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MILS: The Mineral Industry Location System of the Federal Bureau of Mines

By Andrew W. Berg and Fred V. Carrillo



UNITED STATES DEPARTMENT OF THE INTERIOR

Information Circular 8815

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UNITED STATES DEPARTMENT OF THE INTERIOR

Cecil D. Andrus, Secretary

BUREAU OF MINES

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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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CONTENTS

	<u>Page</u>
Abstract.....	1
Introduction.....	1
Input.....	2
Sources of data.....	2
Categories of information.....	2
Identification.....	4
Location.....	4
Universal Transverse Mercator (UTM).....	4
Topographic.....	4
Basin.....	4
Holdings.....	4
Reference.....	4
Commodity.....	4
Public land survey (PLS).....	4
Names.....	5
Bibliography.....	5
Owners.....	5
Precision.....	5
Updating procedures.....	5
Output available.....	5
Open file at the Western Field Operations Center.....	5
1:250,000-scale topographic quadrangles.....	5
1:500,000-scale State overlays.....	7
Commodity overlays.....	7
Cluster point locations.....	7
Density plot overlays.....	8
Indexes.....	8
Reproduction of open file data.....	8
Special requests.....	8
Magnetic tape.....	8
Special areas or data.....	9
Special request listings.....	9
Field operations centers.....	11
Appendix A.--Computer entry forms.....	12
Appendix B.--Computer cluster overlays and printouts.....	14
Appendix C.--Density plot overlays.....	21
Appendix D.--Indexes.....	23

ILLUSTRATIONS

1. Field Operations Center jurisdiction areas.....	3
2. Index for 1:250,000-scale quadrangle maps covering six Western States.....	6
3. Examples of some output options for MILS.....	10
A-1. MILS entry form 1.....	12
A-2. MILS entry form 2.....	13
B-1. Clustered MILS locations for the Wallace 1:250,000 quadrangle.....	14
B-2. Wallace 1:250,000-scale quadrangle.....	15

ILLUSTRATIONS--Continued

	<u>Page</u>
B-3. MILS printout page for Wallace 1:250,000-scale quadrangle.....	16
B-4. Clustered MILS locations for Idaho reduced from 1:500,000 scale...	17
B-5. MILS printout page for Idaho.....	18
B-6. Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.....	19
B-7. Printout page of lead and zinc occurrences in six Western States..	20
C-1. Density plot of MILS locations reduced from 1:7,500,000 scale.....	21
C-2. Density plot of gold occurrences reduced from 1:1,750,000 scale...	22
D-1. Page of State alphabetic index of Idaho MILS locations.....	23
D-2. Page of county alphabetic index for Shoshone County MILS locations	24

MILS: THE MINERAL INDUSTRY LOCATION SYSTEM OF THE FEDERAL BUREAU OF MINES

by

Andrew W. Berg¹ and Fred V. Carrillo²

ABSTRACT

The Bureau of Mines Mineral Industry Location System (MILS) is part of the computerized Minerals Availability System (MAS), a comprehensive data base of known mineral deposits. MILS, the location subsystem of MAS, has become widely used by the minerals industry and organizations with land-use planning and land management responsibilities.

Information on more than 135,000 mineral locations and processing plants in the United States is contained in the data base. This information includes the name, location, mineral commodity, type of operation, bibliography, and cross-references for each property or prospect.

Computer-drawn map overlays at various scales showing clustered MILS locations and computer printouts keyed to those overlays are available for inspection and reproduction at the Bureau's Field Operations Centers at Juneau, Alaska, Denver, Colo., Pittsburgh, Pa., and Spokane, Wash.

INTRODUCTION

The Mineral Industry Location System (MILS) is the location subsystem of the Federal Bureau of Mines Minerals Availability System (MAS). The objective of the MAS program is systematic measurement and classification of domestic and foreign mineral deposits according to their respective extraction technologies, economics, and commercial availability. MAS deals with complete mineral deposit evaluations and provides a rapid and systematic procedure to monitor the present and potential availability of mineral supplies to the United States.

Within MAS, the Mineral Industry Location System (MILS) locates and provides related information on mineral industry sites throughout the world. A "mineral industry location" is defined as metallic or nonmetallic occurrences, prospects, mines (both past and present producers), geothermal wells, and mineral processing plants such as mills, smelters, and refineries.

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Responsibility for development of MAS-MILS data for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii, as well as offshore sites and deep-seabed deposits, resides with the Bureau's Western Field Operations Center (WFOC) at Spokane. Responsibility for the remaining States west of the Mississippi River resides with the Intermountain Field Operations Center (IFOC) at Denver. Responsibility for all States east of the Mississippi River resides with the Eastern Field Operations Center (EFOC) at Pittsburgh. Alaskan locations are the responsibility of the Alaska Field Operations Center (AFOC) at Juneau (fig. 1).

Because of differing startup dates, Field Operations Centers are at different levels of development regarding MAS-MILS input from their areas. To date, the MILS data base in Denver contains more than 4,500 locations for the AFOC area, 30,000 locations for the IFOC area, 39,000 locations for the EFOC area, and 58,000 locations for the WFOC area. Examples discussed in the following pages are from the WFOC area.

For Bureau use and open file availability, a comprehensive library of MILS data is maintained at WFOC for California, Idaho, Montana, Nevada, Oregon, Washington, and Hawaii. Map overlays of MILS locations and their related computer printouts provide a rapid means of identifying mineral properties in various geographic areas. These often provide a convenient starting point for a wide variety of mineral-related projects.

Principal users of MILS data include mining or minerals exploration companies as well as public and private organizations with land-use planning and land management responsibilities.

INPUT

Sources of Data

MILS data, for entry into the system, are derived from a variety of sources. Publications of the Bureau of Mines (USBM), the U.S. Geological Survey (USGS), and State geology departments are reviewed for mineral locations and related data. Unpublished data from the USBM and location information from mining companies comprise important additional sources of information. Various periodicals dealing with the mining industry, along with inspection reports of the Mine Safety and Health Administration (MSHA) on currently operating properties, are a constant source of current information to be incorporated into the MILS system.

Categories of Information

Each MILS property is assigned a numeric code which indicates the State, county, and a numeric sequence number within that county. For example, the Coeur Project property in Idaho is identified by the number 016-079-0040. This indicates the State of Idaho (016), county of Shoshone (079), and numeric sequence number (0040) in that county.

The information collected for each MILS property, when complete, consists of 12 categories or groups, as described in the following paragraphs.

