995	Metals Economics Group, 1995	Mesozoic			sedex	carb-hst	
Dongshengmiao	Peng and others, 2000; CNNC; Tu Guangchi 1990; Zhai and others, 1997	CNNC	Paleoproterozoic			sedex	carb-hst	
Driftpile	MacIntyre, 1992; MacIntyre, 1982	Lydon, 1995	Late Devonian			sedex	sh-hst	
Duddar	Anderson and Lydon, 1990; Jones, 1995	Jones, 1995	Middle Jurassic			sedex	sh-hst	
Dugald River	Connor and others, 1990; Newbery and others, 1993; Wallis and others, 1998	Oz Minerals Ltd, 2008	Paleoproterozoic	1665 Ma (Pb-Pb model age)	Carr and others, 2001	sedex	sh-hst	unclassified
Duncan	Hoy, 1982	Hoy, 1982	Early Cambrian			sedex	carb-hst	MVT
Dy	Jennings and Jilson, 1986; Abbott and others, 1986	Jennings and Jilson, 1986	Cambrian			sedex	sh-hst	
Eclipse	Randell and Anderson, 1996	Dewing and others, 2007	Late Ordovician			MVT		
Ediacara	Drew and Both, 1984	Drew and Both, 1984	Cambrian			N/A		
Edwards	Lea and others, 1968; De Lorraine and others, 1993; De Lorraine and Dill, 1982; Whelan and others, 1984	Steers, 2003	Mesoproterozoic	1305-1284 Ma (geological relations)	McLelland & Chiarenzelli 1990	sedex	carb-hst	unclassified
El Abed	Touahri, 1991, Touahri,1997	Wadjinny, 1997; Touahri, 1991	Middle Jurassic			MVT		
Elura	Goodfellow and Lydon, 2007; David, 2008	David, 2008	Early Devonian			N/A		
Emarat	Ghazanfari, 1998; Ehay and others, 2010	Ghazanfari, 1998	Early Cretaceous			MVT		
Esker	Gummer and others, 1996; Anonymous, 1996; Wachowiak and others, 1997; Rainbird, 1997	Wachowiak and others, 1997; Brook Hunt, 2001	Paleoproterozoic			MVT		
Fagundes	Touahri, 1991	Touahri, 1991	Neoproterozoic			MVT		
Fankou	Song and Tan, 1996	Metals Economics Group, 1995	Middle-Late Devonian			MVT		
Faro	Jennings and Jilson, 1986; Abbott and others, 1986	Jennings and Jilson, 1986	Cambrian			sedex	sh-hst	
Fedj-el Adoum	Clayton and Baird, 1997; Orgeval,1994	Sheppard and others, 1996	Triassic-Cretaceous			MVT	salt dome	
Filizchai	Smirnov and Gorzhevsky, 1977	MMAJ, 2000	Early Jurassic			sedex	sh-hst	
Florida Canyon	Reid, 2001	Basuki and others, 2008	Late Triassic-Early Jurassic			MVT		
Fossil Downs	Dörling and others, 1996	Meridian Minerals Ltd, 2009	Late Devonian			MVT		
Friedensville	Callahan, 1968	Callahan, 1968	Early Ordovician			MVT		
Galmoy	Doyle and Bowden, 1995	Doyle and others, 1992; Lowther and others, 2003	Early Mississippian	290±9 Ma (paleomagnetism)	Pannalal and others, 2008b	MVT	Irish	
Gamsberg	Rozendaal and Stumpfl, 1984; Rozendaal, 1986; Bailie and others, 2007; McClung and others, 2008	Rozendaal, 1986	Mesoproterozoic	1285-1198 Ma (geological relations)	Cornell and others, 2009	sedex	BHT	
Ganesh Himal	Ghimire and others, 1995	Ghimire and others, 1995	unstated	875-785 Ma (Pb-Pb on galena)	Ghosh and others, 2005	sedex	carb-hst	
Ganeshpura	Geological Survey of India, 1994	Geological Survey of India, 1994	Paleoproterozoic			sedex	carb-hst	
Gaobanhe	Xuehui, 1996; Li and Kusky, 2007	CNNC	Mesoproterozoic	1430 Ma (galena isochron)	Li and Kusky, 2007	sedex	sh-hst	carb-hst
Garrycam	Slowey and others, 1995; Slowey, 1986	Andrew, 1990	Early Mississippian			MVT	Irish	
Gayna River	Hewton, 1982	Carriere and Sangster, 1992; Hewton, 1982	Neoproterozoic			MVT		
Gays River	Kontak, 1992; Chagnon and others, 1998	Kontak, 1992	Mississippian	300-320; 303 Ma (paleomagnetism); 297±27 Ma (Ar-Ar	Pan and others, 1993; Kontak and others, 1994; Arne a	MVT		
Goongewa (Twelve Mile Bore)	Vearncombe and others, 1996; Vearnecombe, 1995	Vearnecombe, 1995	Late Devonian	351±15 Ma (U-Pb)	Brannon and others, 1996	MVT		
Gorevsk	Smirnov and Gorzhevsky, 1977; Khiltova and Pleskach, 1997	Khiltova and Pleskach, 1997	Neoproterozoic	860-980 Ma (Rb model age)	Khiltova and Pleskach, 1997	sedex	carb-hst	
Gorno	Omenetto and Vailati, 1977	Klau and Mostler, 1983	Late Triassic			MVT		
Gorubathan	Sarkar and others, 2000; Deb and Thorp, 2004	Nandan and others, 1981	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Goz Creek	Cordilleran Engineering Limited, 1974	Yukon Geological Survey, 2008	Neoproterozoic			MVT		
Grum	Jennings and Jilson, 1986; Abbott and others, 1986	Jennings and Jilson, 1986	Cambrian			sedex	sh-hst	
Guanmenshan	Cheng-Tu and others, 1978; Zongyao and others, 1991	Zongyao and others, 1991	Neoproterozoic			MVT		
Gunga	Anderson and Lydon, 1990; Jones, 1995	Jankovic, 1986	Middle Jurassic			sedex	carb-hst	
H.B.	Hoy, 1982	Hoy, 1982	Early Cambrian			sedex	carb-hst	MVT
Harberton Bridge	Emo, 1986; Holdstock, 1982	Andrew, 1990	Early Mississippian			MVT		
Hilton-George Fisher	Forrestal, 1990; Wallis and others, 1998	Large and others, 2005; Chapman, 2001	Late Paleoproterozoic	1655 Ma (host rock age)	Page and others, 2000	sedex	cc-hst	CR
Houhongqiao	CNNC	CNNC	Late Devonian			MVT		
Howards Pass	Goodfellow and Jonasson, 1986	Selwyn Resources Ltd., 2008 (www.selwynresources.co	Early Silurian			sedex	sh-hst	
Huayuan	Boni and others, 2001;Liu and others, 1997	CNNC; Liu and others, 1997	Early Cambrian			MVT		
Huogeqi	CNNC	CNNC	Mesoproterozoic			sedex	cc-hst	
Hyatt	Lea and others, 1968; De Lorraine and Dill, 1982; Whelan and others, 1984	Steers, 2003	Mesoproterozoic			sedex	carb-hst	unclassified
HYC	Plumb and others, 1998; Logan and others, 1990	MIM, 2002; NTDME, 2002; D. Huston Geoscience Austral	Late Paleoproterozoic	1636±4 Ma (paleomagnetism)	Symons, 2007	sedex	cc-hst	CR
Idol	Lu and others, 1995	Lu and others, 1995	Early Ordovician			MVT		
Indian Creek	Hagni, 1995; Kyle and Gutierrez, 1988	Kyle and Gutierrez, 1988	Late Cambrian			MVT		
Irankuh	Ghazban and others, 1994	Ghazban and others, 1994	Early Cretaceous			MVT		
Jabal Dhaylan	Hayes and others, 2000	Hayes and others, 2000	Middle Miocene			MVT	salt dome	
Januaria	Robertson, 1963	Robertson, 1963	Neoproterozoic			MVT		
Jason	Abbott and others, 1986; Turner, 1990; Bailes and others, 1986	HudBay Minerals Inc, 2008	Late Devonian			sedex	sh-hst	
Jersey	Hoy, 1982; Bradley, 1970	Hoy, 1982; Bradley, 1970	Early Cambrian			sedex	carb-hst	MVT
Jiashengpan	Metals Economics Group, 1995; Xuehui, 2001; Peng and others, 2000	Metals Economics Group, 1995	Mesoproterozoic			sedex	sh-hst	carb-hst
Jubilee	Fallara and others, 1998	Fallara and others, 1998	Early Mississippian			MVT		
Kamarga	Jones and others, 1999	Jones and others, 1999	Late Paleoproterozoic			MVT		
Kankariya	Geological Survey of India, 1994	Geological Survey of India, 1994	Paleoproterozoic			sedex	unclassified	
Kapok	Symons and Arne, 2003	Symons and Arne, 2003	Late Devonian	351±8 Ma (paleomagnetism)	Symons and Arne, 2003	N/A	N/A	N/A
