IC 8784

Bureau of Mines Information Circular/1978

CORES Operations Manual: Bureau of Mines Core Repository System

UNITED STATES DEPARTMENT OF THE INTERIOR

Information Circular 8784

CORES Operations Manual: Bureau of Mines Core Repository System

By Staff, Bureau of Mines

UNITED STATES DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, Secretary

BUREAU OF MINES
Roger A. Markle, Director

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.

This publication has been cataloged as follows:

United States. Bureau of Mines

CORES operations manual : Bureau of Mines Core Repository System / by Staff, Bureau of Mines. [Washington] : U.S. Dept. of the Interior, Bureau of Mines [1978].

118 p. : ill. ; 26 cm. (Information circular - Bureau of Mines ; 8784)

1. Mines and mineral resources - United States. 2. Mineralogy - Collecting of specimens. 3. CORES. I. United States. Bureau of Mines. II. Title. III. Series: United States. Bureau of Mines. Information circular - Bureau of Mines ; 8784.

TN23.U71 no. 8784 622.06173

U.S. Dept. of the Int. Library

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Stock Number 024-004-01936-1

CONTENTS

ILLUSTRATIONS

TABLE

CORES OPERATIONS MANUAL: BUREAU OF MINES CORE REPOSITORY SYSTEM

by

Staff, Bureau of Mines

ABSTRACT

This report describes the new Bureau of Mines Core Repository System (CORES) and presents the methods for selecting, processing, and storing physical samples and descriptive data for future reference by earth scientists. The system preserves splits of chip samples and longitudinally sliced segments of core. A records retrieval system provides for storage of data on microfilm and magnetic tapes and uses the keysort parameters of location and commodity for the identification of data.

INTRODUCTION

Physical samples are the basic tools of mining engineers and geologists. Earth scientists base their decisions on physical examinations of samples as well as on analytically generated values. Data and samples are often reexamined in the light of newly developed techniques or ideas in order to obtain clues that may lead to new interpretations of geology and mineral potential, especially under new economic conditions. Each additional piece of information may enhance the value of previously collected data not only by adding to the data base but hopefully by providing the additional key fact needed for a new interpretation. Often in the earth sciences, particularly in studies of ore genesis or mineral potential, there is a need for having the source materials of previously generated data available for reexamination and evaluation.

The importance of physical samples in exploration and development of hard rock minerals has undergone historical development. In 1850-1900 in the United States, a few high-grade surface samples were adequate to convince fledgling mining companies of the potential existence of minable ore. On the basis of these often inadequate data, mills were constructed and mining was begun. Commonly, tonnage was insufficient and grade too erratic to support a profitable, long-term operation, capable of amortizing the investment. Although the famous Comstock Lode produced more than $390 million during this period, it is doubtful that total production exceeded total investment.

When perseverance and chance were combined with favorable technologies and economics, successful operations ensued and became the forerunners of many of our present-day major mining companies. As mining companies began to

generate exploration funds, very few large mineral deposits were explored or developed on faith; hard facts and data were required. An important factor in the changing scene was the realization that increased sampling decreased risk and development costs.

With the advent of drilling, expensive shafts and adits were obviated in the exploration phase for near-surface, high-grade deposits. Sample recovery from deep deposits and/or large low-grade deposits was still not adequate for proper evaluation of grade and tonnage, and shafts and adits still were necessary. The advent of sintered-bit diamond core drilling in the 1930's permitted less expensive and more rapid exploration and evaluation of deposits of intermediate depth and lower grade. Advances in diamond-coring technology, especially the wire-line concept, and the advent of tricone rotary sampling, led to modern techniques for the exploration and evaluation of intermediate and deeper ore deposits.

Exploration at depth is similar in many respects to surface and near-surface exploration. In surface exploration, a region is sampled to locate an anomalous concentration of minerals. This area is then sampled more intensively in an attempt to locate an ore deposit. Exploration of the subsurface involves an initial general investigation, followed by more intensive sampling once an anomaly is found. This intensive sampling is expensive because of the cost of the drilling. Although surface sampling can be repeated at relatively nominal cost, deep-seated exploration cannot, unless the physical samples from previous drilling have been preserved for analysis and reevaluation. Future requirements for filling and grading of prospect trenches may make it impossible to duplicate even surface sampling at a nominal cost.

Because of a changing economic climate, some sampling done in the past could not be duplicated at present except at ruinous expense; for example, the sampling of gold placers in the 1870's and 1930's. Favorable ratios between exploration costs and the value of mineral product make it feasible to do extensive exploration for certain commodities. Currently, because of the high price of gold, extensive exploration for lode gold is in progress that was not feasible in the 1950's or 1960's at the then fixed price of gold. When this exploration-commodity value ratio is no longer favorable, exploration for gold will cease. The gold data currently being generated may be irretrievably lost, just as the 1870 and 1930 data from placer sampling have been lost, unless steps are taken to preserve them for future exploration programs.

In current practice, some individuals and companies drill and sample a property and then, by neglect, allow these data to deteriorate or be destroyed when their interest wanes. At best, only the drill logs and a few pieces of the highest grade rock are kept intact as the bulk of the samples are discarded to make room for new active projects. Written language is not adequate to describe fully all features of the samples, nor does it allow for future analytical determinations.

Often after a company has abandoned a property, another company with different goals or management outlook becomes interested in it and samples it again. Occasionally, after several phases of sampling, the right combination

of talent and luck recognizes where the ore is, and a mine is developed. In some instances, the period from initial discovery to development has been over 100 years. Had the samples from various periods of exploration been kept intact and made available for inspection, the location of the mineral occurrence might have been more rapid and far less expensive. Probably many mineral deposits have been overlooked because of the lack of sufficient physical data from which to draw correct conclusions.

The depletion of known near-surface to intermediate-depth deposits in the United States indicates that future exploration and development will center on deeper or blind occurrences with concomitant higher exploration costs and risks.

One way of decreasing the risk and cost of mineral exploration is to maintain a public repository of samples obtained during physical exploration. The Bureau of Mines currently operates limited core storage depositories in Denver and Minneapolis. These facilities store collections of core from World War II Strategic and Critical Minerals and Defense Minerals Exploration Administration projects as well as from private exploration. The new Core Repository System (CORES) will consolidate and build upon these two collections and will--

1. Preserve splits of significant core and other samples from industry and Government.

2. Conduct analytical work on stored samples.

3. Store data on microfilm and magnetic tape that can be computer-accessed by the keysort parameters of location and commodity.

4. Make samples and generated analytical data available for public examination.

CORES will initially consist of a master storage and examination facility located in Reno, Nev., operating in conjunction with the analytical facilities of the Bureau's Reno Metallurgy Research Center. It is anticipated that after the initiation of a functional system, up to a maximum of 12 branch facilities will be set up in cooperation with State geologists and/or universities, as funding permits. The branch facilities will store replicate splits of samples of regional interest for examination purposes only.

Exploration footage by diamond, rotary, and percussive drilling techniques (excluding fossil fuels) in 1973 and 1974 amounted to approximately 18 million feet annually.[1] Based on this annual increment of sampling footage, is obvious that a huge backlog of previously accumulated samples exists, even discounting the samples that have been discarded. It is reasonable to assume

---

[1]Morning, J. L. Mining and Quarrying Trends in the Metal and Nonmetal Industries. BuMines Minerals Yearbook 1973, v. 1, 1975, p. 82.
_____. Mining and Quarrying Trends in the Metal and Nonmetal Industries. BuMines Minerals Yearbook 1974, v. 1, 1976, p. 84.

that at some future date a significant fraction of the annual 18 million feet would become available to a public repository.

To preserve this entire footage of samples may be scientifically desirable but is eminently impractical. However, many of the exploration samples generated are redundant in that they are obtained from closely spaced sampling within a single ore body that may have little mineralogic and lithologic variation. In fact, most of the 16.5 million feet of rotary and percussive drilling performed annually is done primarily for information on grade and tonnage and is highly repetitious. In a repetitious sequence the samples most desirable for preservation are those that are spatially remote from other samples and show the maximum variations. Therefore, in many circumstances a large number of samples from a given property or even a district can be represented by a much smaller number of samples without the loss of significant data. Further, some of the rotary and percussive samples are duplications of diamond core samples. Hence, although 18 million feet of exploration samples are drilled annually, a selected small percentage will be representative of the types and areas sampled.

It is understood that not all samples with high priority for preservation will be donated to a public repository. However, those samples currently being destroyed because of a waning, topical interest and high storage costs will probably be readily available.

Obviously new techniques for locating viable ore deposits will be developed in the future. The future geoscientist should have available samples of the ore zone, the host rock, the country rock, and the overburden. If he or she has available past physical samples, as well, the field for testing new evaluation techniques will be complete.

CRITERIA FOR SAMPLE SELECTION FOR PRESERVATION

CORES is primarily donor dependent for the representativeness and authenticity of samples. When a choice is available, the most complete and representative and best documented sample suite offered to CORES will be accepted for preservation.

In areas undergoing active exploration, where many types of samples are available, preference for repository samples will be given to core rather than chip samples if the core recovery is high. To maximize representativeness in a specific area, different types of samples may be accepted from various donors. For example, one donor may have a complete lithologic section with only minor ore, while another donor may have various ore sections and minimal wall rock. In those mineralized areas where channel sampling is more complete than sporadic drill holes with poor recovery, channel samples will be selected to represent the occurrence.

In areas where there is a paucity of samples, a somewhat different procedure is necessary. If more than one type of sample is available from such an area, the most complete, best documented sample (not necessarily the highest grade) will be given preference. In older districts, where nothing else is

available, a single specimen or sequence of hand specimens would be deemed suitable for preservation. In mined-out districts, samples from stockpiles or dumps may be acceptable.

The task of deciding what samples should be selected from the large numbers generated is a formidable one. As the needs of industry, academia, and Government are likely to be somewhat divergent, it is felt that all factions should play a role in the nomination of samples for preservation. With this in mind, two sample acquisition groups have been established: solicited and unsolicited.

Samples to be solicited by CORES will be determined by the Bureau of Mines in consultation with interested parties such as mining companies, State geologists, universities, and other Federal agencies. Unsolicited samples that meet certain criteria will be accepted as funding permits at the convenience of the donor; for example, when companies make space for new sample suites by disposing of old ones.

Eight categories will be used as guidelines to determine the acceptability of unsolicited samples for preservation. If a sample suite falls into two or more categories or where CORES data are completely lacking for a given area and category, priority will be given to acquisition of such samples. The categories follow:

1. Properties that have had or continue to have significant production. These samples will be useful to document typical ore occurrences as well as to predict districtwide trends and variations useful for exploration.

2. Significant discoveries outside established districts. These samples will be useful in establishing exploration criteria for extensions of these occurrences into established districts. An example would be the new lead-zinc discoveries in central Tennessee and Kentucky.

3. Significant discoveries of new types of ore occurrences. Examples would include the submicrometer gold and Spor Mountain beryllium deposits. These samples will facilitate the rapid transfer of the physical and exploration characteristics of these occurrences to exploration personnel and allow for similar discoveries elsewhere.

4. Exploration samples of potential future value. Examples would include samples of the Chattanooga shale in the Eastern United States and the vanadium-bearing shales of the Woodruff Formation in Nevada. Because of the changing technology and economics, exploration personnel of the future will be interested in exploration in areas of previously determined highest grade resource materials.

5. Exploration samples for commodities for which the United States relies heavily on foreign sources.

6. Exploration samples from areas proposed for withdrawal from mineral exploration and development. Because of restrictions on mineral exploration

in Wilderness Areas, any samples obtained prior to official designation may be the only samples on which future assessment of mineral potential can be based.

7. Samples from a unique or one-of-a-known-kind ore occurrence where reserve depletion will ultimately destroy the physical associations of the occurrence.

8. Samples from regional exploration studies made for the assessment of structure, alteration patterns, metallogenic provenance, and similar phenomena that are accompanied by a descriptive report.

DATA REQUIRED FOR SAMPLE SUBMISSION

Since CORES cannot guarantee the representativeness and authenticity of samples, the users of the system will rely primarily on the completeness of samples and associated descriptive data as a guide to its usefulness. A minimum amount of descriptive data is required for the samples to serve a useful purpose. Samples suitable for preservation must be accompanied by the following essential information:

1. Location including State, county, and coordinates (latitude, longitude, Universal Transverse Mercator, or public land survey).

2. Geologic log with lithologies, footage, and percentage recovery in the case of core samples.

3. Date exploration samples were obtained.

4. Name and address of donor.

5. Name and address of company conducting exploration.

6. Name and address of owner.

7. Commodity or commodities sought.

8. Property history.

9. Azimuth and inclination of drill holes, workings, or trenches.

10. Approximate elevation of collar of drill hole or workings.

11. Type of mineral holdings: Fee, claim, or lease.

12. Deposit name or names.

The following are types of desirable descriptive information to accompany donated samples:

1. Claim and/or mine maps with sample locations and company coordinates.

2. Claim group names and county record book and page numbers.

3. Mining district name.

4. Bureau of Land Management serial number.

5. Geologic maps and sections.

6. Surface sample map and analytical results.

7. Sample analyses.

8. Anticipated exploration target type.

9. Geologic logs and summaries of nearby samples.

10. Synopsis of previous exploration work.

11. Reference lists of published reports on the area.

12. Tonnage and grade calculations.

13. Production history: Past, current, or anticipated.

14. Beneficiation tests.

TRANSPORTATION OF SAMPLES

Detailed shipping instructions will accompany a letter of acceptance of samples by CORES. In general, solicited contributions will be shipped either prepaid at donor's expense or by conveyance selected by the Bureau of Mines and accompanied by a Government bill of lading. Unsolicited donations, upon receipt of a letter of acceptance, will be sent at donor's expense. All donors requesting the return of a sawed split of their core will arrange transportation to and from the Master Repository at their expense.

CONFIDENTIALITY OF DATA

The policy of CORES is that no samples will be accepted that are encumbered with permanent confidentiality of company or Bureau data. Under certain circumstances involving criticalness of the data, company and Bureau data, including the physical sample itself, will be accepted for preservation with a maximum confidentiality limit of 3 years. All data become public property at the end of this period. This confidentiality is limited to that available under the Privacy and Freedom of Information Acts.

During the 3-year period, the computer printout will show that these samples are in storage and will list the name, location, type of samples, commodity data, and year the data will become public property. Accession to lithologic or mineralogic analyses by the general public will not be possible until the confidentiality date has passed. As may be seen in appendix A,

file A, any data entered starting with field 22 cannot be accessed prior to the date it becomes public property.

At the time of initial entry of nonconfidential samples into the system, copies of Bureau-generated analyses will be furnished to the donor at least 90 days prior to their accessibility by the public. Analyses generated after the initial entry period will not automatically be sent to the donor.

DISPOSAL OF SAMPLES

At the time samples are accepted into the system, all reject splits will be available for return to the donor. Those portions not claimed by the donor will be disposed of after consulting with appropriate State agencies to determine the extent of their interest.

It is recognized that the quality of the samples and of the data obtained from them will vary with time and from place to place, depending on conditions encountered and the data needs of individual exploration companies. It is the intent of CORES to preserve, insofar as possible, the most representative samples of any given area. In the event that more representative samples become available for a given area, it will be the option of the Bureau to skeletonize previously collected duplicate physical samples to minimize storage space. In no event will CORES synopsize or generalize the analytical data that were previously entered in the system.

SAMPLE PROCESSING FOR STORAGE

General

It cannot be predicted what types of future analyses will lead to a better understanding of the processes of mineralization or what precursors may be indicative of ore deposits. Therefore, any processing technique for storage that preserves continuous sample with the same integrity as the original sample will offer the maximum potential benefit for future users. Any skeletonizing technique preserves significantly less geoscientific data than continuous samples, at a cost only slightly less than that of continuous samples.

Whole-sample storage, continuous-longitudinally-diamond-sliced-core storage, and continuous-split-sample storage all provide ways of preserving integral samples. Because of long-term storage costs, it is impractical to preserve the whole sample (appendix B). The representativeness of core samples and chip samples is dependent primarily on percentage recovery. Slices or splits of the sample will preserve this representativeness without significant loss. If chip samples can be split to reduce volume without a loss of representativeness, core of the enclosing unmineralized country rock can likewise be chipped and split without a significant loss so long as a complete sample interval is chipped and split.

CORES will utilize continuous-diamond-slicing techniques for obtaining samples of core from altered zones or from ore, and continuous chipping and

splitting techniques for the remaining core. Continuous-splitting techniques will be used for rotary, percussion, and channel samples.

All samples suitable for storage will be concisely logged to establish major lithologic units. Longitudinally sawed core samples and splits of chip samples will be packaged in polycarbonate film on permanent storage trays and filed with crushed samples of appropriate intervals for future repetitive sampling.

Experience with statistical analyses of geoscientific data has shown the necessity of maintaining consistent sample intervals. CORES can maintain a constant sample interval only with core samples. Rotary, percussion, and trench or channel sample intervals are established during the original sampling program, and the sample does not allow for recombination into other intervals. Any core sample that can be represented by chips will be sampled in a standard 2-meter sample interval. Any sample interval that is significant enough to be broken into less than a 2-meter interval will also be significant enough to be represented by diamond-sliced slabs that will span even multiples of 2-meter intervals. (See appendix B for comparison of lithologic log and core-sampling technique.) Samples for destructive analysis of intervals represented by chips will represent the standard 2-meter intervals. Samples for destructive analysis of intervals represented by diamond-sliced slabs will represent specific lithologic intervals within the standard 2-meter interval and will be capable of weighted arithmetic recombination to 2-meter intervals.

Core Processing

Core received at the repository will be inspected for completeness relative to the descriptive data submitted by the donor. A check will be made of the CORES data bank for similar samples from the general area as a guide to types of mineralization, and a cursory literature search will be conducted. These data, together with the lithologic logs supplied and any analytical data, will be used to establish a concise lithologic log in the metric system suitable for magnetic storage and retrieval.

The individual logging the core will decide what sample intervals should be preserved by diamond slicing and what intervals are adequately represented by chip samples. In general, all areas of obvious alteration, shear zones, assay values, or spectacular lithologic changes will be preserved by diamond-sliced slabs. In addition, a significant section of wall rock above and below the ore body or anomalous zone will also be sliced for storage.

Textural and structural evidence is better studied in samples larger than chips. These changes in rock fabric are usually megascopically visible to the core logger, and if past logging and analyses are also available most of these textural features will be readily noted. Any subjectivity in the selection of samples for diamond slicing will be biased toward slicing more core than is necessary for representativeness.

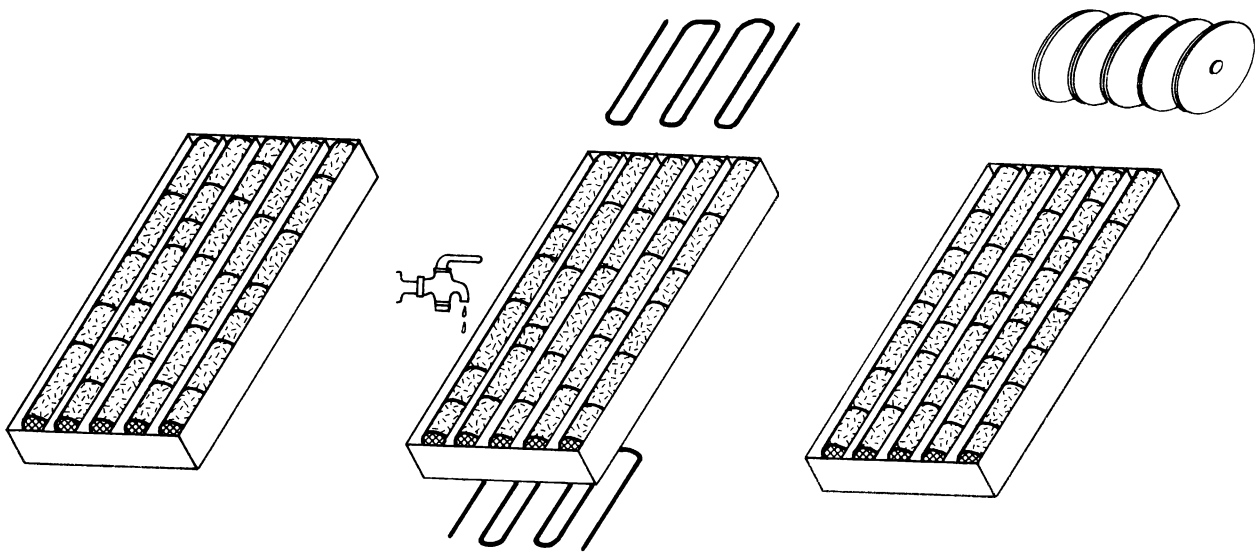


FIGURE 1. - Idealized diagram illustrating freezing and longitudinal diamond slicing of selected core intervals. The strength developed by freezing into a standard-sized block facilitates clamping and sawing.

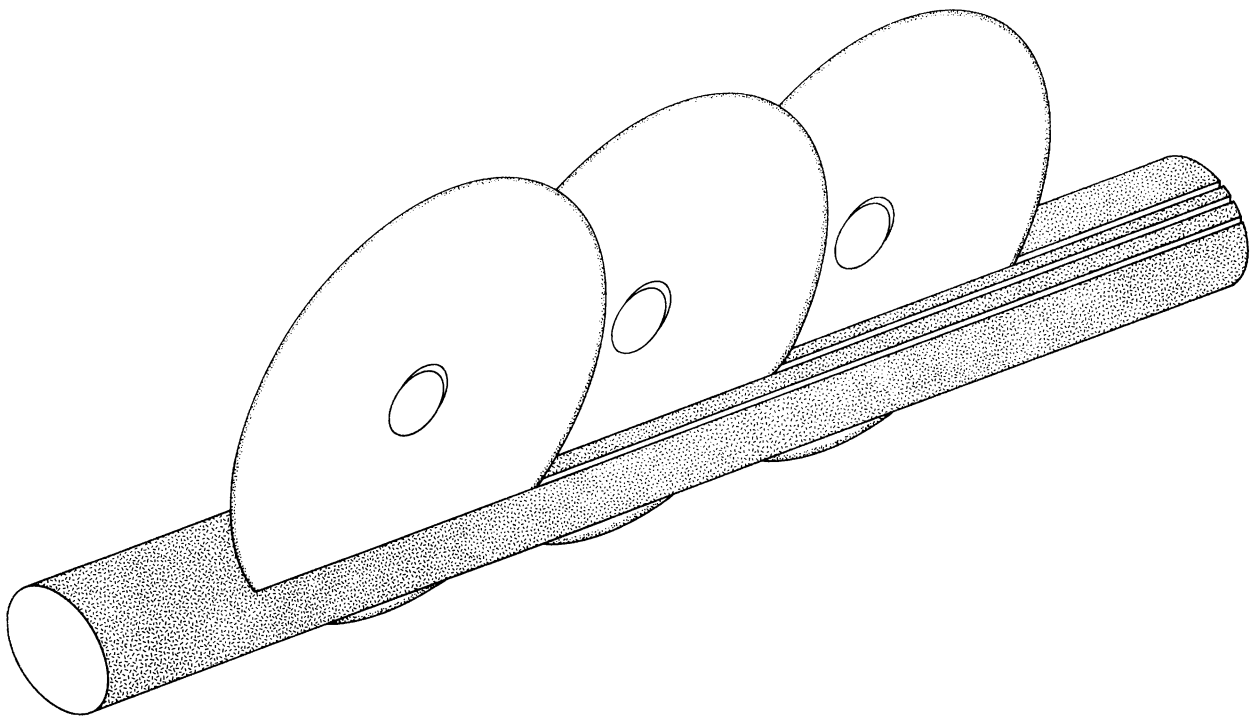


FIGURE 2. - Diagrammatic representation of portion of multiple-gang diamond saw slicing single row of core. A refrigerated coolant composed of ethyl alcohol and water at -30° C is fed to the leading edge of each blade for removal of cuttings. Water at 5° C is fed into cuts at the trailing edge of each blade to freeze in the void and prevent chatter.

Core intervals selected for diamond slicing will be placed in standard-sized, waxed cardboard core boxes. These containers will be flooded with water and the contents frozen to -80° C. This frozen standard-sized block will be sawed on a staggered multiple-gang diamond saw. The outermost slice will be combined into appropriate intervals, dried, and crushed to minus 10 mesh; and approximately 70 grams will be split, placed in a plastic vial, and saved for possible future destructive analysis. If the core logger decides that immediate chemical analyses are needed for a better understanding of select intervals, an additional 80 grams will be split from the bulk sample, pulverized, and submitted for appropriate analysis. Another slice will be dried, packaged, and stored. A third slice will be available for future branch facilities or for return to donor (figs. 1-5). The remainder of the core will be maintained in temporary storage until all processing and analyses of a given

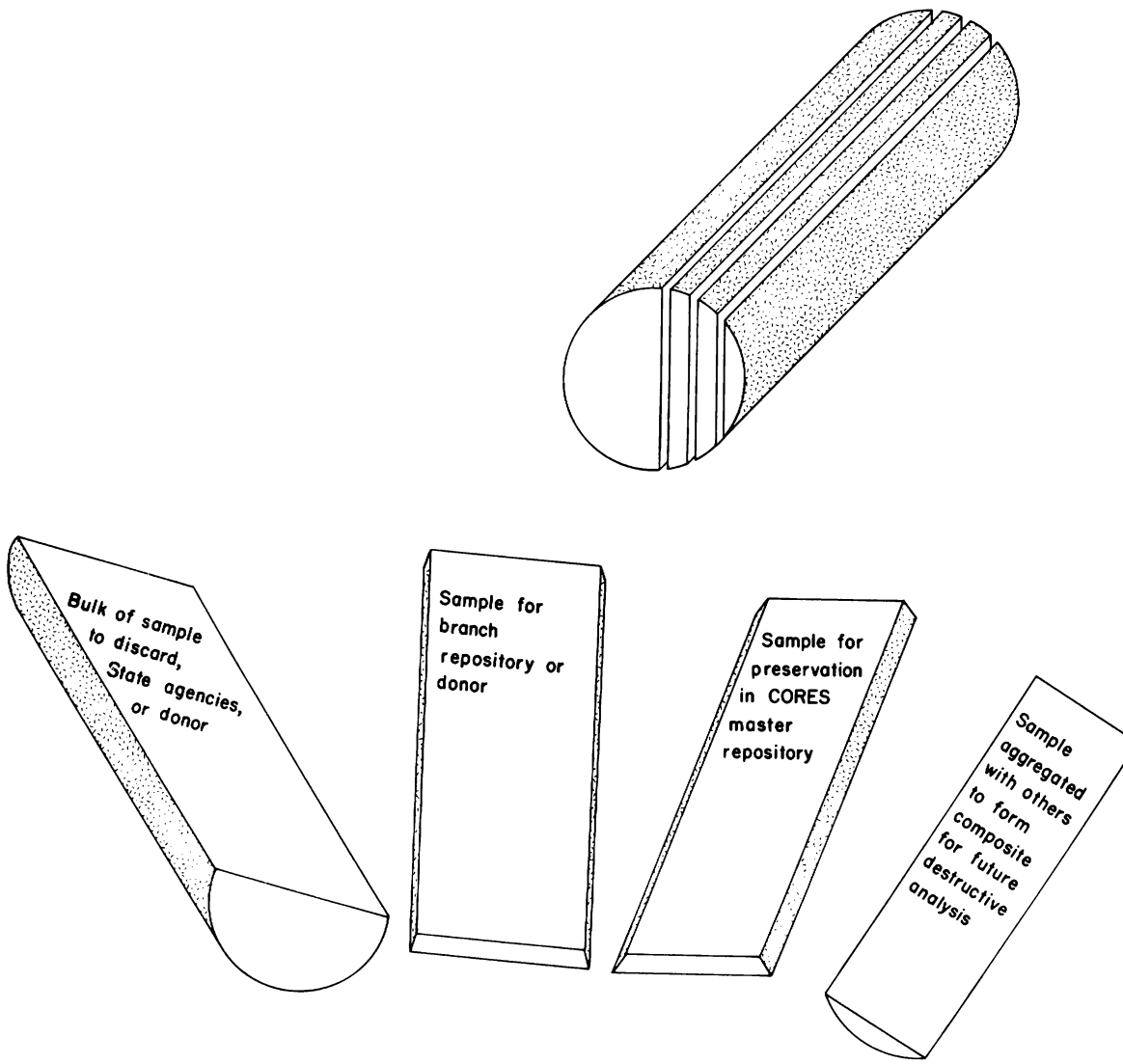


FIGURE 3. - Disposition of slices of longitudinally diamond-sliced core.