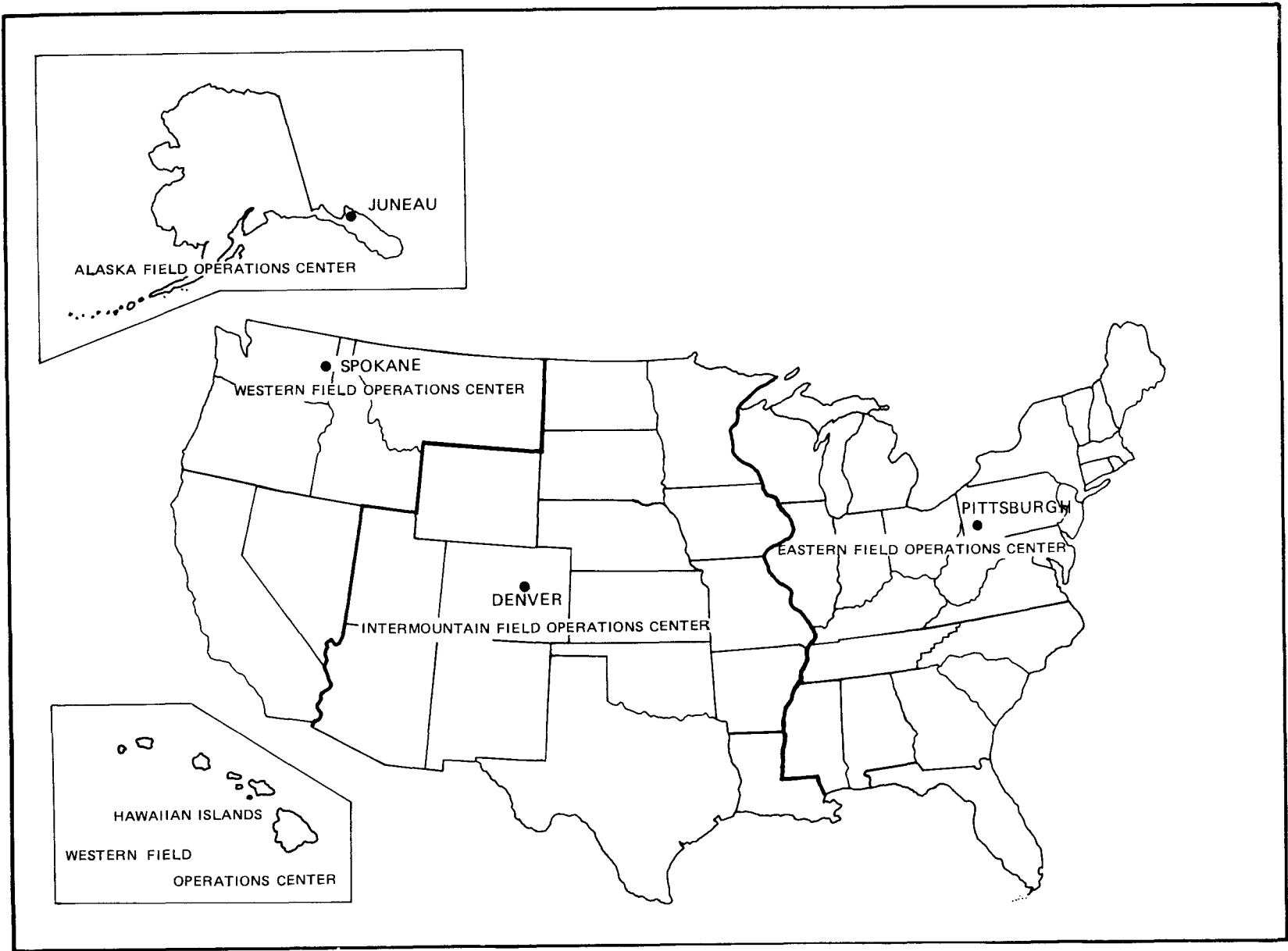


FIGURE 1. - Field Operations Center jurisdiction areas.

Identification

The identification group contains the primary property name, type of operation, and current operational status.

Location

Data entered in the location category include latitude, longitude, point of reference, elevation, and the year in which the property was last field-checked.

Universal Transverse Mercator (UTM)

Universal Transverse Mercator (UTM) coordinates are produced automatically by computer from the latitude-longitude entry, along with zone and hemisphere.

Topographic

The topographic group includes the name of the 1:250,000-scale quadrangle map that includes the MILS location. Name and scale of the largest scale USGS topographic quadrangle map on which the location was plotted for entry into MILS are also entered.

Basin

Under the basin category, the name of the drainage basin in which the mineral property is located and its corresponding USGS River Basin Code are entered.

Holdings

Holdings indicate the type of ownership or control of the mineral deposit or processing plant. Examples are fee ownership, private lease, or located claim. Three types can be entered in order of importance.

Reference

The MILS subsystem is cross-referenced to MSHA identification numbers, USBM mineral property files, USBM mine map repository, USGS Computerized Resources Information Bank (CRIB) system, and the soon-to-be-implemented USBM drill core library at Reno. The cross-references provide access to a wide variety of additional data.

Commodity

Mineral commodities are identified in order of decreasing importance.

Public Land Survey (PLS)

The PLS group provides for entry of the meridian, township, range, section, and section subdivision.

Names

Often a mineral property has had more than one official name. If several names are encountered in studying a property's literature, the "names" group permits their entry.

Bibliography

The bibliography group allows a user of MILS data to consult sources for additional information. The system can accommodate as many as 999 lines of bibliographic citations.

Owners

The name of the owner or operator and the home office location are entered in this group.

Completed computer input forms for the Coeur Project example are illustrated in appendix A. The completed forms can be mailed to the Minerals Availability Field Office in Denver for entry into the system or entered at the Field Operations Centers on remote computer terminals.

Precision

The system provides for an entry reflecting the degree of accuracy by which the location selected by the evaluator represents the actual location of the property. Location information from published sources is sometimes vague. Alternatives to entering such vague locations are either to leave properties out of the system or to apply a low degree of precision. The latter course is usually followed. When better location information becomes available from additional sources or field investigations, the entry is changed to a higher degree of precision.

Updating Procedures

Additions and corrections to the data base are made as new or additional information becomes available. This permits the data base to reflect, on a current basis, the latest and best information. Entry by remote terminal at Field Operations Centers permits daily updating.

OUTPUT AVAILABLE

Open File at the Western Field Operations Center

1:250,000-Scale Topographic Quadrangles

Standard base maps used for clear plastic overlays in MILS are USGS 1:250,000-scale quadrangles. The conterminous United States are covered by 473 of these quadrangles. The WFOC area is covered by 107 1:250,000-scale quadrangles (fig. 2). Computer-generated MILS data supply cluster point locations,³ which are plotted on the overlays. The computer printout keyed

³See definition of cluster point locations, page 7.

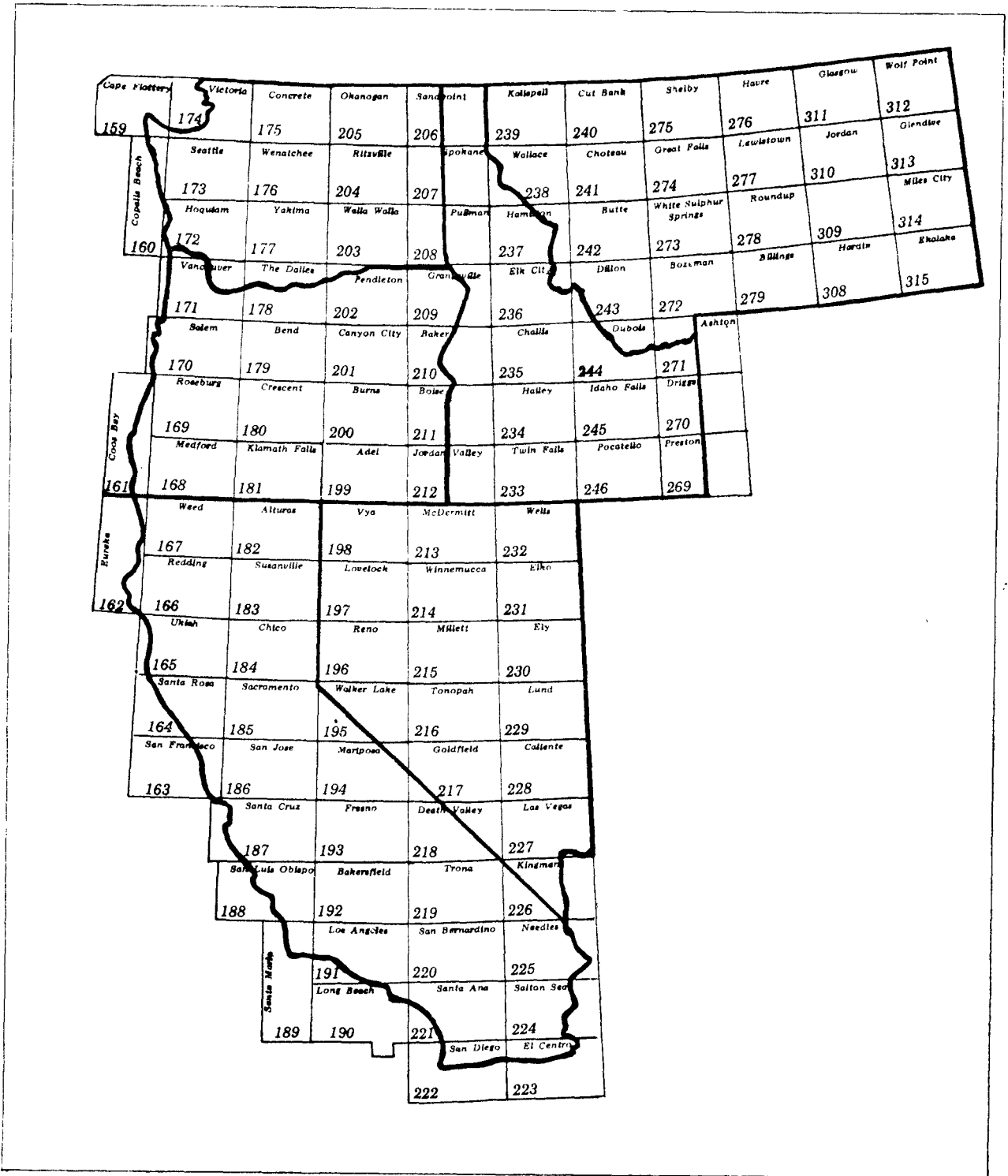


FIGURE 2. - Index for 1:250,000-scale quadrangle maps covering six Western States.

