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Standard Practice for Geospatial Data for Representing Coal Mining Features[1]

This standard is issued under the fixed designation D7780; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice defines a set of terms, procedures, and data required to define the accurate location and description of geospatial data for surface coal mining operations (CMO), underground coal mining extents, land reclamation and performance bond statuses, lands unsuitable for mining petitions (LUMP) and designated areas, coal spoil and refuse features, coal preparation plants, environmental resource monitoring locations (ERMLs), and postmining land uses.

1.2 This practice addresses mining geospatial data relative to the Surface Mining Control and Reclamation Act of 1977 (SMCRA). This geospatial data shall be obtained from each state, tribal, or federal coal mining regulatory authority (RA), or combinations thereof, authorized under SMCRA to regulate CMOs.

1.3 *Units*—The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulator limitations prior to use.*

1.4.1 This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the adequacy of a professional service, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.

1.5 This practice applies to pre-SMCRA or post-SMCRA coal mining features or both.

1.6 *Surface CMOs*—As used in this practice, a surface CMO represents an area where coal removal, reclamation, and related supporting activities have occurred, is occurring, is pending authorization or is authorized by the RA within a defined surface CMO or any other unpermitted area that has been identified by the RA prior to SMCRA.

1.6.1 This practice addresses coal mining geospatial data relative to SMCRA, interim permits, permanent program permits, as well as CMOs before the enactment of SMCRA. Each RA shall be the authoritative data source (ADS) for coal mining geospatial data.

1.7 *Underground Coal Mining Extents*—This practice addresses underground coal mining extents that represent an area where coal removal has occurred within a defined underground CMO.

1.8 *Land Reclamation Status*—This practice addresses the land reclamation status of surface areas within a permitted CMO where coal removal, reclamation and related supporting activities has occurred, is occurring, or is planned and authorized by the RA.

1.9 *Performance Bond Status*—This practice shows the status of coal mine reclamation as outlined by each phase of reclamation that can result in bond release, according to SMCRA, 30 CFR Part 700 et seq, and 30 CFR Part 800, et seq. In addition to defining the status of individual areas covered by a performance bond, use of this standard will identify the changes of the reclamation and bond status to mined areas as they change over time. Reference to bond status means performance bond status.

NOTE 1—A single bond may cover multiple permits or multiple bonds may cover a single permit.

1.10 *Lands Unsuitable for Mining Petition*—This practice addresses boundary data pertaining to areas that have been petitioned and designated as unsuitable for mining relative to Title V Section 522 of the SMCRA. It also addresses those lands that have been found by the RA's process to be designated unsuitable for all or certain types of mining. These areas may be petitioned to be unsuitable for CMOs because they meet criterion that include, but are not limited to: fragile, historic, cultural, scientific, having esthetic values and natural systems such as aquifers that could be significantly damaged due to a CMO.

[1] This practice is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.01.03 on Geospatial Technology.

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1.11 *Refuse Structures*—This practice addresses excess spoil and refuse features produced by CMOs. These features include excess spoil structures, coal refuse structures, and coal preparation plants.

1.11.1 *Excess Spoil Structures*—These structures are created when the total spoil produced during mining exceeds the volume of material that can be utilized for reclamation. This occurrence is common in steep slope areas, where the final grade of reclaimed slopes is limited by stability requirements. It also occurs where overburden volume is significantly larger than the volume of minable coal. Spoil also exhibits a net increase in volume due to the introduction of void spaces in fragmented rock when overburden is removed to expose underlying coal seams. The production of excess spoil requires the creation of disposal structures that extend outside the mined area.

1.11.2 *Coal Preparation Plants*—Facilities where impurities are removed from coal and potentially crushed, resized, and blended with other grades of coal. Preparation plants produce refuse as a byproduct.

1.11.3 *Refuse*—A waste byproduct of coal processing, generally categorized as either coarse or fine. Fine coal refuse often is handled as a slurry containing a blend of water, fine coal, silt, sand, and clay particles.

1.11.4 *Impounding Refuse Structures*—These structures create a holding area for slurry that allows solids to settle out and water to be recovered. Cross-valley and diked impoundments utilize an embankment, often constructed of coarse coal refuse, which forms a basin for slurry retention, as shown in Fig. 1 and Fig. 2, respectively. Incised impoundments dispose of slurry in an excavated area below the natural surface and do not utilize a significant embankment for slurry retention, see Fig. 3.

1.11.5 *Non-Impounding Refuse Structures*—These structures may contain slurry that has been dewatered and stabilized prior to disposal. Non-impounding slurry cells are used to dispose of fine refuse. Methods that significantly reduce the water content of fine coal refuse may allow a refuse structure to avoid being classified as an impoundment.

1.12 *ERML*—This practice addresses locations where monitoring and sampling (such as water, air, soil sampling, and subsidence or air blasting monitoring) has occurred, is occurring, or is planned.

1.13 *Postmining Land Uses*—This practice describes data required to locate and identify postmining land uses for surface coal mining and reclamation operations. Statutory language and definitions are found in Federal regulations 30 CFR 816/817.133 and 30 CFR 701.5. SMCRA identifies land use categories for surface coal mining permits, such as cropland, pasture/hayland, grazing land, forest, residential, fish and wildlife habitat, developed water resources, public utilities, industrial/commercial, and recreation.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D653 Terminology Relating to Soil, Rock, and Contained Fluids

2.2 *ANSI Standards:*[3]

ANSI INCITS 61-1986 (R2002) Geographic Point Locations for Information Interchange, Representation of (formerly ANSI X3.61-1986 (R1997))

ANSI INCITS 320-1998 (R2003) Information Technology—Spatial Data Transfer

2.3 *Federal Geographic Data Committee (FGDC) Standards*[4]

FGDC-STD-001 Content Standard for Digital Geospatial Metadata

Project 1574-D Information Technology—Geographic Information Framework Data Content Standard, Part 5 Governmental Unit and Other Geographic Area Boundaries

2.4 *Code of Federal Regulations:*[5]

30 CFR Part 700 et seq. 30 CFR Parts 800 et seq.

2.5 *Other Documents*

Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87)[6]

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[4] Available from Federal Geographic Data Committee, 590 National Center, Reston, VA 20192, www.fgdc.gov.

[5] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

[6] Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 (SMCRA), passed August 3, 1977, as amended.