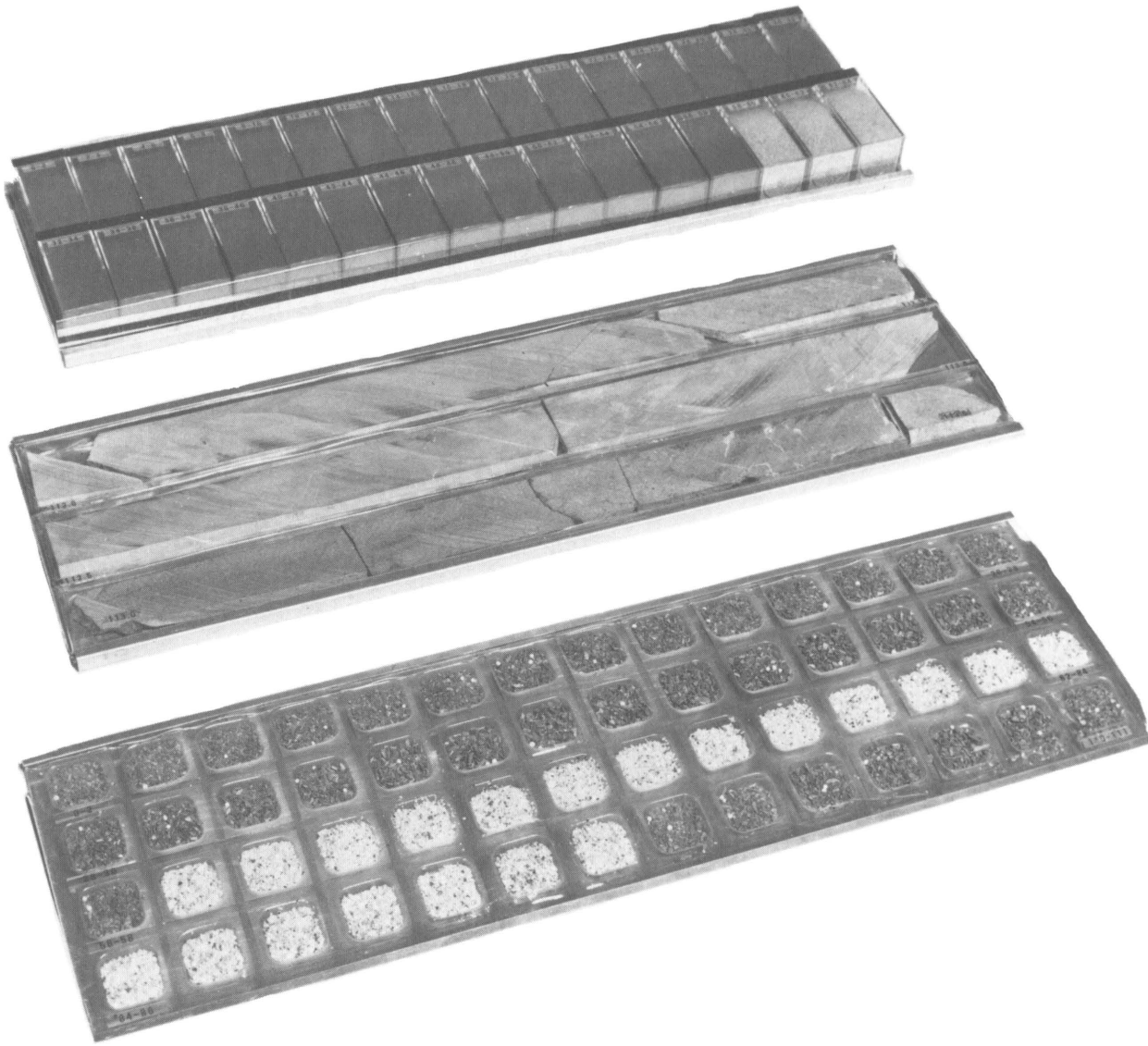


FIGURE 4. - Splits for future destructive analysis, sawed core slices, and chip samples packaged in polycarbonate film on permanent file storage trays.

drill hole are completed and checked. This portion then will be either discarded, sent to interested State agencies, or returned to the donor.

The core selected to be represented by chip samples will be crushed to minus 10 mesh, and two 150-gram splits will be retained. The rejected major portion of these core intervals will be retained in temporary storage along with the diamond-sliced rejects. One 150-gram split will be screened to produce a minus 10-mesh plus 35-mesh fraction. This fraction will be washed, dried, and mounted with clear acrylic lacquer in nominal 25- by 25-mm compartments. These compartments are an integral part of the chip storage file that will also be blister-packaged similar to diamond core slices (fig. 4).

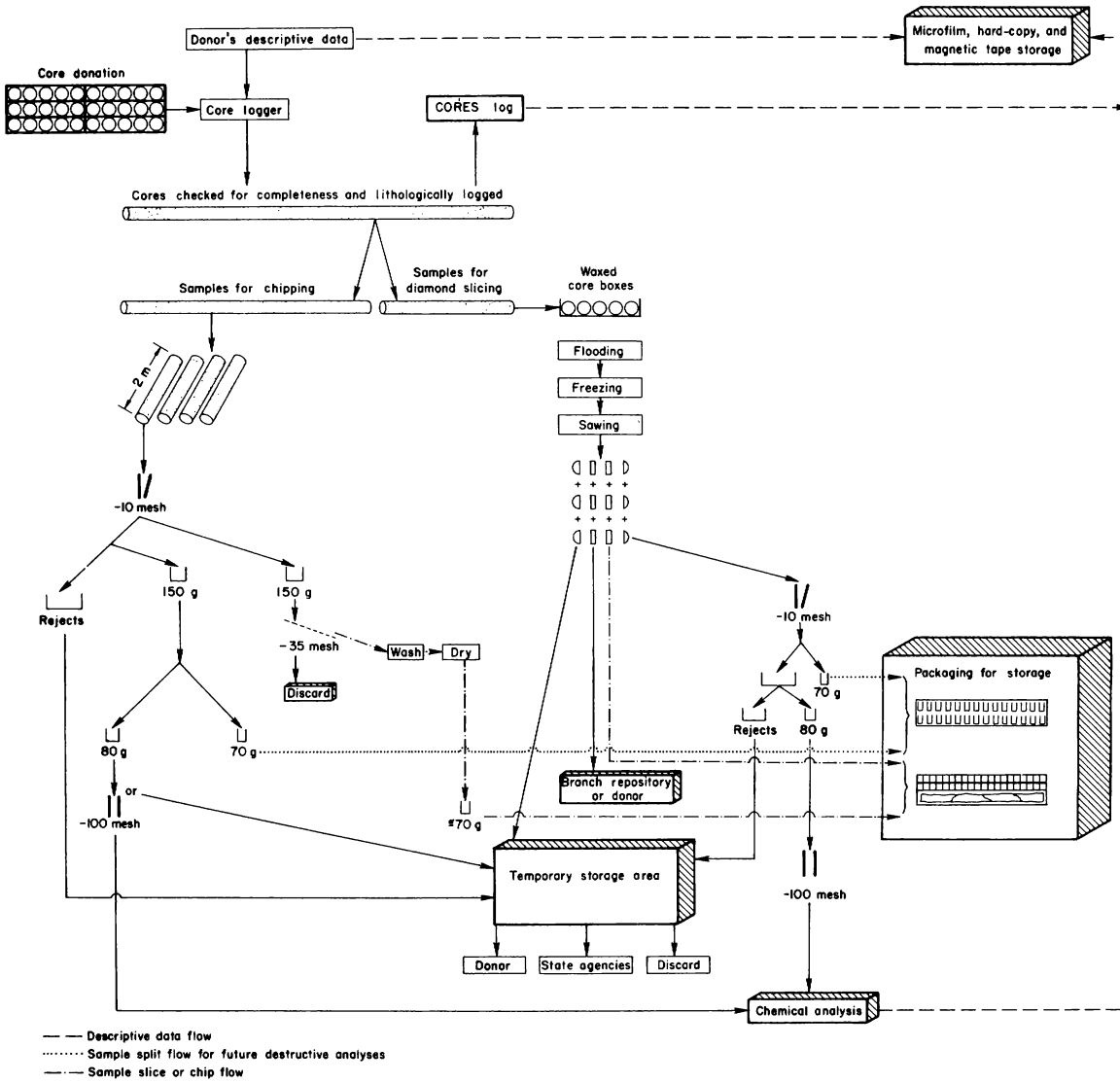


FIGURE 5. - Schematic flowsheet for processing core samples for permanent CORES storage.

The remaining 150-gram split will be split into a 70-gram split and an 80-gram split. The 70-gram split will be placed in a plastic vial and stored in the same box as the appropriate chip file tray for future destructive analysis. If the core logger has decided that immediate chemical analyses are warranted for select intervals, the 80-gram split of the intervals will be pulverized and submitted for analysis. The 80-gram splits not selected for current analyses will be placed in temporary storage along with the appropriate bulk interval split.

Figure 5 is a schematic flowsheet for the processing of core samples accepted for preservation by CORES. No bulk splits of samples will be returned to the donor or discarded until all processing and requested analyses

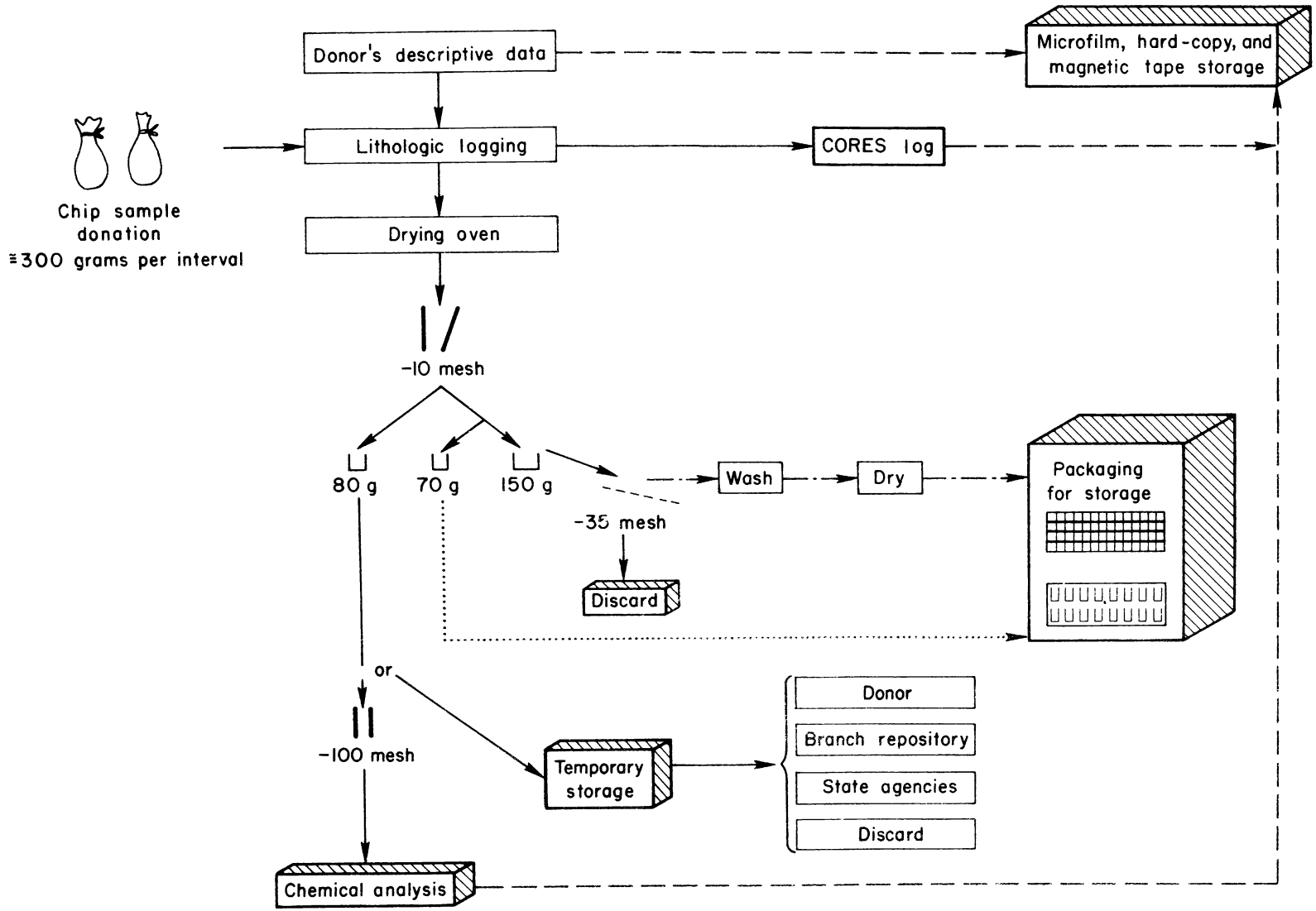


FIGURE 6. - Schematic flowsheet for processing chip sample donations for permanent CORES storage.

have been finished, file storage trays have been checked for completeness, and the core logger is satisfied that the processing technicians have complied with his instructions.

Rotary, Percussive, and Channel-Chip Samples

Rotary, percussive, and channel-chip samples will be received at the repository in essentially their original volume relative to the donor's sampling technique or in approximately 300-gram sample splits. Samples will be examined for completeness and lithologically logged. Samples will be dried and crushed to minus 10 mesh and divided into a 150-gram split, an 80-gram split, and a 70-gram split. The 150-gram split will be screened through a 35-mesh screen, and the plus fraction will be washed, dried, and mounted in clear acrylic lacquer for a permanent chip storage file. The 80-gram split will be pulverized and submitted for chemical analysis if this is deemed appropriate for select intervals. If chemical analyses are not warranted, the 80-gram split will be sent to temporary storage. The 70-gram split will be placed in a plastic vial and stored in the same box with the appropriate chip storage file.

Figure 6 is a schematic flowsheet for the processing of rotary, percussive, and channel-chip samples accepted for preservation.

STORAGE AND RETRIEVAL OF DATA

General

All original documents for each sample suite supplied by the donor will be maintained in a hard-copy file. Selected documents such as sample location maps and drill logs will be microfilmed for ready access. Donor-submitted analyses and pertinent location and descriptive data, plus Bureau-generated lithologic logs and analyses, will be stored on magnetic disks, tapes, or cards. All information in magnetic and microfilm storage and the physical samples will be accessible to interested parties at the master repository during normal working hours. In addition, information in magnetic storage will be accessible through the Bureau of Mines State Liaison Offices or CORES branch facilities by telephone and mail. An electronic records processor at the master facility will enable the user to sort the stored data by location and physical characteristics and produce printed copies of pertinent data. Physical samples will be available for study in examination facilities provided at the master or branch repository, but samples for destructive analysis will be available only at the master repository.

Descriptive Data

All documents submitted by a donor will be maintained in a hard-copy file using the Mineral Industry Location System (MILS) identification number as the file key. When donors request the return of all original documents, appropriate copies will be made for storage purposes. This hard-copy file will be maintained primarily as a backup system for magnetic and microfilm storage.

Because of the bulkiness of the hard-copy file and the time involved in searching and refiling, these records will not be available for general use.

Selected donor's logs, maps, and descriptive data that accompany a sample suite are too bulky to be coded for magnetic storage and will be microfilmed and made accessible for general use. These data will be stored on 35-mm aperture cards that are retrievable and readable on an available reader-printer. The first aperture card for documents for a given sample suite will contain a listing of the total number of frames available for the suite as well as the general descriptive headings. Certain prints of maps, in addition to being maintained at the CORES master repository, will be available through the Bureau of Mines Mine Map Repository System. Magnetic printout will indicate whether these documents are available in Denver, Spokane, or Pittsburgh and will indicate their accession numbers.

Selected donor and CORES-generated descriptive data and analyses for each sample suite will be stored on magnetic disks, tapes, or cards (appendix A). Storage of input data will be in an alphanumeric form readily understandable by the anticipated user without the need for decoding. An electronic records processor at the master repository will make it possible to sort available (nonconfidential) data on the basis of descriptive parameters once the keysort parameter of location by State and county is specified. Unwanted records will be excluded from the search by high-speed electronic selection from the magnetic disk memory on the basis of user-specified parameters. The exact items of information desired by the user will be displayed on an indexable cathode ray tube display and in the form of printed copy, if desired. Numerical limits for search parameters can be specified, but no computations can be performed.

From the standpoint of the prospective user, prompt retrieval of the data is essential. With the system envisioned, a typical search of even a large number of sample suites can be accomplished within 5 or 10 minutes, including the printout of hard copy for permanent reference by the user.

Physical Samples

Diamond-sliced slab or chip file storage trays consist of fabricated metal trays 140 mm wide by 500 mm long with indents 8 mm deep. Vacuum-formed polycarbonate dimpled inserts for chips and grooved inserts appropriate for the width of slices are friction-held in these standard metal trays (fig. 7).

Chip samples are initially held in their individual 25- by 25- by 7-mm compartments with clear acrylic lacquer. The core slices and chip samples are permanently held in place on the file storage trays by a top covering of formed polycarbonate film. The film can be conformed to the shape of the samples because the tray contains minute holes through which a vacuum is applied during the heating process. The clear film does not interfere with microscopic examination of the slices or chips.

The 70-gram splits of samples for future destructive analysis are stored in vials attached to molded plastic trays similar in size to the sample file trays. The vials are attached to the trays by flexible molded projections (fig. 7).

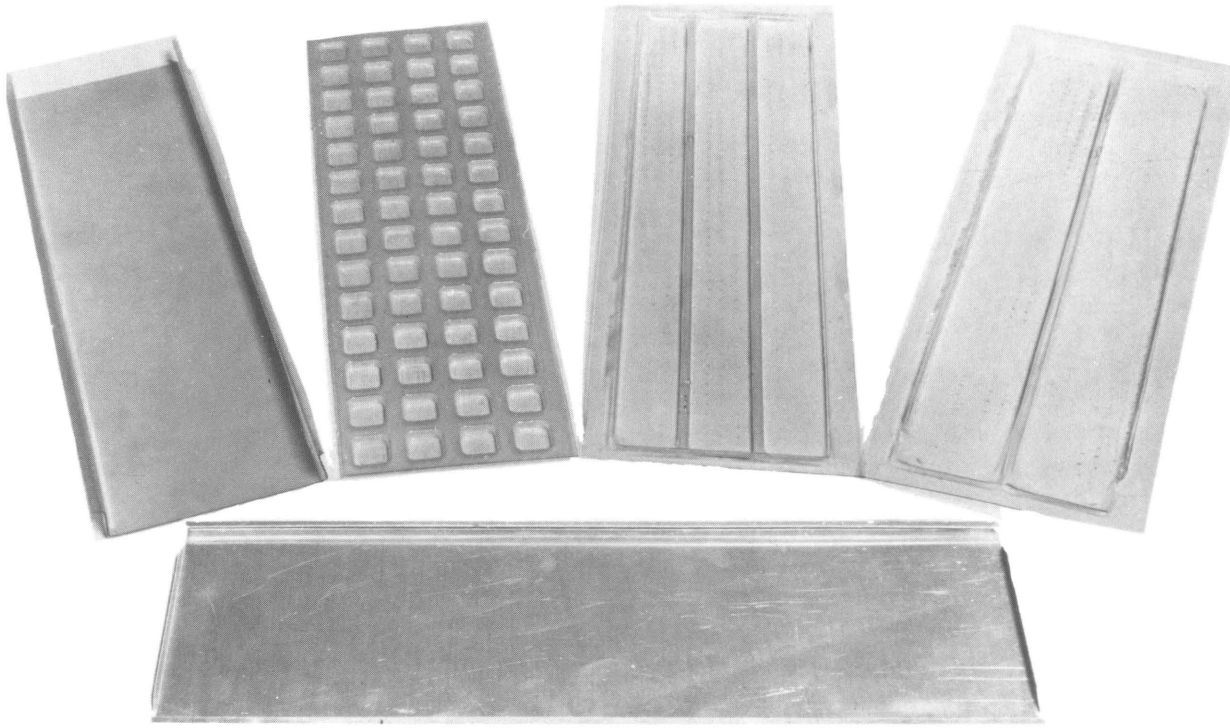


FIGURE 7. - Fabricated metal file storage trays with formed polycarbonate inserts for various sized core slices, and formed inserts for chip samples and sample splits for future destructive analysis. The inserts are friction-held into the standard metal trays.

Core slice and chip file storage trays are placed with their appropriate 70-gram splits for future destructive analysis in fabricated metal boxes. These boxes have interior dimensions of 505 by 755 by 145 mm with walls approximately 3.2 mm thick. These boxes can hold 75 slice and chip file storage trays, or 65 slice and chip trays and 3 trays with sample splits for future destructive analysis. One storage box can contain the slices, chips, and 70-gram splits in the 150-meter, NX core sample described in appendix B.

The tops and bottoms of the metal storage boxes are identical and are held together by steel fasteners that penetrate the sealable closure ears (fig. 8). The assembly is gasketed and dustproof. The stiffening effected by the file storage trays being perpendicular to the long dimension allows the boxes to hold 45 kg and to be supported in storage racks by angle-iron guides along and under the side closure ears.

Samples will be stored in steel racks, and the outsides of the boxes will be permanently coded. Storage location data are part of the permanent magnetic data file (appendix A, field 29).

Sample Inspection Facilities

During normal working hours, Monday through Friday, CORES will maintain sample inspection facilities at the master library in Reno, Nev., for use by the public. Samples stored in the system can be examined with available binocular microscopes, and generated data can be inspected. No destructive analyses may be performed nor samples removed from this facility without prior written approval.

Requests for Additional Analytical Data

Requests may be made for thin sections and/or polished surfaces for detailed study. These requests must be made in writing to the master repository unless the sections requested are already available in the collection. In general, this procedure will require the requestor, with prior written approval, to designate the appropriate areas, and these samples will be sent by the Bureau to approved contractors for sawing and sectioning or polishing. Contractors' price lists will be available, and the requestor's certified or cashier's check will accompany the order to the contractor selected by the requestor. The contractor will return the unused portion of the sample to the repository and the sectioned samples to the requestor. The latter will have 45 days from receipt of the sections to analyze and return them to the master facility with accompanying petrographic descriptions and analyses. Thin-section and polished surfaces available in the permanent collection may be borrowed under the same conditions.

Requests for additional destructive analyses must be made in writing, and consideration will be given as to whether these analyses will be performed by the Bureau, by an outside approved contractor, by the requesting company, or performed at all. In general, all destructive analyses will be performed on the pulverized sample split that accompanies the sawed or chip sample split. In certain cases, a small sample will be ground from a sawed sample split. All generated analytical data will become a part of the permanent storage record of CORES. Analyses performed by outside contractors will be done with the stipulation that the contractor return all unused sample to the Bureau and report all analytical results both to the Bureau and to the requestor. The submission of samples to a contractor will be accompanied by the requestor's certified or cashier's check.

It should be noted that the expression "approved contractor" means that this contractor has supplied price lists and agrees to return unusued samples and duplicate data sheets to the Bureau. The Bureau of Mines does not guarantee the accuracy of these contractors' analytical work or the quality of their thin sections or polished surfaces.

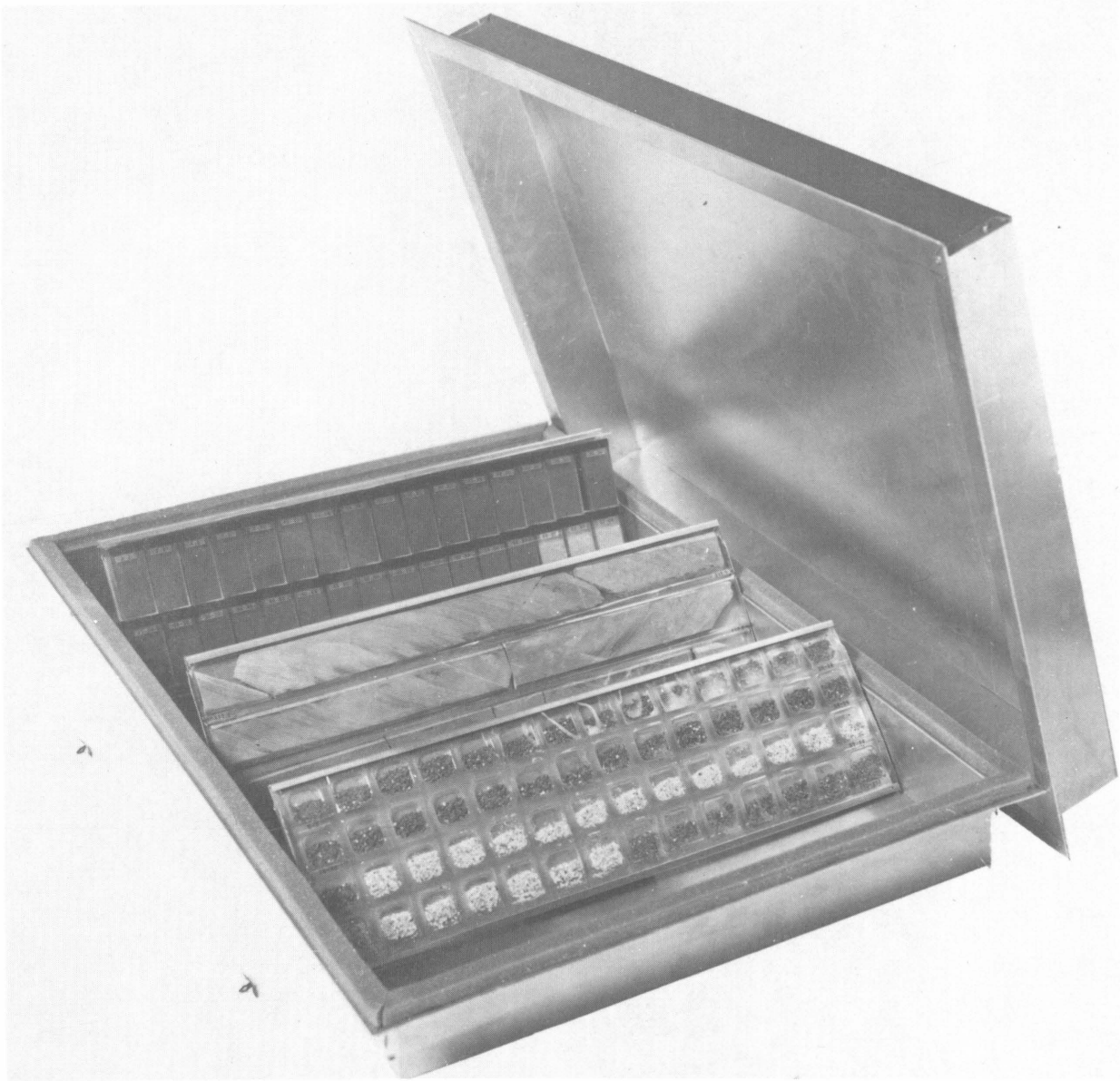


FIGURE 8. - Fabricated metal storage box and permanent file storage trays. The box is gasketed and held together with dart-type metal fasteners.

APPENDIX A.--MAGNETIC STORAGE PRINTOUT FORMAT

This appendix describes the format and typical data contents of a hypothetical sample suite. Figures A-1 and A-2 represent this data record printout where only field titles and contents would be printed for a user request. The record is divided into file A and file B; file A contains predominantly descriptive data in 36 fields composed of 476 characters and/or significant blanks, and file B contains predominantly chemical analysis data, element by element, in 56 fields composed of 283 characters and/or significant blanks. Each file is identifiable by a Mineral Industry Location System (MILS) identification (I.D.) number which is specific for a given sample suite. The first field in each file is composed of this MILS I.D. number. System capability exists for recognition of both a word and a code number in certain of the fields. This capability allows for compatibility with preexisting Bureau of Mines Minerals Availability System (MAS) codes and the MAS data bank.