to these cluster numbers contains the corresponding data for each property represented on the overlay. Appendix B (fig. B-2) shows a reduced reproduction of the 1:250,000-scale map for the Wallace, Idaho, quadrangle. Figure B-1 shows the location symbols that appear on the corresponding computer-drawn MILS overlay. Appendix B also includes a typical page from the corresponding computer printout for the Wallace quadrangle (fig. B-3). The 1:250,000-scale overlays and their corresponding printouts are the most frequently requested MILS product.

1:500,000-Scale State Overlays

State MILS overlays at a scale of 1:500,000 are available. These overlays can be used with USGS State geologic maps as well as land status or other map types. An example of a State overlay is shown in figure B-4. Figure B-5 is a reproduction of a printout page keyed to that overlay. Such overlay and printout sets may be useful to organizations with land-use planning, exploration, or jurisdictional responsibilities on a statewide basis.

Commodity Overlays

Another useful overlay is one displaying clustered locations for a specific commodity or commodities in MILS. For this purpose a WFOC area base map has been prepared at a scale of 1:1,750,000. Figure B-6 illustrates an overlay and base map for lead and zinc. Figure B-7 is a computer printout page keyed to that overlay. Overlays and printouts for most major metal commodities are available at this scale from the WFOC open file library.

Cluster Point Locations

Plotting all individual sites on plastic overlays at most map scales could result in excessive cluttering of points. To avoid this problem, cluster points are used. A cluster point represents all MILS locations lying within 1/4 inch (0.63 cm) of the point on the overlay (fig. B-1). Circle radii distances on the ground represented by the 1/4-inch (0.63-cm) cluster radius at various map scales follow:

<u>Scale</u>	<u>Cluster radius</u>	<u>Ground distance</u>
1:24,000	1/4 inch (0.63 cm)	0.10 mile (0.16 km)
1:62,500	1/4 inch (.63 cm)	.25 mile (.40 km)
1:250,000	1/4 inch (.63 cm)	1.00 mile (1.61 km)
1:500,000	1/4 inch (.63 cm)	2.00 miles (3.22 km)
1:1,750,000	1/4 inch (.63 cm)	7.00 miles (11.26 km)
1:2,500,000	1/4 inch (.63 cm)	10.00 miles (16.10 km)
1:3,168,000	1/4 inch (.63 cm)	12.00 miles (19.31 km)

As the map scale becomes larger, the location density per cluster point can decrease to a minimum of one site. Even at the small scale of 1:1,750,000, with a cluster radius distance on the ground of 7 miles (11.26 km), a cluster point may represent only one site within certain areas or for certain commodities.

Density Plot Overlays

An additional method of displaying MILS data on an overlay is the density plot. By this method each MILS location is represented by a single computer-generated point on the overlay corresponding to its location coordinates. This point generation can be programed for all locations (fig. C-1), or for any selected data category within the system.

A density plot for gold at a scale of 1:1,750,000 is illustrated by a reduced reproduction (fig. C-2). Future uses for density plots could include areal geochemical studies and the definition of metallogenic provinces. Density plots are available on an open file basis for gold, lead, silver, and zinc, and for all MILS locations in the WFOC area.

Indexes

Indexes have been prepared to provide efficient access to the voluminous MILS data on open file. Two frequently used indexes are the State Alphabetic (fig. D-1) and the State/County Alphabetic (fig. D-2).

If a property name and county are known, reference to the appropriate alphabetic indexes will quickly tell the investigator if the property is in the MILS system. If the property name is known, but not the county, then the State alphabetic listing will quickly determine if the property is in the system. These listings also provide secondary names, location, 1:250,000-scale quadrangle name, 7.5- or 15-minute map name, and sequence number.

Reproduction of Open File Data

On receipt of a request for MILS open file data, the open file originals from the Field Operations Center library are taken to a local reproduction firm. Payment for reproduction is arranged between the requestor and the firm selected. In 1979 charges for these services varied somewhat between Field Operations Centers but were about \$0.90 per square foot for plastic overlays and \$0.09 per page for copies of the computer printout.

Special Requests

Magnetic Tape

A magnetic computer tape containing MILS data for the entire United States is available to organizations that wish to use it with their own computer facilities. This tape can be ordered at cost (\$80.00 in late 1979) from the Office of Minerals Availability, Bureau of Mines, 2401 E. Street NW, Washington, DC 20241. Payment should be made by check or money order to the Bureau of Mines. Additional information regarding the MILS computer tape may be obtained by calling 202-634-1292.

Special Areas or Data

The variety of uses for MILS data has created a demand for overlay configurations that differ from those currently maintained on open file at the Field Operations Centers. A Bureau of Land Management area, National Forest, or State land area might be required. Additionally, a need for a different set of information using overlays over standard map scales could develop for a specific problem. These kinds of output can be obtained on a special-request basis through the appropriate Field Operations Center.

Special requests require consideration of some of the output options that exist for MILS (fig. 3). For example, a special request for "producers" should specify whether "current producers" as well as "past producers" are required. In the "type of operation" category, a special request for all mines must include, at least, all surface, surface-underground, and underground mines to be reasonably inclusive.

Special requests are potentially costly, as programing and computer time on a custom basis are involved; therefore, quotations are obtained for the requestor before the work is undertaken.

Special Request Listings

Another type of special request is a list with limited specific data. The user might, for example, desire an alphabetic list of locations by township and range, a list with only the property name and commodity, or a wide variety of combinations limited only by the contents of the data base.

POR Point of Reference and precision is a two-part field. The first part (8 characters) indicates the physical reference point and the second part (6 characters) states the precision:

Precision entry	Reference entry
10M	MAIN ENT
100M	TRENCH
500M	ORE BODY
1KM	CLAIM
5KM	APPROX (0 precision)
10KM	PLANT
100KM	TOWN

Domain (14 characters) describes the type of public or private domain of the deposit area:

- Entry
- UNKNOWN
- MIXED
- PRIVATE
- MUNICIPALITY
- COUNTY
- STATE
- STATE FOREST
- STATE PARK
- STATE OFFSHORE
- FEDERAL
- NAT FOREST
- NAT RECREATION
- NAT WILDERNESS
- NAT PRIMITIVE
- NAT PARK
- NAT MONUMENT
- INDIAN RES
- NAT OFFSHORE
- BLM ADMIN
- MILITARY RES

```

3661
1293 NAME - COEUR PROJECT          REFERENCE NAME - 0160790040
STATE - IDAHO                     COUNTY - SHOSHONE
LATITUDE - 47 29 25 N             PRECISION - 100 METERS
LONGITUDE - 115 59 33 W           REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5259920    EASTING 575890
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER                 OPERATION TYPE - UNDERGROUND
MESA ID NO.                       YEAR FIELD CHECKED -
MAP NAME - WALLACE                TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE      23R MINERAL PROPERTY FILE - 37.176
PRIMARY NAME - 1293 COEUR PROJECT
OTHER NAMES -
COMMODITIES - SILVER              COPPER
                                ZINC                GOLD
                                FRYKLUND V C 1964 USGS PRO PPR 445 P 70
                                LEAD
    
```

Current status (13 characters) must be selected from the following table:

Entry	Description
UNKNOWN	Unknown or undetermined
PRODUCER	Producer
PAST PRODUCER	Past producer
DEVEL DEPOSIT	Developed deposit
EXP PROSPECT	Explore prospect
RAW PROSPECT	Raw prospect
OTHER	Other

Type of Operation (12 characters) must be selected from the following table, and refers to the type of operation presently existing at this site.