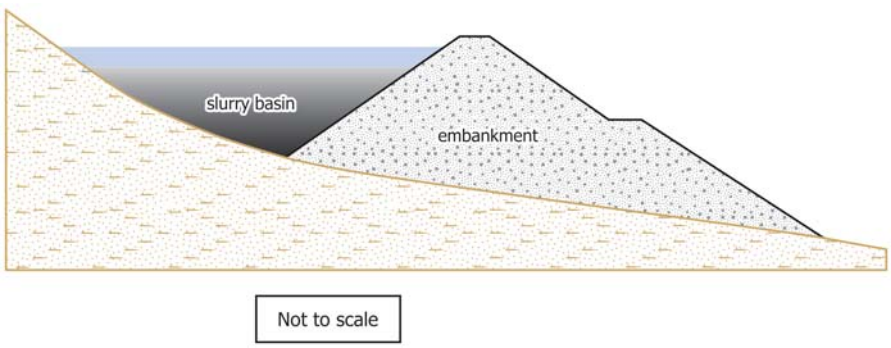

FIG. 1 Cross Sectional Depiction of a Cross-Valley Refuse Impounding Feature

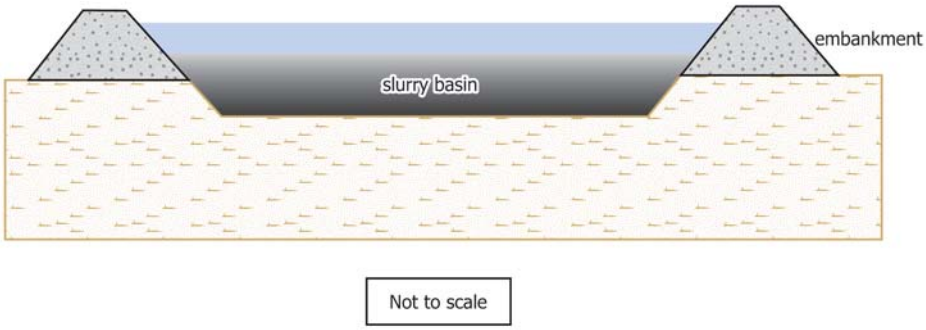

FIG. 2 Cross Sectional Depiction of a Diked Refuse Impounding Feature

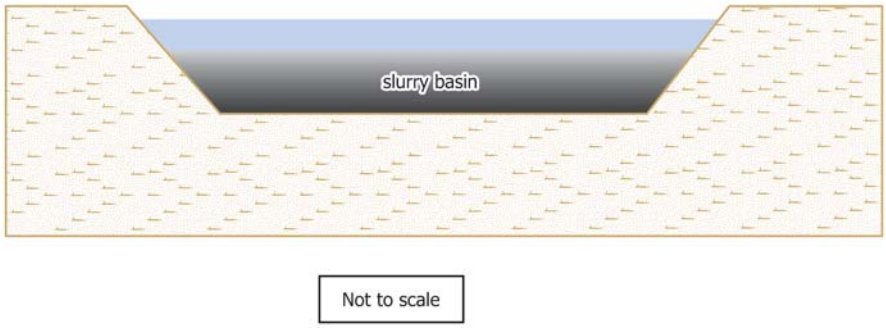

FIG. 3 Cross Sectional Depiction of an Incised Refuse Impounding Feature

DOI-OSM Directive REG-8 Oversight of State and Tribal Regulatory Programs, January 31, 2011 (Transmittal No. 967)

3. Terminology

3.1 Except as listed or noted below, all definitions are in accordance with Terminology D653.

NOTE 2—The terms defined here are consistent with those defined in 30 CFR Part 700 et seq., 30 CFR Part 800 et. seq. though not verbatim.

NOTE 3—Terminology and definitions for identifying geographical features and describing the data model have been adopted from the FGDC Spatial Data Transfer Standard (3) and the FGDC Framework Data Content Standard (FGDC Project 1574- D) Information Technology—Part 5 Governmental unit and other geographic area boundaries.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *attribute, n*—a defined characteristic of a feature.

3.2.2 *attribute value, n*—a specific quality or quantity assigned to an attribute.

3.2.3 *authoritative data source (ADS), n*—a recognized source as defined in SMCRA.

3.2.4 *basin, n*—for purposes of this standard, the area where slurry is deposited in an impoundment.

3.2.5 *bond forfeiture, n*—default of the performance bond resulting in revocation of the permit.

3.2.6 *bond release, n*—the process of releasing permit holder's performance bond following approval of having met reclamation requirements of affected lands.

3.2.7 *bonded area, n*—the land within the permit area upon which the operator has posted financial assurance to conduct surface coal mining and reclamation operations within the permit term. Bond is associated with the entire permit area or an increment of land within the permitted area.

3.2.8 *coal mining operation (CMO), n*—the extent of surface disturbance from surface and underground CMOs.

3.2.9 *coal preparation, n*—the chemical or physical processing and the cleaning, concentrating, or other processing or preparation of coal.

3.2.10 *coarse coal refuse, n*—a solid waste material separated from coal during processing, consisting primarily fragmented waste rock. Coarse coal refuse can vary widely in size, from silt to cobble, but is distinguished from fine coal refuse in that it is handled and disposed of as a dry solid, often in an embankment.

3.2.11 *cross-valley refuse impoundment, n*—a type of slurry impoundment formed by constructing an embankment across the downstream side of a catchment area, allowing slurry to be retained upstream of the embankment. See Fig. 1.

3.2.12 *diked refuse impoundment, n*—a type of impoundment in which slurry is retained by constructing an enclosed embankment. On flat terrain, the embankment may encircle the slurry basin completely. See Fig. 2.

3.2.13 *disturbed, n*—an area where vegetation, topsoil, or overburden is removed or upon which topsoil, spoil, coal processing waste, underground development waste, or non-coal waste is placed by CMO's. Those areas are classified as disturbed until reclamation is complete.

3.2.14 *domain, n*—a range of permissible values for a specified attribute.

3.2.15 *durable rock fill, n*—a type of valley fill, containing excess overburden spoil that consists of at least 80 percent durable rock on a unit volume basis, or rock that can pass certain strength and weathering tests, such as a slake durability test.

3.2.16 *embankment, n*—man-made deposits of earth or coarse coal refuse that is raised above the natural surface of the land. For the purposes of this standard, embankments are a component of an impoundment used to retain slurry.

3.2.17 *ERML point, n*—a geometric point that specifies the locations of environmental resources associated with permitted CMO's, as indicated on the latest map approved by the RA.

3.2.18 *excess spoil, n*—spoil material disposed of in a location outside of the mined-out area, excluding spoil material used to achieve the approximate original contour or to blend the mined-out area with the surrounding terrain.

3.2.19 *feature, n*—a geographical representation of either a discrete real-world phenomenon, such as a building, or an abstract concept, such as a governmental boundary.

3.2.20 *feature class, n*—a collection of similar features having the same geometry type, coordinate system, and a common set of descriptive attributes.

3.2.21 *fine coal refuse, n*—waste material that is hydraulically separated from coal during processing. Particle size varies from clay or very fine silt to fine sands. Solids are suspended in a water solution, or slurry, and usually transported through a pipeline.

3.2.22 *head-of-hollow fill, n*—a type of valley fill, in which the top surface of the fill, when completed is at or blends into the adjacent ridge line, and no significant area of natural drainage occurs above the fill draining into the fill area.

3.2.23 *hydrologic balance, n*—the relationship between the quality and quantity of water inflow to and water outflow from a hydrologic unit including water stored in the unit. It encompasses the dynamic relationships between precipitation, runoff, evaporation, and changes in ground and surface water availability.

3.2.24 *impoundment, n*—a structure created for the retention of water, slurry, refuse, or sediment.

3.2.25 *incised refuse impoundment, n*—an impoundment formed by excavation below the original surface elevation, see Fig. 3.

3.2.26 *incremental bond area, n*—a portion of a permitted area which allows each independent area and its posted performance bond to be released according to its reclamation schedule.

3.2.27 *mine boundary, n*—the perimeter defining the land area upon which surface CMOs have occurred. Some RAs refer to these lands as affected lands. Mine boundaries may include surface CMOs that existed in the early 1900s before any formal permitting or regulatory process had been developed and there was no permit or permittee.

3.2.28 *mine discharge, n*—Discharge of water emanating from or hydrologically connected to a mined area or an area of mining-related activities, which may remain after activities have been completed or abandoned. These discharges have the potential to pollute groundwater or surface water or both, with a detrimental impact upon the environment or public safety.

3.2.29 *National Mine Map Repository, n*—the National Mine Map Repository (NMMR), is part of the United States Department of the Interior (DOI), Office of Surface Mining Reclamation and Enforcement (OSM). It is the central database location for the collection, archival, maintenance and retention of over 134,000 abandoned (coal and non-coal) mine map images and information on microfilm for the United States. This information is available to the public.

3.2.30 *National Pollutant Discharge Elimination System (NPDES), n*—a permit program authorized by the Clean Water Act that controls water pollution by regulating point sources that could potentially discharge pollutants into waters of the United States.

3.2.31 *overburden, n*—consolidated or unconsolidated material of any nature which overlies a coal deposit, excluding topsoil.

3.2.32 *Office of Surface Mining Reclamation and Enforcement (OSM), n*—OSM is the Federal Government agency established under Title II of SMCRA, within the DOI. SMCRA provides OSM a legal basis for assigning primary responsibility for regulation of CMO's and reclamation of abandoned mine land to the states and Indian tribes. The twenty four coal resource states that have been granted primary regulatory authority, also known as "primacy," have the exclusive jurisdiction of the implementation of SMCRA. In coal states that do not have primacy (federal program and Indian lands) OSM issues the coal mine permits, conducts the inspections, and handles the enforcement and reclamation responsibilities.

3.2.33 *permit, n*—written authorization to conduct surface coal mining and reclamation operations issued by an RA to a permittee.

3.2.34 *permit area, n*—the area of land described by a legal description, metes and bounds, or indicated on the latest map approved by the RA, upon which the permittee has approval to conduct surface coal mining and reclamation operations.

3.2.35 *permit boundary, n*—the perimeter of the land on which the permittee may conduct surface coal mining and reclamation operations described by a legal description, metes and bounds, or indicated on the latest map approved by the RA.

