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LEAD ISOTOPE RATIOS OF GALENA FROM THE BAYHORSE MINING DISTRICT, CUSTER COUNTY, IDAHO

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Seven Pb isotopic analyses of galenas from the Bayhorse mining district, Custer County, Idaho, are reported here. These were determined using a 9-inch, fully automated mass spectrometer at M.I.T. Galena samples were reacted to form PbCl and were then loaded onto Re filaments with phosphoric acid and silica gel. From repeated analysis of Cal Tech standard PN-2 it was concluded that ^{204}Pb values were systematically 2% low. The analyses listed below have been corrected by this amount.

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DISCUSSION

The Bayhorse mining district (BMD) is located on the east side of the Idaho Batholith in south-central Idaho. It occupies a window in the Challis Volcanics which exposes Paleozoic shelf sediments; the Garden Creek Phyllite (Cambrian), the Bayhorse Dolomite (Ordovician), the Ramshorn Slate (Ordovician?) and the Clayton Mine Quartzite (Lower Ordovician) (Hobbs and others, 1975; Ross, 1962). The first claim in this area was staked on a replacement deposit in the Bayhorse Dolomite (the Riverview Mine, analysis 3) in March of 1877. Subsequent discoveries of irregular replacement deposits in the Bayhorse Dolomite produced more than \$3,000,000 in silver and lead between 1880 and 1898 (Umpleby, 1913). The analyses presented here are all of galenas from such deposits and the majority are from various parts of the ore body on Pacific Mountain. Lead isotope ratios from the Pacific Mountain ore body form a cluster centered on $^{206}\text{Pb}/^{204}\text{Pb} = 21.35$ and $^{207}\text{Pb}/^{204}\text{Pb} = 15.78$. These values are different from other ores in the Bayhorse mining district and, in fact, are unique compared with lead data from other ores around the Idaho Batholith (Doe, 1976).

Similarity of the lead ratios in the Pacific Mountain deposit to those in the Mississippi Valley Pb-Zn district reflects the geologic similarity of the two deposits: Pb isotopes from both deposits give negative model ages. By analogy with the Mississippi Valley deposits, and in the absence of detailed studies of the Bayhorse area ores, it is hesitantly hypothesized that the Pacific Mountain ores are diagenetic (J. H. Davis, 1977) and, therefore, Ordovician.

The Pb from the Pacific Mountain deposit is extremely homogeneous isotopically, and distinctly different from the ore at the Riverview Mine. It is suggested that the Riverview

mineralization is not genetically related to the Pacific Mountain ores, and may be Cretaceous/Tertiary in age

SAMPLE DESCRIPTIONS

1. 72-9 124 feet Pb
Pacific Mountain ore body, Bayhorse mining district. *Galena* from quartz vein in fractured Bayhorse Dolomite, just above main ore body. (SW $\frac{1}{4}$ S34, T13N, R18E; 44° 24'N, 114° 19'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T., from NL Industries DDH core 72-9. *Data:* 206/204 = 21.323 \pm .003, 207/204 = 15.765 \pm .005, 208/204 = 40.796 \pm .014.
2. 68 Pb
Pacific Mountain ore body, Bayhorse mining district. *Galena* from quartz with CaF₂, Cu and As oxides, K-7 mine dump, E side of Beardsley Gulch. (NW $\frac{1}{4}$ S2, T12N, R18E; 44° 24'N, 114° 18'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T. *Data:* 206/204 = 21.332 \pm .008, 207/204 = 15.771 \pm .006, 208/204 = 40.948 \pm .016.
3. 7 Pb
Riverview Mine ore, Bayhorse mining district. *Galena* disseminated in ZnS mineralization next to Riverview Mine adit. (NE $\frac{1}{4}$ S11, T12N, R18E; 44° 23'N, 114° 17'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T. *Data:* 206/204 = 19.704 \pm .008, 207/204 = 15.806 \pm .010, 208/204 = 39.281 \pm .017. *Note:* This is the one sample in the group statistically different from the others.
4. 74-P9-5B 19-20 feet Pb
Pacific Mountain ore body, Bayhorse mining district. *Galena* in CaF₂ breccia, finely disseminated and associated with FeS₂ and Ag-sulfides. (SW $\frac{1}{4}$ S34, T13N, R18E; 44° 24'N, 114° 19'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T., from NL Industries DDH core 74-P9-5B. *Data:* 206/204 = 21.375 \pm .010, 207/204 = 15.807 \pm .007, 208/204 = 41.004 \pm .019. *Note:* Replicate specimen (below).
5. 74-P9-5B 19-20 feet Pb
Pacific Mountain ore body, Bayhorse mining district. *Galena* in CaF₂ breccia, finely disseminated and associated with FeS₂ and Ag-sulfides. (SW $\frac{1}{2}$ S34, T13N, R18E; 44° 24'N, 114° 19'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T., from NL Industries DDH core 74-P9-5B. *Data:* 206/204 = 21.355 \pm .009, 207/204 = 15.777 \pm .007, 208/204 = 40.897 \pm .017. *Note:* Replicate specimen (above).
6. 73-4 161-75 feet Pb
Pacific Mountain ore body, Bayhorse mining district.

6. (continued)

Galena in dolomite breccia at top of main ore body. (SW¼ S34, T13N, R18E; 44°24'N, 114°19'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T., from NL Industries DDH core 73-4. *Data:* 206/204 = 21.347 ± .012, 207/204 = 15.801 ± .009, 208/204 = 40.966 ± .023.

7. 69

Pb

Pacific Mountain ore body, Bayhorse mining district. *Galena* in CaF₂ breccia in main ore body. (SW¼ S34, T13N, R18E; 44°24'N, 114°19'W; Custer Co., ID). *Collected by:* K. E. Davis, M.I.T. *Data:* 206/204 = 21.431 ± .005, 207/204 = 15.767 ± .004, 208/204 = 40.899 ± .010.

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