Entry	Description
UNKNOWN	Unknown or undetermined
SURFACE	Surface operation
UNDERGROUND	Underground operation
SURF-UNDERG	Surface-underground operation
UNDERWATER	Underwater operation
WELL	Geothermal well
PROC PLANT	Processing plant
PROSPECT	Mineral prospect
MINERAL LOC	Mineral location (claim)
PLACER	Placer operation

FIGURE 3. - Examples of some output options for MILS.

FIELD OPERATIONS CENTERS

A request for information about the MILS system or the implementation of a MILS request should be directed to the appropriate Field Operations Center. Addresses of the four centers follow.

Alaska Field Operations Center
Bureau of Mines
P.O. Box 550
Juneau, Alaska 99802

Intermountain Field Operations Center
Bureau of Mines
Building 20, Denver Federal Center
Denver, Colo. 80225

Eastern Field Operations Center
Bureau of Mines
4800 Forbes Avenue
Pittsburgh, Pa. 15213

Western Field Operations Center
Bureau of Mines
E. 315 Montgomery
Spokane, Wash. 99207

MINERALS AVAILABILITY SYSTEM (MILS ENTRY FORM)

SEQUENCE NUMBER			
1	2	3	4
016	079	004	0

DATE: 11/1/79 PAGE 1 OF 2

EVALUATOR: Sweeney

IDENTIFIER
11 15
IDENT

LOCAT

UTM

TOPOG

BASIN

HOL

REFER

11	15	REC
COMM	MO	01
		02
		03
		04
		05

PLS

20	21	NAME (primary)																				55	56	TYPE of operation										67	68	CURRENT status										80
COEUR PROJECT																				UNDERGROUND PRODUCER																										
21	LATitude		27	28	LONGitude		35	36	POR(Point of Reference)				49	50	ELEvation & precision		59	60	DATUM		68	69	YFC 72		Year		Field		Checked																	
N472925		W1151933		MAIN ENT: 100M				95M:		00M		SEA LEVEL																																		
ZONE		24		NORTHING		30		EASTING		36																																				
21	QUADrangle (1 250,000)				38	39	MAP name				56	57	SCALE		62	63	DOMAIN				76																									
WALLACE				WALLACE				02				PRIVATE																																		
21	RIVER basin				44	45	RBC		48	49	HUC		56																																	
				76U																																										
21	mineral HOLDings				49					56																																				
FREE OWNERSHIP:																																														
21	EVAuator		35	36	MPF		38	39	MID		45	46	GSC		52	53	YO		57																											
WFOG-MILS						W		1000479		M		7977																																		
21	COMmodity				34	35	MOC(Modifier of Commodity)				56	57	M		58	59	S		61																											
5400																																														
1700																																														
3400																																														
ZINC																																														
GOLD																																														
21	P-MERidian				34	35	P-TWN		39	40	P-RNG		44	45	P-SEC		47	48	P-SUB		52	53	P-SURvey		58																					
ROISE MERIDIAN				048		M004		E19E2																																						

FIGURE A-1. - MILS entry form 1.

APPENDIX B.--COMPUTER CLUSTER OVERLAYS AND PRINTOUTS

Editor's Note.--In the following figure B-1, a single symbol represents all sites at a particular location.

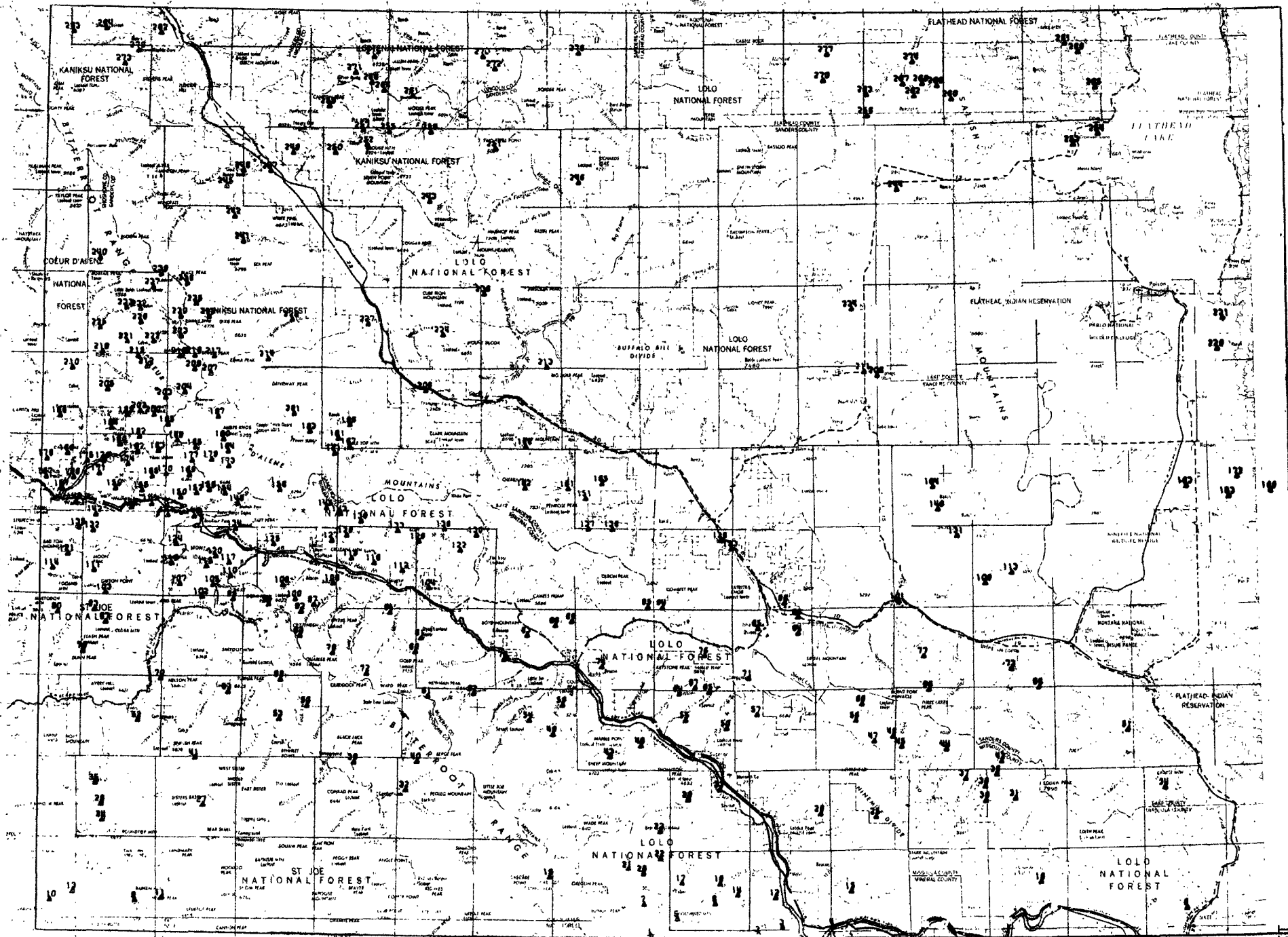


Figure B-1. Clustered MILS locations for the Wallace 1:250,000 quadrangle.

FIGURE B-2. Wallace 1:250,000-scale quadrangle.