Kayar	Geological Survey of India, 1994	Haldar, 2001	Paleoproterozoic			sedex	unclassified	
Keel	Slowey and others, 1995; Slowey, 1986	Slowey, 1986	Early Mississippian			MVT	Irish	
Kherzet Youcef	Touahri, 1991	Touahri, 1991	Early Cretaceous			MVT		
Kholodninskoye	Smirnov and Gorzhevsky, 1977; Larin and others, 1997; Distanov and others, 1982; Dobretsov, 1996	Laznicka, 1981	Neoproterozoic	760-720 Ma (Pb model ages)	Dobretsov, 1996	sedex	sh-hst	
Komdok	Hedenquist and others, 2001; Tse, 2001	Tse, 2001	Paleoproterozoic			MVT		
Kootenay King	Hoy, 1982; Ney, 1957a	Hoy, 1982; Paiement and others, 2007	Mesoproterozoic			sedex	cc-hst	
Kuangshanchang	Li Wenbo, 2003; CNNC	CNNC	Mississippian	228±16 Ma (Sm-Nd on gangue calcite)	Li and others, 2006	MVT		
Kuh-e-Surmeh	Liaghat and others, 2000	Liaghat and others, 2000	Late Permian			MVT		
Kushk	Gibbs, 1976; Forster and Jafarzadeh, 1994	Forster and Jafarzadeh, 1994	Eocambrian			sedex	sh-hst	carb-hst
Lady Loretta	Loudon and others, 1975; Large and McGoldrick, 1998; Dunster and Mcconachie, 1998; Wallis and others, 1998	Xstrata, 2009	Paleoproterozoic	1645 Ma	D. Huston Geoscience Australia, oral commun.	sedex	cc-hst	CR
Lafatsch	Klau and Mostler, 1983	Klau and Mostler, 1983	Late Triassic			MVT		
Les Malines	Foglierini and others, 1980; Macquar and others, 1990	Caia and Michaud, 1980	Middle Cambrian			MVT		
Lik	Forrest and Sawkins, 1987	Northern Miner, May 28, 2009	Mississippian			sedex	sh-hst	CR
Lisheen	Shearley and others, 1995	Goodfellow and Lydon, 2007 (reference cited within)	Early Mississippian	350 Ma (Ar-Ar); 315 Ma (Ar-Ar); 340 Ma (Ar-Ar); 277±7	Hitzman , 1994; Pannalal and others, 2008a	MVT	Irish	
Luoba	Cook and others, 1991	CNNC	Middle Devonian			sedex	carb-hst	
Madarpura	Geological Survey of India, 1994	Geological Survey of India, 1994	Paleoproterozoic			sedex	unclassified	
Magmont	Sweeney and others, 1977; Bradley and Krolak, 1989; Hagni, 1995	Bradley and Krolak, 1989	Late Cambrian			MVT		
Maozu	Metals Economics Group, 1995	Metals Economics Group, 1995	Early Cambrian			sedex	carb-hst	
Maramungee	Wallis and others, 1998; Williams and Heinemann, 1993	Williams and Heinemann, 1993	Mesoproterozoic			sedex	unclassified	
Matahambre	Valdes-Nodarse and Diaz-Carmona, 1993	Valdes-Nodarse and Diaz-Carmona, 1993	Jurassic			sedex	sh-hst	
Meggen	Walther, 1986; Krebs, 1981	Krebs, 1981	Middle Devonian			sedex	carb-hst	CR
Mehdiabad	Chapple, 2003	Chapple, 2003; Reichert and Borg, 2008 (references cite	Early Cretaceous			MVT		
Mel	MacIntyre, 1991; Miller and Wright, 1986	Goodfellow and Lydon, 2007 (reference cited within)	Cambrian to Ordovician			sedex	carb-hst	
Mezica	Bancroft and others, 1991	Klau and Mostler, 1983	Late Triassic			MVT		
Mochia	Geological Survey of India, 1994; Raghu Nandan and others, 1989; Roonwal and Wadhawan, 1980; Ghose, 1957; Straczek and Srikantan, 1996	Haldar, 2001	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	
Mofjellet	Bugge, 1989	Galley and others, 2007 (references cited within)	Neoproterozoic			sedex	unclassified	
Mokanpura North	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Haldar, 2001	Paleoproterozoic	1800 Ma	Deb and Thorpe, 2004	sedex	carb-hst	
Monarch-Kicking Horse	Ney, 1951, 1954, 1957b	Paradis and others, 2007 (references cited within)	Middle Cambrian	Late Cretaceous to Paleocene (paleomagnetism)	Symons and others, 1998	MVT		
Morro Agudo	Hitzman and others, 1995	Hitzman and others, 1995	Neoproterozoic			MVT	Irish	sedex
Mount Isa	Forrestal, 1990; Mathias and Clark, 1975; Wallis and others, 1998; Blake and others, 1990	Large and others, 2002	Late Paleoproterozoic	1655 Ma (Pb-Pb model age)	Carr and others, 2001	sedex	cc-hst	CR
Mount Torrens	Belperio and others, 1998	Belperio and others, 1998	Cambrian			sedex	cc-hst	
Moyvoughly	Poustie and Kucha, 1986	Poustie and Kucha, 1986	Early Mississippian			MVT		
Nanisivik	Sutherland and Dumka, 1995	Sherlock and others, 2004; Sutherland and Dumka, 1995	Mesoproterozoic	1095±10 Ma (paleomagnetism); 461±2 Ma (Ar-Ar)	Symons and others 2001; Sherlock and others, 2004	MVT		
Napier Range (Narlarla)	Ringrose, 1984	Meridian Minerals Ltd, 2009; Ringrose, 1984	Late Devonian			MVT		
Navan	Ashton and others, 1986; Ashton, 1995; Anderson and others, 1998	Ashton, 2005	Early Mississippian	333±4 Ma (paleomagnetism)	Symons and others, 2002	MVT	Irish	
Newfoundland Zinc	Lane, 1990; Nakai and others, 1993	Lane, 1990	Early Ordovician	380±7 Ma (paleomagnetism); 360±10 Ma (Ar-Ar)	Pan and Symons, 1993; Nakai and others, 1993; Hall a	MVT		
Niujiaotang	Ye and Liu, 1999	CNNC	Early Cambrian			MVT		
North Park	Karlstrom and others, 1983	Caprock Corp.Newsletter, 1991	Paleoproterozoic			sedex	unclassified	
Nova Redencao	Misi and others, 1999	Misi and others, 1999	Neoproterozoic			MVT		
Nunngarut	Carmichael, 1988	Carmichael, 1988	Paleoproterozoic			sedex	carb-hst	MVT
Oldcastle	Brand and Emo, 1986	Brand and Emo, 1986	Early Mississippian			MVT	Irish	
Paduna North Block	Geological Survey of India, 1994	Geological Survey of India, 1994	Paleoproterozoic			sedex	carb-hst	
Pavlovskoye	Kalenich and others, 2002	Kalenich and others, 2002	Early Devonian			MVT	sedex	
Pegmont	Vaughan and Stanton, 1986; Stanton and Vaughan, 1979; Wallis and others, 1998	Wallis and others, 1998; D. Huston Geoscience Australia	Paleoproterozoic	1675 Ma	D. Huston Geoscience Australia, oral commun.	sedex	BHT	unclassified
Pend Oreille-Yellowhead	Zieg, 2001	Zieg, 2001	Cambro-Ordovician			MVT	Irish	
Perau	Da Silva and others, 1988; Daitx, 1998	Daitx, 1998	Mesoproterozoic			sedex	unclassified	
Pering	Southwood, 1986; Wheatley and others, 1986a	Wheatley and others, 1986	Neoarchean	1980±80 Ma (Rb-Sr)	Kruger and others, 1999, Kruger and others, 2001	MVT		
Picos de Europa	Gomez Fernandez and Arribas Moreno, 1994	Gomez Fernandez and Arribas Moreno, 1994	Pennsylvanian			MVT		
Pierrepont	Meusy, 1986	Steers, 2003	Mesoproterozoic			sedex	carb-hst	unclassified
Pillara (Blendevale)	Vearncombe and others, 1996; Vearncombe and others, 1995b	Gwatkin and Muccilli, 2002	Late Devonian	357±3 Ma (Rb-Sr); 356±3 Ma (paleomagnetism)	Christensen and others, 1995; Symons and Arne, 2005	MVT		
Pinnacles	Parr, 1994	Parr, 1994	Paleoproterozoic	1695 Ma (Pb-Pb model age)	Parr and others, 2004	sedex	BHT	unclassified
Polaris	Sharp and others, 1995; Christensen and others, 1996; Symons and Sangster, 1992; Randell, 1994	Randell, 1994	Late Ordovician	367±7 Ma (paleomagnetism); 366±15 Ma (Rb-Sr); 374	Symons and Sangster, 1992; Christensen and others, 1	MVT		