For ease of addressing fields selected for display or printout, each field is identified by an ordinal number. For example, in file A the field consisting of columns 1-11 is identified by the system operator as field 1, the field consisting of columns 12-13 is identified as field 2, and so on.

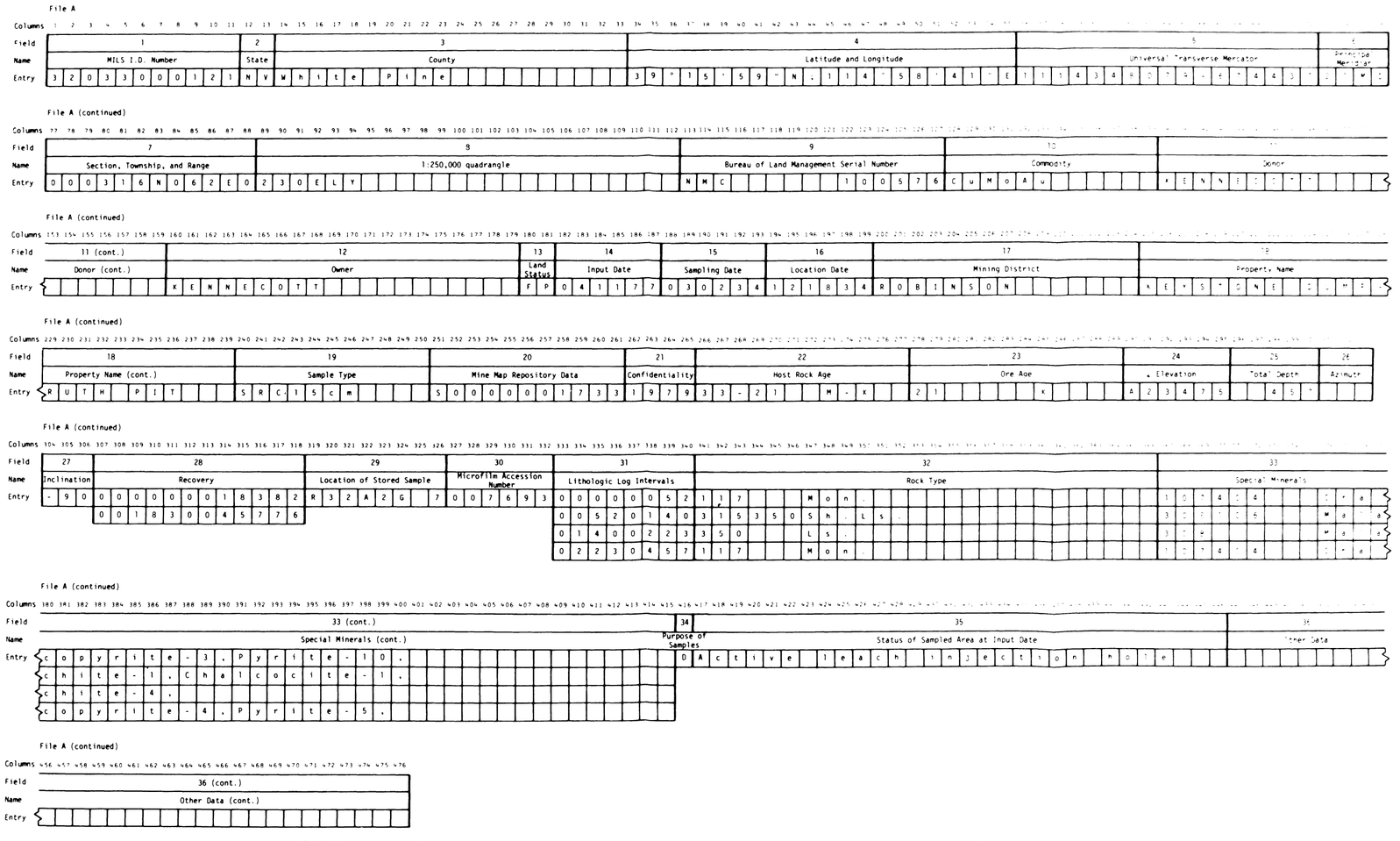


FIGURE A-1. - Data record printout format for file A for a hypothetical sample suite from White Pine County, Nev.

File B

Columns	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Field	1											2									3		4	5					6					7					8					9				
Name	MILS I.D. Number											Analytical Intervals									Type Analysis		Analyst	Ag					Al					As					Au					B				
Entry	3	2	0	3	3	0	0	0	1	2	1																																					

File B (continued)

Columns	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
Field	10					11					12					13					14					15					16					17					18					19				
Name	Ba					Be					Bi					Br					Ca					Cd					Ce					Cl					Co					Cr				
Entry																																																		

File B (continued)

Columns	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148
Field	20					21					22					23					24					25					26					27					28					29				
Name	Cu					F					Fe					Ga					He					Hg					I					K					La					Li				
Entry																																																		

File B (continued)

Columns	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198
Field	30					31					32					33					34					35					36					37					38					39				
Name	Mg					Mn					Mo					Na					Nb					Ni					P					Pb					Pd					Pt				
Entry																																																		

File B (continued)

Columns	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248
Field	40					41					42					43					44					45					46					47					48					49				
Name	Sb					Sc					Se					Si					Sn					Sr					Ta					Te					Th					Ti				
Entry																																																		

File B (continued)

Columns	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283
Field	50					51					52					53					54					55					56						
Name	U					V					W					Y					Zn					Zr					Other						
Entry																																			

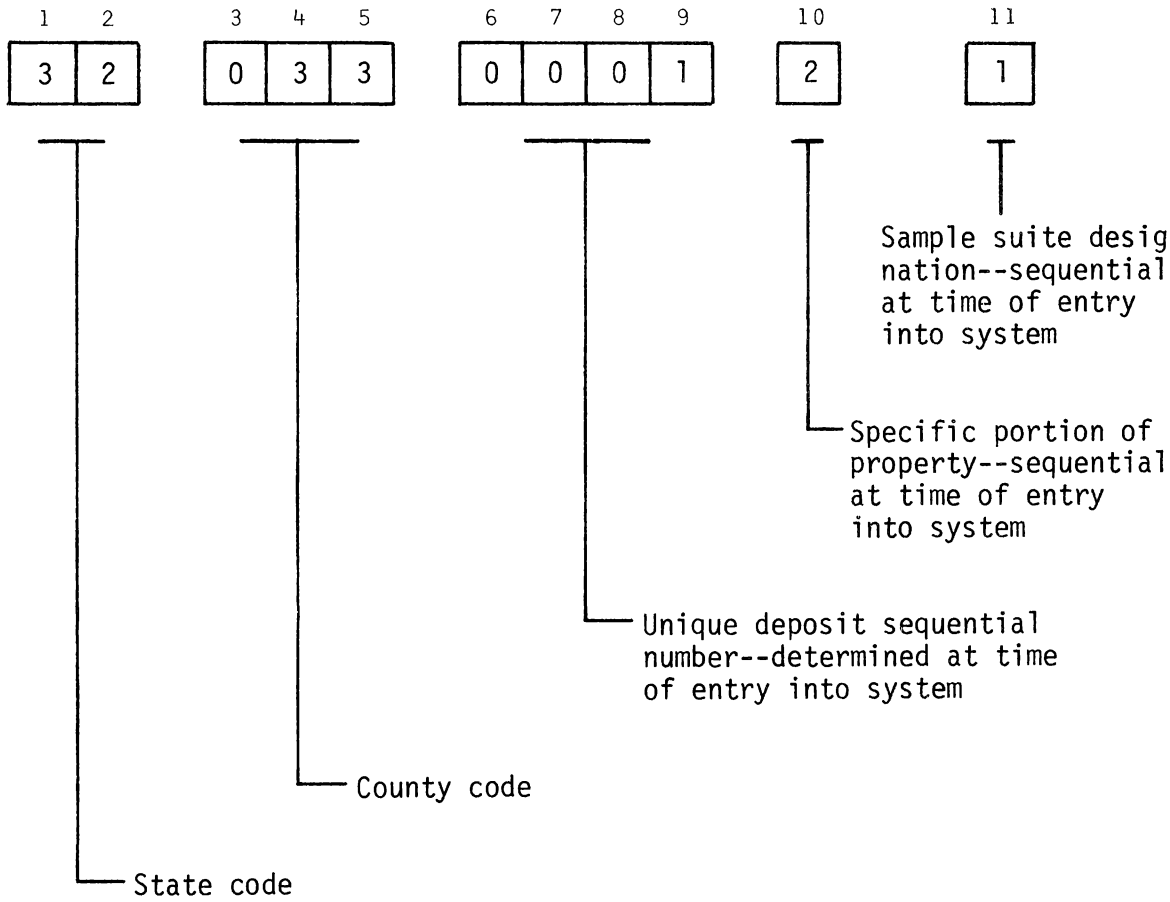
FIGURE A-2. - Data record printout format for file B for the sample suite shown in figure A-1.

File A

Columns 1-11

Field 1

MILS I.D. Number



States of the United States

Code	State	Code	State
01	Alabama	44	Rhode Island
02	Alaska	45	South Carolina
04	Arizona	46	South Dakota
05	Arkansas	47	Tennessee
06	California	48	Texas
08	Colorado	49	Utah
09	Connecticut	50	Vermont
10	Delaware	51	Virginia
11	District of Columbia	53	Washington
12	Florida	54	West Virginia
13	Georgia	55	Wisconsin
15	Hawaii	56	Wyoming
16	Idaho		
17	Illinois		
18	Indiana		
19	Iowa		
20	Kansas		
21	Kentucky		
22	Louisiana		
23	Maine		
24	Maryland		
25	Massachusetts		
26	Michigan		
27	Minnesota		
28	Mississippi		
29	Missouri		
30	Montana		
31	Nebraska		
32	Nevada		
33	New Hampshire		
34	New Jersey		
35	New Mexico		
36	New York		
37	North Carolina		
38	North Dakota		
39	Ohio		
40	Oklahoma		
41	Oregon		
42	Pennsylvania		

Source: U.S. Bureau of Mines. The Bureau of Mines Minerals Availability System and Resource Classification Manual. IC 8654, 1974, pp. 100-136.

Counties and County Equivalents of the States of the United States

ALABAMA
State Code: 01

Code	County Name
001	Autauga
003	Baldwin
005	Barbour
007	Bibb
009	Blount
011	Bullock
013	Butler
015	Calhoun
017	Chambers
019	Cherokee
021	Chilton
023	Choctaw
025	Clarke
027	Clay
029	Cleburne
031	Coffee
033	Colbert
035	Conecuh
037	Coosa
039	Covington
041	Crenshaw
043	Cullman
045	Dale
047	Dallas
049	De Kalb
051	Elmore
053	Escambia
055	Etowah
057	Fayette
059	Franklin
061	Geneva
063	Greene
065	Hale
067	Henry
069	Houston
071	Jackson
073	Jefferson
075	Lamar
077	Lauderdale
079	Lawrence
081	Lee
083	Limestone
085	Lowndes
087	Macon
089	Madison
091	Marengo
093	Marion
095	Marshall
097	Mobile
099	Monroe
101	Montgomery
103	Morgan
105	Perry
107	Pickens
109	Pike
111	Randolph
113	Russell
115	St. Clair
117	Shelby
119	Sumter
121	Talladega
123	Tallapoosa
125	Tuscaloosa
127	Walker
129	Washington
131	Wilcox
133	Winston

ALASKA
State Code: 02

No county subdivision in Alaska; topographic quadrangle names are used instead.

Code	Quadrangle Name
149	Adak
127	Afognak
028	Ambler River
146	Amukta
085	Anchorage
024	Arctic
148	Atka
110	Atlin
153	Attu
090	Baird Inlet
027	Baird Mts.
001	Barrow
008	Barter Island
040	Beaver
006	Beechey Point
044	Bendeleben
097	Bering Glacier

091	Bethel
039	Bettles
059	Big Delta
070	Black
042	Black River
105	Blying Sound
118	Bradfield
128	Bristol Bay
045	Candle
099	Cape Mendenhall
031	Chandalar
022	Chandler Lake
051	Charley River
133	Chignik
032	Christian
050	Circle
139	Cold Bay
033	Coleen
096	Cordova
119	Craig
018	De Long Mts
016	Demarcation Point
102	Dillingham
121	Dixon Entrance
060	Eagle
058	Fairbanks
141	False Pass
007	Flaxman Island
041	Fort Yukon
150	Gareloi Island
101	Goodnews
077	Gulkana
123	Hagemeister Island
005	Harrison Bay
067	Healy
072	Holy Cross
079	Hooper Bay
020	Howard Pass
038	Hughes
107	Icy Bay
073	Iditarod
012	Ikpikpuk River
103	Iliamna
112	Juneau
136	Kaguyak
057	Kantishna River
130	Karluk
046	Kateel River
094	Kenai
120	Ketchikan
021	Killik River
152	Kiska
131	Kodiak
035	Kotzebue
100	Kuskokwim Bay
071	Kwiguk
093	Lake Clark
083	Lime Hills
049	Livengood
011	Lookout Ridge
080	Marshall
087	McCarthy
074	McGrath
003	Meade River
065	Medfra
047	Melozitna
106	Middleton Island
019	Miskeguk Mtn.
111	Mt. Fairweather
068	Mt. Hayes
126	Mt. Katmai
066	Mt. McKinley
015	Mt. Michelson
098	Mt. St. Elias
078	Nabesna
125	Naknek
026	Noatak
052	Nome
054	Norton Bay
055	Nulato
089	Nunivak Island
124	Nushagak Bay
064	Ophir
117	Petersburg
023	Phillip Smith Mtn.
017	Point Hope
009	Point Lay
116	Port Alexander
138	Port Moller
132	Pribilof Islands
122	Prince Rupert
151	Rat Islands
056	Ruby
081	Russian Mission
061	St. Lawrence
088	St. Matthew
062	St. Michael
014	Sagavanirktok
145	Samalga Island
147	Seguam

036	Selawik
104	Seldovia
095	Seward
034	Shishmaref
037	Shungnak
140	Simeonof Island
114	Sitka
109	Skagway
082	Sleetmute
053	Solomon
137	Stepovak Bay
115	Sumdum
029	Survey Pass
134	Sutwik Island
025	Table Mtn.
113	Taku River
075	Talkeetna
076	Talkeetna Mtns.
069	Tanacross
048	Tanana
092	Taylor Mtns.
043	Teller
004	Teshekpuk
135	Trinity Islands
084	Tyonek
129	Ugashik
013	Umiat
144	Umnak
063	Unalakleet
143	Unalaska
142	Unimak
010	Utukok River
086	Valdez
002	Wainwright
030	Wiseman
108	Yakutat

ARIZONA
State Code: 04

Code	County Name
001	Apache
003	Cochise
005	Coconino
007	Gila
009	Graham
011	Greenlee
013	Maricopa
015	Mohave
017	Navajo
019	Pima
021	Pinal
023	Santa Cruz
025	Yavapai
027	Yuma

ARKANSAS
State Code: 05

Code	County Name
001	Arkansas
003	Ashley
005	Baxter
007	Benton
009	Boone
011	Bradley
013	Calhoun
015	Carroll
017	Chicot
019	Clark
021	Clay
023	Cleburne
025	Cleveland
027	Columbia
029	Conway
031	Craighead
033	Crawford
035	Crittenden
037	Cross
039	Dallas
041	Desha
043	Drew
045	Faulkner
047	Franklin
049	Fulton
051	Garland
053	Grant
055	Greene
057	Hempstead
059	Hot Spring
061	Howard
063	Independence
065	Izard
067	Jackson
069	Jefferson
071	Johnson
073	Lafayette

075	Lawrence
077	Lee
079	Lincoln
081	Little River
083	Logan
085	Lonoke
087	Madison
089	Marion
091	Miller
093	Mississippi
095	Monroe
097	Montgomery
099	Nevada
101	Newton
103	Ouachita
105	Perry
107	Phillips
109	Pike
111	Poinsett
113	Polk
115	Pope
117	Prairie
119	Pulaski
121	Randolph
123	St. Francis
125	Saline
127	Scott
129	Searcy
131	Sebastian
133	Sevier
135	Sharp
137	Stone
139	Union
141	Van Buren
143	Washington
145	White
147	Woodruff
149	Yell

CALIFORNIA
State Code: 06

Code	County Name
001	Alameda
003	Alpine
005	Amador
007	Butte
009	Calaveras
011	Colusa
013	Contra Costa
015	Del Norte
017	El Dorado
019	Fresno
021	Glenn
023	Humboldt
025	Imperial
027	Inyo
029	Kern
031	Kings
033	Lake
035	Lassen
037	Los Angeles
039	Madera
041	Marin
043	Mariposa
045	Mendocino
047	Merced
049	Modoc
051	Mono
053	Monterey
055	Napa
057	Nevada
059	Orange
061	Placer
063	Plumas
065	Riverside
067	Sacramento
069	San Benito
071	San Bernardino
073	San Diego
075	San Francisco
077	San Joaquin
079	San Luis Obispo
081	San Mateo
083	Santa Barbara
085	Santa Clara
087	Santa Cruz
089	Shasta
091	Sierra
093	Siskiyou
095	Solano
097	Sonoma
099	Stanislaus
101	Sutter
103	Tehama
105	Trinity
107	Tulare
109	Tuolumne
111	Ventura
113	Yolo
115	Yuba

COLORADO
State Code: 08

Code	County Name
001	Adams
003	Alamosa
005	Arapahoe
007	Archuleta
009	Baca
011	Bent
013	Boulder
015	Chaffee
017	Cheyenne
019	Clear Creek
021	Conejos
023	Costilla
025	Crowley
027	Custer
029	Delta
031	Denver
033	Dolores
035	Douglas
037	Eagle
039	Elbert
041	El Paso
043	Fremont
045	Garfield
047	Gilpin
049	Grand
051	Gunnison
053	Hinsdale
055	Huerfano
057	Jackson
059	Jefferson
061	Kiowa
063	Kit Carson
065	Lake
067	La Plata
069	Larimer
071	Las Animas
073	Lincoln
075	Logan
077	Mesa
079	Mineral
081	Moffat
083	Montezuma
085	Montrose
087	Morgan
089	Otero
091	Ouray
093	Park
095	Phillips
097	Pitkin
099	Prowers
101	Pueblo
103	Rio Blanco
105	Rio Grande
107	Routt
109	Saguache
111	San Juan
113	San Miguel
115	Sedgwick
117	Summit
119	Teller
121	Washington
123	Weld
125	Yuma

CONNECTICUT
State Code: 09

Code	County Name
001	Fairfield
003	Hartford
005	Litchfield
007	Middlesex
009	New Haven
011	New London
013	Tolland
015	Windham

DELAWARE
State Code: 10

Code	County Name
001	Kent
003	New Castle
005	Sussex

DISTRICT OF COLUMBIA
State Code: 11

Code	Name
001	Washington

FLORIDA
State Code: 12

Code	County Name
001	Alachua
003	Baker
005	Bay
007	Bradford
009	Brevard
011	Broward
013	Calhoun
015	Charlotte
017	Citrus
019	Clay
021	Collier
023	Columbia
025	Dade
027	De Soto
029	Dixie
031	Duval
033	Escambia
035	Flagler
037	Franklin
039	Gadsden
041	Gilchrist
043	Glades
045	Gulf
047	Hamilton
049	Hardee
051	Hendry
053	Hernando
055	Highlands
057	Hillsborough
059	Holmes
061	Indian River
063	Jackson
065	Jefferson
067	Lafayette
069	Lake
071	Lee
073	Leon
075	Levy
077	Liberty
079	Madison
081	Manatee
083	Marion
085	Martin
087	Monroe
089	Nassau
091	Okaloosa
093	Okeechobee
095	Orange
097	Osceola
099	Palm Beach
101	Pasco
103	Pinellas
105	Polk
107	Putnam
109	St. Johns
111	St. Lucie
113	Santa Rosa
115	Sarasota
117	Seminole
119	Sumter
121	Suwannee
123	Taylor
125	Union
127	Volusia
129	Wakulla
131	Walton
133	Washington

GEORGIA
State Code: 13

Code	County Name
001	Appling
003	Atkinson
005	Bacon
007	Baker
009	Baldwin
011	Banks
013	Barrow
015	Bartow
017	Ben Hill
019	Berrien
021	Bibb
023	Bleckley
025	Brantley
027	Brooks
029	Bryan
031	Bulloch
033	Burke
035	Butts
037	Calhoun
039	Camden
043	Candler
045	Carroll

047	Catoosa
049	Charlton
051	Chatham
053	Chattahoochee
055	Chattooga
057	Cherokee
059	Clarke
061	Clay
063	Clayton
065	Clinch
067	Cobb
069	Coffee
071	Colquitt
073	Columbia
075	Cook
077	Coweta
079	Crawford
081	Crisp
083	Dade
085	Dawson
087	Decatur
089	De Kalb
091	Dodge
093	Dooly
095	Dougherty
097	Douglas
099	Early
101	Echols
103	Effingham
105	Elbert
107	Emanuel
109	Evans
111	Fannin
113	Fayette
115	Floyd
117	Forsyth
119	Franklin
121	Fulton
123	Gilmer
125	Glascock
127	Glynn
129	Gordon
131	Grady
133	Greene
135	Gwinnett
137	Habersham
139	Hall
141	Hancock
143	Haralson
145	Harris
147	Hart
149	Heard
151	Henry
153	Houston
155	Irwin
157	Jackson
159	Jasper
161	Jeff Davis
163	Jefferson
165	Jenkins
167	Johnson
169	Jones
171	Lamar
173	Lanier
175	Laurens
177	Lee
179	Liberty
181	Lincoln
183	Long
185	Lowndes
187	Lumpkin
189	McDuffie
191	McIntosh
193	Macon
195	Madison
197	Marion
199	Meriwether
201	Miller
205	Mitchell
207	Monroe
209	Montgomery
211	Morgan
213	Murray
215	Muscogee
217	Newton
219	Oconee
221	Oglethorpe
223	Paulding
225	Peach
227	Pickens
229	Pierce
231	Pike
233	Polk
235	Pulaski
237	Putnam
239	Quitman
241	Rabun
243	Randolph
245	Richmond
247	Rockdale
249	Schley
251	Screven

253	Seminole
255	Spalding
257	Stephens
259	Stewart
261	Sumter
263	Talbot
265	Taliaferro
267	Tattnall
269	Taylor
271	Telfair
273	Terrell
275	Thomas
277	Tift
279	Toombs
281	Towns
283	Treutlen
285	Troup
287	Turner
289	Twiggs
291	Union
293	Upson
295	Walker
297	Walton
299	Ware
301	Warren
303	Washington
305	Wayne
307	Webster
309	Wheeler
311	White
313	Whitfield
315	Wilcox
317	Wilkes
319	Wilkinson
321	Worth

HAWAII
State Code: 15

Code	County Name
001	Hawaii
003	Honolulu
005	Kalawao district
007	Kauai
009	Maui

IDAHO
State Code: 16

Code	County Name
001	Ada
003	Adams
005	Bannock
007	Bear Lake
009	Benewah
011	Bingham
013	Blaine
015	Boise
017	Bonner
019	Bonneville
021	Boundary
023	Butte
025	Camas
027	Canyon
029	Caribou
031	Cassia
033	Clark
035	Clearwater
037	Custer
039	Elmore
041	Franklin
043	Fremont
045	Gem
047	Gooding
049	Idaho
051	Jefferson
053	Jerome
055	Kootenai
057	Latah
059	Lemhi
061	Lewis
063	Lincoln
065	Madison
067	Minidoka
069	Nez Perce
071	Oneida
073	Owyhee
075	Payette
077	Power
079	Shoshone
081	Teton
083	Twin Falls
085	Valley
087	Washington

ILLINOIS
State Code: 17

Code	County Name
001	Adams
003	Alexander
005	Bond
007	Boone
009	Brown
011	Bureau
013	Calhoun
015	Carroll
017	Cass
019	Champaign
021	Christian
023	Clark
025	Clay
027	Clinton
029	Coles
031	Cook
033	Crawford
035	Cumberland
037	De Kalb
039	De Witt
041	Douglas
043	Du Page
045	Edgar
047	Edwards
049	Effingham
051	Fayette
053	Ford
055	Franklin
057	Fulton
059	Gallatin
061	Greene
063	Grundy
065	Hamilton
067	Hancock
069	Hardin
071	Henderson
073	Henry
075	Iroquois
077	Jackson
079	Jasper
081	Jefferson
083	Jersey
085	Jo Daviess
087	Johnson
089	Kane
091	Kankakee
093	Kendall
095	Knox
097	Lake
099	La Salle
101	Lawrence
103	Lee
105	Livingston
107	Logan
109	McDonough
111	McHenry
113	McLean
115	Macon
117	Macoupin
119	Madison
121	Marion
123	Marshall
125	Mason
127	Massac
129	Menard
131	Mercer
133	Monroe
135	Montgomery
137	Morgan
139	Moultrie
141	Ogle
143	Peoria
145	Perry
147	Piatt
149	Pike
151	Pope
153	Pulaski
155	Putnam
157	Randolph
159	Richland
161	Rock Island
163	St. Clair
165	Saline
167	Sangamon
169	Schuyler
171	Scott
173	Shelby
175	Stark
177	Stephenson
179	Tazewell
181	Union
183	Vermilion
185	Wabash
187	Warren
189	Washington
191	Wayne
193	White

195	Whiteside
197	Will
199	Williamson
201	Winnebago
203	Woodford

INDIANA
State Code: 18

Code	County Name
001	Adams
003	Allen
005	Bartholomew
007	Benton
009	Blackford
011	Boone
013	Brown
015	Carroll
017	Cass
019	Clark
021	Clay
023	Clinton
025	Crawford
027	Daviess
029	Dearborn
031	Decatur
033	De Kalb
035	Delaware
037	Dubois
039	Elkhart
041	Fayette
043	Floyd
045	Fountain
047	Franklin
049	Fulton
051	Gibson
053	Grant
055	Greene
057	Hamilton
059	Hancock
061	Harrison
063	Hendricks
065	Henry
067	Howard
069	Huntington
071	Jackson
073	Jasper
075	Jay
077	Jefferson
079	Jennings
081	Johnson
083	Knox
085	Kosciusko
087	Lagrange
089	Lake
091	La Porte
093	Lawrence
095	Madison
097	Marion
099	Marshall
101	Martin
103	Miami
105	Monroe
107	Montgomery
109	Morgan
111	Newton
113	Noble
115	Ohio
117	Orange
119	Owen
121	Parke
123	Perry
125	Pike
127	Porter
129	Posey
131	Pulaski
133	Putnam
135	Randolph
137	Ripley
139	Rush
141	St. Joseph
143	Scott
145	Shelby
147	Spencer
149	Starke
151	Steuben
153	Sullivan
155	Switzerland
157	Tippecanoe
159	Tipton
161	Union
163	Vanderburgh
165	Vermillion
167	Vigo
169	Wabash
171	Warren
173	Warrick
175	Washington
177	Wayne
179	Wells
181	White
183	Whitley

IOWA
State Code: 19

Code	County Name
001	Adair
003	Adams
005	Allamakee
007	Appanoose
009	Audubon
011	Benton
013	Black Hawk
015	Boone
017	Bremer
019	Buchanan
021	Buena Vista
023	Butler
025	Calhoun
027	Carroll
029	Cass
031	Cedar
033	Cerro Gordo
035	Cherokee
037	Chickasaw
039	Clarke
041	Clay
043	Clayton
045	Clinton
047	Crawford
049	Dallas
051	Davis
053	Decatur
055	Delaware
057	Des Moines
059	Dickinson
061	Dubuque
063	Emmet
065	Fayette
067	Floyd
069	Franklin
071	Fremont
073	Greene
075	Grundy
077	Guthrie
079	Hamilton
081	Hancock
083	Hardin
085	Harrison
087	Henry
089	Howard
091	Humboldt
093	Ida
095	Iowa
097	Jackson
099	Jasper
101	Jefferson
103	Johnson
105	Jones
107	Keokuk
109	Kossuth
111	Lee
113	Linn
115	Louisa
117	Lucas
119	Lyon
121	Madison
123	Mahaska
125	Marion
127	Marshall
129	Mills
131	Mitchell
133	Monona
135	Monroe
137	Montgomery
139	Muscatine
141	O'Brien
143	Osceola
145	Page
147	Palo Alto
149	Plymouth
151	Pocahontas
153	Polk
155	Pottawattamie
157	Poweshiek
159	Ringgold
161	Sac
163	Scott
165	Shelby
167	Sioux
169	Story
171	Tama
173	Taylor
175	Union
177	Van Buren
179	Wapello
181	Warren
183	Washington
185	Wayne
187	Webster
189	Winnebago
191	Winneshiek
193	Woodbury
195	Worth
197	Wright