3.2.36 *point, n*—a one-dimensional geometric object that specifies a geographic location.

3.2.37 *polygon, n*—a two-dimensional closed geometric shape that specifies the boundaries of a geographic area.

3.2.38 *preparation plant, n*—a facility where coal is subjected to chemical or physical processing, cleaning, concentrating, or other preparation. It includes facilities associated with coal preparation activities, including, but not limited to: loading facilities; storage and stockpile facilities; sheds; shops and other buildings; water-treatment and water-storage facilities.

3.2.39 *reclamation, n*—those actions taken to reestablish and return mined land to an approved land use from the effects of mining and mining-related disturbances.

3.2.40 *regulatory authority, n*—entity(s) with exclusive jurisdiction over the regulation of coal or non-coal mining, or both, and reclamation operations or mitigation, or both, of AML problems under a program approved by the Secretary of the DOI.

3.2.41 *side-hill fill, n*—a controlled earth and rock fill located on the side of an existing hill that is designed as a stable, permanent structure for excess spoil.

3.2.42 *slurry, n*—a waste product generated from processing coal, consisting of a mixture of water and fine particulate waste which is most commonly disposed of in an impoundment.

3.2.43 *slurry cell, n*—a disposal method in which coal slurry refuse is placed in dug-out isolated troughs. The slurry material is covered with coarse refuse encapsulating the cell.

3.2.44 *spoil, n*—overburden that has been removed during a CMO.

3.2.45 *state, n*—a state of the United States of America recognized by the DOI Secretary that has been granted full regulatory authority over the administration and enforcement of mining and mining-related operations or abandoned mine lands.

3.2.46 *termination of jurisdiction, n*—an area subject to the initial and permanent program regulations where the RA has released jurisdiction as defined under 30 CFR 700.11(d)(1)(i and ii).

3.2.47 *tribe, n*—any Native American or Alaskan Native tribe, band, group, or community having a governing body recognized by the DOI Secretary that has been granted full regulatory authority over the administration and enforcement of coal mining operations or abandoned mine lands on Native American lands. Navajo, Hopi, and Crow tribes have initiated efforts to assume primacy in being the RA.

3.2.48 *valley fill, n*—an excess spoil structure where side slopes of the existing valley, measured at the steepest point, are greater than 20 degrees, or where the average slope of the profile of the valley from the toe of the fill to the top of the fill is greater than 10 degrees, see Fig. 4.

3.3 *Acronyms:*

3.3.1 *ADS*—Authoritative Data Source

3.3.2 *AMD*—Acid Mine Drainage

3.3.3 *CAD*—Computer Aided Design

3.3.4 *CFR*—Code of Federal Regulations

3.3.5 *CMO*—Coal Mining Operation

3.3.6 *DOI*—U.S. Department of the Interior

3.3.7 *ERML*—Environmental Resource Monitoring Location

3.3.8 *FGDC*—Federal Geographic Data Committee

3.3.9 *GIS*—Geographic Information System

3.3.10 *LUMP*—Lands Unsuitable for Mining Petition (also known as "petition")

3.3.11 *MSHA*—Mine Safety and Health Administration (U.S. Department of Labor)

3.3.12 *NMMR*—National Mine Map Repository

3.3.13 *NPDES*—National Pollutant Discharge Elimination System

3.3.14 *OSM*—Office of Surface Mining Reclamation and Enforcement

3.3.15 *RA*—Regulatory Authority

3.3.16 *SMCRA*—Surface Mining Control and Reclamation Act (of 1977 as amended)

3.3.17 *TOJ*—Termination of Jurisdiction

FIG. 4 Planimetric View of a Reclaimed Excess Spoil Valley Fill

4. Significance and Use

4.1 This practice addresses coal mining geospatial data in general, as well as data relative to SMCRA, 30 CFR Part 700, et seq., and 30 CFR Part 800, et seq. This practice is significant to the coal mining community because it provides uniformity of geospatial data pertaining to coal mining features throughout the United States. Currently, each coal producing state organizes their data in a different method with their own naming conventions and terminology. By establishing national geospatial data standards, guidance is provided to RA programs that do not have geospatial data standards of their own. This practice will create an easier and more efficient way to utilize and share coal mining geospatial data relative to SMCRA between RAs and the coal mining community.

4.1.1 The datasets may be served as layers, for example, in The National Map (http://nationalmap.gov), an online, interactive map service sponsored by a consortium of Federal, State, and local partners and hosted by the U.S. Geological Survey (USGS).[7]

4.2 Some RA data for coal mining feature attributes may not have values. Those RAs may not collect those attributes as part of their regulatory program or those attributes may not be applicable within their area of responsibility. As a result, a national dataset of coal mining features may appear to be incomplete for those RAs.

4.3 Within its area of exclusive jurisdiction, each RA is the ADS for the coal mining geospatial data that it creates and uses to regulate mining activity.

4.4 *Limitations of Use*—Uses of a national dataset are limited by several factors affecting the completeness, currency, and accuracy, of various data sources.

4.4.1 *Completeness*—Participation in the compilation of spatial data may not be uniform across RAs, which may affect completeness, both in terms of spatial data, and associated attributes. For some RAs, this standard may not be applicable because features described herein do not occur within their area of responsibility.

4.4.2 *Currency*—Source data is subject to change as a result of regulatory actions that may change the geographical location, extent, or attributes of particular features which may not be reflected in the national dataset. If detailed information is needed for individual features, the appropriate RA should be contacted for additional information.

4.4.3 Data compiled in accordance with this standard is not intended to be used as a primary source for evaluating risk or safety.

4.4.4 Data compiled in accordance with this standard is intended for informative purposes; it is not authoritative.

5. Procedure

5.1 *Introduction*—The individual location and attribute characteristics listed in this section represent the data necessary to develop and maintain these geospatial datasets. Geospatial data and descriptions may be obtained from state, tribal, and federal RAs. The use of this standard's data will help ensure uniformity of the geospatial data developed and maintained by RAs.

5.2 *Coordinates and Related Data*—Coordinates and related geospatial data allow features to be accurately positioned on the earth's surface in a variety of recognized datums, grid systems, and geographic projections. The data is compiled from federal, state, and tribal resources that may utilize different known datum, coordinate, and projection systems. All submitted data will have known datum, coordinate, and projection systems which will be described in the metadata statement. ANSI INCITS 61-1986 (R2002) contains additional guidance on representation of coordinates.

5.3 *ADS Responsibilities*—Subject to the applicability and capability of the ADS. Each ADS will provide relevant data for its area of responsibility, compiled in accordance with this standard, to OSM for compilation in a national dataset.

5.4 A designee within OSM will serve as the data steward for the national geospatial dataset that complies with this standard. This designee will coordinate with individual RA's for submission of data that adheres to this standard. OSM will compile a national dataset and map service.

5.5 *Source Data*—Information for each feature class will be compiled by each ADS from the best available source. Digital data in CAD or GIS format should be used if available.

5.5.1 *Data Format*—Data should be provided in a commonly recognized format, such as shapefile, coverage, geodatabase, or XML recordset.

5.5.2 *Coordinate System*—The coordinate system and datum used will be identified by the ADS. This information will be sufficient for OSM to reproject the dataset to a common coordinate system.

5.5.3 *Metadata*—Metadata documentation must meet FGDC-STD-001.

5.5.4 *Update Frequency*—Subject to the applicability and capability of the ADS. Each ADS will provide updated versions of their dataset periodically, so that changes can be propagated to the national dataset.

5.5.5 *Feature Classes*—Features relevant to this standard are organized into multiple feature classes. Each feature class is defined by describing what features are to be included, how the features are represented geographically, and what descriptive attributes are associated with each feature.

5.6 *Common Descriptive Attributes*—Defined characteristics associated with a feature class. Common attributes include:

5.6.1 *Calculated Area*—The area of a feature as calculated from a polygon (acres).

5.6.2 *Coal Bed Name(s)*—The geologic name of the coal seam extracted as reported in the permit document, determined by the RA, or identified as unknown/undetermined.

5.6.3 *Comment*—Any additional comments as reported by the RA.

5.6.4 *Company*—The name of the coal company that operated the underground mine.