Prairie Creek	Canadian Zinc Corporation	The Northern Miner, 2003	Early Ordovician			MVT		
Qiandongshan	Song, 1994	Anonymous, 1994	Middle Devonian			sedex	unclassified	
Qilinchang	Zhou and others, 2001	Zhou and others, 2001	Mississippian	225±9.9 Ma (Sm-Nd on gangue calcite); 223±3.9, 226	Li and others, 2006; Mudan and others, 2009	MVT		
Qixiashan	Metals Economics Group, 1995	Metals Economics Group, 1995	Devonian-Permian			MVT		
Raibl	Brigo and Omenetto, 1978; Casari, 1996; Brigo and others, 1977	Laznicka, 1981	Middle to Late Triassic			MVT		
Rajpura-Dariba	Deb and others, 1989; Deb and Bhattacharya, 1978; Halder and Deb, 2001; Deb and Kumar, 1982; Rao and others, 1972	Haldar, 2001	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex		
Rammelsberg	Hannak, 1981; Walther, 1986	Large and Walcher, 1999	Middle Devonian			sedex	sh-hst	
Rampura-Agucha	Deb, 1992; Gandhi, 2001; Gandhi and others, 1984; Deb and Sehgal, 1997; Holler and Gandhi, 1995	Vedanta Resources plc, 2008	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Rangpo	Sarkar and others, 2000	Nandan and others, 1981; Deb and Thorp, 2004	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	cc-hst	unclassified
Red Dog	Jennings and King, 2002	Jennings and King, 2002	Mississippian	338.3±5.8 Ma (Re-Os on pyrite)	Morelli and others, 2004	sedex	sh-hst	
Reef Ridge	Schmidt, 1997; Nokleberg and others, 1994	Schmidt, 1997	Early Devonian			MVT		
Remac	Hoy, 1982	Hoy, 1982	Early Cambrian			sedex	carb-hst	MVT/Irish
Reocin	Vadala and others, 1981; Barbanson and others, 1983; Velasco and others, 2003	Velasco and others, 2003	Early Cretaceous	15±10 Ma (paleomagnetism)	Symons and others, 2009	MVT		
Rewara	Deb and Sarkar, 1990; Deb and others, 1989; Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic			sedex	unclassified	
Rickardstown	Hitzman and Beaty, 1996	Hitzman and Beaty, 1996	Early Mississippian			MVT		
River Jordan	Hoy, 1982	Hoy, 1982	Proterozoic			sedex	cc-hst	
Robb Lake	Macqueen and Thompson, 1978; Paradis and others, 1999	Paradis and others, 1999	Early to Middle Devonian	47±17 Ma (paleomagnetism)	Smethurst and others, 1999	MVT		
Rosh Pinah	Vuuren 1986; Page and Watson, 1976	Moore, 2002	Neoproterozoic			sedex	VMS	cc-hst
Ruddock Creek	Hoy, 1982	Hoy, 1982	Proterozoic			sedex	unclassified	
Saladipura	Das Gupta, 1970; Sarkar and others, 1980; Raghu Nandan and others, 1989; Deb and others, 1989	Raghu Nandan and others, 1989	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Salafossa	Lagny, 1975	Klau and Mostler, 1983	Late Triassic			MVT		
Samodi	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic			sedex	unclassified	
San Vicente	Fontbote and Gorzawski, 1990	Fontbote and others, 1995	Early Jurassic			MVT		
Santa Lucia	Valdes-Nodarse and Diaz-Carmona, 1993	Valdes-Nodarse and Diaz-Carmona, 1993	Jurassic			sedex	sh-hst	
Sardana	Zapolnov, 1997	Shpikerman, 1987	Neoproterozoic			MVT		
Sawar	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	
Schmalgraf	Dejonghe, 1998	Dejonghe and others, 1993	Devonian-Carboniferous			MVT		
Sedmochislenitsi	Minceva-Stefanova, 1967	Laznicka, 1981	Triassic			MVT		
Sherman	Johansing and Thompson, 1990	Johansing and Thompson, 1990	Mississippian	272±18 Ma (paleomagnetism)	Symons and others, 2000	MVT	CR	
Siding	Schneider and others, 1991	CNNC	Early-Middle Devonian			MVT		
Silvermines	Andrew, 1986	Andrew, 1995	Early Mississippian	269±4 Ma (paleomagnetism); 360±5 Ma (Rb-Sr on sph	Symons and others, 2007; Schneider and others, 2007	MVT	Irish	
Sindesar Kalan East	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Haldar, 2001; http://www.mecl.gov.in/SaleReportList.as	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Sindesar Khurd	Haldar and Deb, 2001	Vedanta Resources plc, 2008	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	unclassified
Sorby Hills	Jorgensen and others, 1990	Jorgensen and others, 1990	Mississippian			MVT		
South Cirque	MacIntyre, 1983; MacIntyre, 1992	MacIntyre, 1983	Late Devonian			sedex	sh-hst	
South Dedwas	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic			sedex	unclassified	
Su (Lik south)	Jennings and King, 2002	Zazu Metals Corp., 2009	Mississippian	338±5.8 Ma (Re-Os on pyrite)	Morelli and others, 2004	sedex	sh-hst	
Sullivan	Lydon, 2000	Lydon, 2000	Mesoproterozoic	1470 Ma (U/Pb and geologic relations)	Lydon, 2000	sedex	cc-hst	
Sumsar	Laznicka, 1981	Laznicka, 1981	Devonian			MVT		
Swim	Jennings and Jilson, 1986; Abbott and others, 1986	Gardiner, 1988	Cambrian			sedex	sh-hst	
Tanyaokou	Metals Economics Group, 1995; Xuehui, 2001; Peng and others, 2000	Metals Economics Group, 1995	Mesoproterozoic			sedex	sh-hst	carb-hst
Tatestown	Andrew and Poustie, 1986	Johnston, 1999	Early Mississippian			MVT	Irish	
Tianbaoshan	Wang and others, 2000	Cromie and others, 1996	Neoproterozoic			MVT		
Tikhi	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic			sedex	carb-hst	
Tiranga	Raghu Nandan and others, 1989; Geological Survey of India, 1994	Raghu Nandan and others, 1989	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	unclassified	
Tom	Goodfellow and Rhodes, 1990; Abbott and others, 1986; McClay and Bidwell, 1986	HudBay Minerals Inc, 2008	Late Devonian			sedex	sh-hst	
Tongmugou	Jiang and others, 1995; CNNC	CNNC	Middle Devonian			sedex	carb-hst	
Touissit-Bou Beker	Bouabdellah and others, 1999	Bouabdellah and others, 1999	Middle Jurassic			MVT		
Tres Irmas	Kyle and Misi, 1997	Companhia Baiana de Pesquisa Mineral, undated	Neoproterozoic			MVT	Irish	
Treves	Macquar and others, 1990; Macquar and Lagny, 1981	Michaud, 1976	Early Jurassic	Late Paleocene to Early Eocene (paleomagnetism)	Henry and others, 2001; Rouvier and others, 2001	MVT		
Triumph	Otto and Turner, 1989	Otto and Turner, 1989; Otto and Zieg, 2003	Early Middle Devonian			sedex	cc-hst	
Troya	Fernandez-Martinez and Velasco, 1996	Fernandez-Martinez and Velasco, 1996	Early Cretaceous			sedex	carb-hst	MVT
Tsongoari	Henry and others, 2002; Stanistreet and Charlesworth, 1999; 2001	Henry and others, 2002	Neoproterozoic	≈650 Ma (geological relations)	Stanistreet and Charlesworth, 1999; 2001	sedex	carb-hst	sh-hst
Tynagh	Clifford and others, 1986	Andrew, 1990	Early Mississippian			MVT	Irish	
Umm Gheig	Hassaan, 1990	Moharram and others, 1970	Neogene			MVT		
Upton	Paradis and others, 2004; Goodfellow and Lydon, 2007	Paradis and others, 2004	Early Ordovician			N/A		
Urultun	Shpikerman, 1987	Shpikerman, 1987	Early Devonian			MVT		

