



Conserve O Gram

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Preparing and Storing Geological Drill Cores

Exploration drilling for oil, gas, coal and minerals retrieves solid cores or cuttings of rock from beneath the earth's surface. Cores and cuttings provide a record of subsurface geology and data that might not be available in surface exposures where weathering degrades diagnostic organic matter. This *Conserve O Gram [COG]* provides general guidelines for preparing and storing geological drill cores. See *Museum Handbook, Part I* for information on managing natural history collections.

Types of Materials from Drilling

Cores. Drill (also referred to as rock or well) cores are cylindrical samples extracted from hard rock or soft mud by drilling or driving a corer into the ground. They represent a relatively continuous sample.

Cuttings. These are fragments of rock collected at regular intervals during the rotary drilling process to document the sequence of types of rocks present.

Collecting Drill Cores

Different methods are used to collect drill cores, depending on the hardness of the rock.

A special hollow diamond drill is used to cut a drill core from the surrounding **hard rock** formation. It has protective steel pipe (core barrel) that surrounds the core during the drilling process. After a certain depth has been reached, the core is extracted while still encased in the

core barrel. These solid cores are removed from the barrel, marked with depths, cut into appropriate lengths and placed in core boxes for transport and storage.

When a core is collected from **soft soil** or from sediment accumulated on the seabed or a lake bed, a hollow cylinder, such as a steel pipe with a PVC plastic liner, is sunk into the soil by gravity to fill it with the bottom material. The resulting core of sediment is extracted while still encased in the cylinder. The core may be removed from the cylinder or the cylinder may be cut in half.

Safety note: Some cores may contain rocks with radioactive minerals. Determine if any part of the core contains radioactive minerals. If so, contact a qualified expert to arrange for their safe storage.

See *COG 11/10* Radioactive Minerals; *COG 11/11* Health and Safety Issues with Geological Specimens.

Storing Drill Cores

Full diameter cores are often cut along their full length to produce one inch thick core slabs. This enhances their usefulness by creating a surface that reveals details in the rock.

Note: Cores are most valuable when they are continuous. Sometimes to save storage space only 2 – 4 inches per foot of core is saved. This

practice is discouraged as it results in the loss of important information.

House drill cores in sturdy and durable boxes. The amount of core per box depends on the size and weight of the core. Full core that is 4 inches or more in diameter can be stored in 3 foot lengths in a single box. Smaller diameter cores can have 3 or 4 two-foot lengths stored in a box separated by dividers.

Mark each box with catalog numbers, identifying names and numbers, basic locality information, and depths of core contained in the box.

Calculate the correct amount of storage needed to house the cores. See COG 4/10, Determining Museum Storage Equipment Needs and COG 4/11, Determining Museum Storage Space Requirements.

Maintain each core section in its relative position to all other sections from a single core.

Fasten each core section securely in the core box so it does not shift.

Strap the lid of the box firmly to avoid mixing cores.

Store narrow tray style boxes on their edge to facilitate access.

Number the boxes sequentially according to depth in meters/feet and organize on the shelf by depth when material from a given drill core occupies more than one box.

Indicate the depth and positions of sections removed for analysis on the inside of the trays.

House cuttings in individual packets and store in sequential order by depth in a box

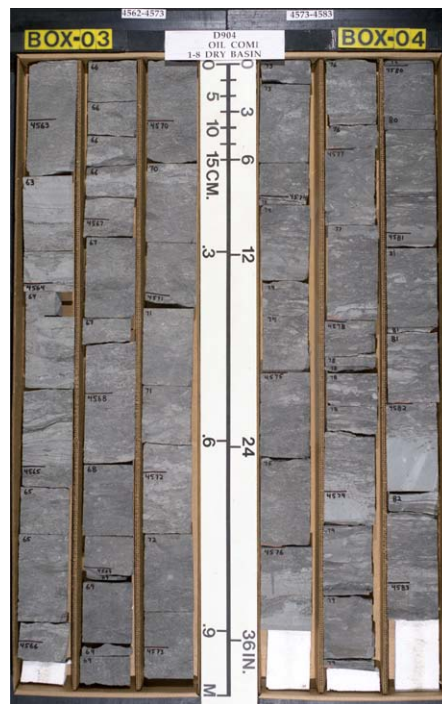


Figure 1. Storage tray of drill core sections

Drill Core Storage Boxes

Most cores are marked in feet, the standard for the oil industry. Core diameters vary from 1 – 5 inches but most range between 3 – 4 inches. Core diameters determine the thickness of the storage box used.

Boxes for storing cores come in a variety of sizes. The U.S. Geological Survey (USGS) uses unwaxed cardboard boxes that are 3 feet long and 1 foot wide for slabbed cores. Cardboard boxes work well for most applications. Wood boxes increase the weight and are more difficult to handle safely.

Generally, 10 feet of slabbed 3 – 4 inch size cores can be stored in a 3 foot by 1 foot box. Smaller diameter cores may allow 18 feet per box.

Boxes of drill cores and cuttings are heavy and may require power equipment to lift and move. A full box with multiple core segments can weigh up to 30 lbs. Ensure shelving or storage racks can support this weight. Attach shelving and racks to walls or floors to prevent toppling. Boxes of core may also be stacked on pallets and stored in pallet racks.

Sampling Drill Cores

Samples removed from the core for analysis can include fossils or rock samples prepared as thin sections to permit examination of microscopic details of the rocks. Thin section slides may be given their own individual catalog numbers or the same catalog number as the drill core. If given a separate catalog number, make sure the catalog record indicates the catalog number of the core, and depth of the rock section from which the sample used to make the thin section slide was taken. Catalog specimens and file associated information in accordance with procedures outlined in the NPS *Museum Handbook*.

Thin sections mounted on glass slides are usually stored separately from the boxes holding the core. Store slides in commercial microscope slide storage boxes.



Figure 2. Geological thin sections made from a drill core.

When a sample is removed from a core for research, destructive analysis or consumptive use, update the catalog card and place a copy of the lab data and final report into the accession folder.

When sample material is returned after non-destructive testing, label the core pieces to indicate the core from which they were removed, and the location from where in the core they originated. Return the core pieces to their original storage box and their original location within the box.

Note: Do not remove a drill core section in its entirety during sampling to maintain its original sequence. When sampling is required, split the core lengthwise, with at least one half remaining in the box so that a continuous vertical portion of the core remains. Do not permit sampling that would result in the total loss of a core interval.

Selected Sources

Legend Inc. [core boxes]
988 Packer Way
Sparks, Nevada 89431
www.lmine.com

Acker Drill Company [drill supplies]
P.O. Box 830
Scranton, Pennsylvania 18501
Tel: (800) 752-2537
www.ackerdrill.com

Coeur Products [boxes, drills, survey tools]
P.O. Box 2818
Coeur d'Alene, Idaho, 83816-2818
Tel: (208) 762-1376
www.corebox.com

References

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