5.6.5 *Contact*—The name of the RA responsible for overseeing the permitted and non-permitted mining operation(s) and for creating or maintaining the CMO geospatial data.

[7] USGS National Center, 12201 Sunrise Valley Drive, Reston, VA 20192, www.usgs.gov.

5.6.6 *Date of Map*—The date of the source document used to generate the underground coal mining extent data. The source document may not represent the actual "final" extent of mining.

5.6.7 *Edit Date*—Represents the last date the record was updated or changed for a coal mining feature or attribute, or both, as recorded by the ADS.

5.6.8 *Mine Name*—The legal name for a CMO.

5.6.9 *MSHA ID*—The unique identifier assigned by the Mine Safety and Health Administration. The identifier is usually a number or an alphanumeric combination.

5.6.10 *National ID*—A unique identifier created by combining the standard state or tribal abbreviation code and the Permit ID assigned by the RA; this unique identifier helps in organization, retrieval, and analysis of individual state or tribal data combined into the nationwide data set.

5.6.11 *Permit Application Date*—The date of the original application or an application to revise the permit that brings about a change to the geospatial feature.

5.6.12 *Permit Application Approval Date*—The date the permit application was approved by the RA that could result in creation or change to a geospatial feature.

5.6.13 *Permit Application Types*—SMCRA permit types as defined in Table 4.

5.6.14 *Permit ID*—The unique identifier assigned by the RA which issues a coal mining and reclamation permit; the identifier is usually a number or alphanumeric combination.

5.6.15 *Permit Status*—The status of the coal mining and reclamation permit operations, as defined by the RA.

5.6.16 *Permittee*—The entity to whom a permit has been issued by the RA to conduct surface coal mining and reclamation operations.

5.6.17 *Post-SMCRA*—Indicates whether mining occurred after the passage of SMCRA.

5.6.18 *Reported Area*—The area of a feature as reported to the RA (acres).

5.6.19 *State/Tribe Mine ID*—The unique identifier assigned by the RA which issues a coal mining and reclamation mine ID; the identifier is usually a number or alphanumeric combination.

5.7 *Coal Mining Operations (CMO)*—This dataset defines the extent of surface disturbance from surface and underground CMOs.

5.7.1 *CMOs Feature Class*—This feature class contains polygons depicting boundaries of surface CMOs and surface disturbance due to underground CMOs.

5.7.2 The list of CMOs attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting surface coal mining boundary locations.

5.7.3 *Origin of CMOs Geometry*—The feature geometry must originate from the most accurate data available to the ADS. For surface coal mining boundaries of post-SMCRA surface CMOs, the most recently approved map in the permit application issued by the RA should be used. For surface coal mining boundaries of pre-SMCRA surface CMOs, the best available map available to the ADS should be used regardless of whether or not a permit had been issued.

5.7.4 *Geographical Representation*—CMOs features will be represented using a polygon.

5.7.5 *CMOs Attributes*—Individual attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the CMOs feature layer are defined below. See Table 1 for attributes.

5.7.5.1 *Coal Mine Operation Status*—The status of coal mining and reclamation operations, as defined by the RA.

5.7.5.2 *Inspectable Unit*—As per OSM's Directive REG-8, Table 6, An Inspectable Unit is defined by the regulatory authority and may include multiple small and neighboring Initial Program Sites or Permanent Program Permits that have been grouped together as one Inspectable Unit for inspection efficiency. An Inspectable Unit also may be one of multiple inspectable units for one Permanent Program Permit that was divided into multiple inspectable units to allow full coverage of complete inspections of the site.

5.7.5.3 *Surface Mining Method(s)*—Method of coal mine operations/activities/mine types within the surface coal mining boundary.

5.8 *Underground Coal Mining Extents*—This dataset defines the extent of an underground mining operation.

5.8.1 *Underground Coal Mining Extents Feature Class*—This feature class contains polygons depicting the locations of underground coal mining extents.

5.8.2 The list of Underground Coal Mining Extents attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting underground coal mining extents.

5.8.3 The dataset is subject to change as a result of regulatory actions that may change the boundary area or feature attribute data. If detailed underground coal mining extents information is needed, the appropriate RA should be contacted for additional information.

5.8.4 *Origin of Underground Coal Mining Extents Geometry*—The feature geometry must originate from the best data available to the RA. For contemporary, post-SMCRA, underground coal mining extents, feature geometry and attributes will be captured using the most recently approved map submitted to the RA. For older, pre-SMCRA underground mining extents, feature geometry and attributes will be captured using the best available map resources.

5.8.5 *Geographical Representation*—Underground Coal Mining Extents features will be represented using a polygon.

5.8.6 *Underground Coal Mining Extents Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Underground Coal Mining Extents feature layer are defined below. See Table 2 for attributes.

5.8.6.1 *Mine Status*—The regulatory status of the underground mining operation, as reported by the RA, as defined in the evaluation section of OSM Directive INE-23.

TABLE 1 Surface CMOs Attributes[A]

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Coal Mine Operation Status	See 5.7.5.1	Active	Text	See Table 2 for domains and definitions	Status of mining operations
Mine Name	See 5.6.8	Peterson Mine No. 1	Text		
Permit ID	See 5.6.14	1201834	Text		
MSHA ID	See 5.6.9	39-39022	Text		
State/Tribe Mine ID	See 5.6.19	WA001			Text Identification number issued by RA
National ID	See 5.6.10	VA2020010	Text		
Coal Bed Name(s)	See 5.6.2	Appleton No. 2	Text		Local/regional name or state geological survey stratigraphic name
Date of Map	See 5.6.6	3/11/1977	Date		The source document used to show the actual "final" extent of mining
Inspectable Unit Status	See 5.7.5.2	Active	Text	See Table 3 for domains and definitions	Use terms as defined by the approved RA
Post-SMCRA	See 5.6.16	Yes	Text	Yes, No	To determine whether mining has occurred post- SMCRA
Calculated Area	See 5.6.1	23200	Numeric		For comparison with reported value
Reported Area	See 5.6.18	23300	Numeric		For comparison with calculated value
Permit Application Types	See 5.6.13	IBR	Text	See Table 4 for domains and definitions	
Permit Application Date	See 5.6.11	01/30/2009	Date		
Permit Application Approval Date	See 5.6.12	01/30/2010	Date		
Edit Date	See 5.6.7	01/30/2011	Date		Last update of data
Surface Mining Method(s)	See 5.7.5.3	Area mine	Text	See Table 5 for domains and definitions	Type of surface mining method(s)
Comment	See 5.6.3			Text	
Contact	See 5.6.5	Virginia Department of Mines, Minerals, and Energy	Text		

[A]This data is also associated with the bonded areas for underground coal mine operations.

TABLE 2 Preferred Domain Definitions for CMO Status and Permit Status

Domain Value	Definition
Active	Mine site has ongoing coal production and/or reclamation activities.
Inactive	Mine site has no coal extraction or reclamation activity taking place as defined in 30 CFR 840.11(f).
Abandoned	All surface coal mining activities have ceased and operator has left the site without completing reclamation as defined in 30 CFR 840.11(g)(1-2).
Not Applicable	Surface mine operations mined prior to the enactment of SMCRA, August 3, 1977.
Revoked	Surface mine permit that has been repealed, rescinded, cancelled, or annulled by the RA.
Initial (Interim) Program	Those permits issued by the RAs between the enactment of SMCRA on August 3, 1977 and the date they gained primacy over the permanent regulatory program. The exact date of primacy varies by State RA.
Released	The permittee has met all reclamation requirements for final bond release.

TABLE 3 Preferred Domain Definitions for Inspectable Unit Status

Domain Value	Definition
Active	Mine site has ongoing coal production and/or reclamation activities.
Inactive	Mine site has no coal extraction or reclamation activity taking place as defined in 30 CFR 840.11(f).
Abandoned	All surface and underground coal mining activities have ceased and operator has left the site without completing reclamation as defined in 30 CFR 840.11(g)(1-2).
Unpermitted or Illegal	Coal mining activity is occurring without a permit.