KANSAS
State Code: 20

Code	County Name
001	Allen
003	Anderson
005	Atchison
007	Barber
009	Barton
011	Bourbon
013	Brown
015	Butler
017	Chase
019	Chautauqua
021	Cherokee
023	Cheyenne
025	Clark
027	Clay
029	Cloud
031	Coffey
033	Comanchee
035	Cowley
037	Crawford
039	Decatur
041	Dickinson
043	Doniphan
045	Douglas
047	Edwards
049	Elk
051	Ellis
053	Ellsworth
055	Finney
057	Ford
059	Franklin
061	Geary
063	Gove
065	Graham
067	Grant
069	Gray
071	Greeley
073	Greenwood
075	Hamilton
077	Harper
079	Harvey
081	Haskell
083	Hodgeman
085	Jackson
087	Jefferson
089	Jewell
091	Johnson
093	Kearny
095	Kingman
097	Kiowa
099	Labette
101	Lane
103	Leavenworth
105	Lincoln
107	Linn
109	Logan
111	Lyon
113	McPherson
115	Marion
117	Marshall
119	Meade
121	Miami
123	Mitchell
125	Montgomery
127	Morris
129	Morton
131	Nemaha
133	Neosho
135	Ness
137	Norton
139	Osage
141	Osborne
143	Ottawa
145	Pawnee
147	Phillips
149	Pottawatomie
151	Pratt
153	Rawlins
155	Reno
157	Republic
159	Rice
161	Riley
163	Rooks
165	Rush
167	Russell
169	Saline
171	Scott
173	Sedgwick
175	Seward
177	Shawnee
179	Sheridan
181	Sherman
183	Smith
185	Stafford
187	Stanton
189	Stevens
191	Sumner
193	Thomas

195	Trego
197	Wabaunsee
199	Wallace
201	Washington
203	Wichita
205	Wilson
207	Woodson
209	Wyandotte

KENTUCKY
State Code: 21

Code	County Name
001	Adair
003	Allen
005	Anderson
007	Ballard
009	Barren
011	Bath
013	Bell
015	Boone
017	Bourbon
019	Boyd
021	Boyle
023	Bracken
025	Breathitt
027	Breckinridge
029	Bullitt
031	Butler
033	Caldwell
035	Calloway
037	Campbell
039	Carlisle
041	Carroll
043	Carter
045	Casey
047	Christian
049	Clark
051	Clay
053	Clinton
055	Crittenden
057	Cumberland
059	Daviess
061	Edmonson
063	Elliott
065	Estill
067	Fayette
069	Fleming
071	Floyd
073	Franklin
075	Fulton
077	Gallatin
079	Garrard
081	Grant
083	Graves
085	Grayson
087	Green
089	Greenup
091	Hancock
093	Hardin
095	Harlan
097	Harrison
099	Hart
101	Henderson
103	Henry
105	Hickman
107	Hopkins
109	Jackson
111	Jefferson
113	Jessamine
115	Johnson
117	Kenton
119	Knott
121	Knox
123	Larue
125	Laurel
127	Lawrence
129	Lee
131	Leslie
133	Letcher
135	Lewis
137	Lincoln
139	Livingston
141	Logan
143	Lyon
145	McCracken
147	McCreary
149	McLean
151	Madison
153	Magoffin
155	Marion
157	Marshall
159	Martin
161	Mason
163	Meade
165	Menifee
167	Mercer
169	Metcalfe
171	Monroe
173	Montgomery
175	Morgan

177	Muhlenberg
179	Nelson
181	Nicholas
183	Ohio
185	Oldham
187	Owen
189	Owsley
191	Pendleton
193	Perry
195	Pike
197	Powell
199	Pulaski
201	Robertson
203	Rockcastle
205	Rowan
207	Russell
209	Scott
211	Shelby
213	Simpson
215	Spencer
217	Taylor
219	Todd
221	Trigg
223	Trimble
225	Union
227	Warren
229	Washington
231	Wayne
233	Webster
235	Whitley
237	Wolfe
239	Woodford

LOUISANA
State Code: 22

Code	Parish Name
001	Acadia
003	Allen
005	Ascension
007	Assumption
009	Avoyelles
011	Beauregard
013	Bienville
015	Bossier
017	Caddo
019	Calcasieu
021	Caldwell
023	Cameron
025	Catahoula
027	Claiborne
029	Concordia
031	De Soto
033	East Baton Rouge
035	East Carroll
037	East Feliciana
039	Evangeline
041	Franklin
043	Grant
045	Iberia
047	Iberville
049	Jackson
051	Jefferson
053	Jefferson Davis
055	Lafayette
057	LaFourche
059	La Salle
061	Lincoln
063	Livingston
065	Madison
067	Morehouse
069	Natchitoches
071	Orleans
073	Ouachita
075	Plaquemines
077	Pointe Coupee
079	Rapides
081	Red River
083	Richland
085	Sabine
087	St. Bernard
089	St. Charles
091	St. Helena
093	St. James
095	St. John the Baptist
097	St. Landry
099	St. Martin
101	St. Mary
103	St. Tammany
105	Tangipahoa
107	Tensas
109	Terrebonne
111	Union
113	Vermilion
115	Vernon
117	Washington
119	Webster
121	West Baton Rouge
123	West Carroll
125	West Feliciana
127	Winn

MAINE
State Code: 23

Code	County Name
001	Androscoggin
003	Aroostook
005	Cumberland
007	Franklin
009	Hancock
011	Kennebec
013	Knox
015	Lincoln
017	Oxford
019	Penobscot
021	Piscataquis
023	Sagadahoc
025	Somerset
027	Waldo
029	Washington
031	York

MARYLAND
State Code: 24

Code	County Name
001	Allegany
003	Anne Arundel
005	Baltimore
009	Calvert
011	Caroline
013	Carroll
015	Cecil
017	Charles
019	Dorchester
021	Frederick
023	Garrett
025	Harford
027	Howard
029	Kent
031	Montgomery
033	Prince Georges
035	Queen Annes
037	St. Marys
039	Somerset
041	Talbot
043	Washington
045	Wicomico
047	Worcester

Code	Independent City
510	Baltimore City

MASSACHUSETTS
State Code: 25

Code	County Name
001	Barnstable
003	Berkshire
005	Bristol
007	Dukes
009	Essex
011	Franklin
013	Hampden
015	Hampshire
017	Middlesex
019	Nantucket
021	Norfolk
023	Plymouth
025	Suffolk
027	Worcester

MICHIGAN
State Code: 26

Code	County Name
001	Alcona
003	Alger
005	Allegan
007	Alpena
009	Antrim
011	Arenac
013	Baraga
015	Barry
017	Bay
019	Benzie
021	Berrien
023	Branch
025	Calhoun
027	Cass
029	Charlevoix
031	Cheboygan
033	Chippewa
035	Clare
037	Clinton
039	Crawford
041	Delta

043	Dickinson
045	Eaton
047	Emmet
049	Genesee
051	Gladwin
053	Gogebic
055	Grand Traverse
057	Gratiot
059	Hillsdale
061	Houghton
063	Huron
065	Ingham
067	Ionia
069	Iosco
071	Iron
073	Isabella
075	Jackson
077	Kalamazoo
079	Kalkaska
081	Kent
083	Keweenaw
085	Lake
087	Lapeer
089	Leelanau
091	Lenawee
093	Livingston
095	Luce
097	Mackinac
099	Macomb
101	Manistee
103	Marquette
105	Mason
107	Mecosta
109	Menominee
111	Midland
113	Missaukee
115	Monroe
117	Montcalm
119	Montmorency
121	Muskegon
123	Newaygo
125	Oakland
127	Oceana
129	Ogemaw
131	Ontonagon
133	Osceola
135	Oscoda
137	Otsego
139	Ottawa
141	Presque Isle
143	Roscommon
145	Saginaw
147	St. Clair
149	St. Joseph
151	Sanilac
153	Schoolcraft
155	Shiawassee
157	Tuscola
159	Van Buren
161	Washtenaw
163	Wayne
165	Wexford

MINNESOTA

State Code: 27

Code	County Name
001	Aitkin
003	Anoka
005	Becker
007	Beltrami
009	Benton
011	Big Stone
013	Blue Earth
015	Brown
017	Carlton
019	Carver
021	Cass
023	Chippewa
025	Chisago
027	Clay
029	Clearwater
031	Cook
033	Cottonwood
035	Crow Wing
037	Dakota
039	Dodge
041	Douglas
043	Faribault
045	Fillmore
047	Freeborn
049	Goodhue
051	Grant
053	Hennepin
055	Houston
057	Hubbard
059	Isanti
061	Itasca
063	Jackson
065	Kanabec
067	Kandiyohi

069	Kittson
071	Koochiching
073	Lac Qui Parle
075	Lake
077	Lake of the Woods
079	Le Sueur
081	Lincoln
083	Lyon
085	McLeod
087	Mahnomen
089	Marshall
091	Martin
093	Meeker
095	Mille Lacs
097	Morrison
099	Mower
101	Murray
103	Nicollet
105	Nobles
107	Norman
109	Olmsted
111	Otter Tail
113	Pennington
115	Pine
117	Pipestone
119	Polk
121	Pope
123	Ramsey
125	Red Lake
127	Redwood
129	Renville
131	Rice
133	Rock
135	Roseau
137	St. Louis
139	Scott
141	Sherburne
143	Sibley
145	Stearns
147	Steele
149	Stevens
151	Swift
153	Todd
155	Traverse
157	Wabasha
159	Wadena
161	Waseca
163	Washington
165	Watonwan
167	Wilkin
169	Winona
171	Wright
173	Yellow Medicine

MISSISSIPPI

State Code: 28

Code	County Name
001	Adams
003	Alcorn
005	Amite
007	Attala
009	Benton
011	Bolivar
013	Calhoun
015	Carroll
017	Chickasaw
019	Choctaw
021	Claiborne
023	Clarke
025	Clay
027	Coahoma
029	Copiah
031	Covington
033	De Soto
035	Forrest
037	Franklin
039	George
041	Greene
043	Grenada
045	Hancock
047	Harrison
049	Hinds
051	Holmes
053	Humphreys
055	Issaquena
057	Itawamba
059	Jackson
061	Jasper
063	Jefferson
065	Jefferson Davis
067	Jones
069	Kemper
071	Lafayette
073	Lamar
075	Lauderdale
077	Lawrence
079	Leake
081	Lee
083	Leflore
085	Lincoln

087	Lowndes
089	Madison
091	Marion
093	Marshall
095	Monroe
097	Montgomery
099	Neshoba
101	Newton
103	Noxubee
105	Oktibbeha
107	Panola
109	Pearl River
111	Perry
113	Pike
115	Pontotoc
117	Prentiss
119	Quitman
121	Rankin
123	Scott
125	Sharkey
127	Simpson
129	Smith
131	Stone
133	Sunflower
135	Tallahatchie
137	Tate
139	Tippah
141	Tishomingo
143	Tunica
145	Union
147	Walthall
149	Warren
151	Washington
153	Wayne
155	Webster
157	Wilkinson
159	Winston
161	Yalobusha
163	Yazoo

MISSOURI

State Code: 29

Code	County Name
001	Adair
003	Andrew
005	Atchison
007	Audrain
009	Barry
011	Barton
013	Bates
015	Benton
017	Bollinger
019	Boone
021	Buchanan
023	Butler
025	Caldwell
027	Callaway
029	Camden
031	Cape Girardeau
033	Carroll
035	Carter
037	Cass
039	Cedar
041	Chariton
043	Christian
045	Clark
047	Clay
049	Clinton
051	Cole
053	Copper
055	Crawford
057	Dade
059	Dallas
061	Daviess
063	De Kalb
065	Dent
067	Douglas
069	Dunklin
071	Franklin
073	Gasconade
075	Gentry
077	Greene
079	Grundy
081	Harrison
083	Henry
085	Hickory
087	Holt
089	Howard
091	Howell
093	Iron
095	Jackson
097	Jasper
099	Jefferson
101	Johnson
103	Knox
105	Laclede
107	Lafayette
109	Lawrence
111	Lewis
113	Lincoln

115	Linn
117	Livingston
119	McDonald
121	Macon
123	Madison
125	Maries
127	Marion
129	Mercer
131	Miller
133	Mississippi
135	Moniteau
137	Monroe
139	Montgomery
141	Morgan
143	New Madrid
145	Newton
147	Nodaway
149	Oregon
151	Osage
153	Ozark
155	Pemiscot
157	Perry
159	Pettis
161	Phelps
163	Pike
165	Platte
167	Polk
169	Pulaski
171	Putnam
173	Ralls
175	Randolph
177	Ray
179	Reynolds
181	Ripley
183	St. Charles
185	St. Clair
187	St. Francois
189	St. Louis
193	Ste. Genevieve
195	Saline
197	Schuyler
199	Scotland
201	Scott
203	Shannon
205	Shelby
207	Stoddard
209	Stone
211	Sullivan
213	Taney
215	Texas
217	Vernon
219	Warren
221	Washington
223	Wayne
225	Webster
227	Worth
229	Wright

Code	Independent City
510	St. Louis City

MONTANA

State Code: 30

Code	County Name
001	Beaverhead
003	Big Horn
005	Blaine
007	Broadwater
009	Carbon
011	Carter
013	Cascade
015	Chouteau
017	Custer
019	Daniels
021	Dawson
023	Deer Lodge
025	Fallon
027	Fergus
029	Flathead
031	Gallatin
033	Garfield
035	Glacier
037	Golden Valley
039	Granite
041	Hill
043	Jefferson
045	Judith Basin
047	Lake
049	Lewis and Clark
051	Liberty
053	Lincoln
055	McCone
057	Madison
059	Meagher
061	Mineral
063	Missoula
065	Musselshell
067	Park
069	Petroleum

071	Phillips
073	Pondera
075	Powder River
077	Powell
079	Prairie
081	Ravalli
083	Richland
085	Roosevelt
087	Rosebud
089	Sanders
091	Sheridan
093	Silver Bow
095	Stillwater
097	Sweet Grass
099	Teton
101	Toole
103	Treasure
105	Valley
107	Wheatland
109	Wibaux
111	Yellowstone
113	Yellowstone National Park--Part

NEBRASKA

State Code: 31

Code	County Name
001	Adams
003	Antelope
005	Arthur
007	Banner
009	Blaine
011	Boone
013	Box Butte
015	Boyd
017	Brown
019	Buffalo
021	Burt
023	Butler
025	Cass
027	Cedar
029	Chase
031	Cherry
033	Cheyenne
035	Clay
037	Colfax
039	Cuming
041	Custer
043	Dakota
045	Dawes
047	Dawson
049	Deuel
051	Dixon
053	Dodge
055	Douglas
057	Dundy
059	Fillmore
061	Franklin
063	Frontier
065	Furnas
067	Gage
069	Garden
071	Garfield
073	Gosper
075	Grant
077	Greeley
079	Hall
081	Hamilton
083	Harlan
085	Hayes
087	Hitchcock
089	Holt
091	Hooker
093	Howard
095	Jefferson
097	Johnson
099	Kearney
101	Keith
103	Keya Paha
105	Kimball
107	Knox
109	Lancaster
111	Lincoln
113	Logan
115	Loup
117	McPherson
119	Madison
121	Merrick
123	Morrill
125	Nance
127	Nemaha
129	Nuckolls
131	Otoe
133	Pawnee
135	Perkins
137	Phelps
139	Pierce
141	Platte
143	Polk
145	Red Willow

147	Richardson
149	Rock
151	Saline
153	Sarpy
155	Saunders
157	Scotts Bluff
159	Seward
161	Sheridan
163	Sherman
165	Sioux
167	Stanton
169	Thayer
171	Thomas
173	Thurston
175	Valley
177	Washington
179	Wayne
181	Webster
183	Wheeler
185	York

NEVADA
State Code: 32

Code	County Name
001	Churchill
003	Clark
005	Douglas
007	Elko
009	Esmeralda
011	Eureka
013	Humboldt
015	Lander
017	Lincoln
019	Lyon
021	Mineral
023	Nye
027	Pershing
029	Story
031	Washoe
033	White Pine

Code	Independent City
510	Carson City

NEW HAMPSHIRE
State Code: 33

Code	County Name
001	Belknap
003	Carroll
005	Cheshire
007	Coos
009	Grafton
011	Hillsborough
013	Merrimack
015	Rockingham
017	Strafford
019	Sullivan

NEW JERSEY
State Code: 34

Code	County Name
001	Atlantic
003	Bergen
005	Burlington
007	Camden
009	Cape May
011	Cumberland
013	Essex
015	Gloucester
017	Hudson
019	Hunterdon
021	Mercer
023	Middlesex
025	Monmouth
027	Morris
029	Ocean
031	Passaic
033	Salem
035	Somerset
037	Sussex
039	Union
041	Warren

NEW MEXICO
State Code: 35

Code	County Name
001	Bernalillo
003	Catron
005	Chaves
007	Colfax
009	Curry
011	De Baca
013	Dona Ana
015	Eddy
017	Grant
019	Guadalupe
021	Harding
023	Hidalgo
025	Lea
027	Lincoln
028	Los Alamos
029	Luna
031	McKinley
033	Mora
035	Otero
037	Quay
039	Rio Arriba
041	Roosevelt
043	Sandoval
045	San Juan
047	San Miguel
049	Santa Fe
051	Sierra
053	Socorro
055	Taos
057	Torrance
059	Union
061	Valencia

NEW YORK
State Code: 36

Code	County Name
001	Albany
003	Allegany
005	Bronx
007	Broome
009	Cattaraugus
011	Cayuga
013	Chautauqua
015	Chemung
017	Chenango
019	Clinton
021	Columbia
023	Cortland
025	Delaware
027	Dutchess
029	Erie
031	Essex
033	Franklin
035	Fulton
037	Genesee
039	Greene
041	Hamilton
043	Herkimer
045	Jefferson
047	Kings
049	Lewis
051	Livingston
053	Madison
055	Monroe
057	Montgomery
059	Nassau
061	New York
063	Niagara
065	Oneida
067	Onondaga
069	Ontario
071	Orange
073	Orleans
075	Oswego
077	Otsego
079	Putnam
081	Queens
083	Rensselaer
085	Richmond
087	Rockland
089	St. Lawrence
091	Saratoga
093	Schenectady
095	Schoharie
097	Schuyler
099	Seneca
101	Steuben
103	Suffolk
105	Sullivan
107	Tioga
109	Tompkins
111	Ulster
113	Warren
115	Washington
117	Wayne

119	Westchester
121	Wyoming
123	Yates

NORTH CAROLINA
State Code: 37

Code	County Name
001	Alamance
003	Alexander
005	Alleghany
007	Anson
009	Ashe
011	Avery
013	Beaufort
015	Bertie
017	Bladen
019	Brunswick
021	Buncombe
023	Burke
025	Cabarrus
027	Caldwell
029	Camden
031	Carteret
033	Caswell
035	Catawba
037	Chatham
039	Cherokee
041	Chowan
043	Clay
045	Cleveland
047	Columbus
049	Craven
051	Cumberland
053	Currituck
055	Dare
057	Davidson
059	Davie
061	Duplin
063	Durham
065	Edgecombe
067	Forsyth
069	Franklin
071	Gaston
073	Gates
075	Graham
077	Granville
079	Greene
081	Guilford
083	Halifax
085	Harnett
087	Haywood
089	Henderson
091	Hertford
093	Hoke
095	Hyde
097	Iredell
099	Jackson
101	Johnston
103	Jones
105	Lee
107	Lenoir
109	Lincoln
111	McDowell
113	Macon
115	Madison
117	Martin
119	Mecklenburg
121	Mitchell
123	Montgomery
125	Moore
127	Nash
129	New Hanover
131	Northampton
133	Onslow
135	Orange
137	Pamlico
139	Pasquotank
141	Pender
143	Perquimans
145	Person
147	Pitt
149	Polk
151	Randolph
153	Richmond
155	Robeson
157	Rockingham
159	Rowan
161	Rutherford
163	Sampson
165	Scotland
167	Stanly
169	Stokes
171	Surry
173	Swain
175	Transylvania
177	Tyrrell
179	Union
181	Vance
183	Wake
185	Warren

187	Washington
191	Wayne
193	Wilkes
195	Wilson
197	Yadkin
199	Yancey

NORTH DAKOTA
State Code: 38

Code	County Name
001	Adams
003	Barnes
005	Benson
007	Billings
009	Bottineau
011	Bowman
013	Burke
015	Burleigh
017	Cass
019	Cavalier
021	Dickey
023	Divide
025	Dunn
027	Eddy
029	Emmons
031	Foster
033	Golden Valley
035	Grand Forks
037	Grant
039	Griggs
041	Hettinger
043	Kidder
045	La Moure
047	Logan
049	McHenry
051	McIntosh
053	McKenzie
055	McLean
057	Mercer
059	Morton
061	Mountrail
063	Nelson
065	Oliver
067	Pembina
069	Pierce
071	Ramsey
073	Ransom
075	Renville
077	Richland
079	Rolette
081	Sargent
083	Sheridan
085	Sioux
087	Slope
089	Stark
091	Steele
093	Stutsman
095	Towner
097	Traill
099	Walsh
101	Ward
103	Wells
105	Williams

OHIO
State Code: 39

Code	County Name
001	Adams
003	Allen
005	Ashland
007	Ashtabula
009	Athens
011	Auglaize
013	Belmont
015	Brown
017	Butler
019	Carroll
021	Champaign
023	Clark
025	Clermont
027	Clinton
029	Columbiana
031	Coshocton
033	Crawford
035	Cuyahoga
037	Darke
039	Defiance
041	Delaware
043	Erie
045	Fairfield
047	Fayette
049	Franklin
051	Fulton
053	Gallia
055	Geauga
057	Greene
059	Guernsey
061	Hamilton

063	Hancock
065	Hardin
067	Harrison
069	Henry
071	Highland
073	Hocking
075	Holmes
077	Huron
079	Jackson
081	Jefferson
083	Knox
085	Lake
087	Lawrence
089	Licking
091	Logan
093	Lorain
095	Lucas
097	Madison
099	Mahoning
101	Marion
103	Medina
105	Meigs
107	Mercer
109	Miami
111	Monroe
113	Montgomery
115	Morgan
117	Morrow
119	Muskingum
121	Noble
123	Ottawa
125	Paulding
127	Perry
129	Pickaway
131	Pike
133	Portage
135	Preble
137	Putnam
139	Richland
141	Ross
143	Sandusky
145	Scioto
147	Seneca
149	Shelby
151	Stark
153	Summit
155	Trumbull
157	Tuscarawas
159	Union
161	Van Wert
163	Vinton
165	Warren
167	Washington
169	Wayne
171	Williams
173	Wood
175	Wyandot

OKLAHOMA
State Code: 40

Code	County Name
001	Adair
003	Alfalfa
005	Atoka
007	Beaver
009	Beckham
011	Blaine
013	Bryan
015	Caddo
017	Canadian
019	Carter
021	Cherokee
023	Choctaw
025	Cimarron
027	Cleveland
029	Coal
031	Comanche
033	Cotton
035	Craig
037	Creek
039	Custer
041	Delaware
043	Dewey
045	Ellis
047	Garfield
049	Garvin
051	Grady
053	Grant
055	Greer
057	Harmon
059	Harper
061	Haskell
063	Hughes
065	Jackson
067	Jefferson
069	Johnston
071	Kay
073	Kingfisher
075	Kiowa
077	Latimer

079	Le Flore
081	Lincoln
083	Logan
085	Love
087	McClain
089	McCurtain
091	McIntosh
093	Major
095	Marshall
097	Mayes
099	Murray
101	Muskogee
103	Noble
105	Nowata
107	Okfuskee
109	Oklahoma
111	Okmulgee
113	Osage
115	Ottawa
117	Pawnee
119	Payne
121	Pittsburg
123	Pontotoc
125	Pottawatomie
127	Pushmataha
129	Roger Mills
131	Rogers
133	Seminole
135	Sequoyah
137	Stephens
139	Texas
141	Tillman
143	Tulsa
145	Wagoner
147	Washington
149	Washita
151	Woods
153	Woodward

OREGON
State Code: 41

Code	County Name
001	Baker
003	Benton
005	Clackamas
007	Clatsop
009	Columbia
011	Coos
013	Crook
015	Curry
017	Deschutes
019	Douglas
021	Gilliam
023	Grant
025	Harney
027	Hood River
029	Jackson
031	Jefferson
033	Josephine
035	Klamath
037	Lake
039	Lane
041	Lincoln
043	Linn
045	Malheur
047	Marion
049	Morrow
051	Multnomah
053	Polk
055	Sherman
057	Tillamook
059	Umatilla
061	Union
063	Wallowa
065	Wasco
067	Washington
069	Wheeler
071	Yamhill

PENNSYLVANIA
State Code: 42

Code	County Name
001	Adams
003	Allegheny
005	Armstrong
007	Beaver
009	Bedford
011	Berks
013	Blair
015	Bradford
017	Bucks
019	Butler
021	Cambria
023	Cameron
025	Carbon
027	Centre
029	Chester
031	Clarion

033	Clearfield
035	Clinton
037	Columbia
039	Crawford
041	Cumberland
043	Dauphin
045	Delaware
047	Elk
049	Erie
051	Fayette
053	Forest
055	Franklin
057	Fulton
059	Greene
061	Huntingdon
063	Indiana
065	Jefferson
067	Juniata
069	Lackawanna
071	Lancaster
073	Lawrence
075	Lebanon
077	Lehigh
079	Luzerne
081	Lycoming
083	McKean
085	Mercer
087	Mifflin
089	Monroe
091	Montgomery
093	Montour
095	Northampton
097	Northumberland
099	Perry
101	Philadelphia
103	Pike
105	Potter
107	Schuylkill
109	Snyder
111	Somerset
113	Sullivan
115	Susquehanna
117	Tioga
119	Union
121	Venango
123	Warren
125	Washington
127	Wayne
129	Westmoreland
131	Wyoming
133	York

RHODE ISLAND
State Code: 44

Code	County Name
001	Bristol
003	Kent
005	Newport
007	Providence
009	Washington

SOUTH CAROLINA
State Code: 45

Code	County Name
001	Abbeville
003	Aiken
005	Allendale
007	Anderson
009	Bamberg
011	Barnwell
013	Beaufort
015	Berkeley
017	Calhoun
019	Charleston
021	Cherokee
023	Chester
025	Chesterfield
027	Clarendon
029	Colleton
031	Darlington
033	Dillon
035	Dorchester
037	Edgefield
039	Fairfield
041	Florence
043	Georgetown
045	Greenville
047	Greenwood
049	Hampton
051	Horry
053	Jasper
055	Kershaw
057	Lancaster
059	Laurens
061	Lee
063	Lexington
065	McCormick
067	Marion
069	Marlboro

071	Newberry
073	Oconee
075	Orangeburg
077	Pickens
079	Richland
081	Saluda
083	Spartanburg
085	Sumter
087	Union
089	Williamsburg
091	York