167 259
 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
 LATITUDE - 47 29 25 N PRECISION - 100 METERS
 LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259920 EASTING 575890
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 E 1/2
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
 STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
 MESA ID NO. 10 00479 YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
 PRIMARY NAME - 167 COEUR PROJECT
 COMMODITIES - SILVER COPPER LEAD
 ZINC GOLD
 FRYKLUND V C 1964 USGS PRO PPR 445 P 70
 MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALLY

260
 167 NAME - RAINBOW MINE REFERENCE NUMBER - 0160790361
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0899 METERS
 LATITUDE - 47 29 26 N PRECISION - 100 METERS
 LONGITUDE - 115 59 15 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5259865 EASTING 576271
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
 DESCRIPTION SECTION - 19 SE 1/4 SE 1/4 NE 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 167 RAINBOW MINE
 COMMODITIES - LEAD ZINC SILVER
 HOBBS ET AL 1965 USGS PROF PAPER 478.

261
 168 NAME - CUNNINGHAM MINE REFERENCE NUMBER - 0160790304
 STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1736 METERS
 LATITUDE - 47 30 13 N PRECISION - 100 METERS
 LONGITUDE - 115 49 40 W REFERENCE POINT - MAIN ENT.
 UTM: ZONE 11 NORTHING 5261578 EASTING 588280
 PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 005 E
 DESCRIPTION SECTION - 16 SW 1/4 SE 1/4 NW 1/4
 RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
 STATUS - RAW PROSPECT OPERATION TYPE - UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED -
 MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
 1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
 PRIMARY NAME - 168 CUNNINGHAM MINE
 COMMODITIES - LEAD SILVER
 HOBBS AND OTHERS 1965 USGS PROF PAPER 478

FIGURE B-3. - MILS printout page for Wallace 1:250,000-scale quadrangle.

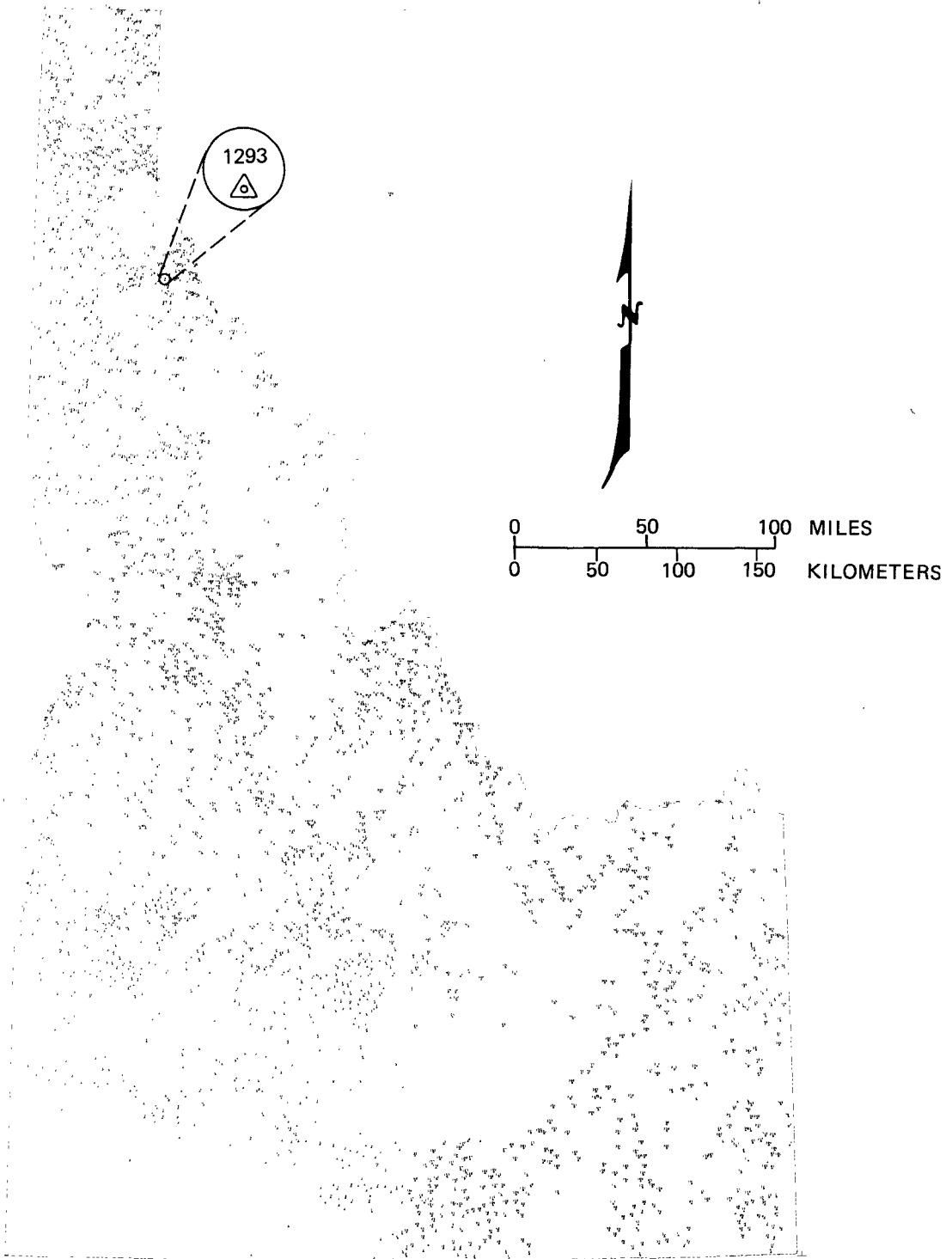


FIGURE B-4. - Clustered MILS locations for Idaho reduced from 1:500,000 scale.

3660
1293 NAME - CALADAY REFERENCE NUMBER - 0160790245
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1097 METERS
LATITUDE - 47 27 44 N PRECISION - 500 METERS
LONGITUDE - 115 56 26 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5256860 EASTING 579850
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 16 NONE
RIVER BASIN - 76AA LOCHSA RIVER 7627 DOMAIN - PRIVATE
STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
PRIMARY NAME - 1293 CALADAY
COMMODITIES - UNDETERMINED
3 MI SE OF OSBURN
USBM LIAISON OFF REPT MNG OP 1972

3661
1293 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
LATITUDE - 47 29 25 N PRECISION - 100 METERS
LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5259920 EASTING 575890
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 19 E 1/2
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
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MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
PRIMARY NAME - 1293 COEUR PROJECT
OTHER NAMES -
COMMODITIES - SILVER COPPER LEAD
ZINC GOLD
FRYKLUND V C 1964 USGS PRO PPR 445 P 70

3662
1293 NAME - GALENA MINE REFERENCE NUMBER - 0160790010
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
LATITUDE - 47 28 40 N PRECISION - 100 METERS
LONGITUDE - 115 57 58 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5258560 EASTING 577900
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION - 29 E 1/2
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 64.013
PRIMARY NAME - 1293 GALENA MINE
COMMODITIES - LEAD ZINC COPPER
ANTIMONY SILVER
MINE-TONNES/YR - ORE =254016 LEACH = WASTE= 1975
PLANT - TYPE=FLOTATION TONNES/YR- INPUT=254016 OUTPUT= 1975
FRYKLUND V C 1964 USGS PP 445 (GOOD)
IDA BUM & GEOL BULL 16 (GOOD)

FIGURE B-5. - MILS printout page for Idaho.