Table A1. Compilation of Data from Global MVT and SEDEX Deposits

Deposit	General References	Prod. or Res. References	Host-Rock Age	Mineralization Age and Method	Age Reference	Dep. type A	Dep. type B	Dep. type C
Van Stone	Cox, 1968	Zieg, 2001; Cox, 1968	Cambro-Ordovician			MVT		
Vangorda	Jennings and Jilson, 1986; Abbott and others, 1986	Goodfellow and Lydon, 2007 (reference cited within)	Cambrian			sedex	sh-hst	
Viburnum #27	Hagni, 1995	Grundmann, Jr., 1977	Late Cambrian			MVT		
Villemagne	Macquar and others, 1981;1990	Macquar and others, 1981;1990	Early Jurassic	Late Paleocene to Early Eocene (paleomagnetism)	Henry and others, 2001; Rouvier and others, 2001	MVT		
Wagon Pass	Vearncombe, 1995	Vearnecombe, 1995	Late Devonian			MVT		
Walton	Goodfellow and Lydon, 2007; Kontak and others, 2006	Goodfellow and Lydon, 2007 (reference cited within)	Mississippian			N/A		
West Fork	Dingess, 1989; Hagni, 1995; Dingess and Erickson, 1995	Dingess and Erickson, 1995	Late Cambrian			MVT		
Xidinggou	Song, 1994	CNNC	Middle Devonian			sedex	carb-hst	
Yahyali	Yigit, 2009; www.anatolia_minerals.com, accessed 2003	www.anatolia_minerals.com, accessed 2003	Devonian			MVT		
Yindongliang	CNNC	CNNC	Middle Devonian			sedex	sh-hst	carb-hst
Zawarmala	Geological Survey of India, 1994; Raghu Nandan and others, 1989; Singh, 1988	Goodfellow and Lydon, 2007 (reference cited within)	Paleoproterozoic	≈1800 Ma (geological relations)	Deb and Thorpe, 2004	sedex	carb-hst	

Table A2. Compilation of age and resource information for selected sediment-hosted lead-zinc districts.

District	Country	Latitude	Longitude	Dep. Type A	Dep. Type B	Host Rocks	Host Rock Age	General References	Mineralization Age (Ma) and Method	Age Reference	Prod.+Res. (Million Metric Tonnes)	Pb %	Zn %	Ag (g/t)	Zn Metal (Mt)	Other	Prod or Res. References
Austinville-Ivanhoe	United States	36.85	-80.92	MVT		dolostone	Cambrian	Brown and Weinberg, 1968			22.63	0.70	3.70				Brown and Weinberg, 1968
Bajiazi	China	40.62	120.12	CD	CR	dolostone	Mesoproterozoic	Hou and Zhao, 1993			22.00	5.50	5.10	1000.00		25.5%S	Hou and Zhao, 1993
Central Tennessee	United States	36.20	-85.94	MVT		limestone	Early Ordovician	Gaylord, 1995; Gaylord and Briskey, 1983	249 (Paleomagnetism); 260 (Th-Pb)	Lewchuk and Symons, 1996; Brannon and others, 1993	71.00		3.31				Briskey and others, 1986; PASMINCO Ann. Reports
Mascot-Jefferson City	United States	36.13	-83.63	MVT		dolostone	Early Ordovician	Misra and Fulweiler, 1995; Briskey and others, 1986	286 (Paleomagnetism); 347, 377 (Rb-Sr)	Bachtadse and others, 1987; Nakai and others, 1993	500.00		3.00				Briskey and others, 1986
Metaline	United States	48.88	-117.33	MVT		limestone	Middle Cambrian	Dings and Whitebread,1965			7.52	1.34	2.77				Dings and Whitebread,1965
Old Lead Belt	United States	37.58	-90.53	MVT		dolostone	Late Cambrian	Snyder and Gerdemann, 1968			206.00	2.80					Hagni, 1995
Tri-State	United States	37.08	-94.50	MVT		limestone	Early to Late Mississippian	Brockie and others, 1968	265 (Paleomagnetism); 251 (Th-Pb)	Pan and others, 1990; Brannon and others, 1996	453.59	0.57	2.33				Brockie and others, 1968
Upper Mississippi Valley	United States	42.45	-90.42	MVT		dolostone	Middle Ordovician	Heyl and others, 1959	269 (Rb-Sr); 277 (Rb-Sr)	Brannon and others, 1993; 1996	40.22	1.86	2.73				Heyl and others, 1959
Upper Silesia	Poland	50.40	19.33	MVT		dolostone	Middle Triassic	Leach and others, 2003	46 (Paleomagnetism); 135 (Rb-Sr)	Symons and others, 1995; Heijlen and others, 2003	731.00[a]	1.34	4.24				Leach and others, 2003
Viburnum Trend	United States	37.55	-91.25	MVT		dolostone	Late Cambrian	Hagni, 1995; Wisniowiecki and others, 1983			215.91	6.47	0.93				Hagni and Coveney, 1989; Rogers and Davis, 1977
Pine Point	Canada	60.78	-114.58	MVT		dolostone	Middle Devonian	Rhodes and others, 1984; Arne, 1991; Nakai and others, 1993; Symons and others, 1993	71 (Paleomagnetism); 361 (Rb-Sr)	Symons and others, 1993; Nakai and others, 1993	76.11	2.91	6.51				Rhodes and others, 1984
Northern Arkansas	United States	36.12	-92.75	MVT		dolostone, limestone	Ordovician; Mississippian	McKnight, 1935	265 (Paleomagnetism)	Pan and others, 1990					0.65		McKnight, 1935

[a] Plus oxidixed ore reserves of 57 Mt

*Note: Data for Central Tennessee represents production for 1975 to 1985, 1993 to 2003, and unmined resources as of 2003. Production data for the years 1986 to 1992 were not available at the time of compilation.

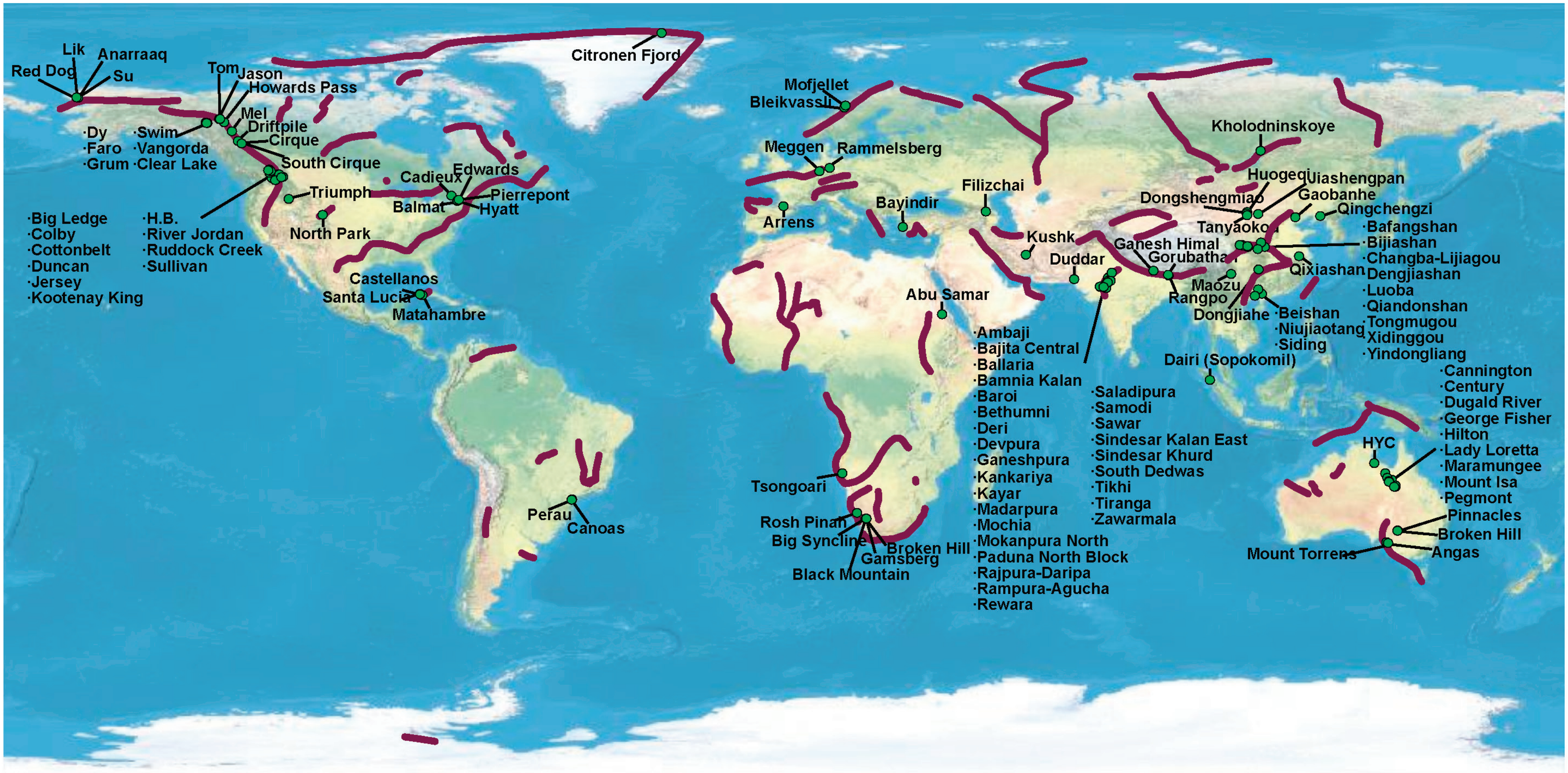

Figure B1. Global distribution of clastic-dominated lead-zinc deposits and ancient passive margin sequences (shown as purple lines).