SOUTH DAKOTA
State Code: 46

Code	County Name
003	Aurora
005	Beadle
007	Bennett
009	Bon Homme
011	Brookings
013	Brown
015	Brule
017	Buffalo
019	Butte
021	Campbell
023	Charles Mix
025	Clark
027	Clay
029	Codington
031	Corson
033	Custer
035	Davison
037	Day
039	Deuel
041	Dewey
043	Douglas
045	Edmunds
047	Fall River
049	Faulk
051	Grant
053	Gregory
055	Haakon
057	Hamlin
059	Hand
061	Hanson
063	Harding
065	Hughes
067	Hutchinson
069	Hyde
071	Jackson
073	Jerauld
075	Jones
077	Kingsbury
079	Lake
081	Lawrence
083	Lincoln
085	Lyman
087	McCook
089	McPherson
091	Marshall
093	Meade
095	Mellette
097	Miner
099	Minnehaha
101	Moody
103	Pennington
105	Perkins
107	Potter
109	Roberts
111	Sanborn
113	Shannon
115	Spink
117	Stanley
119	Sully
121	Todd
123	Tripp
125	Turner
127	Union
129	Walworth
131	Washabaugh
135	Yankton
137	Ziebach

TENNESSEE
State Code: 47

Code	County Name
001	Anderson
003	Bedford
005	Benton
007	Bledsoe
009	Blount
011	Bradley
013	Campbell
015	Cannon
017	Carroll
019	Carter
021	Cheatham
023	Chester
025	Claiborne

027	Clay
029	Cocke
031	Coffee
033	Crockett
035	Cumberland
037	Davidson
039	Decatur
041	DeKalb
043	Dickson
045	Dyer
047	Fayette
049	Fentress
051	Franklin
053	Gibson
055	Giles
057	Grainger
059	Greene
061	Grundy
063	Hamblen
065	Hamilton
067	Hancock
069	Hardeman
071	Hardin
073	Hawkins
075	Haywood
077	Henderson
079	Henry
081	Hickman
083	Houston
085	Humphreys
087	Jackson
089	Jefferson
091	Johnson
093	Knox
095	Lake
097	Lauderdale
099	Lawrence
101	Lewis
103	Lincoln
105	Loudon
107	McMinn
109	McNairy
111	Macon
113	Madison
115	Marion
117	Marshall
119	Maury
121	Meigs
123	Monroe
125	Montgomery
127	Moore
129	Morgan
131	Obion
133	Overton
135	Perry
137	Pickett
139	Polk
141	Putnam
143	Rhea
145	Roane
147	Robertson
149	Rutherford
151	Scott
153	Sequatchie
155	Sevier
157	Shelby
159	Smith
161	Stewart
163	Sullivan
165	Sumner
167	Tipton
169	Trousdale
171	Unicoi
173	Union
175	Van Buren
177	Warren
179	Washington
181	Wayne
183	Weakley
185	White
187	Williamson
189	Wilson

TEXAS

State Code: 48

Code	County Name
001	Anderson
003	Andrews
005	Angelina
007	Aransas
009	Archer
011	Armstrong
013	Atascosa
015	Austin
017	Bailey
019	Bandera
021	Bastrop
023	Baylor
025	Bee
027	Bell

029	Bexar
031	Blanco
033	Borden
035	Bosque
037	Bowie
039	Brazoria
041	Brazos
043	Brewster
045	Briscoe
047	Brooks
049	Brown
051	Burleson
053	Burnet
055	Caldwell
057	Calhoun
059	Callahan
061	Cameron
063	Camp
065	Carson
067	Cass
069	Castro
071	Chambers
073	Cherokee
075	Childress
077	Clay
079	Cochran
081	Coke
083	Coleman
085	Collin
087	Collingsworth
089	Colorado
091	Comal
093	Comanche
095	Concho
097	Cooke
099	Coryell
101	Cottle
103	Crane
105	Crockett
107	Crosby
109	Culberson
111	Dallam
113	Dallas
115	Dawson
117	Deaf Smith
119	Delta
121	Denton
123	De Witt
125	Dickens
127	Dimmit
129	Donley
131	Duval
133	Eastland
135	Ector
137	Edwards
139	Ellis
141	El Paso
143	Erath
145	Falls
147	Fannin
149	Fayette
151	Fisher
153	Floyd
155	Foard
157	Fort Bend
159	Franklin
161	Freestone
163	Frio
165	Gaines
167	Galveston
169	Garza
171	Gillespie
173	Glasscock
175	Goliad
177	Gonzales
179	Gray
181	Grayson
183	Gregg
185	Grimes
187	Guadalupe
189	Hale
191	Hall
193	Hamilton
195	Hansford
197	Hardeman
199	Hardin
201	Harris
203	Harrison
205	Hartley
207	Haskell
209	Hays
211	Hemphill
213	Henderson
215	Hidalgo
217	Hill
219	Hockley
221	Hood
223	Hopkins
225	Houston
227	Howard
229	Hudspeth
231	Hunt

233	Hutchinson
235	Irion
237	Jack
239	Jackson
241	Jasper
243	Jeff Davis
245	Jefferson
247	Jim Hogg
249	Jim Wells
251	Johnson
253	Jones
255	Karnes
257	Kaufman
259	Kendall
261	Kenedy
263	Kent
265	Kerr
267	Kimble
269	King
271	Kinney
273	Kleberg
275	Knox
277	Lamar
279	Lamb
281	Lampasas
283	La Salle
285	Lavaca
287	Lee
289	Leon
291	Liberty
293	Limestone
295	Lipscomb
297	Live Oak
299	Llano
301	Loving
303	Lubbock
305	Lynn
307	McCulloch
309	McLennan
311	McMullen
313	Madison
315	Marion
317	Martin
319	Mason
321	Matagorda
323	Maverick
325	Medina
327	Menard
329	Midland
331	Milam
333	Mills
335	Mitchell
337	Montague
339	Montgomery
341	Moore
343	Morris
345	Motley
347	Nacogdoches
349	Navarro
351	Newton
353	Nolan
355	Nueces
357	Ochiltree
359	Oldham
361	Orange
363	Palo Pinto
365	Panola
367	Parker
369	Parmer
371	Pecos
373	Polk
375	Potter
377	Presidio
379	Rains
381	Randall
383	Reagan
385	Real
387	Red River
389	Reeves
391	Refugio
393	Roberts
395	Robertson
397	Rockwall
399	Runnels
401	Rusk
403	Sabine
405	San Augustine
407	San Jacinto
409	San Patricio
411	San Saba
413	Schleicher
415	Scurry
417	Shackelford
419	Shelby
421	Sherman
423	Smith
425	Somervell
427	Starr
429	Stephens
431	Sterling
433	Stonewall
435	Sutton

437	Swisher
439	Tarrant
441	Taylor
443	Terrell
445	Terry
447	Throckmorton
449	Titus
451	Tom Green
453	Travis
455	Trinity
457	Tyler
459	Upshur
461	Upton
463	Uvalde
465	Val Verde
467	Van Zandt
469	Victoria
471	Walker
473	Waller
475	Ward
477	Washington
479	Webb
481	Wharton
483	Wheeler
485	Wichita
487	Wilbarger
489	Willacy
491	Williamson
493	Wilson
495	Winkler
497	Wise
499	Wood
501	Yoakum
503	Young
505	Zapata
507	Zavala

UTAH
State Code: 49

Code	County Name
001	Beaver
003	Box Elder
005	Cache
007	Carbon
009	Daggett
011	Davis
013	Duchesne
015	Emery
017	Garfield
019	Grand
021	Iron
023	Juab
025	Kane
027	Millard
029	Morgan
031	Piute
033	Rich
035	Salt Lake
037	San Juan
039	Sanpete
041	Sevier
043	Summit
045	Tooele
047	Uintah
049	Utah
051	Wasatch
053	Washington
055	Wayne
057	Weber

VERMONT
State Code: 50

Code	County Name
001	Addison
003	Bennington
005	Caledonia
007	Chittenden
009	Essex
011	Franklin
013	Grand Isle
015	Lamoille
017	Orange
019	Orleans
021	Rutland
023	Washington
025	Windham
027	Windsor

VIRGINIA
State Code: 51

Code	County Name
001	Accomack
003	Albemarle
005	Alleghany
007	Amelia
009	Amherst

011	Appomattox
013	Arlington
015	Augusta
017	Bath
019	Bedford
021	Bland
023	Botetourt
025	Brunswick
027	Buchanan
029	Buckingham
031	Campbell
033	Caroline
035	Carroll
036	Charles City
037	Charlotte
041	Chesterfield
043	Clarke
045	Craig
047	Culpeper
049	Cumberland
051	Dickenson
053	Dinwiddie
057	Essex
059	Fairfax
061	Fauquier
063	Floyd
065	Fluvanna
067	Franklin
069	Frederick
071	Giles
073	Gloucester
075	Goochland
077	Grayson
079	Greene
081	Greensville
083	Halifax
085	Hanover
087	Henrico
089	Henry
091	Highland
093	Isle of Wight
095	James City
097	King and Queen
099	King George
101	King William
103	Lancaster
105	Lee
107	Loudoun
109	Louisa
111	Lunenburg
113	Madison
115	Mathews
117	Mecklenburg
119	Middlesex
121	Montgomery
123	Nansemond
125	Nelson
127	New Kent
131	Northampton
133	Northumberland
135	Nottoway
137	Orange
139	Page
141	Patrick
143	Pittsylvania
145	Powhatan
147	Prince Edward
149	Prince George
153	Prince William
155	Pulaski
157	Rappahannock
159	Richmond
161	Roanoke
163	Rockbridge
165	Rockingham
167	Russell
169	Scott
171	Shenandoah
173	Smyth
175	Southampton
177	Spotsylvania
179	Stafford
181	Surry
183	Sussex
185	Tazewell
187	Warren
191	Washington
193	Westmoreland
195	Wise
197	Wythe
199	York

Code	Independent Cities
510	Alexandria
515	Bedford
520	Bristol
530	Buena Vista
540	Charlottesville
550	Chesapeake
560	Clifton Forge
570	Colonial Heights

580	Covington
590	Danville
595	Emporia
600	Fairfax
610	Falls Church
620	Franklin
630	Fredericksburg
640	Galax
650	Hampton
660	Harrisonburg
670	Hopewell
678	Lexington
680	Lynchburg
690	Martinsville
700	Newport News
710	Norfolk
720	Norton
730	Petersburg
740	Portsmouth
750	Radford
760	Richmond
770	Roanoke
775	Salem
780	South Boston
790	Staunton
800	Suffolk
810	Virginia Beach
820	Waynesboro
830	Williamsburg
840	Winchester

WASHINGTON
State Code: 53

Code	County Name
001	Adams
003	Asotin
005	Benton
007	Chelan
009	Clallam
011	Clark
013	Columbia
015	Cowlitz
017	Douglas
019	Ferry
021	Franklin
023	Garfield
025	Grant
027	Grays Harbor
029	Island
031	Jefferson
033	King
035	Kitsap
037	Kittitas
039	Klickitat
041	Lewis
043	Lincoln
045	Mason
047	Okanogan
049	Pacific
051	Pend Oreille
053	Pierce
055	San Juan
057	Skagit
059	Skamania
061	Snohomish
063	Spokane
065	Stevens
067	Thurston
069	Wahkiakum
071	Walla Walla
073	Whatcom
075	Whitman
077	Yakima

WEST VIRGINIA
State Code: 54

Code	County Name
001	Barbour
003	Berkeley
005	Boone
007	Braxton
009	Brooke
011	Cabell
013	Calhoun
015	Clay
017	Doddridge
019	Fayette
021	Gilmer
023	Grant
025	Greenbrier
027	Hampshire
029	Hancock
031	Hardy
033	Harrison
035	Jackson
037	Jefferson
039	Kanawha
041	Lewis

043	Lincoln
045	Logan
047	McDowell
049	Marion
051	Marshall
053	Mason
055	Mercer
057	Mineral
059	Mingo
061	Monongalia
063	Monroe
065	Morgan
067	Nicholas
069	Ohio
071	Pendleton
073	Pleasants
075	Pocahontas
077	Preston
079	Putnam
081	Raleigh
083	Randolph
085	Ritchie
087	Roane
089	Summers
091	Taylor
093	Tucker
095	Tyler
097	Upshur
099	Wayne
101	Webster
103	Wetzel
105	Wirt
107	Wood
109	Wyoming

WISCONSIN
State Code: 55

Code	County Name
001	Adams
003	Ashland
005	Barron
007	Bayfield
009	Brown
011	Buffalo
013	Burnett
015	Calumet
017	Chippewa
019	Clark
021	Columbia
023	Crawford
025	Dane
027	Dodge
029	Door
031	Douglas
033	Dunn
035	Eau Claire
037	Florence
039	Fond du Lac
041	Forest
043	Grant
045	Green
047	Green Lake
049	Iowa
051	Iron
053	Jackson
055	Jefferson
057	Juneau
059	Kenosha
061	Kewaunee
063	La Crosse
065	Lafayette
067	Langlade
069	Lincoln
071	Manitowoc
073	Marathon
075	Marinette
077	Marquette
078	Menominee
079	Milwaukee
081	Monroe
083	Oconto
085	Oneida
087	Outagamie
089	Ozaukee
091	Pepin
093	Pierce
095	Polk
097	Portage
099	Price
101	Racine
103	Richland
105	Rock
107	Rusk
109	St. Croix
111	Sauk
113	Sawyer
115	Shawano
117	Sheboygan
119	Taylor
121	Trempealeau

123	Vernon
125	Vilas
127	Walworth
129	Washburn
131	Washington
133	Waukesha
135	Waupaca
137	Waushara
139	Winnebago
141	Wood

WYOMING
State Code: 56

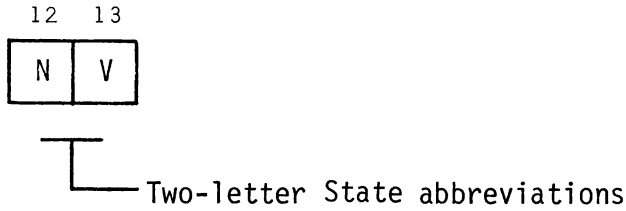
Code	County Name
001	Albany
003	Big Horn
005	Campbell
007	Carbon
009	Converse
011	Crook
013	Fremont
015	Goshen
017	Hot Springs
019	Johnson
021	Laramie
023	Lincoln
025	Natrona
027	Niobrara
029	Park
031	Platte
033	Sheridan
035	Sublette
037	Sweetwater
039	Teton
041	Uinta
043	Washakie
045	Weston

File A

Columns 12-13

Field 2

State



TWO-LETTER STATE ABBREVIATIONS

Alabama	AL	Montana	MT
Alaska	AK	Nebraska	NE
Arizona	AZ	Nevada	NV
Arkansas	AR	New Hampshire	NH
California	CA	New Jersey	NJ
Colorado	CO	New Mexico	NM
Connecticut	CT	New York	NY
Delaware	DE	North Carolina	NC
District of Columbia	DC	North Dakota	ND
Florida	FL	Ohio	OH
Georgia	GA	Oklahoma	OK
Hawaii	HI	Oregon	OR
Idaho	ID	Pennsylvania	PA
Illinois	IL	Rhode Island	RI
Indiana	IN	South Carolina	SC
Iowa	IA	South Dakota	SD
Kansas	KS	Tennessee	TN
Kentucky	KY	Texas	TX
Louisiana	LA	Utah	UT
Maine	ME	Vermont	VT
Maryland	MD	Virginia	VA
Massachusetts	MA	Washington	WA
Michigan	MI	West Virginia	WV
Minnesota	MN	Wisconsin	WI
Mississippi	MS	Wyoming	WY
Missouri	MO		

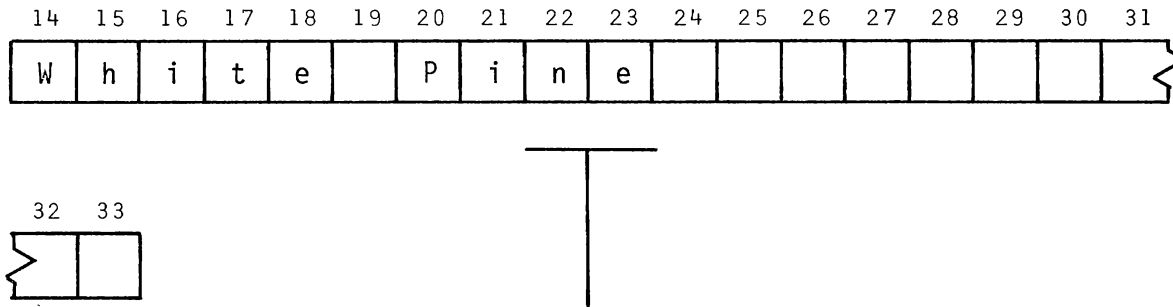
Source: U.S. Postal Service. National ZIP Code Directory. 1974, p. vii.

File A

Columns 14-33

Field 3

County



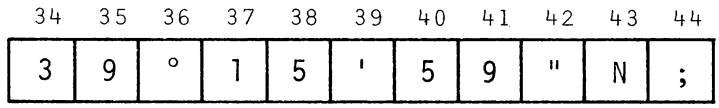
See pages 26-61 for accepted spelling and capitalization

File A

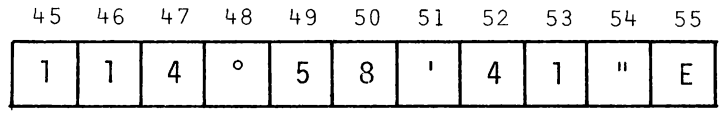
Columns 34-55

Field 4

Latitude and Longitude



Latitude in degrees, minutes, and seconds with compass direction



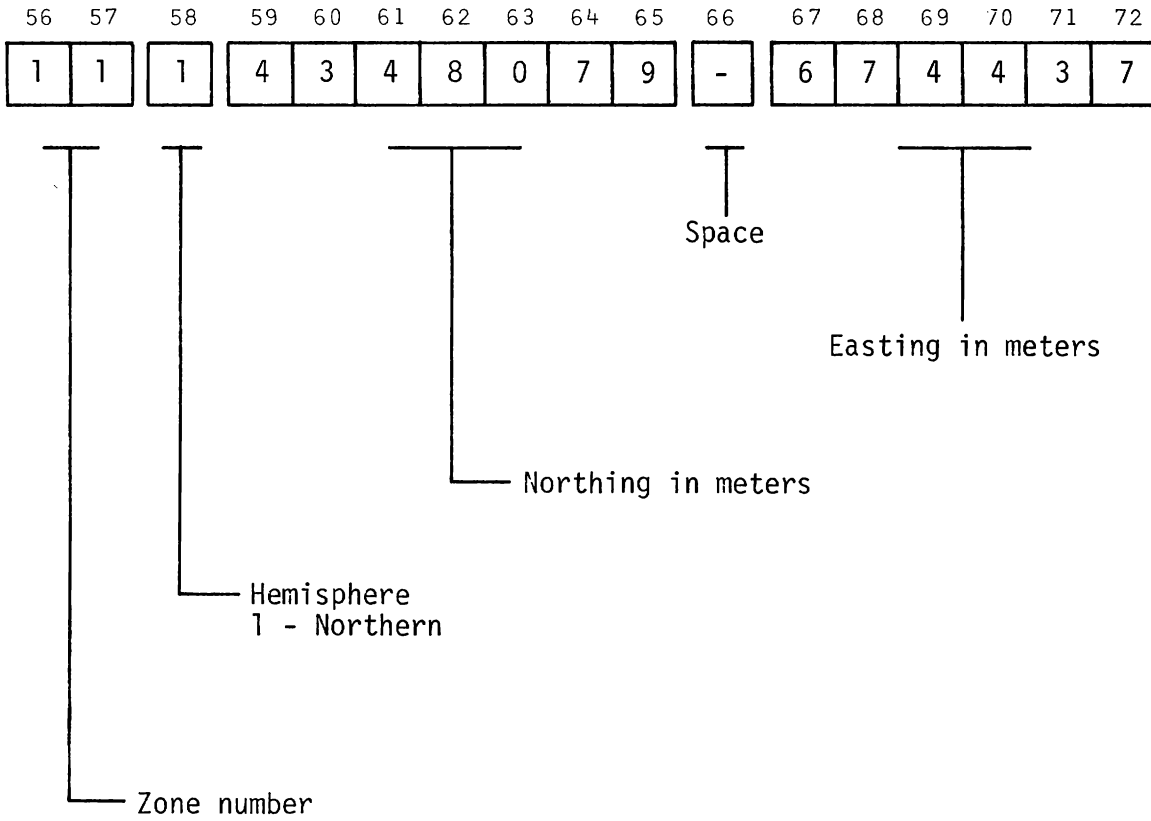
Longitude in degrees, minutes, and seconds with compass direction

File A

Columns 56-72

Field 5

Universal Transverse Mercator



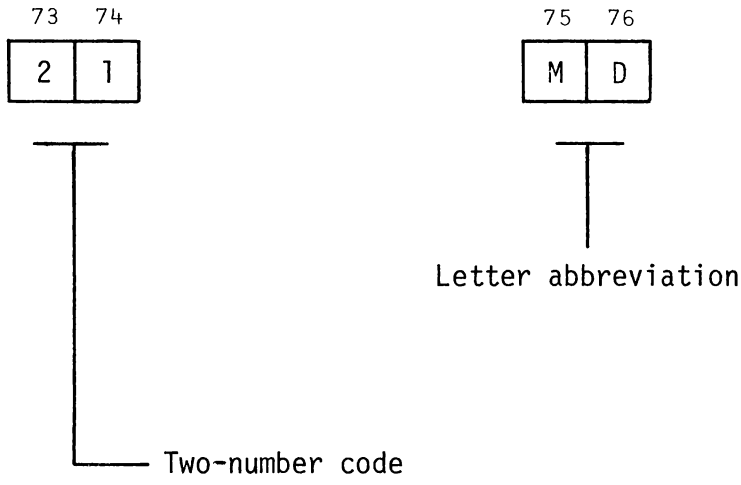
The estimation of Universal Transverse Mercator coordinates is described in U.S. Army Manual FM21-26.

File A

Columns 73-76

Field 6

Principal Meridian



Code	Abbreviation	Principal Meridian and Base Line
01	1P	1st Principal
39	1S	1st Scioto River
02	2P	2d Principal
40	2S	2d Scioto River
03	3P	3d Principal
41	3S	3d Scioto River
04	4P	4th Principal
05	5P	5th Principal
06	6P	6th Principal
07	BH	Black Hills
08	BO	Boise
09	CS	Chickasaw
10	CT	Choctaw
11	CM	Cimarron
12	CR	Copper River
42	EL	Ellicott's Line
13	FR	Fairbanks
14	GS	Gila and Salt River
36	GM	Great Miami River
15	HB	Humboldt
16	HT	Huntsville
17	IN	Indian
44	KR	Kateel River
18	LA	Louisiana
19	MI	Michigan
20	MP	Montana Principal
21	MD	Mount Diablo
37	MR	Muskingum River
22	NA	Navajo
23	NM	New Mexico
35	OH	Ohio
38	OR	Ohio River
26	SL	Salt Lake
27	SB	San Bernardino
28	SW	Seward
24	SH	St. Helena
25	SS	St. Stephens
29	TL	Tallahassee
43	TM	Twelve Mile Square
30	US	Uintah Special
45	UM	Umiat
31	UT	Ute
32	WA	Washington
33	WL	Willamette
34	WR	Wind River
96	UN	Principal meridian and base line unknown
99	VM	Various principal meridians and base lines

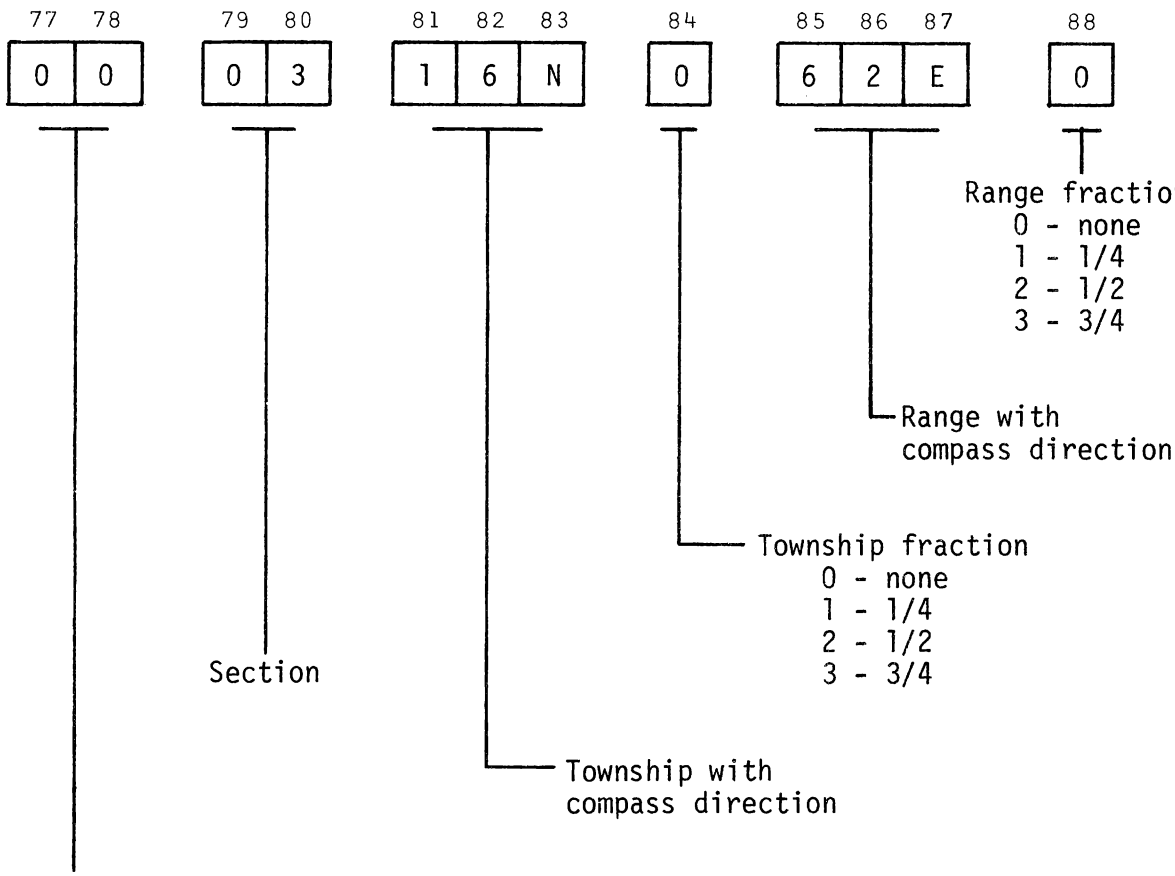
Source: U.S. Bureau of Mines. The Bureau of Mines Minerals Availability System and Resource Classification Manual. IC 8654, 1974, p. 28.