TABLE 4 Preferred Domain Definitions for CMO Permit Application Types

Domain Value	Definition
Pending Application	Surface mine permit application that has been submitted, but not approved by the RA.
Permit Revision	A revision that is a significant departure from the existing permit which may result in a significant impact in the health, safety, and welfare of the public, the hydrologic balance in the area of the operation and in the postmining land use. (30 CFR 774.13 (a) - (c)).
Incremental Boundary Revision (IBR)	A revision limited to minor shifts or extensions of the permit boundary into non-coal area(s) where any coal extraction is incidental. IBR's also includes the addition or deletion of bonded permit acreage (30 CFR 774.13 (d)).

TABLE 5 Preferred Domain Definitions for Surface Mining Method(s)

Domain Value	Definition
Area Mine	A surface mining method that is carried out on level to gently rolling topography or relatively large tracts of land.
Contour	A mining method commonly used in eastern mountainous topography where coal is removed in a narrow strip around the hillside.
Mountaintop	A mining operation that removes an entire coal seam or seam(s) in an upper fraction of a mountain, ridge, or hill and creating a level plateau or a gently rolling contour with no highwalls.
Steep Slope	Coal mining and reclamation operations on natural slopes that exceed 20 degrees that are subject to performance standards specified in 30 CFR 716.2.
Highwall	Highwall mining systems capable of mining parallel underground entries from the surface to predetermined depths to maximize mineral recovery and limit personnel exposure to underground hazards.
Auger	Method of recovering coal by boring into the coal seam exposed by excavation.

5.8.6.2 *National Mine Map Repository ID*—The unique identifier assigned by the NMMR when a map is added to the repository collection. The identifier is usually an alphanumeric combination.

5.8.6.3 *Underground Mining Method(s)*—The type of mining operation, as reported in the permit document, that is, longwall, room and pillar, breast and pillar, highwall, and auger.

5.9 *Performance Bond and Land Reclamation Status*—This dataset defines the status of an area where coal removal, reclamation and related supporting activities has occurred, is occurring, or is planned within a CMO.

5.9.1 *Performance Bond and Land Reclamation Status Feature Class*—This feature class contains polygons depicting performance bond and land reclamation statuses for CMO's.

5.9.2 The list of coal mining Performance Bond and Land Reclamation Status attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting the performance bond and land reclamation status of individual areas within each CMO.

5.9.3 *Origin of Coal Mining Performance Bond and Land Reclamation Status Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA, using the most recently approved permit application map.

5.9.4 *Geographical Representation*—Performance Bond and Land Reclamation Status features will be represented using a polygon.

5.9.5 *Permitted Coal Mining Performance Bond and Land Reclamation Status Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Performance Bond and Land Reclamation Status feature layer are defined below. See Table 9 and Table 11 for attributes.

5.9.5.1 *Bond Amount*—Amount of posted bond attached to a specific permit or incremental bond area within the permit area.

5.9.5.2 *Increment Area ID*—An identifier that helps in organization, retrieval, and analysis of individual state or tribal

TABLE 6 Underground Coal Mining Extents Attributes[A]

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Mine Name	See 5.6.8	Peterson Mine No.1	Text		
Permit ID	See 5.6.14	2939829	Text		
MSHA ID	See 5.6.9	39-39022	Text		
State/Tribe Mine ID	See 5.6.19	WA001	Text		Alternate mine identification number
National ID	See 5.6.10	WV1201834	Text		Unique OSM identifier
National Mine Map Repository ID	See 5.8.6.2	700000A	Alphanumeric		
Coal Bed Name(s)	See 5.6.2	Appleton No. 2	Text		Local/regional name or state geological survey stratigraphic name
Date of Map	See 5.6.6	3/11/1977	Date		The source document used to show the actual "final" extent of mining
Mine Status	See 5.8.6.1	Active	Text	See Table 7 for domains and definitions	As defined by the approved RA
Underground Mining Method(s)	See 5.8.6.3	Longwall	Text	See Table 8 for domains and definitions	
Post-SMCRA	See 5.6.17	Yes	Text	Yes, No	To determine whether mining has occurred post-SMCRA
Calculated Area	See 5.6.1	23400	Numeric		For comparison with reported value
Reported Area	See 5.6.18	23600	Numeric		For comparison with calculated value
Permit Application Types	See 5.6.13	IBR	Text	See Table 4 for domains and definitions	
Permit Application Date	See 5.6.11	01/30/2009	Date		
Permit Application Approval Date	See 5.6.12	01/30/2009	Date		
Edit Date	See 5.6.7	01/30/2007	Date		To determine last update of data
Comment	See 5.6.3	Multi seam, combined surface and underground operation, highwall	Text		
Contact	See 5.6.5	West Virginia Department of Environmental Protection	Text		

[A]This data is also associated with the bonded areas for underground coal mine operations.

TABLE 7 Preferred Domain Definitions for Underground Mine Status

Domain Value	Definition
Active	Mine site has ongoing coal production and/or reclamation activities.
Inactive	Mine site has no coal extraction or reclamation activity taking place as defined in 30 CFR 840.11(f).
Abandoned	All surface and underground coal mining activities have ceased and operator has left the site without completing reclamation as defined in 30 CFR 840.11(g)(1-2).
Temporary Cessation	RA has granted cessation of mining pursuant to 30 CFR 816/817.131(b).
Pre-SMCRA	Underground mining that has occurred prior to the passage of SMCRA

TABLE 8 Preferred Domain Definitions for Underground Mining Method(s)

Domain Value	Definition
Long wall	A method of working a coal seam in a single operation by means of a long working face in a continuous line, generally several hundred feet in width. The resultant space from which the coal has been removed is allowed to collapse (caving) behind the mining face.
Room & Pillar	System of mining in which typically flat-lying beds of coal are mined in room-type openings, separated by pillars of undisturbed coal left for roof support.
Breast and Pillar	A system of working anthracite coal using passages with narrow pillars between them, connected at specific intervals.
Highwall	Highwall mining systems capable of mining parallel underground entries from the surface to predetermined depths to maximize mineral recovery and limit personnel exposure to underground hazards.
Auger	Method of recovering coal by boring into the coal seam exposed by excavation.

data associated with the area, based on increment identification(s) issued by the RA.

5.9.5.3 *Land Reclamation Status*—Designates the current state of reclamation on individual areas within permitted coal mining and reclamation operations represented by disturbed, backfilled/regraded, revegetated, topsoiled, TOJ, and not disturbed.

5.9.5.4 *Reclamation Bond Status*—Designated by the RA for individual areas within permitted coal mining and reclamation operations. The bond statuses may be represented by bonded, not bonded, Phase I Release, Phase II Release, or Phase III Release, Forfeited or TOJ.

5.9.5.5 *Reclamation Bond Status Date*—Date of approval by the RA.

5.9.5.6 *Release Eligibility*—Designates the phase of bond release for which an individual area within a permitted coal mining and reclamation operation boundary is eligible and may represent Phase I, Phase II, and Phase III under SMCRA or Not Applicable (NA) if on interim lands.

5.10 *Lands Unsuitable for Mining Petition Area (LUMP)*—This dataset defines an area(s) that has been petitioned to be designated as unsuitable for mining.

5.10.1 *LUMP Area Feature Class*—This feature class contains polygons that depict areas that have been petitioned to be designated as unsuitable for CMO's.

5.10.2 The list of LUMP Area attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting these area types.

5.10.3 *Origin of LUMP Area Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

5.10.4 *Geographical Representation*—LUMP Area features will be represented using a polygon.

5.10.5 *LUMP Area Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site to help in analysis and retrieval of additional information. The feature attributes specific to the LUMP Area feature layer are defined below. See Table 14 for attributes.

5.10.5.1 *LUMP Basis*—The rationale for the petition or LUMP.

5.10.5.2 *LUMP Date*—Date petition received for review by the RA.

5.10.5.3 *LUMP Designation Date*—Designation date of petition decision assigned by RA.

5.10.5.4 *LUMP Name*—Name given to petition by RA.

5.10.5.5 *LUMP Status*—The status of the decision regarding petition area.

5.11 *Lands Unsuitable for Mining Designated Areas*—This dataset defines an area(s) that is designated as unsuitable for mining.

5.11.1 *Lands Unsuitable for Mining Designated Areas Feature Class*—This feature class contains polygons that depict areas that are designated lands unsuitable for mining.

5.11.2 The list of Lands Unsuitable for Mining Designated Areas attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting these area types.

5.11.3 *Origin of Lands Unsuitable for Mining Designated Areas Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

5.11.4 *Geographical Representation*—Lands Unsuitable for Mining Designated Areas features will be represented using a polygon.

