

**National Geological and Geophysical Data Preservation Program
Fiscal Year 2011**

Final Technical Report for

**Inventory and Metadata Development for the Ohio Division of
Geological Survey's Chesapeake Energy Corporation Well Cutting and
Core Collection-an exceptional record of Ohio's Oil and Gas industry
dating from the 1940's**

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Abstract

The Energy Policy Act of 2005 mandates the U.S. Geological Survey to implement a National Geologic and Geophysical Data Preservation Program to inventory, archive, and preserve geologic and geophysical data collected over the past 150 years. With financial assistance from U.S. Geological Survey Grant 11HQPA0014 proposal 2011-0006, Ohio Department of Natural Resources, Division of Geological Survey completed a comprehensive inventory for the Chesapeake Energy Corporation well cuttings and core collection donated in 2010. In addition, the Ohio Division of Geological Survey (ODGS) also included in this inventory recently received well cuttings from new wells drilled by Chesapeake between 2010 and 2012. A total of 392 wells containing 47,544 envelopes of cuttings were inventoried, of which, 288 cutting suites were new to the ODGS collections, 104 cutting suites were duplicates of cutting suites currently in the ODGS collections. Collection metadata and ACCESS databases were uploaded to the National Catalog for these records.

Originally, the ODGS planned to inventory the cuttings suites to be donated from about 1,400 wells contained within the Chesapeake Energy collection. This did not occur because Chesapeake decided to retain the bulk of their cutting and core collection along with the associated data bases as a result of the new discoveries of oil and gas resources in the Utica and Point Pleasant Formations located in eastern and northeastern Ohio. As a result, Chesapeake Energy Corporation donated only about 25% of the ~1,400 cutting suites from wells located primarily outside of the Utica and Point Pleasant oil and gas play located in northeast Ohio.

This turn of events was very disappointing. On the bright side, the cutting suites collected were from 236 wells that begin above the organic-rich Utica and Point Pleasant shales and continue through the oil and gas producing horizons of the Rose Run Sandstone and upper Knox Dolomite. In a few cutting suites, cuttings from the organic-rich shales of the Ohio Shale were donated. These new cuttings will provide additional material to be analyzed for potential oil and gas producing horizons for future exploration.

Introduction

In the mid 1980's, the ODGS began work to include all paper inventories and records from physical samples, derived geoscience collections, and indirect geoscience collections into the National Catalog of Archived Materials and produce user friendly web-based maps. From June of 2005, a major effort has been underway to inventory and develop ACCESS databases for the 15 major geoscience collections housed at the Horace R. Collins Laboratory and to update the National Catalog when large collections of new material are donated to the ODGS. Cooperative efforts with the USGS and funding provided by USGS Grant 07HQGR0145, proposal 0024 (2007), Grant 08HQGR0106-

0007 (2008), Grant G09AP00094-0006 (2009), and Grant G10AP00118-0016 (2010) provided funds to assist the ODGS in completing inventories for 15 of 15 major collections housed at the Horace R. Collins Laboratory. U.S. Geological Survey Grant 11HQPA0014 proposal 2011-0006 allowed the ODGS to complete the inventory and collection metadata for the Chesapeake Energy collection of well cutting and limited core donated in 2010.

Goals Accomplished

The ODGS completed comprehensive inventories, ACCESS databases, and metadata for the Chesapeake Energy Corporation well cutting and limited core collection. A total of 392 well cuttings suites or 47,544 envelopes of cuttings were added to the cutting sample collection of the ODGS. This represents a 7.6% increase in the ODGS cutting collection. One new core was added to the core collection of the ODGS. This data was entered into an ACCESS database. The ACCESS database was reviewed and edited to ensure that reliable information was entered. Copies of the database and site specific metadata were provided to the USGS to be incorporated into the National Catalog.

The inventory and uploading of the data contained in the Chesapeake Energy Corporation well cutting and limited core collection represents a major revision and update of the ODGS cuttings and core collection and the National Catalog of Archived Materials.

Chesapeake Energy Corporation Collection

In November of 2010, Chesapeake agreed to donate to the ODGS a large collection of well cuttings and a small amount of core removed from about 1,400 wells drilled in Ohio. The cuttings collected for some of these wells were drilled in the 1940's and the collection represents a unique history of Ohio's oil and gas industry over the past 70 years. In addition, Chesapeake suggested that they would also donate data bases containing the necessary information such as American Petroleum Institute (API) number, top and bottom footage of cutting and core samples, missing intervals, and the range of formations sampled.

In May of 2011, Chesapeake shipped four pallets of cuttings suites to the ODGS H. R. Collins Laboratory along with one pallet of core. Also, two spreadsheets containing Chesapeake well number, state, county, depth range, and warehouse location were provided. However, necessary information, such as API number, missing intervals, and the formations sampled was not provided. Efforts to acquire this information from Chesapeake Energy Corporation were unsuccessful. As a result, ODGS personnel were required to utilize a large number of hours beyond those hours funded by grant 11HQPA0014 proposal 2011-0006 to determine the API number for each well, missing intervals, and the formations sampled for the Chesapeake collection.

The new cutting samples from the Chesapeake Energy Collection increases the size of the ODGS well cuttings collection from 4,745 to 5,137 cutting suites or an increase of 7.6 %. The new cuttings suites are a major addition to the existing ODGS cuttings and core collections because many of the deeper oil and gas producing horizons

of eastern Ohio do not have cuttings and core samples available. Thus, in spite of the difficulties associated with the acquisition of the Chesapeake Energy Corporation cutting and core collection, this new collection will provide vital new data to assist private industry and the ODGS with ongoing CO2 sequestration studies, to study the geologic and reservoir properties of eastern Ohio oil and gas horizons, and assist in the development of potential underground storage fields and/or injection wells.

Goals yet be to Accomplished

All goals were met as proposed for grant 11HQPA0014 proposal 2011-0006.