File A

Columns 77-88

Field 7

Section, Township, and Range



Section subdivision. Begin entry in column 77, and reduce area through column 78 as follows:

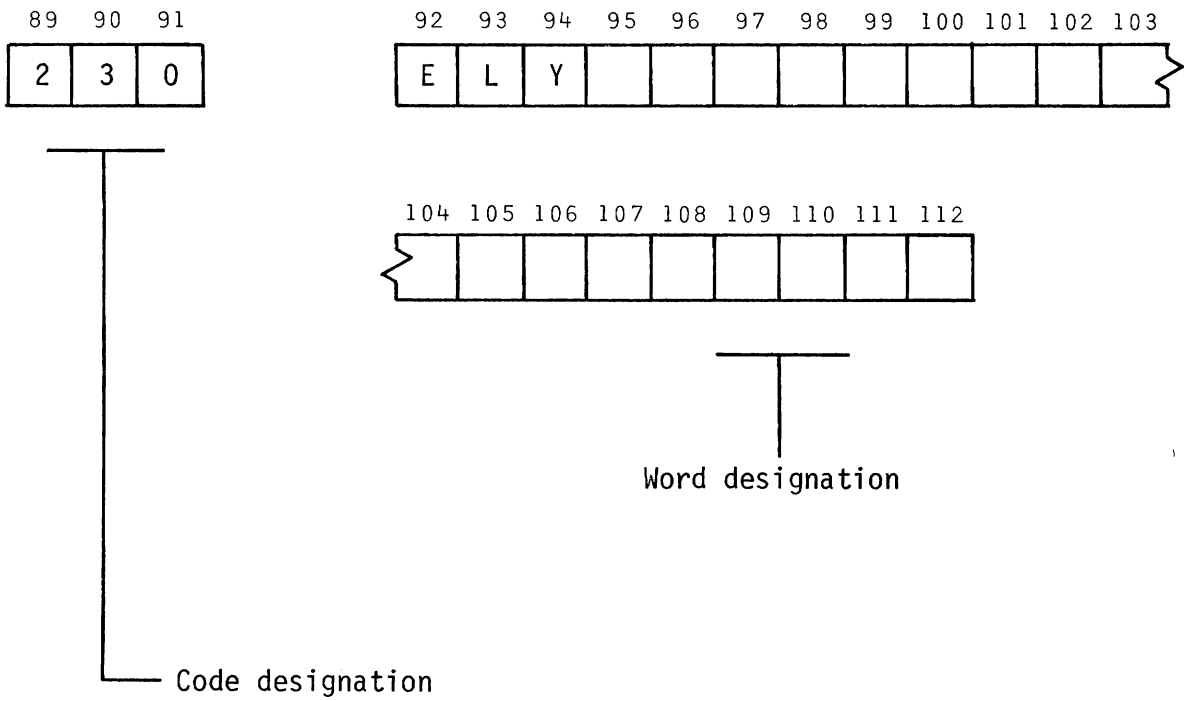
1 - Center	6 - Northeast quarter
2 - North half	7 - Northwest quarter
3 - South half	8 - Southeast quarter
4 - East half	9 - Southwest quarter
5 - West half	0 - No section subdivision

File A

Columns 89-112

Field 8

1:250,000 quadrangle



1:250,000 Quadrangle Names

Code	Map Name	Code	Map Name
392	Aberdeen	416	Beeville
379	Abilene	491	Belleville
149	Adak	386	Beloit
199	Adel	438	Bemidji
127	Afognak	179	Bend
256	Ajo	044	Bendeleben
609	Albany	097	Bering Glacier
298	Albuquerque	091	Bethel
458	Alexandria	039	Bettles
345	Alliance	059	Big Delta
554	Alpena	368	Big Spring
110	Altin	279	Billings
182	Alturas	604	Binghamton
365	Amarillo	504	Birmingham
028	Ambler River	354	Bismarck
146	Amukta	070	Black
085	Anchorage	042	Black River
502	Andalusia	555	Blind River
535	Apalachicola	561	Bluefield
024	Arctic	105	Blying Sound
410	Ardmore	494	Blytheville
306	Arminto	211	Boise
478	Ashland	613	Boston
271	Ashton	272	Bozeman
542	Athens	118	Bradfield Canal
148	Atka	437	Brainerd
531	Atlanta	500	Breton Sound
153	Attu	247	Brigham City
565	Augusta	128	Bristol Bay
488	Aurora	388	Broken Bow
414	Austin	336	Brownfield
299	Aztec	418	Brownsville
090	Baird Inlet	378	Brownwood
027	Baird Mts.	567	Brunswick
210	Baker	585	Buffalo
192	Bakersfield	472	Burlington
592	Baltimore	200	Burns
621	Bangor	242	Butte
001	Barrow	228	Caliente
008	Barter Island	626	Campbellton
622	Bath	045	Candle
462	Baton Rouge	558	Canton
419	Bay City	201	Canyon City
597	Beaufort	159	Cape Flattery
421	Beaumont	099	Cape Mendenhall
040	Beaver	328	Carlsbad
006	Beechey Point	305	Casper

Source: U.S. Bureau of Mines. The Bureau of Mines Minerals Availability System and Resource Classification Manual. IC 8654, 1974, pp. 137-143.

Code	Map Name
251	Cedar City
449	Centerville
235	Challis
031	Chandalar
022	Chandler Lake
560	Charleston
051	Charley River
563	Charlotte
581	Charlottesville
529	Chattanooga
519	Cheboygan
319	Cheyenne
512	Chicago
184	Chico
133	Chignik
241	Choteau
032	Christian
525	Cincinnati
050	Circle
559	Clarksburg
557	Cleveland
291	Clifton
382	Clinton
337	Clovis
280	Cody
139	Cold Bay
033	Coleen
506	Columbia
548	Columbus
175	Concrete
161	Coos Bay
160	Copalis Beach
528	Corbin
096	Cordova
417	Corpus Christi
287	Cortez
119	Craig
303	Craig
180	Crescent
375	Crystal City
582	Cumberland
240	Cut Bank
339	Dalhart
412	Dallas
511	Danville
473	Davenport
569	Daytona Beach
018	De Long Mts.
218	Death Valley
490	Decatur
371	Del Rio
249	Delta
016	Demarcation Point
321	Denver
448	Des Moines
551	Detroit
395	Devils Lake
349	Dickinson
102	Dillingham
243	Dillon
121	Dixon Entrance
363	Dodge City
533	Dothan
293	Douglas
270	Driggs
244	Dubois
474	Dubuque
443	Duluth
300	Durango
493	Dyersburg
060	Eagle
372	Eagle Pass
623	Eastport
599	Eastville
476	Eau Claire
618	Edmundston
315	Ekalaka
223	El Centro
456	El Dorado
294	El Paso
236	Elk City
231	Elko
589	Elmira
230	Ely
332	Emory Peak
408	Enid
556	Erie
264	Escalante
516	Escanaba
162	Eureka
508	Evansville
058	Fairbanks
434	Fairmont
141	False Pass
398	Fargo
262	Flagstaff
007	Flaxman Island
552	Flint

Code	Map Name
577	Florence
309	Forsyth
041	Fort Yukon
624	Fredericton
403	Fremont
193	Fresno
433	Ft. Dodge
571	Ft. Pierce
426	Ft. Smith
333	Ft. Stockton
326	Ft. Sumner
523	Ft. Wayne
481	Ft. William
505	Gadsden
538	Gainesville
289	Gallup
150	Gareloi Island
576	Georgetown
316	Gillette
311	Glasgow
313	Glendive
608	Glens Falls
217	Goldfield
361	Goodland
101	Goodnews
252	Grand Canyon
397	Grand Forks
387	Grand Island
285	Grand Junction
522	Grand Rapids
209	Grangeville
385	Great Bend
274	Great Falls
320	Greeley
485	Green Bay
579	Greensboro
543	Greenville
465	Greenwood
077	Gulkana
123	Hagemeister Island
234	Hailey
237	Hamilton
482	Hancock
308	Hardin
591	Harrisburg
453	Harrison
005	Harrison Bay
610	Hartford
498	Hattiesburg
276	Havre
157	Hawaii North
158	Hawaii South
067	Healy
466	Helena
442	Hibbing
335	Hobbs
261	Holbrook
072	Holy Cross
079	Hooper Bay
172	Hoquiam
346	Hot Springs
420	Houston
020	Howard Pass
038	Hughes
547	Huntington
391	Huron
406	Hutchinson
107	Icy Bay
245	Idaho Falls
073	Iditarod
012	Ikpikpuk River
103	Iliamna
510	Indianapolis
441	International Falls
484	Iron Mtn
483	Iron River
464	Jackson
568	Jacksonville
575	James Island
393	Jamestown
451	Jefferson City
546	Jenkins
545	Johnson City
428	Joplin
212	Jordan Valley
310	Jordan
112	Juneau
136	Kaguyak
239	Kalispell
430	Kansas City
057	Kantishna River
130	Karluk
046	Kateel River
154	Kauai
094	Kenai
440	Kenora
120	Ketchikan
574	Key West

Code	Map Name
021	Killik River
226	Kingman
587	Kingston
152	Kiska
181	Klamath Falls
544	Knoxville
131	Kodiak
035	Kotzebue
100	Kuskokwim Bay
071	Kwiguk
475	La Crosse
340	La Junta
607	Lake Champlain
459	Lake Charles
093	Lake Clark
341	Lamar
282	Lander
374	Laredo
295	Las Cruces
227	Las Vegas
429	Lawrence
381	Lawton
302	Leadville
348	Lemmon
615	Lewiston
277	Lewistown
083	Lime Hills
342	Limon
404	Lincoln
455	Little Rock
049	Livengood
377	Llano
190	Long Beach
011	Lookout Ridge
191	Los Angeles
526	Louisville
197	Lovelock
367	Lubbock
257	Lukeville
229	Lund
541	Macon
486	Madison
405	Manhattan
515	Manitowoc
598	Manteo
263	Marble Canyon
330	Marfa
549	Marion
194	Mariposa
517	Marquette
080	Marshall
357	Martin
446	Mason City
156	Maui
425	McAlester
373	McAllen
087	McCarthy
353	McClusky
360	McCook
213	McDermitt
074	McGrath
355	McIntosh
168	Medford
065	Medfra
047	Melozitna
467	Memphis
003	Meade River
497	Meridian
260	Mesa
573	Miami
106	Middleton Island
521	Midland
399	Milbank
314	Miles City
215	Millett
620	Millinocket
514	Milwaukee
352	Minot
019	Misheguk Mtn.
390	Mitchell
286	Moab
450	Moberly
499	Mobile
503	Mongomery
301	Montrose
111	Mt. Fairweather
068	Mt. Hayes
126	Mt. Katmai
066	Mt. McKinley
015	Mt. Michelson
098	Mt. St. Elias
524	Muncie
078	Nabesna
125	Naknek
507	Nashville
463	Natchez

Code	Map Name
431	Nebraska City
225	Needles
317	New Castle
461	New Orleans
394	New Rockford
435	New Ulm
611	New York
602	Newark
026	Noatak
258	Nogales
052	Nome
595	Norfolk
359	North Platte
054	Norton Bay
055	Nulato
089	Nunivak Island
124	Nushagak Bay
389	O'Neill
155	Oahu
268	Ogden
606	Ogdensburg
205	Okanogan
409	Oklahoma City
432	Omaha
064	Ophir
570	Orlando
492	Paducah
422	Palestine
334	Pecos
202	Pendleton
501	Pensacola
489	Peoria
364	Perryton
117	Petersburg
532	Phenix City
023	Philip Smith Mtn.
255	Phoenix
356	Pierre
583	Pittsburgh
366	Plainview
537	Plant City
246	Pocatello
017	Point Hope
009	Point Lay
468	Poplar Bluff
116	Port Alexander
460	Port Arthur
138	Port Moller
614	Portland
384	Pratt
254	Prescott
331	Presidio
619	Presque Isle
269	Preston
132	Pribilof Islands
266	Price
122	Prince Rupert
612	Providence
322	Pueblo
208	Pullman
617	Quebec
480	Quetico
471	Quincy
513	Racine
578	Raleigh
347	Rapid City
151	Rat Islands
324	Raton
304	Rawlins
166	Redding
196	Reno
477	Rice Lake
250	Richfield
594	Richmond
204	Ritzville
580	Roanoke
588	Rochester
283	Rock Springs
487	Rockford
596	Rocky Mount
469	Rolla
530	Rome
439	Roseau
169	Roseburg
327	Roswell
278	Roundup
056	Ruby
454	Russellville
081	Russian Mission
185	Sacramento
014	Sagavanirktok
170	Salem
265	Salina
600	Salisbury
267	Salt Lake City
224	Salton Sea

Code	Map Name
145	Samalga Island
369	San Angelo
376	San Antonio
220	San Bernardino
222	San Diego
163	San Francisco
186	San Jose
188	San Luis Obispo
206	Sandpoint
221	Santa Ana
187	Santa Cruz
325	Santa Fe
189	Santa Maria
164	Santa Rosa
518	Sault Sainte Marie
566	Savannah
362	Scott City
344	Scottsbluff
603	Scranton
173	Seattle
147	Seguam
415	Seguin
036	Selawik
104	Selodvia
095	Seward
275	Shelby
616	Sherbrooke
307	Sheridan
411	Sherman
288	Shiprock
034	Shishmaref
457	Shreveport
037	Shungnak
292	Silver City
140	Simeonof Island
402	Sioux City
401	Sioux Falls
114	Sitka
109	Skagway
082	Sleetmute
297	Socorro
053	Solomon
370	Sonora
564	Spartanburg
207	Spokane
452	Springfield
436	St. Cloud
290	St. Johns
061	St. Lawrence
470	St. Louis
088	St. Matthew
062	St. Michael
445	St. Paul
137	Stepovak Bay
343	Sterling
444	Stillwater
115	Sumdum
029	Survey Pass
183	Susanville
134	Sutwik Island
025	Table Mtn.
113	Taku River
075	Talkeetna
076	Talkeetna Mts.
534	Tallahassee
536	Tampa
069	Tanacross
048	Tanana
553	Tawas City
092	Taylor Mts.
043	Teller
004	Teshekpuk
424	Texarkana
178	The Dalles
281	Thermopolis
396	Thief River Falls
550	Toledo
216	Tonopah
248	Tooele
586	Toronto
318	Torrington
520	Traverse City
323	Trinidad
135	Trinity Islands
219	Trona
259	Tucson
338	Tucumcari
296	Tularosa
427	Tulsa
495	Tupelo
233	Twin Falls
479	Two Harbors
423	Tyler
084	Tyonek
129	Ugashik
165	Ukiah

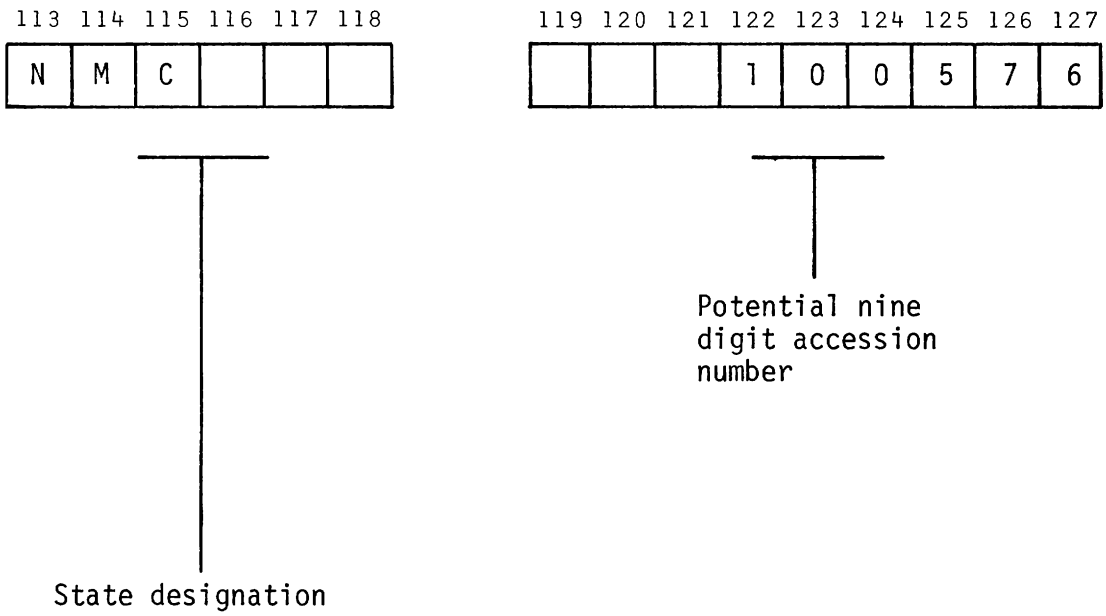
Code	Map Name
013	Umiat
144	Umnak
063	Unalakleet
143	Unalaska
142	Unimak
605	Utica
010	Utukok River
086	Valdez
539	Valdosta
358	Valentine
329	Van Horn
171	Vancouver
284	Vernal
174	Victoria
509	Vincennes
198	Vya
413	Waco
002	Wainwright
195	Walker Lake
203	Walla Walla
238	Wallace
584	Warren
593	Washington
447	Waterloo
400	Watertown
350	Watford City
540	Waycross
167	Weed
232	Wells
176	Wenatchee
572	West Palm Beach
496	West Point
273	White Sulphur Springs
407	Wichita
380	Wichita Falls
253	Williams
590	Williamsport
351	Williston
601	Wilmington
527	Winchester
214	Winnemucca
562	Winston-Salem
030	Wiseman
312	Wolf Point
625	Woodstock
383	Woodward
177	Yakima
108	Yakutat

File A

Columns 113-127

Field 9

Bureau of Land Management Serial Number



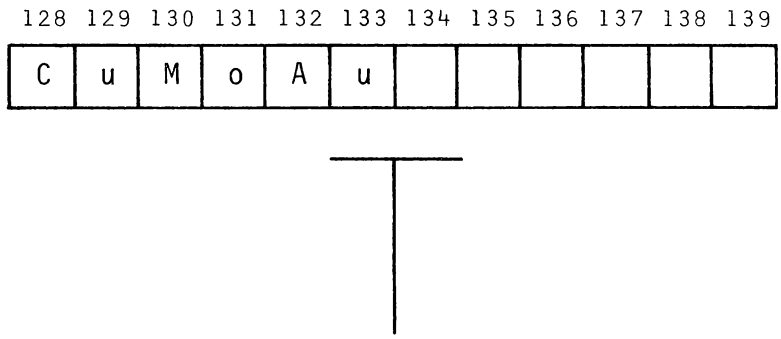
The Bureau of Land Management has not formalized a serial numbering system for mining claims. This will be done in the near future. For example, in Nevada the Bureau is considering Nevada Mining Claims and a six-digit accession number.

File A

Columns 128-139

Field 10

Commodity



Symbols representing commodities associated with sample suite in the order of relative importance

Commodities

(* indicates that it is necessary to make a two-character symbol)

Commodity	Symbol	Commodity	Symbol
Aluminum	Al	Gypsum	Gp
Antimony	Sb	Hafnium	Hf
Aplite	Ap	Helium	He
Arsenic	As	Indium	In
Asbestos	Ab	Iodine	I*
Barium	Ba	Iron	Fe
Beryllium	Be	Kyanite group (kyanite, sillimanite, andalusite, natural mullite, topaz, dumortierite)	Ky
Bismuth	Bi		
Boron	B*		
Bromine	Br	Lead	Pb
Cadmium	Cd	Lithium	Li
Calcium	Ca	Magnesium	Mg
Cesium	Cs	Manganese	Mn
Chlorine	Cl	Mercury	Hg
Chromium	Cr	Mica	Mi
Clays	Cy	Molybdenum	Mo
Cobalt	Co	Nickel	Ni
Columbium	Cb	Nitrogen	N*
Copper	Cu	Perlite	Pe
Corundum	Cn	Phosphorus	P*
Diamond	Dm	Platinum group	PG
Diatomite	Di	Potassium (K_2O content)	K*
Emery	Em	Pumice	Pm
Feldspar	Fd	Quartz crystal	Qz
Fluorine	Fl	Rare earth metals	RE
Gallium	Ga	Radium	Ra
Garnet	Gr	Rhenium	Re
Gem stones	Gm	Rubidium	Rb
Germanium	Ge	Scandium	Sc
Gold	Au	Selenium	Se
Graphite	Cx	Silicon	Si

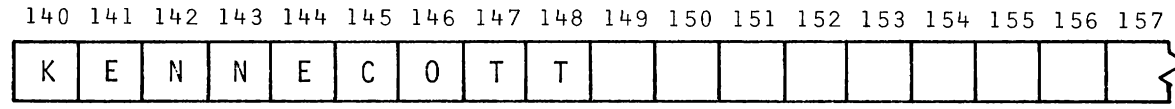
Commodity	Symbol
Silver	Ag
Sodium	Na
Strontium	Sr
Sulfur	S*
Talc group	Tc
Tantalum	Ta
Tellurium	Te
Thallium	Tl
Thorium	Th
Tin	Sn
Titanium (TiO_2 content)	Ti
Tungsten (WO_3 content)	W*
Uranium (U_3O_8 content)	U*
Vanadium	V*
Vermiculite	Vm
Wollastonite	Wl
Zeolites	Zo
Zinc	Zn
Zirconium	Zr

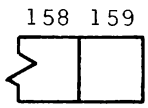
File A

Columns 140-159

Field 11

Donor





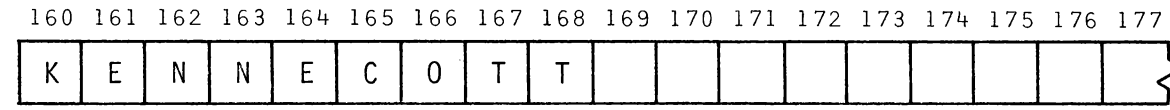
Surname of an individual or appropriate abbreviation of company if complete name is too long for available spaces

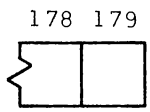
File A

Columns 160-179

Field 12

Owner





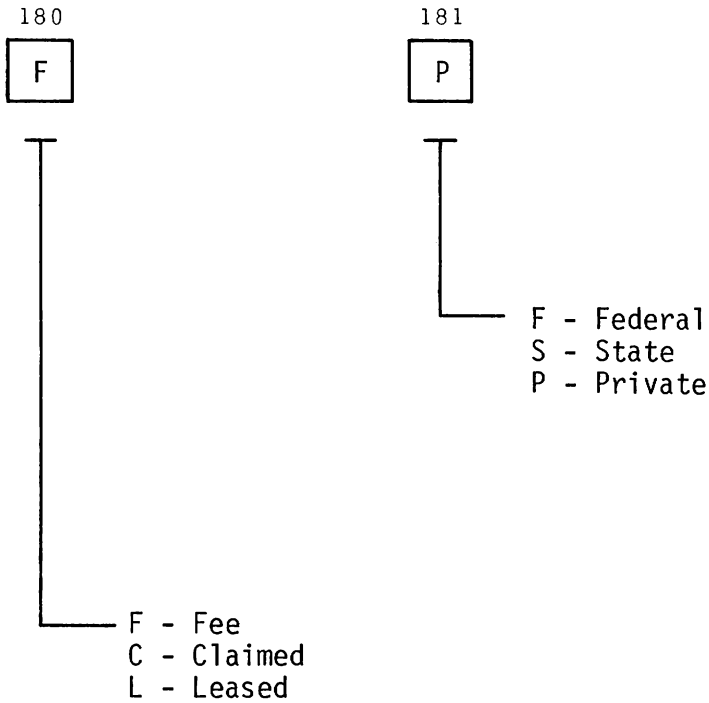
Surname of an individual or appropriate abbreviation of company if complete name is too long for available spaces

File A

Columns 180-181

Field 13

Land Status

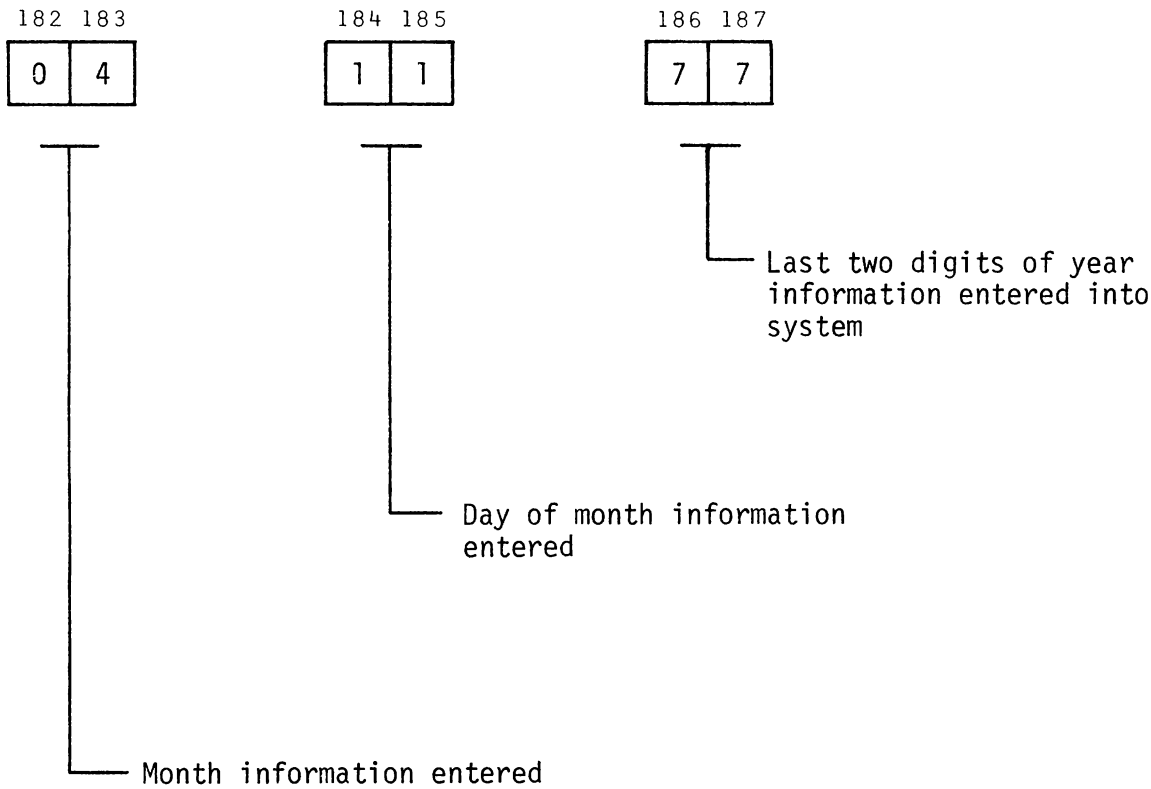


File A

Columns 182-187

Field 14

Input Date

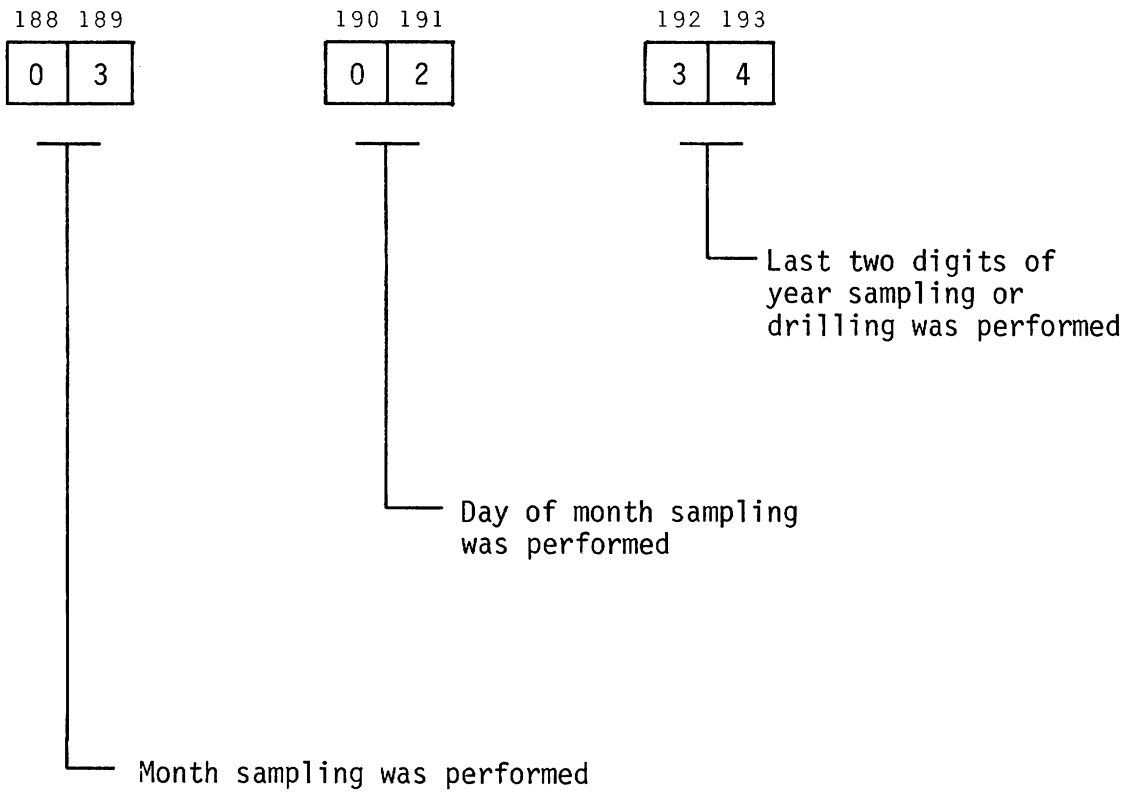


File A

Columns 188-193

Field 15

Sampling Date

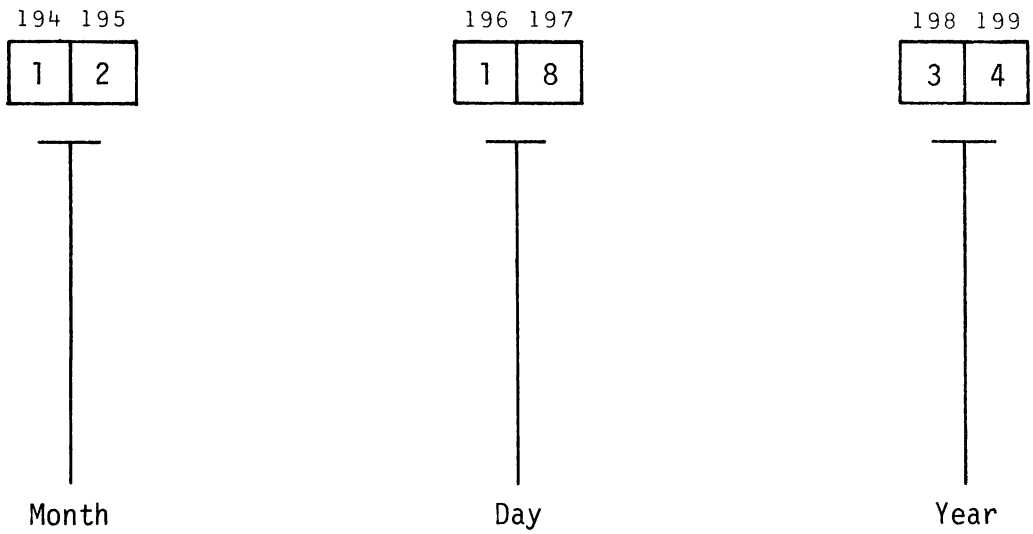


File A

Columns 194-199

Field 16

Location Date



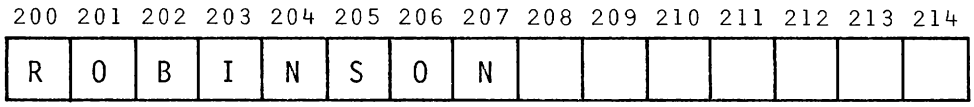
Date claims for sample suite were originally located

File A

Columns 200-214

Field 17

Mining District



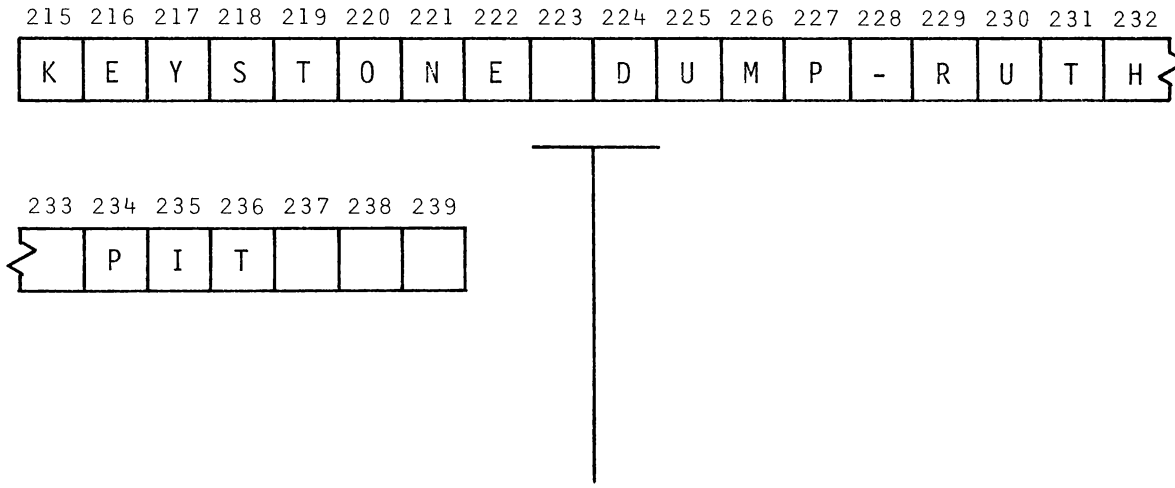
Name of mining district or acceptable abbreviation to fit number of spaces. If unorganized area, state UNORGANIZED.