5.11.5 *Lands Unsuitable for Mining Designated Areas Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Lands Unsuitable for Mining Designated Areas feature layer are defined below. See Table 17 for attributes.

5.11.5.1 *Designated Area Name*—Name given by the RA.

5.11.5.2 *Designation*—The RA's ruling of the designated area.

5.11.5.3 *Designation Date*—Designation date of decision assigned by the RA.

TABLE 9 Bond Status Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining, Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit ID	See 5.6.14	1201834	Text		
National ID	See 5.6.10	VA1201834	Text		
Increment Area ID	See 5.9.5.2	Increment 3	Text		Area, Increment ID, or permit ID(s) associated with a bond
Reclamation Bond Status	See 5.9.5.4	Phase II Release	Text	See Table 10 for domains and definitions	Status of reclamation according to phase
Reclamation Bond Status Date	See 5.9.5.5	10/01/2000	Date		
Bond Amount	See 5.9.5.1	4200000	Numeric		
Calculated Area	See 5.6.1	1402	Numeric		For comparison with reported value
Reported Area	See 5.6.18	1400	Numeric		For comparison with calculated value
Permit Application Date	See 5.6.11	01/30/2009	Date		
Permit Application Approval Date	See 5.6.12	01/30/2009	Date		
Edit Date	See 5.6.7	01/30/2007	Date		Last update of data
Comment	See 5.6.3		Text		
Contact	See 5.6.5	West Virginia Department of Environmental Protection	Text		

TABLE 10 Preferred Domain Definitions for Reclamation Bond Status

Domain Value	Definition
Phase I Release	Evaluated and released upon completion of backfill/grading, and drainage control for areas under the performance bond, in accordance with the approved reclamation plan and 30 CFR 800.40 (c)(1).
Phase II Release	Evaluated and released upon establishment of vegetation on the graded mined lands for areas under the performance bond, in accordance with the approved reclamation plan and 30 CFR 800.40(c)(2).
Phase III Release	Evaluated and released upon completion of all reclamation and hydrologic requirements fully met for areas under the performance bond and 30 CFR 800.40(c)(3).
Forfeited	Default of the performance bond resulting in revocation of the permit.
Bonded	Fully bonded by the permittee to conduct surface coal mining and reclamation operations within the permit term.
Not Bonded	Approved for surface coal mining and reclamation operations. Performance bond not yet submitted.
Termination of Jurisdiction	An area subject to the initial and permanent program regulations where the RA has released jurisdiction as defined under 30 CFR 700.11(d)(1)(i and ii).

5.12 *Excess Spoil*—This dataset defines the location(s) of excess spoil placement and materials produced by CMOs.

5.12.1 *Excess Spoil Feature Class*—This feature class contains polygons that depict the location of excess spoil placement area(s). These include, but are not limited to, valley fills (including head-of-hollow fills and durable rock fills) and side-hill fills. These structures usually take the form of out-of-pit spoil piles, side-hill fills, or valley fills (depicted in Fig. 4).

5.12.2 The list of Excess Spoil attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting these area types.

5.12.3 *Origin of Excess Spoil Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

5.12.4 *Geographical Representation*—The geographical representation of these features will encompass the extent of the area used for excess spoil deposition, based on contemporary permit design plans and maps, as-built construction conditions, or remote sensing. Excess spoil features will be represented using a polygon.

5.12.5 *Excess Spoil Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Excess Spoil feature layer are defined below. See Table 19 for attributes.

5.12.5.1 *Design Volume*—The maximum design volume of a structure represented in the permit as a feature. For overburden or coarse coal refuse or both, use cubic yards.

5.12.5.2 *Excess Spoil Valley Fill Placement Status*—Construction status of feature.

5.12.5.3 *Feature ID*—Identifier used to uniquely identify multiple spoil features that may be associated with a single permit.

5.12.5.4 *Permanent Feature*—The feature is designated permanent or temporary in the permit.

5.12.5.5 *Reported Volume*—The reported volume of feature as of the edit date. For coarse material, use cubic yards.

5.13 *Coal Refuse*—This dataset defines the location(s) of coal refuse placement and materials produced by CMOs.

5.13.1 *Coal Refuse Feature Class*—This feature class contains polygons that depict the location of coal refuse disposal area(s). These include, but are not limited to, slurry impoundments (including cross valley, diked, and incised impoundments), slurry cell structures, and coarse coal refuse structures.

5.13.2 The list of Coal Refuse attributes represent the data required to develop and maintain a nationwide geospatial data set depicting these area types.

5.13.3 *Origin of Coal Refuse Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

5.13.4 *Geographical Representation*—The geographical representation of a coal refuse feature will encompass the entire area designated for refuse disposal, based on contemporary permit design plans and maps, as-built construction conditions, or remote sensing. For non-incised impounding structures, this area includes all of the designated disposal area and the entire embankment. Coal Refuse features will be represented as a polygon.

5.13.5 *Coal Refuse Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Coal Refuse feature layer are defined in Table 21.

5.13.5.1 *Coal Refuse Feature Placement Status*—Status of feature.

5.13.5.2 *Impounding Feature*—Water, sediment, or slurry holding structures and depressions, either naturally formed or artificially constructed.

5.13.5.3 *Normal Pool Elevation*—Height above mean sea level of water/slurry surface under normal conditions.

5.13.5.4 *Design Refuse Impounded Volume*—The maximum design volume of a structure represented in the permit as a feature. For impounding features or slurry or both, use acre-feet and for coarse refuse, use cubic yards.

5.13.5.5 *Reported Refuse Impounded Volume*—The volume of the impoundment in the permit as a feature. For impounding features or slurry or both, use acre-feet and for coarse refuse, use cubic yards.

5.13.5.6 *Slurry Cells*—Disposal areas in which coal slurry refuse is placed in dug-out isolated troughs.

5.14 *Coal Preparation Plant*—This dataset defines the location of a coal preparation plant(s) on a given CMO.

5.14.1 *Coal Preparation Plant Feature Class*—This feature class contains points that depict the location of coal preparation plants.

5.14.2 The list of Preparation Plant attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting these area types.

TABLE 11 Land Reclamation Status Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining, Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit ID	See 5.6.14	1201834	Text		
National ID	See 5.6.10	VA1201834	Text		
Land Reclamation Status	See 5.9.5.3	Disturbed	Text	See Table 12 for domains and definitions	Status of reclamation
Release Eligibility	See 5.9.5.6	Phase I Eligible	Text	See Table 13 for domains and definitions	
Calculated Area	See 5.6.1	150.1	Numeric		Used for comparison to reported value
Reported Area	See 5.6.18	150.3	Numeric		Used for comparison to calculated value
Permit Application Date	See 5.6.11	01/30/2009	Date		
Permit Application Approval Date	See 5.6.12	01/30/2009	Date		
Edit Date	See 5.6.7	01/30/2007	Date		Used to determine the last data update
Comment	See 5.6.3		Text		
Contact	See 5.6.5	West Virginia Department of Environmental Protection	Text		

TABLE 12 Preferred Domain Definitions for Land Reclamation Status

Domain Value	Definition
Backfilled	An area where material has been placed back into an excavated area.
Disturbed	All areas affected to facilitate mining operations. Those areas are classified as disturbed until reclamation is complete, such as active pit after operation, grubbing, facilities, and pre-stripping.
Not Disturbed	An area approved for surface CMO's which is still in its pre-mining state.
Graded/Regraded	The contours of a surface have been changed to achieve the approved postmining grade within a surface coal mining and reclamation operation.
Revegetated	An area where the permittee has seeded or planted a diverse, effective, and permanent vegetative cover that is in accordance with the approved reclamation plan in order to achieve the approved postmining land use.
Topsoiled	As specified by the reclamation plan, an area where the redistribution of topsoil or suitable substitute soil has been completed.

TABLE 13 Preferred Domain Definitions for Release Eligibility

Domain Value	Definition
Phase I Eligible	Eligible for release upon completion of backfill/grading, and drainage control for areas under the performance bond, in accordance with the approved reclamation plan and 30 CFR 800.40(c)(1).
Phase II Eligible	Eligible for release upon establishment of vegetation on the graded mined lands for areas under the performance bond, in accordance with the approved reclamation plan and 30 CFR 800.40(c)(2).
Phase III	Eligible Eligible for release upon completion of all reclamation, vegetation, and hydrologic requirements fully met for areas under the performance bond and 30 CFR 800.40(c)(3).