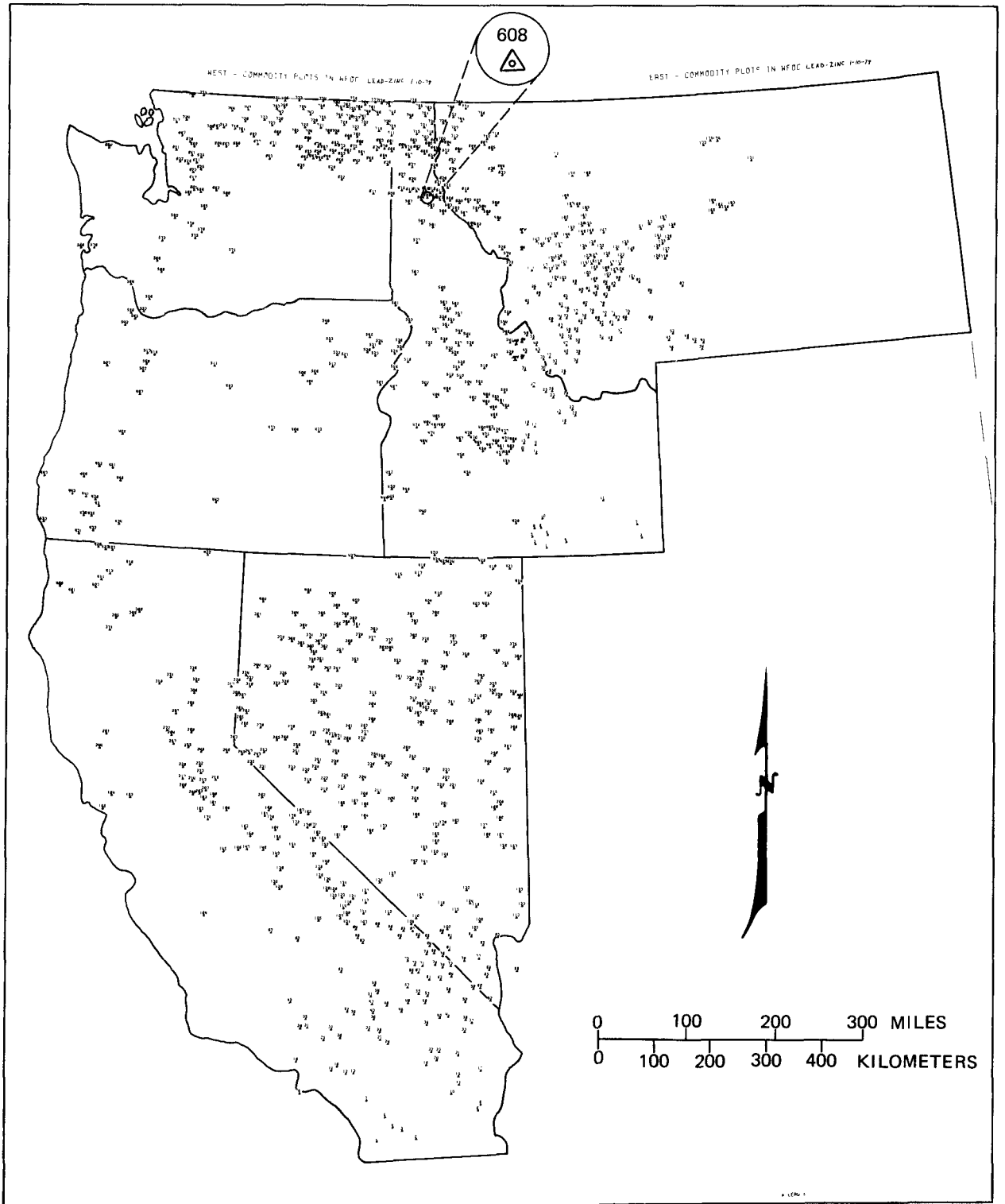


FIGURE B-6. - Clustered MILS lead and zinc locations reduced from 1:1,750,000 scale.

2239
608 NAME - CAPITOL SILVER LEAD MINE NO. 2 REFERENCE NUMBER - 0160790293
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 1496 METERS
LATITUDE - 47 33 25 N PRECISION - 100 METERS
LONGITUDE - 115 58 20 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5267351 EASTING 577323
PUBLIC LAND SURVEY TOWNSHIP - 049 N RANGE - 004 E
DESCRIPTION SECTION - 32 NE 1/4 NW 1/4 NE 1/4
RIVER BASIN - U UNIDENTIFIED CODE DOMAIN - UNDETERMINED
STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - BURKE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 00.000
PRIMARY NAME - 608 CAPITAL SILVER LEAD MINE NO. 2
COMMODITIES - LEAD SILVER
HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2240
608 NAME - COEUR D ALENE MINE REFERENCE NUMBER - 0160790295
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0871 METERS
LATITUDE - 47 29 53 N PRECISION - 100 METERS
LONGITUDE - 116 00 45 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5260767 EASTING 574376
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 003 E
DESCRIPTION SECTION - 24 NE 1/4 NE 1/4 SW 1/4
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - UNDETERMINED
STATUS - EXPLORED PROSPECT OPERATION TYPE - UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED -
MAP NAME - CALDER TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - SPOKANE 207 MINERAL PROPERTY FILE - 00.000
PRIMARY NAME - 608 COEUR D ALENE MINE
COMMODITIES - LEAD SILVER
HOBBS AND OTHERS 1965 USGS PROF PAPER 478

2241
608 NAME - COEUR PROJECT REFERENCE NUMBER - 0160790040
STATE - IDAHO COUNTY - SHOSHONE ELEVATION - 0951 METERS
LATITUDE - 47 29 25 N PRECISION - 100 METERS
LONGITUDE - 115 59 33 W REFERENCE POINT - MAIN ENT.
UTM: ZONE 11 NORTHING 5259920 EASTING 575890
PUBLIC LAND SURVEY TOWNSHIP - 048 N RANGE - 004 E
DESCRIPTION SECTION 19 E 1/2
RIVER BASIN - 76U COEUR D ALENE RIVER 7621 DOMAIN - PRIVATE
STATUS - PRODUCER OPERATION TYPE - UNDERGROUND
MESA ID NO. 10 00479 YEAR FIELD CHECKED -
MAP NAME - WALLACE TYPE - 15 MIN USGS TOPO
1:250,000 MAP NAME - WALLACE 238 MINERAL PROPERTY FILE - 37.176
PRIMARY NAME - 608 COEUR PROJECT
COMMODITIES - SILVER COPPER LEAD
ZINC GOLD
FRYKLUND V C 1964 USGS PRO PPR 445 P 70
MILL CAPACITY 450 TPD PRODUCING 100,000 to 500,000 TONS ANNUALY

FIGURE B-7. - Printout page of lead and zinc occurrences in six Western States.