File A

Columns 215-239

Field 18

Property Name

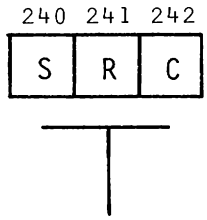


File A

Columns 240-250

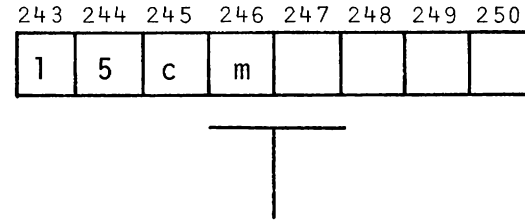
Field 19

Sample Type



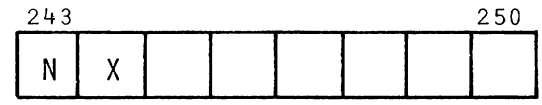
Sampling Technique

SRC - Surface Rotary Chip
URC - Underground Rotary Chip
SCO - Surface Core
UCO - Underground Core
SPR - Surface Percussion
UPR - Underground Percussion
SBK - Surface Bulk
UBK - Underground Bulk
SCP - Surface Chip
UCP - Underground Chip
SCH - Surface Channel
UCH - Underground Channel

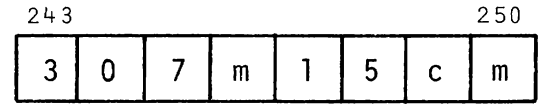


Sample Size

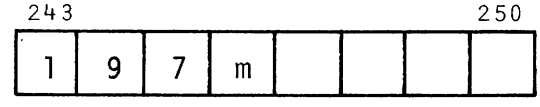
Diameter of rotary or percussive hole. Core size in accordance with DCDMA standards as per



Length and size of channel as per

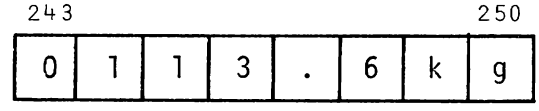


Length of chip sample as per



Decimal point assumed between columns 244 and 245

Size of bulk sample as per

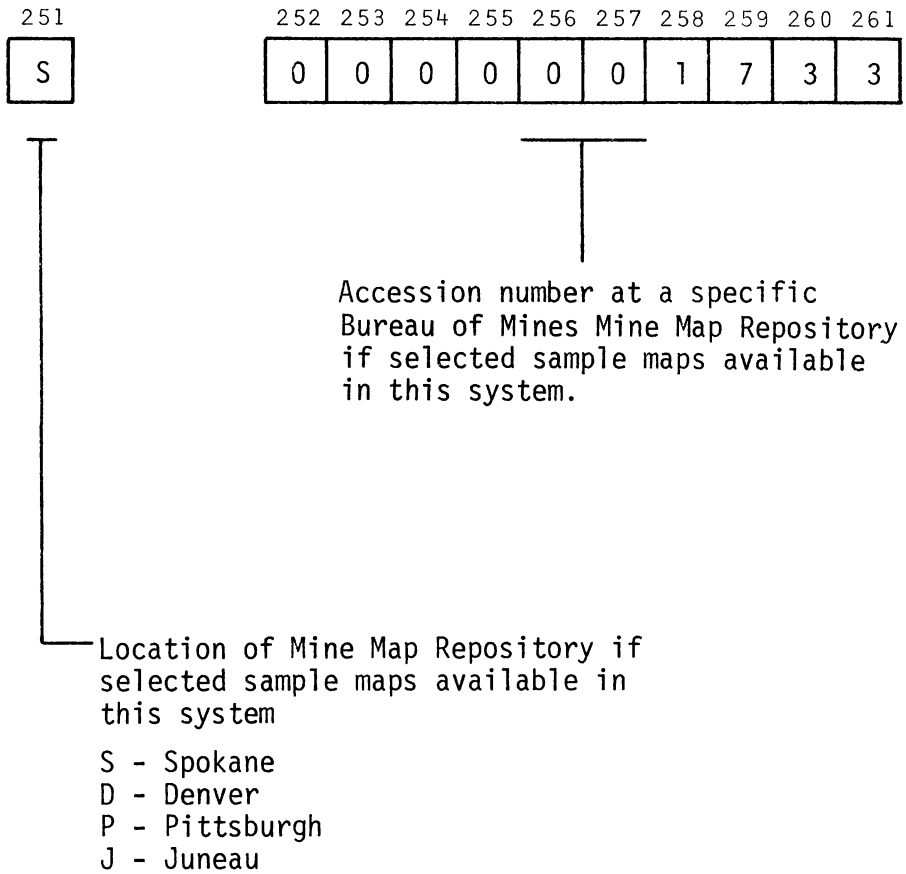


File A

Columns 251-261

Field 20

Mine Map Repository Data

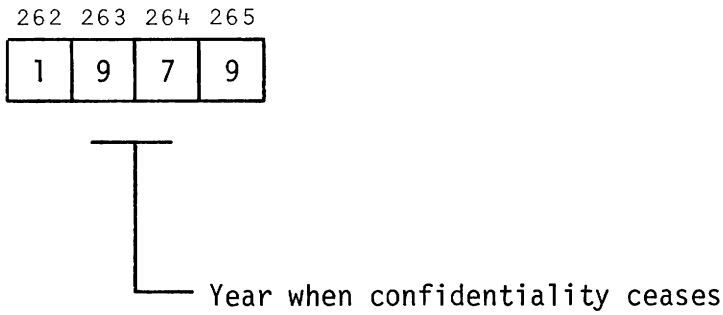


File A

Columns 262-265

Field 21

Confidentiality



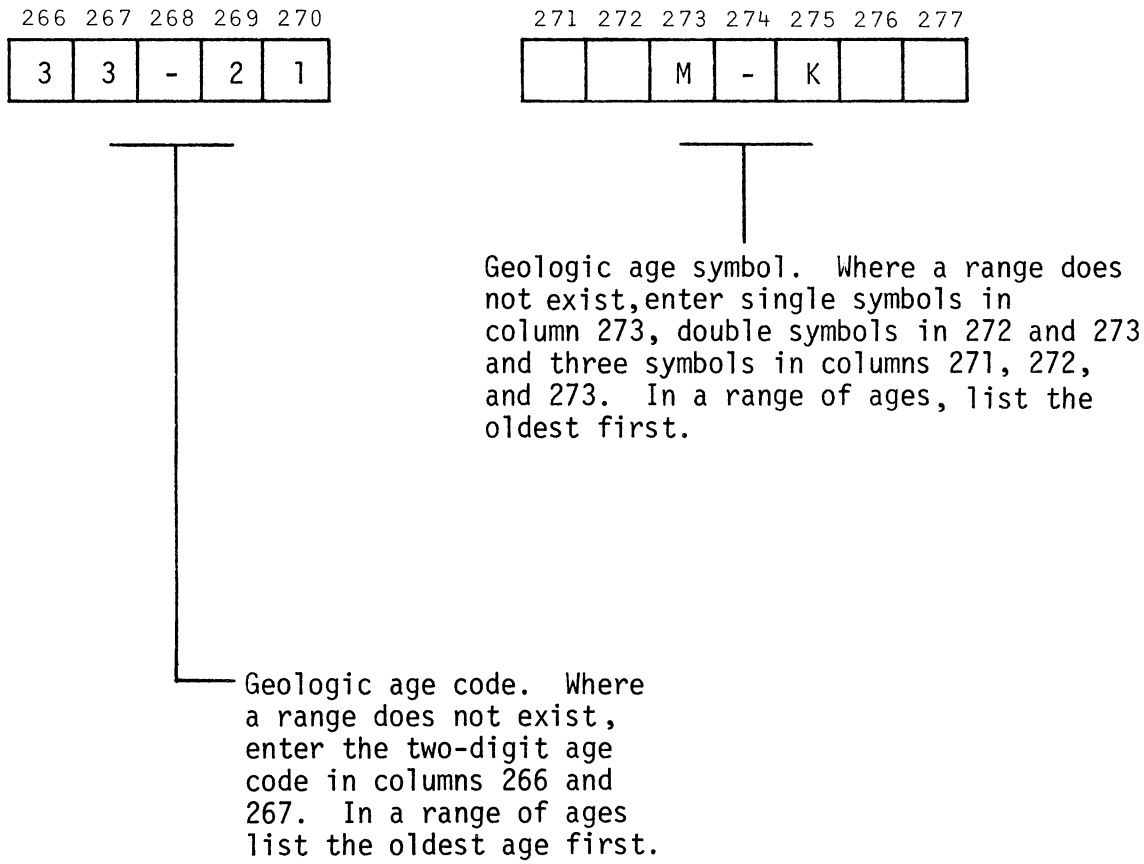
All data in file A to this field can be accessed by the general public. Accession to data beyond this field requires a special code if the date in this field has not expired.

File A

Columns 266-277

Field 22

Host Rock Age



Geologic Age

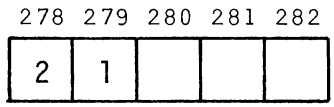
Code	Erathem	Symbol	System	Symbol
10	Cenozoic	Cen	-	-
11	-	-	Quaternary	Q
12	-	-	Tertiary	T
20	Mesozoic	Mes	-	-
21	-	-	Cretaceous	K
22	-	-	Jurassic	J
23	-	-	Triassic	TR
30	Paleozoic	Pal	-	-
31	-	-	Permian	P
32	-	-	Pennsylvanian	PA
33	-	-	Mississippian	M
34	-	-	Devonian	D
35	-	-	Silurian	S
36	-	-	Ordovician	O
37	-	-	Cambrian	C
40	Precambrian	pC	-	-

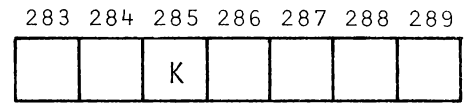
File A

Columns 278-289

Field 23

Ore Age





Geologic age symbol. Enter ranges centered on a dash in column 286. Enter a single symbol in 285, double symbols in 284 and 285, and three symbols in 283, 284, and 285. See page 93 for symbols.

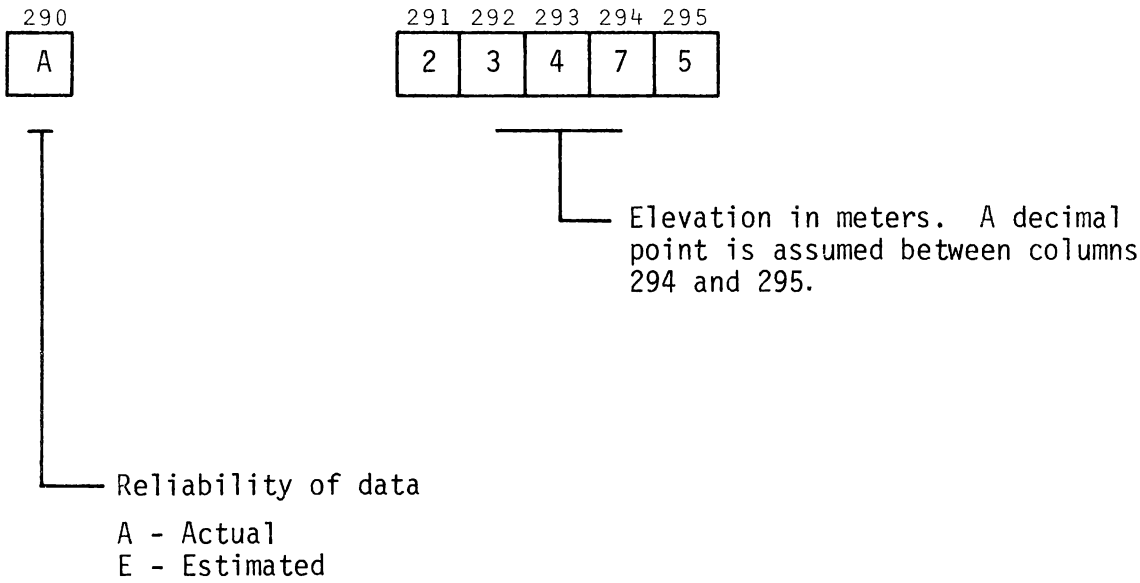
Geologic age code. A single age code is entered in columns 278 and 279. A range of ages is centered on a dash in column 280. See page 93 for two-digit codes.

File A

Columns 290-295

Field 24

Elevation



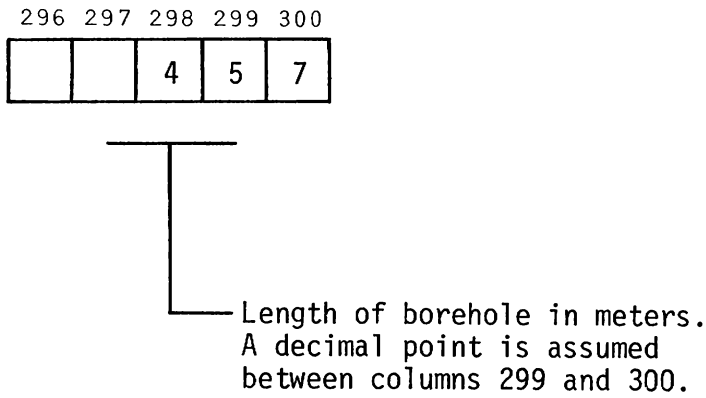
Elevation is either the collar elevation of a borehole or the elevation of the highest sample of a chip, channel, or bulk sample suite.

File A

Columns 296-300

Field 25

Total Depth

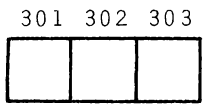


File A

Columns 301-303

Field 26

Azimuth



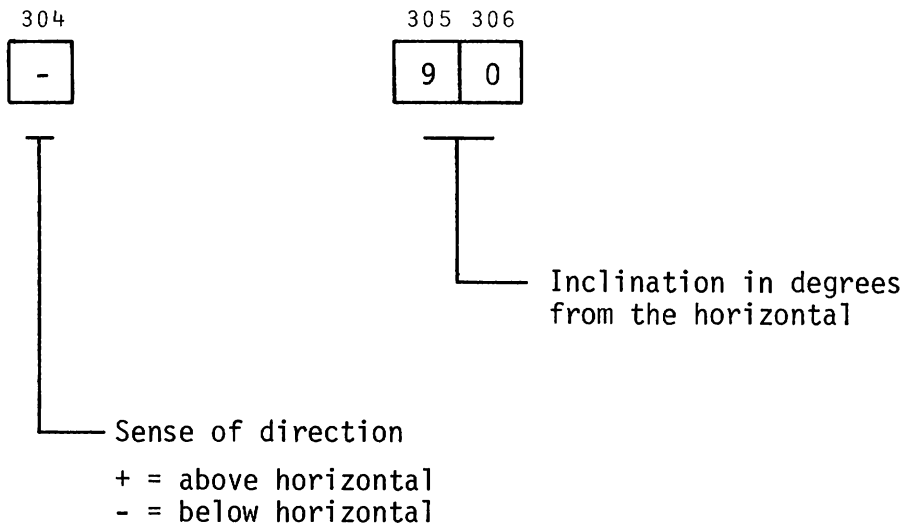
Clockwise direction of an inclined borehole from 0° to 360° where 0° equals true north

File A

Columns 304-306

Field 27

Inclination

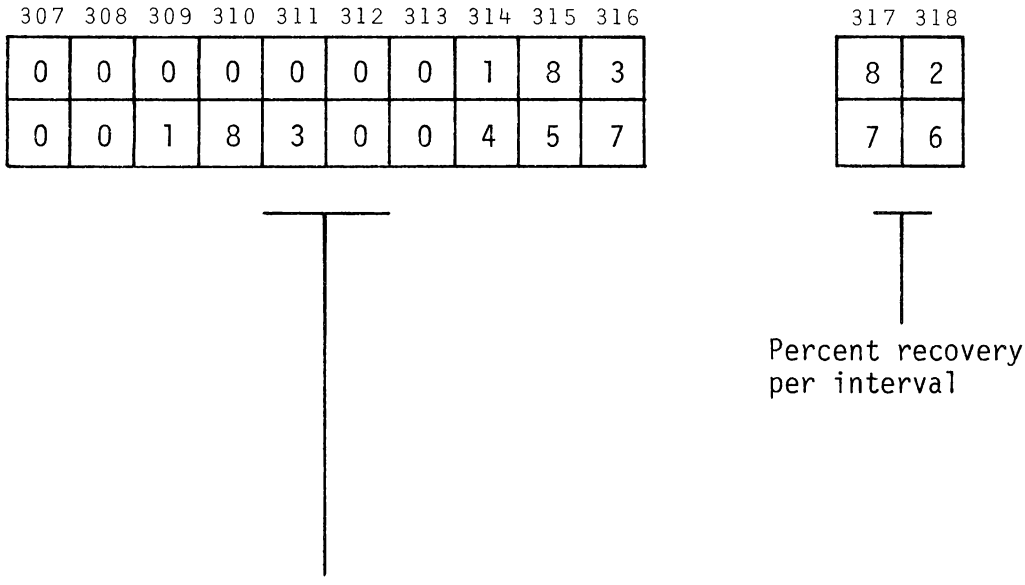


File A

Columns 307-318

Field 28

Recovery

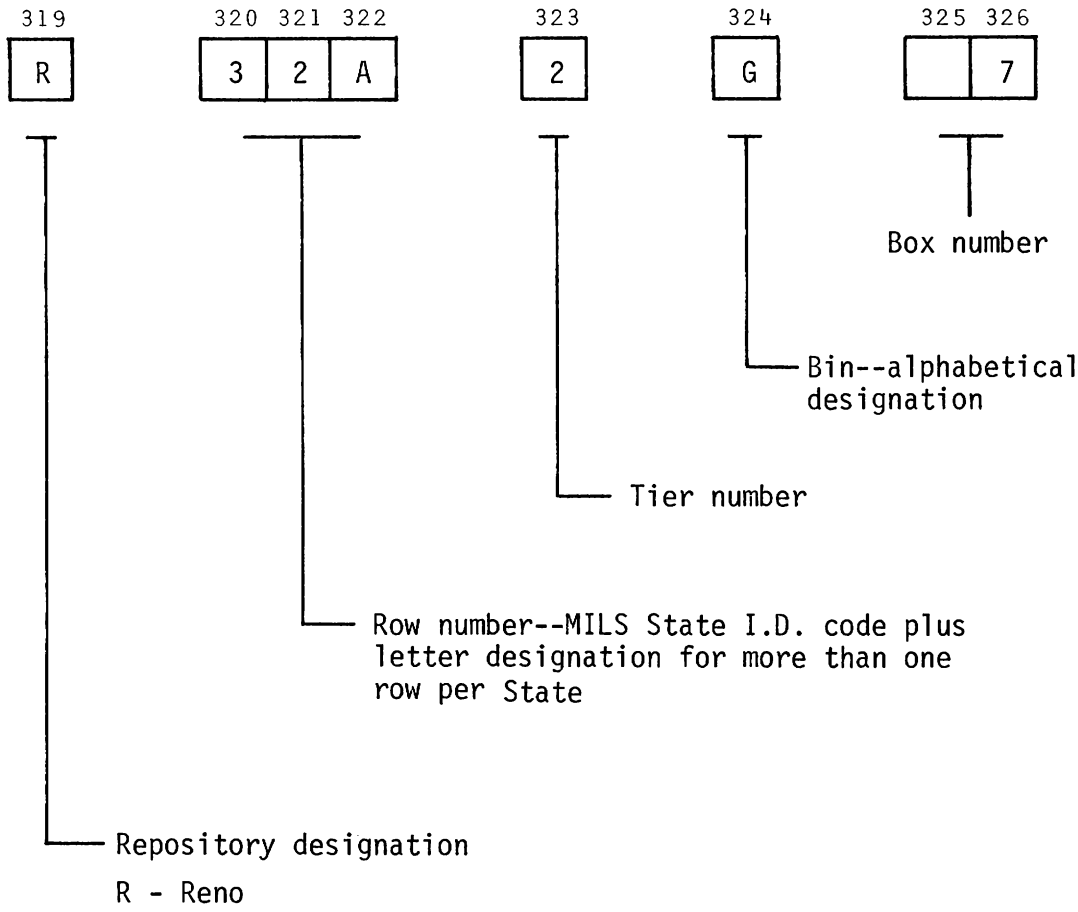


File A

Columns 319-326

Field 29

Location of Stored Sample



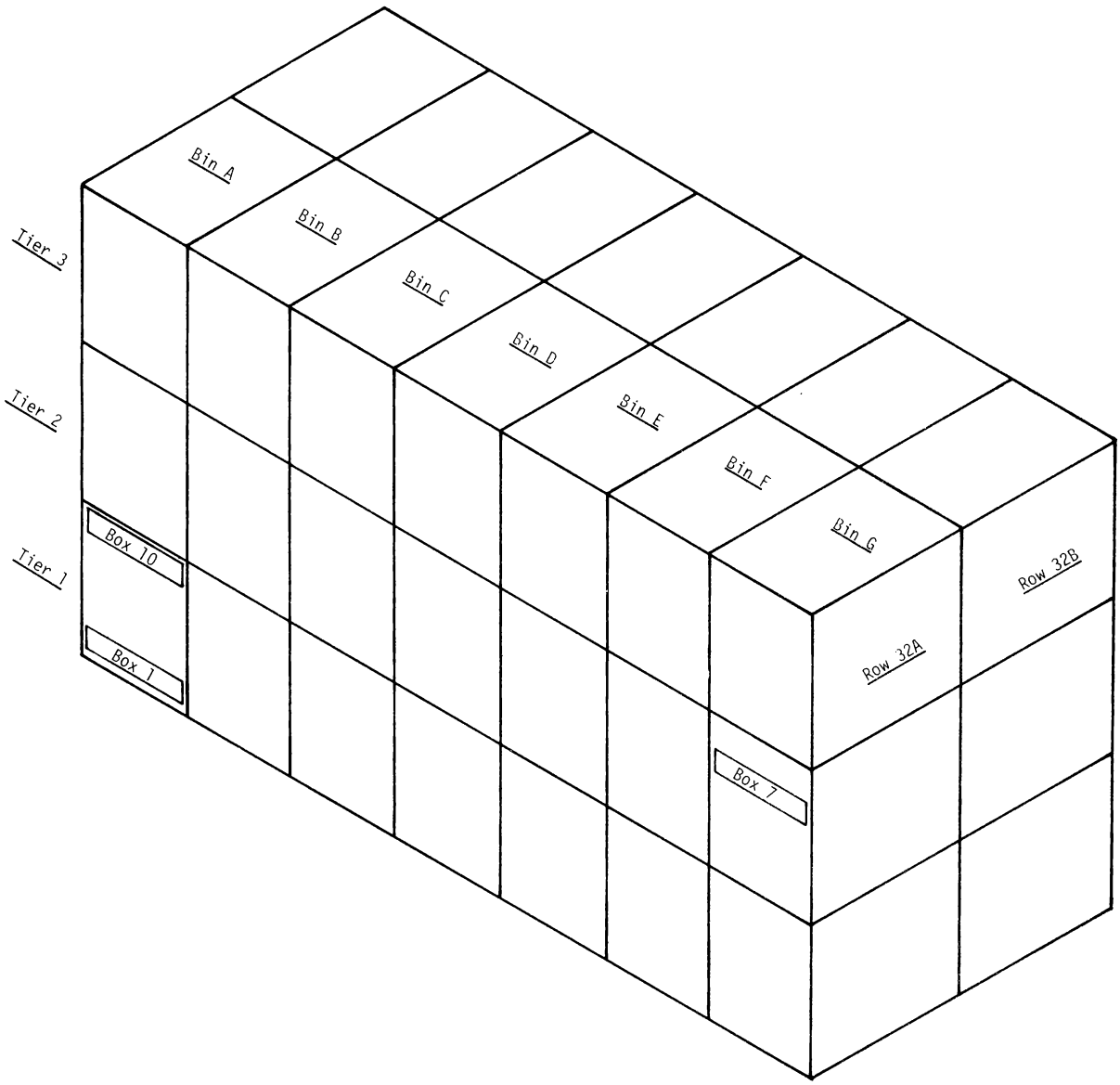


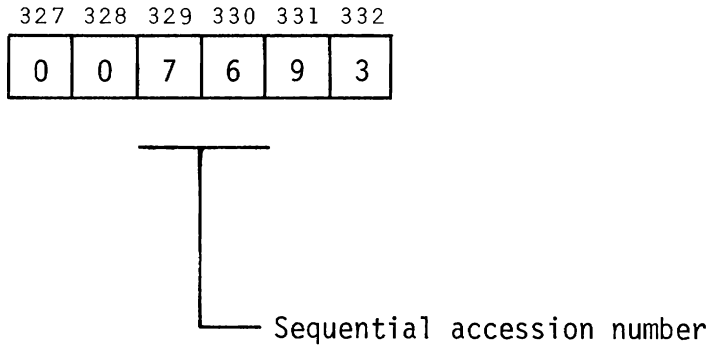
FIGURE A-3. - Diagrammatic representation of storage grid system showing relationship of rows, tiers, bins, and boxes.