5.14.3 *Origin of Coal Preparation Plant Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

5.14.4 *Geographical Representation*—The geographical representation will be defined as the approximate center location of each structure. Each coal preparation plant feature will be represented as a point.

5.14.5 *Coal Preparation Plant Attributes*—Attributes contain information about a particular point. Each attribute associated with a point contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Coal Preparation Plant feature layer are defined below. See Table 23 for attributes.

5.14.5.1 *Coarse Refuse*—The coal preparation plant facility produces coarse coal refuse.

5.14.5.2 *Facility Name*—Common name of the coal preparation plant.

5.14.5.3 *Fine Refuse*—The coal preparation plant facility produces fine coal refuse; includes slurry and dry refuse.

5.15 *Environmental Resource Monitoring Location (ERML)*—This dataset identifies ERML(s) related to a CMO.

5.15.1 *ERML Feature Class*—This feature class contains points that depict the location of ERML sites.

5.15.2 The list of ERML attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting ERML's.

5.15.3 *Origin of ERML Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA. For post-SMCRA ERML's, the most recently approved map in the permit application issued by the RA must be used.

5.15.4 *Geographical Representation*—Environmental Resource Monitoring Location features will be represented as a point.

5.15.5 *ERML Attributes*—Attributes contain information about a particular point. Each attribute associated with a point contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the ERML feature layer are defined below. See Table 24 for attributes.

5.15.5.1 *Elevation*—The orthometric height above mean sea level of a monitoring location. Elevation will be given in feet.

5.15.5.2 *ERML Monitoring Type*—The type of monitoring for each specific ERML.

5.15.5.3 *Monitoring Site ID*—A GIS-managed value that uniquely identifies each environmental resource location point.

5.16 *Postmining Land Uses*—This dataset defines and identifies areas of postmining land uses allowed for surface coal mining and reclamation operations.

5.16.1 *Postmining Land Uses Feature Class*—This feature class contains polygons that depict the locations of identified postmining land use areas.

5.16.2 The list of Postmining Land Use attributes represent the data necessary to develop and maintain a nationwide geospatial data set depicting the location of each CMOs approved postmining land use(s).

5.16.3 The proposed postmining land use must be capable of supporting pre-mine uses. If the land cannot be reclaimed to its pre-mining land use, the appropriate postmining land use shall be documented on the basis of the highest and best use that can be achieved and which is compatible with surrounding undisturbed areas. (30 CFR 816.133 & 701.5)

5.16.4 The proposed postmining use will be compatible with adjacent land uses and existing State and local land use plans.

5.16.5 Local, State, and Federal government agencies provide an opportunity to review and comment on the proposed postmining land use(s).

5.16.6 The proposed postmining surface must be designed by a registered professional engineer licensed to practice in the state to assure the stability, drainage, and configuration necessary for the intended use of the site.

5.16.7 *Origin of Postmining Land Uses Geometry*—The feature geometry and attributes must originate from the most accurate data available to the RA.

TABLE 14 LUMP Area Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
LUMP Name	See 5.10.5.4	Lands Unsuitable Petition 98-2	Text		
LUMP Status	See 5.10.5.5	Under Review	Text	See Table 15 for domains and definitions	
LUMP Date	See 5.10.5.2	02/20/1998	Date		The date of receipt of the petition
LUMP Basis	See 5.10.5.1	Fragile	Text	See Table 16 for domains and definitions	
LUMP Designation Date	See 5.10.5.3	06/30/1999	Date		If still under review, no designation date
Calculated Area	See 5.6.1	23400	Numeric		Used for comparison to reported value
Reported Area	See 5.6.18	23600	Numeric		Used for comparison to calculated value
Edit Date	See 5.6.7	08/20/2008	Date		Last update of data
Comment	See 5.6.3	Deep mining allowance to be determined	Text		Used to describe conditions of a designated area
Contact	See 5.6.5	KY Department of Natural Resources, Division of Mine Permits	Text		

TABLE 15 Preferred Domain Definitions for LUMP Status

Domain Value	Definition
Under Review	A petition is under consideration by the appropriate authority.
Frivolous	The petition did not meet the required criterion to be considered.
Accepted for Study	The petition met the required criterion and is under further review by the appropriate authority.
Incomplete	The petition was determined to be administratively incomplete and was returned to the petitioner.

TABLE 16 Preferred Domain Definitions for LUMP Basis

Domain Value	Definition
Incompatible	Petition area is *incompatible* with existing State or local land use plans or programs.
Fragile or Historic	Petition area is designated unsuitable because it may affect *fragile* or *historic* lands in which such operations could result in significant damage to important historic, cultural, scientific, and esthetic values and natural systems.
Renewable Resource	*Resource* lands in which mining operations could result in a substantial loss or reduction of longrange productivity of water supply or of food or fiber products, and such lands to include aquifers and aquifer recharge areas.
Hazardous	Petition area is designated unsuitable because mining operations may affect *natural hazard* lands in which such operations could substantially endanger life and property, such lands to include areas subject to frequent flooding and areas of unstable geology.

5.16.8 *Geographical Representation*—Postmining Land Uses features will be represented as a point.

5.16.9 *Postmining Land Uses Attributes*—Attributes contain information about a particular polygon. Each attribute associated with a polygon contributes to the unique identity of the site and helps in analysis and retrieval of additional information. The feature attributes specific to the Postmining Land Use's feature layer are defined below. See Table 26 for attributes.

5.16.9.1 *Land Use Type*—Identifies the approved postmining land use type.

NOTE 4—The postmining land use terms defined here are consistent with those defined in 30 CFR Part 701.5, and CFR 816.133/817.133, although not verbatim.

6. Keywords

6.1 bond release; coal mining; coal mining operation; coal mining permit boundary; mine permit; mine reclamation; phase bond release; reclamation performance bond release; release of jurisdiction; SMCRA; surface mining; termination of jurisdiction

TABLE 17 Lands Unsuitable for Mining Designated Areas Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Designated Area Name	See 5.11.5.1	Designation 98-2	Text		
Designation	See 5.11.5.2	Unsuitable	Text	See Table 18 for domains and definitions	
Designation Date	See 5.11.5.3	06/30/1999	Date		
Calculated Area	See 5.6.1	11300	Numeric		
Edit Date	See 5.6.7	08/20/2008	Date		Last update of data
Comment	See 5.6.3	Deep mining allowed, no mining in the Hazard 8 coal seam	Text		It may be used to describe conditions of designated area
Contact	See 5.6.5	KY Department of Natural Resources, Division of Mine Permits	Text		

TABLE 18 Preferred Domain Definitions for Designation

Domain Value	Definition
Unsuitable	The appropriate authority deemed the area unsuitable for mining.
Suitable with Exceptions	The appropriate authority deemed the area suitable for mining with certain exceptions that need to be adhered to by a subsequent permittee.
Unsuitable with Exceptions	The appropriate authority deemed the area unsuitable for mining with certain exceptions that need to be adhered to by a subsequent permittee.

TABLE 19 Excess Spoil Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit Status	See 5.6.15	Active	Text	See Table 2 for domains and definitions	
Permit ID	See 5.6.14	1201834	Text		
National ID	See 5.6.10	VA1201834	Text		
Feature ID	See 5.12.5.3	3A	Text		
Permanent Feature	See 5.12.5.4	Yes	Text	Yes, No	
Design Volume	See 5.12.5.1	400	Numeric		Used when solid material is placed per design specifications
Reported Volume	See 5.12.5.5	355	Numeric		Used when solid material is placed as reported
Excess Spoil Valley Fill Placement Status	See 5.12.5.2	Proposed	Text	See Table 20 for domains and definitions	
Calculated Area	See 5.6.1	630	Numeric		
Reported Area	See 5.6.18	600	Numeric		
Permit Application Date	See 5.6.11	01/30/2005	Date		
Permit Application Approval Date	See 5.6.12	01/30/2006	Date		
Edit Date	See 5.6.7	01/30/2007	Date		
Comment	See 5.6.3		Text		
Contact	See 5.6.5	Virginia Department of Mines, Minerals, and Energy	Text		

TABLE 20 Preferred Domain Definitions for Excess Spoil Valley Fill Placement Status

Domain Value	Definition
Proposed	Excess spoil material placement has not yet started.
Active	Excess spoil placement is ongoing.
Inactive	Excess spoil placement has ceased.
Complete	All excess spoil placement has been completed.