APPENDIX C.--DENSITY PLOT OVERLAYS

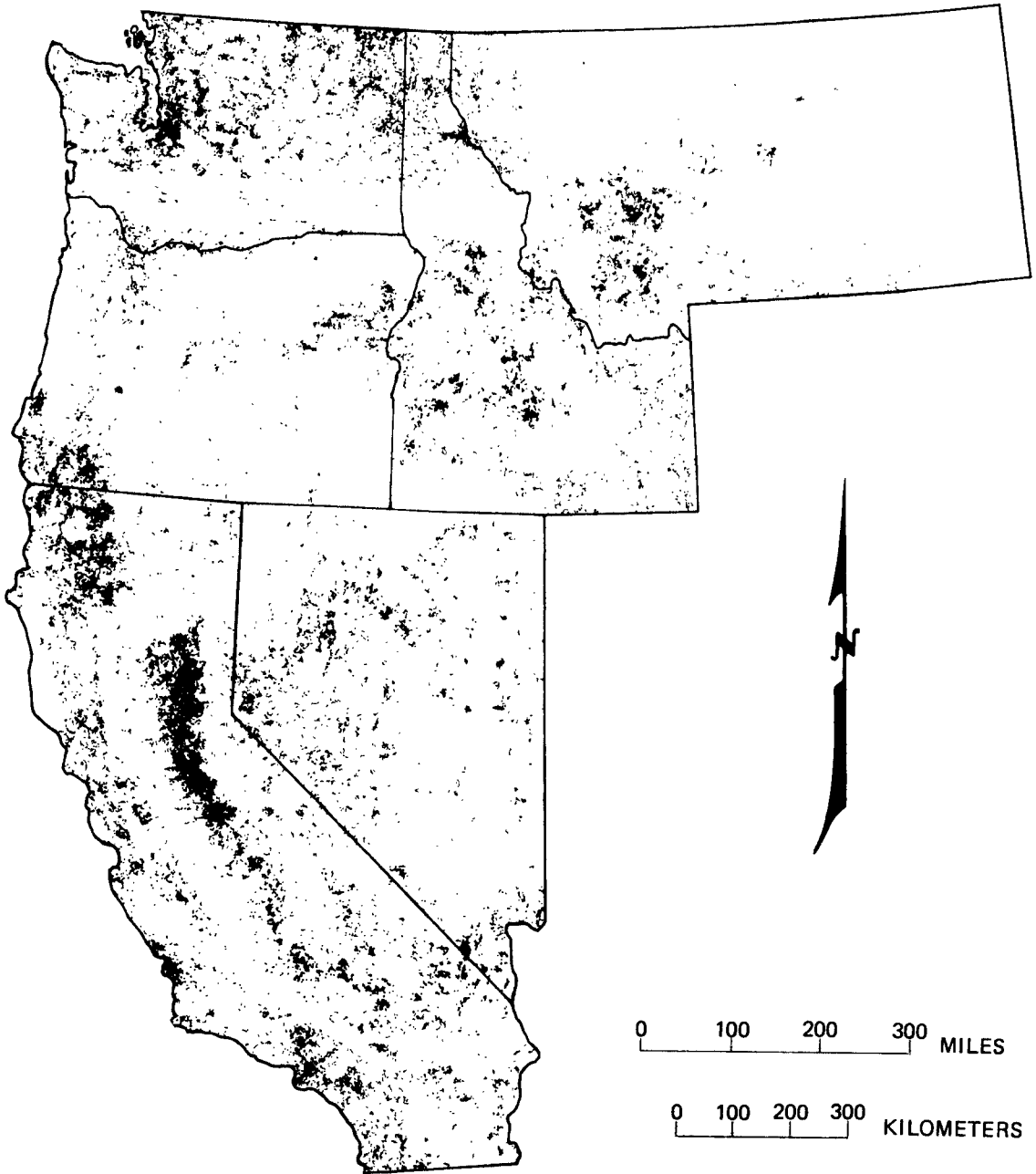


FIGURE C-1. - Density plot of MILS locations reduced from 1:7,500,000 scale.

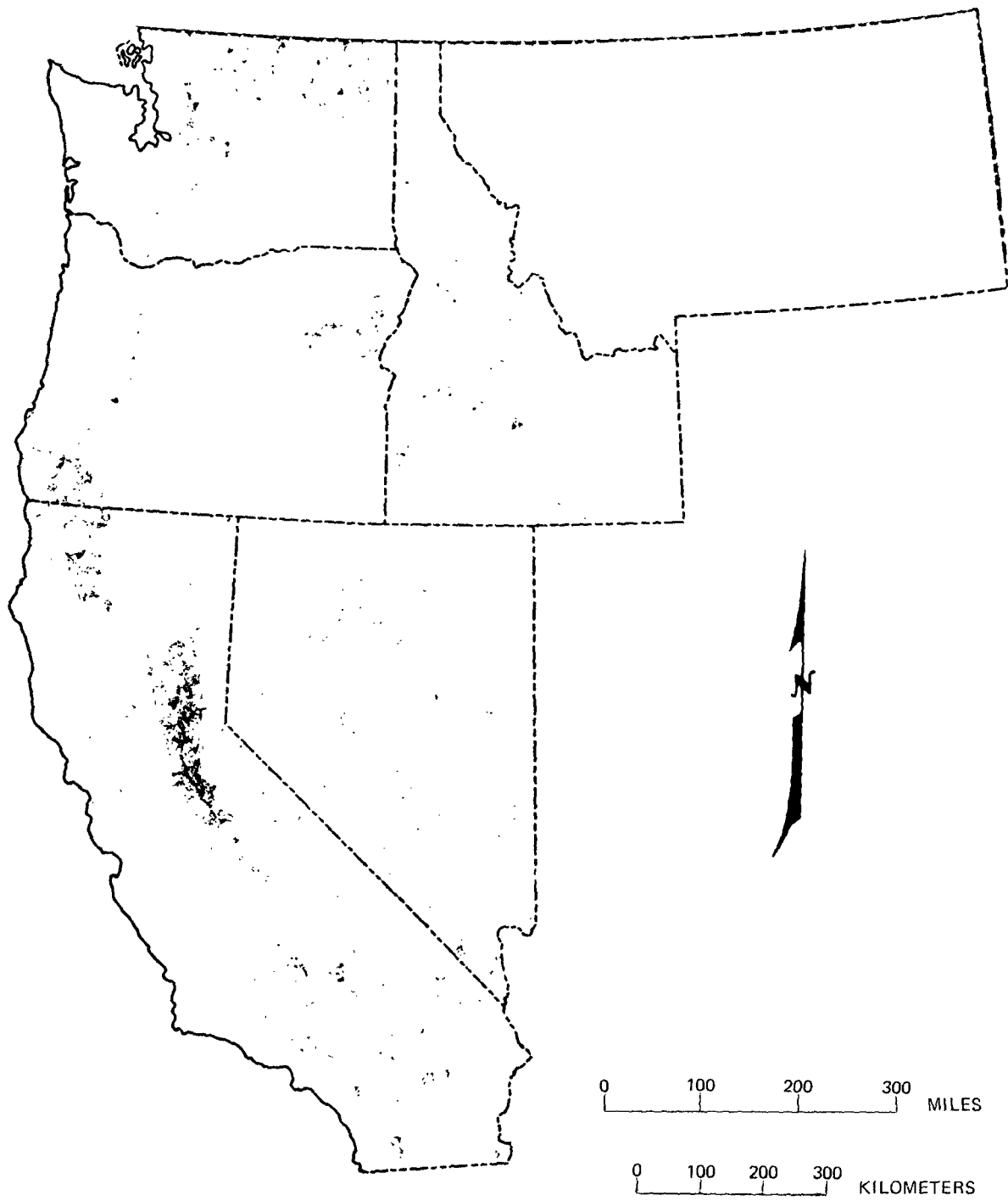


FIGURE C-2. - Density plot of gold occurrences reduced from 1:1,750,000 scale.