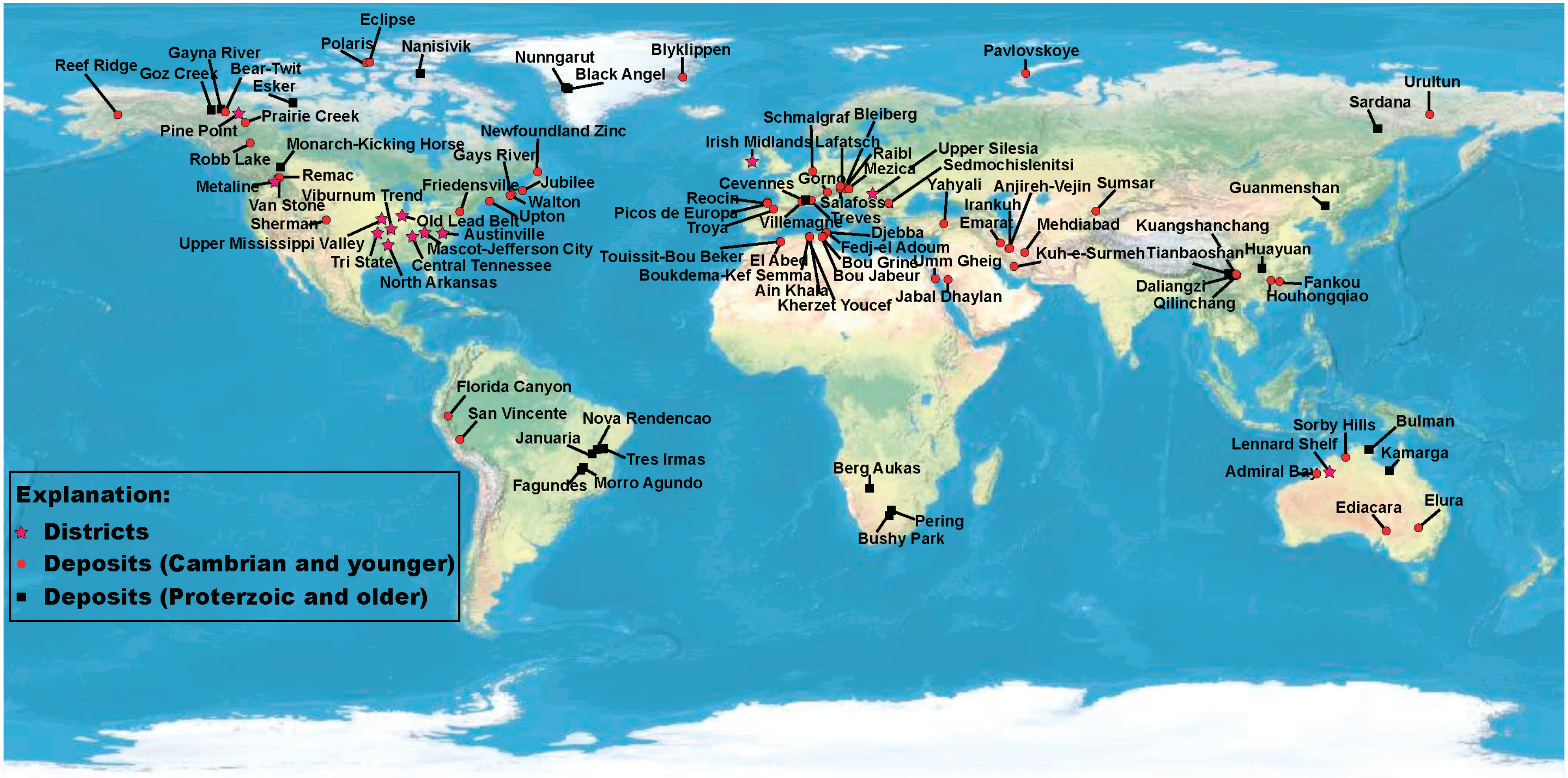

Figure B2. Global distribution of Mississippi Valley-type lead-zinc deposits and districts.

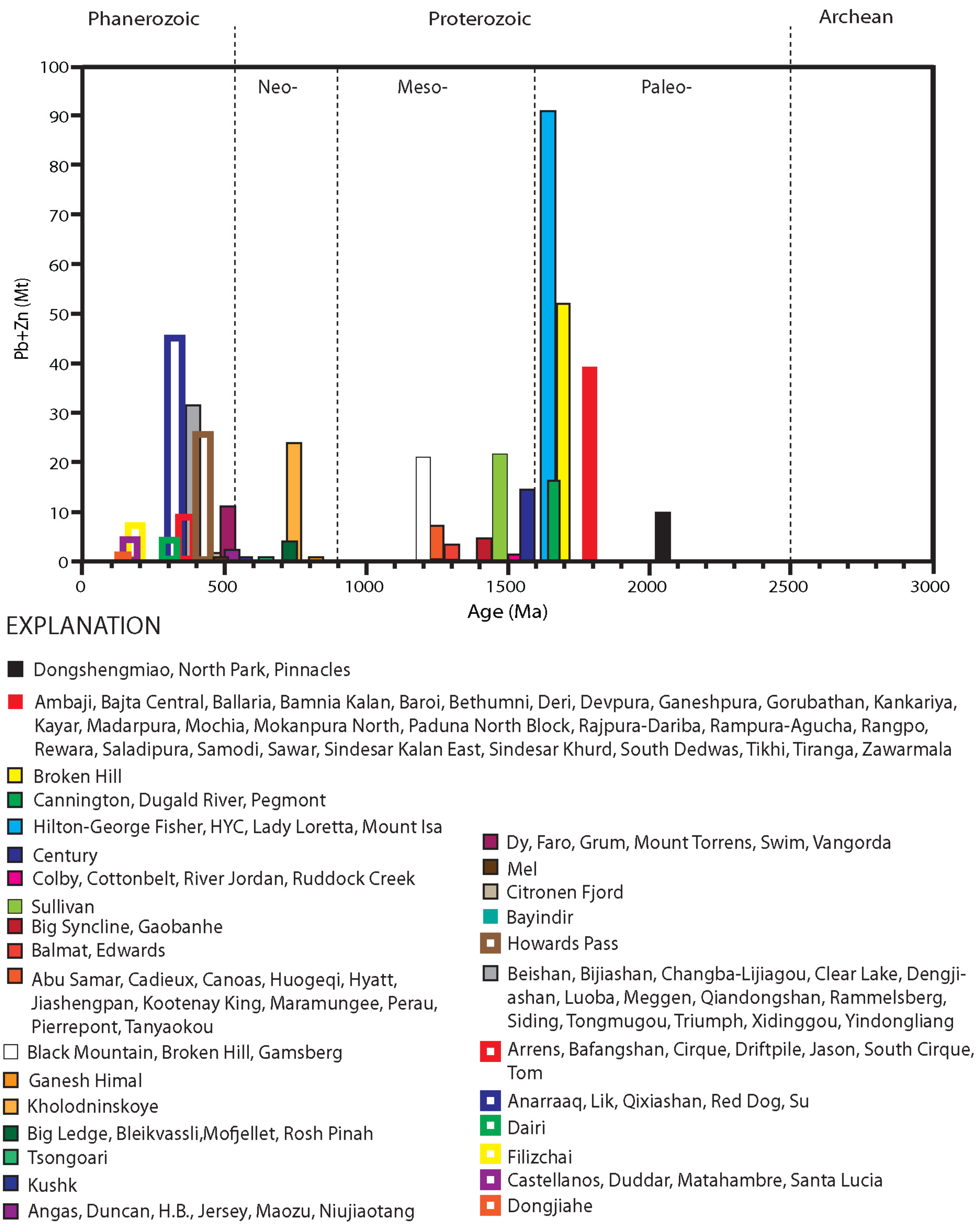

Figure B3. Clastic-dominated lead-zinc deposits through time. Ages based on direct dating of ore mineralization or age of host-rock. Explanation list ordered from oldest to youngest deposits.