File A

Columns 327-332

Field 30

Microfilm Accession Number

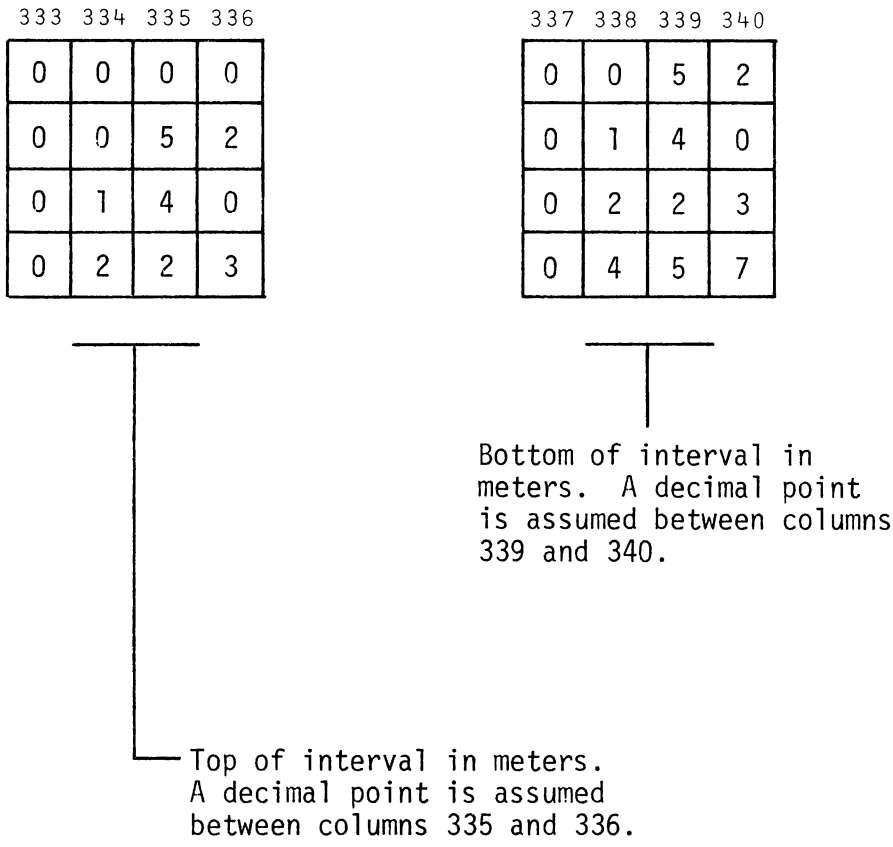


File A

Columns 333-340

Field 31

Lithologic Log Intervals



File A

Columns 341-366

Field 32

Rock Type

341	342	343	344	345	346
1	1	7			
3	1	5	3	5	0
3	5	0			
1	1	7			

Rock type code. Predominant type is listed first.

347	348	349	350	351	352	353	354	355	356
M	o	n	.						
S	h	.	L	s	.				
L	s	.							
M	o	n	.						

357	358	359	360	361	362	363	364	365	366

Rock type abbreviation. Where more than one rock type is present in an interval, the predominant type is listed first.

Rock Names

Code	Symbol	Rock Name
	General Igneous Rocks	
100	Ign	Igneous
101	Ext	Extrusive
102	Int	Intrusive
103	Felign	Felsic igneous
104	Intign	Intermediate igneous
105	Mafign	Mafic igneous
106	Umafign	Ultramafic igneous
107	Alkign	Alkalic igneous
	Specific Igneous Rocks	
110	Carbon	Carbonatite
111	Alask	Alaskite
112	Gran	Granite
113	Peg	Pegmatite
114	Apl	Aplite
115	Syen	Syenite
116	Qtzmon	Quart monzonite
117	Mon	Monzonite
118	Grandior	Granodiorite
119	Qtzdior	Quartz diorite
120	Dior	Diorite
121	Gab	Gabbro
122	Diab	Diabase
123	Dun	Dunite
124	Anor	Anorthosite
125	Pyrox	Pyroxenite
126	Amphib	Amphibolite
127	Perid	Peridotite
150	Rhy	Rhyolite
151	Trach	Trachyte
152	Phono	Phonolite
153	Qtzlat	Quartz latite
154	Lat	Latite
155	Dac	Dacite
156	And	Andesite
157	Bas	Basalt
158	Olivbas	Olivine basalt
159	Lampr	Lamprophyre
160	Volgls	Volcanic glass
161	Obsid	Obsidian
162	Pum	Pumice
163	Sac	Saconite
164	Cind	Cinders

Code	Symbol	Rock Name
	General Metamorphic Rocks	
200	Meta	Metamorphic
201	Calcsil	Calc-silicate
	Specific Metamorphic Rocks	
210	Slate	Slate
211	Phyll	Phyllite
212	Schist	Schist
213	Gns	Gneiss
214	Granofels	Granofels
215	Hfels	Hornfels
216	Qtzite	Quartzite
217	Marble	Marble
218	Tact	Skarn (tactite)
219	Gnstone	Greenstone
220	Mig	Migmatite
221	Umaf	Ultramafic
222	Serptite	Serpentinite
223	Amphite	Amphibolite
224	Pyroxite	Pyroxenite
225	Caclasite	Cataclastite
226	Mylite	Mylonite
227	Auggns	Augen gneiss
228	Phyllonite	Phyllonite
229	Eclogite	Eclogite
230	Opalite	Opalite
231	Gouge	Gouge
	General Sedimentary Rocks	
300	Sed	Sedimentary
301	Clast	Clastic
302	Nclast	Nonclastic
303	Pyroclast	Pyroclastic
304	Carb	Carbonate

Code	Symbol	Rock Name
	Specific Sedimentary Rocks	
310	Breccia	Breccia
311	Congl	Conglomerate
312	Ss	Sandstone
313	Silts	Siltstone
314	Ms	Mudstone
315	Sh	Shale
350	Ls	Limestone
351	Coq	Coquina
352	Dol	Dolomite
353	Evap	Evaporite
354	Phos	Phosphorite
355	Chert	Chert
356	Bent	Bentonite
	Pyroclastic Rocks	
380	Tuf	Tuff
381	Volbreccia	Volcanic breccia
382	Agglom	Agglomerate
	Unconsolidated Sediments	
400	Gravel	Gravel
401	Sand	Sand
402	Silt	Silt
403	Clay	Clay

File A

Columns 367-415

Field 33

Special Minerals

367	368	369	370	371	372	373	374	375
1	0	7	4	0	4			
3	0	8	1	0	6			
3	0	8						
1	0	7	4	0	4			

376	377	378	379	380	381	382	383
C	h	a	l	c	o	p	y
M	a	l	a	c	h	i	t
M	a	l	a	c	h	i	t
C	h	a	l	c	o	p	y

Three-digit code for minerals. No space for percentage entry.

384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401
r	i	t	e	-	3	,	P	y	r	i	t	e	-	1	0	,	
e	-	1	,	C	h	a	l	c	o	c	i	t	e	-	1	,	
e	-	4	,														
r	i	t	e	-	4	,	P	y	r	i	t	e	-	5	,		

402	403	404	405	406	407	408	409	410	411	412	413	414	415

Mineral name and estimated percent. Name is followed by a dash preceding percent, and percent is followed by a comma to separate from additional entries.

Mineral Names

001 Acadialite
002 Acanthite
003 Achroite
004 Acmite
005 Actinolite
006 Adularia
007 Aegirine (aegerite)
008 Aenigmatite
009 Agate
010 Alabandite
011 Alabaster
012 Albite
013 Alexandrite
014 Allanite (orthite)
015 Allemontite
016 Almandite (almandine)
017 Altaite
019 Alunite
020 Amalgam
021 Amazonstone
022 Amblygonite
023 Amethyst
024 Amphibole
025 Analcime (analcite)
026 Anatase (octahedrite)
027 Anauxite
028 Andalusite
029 Andesine
030 Andradite
031 Anglesite
032 Anhydrite
033 Ankerite
034 Annabergite
035 Anorthite
036 Anorthoclase
037 Anthophyllite
038 Antigorite
039 Antimony
040 Antlerite
041 Apatite
042 Apophyllite
043 Aquamarine
044 Aragonite
045 Arfvedsonite
046 Argentite
047 Arsenic
048 Arsenopyrite
049 Asbestos
050 Astrophyllite
051 Atacamite
052 Augite
053 Aurichalcite
054 Autunite
055 Aventurine
056 Axinite
057 Azurite
058 Balas ruby
059 Barite
060 Bauxite
061 Beidellite
062 Benitoite
063 Bentonite
064 Beryl
065 Biotite
066 Bismuth
067 Bismuthinite
071 Boehmite
073 Boracite
074 Borax
075 Bornite
076 Boulangerite
077 Bournonite
078 Bravoite
079 Breithauptite
081 Brochantite
082 Bromyrite
083 Bronzite
084 Brookite
085 Brucite
086 Bytownite
088 Calamine
089 Calaverite
090 Calcite
092 Cancrinite
094 Carnallite
095 Carnelian
096 Carnotite
097 Cassiterite
098 Cat's-eye
099 Celestite
100 Celsian
101 Cerargyrite
102 Cerussite
103 Chabazite

104 Chalcanthite
105 Chalcedony
106 Chalcocite
107 Chalcopyrite
108 Chalcosiderite
110 Chalk
112 Chert
114 Chiastolite
115 Chloanthite
116 Chlorite
117 Chloritoid
118 Chondrodite
119 Chromite
120 Chrysoberyl (cymophane)
121 Chrysocolla
122 Chrysolite
123 Chrysoprase
124 Chrysotile
125 Cinnabar
127 Citrine
130 Cliachite
131 Clinochlore
132 Clinoenstatite
133 Clinohumite
134 Clinohypersthene
135 Clinozoisite
136 Cobaltite
137 Coseite
138 Colemanite
139 Collophane
140 Columbite
142 Copper
145 Cordierite
146 Corundum
148 Covellite
149 Cristobalite
150 Crocidolite
151 Crocoite (crocoisite)
152 Cryolite
153 Cummingtonite
154 Cuprite

156 Danburite
157 Datolite
158 Demantoid
159 Diallage
160 Diamond
161 Diaspore
163 Diatomite
165 Dickite
166 Digenite
167 Diopside
168 Dioptase
169 Dolomite
171 Dumortierite

172 Edenite
173 Electrum
175 Embolite
176 Emerald
177 Emery
178 Enargite
179 Endlichite
180 Enstatite
181 Epidote
182 Epsomite (epsom salt)
184 Erythrite
185 Essonite
186 Euclase
187 Eucryptite
188 Euxenite

189 Famatinite
190 Fayalite
192 Feldspar
193 Feldspathoid
194 Ferberite
195 Fergusonite
196 Fersmannite
198 Flint
200 Fluorite
201 Forsterite
202 Fowlerite
203 Franklinite
204 Freibergite

205 Gadolinite
207 Galaxite
208 Galena
209 Garnet
210 Garnierite
211 Gaylussite
212 Gedrite
213 Geikielite
214 Geocronite
215 Gersdorffite
216 Geyserite
217 Gibbsite
218 Glaucodot
219 Glauconite

220 Glaucophane
221 Gmelinite
222 Goethite
223 Gold
224 Graphite
226 Greenockite
227 Grossularite
228 Gypsum

229 Halite
230 Halloysite
231 Harmotome
232 Hastingsite
233 Hauynite
235 Hectorite
236 Hedenbergite
238 Hematite
239 Hemimorphite
240 Hercynite
241 Hessite
242 Heulandite
243 Hiddenite
244 Holmquistite
245 Hornblende
247 Huebnerite
248 Humite
249 Hyacinth
250 Hyalite
251 Hyalophane
252 Hypersthene

254 Iddingsite
255 Idocrase
256 Illite
257 Ilmenite
258 Ilvaite
259 Indicolite
260 Inyoite
261 Iodobromite
262 Iodyrite
264 Iridium
265 Iridosmine
266 Iron

269 Jacobsite
270 Jade
271 Jadeite
272 Jamesonite
273 Jargon
274 Jarosite
275 Jasper

276 Kaersutite
277 Kainite
279 Kaolin
280 Kaolinite
281 Keatite
282 Kernite
283 Krennerite
284 Kunzite
286 Kyanite

287 Labradorite
288 Lamprophyllite
289 Lapis-lazuli
290 Larsenite
291 Laumontite
292 Lawsonite
293 Lazulite
294 Lazurite
296 Lepidocrocite
297 Lepidolite
298 Leucite
299 Limonite
300 Linnaeite
301 Lithiophilite (triphylite)

304 Magnesiochromite
305 Magnesioferrite
306 Magnesite
307 Magnetite
308 Malachite
309 Manganite
310 Manganotantalite
312 Marcasite
313 Margarite
314 Marialite
315 Martite
317 Meionite
319 Melanite
320 Melanterite
322 Meneghinite
323 Mercury
324 Metacinnabar
325 Mica
326 Microcline
327 Microlite
329 Millerite
330 Mimetite
331 Molybdenite
332 Monazite
333 Monticellite
334 Montmorillonite

335 Moonstone
336 Morganite
337 Mullite
338 Muscovite

339 Nacrite
340 Nagyagite
341 Natroalunite
342 Natrolite
343 Nepheline
344 Nephrite
345 Neptunite
346 Niccolite
348 Nickel iron
349 Nickel skutterudite
350 Niter (saltpeter)
351 Nontronite
352 Norbergite
353 Noselite (nosean)

355 Oligoclase
356 Olivine
357 Onyx
358 Opal
359 Orpiment
361 Orthoclase
362 Orthoferrosilite
363 Ottrelite

364 Palladium
365 Paragonite
366 Pargasite
367 Patronite
368 Pectolite
369 Penninite
370 Pentlandite
371 Peridot
372 Perovskite
375 Petalite
376 Petzite
377 Phenacite
378 Phillipsite
379 Phlogopite
380 Phosgenite
382 Picotite
383 Piedmontite (piemontite)
384 Pinite
386 Plagioclase
387 Plagionite
388 Platinum

389 Pleonaste (ceylonite)
390 Polianite
391 Pollucite
392 Polybasite
393 Polyhalite
395 Powellite
396 Prase
397 Prehnite
398 Prochlorite
399 Proustite
400 Pseudoleucite
401 Pseudowollastonite
402 Psilomelane
403 Pyrargyrite
404 Pyrite
405 Pyrochlore
406 Pyrolusite
407 Pyromorphite
408 Pyrope
409 Pyrophyllite
410 Pyroxene
411 Pyrrhotite

412 Quartz

413 Ramsayite
414 Realgar
416 Rhodochrosite
417 Rhodolite
418 Rhodonite
419 Riebeckite
422 Roscoelite
423 Rubellite
424 Ruby
427 Rutile

429 Sanidine
430 Saponite
431 Sapphire
432 Sard
433 Sardonyx
435 Scapolite
436 Scheelite
437 Schorlite
438 Scolecite
439 Scorzalite
440 Selenite
441 Semseyite
442 Sepiolite (meerschaum)
443 Sericite

444 Serpentine
445 Siderite
446 Sillimanite
447 Silver
449 Skutterudite
450 Smaltite
451 Smithsonite
452 Soapstone
453 Sodalite
454 Sodamicrocline
455 Soda niter
457 Sperrylite (spessartine)
458 Spessartite
459 Sphalerite
460 Sphene (titanite)
461 Spinel
462 Spodumene
463 Staurolite
464 Steatite
465 Stephanite
466 Stibnite
467 Stilbite
468 Stishovite
469 Stolzite
470 Stromeyerite
471 Strontianite
472 Sulfur
473 Sunstone
474 Sylvanite
475 Sylvite

476 Talc
477 Tantalite
478 Tennantite
479 Tenorite (malaconite)
480 Tephroite
481 Tetrahedrite
482 Thomsonite
483 Thorianite
484 Thorite
485 Thulite
486 Tiger's eye
487 Tin
488 Tincalconite
492 Topaz
493 Torbernite
494 Tourmaline
495 Travertine (tufa)
496 Tremolite
497 Tridymite
499 Troilite
500 Trona
501 Troostite
503 Turgite
504 Turquoise
505 Tyuyamunite

506 Ulexite (boronatrocalcite)
507 Uralian emerald
508 Uraninite (pitchblende)
509 Uvarovite

510 Vanadinite
512 Variscite
513 Verde antique
514 Vermiculite
515 Vesuvianite
516 Vivianite

517 Wad
518 Wavellite
519 Wernerite
521 Willemite
522 Witherite
523 Wolframite
524 Wollastonite
526 Wulfenite
527 Wurtzite

528 Zeolite
530 Zincite
532 Zinkenite
533 Zircon
534 Zoisite

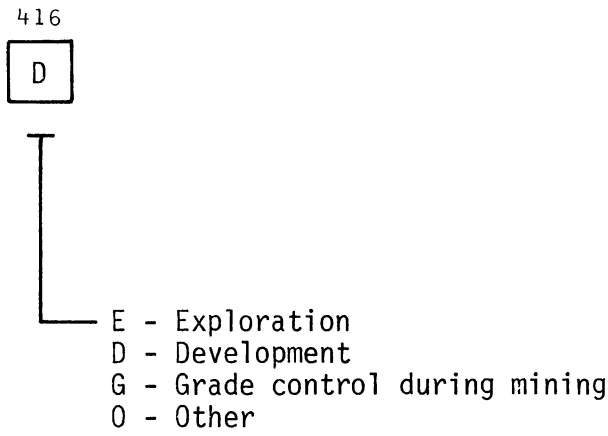
540 Cubanite
541 Siegenite
542 Specularite
543 Stannite
544 Ullmannite

File A

Column 416

Field 34

Purpose of Samples

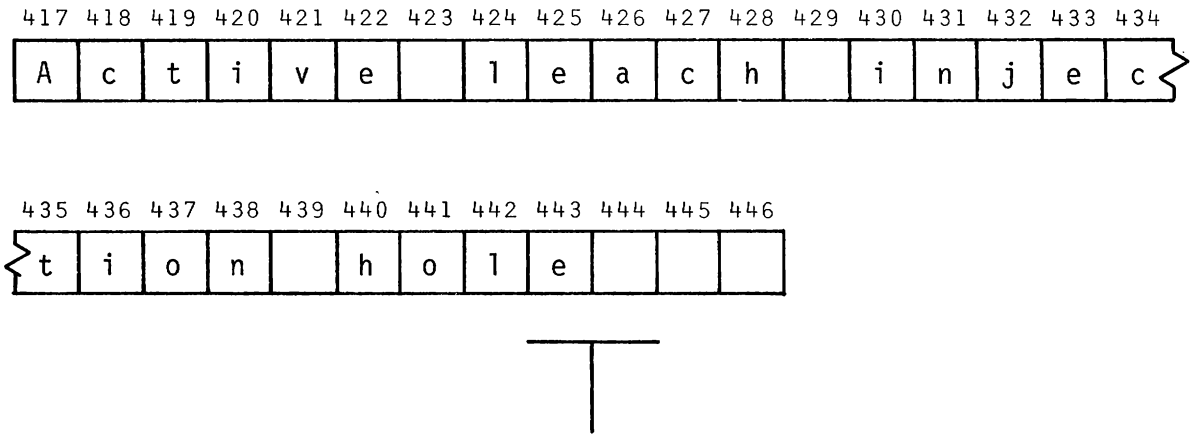


File A

Columns 417-446

Field 35

Status of Sampled Area at Input Date



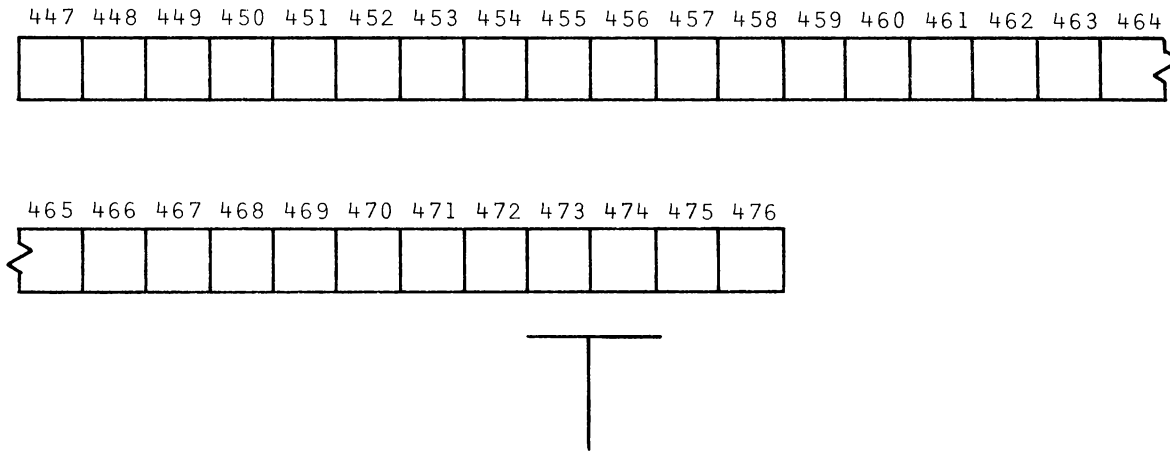
Abbreviated description of status of area sampled at the time of input into the system such as mined out, pilot hole for raise, shaft pillar left for support

File A

Columns 447-476

Field 36

Other Data



APPENDIX B.--WEIGHT AND VOLUME COMPARISONS OF VARIOUS STORAGE METHODS

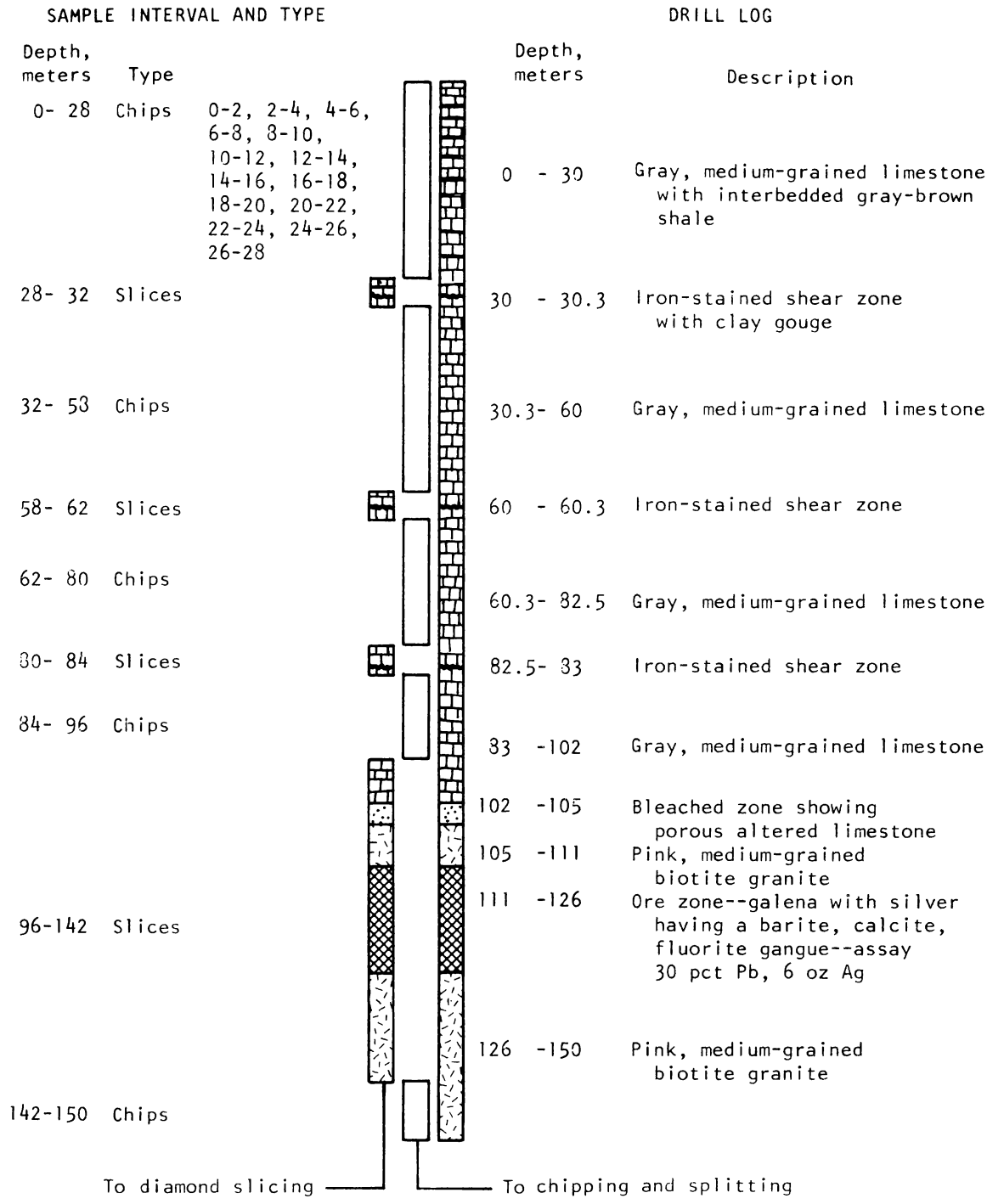
Comparison of weight and volume storage methods is a valid cost criterion because the major cost of the sample repository is that of warehousing for the projected 50-year storage life. A comparison can be made using a hypothetical, 150-meter, NX-size, diamond core with 100-percent core recovery. Figure B-1 shows the lithologic log and the sample types and intervals. The weight and volumes of the various storage techniques are shown in table B-1.

TABLE B-1. - Comparison of storage volumes and weights for various core-processing techniques for a 150-meter, NX-size drill core

	Whole core	Split core	Continuous-diamond-sliced core	Selective diamond slices and chips
Storage volume.....cubic meters..	0.65	0.33	0.08	0.04
Weight.....kilograms..	909	454	109	48

Whole-core storage contains the greatest volume and weight of any preservation technique. Split core reduces the volume and weight by 50 percent. Continuous diamond slicing greatly reduces the weight and volume of the stored sample; only about 12 percent of the original sample volume and weight is retained. This diminished volume can be cut in half by a combination of chipping and diamond slicing. Selective chipping and diamond slicing maintains maximum geoscience data with only 6 percent the volume and weight of whole-core storage. CORES will employ this technique for sample storage.

As a concrete example of the significance of this volume reduction, one can compare the current storage space occupied by a whole core at the Bureau's Twin Cities, Minn., storage facility with the area this core would occupy with the proposed chipping and diamond-slicing technique. Twin Cities stores 1,113,000 linear feet of core in approximately 9,600 square feet of warehouse space. This core is of various diameters, but for ease of calculation it is assumed to be all NX size. In addition, one can assume that the percentage to be chipped and diamond-sliced is the same as the example in figure B-1. The 1,113,000 feet of core would occupy approximately 880 square feet of warehouse space after chipping and diamond slicing, a reduction of 91 percent. This reduction is less than the theoretical 6 percent of whole-core volume because of space requirements for maneuverability of stored samples.



NOTE: Standard 2-meter core intervals are used for chip and diamond-sliced samples

FIGURE B-1. Hypothetical 150-meter, NX-size, lithologic log showing typical sample intervals for chips and diamond slicing for CORES.

☆ U.S. GOVERNMENT PRINTING OFFICE : 1978 O—276-080