PROPERTY NAME	PRIMARY NAME	SEC LOCATION	QUAD NAME	SEQUENCE #
CLEARWATER		23 T042N R010E	CHAMBERLAIN MTN	7 1603500005
CLEARWATER AND WOLVERINE		33 T003N R019E	HAILEY	1601300074
CLEARWATER COPPER MINE		16 T042N R007E	MALLARD PEAK	7 1607900186
CLEARWATER GULCH		06 T036N R006E	PIERCE	7 1603500038
CLEARWATER MINE		23 T042N R010E	CHAMBERLAIN MTN	7 1607900091
CLEARWATER MINE		34 T029N R006E	GOLDEN	7 1604900413
CLEVELAND		17 T028N R008E	ELK CITY	7 1604900090
CLEVELAND		16 T020N R009E	EDWARDSBURG	7 1608500095
CLEVELAND		31 T012S R041E	ONEIDA NARROWS RE	7 1604100003
CLEVELAND MINE		06 T006N R006E	PIONEERVILLE	7 1601500042
CLIFF		14 T022N R003W	CUPRUM	15 1600300020
CLIFTON BELL		07 T004N R010E	ROCKY BAR	7 1603200017
CLIMAX		20 T002N R018E	BELLEVUE	15 1601300030
CLIMAX		16 T016N R004W	STURGILL PEAK	15 1608700019
S CLIMAX	GOLDSTONE MINE	14 T021N R024E	GOLDSTONE MTN	15 1605200187
CLIMAX GROUP		11 T012N R029E	SCOTT PEAK	15 1605200331
S CLIMAX MINE	SILVER CROWN MINE	18 T003N R015E	SAWTOOTH	30 1602500053
CLIPPER		14 T012N R029E	SCOTT PEAK	15 1605200333
CLIPPER BULLION MINE		31 T024N R019E	SHOUP	15 1605200784
CLOVERLEAF MINE		06 T006N R006E	PIONEERVILLE	7 1601500047
CLUFF TUNNELS		32 T005N R044E	GARNS MTN	15 1608100006
COAL		15 T007S R033E	MICHAUD	15 1607700027
COAL CLOWARD MINE		06 T001N R040E	AMMON. ID	15 1601900073
COAL CREEK		16 T011N R014E	EAST BASIN CREEK	7 1603700382
COAL- FALL CK BASIN MINE		03 T001S R042E	HELL CREEK ID	7 1601900071
COAL-BRINSON MINE, CANYON COAL MNG		35 T002N R040E	HELL CREEK, ID	7 1601900072
COAL-CROLEY MINE		35 T001S R041E	HELL CREEK	15 1601900070
COAL-GOD SEND TO HEALTH MINE		04 T001S R042E	HELL CREEK, ID	15 1601900074
COBALT MINE		35 T021N R018E	BLACKBIRD MTN	15 1605200075
COEUR D ALENE AND PINE CK ANTIMONY		06 T048N R002E	KELLOGG	15 1607900018
COEUR D ALENE BIG CREEK		16 T048N R003E	KELLOGG	15 1607900076
COEUR D ALENE CHAMPION		12 T048N R005E	BURKE	15 1607900296
COEUR D ALENE MINE		24 T048N R003E	CALDER	15 1607900295
COEUR D ALENE MINE		05 T028N R007E	CENTER STAR MTN	7 1604900519
COEUR D ALENE MINING CO.		18 T049N R006E	COOPER GULCH	15 1607900137
COEUR D ALENE MOUNTAIN		12 T049N R003W	LANE	15 1605500027
S COEUR D ALENE NORTH FORK	MONARCH MINE	23 T049N R005E	BURKE	15 1607900130
COEUR D ALENE PREMIER		08 T047N R002E	CALDER	15 1607900243
S COEUR D ALENE INVESTORS INC	GOOD HOPE PLACERS INC	05 T005S R003E	SILVER CREEK	15 1607300246
COEUR PROJECT		19 T048N R004E	WALLACE	15 1607900040
COGDILL MINE		35 T049N R003E	KELLOGG	15 1607900297
COIN BOND GROUP		10 T007N R004E	PLACERVILLE	7 1601500015
COLE ROAD PIT		08 T 3N R 2E	BOISE	15 1600100129
COLGATE LICKS		15 T036N R012E	BEAR MOUNTAIN	7 1604900542
COLLISTER		23 T014N R011E	GREYHOUND RIDGE	15 1603700246
COLONEL		16 T026N R006E	ELK CITY	1604900292
S COLONEL	COLONEL SELLERS	13 T029N R008E	ELK CITY	7 1604900041
COLONEL SELLERS		13 T029N R008E	ELK CITY	7 1604900041
COLONIAL CONCRETE PLANT		17 T010S R017E	TWIN FALLS	7 1608300076
COLONIAL CONCRETE SNAKE RIVER DREGG		33 T017S R009E	TWIN FALLS	7 1608300077
S COLORADO	TRADE DOLLAR	07 T005S R003W	SILVER CITY	15 1607300036

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-1. - Page of State alphabetic index of Idaho MILS locations.

APPENDIX D. -- INDEXES

COUNTY: 079 SHOSHONE

PROPERTY NAME	PRIMARY NAME	COMMODITY	LOCATION	SEC	QUAD-DESC	SEQ
S CHARLES DICKENS	SILVER CRESCENT	LEAD	T049N	R003E	25 SPOKANE	0039
CHESTER		GOLD	T050N	R005E	33 WALLACE	0113
S CHESTER	SILVER DOLLAR MINE	LEAD	T048N	R003E	14 SPOKANE	0036
S CHICAGO	PARAGON MINE	LEAD	T049N	R006E	07 WALLACE	0132
S CHICAGO-LONDON	PARAGON MINE	LEAD	T049N	R006E	07 WALLACE	0132
CHRISTOPHERSON		GOLD	T049N	R004E	16 WALLACE	0248
CININNATI MINE		LEAD	T048N	R005E	23 WALLACE	0294
S CINNABAR PROSPECT	EDWARDS PROSPECT		T050N	R003E	27 SPOKANE	0207
S CLARKE MINE	SUNSET MINE	LEAD	T049N	R005E	33 WALLACE	0079
CLEARWATER COPPER MINE		COPPER	T042N	R007E	16 HAMILTON	0186
CLEARWATER MINE		GOLD	T042N	R010E	23 HAMILTON	0091
COEUR D ALENE AND PINE CK ANTIMONY		COPPER	T048N	R002E	06 SPOKANE	0018
COEUR D ALENE BIG CREEK		SILVER	T048N	R003E	16 SPOKANE	0076
COEUR D ALENE MINING CO.			T049N	R006E	18 WALLACE	0137
S COEUR D ALENE NORTH FORK	MONARCH MINE	LEAD	T048N	R004E	14 WALLACE	0130
COEUR D ALENE PREMIER		LEAD	T047N	R002E	08 SPOKANE	0243
COEUR D ALENE CHAMPION MINE		LEAD	T048N	R005E	12 WALLACE	0296
COEUR D ALENE MINE		LEAD	T048N	R003E	24 SPOKANE	0295
COEUR PROJECT		SILVER	T048N	R004E	19 WALLACE	0040
COGDILL MINE		LEAD	T049N	R003E	35 SPOKANE	0297
S COLUMBIA VEIN	TRIMETALLIC MNG CO CLAIMS	COPPER	T042N	R009E	16 HAMILTON	0182
COLUMBUS			T050N	R005E	13 WALLACE	0101
S COLUSA	LEUSCHEL N. P. LEASE	COPPER	T047N	R002E	19 SPOKANE	0114
COLUSA MINE		LEAD	T047N	R002E	18 SPOKANE	0202
CONRADS CROSSING		GOLD	T044N	R008E	14 WALLACE	0177
CONSOLIDATED SILVER		SILVER	T048N	R003E	23 WALLACE	0420
S CONSOLIDATED SILVER-LEAD MINE	U.S. SILVER-LEAD MINE	LEAD	T050N	R005E	13 SPOKANE	0100
S CONSOLIDATED SILVER-LEAD MINES	U.S. SILVER-LEAD MINE	LEAD	T050N	R005E	13 SPOKANE	0100
CONSTITUTION MINE		LEAD	T047N	R002E	02 SPOKANE	0030
COPPER CHIEF		COPPER	T047N	R006E	21 WALLACE	0148
COPPER KING MINE		LEAD	T048N	R005E	24 WALLACE	0065
COPPER PLATE MINE		LEAD	T048N	R005E	23 WALLACE	0298
COPPER PRINCE		COPPER	T045N	R003E	10 SPOKANE	0278
COPPER QUEEN MINE		LEAD	T047N	R005E	12 WALLACE	0300
CORBY MINE		LEAD	T048N	R002E	08 SANDPOINT	0301
COUGAR GROUP		COPPER	T045N	R004E	18 SPOKANE	0165
COUGHLIN MINE		LEAD	T048N	R005E	25 WALLACE	0302
CRANE		LEAD	T048N	R003E	15 SPOKANE	0303
CRATER LAKE PEGMATITE		FELDSPAR	T043N	R004E	32 WALLACE	0192
CRESCENT		SILVER	T048N	R003E	16 SPOKANE	0009
CROWN POINT MINE		LEAD	T048N	R002E	11 SPOKANE	0031
CRYSTAL LEAD MINE		LEAD	T050N	R005E	03 WALLACE	0096
S CUMMINGS MURRAY	SH-63 PIT	STONE	T048N	R003E	34 SPOKANE	0422
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIMS	MANGANESE	T050N	R004E	28 WALLACE	0421
S CUMMINGS MURRAY	TEFFI GROUP MANGANESE CLAIM	MANGANESE	T050N	R004E	28 WALLACE	0421
CUNNINGHAM MINE		LEAD	T048N	R005E	16 WALLACE	0304
S CURLEW	PAGE MINE	LEAD	T048N	R002E	10 SPOKANE	0019
S CURLEW MINE	PAGE MINE	LEAD	T048N	R002E	10 SPOKANE	0019

* 'S' indicates secondary name, with primary name listed to the right.

FIGURE D-2. - Page of county alphabetic index for Shoshone County MILS locations.