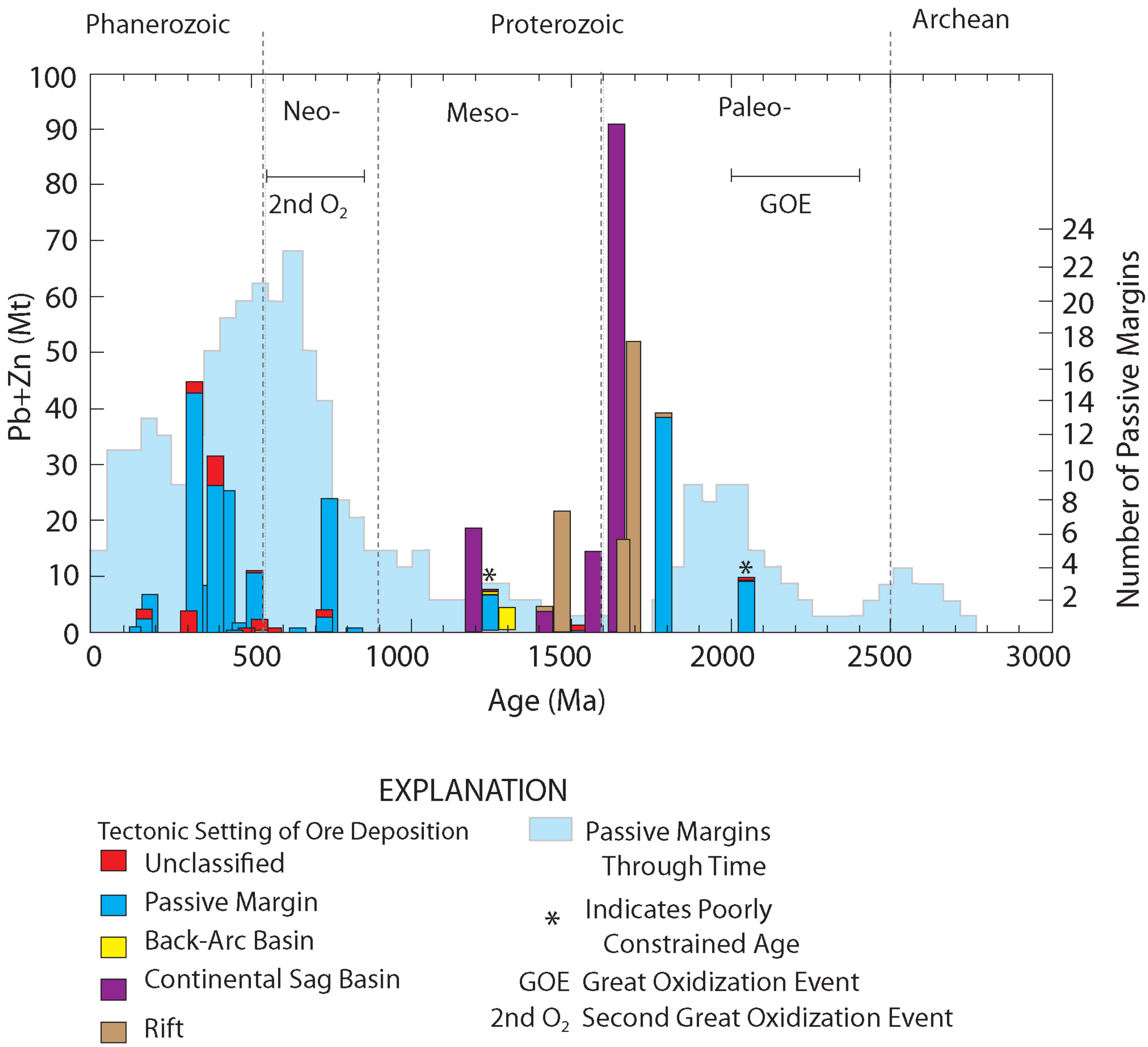

Figure B4. Secular distribution of clastic-dominated lead-zinc deposits classified by their tectonic setting during mineralization. The number of passive margins through time are shown for comparison. Passive margins through time from Bradley, 2008.

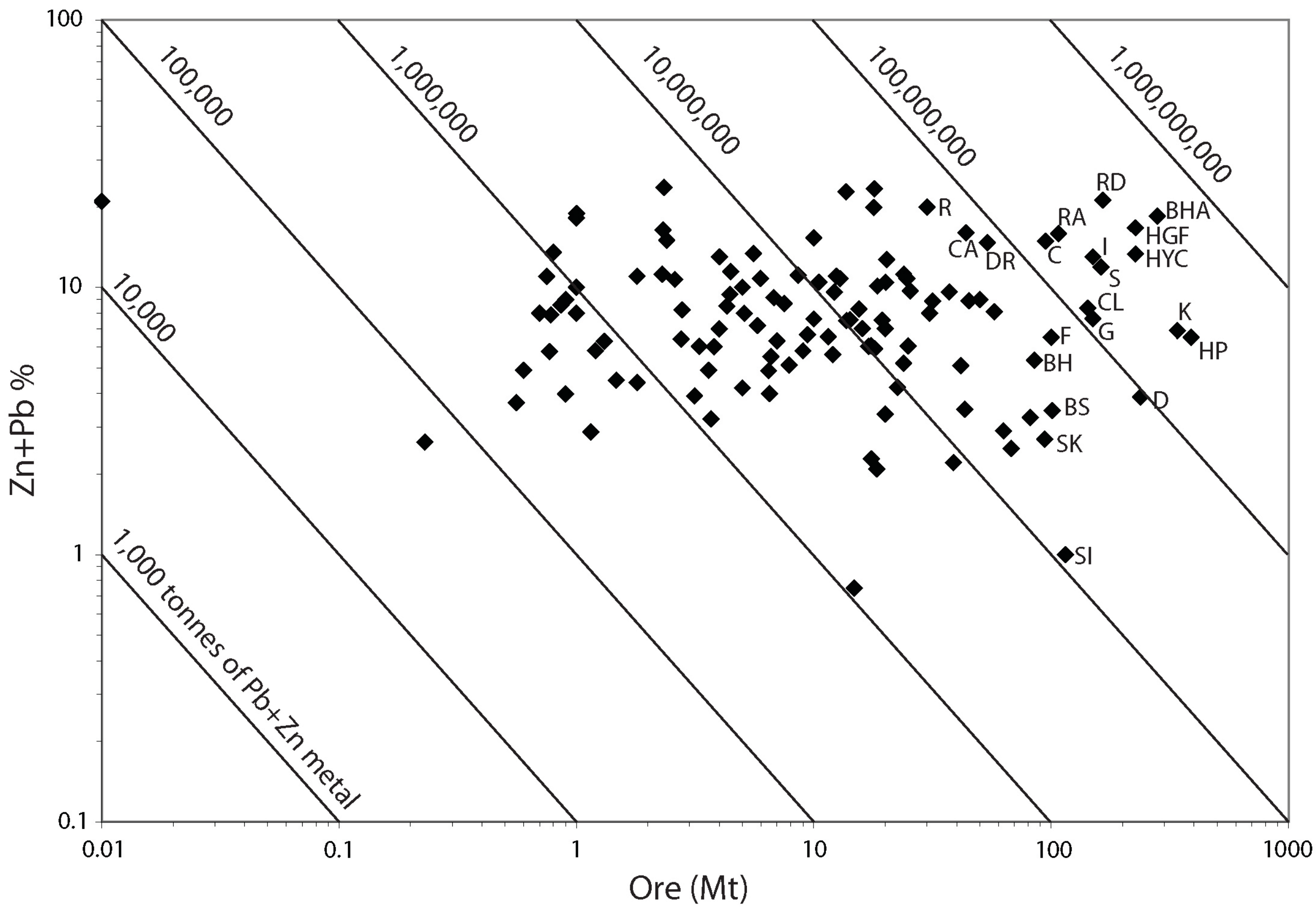

Figure B5. Grade/tonnage for 121 clastic-dominated lead-zinc deposits. Diagonal lines represent total tonnage of contained zinc and lead metal. Select deposits are labeled as: BH=Broken Hill, South Africa; BHA=Broken Hill, Australia; BS=Big Syncline, South Africa; C= Century, Australia; CA=Cannington, Australia; CL= Changba-Lijiagou, China; D=Dongshengmiao, China; DR=Dugald River, Australia; F=Filizchai, Azerbaijan; G=Gamsberg, Germany; HGF=Hilton-George Fisher, Australia; HP=Howards Pass, Canada; HYC=HYC, Australia; I=Mount Isa, Australia; K=Kholodninskoye, Russia; R=Rammelsberg, Germany; RA=Rampura-Agucha, India; RD=Red Dog, USA; S=Sullivan, Canada; SI= Saldipura, India; SK= Sindesar Kalan East, India.