TABLE 21 Coal Refuse Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit Status	See 5.6.15	Active	Text	See Table 2 for domains and definitions	
Permit ID	See 5.6.14	1201834	Text		
MSHA ID	See 5.6.9	1211-VA03-00145-00	Text		
National ID	See 5.6.10	VA1201834	Text		
Impounding Feature	See 5.13.5.2	Yes	Text	Yes, No	
Design Refuse Impounded Volume	See 5.13.5.4	400	Numeric		Information provided in the permit
Reported Refuse Impounded Volume	See 5.13.5.5	355	Numeric		Per regulatory requirements
Normal Pool Elevation	See 5.13.5.3	421	Numeric		
Slurry Cells	See 5.13.5.6	Yes	Text	Yes, No	
Coal Refuse Feature Placement Status	See 5.13.5.1	Proposed	Text	See Table 22 for domains and definitions	
Calculated Area	See 5.6.1	630	Numeric		
Reported Area	See 5.6.18	600	Numeric		
Permit Application Date	See 5.6.11	01/30/2005	Date		
Permit Application Approval Date	See 5.6.12	01/30/2006	Date		
Edit Date	See 5.6.7	01/30/2007	Date		
Comment	See 5.6.3		Text		
Contact	See 5.6.5	Virginia Department of Mines, Minerals, and Energy	Text		

TABLE 22 Preferred Domain Definitions for Coal Refuse Feature Placement Status

Domain Value	Definition
Proposed	Coal refuse placement has not yet started.
Active	Coal refuse placement is active.
Inactive	Coal refuse placement activity has ceased.
Complete	All coal refuse placement has been completed.

TABLE 23 Coal Preparation Plant Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit Status	See 5.6.15	Active	Text	See Table 2 for domains and definitions	
Facility Name	See 5.14.5.2	Plant A1	Text		
Permit ID	See 5.6.14	1201834	Text		
National ID	See 5.6.10	VA1201834	Text		
Coarse Refuse	See 5.14.5.1	Yes	Text	Yes, No	
Fine Refuse	See 5.14.5.3	Yes	Text	Yes, No	
Permit Application Date	See 5.6.11	01/30/2005	Date		
Permit Application Approval Date	See 5.6.12	01/30/2006	Date		
Edit Date	See 5.6.7	01/30/2007	Date		
Comment	See 5.6.3		Text		
Contact	See 5.6.5	Virginia Department of Mines, Minerals, and Energy	Text		

TABLE 24 Environmental Resource Monitoring Location Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit ID	See 5.6.14	3191	Text		Unique identifier for individual surface CMO's
Monitoring Site ID	See 5.15.5.3	S1	Text		Used to identify all environmental resource location points
National ID	See 5.6.10	TN3191	Text		
ERML Monitoring Type	See 5.15.5.2	Groundwater	Text	See Table 25 for domains and definitions	
Elevation	See 5.15.5.1	1205	Numeric		
Permit Application Date	See 5.6.11	08/30/2007	Date		
Permit Application Approval Date	See 5.6.12	08/30/2008	Date		
Edit Date	See 5.6.7	08/30/2009	Date		Used to determine the last data update
Comment	See 5.6.3		Text		
Contact	See 5.6.5	OSM-Tennessee	Text		

TABLE 25 Preferred Domain Definitions for ERML Monitoring Type

Domain Value	Definition
Groundwater	A collection of groundwater chemistry data used to monitor and evaluate biological, chemical, and environmental factors affecting water quality and quantity for potential impacts that may occur from surface CMOs. Groundwater monitoring and sampling locations may include monitoring wells, residential water wells, piezometers, springs, and seeps.
Surface Water	A collection of water chemistry and flow rate data used to monitor and evaluate biological, chemical, and environmental factors affecting water quality and quantity for potential impacts that may occur from surface CMOs. Surface water can include streams, rivers, wetlands, and ponds.
Geologic	A collection of information at locations identified in a coal mining permit application from which geologic samples have been collected by the applicant for submission in the application to the RA. The chemistry from these samples can be used by the RA to determine potential environmental impacts that may occur from CMOs. Sampling methods can include the use of drill-hole data, and highwall sampling techniques.
Graded Spoil Sampling	A collection of information from identified graded spoils used to determine that the properties are suitable for the placement of topsoil or substitute material.
Rain Gage	A device used to measure precipitation.
Trend Station	Any systematic, long-term, established ambient monitoring point used to measure or assess a pollutant level and subsequent changes by measuring the quantity and types of certain pollutants in stream sediments, water column, or in the interstitial water of the hyporheic zone associated with stream, river, or lacustrine deposits. The term may also apply to any long-term biological data which is used to reflect the quality, integrity, or biological support of a system and its habitat.
NPDES	National Pollutant Discharge Elimination System (NPDES)—a permit system for regulating point sources of pollution such as those originating from mining. Includes information from in-stream and outfall water discharges associated with mining operations, authorized under Section 402 of the Clean Water Act. The discharges from these points are sampled throughout the lifetime of the mining operation to ensure no environmental impacts are occurring as a result of mining and/or reclamation operations.
Subsidence	The movement of the ground as a result of the collapse of underground coal mine workings.
Topsoil Samples	A collection of information from all soil horizons used to evaluate the properties of the material for use as a growth medium in reclamation of mining related disturbances.
Topsoil Substitute	A collection of information from identified overburden materials used to evaluate the properties of the material for use as a growth medium that is equal to or better than the exiting soils for use in reclamation of miningrelated disturbances.
Mine Discharges	Acid or net alkaline mine drainages.
Other	Monitoring or sample locations may include air blasting, dam construction safety, air quality, construction, benthic, threatened and endangered species, and biological assessments.

TABLE 26 Postmining Land Use's Attributes

Attribute Name	Definition	Example	Data Type	Preferred Domain	Clarification
Permittee	See 5.6.16	ACME Coal Mining Co., Inc.	Text		The ADS should consider naming conventions for this attribute
Company	See 5.6.4	XYZ Coal Co.	Text		
Permit ID	See 5.6.14	1201834	Text		
National ID	See 5.6.10	VA12011834	Text		
Land Use Type	See 5.16.9.1	Forestry	Text	See Table 27 for domains and definitions	
Calculated Area	See 5.6.1	23400	Numeric		Used for comparison to the reported area value
Reported Area	See 5.6.18	23398	Numeric		Used for comparison to calculated area value
Permit Application Date	See 5.6.11	01/30/2005	Date		
Permit Application Approval Date	See 5.6.12	01/30/2006	Date		
Edit Date	See 5.6.7	01/30/2007	Date		Used to determine the last data update
Comment	See 5.6.3		Text		
Contact	See 5.6.5	West Virginia Department of Environmental Protection (WVDEP)	Text		

TABLE 27 Preferred Domain Definitions for Land Use Type

Domain Value	Definition
Pasture/Hayland	Land used primarily for the long-term production of forage plants to be grazed by livestock.
Grazing land	Land used for grasslands and forest lands where the indigenous vegetation is actively managed for grazing, browsing, or occasional hay production.
Forestry	Land used or managed for the long-term production of wood, wood fiber, or wood-derived products.
Residential	Single and multi-family housing, mobile home parks, or other residential lodgings.
Fish and Wildlife Habitat	Land dedicated wholly or partially to the production, protection or management of species of fish or wildlife.
Developed Water Resources (Water Impoundments)	Lands used for storing water for beneficial uses such as stock ponds, irrigation, fire protection, flood control, and water supply.
Public Utilities/Facilities	Schools, hospitals, churches, libraries, water treatment facilities, or solid waste disposal facilities.
Industrial and Commercial Services	Land used for extraction or transformation of materials for fabrication of products, wholesaling of products, or long-term storage of products. This includes all heavy or light manufacturing facilities.
Recreation	Land used for public or private leisure-time activities.
Undeveloped Land or No Current Use or Land Management	Land that is not developed or if previously developed allowed to return naturally to an undeveloped state or return to forest.
Cropland	Land used for the production of adapted crops for harvest.