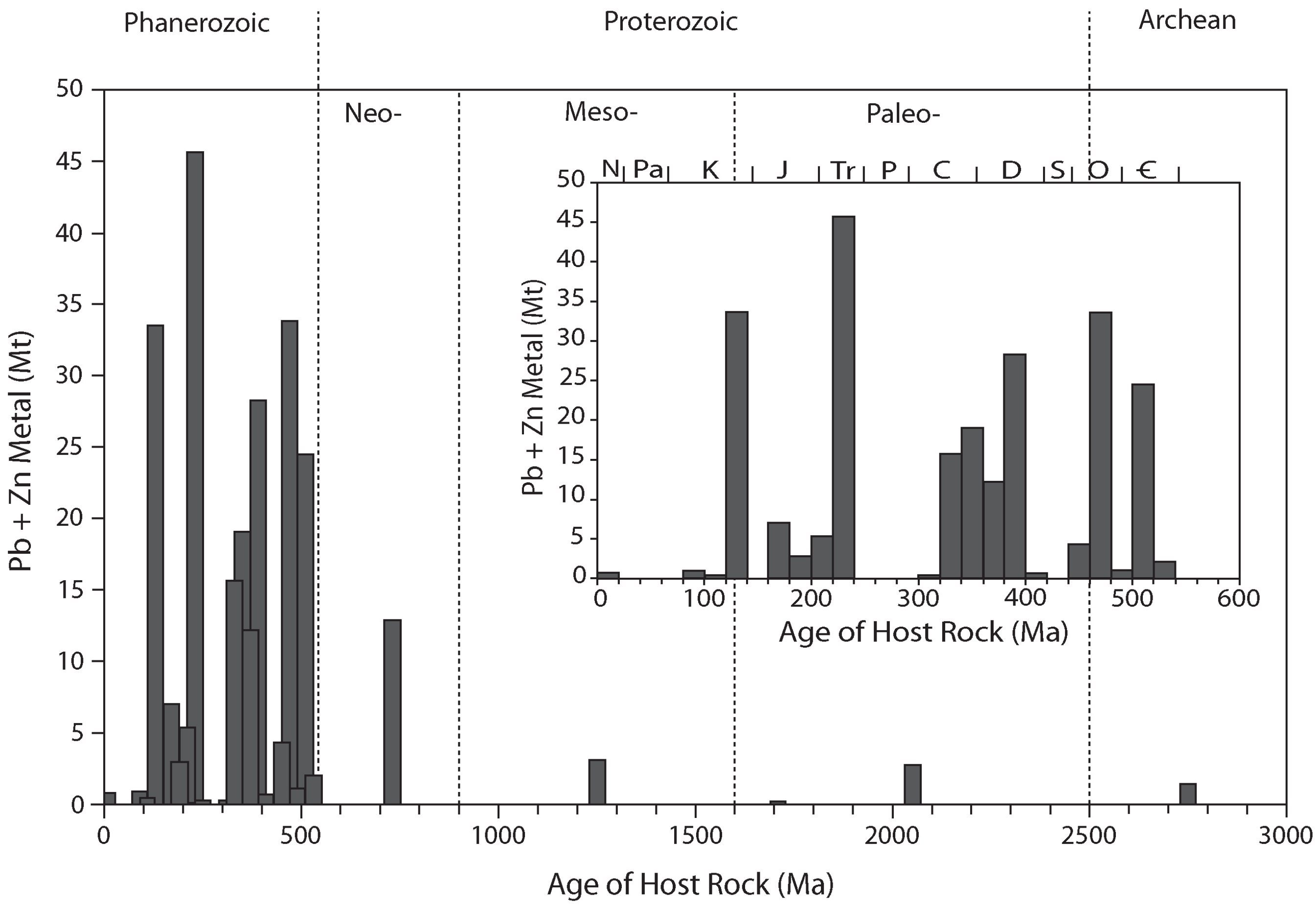

Figure B6. Secular distribution of Mississippi Valley-type metal and age of host rock. Data for 107 deposits and 10 districts are summarized from the Neoproterozoic to present. Mesoproterozoic deposits include Bulman and Nanisivik. Paleoproterozoic deposits include Black Angel, Esker, and Nunngarut. Archean deposits include Bushy Park-Pering. Inset shows a more detailed distribution of metal content from 600 Ma to present.

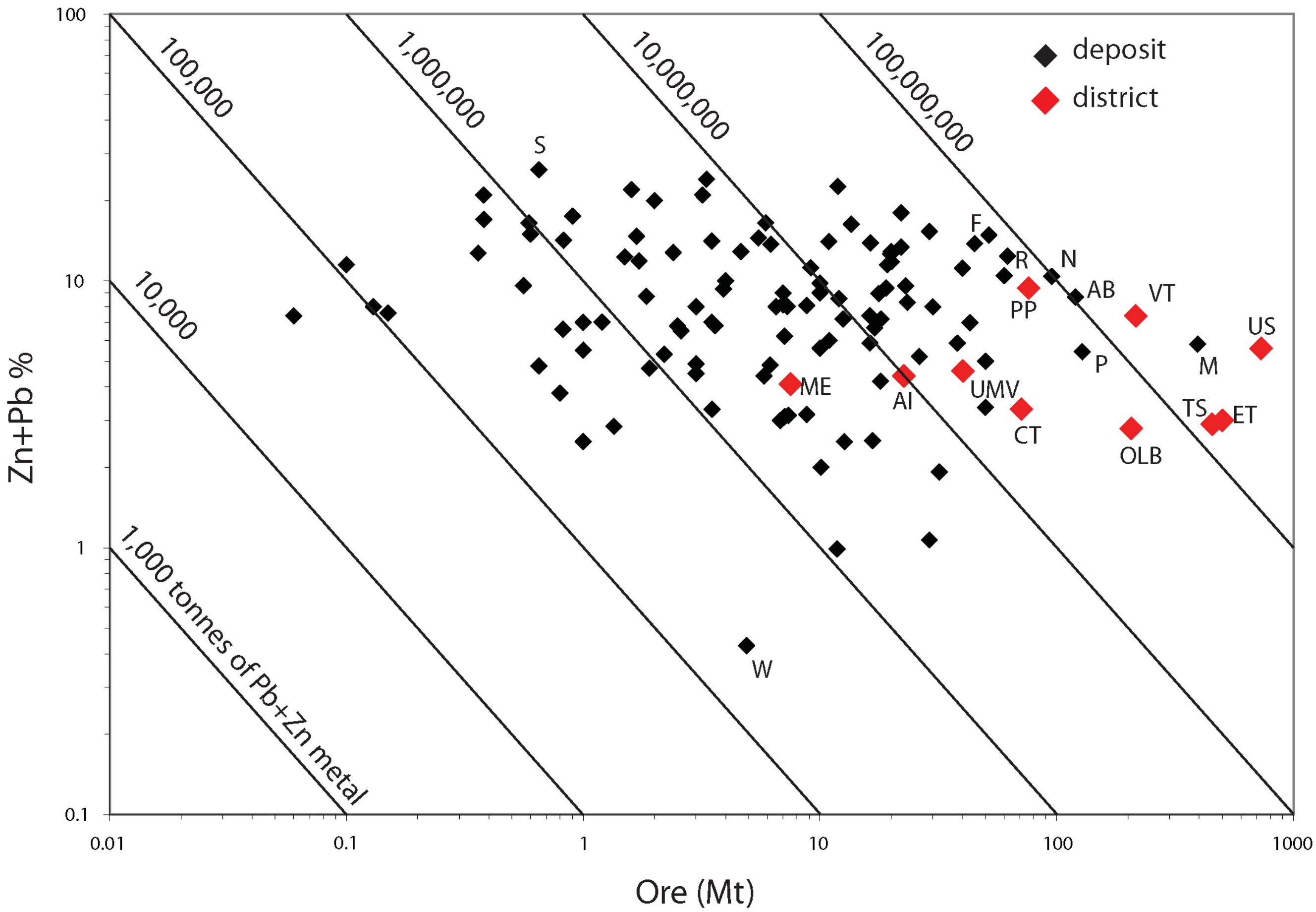

Figure B7. Grade-tonnage for 113 Mississippi Valley-type deposits and 10 districts. Diagonal lines represent tonnage of Pb and Zn metal. Select districts and deposits are labeled as: AB=Admiral Bay, Australia; AI=Austinville-Ivanhoe, USA; CT=Central Tennessee, USA; ET=East Tennessee, USA; F=Fankou, China; M=Mehdiabad, Iran; ME=Metaline, USA; N=Navan, Ireland; OLB=Old Lead Belt, USA; P=Pavlovskoye, Russia; PP=Pine Point, Canada; R=Reocin, Spain; S=Schmalgraf, Belgium; TS=Tri-State, USA; UMV=Upper Mississippi Valley, USA; US=Upper Silesia, Poland; VT=Viburnum Trend, USA; W=Walton, Canada.

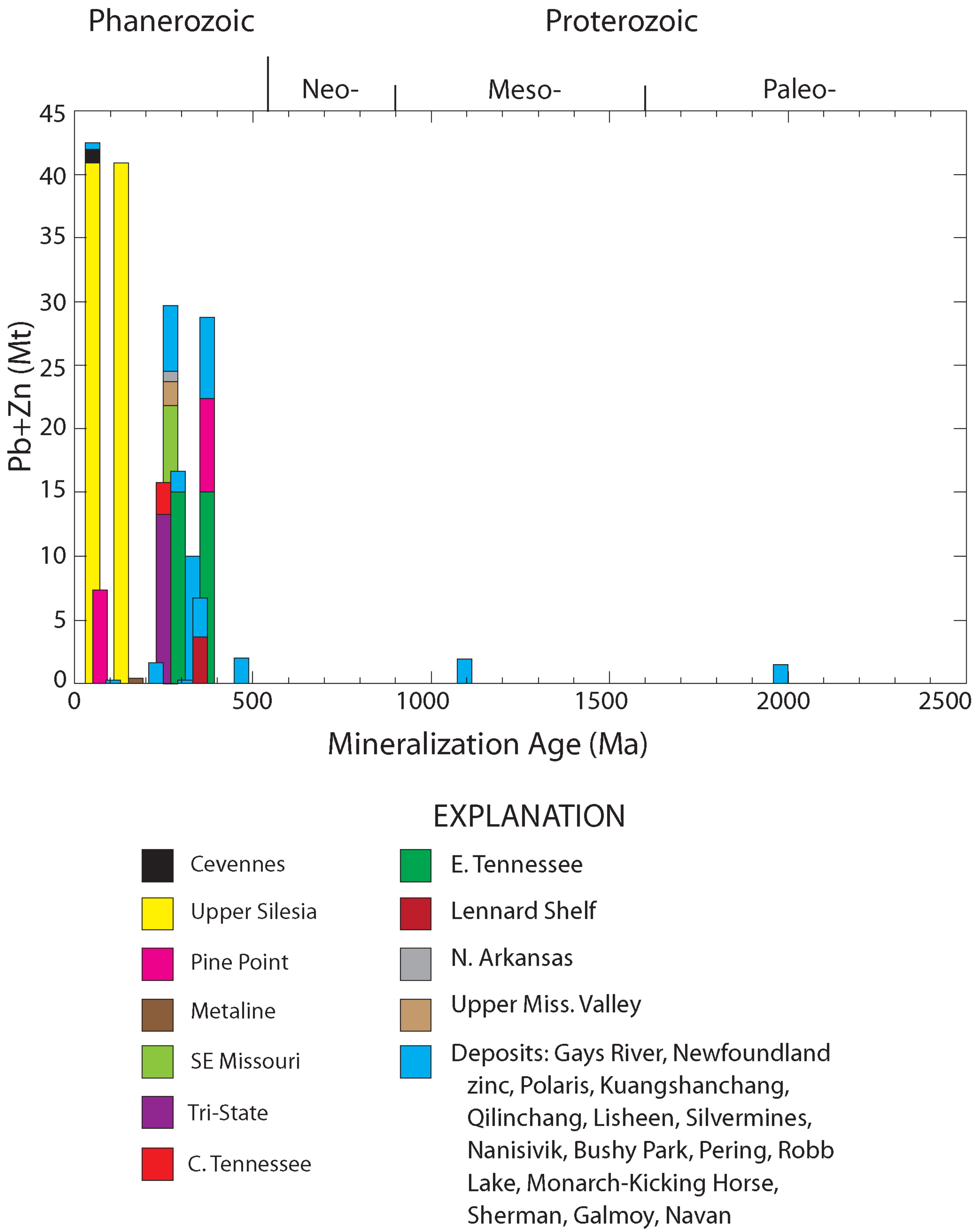

Figure B8. Age of mineralization for Mississippi Valley-type districts and deposits. Ages determined by paleomagnetism and/or radiometric dating.

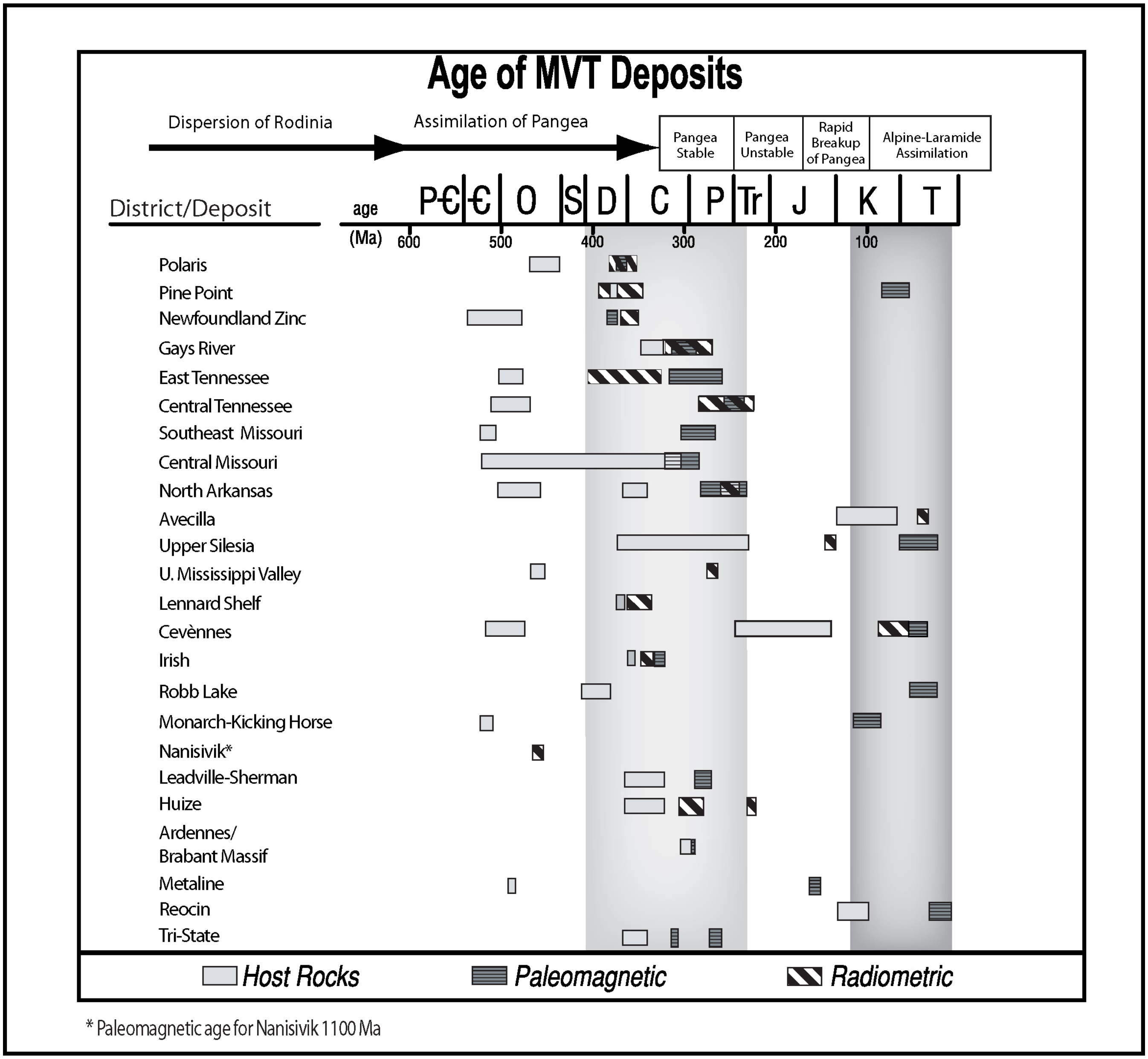

Figure B9. Ages of mineralization and host-rock for Mississippi Valley-type deposits and districts. The two shaded columns represent periods of tectonic assimilation and deposition of 97 percent of the total lead and zinc mineralization in dated Mississippi Valley-type deposits and districts.